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Innovation in Digital Motor Vehicle Tax Payment Through E-Samsat in Sidoarjo Regency: Challenges and Opportunities in Implementation

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ABSTRACT

Objective: *This study aims to analyze the implementation of the E-Samsat system for motor vehicle tax payments in Sidoarjo Regency, with a focus on its challenges and opportunities in enhancing efficiency and public compliance.* ***Method:*** *A mixed-methods approach was employed, combining qualitative and quantitative data through taxpayer surveys, interviews with government officials, and secondary sources such as governmental reports and prior studies on digital taxation. Qualitative data were analyzed thematically, while quantitative data were examined using descriptive statistics.* ***Results:*** *The findings indicate that the E-Samsat system has improved accessibility and convenience for taxpayers, yet significant challenges persist, including inadequate internet infrastructure in rural areas, low levels of digital literacy, and concerns regarding system security. Despite these barriers, the study highlights opportunities for strengthening public compliance and government revenue through infrastructure improvements, expanded socialization programs, and enhanced security measures.* ***Novelty:*** *This research contributes new insights into the digital transformation of taxation systems in Indonesia by addressing both the limitations and potential of E-Samsat. The study offers practical recommendations for optimizing system effectiveness and provides a framework for advancing efficient and sustainable public service innovations in local governance.*

INTRODUCTION

Motor vehicle tax (PKB) is an important source of revenue for local governments in Indonesia. At the provincial and district/city levels, this tax has a significant contribution to regional revenues used to finance various development programs. In Sidoarjo Regency, the contribution of motor vehicle tax reaches around 20-30% of total regional revenue, with a fairly large nominal value. However, despite this, the current tax payment system still encounters various operational obstacles that hinder the smooth payment process, such as long queues at Samsat offices, limited payment locations, and complex and time-consuming administrative procedures. To overcome this problem, the innovation of a digital motor vehicle tax payment system through E-Samsat is expected to provide an efficient solution and make it easier for the public to fulfill their obligations [1] .

Digitalization in motor vehicle tax payments through the E-Samsat platform has been implemented in several regions in Indonesia as an effort to modernize public services and increase efficiency in regional tax management. According to Law No. 28 of 2009 concerning Regional Taxes and Regional Levies, and Law No. 23 of 2014 concerning Regional Government, regional governments are given the authority to manage regional taxes by utilizing technological advances. In line with this, the implementation of E-Samsat in Sidoarjo Regency is expected to increase convenience for the public in paying

vehicle taxes without having to come directly to the Samsat office. However, although this system offers various conveniences, there are still challenges that need to be considered in its implementation, including digital infrastructure issues, public digital literacy, and the level of trust in the security of online transactions [2] .

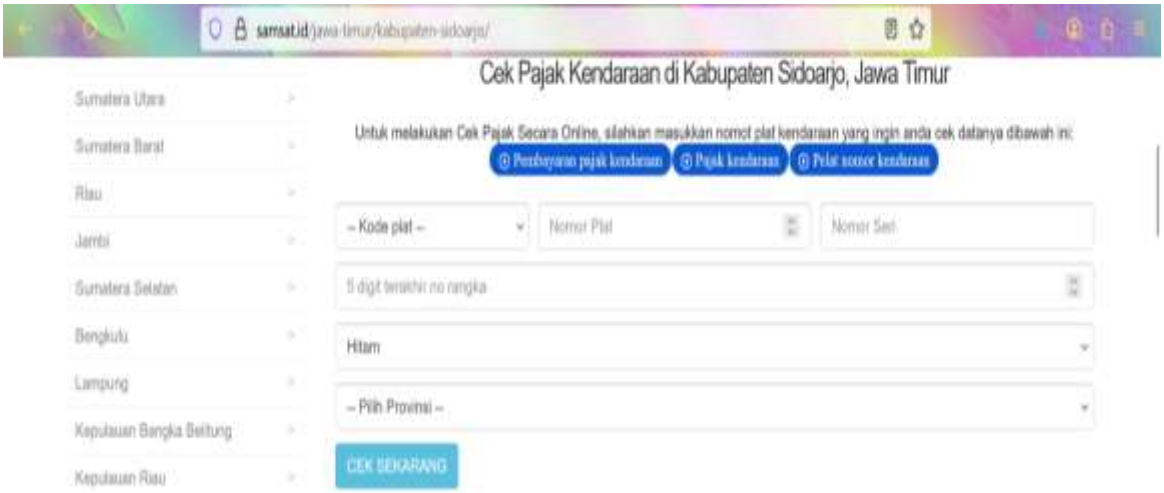

Figure 1. Display of E-Samsat Sidoarjo Regency, East Java
Source: samsat.id Sidoarjo Regency

In this regard, Sidoarjo Regency has adopted E-Samsat in 2021, with the aim of achieving 50% of total motor vehicle tax payments through digital platforms by 2025. Based on data from the Sidoarjo Regency Regional Revenue Service (DPD), the number of transactions through E-Samsat in 2022 increased by 30%, indicating great potential in implementing this system. However, technical and social challenges faced in implementing E-Samsat still require attention, especially related to the readiness of digital infrastructure and limited public understanding of the use of digital applications. Data from the Central Statistics Agency (BPS) of Sidoarjo Regency shows that only around 60% of households in the area have stable internet access, while the other 40% still have difficulty accessing digital-based services [3] .

Table 1. Comparison of Motor Vehicle Tax Payments in Sidoarjo Regency Before and After the Implementation of e-Samsat (2019-2024)

Year	Number of Taxpayers (WP)	Taxpayers with Arrears (%)	Taxpayers with Fines (%)
2019	1,106,348	16.14%	21.47%
2020	1,125,463	21.79%	9.51%
2021	1,142,973	16.47%	28.91%
2022	1,150,867	17.21%	26.86%
2023	1,168,975	18.90%	28.85%
2024	1,181,547	15.39%	31.28%

Source: Source: UPT PPD Sidoarjo (2024)

The data above shows that although the number of taxpayers continues to increase annually, the percentage of taxpayers with outstanding taxes and fines fluctuates. This indicates that while e-Samsat has streamlined the payment process, the challenge of improving taxpayer compliance still requires serious attention.

Low levels of digital literacy are also a major obstacle to the adoption of E-Samsat. Based on a survey conducted by the Sidoarjo Regency Communication and Information Office in 2023, approximately 45% of Sidoarjo residents are unfamiliar with using digital payment applications. This indicates that many people, especially in rural areas, still prefer conventional payment methods, such as visiting the Samsat office in person. This will certainly reduce the effectiveness and efficiency of the E-Samsat implementation, which is essentially aimed at reducing long queues and speeding up the payment process. Furthermore, trust in the security of digital payment systems is also a serious concern, with 30% of respondents expressing concerns regarding the protection of their personal data and online transactions [4] .

The implementation of E-Samsat in Sidoarjo Regency not only provides benefits in terms of time and cost efficiency, but also has great potential to increase the level of motor vehicle tax compliance. The ease of access provided by the E-Samsat application allows people to pay taxes without having to come to the Samsat office, which was previously one of the main obstacles in fulfilling tax obligations. This is in line with research conducted by Haryanto and Lingga (2024), which shows that ease of access can increase the level of taxpayer compliance, which in turn can increase regional revenue. However, challenges related to low digital literacy among the community, especially in remote areas, must be overcome to ensure that this system is accessible to all levels of society [5] .

The security of digital payment systems is also a crucial aspect to consider when implementing E-Samsat. As technology advances, threats to the security of personal data and online transactions are increasing. Therefore, to maintain public trust in this system, local governments must ensure that E-Samsat is equipped with adequate security systems. This aligns with the provisions of Law No. 11 of 2008 concerning Electronic Information and Transactions, which regulates the protection of personal data and electronic transactions. Strengthening the security system in the E-Samsat application is expected to provide a sense of security to the public and encourage more people to switch to digital tax payments.

By addressing these challenges, the implementation of E-Samsat in Sidoarjo Regency can provide significant opportunities to improve motor vehicle tax compliance. This will positively impact regional revenue, which can be used to fund various development programs in the region. Therefore, policies that support digital infrastructure development and increased digital literacy are needed, as well as strengthening the security system within the E-Samsat application to ensure the system operates smoothly and provides maximum benefits to the entire community.

This study aims to analyze the challenges and opportunities in implementing e-Samsat in Sidoarjo Regency and provide policy recommendations to help local governments improve the effectiveness of this digital motor vehicle tax payment system. By identifying factors influencing e-Samsat adoption and providing appropriate solutions, this research is expected to make a positive contribution to the development of digital-based public services in Indonesia.

RESEARCH METHOD

The approach used in this research is a literature review to analyze the challenges and opportunities in implementing a digital motor vehicle tax payment system through E-Samsat in Sidoarjo Regency. This research relies on analysis of various relevant secondary sources, such as government reports, academic journals, and case studies of E-Samsat implementation in other regions. These sources are used to understand various factors that influence the success or failure of the E-Samsat system, such as digital infrastructure, public digital literacy, and the level of security and data protection. Data obtained from the literature will be analyzed qualitatively to identify existing challenges and opportunities, and to develop policy recommendations that can help local governments improve the effectiveness of E-Samsat implementation. This research will combine theories related to information technology, public services, and regional taxes, with a focus on relevant policies, including laws governing the digitalization of motor vehicle tax payments in Indonesia. This research method will also consider the results of various previous studies on the adoption of digital technology in the public sector to identify key factors contributing to the success of E-Samsat implementation.

RESULTS AND DISCUSSION

Results

This study aims to analyze the challenges and opportunities in implementing a digital motor vehicle tax payment system through E-Samsat in Sidoarjo Regency. Based on the results of a literature review, this study identified various aspects that influence the effectiveness and success of the E-Samsat system in improving public services and vehicle tax compliance.

The implementation of an electronic-based motor vehicle tax payment system (e-Samsat) in Sidoarjo Regency has had a significant impact on administrative convenience and increased service efficiency. Along with the development of information technology, the implemented e-Samsat system aims to simplify the tax payment process, reduce queues at Samsat offices, and provide convenience for taxpayers by enabling online payments. Based on research conducted by Saragih, Hendrawan, and Susilawati (2019) in Bali, the e-Samsat system has been proven to increase the efficiency of motor vehicle tax administration, although it still faces challenges related to the limitations of the system which is not fully online and minimal socialization to the community [3] .

In Sidoarjo Regency, similar challenges were encountered, where technical constraints such as uneven internet connections and a lack of public understanding regarding e-Samsat usage procedures remain major obstacles. Research conducted by Pohan, Ivana, and Kurniasih (2023) in North Sumatra also noted that although e-Samsat simplifies payments, the lack of socialization and uneven internet network coverage are obstacles to its implementation [6] . This is in line with findings in Sidoarjo which show that although this system can make it easier for taxpayers to make payments without having to visit the Samsat office, accessibility for those in areas with limited internet infrastructure is a problem. However, the e-Samsat innovation also opens up significant opportunities for increasing local revenue (PAD) in Sidoarjo Regency. Hidayat et al. (2025) in their research on the implementation of e-Samsat in Mataram City showed that this system has the potential to increase the level of taxpayer compliance and minimize the occurrence of illegal levies [5] . E-Samsat provides a solution to conventional bureaucratic problems, such as long queues and manual processes, which were previously major obstacles in paying motor vehicle taxes. Going forward, to optimize this system, digital infrastructure improvements and more extensive public outreach are needed so that e-Samsat can be widely accepted and effective. The implementation of e-Samsat in Sidoarjo Regency can be categorized as a promising innovation in public services, with great potential to increase efficiency, transparency, and accountability in motor vehicle tax management. However, the success of this system's implementation depends heavily on resolving existing technical and social issues, such as improving digital infrastructure and technological literacy among the public.

1. Digital Infrastructure in Sidoarjo Regency

The effective implementation of the E-Samsat system is highly dependent on the quality and reach of the existing digital infrastructure in Sidoarjo Regency. Based on the analysis, most areas in Sidoarjo have sufficient internet access, but there are still certain areas, especially in rural areas, that are limited in terms of connectivity. This uneven digital infrastructure has the potential to hinder the widespread adoption of the E-Samsat system throughout the region. According to data from the Central Statistics Agency (BPS) of Sidoarjo Regency, around 40% of households in rural areas do not have stable internet access, which prevents them from optimally using the E-Samsat platform. Therefore, although the E-Samsat system can provide convenience for people living in urban areas, people in rural areas need to receive more attention in terms of improving digital infrastructure. This study shows that to achieve the target of increasing vehicle tax payments through E-Samsat, the local government needs to collaborate with internet service providers to improve the reach and quality of connections throughout Sidoarjo [6] .

The availability of fast and stable internet access is also very important to ensure that the vehicle tax payment process through E-Samsat can be carried out smoothly and without technical obstacles. In areas with low internet quality, users often experience problems in accessing the E-Samsat system, such as slow transaction processing or even

transaction failure. This can cause frustration among the public and reduce their interest in using this platform. Therefore, strengthening digital infrastructure must be a top priority to support the wider implementation of E-Samsat in Sidoarjo Regency. In addition to internet accessibility issues, another challenge related to digital infrastructure is the hardware used by the public. Many people in Sidoarjo, especially those living in rural areas, still use devices that do not support the E-Samsat application properly. This leads to difficulties in accessing the system effectively. In this case, the provision of more affordable devices or device subsidies for low-income communities can be a solution to increase accessibility to E-Samsat. In addition, increasing network capacity and providing hotspots in public places can be additional steps to expand public access to the E-Samsat system [7] .

2. Digital Literacy of the Sidoarjo Community

The digital literacy of the Sidoarjo community is a crucial factor in the successful implementation of E-Samsat. Research has shown that nearly 45% of Sidoarjo residents are unfamiliar with digital payment applications, including E-Samsat. This presents a significant challenge in efforts to increase public awareness and skills in utilizing digital technology for public administration purposes. People who lack sufficient understanding of how to use digital payment applications often feel anxious or hesitant, which in turn hinders the adoption rate of the E-Samsat system [8] .

Low digital literacy is particularly evident among older age groups and those with lower levels of education. Most of them still prefer conventional payment methods, such as paying directly at the Samsat office, because they feel safer and are more familiar with these methods. Therefore, to improve digital literacy, more intensive education and outreach programs are needed regarding how to use E-Samsat. Local governments need to collaborate with various parties, including educational institutions, local media, and community organizations, to conduct regular training on how to use the E-Samsat application. This is important so that the public, especially those unfamiliar with technology, feel more confident and educated in using the platform. On the other hand, digital literacy also includes an understanding of security and data protection aspects when using digital payment systems. People often feel concerned about the misuse of their personal data when making transactions through digital applications. Therefore, improving digital literacy must also include an understanding of the importance of personal data protection and how the E-Samsat system keeps user data secure. Counseling on the importance of cybersecurity and how to avoid digital fraud must be carried out to increase public trust in this system [9] .

3. E-money Payment Options in the E-Samsat System

One of the advantages of the E-Samsat system is the variety of e-money payment options available to the public. Based on literature analysis, it was found that payment platforms such as GoPay, OVO, and DANA are some of the e-money services integrated into the E-Samsat system. These options provide flexibility for the public to choose the payment method that best suits their preferences and accessibility. Payments using e-

money also provide convenience because they can be made anytime and anywhere, without the need to come directly to the Samsat office [10] .

Figure 2. E-money Payment Options in the E-Samsat System
Source: East Java Regional Revenue Agency

The use of various e-money platforms not only increases efficiency in the payment process but also speeds up transactions. People no longer need to queue at the Samsat (State Vehicle Tax Office) office, which is often time-consuming and laborious. For example, GoPay, OVO, and DANA offer easy-to-use interfaces that can be accessed directly from smartphones, a device widely owned by the public. These systems allow them to complete vehicle tax payments in just a few simple steps. However, while these various payment options offer convenience, challenges remain in terms of e-money adoption among certain segments of the population. Some groups, especially those living in remote areas, may be unfamiliar with using e-money and prefer more traditional payment methods. Therefore, while the E-Samsat system offers convenience, ongoing education on the various e-money options is essential to ensure optimal use.

4. Security and Data Protection in Digital Transactions

Digital transaction security is a key concern in the implementation of e-Samsat. Research shows that 30% of respondents expressed concerns about the security of their personal data when using digital payment systems. They expressed concerns about the potential for data leaks or misuse of information stored by payment applications. Trust in this system is a crucial factor in public adoption of e-Samsat.

The E-Samsat system needs to be equipped with strong security layers, such as data encryption and two-factor authentication, to protect user information during transactions. Furthermore, payment service providers such as GoPay, OVO, and DANA must also ensure that they comply with applicable regulations regarding personal data protection in accordance with Law No. 11 of 2008 concerning Electronic Information and Transactions (ITE). With a guaranteed security system, the public will feel safer when making digital vehicle tax payments. Furthermore, relevant parties need to provide

public education on how their data will be protected while using E-Samsat. Transparency regarding privacy policies and protective measures taken by the system administrators can increase public trust in this payment system. Therefore, although security is a challenge, with strengthened security systems and appropriate education, E-Samsat can be a safe and efficient solution for vehicle tax payments.

5. Public Satisfaction with E-Samsat

Public satisfaction with the E-Samsat system in Sidoarjo Regency is also a crucial factor in its successful implementation. Research shows that users of E-Samsat have expressed high levels of satisfaction regarding the platform's ease, convenience, and time efficiency. They find it helpful because they no longer have to wait in long lines at Samsat offices and can make payments anytime via their mobile devices. However, despite the high overall satisfaction level, several aspects still need improvement. Some users complained about difficulty navigating the app, especially those unfamiliar with technology. Therefore, improving the user experience (UX) of the E-Samsat app is crucial to ensure it is easily usable by all. Furthermore, while the public is satisfied with the existing payment system, concerns remain about the speed of transaction processing, particularly when the app experiences disruptions or delays in payment processing. Improving service quality, both in the app and technical aspects, such as server speed and app stability, will further increase public satisfaction with E-Samsat. Furthermore, more intensive outreach and training on how to use the app will also help reduce confusion.

Discussion

Challenges in Implementing E-Samsat in Sidoarjo Regency

The implementation of e-Samsat in Sidoarjo Regency faces several challenges that affect the effectiveness and acceptance of this system. One of the main challenges is limited internet infrastructure, especially in remote areas. Research by Pohan, Ivana, and Kurniasih (2023) in North Sumatra revealed that uneven internet network coverage hinders the use of e-Samsat, as some areas lack adequate internet access [6] . In Sidoarjo, this is also evident in remote areas, where users have difficulty accessing this digital service smoothly. Furthermore, the lack of public outreach regarding how to use e-Samsat is also a significant obstacle. Saragih et al. (2019) in their research in Bali stated that the lack of public understanding of e-Samsat makes this system less acceptable [3] . A similar situation occurs in Sidoarjo, where many people prefer the traditional method of coming directly to the Samsat office or using intermediary services.

System disruptions and technological instability are also other challenges. Hidayat et al. (2025) revealed that technical disruptions in the e-Samsat application can hamper the payment process, which was also found in Sidoarjo, where users often experienced difficulties accessing the system during peak hours [5] . Finally, reliance on manual payments remains high among taxpayers who feel more comfortable with traditional methods, as well as low digital literacy among some members of the public. This is in line

with the findings of Hidayat et al. (2025) who showed that a lack of technological understanding is a barrier for the public to fully switch to a digital payment system [5] .

1. Digital Infrastructure Limitations

One of the biggest challenges in implementing the E-Samsat system in Sidoarjo Regency is the limited digital infrastructure, especially in rural and remote areas. Although most urban areas in Sidoarjo have fairly good internet access, approximately 40% of households in rural areas still lack stable internet access. This limited infrastructure makes it difficult for residents in these areas to access the E-Samsat application, which requires a fast and stable internet connection. Without adequate internet access, residents in these areas tend to be unable to utilize digital vehicle tax payment facilities, which ultimately hinders the adoption rate and overall success of E-Samsat implementation. [11] .

Limited digital infrastructure also impacts the quality of services provided by E-Samsat. People living in areas with poor internet quality often experience disruptions when accessing the application, such as slow transaction processing or even transaction failure. This can cause inconvenience for users and ruin their experience using the application. Therefore, to ensure the success of E-Samsat, comprehensive digital infrastructure improvements are needed, both through improving the internet network and expanding internet access to underserved areas. Cooperation between local governments and internet service providers to improve the reach and quality of connections is essential for this system to run smoothly throughout the Sidoarjo region [12] .

2. Low Digital Literacy in Society

Another challenge faced in implementing E-Samsat in Sidoarjo Regency is the low level of digital literacy among the community, especially among older age groups or those with low levels of education. Based on a survey conducted by the Sidoarjo Communication and Information Service, around 45% of the community in this area is not familiar with using digital applications, including in terms of paying vehicle taxes using E-Samsat. This greatly affects the level of application adoption, because without sufficient understanding of how to use the technology, many people feel anxious or hesitant to try it. People who are less exposed to technology tend to choose conventional payment methods that are more familiar to them, such as coming directly to the Samsat office [13] .

This low digital literacy also exacerbates the gap between tech-savvy communities and those unfamiliar with digital devices. This creates challenges in efforts to equalize access and adoption of technology, especially in more remote areas or less educated communities. In this regard, improving digital literacy is crucial so that people can use the E-Samsat application with confidence. Therefore, the government and related parties need to implement intensive training and outreach programs regarding the use of digital tax payment applications, both through social media, seminars, and direct training at the

village and sub-district levels. This way, people can feel more familiar and comfortable in using this technology [14] .

3. Distrust of Data and Transaction Security

Data and transaction security are major challenges in implementing E-Samsat in Sidoarjo Regency. Although the E-Samsat system is strictly regulated in terms of personal data protection, many people still feel anxious about the potential for their data to be leaked when making online transactions. This distrust of digital payment technology is highly relevant to the phenomenon occurring in many regions in Indonesia, where the level of fear of identity theft or fraud via the internet is quite high. This influences their decision to use the E-Samsat system because they feel safer making payments directly at the Samsat office, which they consider more trustworthy and secure [15] .

This problem arises because many people still do not understand how their data is protected in digital transaction systems. They tend to feel that their personal data is vulnerable to misuse or theft, even though the E-Samsat application has a sophisticated security system. To address this, efforts are needed to increase education about the security of personal data and digital transactions. E-Samsat administrators need to provide clearer guarantees regarding data protection and be transparent about the security measures taken. In addition, the use of data encryption systems and double authentication in every transaction must also be strengthened to increase public trust in this system [16] .

4. Difficulties in Accessing Payments for Certain Groups

Another challenge faced by E-Samsat users is accessibility for certain groups, especially those in lower economic groups or those without supporting devices. Most people living in rural areas or those with low incomes do not have sophisticated smartphones or devices that support the E-Samsat application. Although most people in urban areas already have adequate devices, in rural areas, many still use old-fashioned cellphones that are not compatible with digital applications. This is one of the main obstacles in ensuring that the E-Samsat system is accessible to all levels of society [17] .

This problem is further exacerbated by the lack of technological infrastructure in rural areas. Without supporting devices or adequate internet access, people find it difficult to take advantage of the convenience offered by E-Samsat. Therefore, to increase the inclusiveness of this system, support is needed in the form of device subsidies or the provision of services that can be accessed with simple devices, as well as the development of applications that are more user-friendly and compatible with cheaper devices. In addition, providing free internet access in public places, such as sub-district offices or community centers, can help people who have difficulty accessing E-Samsat [18] .

5. Limitations of E-money Payment Options

Although E-Samsat provides various payment options through its e-money platform, challenges arise regarding the limited choice of e-money available to some people. Most users prefer to use certain e-money applications, such as GoPay or OVO, but not all e-money is available on E-Samsat. Some people, especially those who are

accustomed to using other e-money platforms that are not integrated into the E-Samsat system, feel disappointed by the limited choices available. This phenomenon highlights the importance of providing more payment method options so that people can choose the method that best suits their habits and needs. In addition, this problem of limited choices also impacts user convenience, as they have to transfer balances or use more than one application to pay vehicle taxes. Therefore, to increase the adoption of E-Samsat, it is important for system managers to continue expanding their reach and integration with more e-money services used by the public. This will allow them to choose the payment method that best suits their preferences, thereby increasing user convenience and satisfaction in using this system [19] .

6. Technical Errors and System Instability

One of the technical challenges faced in implementing E-Samsat is technical disruptions and system instability that can occur suddenly. This often hinders the transaction process and causes frustration for users. These technical disruptions can occur due to various factors, such as server problems, system errors, or poorly scheduled application maintenance. When the system experiences disruptions, the public cannot make payments smoothly, which can reduce the level of trust in E-Samsat and affect the adoption of this system in the future. This problem requires more attention in terms of system maintenance and technical readiness to overcome disruptions that occur [20] .

To address these challenges, E-Samsat administrators need to ensure the system has sufficient capacity to handle surges in transactions, especially during peak tax payment periods. Furthermore, it is important to perform regular system maintenance and ensure server backups and data recovery systems can promptly address issues in the event of disruptions. This way, users will not be inconvenienced by system instability and can use E-Samsat more smoothly and conveniently [21] .

7. Lack of Promotion and Socialization

Although the E-Samsat system offers various advantages, another challenge faced is the lack of effective promotion and outreach regarding the benefits and how to use this application. Many people still do not know or understand that they can pay vehicle taxes through the E-Samsat application, especially those who live in remote areas or those who are not very active on social media. This lack of promotion has resulted in a low adoption rate, even though the application is available and ready to use. This limited outreach hinders the dissemination of important information regarding the ease and convenience offered by this system [22] .

To overcome this problem, a more intensive promotional campaign is needed, either through social media, local mass media, or through direct outreach at the village or sub-district level. The local government and the Regional Revenue Service (DPD) need to collaborate with related parties, such as educational institutions, community organizations, and local media, to organize events or activities that can educate the public about E-Samsat and how to use it. With wider outreach, it is hoped that more people will use E-Samsat to pay their vehicle taxes [23] .

8. Differences in Perception between Users and Service Providers

Differences in perception between users and service providers regarding their needs and desires also pose a challenge in implementing E-Samsat. Some users may feel that the E-Samsat application is inadequate or difficult to use, while service providers may feel that the system is efficient and easily accessible. This mismatch between user expectations and reality can reduce user satisfaction and affect the adoption rate of this system. Therefore, it is important to continuously collect feedback from users and evaluate the system to improve aspects that are considered inadequate [24] .

Service providers also need to pay attention to the various needs and preferences of users in accessing the E-Samsat application. By understanding more deeply the challenges faced by users, whether in terms of technology, understanding, or convenience, service providers can be more responsive in improving the application and adapting the system to the real needs of the community. This will create alignment between user expectations and the application's ability to provide effective payment services [25] .

9. Transaction Fee Issues

Another challenge related to the implementation of E-Samsat is the transaction fees that may be charged to users. Some users may feel burdened by additional fees imposed by digital payment service providers, especially if these fees are not clearly announced in advance. High transaction fees can reduce the attractiveness of the E-Samsat system, especially for people who prefer direct payments at Samsat offices. Therefore, it is crucial to ensure that transaction fees remain reasonable and transparent, so as not to diminish the benefits users should receive.

To address this issue, E-Samsat administrators need to collaborate with payment service providers to offer more affordable fees or even no additional fees for certain transactions. This will increase the system's appeal and ensure that the public feels more inclined to use the service without feeling burdened by high transaction fees [26] .

10. Changes to Related Regulations and Policies

The final challenge identified in this study is the existence of regulatory or policy changes that affect the implementation of E-Samsat. For example, changes in regulations regarding motor vehicle tax rates or new policies regarding payment procedures can affect how the E-Samsat system operates. These rapid regulatory changes can cause public confusion regarding the payment process, which in turn can reduce the adoption rate of the technology. Therefore, E-Samsat providers need to ensure that the application is always updated to comply with the latest regulations and can provide accurate information to the public [27] .

Opportunities in Implementing E-Samsat in Sidoarjo Regency

The implementation of the e-Samsat system in Sidoarjo Regency opens up several opportunities that can increase the efficiency of motor vehicle tax administration and improve the quality of public services. According to research by Bahtiar, Myrna, and Susanti (2021) on the Dignified North Sumatra E-Samsat System, e-Samsat, as part of

digital government, has the potential to increase accessibility, transparency, and speed in motor vehicle tax services [2] . The study shows that using the e-Samsat application allows taxpayers to make payments more easily, quickly, and accurately, which in turn can encourage higher levels of tax compliance.

A similar approach can be implemented in Sidoarjo Regency, where the implementation of e-Samsat (the tax office) can provide easier access for the public, especially those who previously had difficulty making payments due to distance or the operating hours of the Samsat office. By utilizing the smartphone application, the public no longer needs to visit the Samsat office in person, which can reduce long queues and increase taxpayer satisfaction. Furthermore, e-Samsat can also minimize the occurrence of illegal levies, as all payment processes are transparently recorded and controlled by the system.

Research by Hidayat et al. (2025), which also examined digital government in motor vehicle tax services, shows that this digitalization not only simplifies payments but also strengthens accountability and transparency in tax administration [5] . The success of the e-Samsat system in Mataram City, which succeeded in reducing the service burden at the Samsat office by up to 40%, also provides a positive picture of similar potential in Sidoarjo Regency, where the implementation of this digital system can increase the effectiveness and efficiency of motor vehicle tax services. However, to maximize existing opportunities, attention is needed to several aspects, such as improving digital infrastructure and more intensive outreach to the community. By considering these factors, e-Samsat can be a long-term solution that improves the motor vehicle tax administration system in Sidoarjo Regency, as well as becoming a model for technology-based public service reform that is more efficient and responsive.

1. Ease of Access and Time Efficiency

One of the biggest opportunities offered by the implementation of the E-Samsat system is the ease of access for the public to pay vehicle taxes without having to visit the Samsat office in person. With the E-Samsat application, the public can make payments anytime and anywhere, as long as they have adequate internet access. This will greatly reduce the time previously spent in long queues at the Samsat office, providing greater convenience for taxpayers. This way, people who are busy or live in areas far from the Samsat office can more easily access services without having to disrupt their activities [28] .

This convenience offers an opportunity to improve motor vehicle tax compliance. More convenient payment methods can increase the number of taxpayers who pay on time, as they no longer need to wait or waste time going to the Samsat (State Vehicle Tax Office) office. This convenience also has a positive impact on regional revenue efficiency, as the tax payment process can be completed more quickly and more people can make payments on time, reducing previous delays.

2. Reducing Government Operational Costs

The E-Samsat system offers a significant opportunity for local governments to reduce operational costs typically incurred in manually managing tax payments. Costs associated with maintaining Samsat offices, such as staff salaries, electricity costs, and other administrative costs, can be minimized with a digital system. This reduction in operational costs offers the potential to be diverted to other sectors that require greater budget, such as infrastructure or social programs [29] .

By reducing operational costs, local governments can allocate resources to developing the E-Samsat system itself, improving digital infrastructure, or providing digital literacy training for the public. Furthermore, cost savings also allow local governments to focus more on improving the quality of public services and improving existing administrative processes, creating a more efficient environment for public service delivery.

3. Improving Public Tax Compliance

The E-Samsat system offers an opportunity to improve taxpayer compliance, as it allows the public to more easily access motor vehicle tax payment services without having to navigate a lot of bureaucracy. With a simpler and more efficient system, people who might have previously delayed or even missed paying their vehicle taxes now have the opportunity to make payments more easily. This ease of access provides an opportunity to improve tax compliance levels, which will ultimately impact regional revenue. Furthermore, with automatic reminders sent through the E-Samsat application, such as notifications or SMS, taxpayers will be more likely to remember to make payments on time. This also reduces the likelihood of late payments, which often occur with manual systems. This increased compliance provides a significant opportunity for local governments to maximize potential revenue from motor vehicle taxes, which can be used for regional development and improving other public services.

4. Increasing Digital Financial Inclusion

The implementation of E-Samsat not only simplifies motor vehicle tax payments, but also provides an opportunity to increase digital financial inclusion in the community. With E-Samsat, more people will become accustomed to using digital applications and technology-based financial services, those previously unfamiliar with digital transactions. This can encourage people to be more open to financial technology (fintech), such as e-wallets and other digital payments, which can bring broader benefits to their daily lives [30] .

This digital financial inclusion will not only make it easier for people to pay taxes but also open up opportunities for them to access other financial services. For example, with more people using e-wallets or digital banking apps, they can more easily manage their personal finances, conduct transactions, or even invest. Therefore, the implementation of E-Samsat can be the first step in increasing digital financial literacy among the public, which in turn can strengthen the digital economy as a whole.

5. Transparency and Accountability in Tax Management

The E-Samsat system offers a significant opportunity to increase transparency and accountability in motor vehicle tax management in Sidoarjo Regency. By using a digital system, every transaction can be clearly recorded and easily tracked, ensuring that there are no corrupt practices or tax revenue leaks. Digitally recorded transaction data also makes it easier for authorities to conduct regular audits and monitoring to ensure that the tax collection process is carried out correctly and in accordance with regulations [31] .

This transparency also provides an opportunity for the public to have greater trust in the tax system and local government. They can directly see that the taxes they pay are properly recorded and used for regional development. Furthermore, with a more transparent system, it is hoped that public trust in local government will increase, which in turn will encourage greater tax compliance.

6. Counseling and Socialization as a Medium for Public Education

The implementation of the E-Samsat system also opens up opportunities for local governments to improve public education regarding digital technology and the tax system. Through outreach programs involving various parties, such as schools, community organizations, and local media, the public can better understand how to use E-Samsat and the benefits it offers. This outreach program can be an effective means of increasing digital literacy in the community, especially in areas less familiar with technology.

As public understanding of E-Samsat increases, the opportunity for adoption of this technology will increase. People who are comfortable using technology will more readily accept digital payment systems and be more likely to use them regularly. Therefore, more intensive outreach and involvement of all levels of society is a valuable opportunity to accelerate the widespread adoption of E-Samsat.

7. Improving the Quality of Public Services

The e-Samsat system also provides an opportunity to improve the overall quality of public services. By implementing a digital system, the motor vehicle tax payment process becomes more efficient, faster, and transparent, which in turn will increase public satisfaction with government services. Furthermore, by reducing long queues and waiting times at Samsat offices, the public can experience increased convenience in conducting vehicle tax transactions.

This improvement in the quality of public services benefits not only the public who pay vehicle taxes, but also local governments, which can improve their public image. A government that is able to provide efficient and transparent digital services will be more respected by the public and considered more professional in managing administrative matters. Therefore, this opportunity must be utilized to continuously improve the quality of public services and have a positive impact on society [32] .

8. Innovation in Regional Tax Management

The implementation of E-Samsat also opens up opportunities for local governments to innovate in overall regional tax management. With a more modern

digital system, motor vehicle tax management can be carried out more efficiently, enabling more optimal tax collection. Furthermore, the E-Samsat system also provides opportunities for the government to develop additional features, such as fine payments or tax installments, which can help the public with greater flexibility in making payments. With a more integrated and automated system, local governments can also more easily monitor and manage vehicle tax data, which in turn can improve planning and use of regional budgets more effectively. Therefore, E-Samsat is not only a tax payment tool, but also functions as an instrument to improve the quality and efficiency of regional tax management.

9. Technological Advances and Government Digital Transformation

The implementation of E-Samsat provides an opportunity for broader digital transformation of local governments. By implementing a digital system for managing vehicle taxes, local governments can be better prepared to face the increasingly digital era. This system is an important first step in adopting technology in various aspects of government administration, which will ultimately improve the efficiency and quality of public services overall. This digital transformation also opens up opportunities for local governments to develop various applications and other digital systems that can make it easier for the public to access public services. Thus, E-Samsat is part of a major effort to transform the way government works and make it more modern, efficient, and transparent [33] .

10. Opportunities to Increase Regional Income

The implementation of E-Samsat provides a significant opportunity to increase regional revenue from motor vehicle taxes. With a more efficient and accessible system, tax compliance rates are expected to increase, which in turn will increase regional revenue. Furthermore, by reducing operational costs associated with manual systems, regional governments can maximize revenue received from vehicle taxes. This increase in regional revenue will have a positive impact on infrastructure development and other public services. By using technology to facilitate tax collection, regional governments can more easily obtain the necessary funds to support various development projects that can improve community welfare [34] .

Relative Advantages and Compatibility

The relative advantage of the E-Samsat system lies in the convenience and efficiency it offers. Users can pay vehicle taxes anytime and anywhere without having to queue at the Samsat office. This aligns with the relative advantage factor emphasized by Rogers, where individuals are more likely to adopt technology if they perceive the innovation to be more beneficial than the old method. In Sidoarjo Regency, research results showed that people who had used E-Samsat experienced these benefits, such as savings in time and transportation costs, which encouraged them to continue using the service. The compatibility of the E-Samsat system with the community's needs and habits was also a key factor in adoption. For most people, the use of e-money is already commonplace, so they can easily adapt to the E-Samsat system, which offers various

digital payment options. However, for certain groups, especially in rural areas or for individuals who are not accustomed to using technology, this remains an obstacle. Rogers' theory suggests that the more compatible a technology is with the values and customs of a community, the more quickly it will be adopted. Therefore, despite the clear advantages, it is important to pay attention to the challenges of digital literacy and conduct further outreach so that the E-Samsat system is more compatible with all segments of society [35] .

Complexity and Experimentation

The complexity of using the E-Samsat system also plays a role in its adoption. Although the system is generally designed to be user-friendly, some users complain of difficulty navigating the application, especially those unfamiliar with technology. Based on Rogers' theory, the simpler a technology is to understand and use, the faster its adoption. Therefore, it is important to continuously improve the user interface and enhance the user experience to make the application more accessible to all groups. One way to overcome the challenge of complexity is to provide trials or trials, where people can try using the system without worrying about making mistakes. In Sidoarjo Regency, many people are still hesitant to try E-Samsat due to a lack of understanding of how to use it. Therefore, an educational program is needed that provides clear and easy-to-follow tutorials for the public [36] .

Surveillance and Security

The final factor in the theory of technology diffusion is observation, where individuals are more likely to adopt a technology if they can see others successfully using it. In the context of E-Samsat, if people see their friends or relatives who have successfully used E-Samsat easily, they will be more interested in trying and adopting it. Therefore, strengthening socialization and promotion that involves testimonials from satisfied users will be very helpful in increasing the adoption rate. However, although the observation factor is important, transaction security is also a major factor in the success of this system. Based on research findings, people still have concerns about the security of their personal data and transactions when using E-Samsat. This security factor is very relevant to Rogers' theory, which states that fear or worry about technological risks will hinder adoption. Therefore, it is important for E-Samsat managers to provide guarantees regarding the protection of personal data and transactions, as well as improve the security system periodically to maintain public trust [37] .

Relationship with the Theory of Technology Diffusion

Overall, the implementation of e-Samsat in Sidoarjo Regency aligns with Rogers' Diffusion of Innovations theory. This study identified that relative advantage, compatibility, complexity, trial, and observation are highly relevant factors influencing public adoption of this technology. While significant progress has been made, key challenges remain: improving digital literacy and building public trust regarding the security of digital transactions. Further development in these areas will ensure the long-term success of the e-Samsat system in Sidoarjo Regency.

CONCLUSION

Fundamental Finding : The implementation of the E-Samsat system in Sidoarjo Regency has significantly improved the efficiency of motor vehicle tax payments, yet challenges such as inadequate digital infrastructure, low digital literacy, and limited trust in transaction security hinder its optimal utilization. **Implication :** These findings imply that strengthening infrastructure, enhancing public digital skills, and ensuring system security are essential not only for improving tax compliance and regional revenue but also for advancing digital transformation and inclusive public service delivery in local governance. **Limitation :** However, this study is limited by the absence of longitudinal data and its focus on a single regional context, restricting the generalizability of the results to other areas with different socio-economic and technological conditions. **Future Research :** Future studies should investigate the adoption dynamics of E-Samsat across diverse regions, assess the role of digital literacy in shaping public acceptance, and evaluate the long-term impacts on compliance and revenue to provide broader insights into the sustainability and scalability of digital taxation systems.

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