

## ANALYSIS OF THE EFFECTIVENESS OF THE IMPLEMENTATION OF THE ELECTRONIC LICENSING SYSTEM (SIPECI) AND ITS IMPACT ON THE PRODUCTIVITY OF MSMEs IN THE INDUSTRIAL AREA OF CILEGON CITY

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### Abstract

This study evaluates the impact of technological infrastructure gaps on the effectiveness of the Cilegon Electronic Licensing Information System (SIPECI) in enhancing administrative efficiency and supporting micro, small, and medium enterprises (MSMEs) in Cilegon City, Indonesia. As a major industrial hub, Cilegon requires efficient and inclusive licensing services to support its economic ecosystem. The research employs a mixed-methods approach, combining quantitative surveys of 100 MSME respondents with qualitative interviews involving key stakeholders. The results indicate that SIPECI significantly reduces licensing completion time from 14 days to 3-5 days, improving service efficiency by 64-78%, while also lowering administrative costs by 20-30%. SIPECI positively impacts MSME productivity, increasing average business revenue by 15-25% and facilitating access to formal financing. However, significant challenges remain, including limited internet access in peripheral areas and insufficient server capacity, which hinder system performance and inclusivity. Additionally, low digital literacy among users further restricts system utilization. The findings highlight the need for improved technological infrastructure, expanded internet accessibility, and enhanced server capacity to ensure system reliability and inclusivity. Further, digital literacy training programs are essential to maximize SIPECI's benefits. This study contributes to the e-government literature by providing empirical insights into the challenges and impacts of implementing digital licensing systems in industrial regions. Future research should explore comparative analyses across regions and assess the long-term impacts of such systems on local economic growth.

**Keyword:** SIPECI (Cilegon Electronic Licensing Information System), E-government, Digital transformation, Digital-based public services, MSMEs (Micro, Small, and Medium Enterprises)

### INTRODUCTION

Digital transformation in public services has become one of the main strategies in increasing government efficiency, transparency, and accountability. The concept of e-government or electronic government exists as an effort to overcome conventional



bureaucratic obstacles that are often slow, inefficient, and less responsive to the needs of the community (Lenak et al., 2021). One of the real applications of e-government is the electronic licensing system, which allows the licensing administration process to be carried out online to shorten time, reduce costs, and increase service transparency. In the context of the local economy, the electronic licensing system has a significant impact, especially for micro, small, and medium enterprises (MSMEs) which are often burdened by long and expensive bureaucratic processes (Yustina & Zainuri, 2022).

In Indonesia, the implementation of the electronic licensing system has become a policy focus in order to encourage a more conducive business climate. Local governments have an important role in adopting technology to support the digital transformation of public services. One of the cities that has implemented this system is Cilegon City, Banten Province. As a strategic industrial area, Cilegon City has a high level of economic activity with the dominance of the manufacturing and trade sectors. MSMEs play a key role in supporting large industrial supply chains, creating jobs, and encouraging inclusive economic growth. However, access to fast, efficient, and transparent licensing services remains a major challenge in the region.

To overcome these obstacles, the Cilegon City Government developed the Cilegon Electronic Licensing Information System (SIPECI) as a digital solution to simplify the business licensing process. SIPECI is designed to cut permit processing time from 14 working days to 3-5 working days, reduce administrative costs, and improve the accessibility of services through online platforms. In addition, this system is also expected to improve service transparency with a real-time application status tracking feature. With the presence of SIPECI, it is hoped that MSMEs can obtain business legality faster, open access to formal funding, and increase competitiveness in a wider market.

Although the implementation of SIPECI has brought tangible benefits in improving service efficiency, its effectiveness is still affected by a number of challenges. One of the biggest obstacles is the gap in technological infrastructure, especially in the suburbs of Cilegon City. The results of Dewi et al. (2023) show that uneven internet access in developing areas is often the main barrier to the use of digital systems. In the suburbs of Cilegon City, 40% of users reported difficulties in accessing SIPECI due to limited internet networks. This creates a digital disparity between downtown areas that have adequate infrastructure and technologically lagging suburbs.

In addition, limited server capacity is also a significant challenge. Technical glitches, such as data processing delays or login failures, were reported by 30% of respondents during busy periods, especially when spikes in the number of applications occurred. These findings are consistent with the study by Lenak et al. (2021), which stated that the limited capacity of technological infrastructure, such as servers and software, can hinder the performance of digital services. In the context of industrial estates with a high level of economic activity, this technical disruption has a direct impact on the productivity of business actors and reduces user trust in the system.

The low digital literacy among some MSME actors is also an obstacle to the optimal use of SIPECI. Most MSME actors, especially from the older generation, have difficulty



using technology-based platforms. This lack of digital understanding and skills is exacerbated by the lack of socialization and assistance from the government. The study by Yunus et al. (2023) emphasizes that digital literacy is a key factor in the successful implementation of e-government, especially in areas that are still in the technology development stage.

In the context of Cilegon City as an industrial area, the effectiveness of SIPECI implementation is highly dependent on the readiness of technological infrastructure and user capacity in utilizing the system. The complexity of the economy in industrial estates demands more efficient, fast, and stable services to support the productivity of MSMEs and the competitiveness of the local economy. However, previous studies tended to ignore the differences in characteristics between industrial estates and non-industrial areas in the implementation of e-government. This gap points to the need for more in-depth research to evaluate the extent to which technological infrastructure affects the success of digital services in environments with higher economic complexity (Dewi et al., 2023; Lenak et al., 2021).

Based on this problem, this study aims to evaluate the impact of the technological infrastructure gap on the implementation of SIPECI in Cilegon City. This research focuses on three main aspects, namely:

1. The impact of limited internet access on the accessibility and utilization of SIPECI.
2. The effect of limited server capacity on service stability and user satisfaction.
3. The impact of SIPECI implementation on time efficiency, administrative cost efficiency, and MSME productivity.

To achieve this goal, this study uses a mixed methods approach, which combines quantitative and qualitative analysis. Quantitative methods are used to measure indicators of service effectiveness, such as time and cost efficiency, as well as user satisfaction. Quantitative data was obtained through a questionnaire survey of 100 MSME respondents in Cilegon City. Meanwhile, qualitative methods are used to dig deep insights from key informants through semi-structured interviews. This approach allows triangulation of data, so that the results of the study become more comprehensive and valid (Creswell, 2014).

This research makes a significant contribution to the e-government literature by evaluating the challenges of implementing digital systems in the context of industrial estates. The focus on Cilegon City as a case study provides a new perspective related to the complexity of implementing e-government in an environment with a high density of economic activity. In addition, this study offers practical recommendations for policymakers to overcome technological barriers and increase the use of SIPECI by MSMEs.

Practically, the results of this study are expected to help local governments formulate more effective strategies to improve technology infrastructure, increase digital literacy, and ensure the inclusivity of SIPECI services. By overcoming these obstacles, SIPECI has great potential to support the legality of MSME businesses, increase local economic productivity, and strengthen the competitiveness of Cilegon City as a strategic industrial center.

Thus, this research not only fills the gap in the e-government literature, but also provides data-driven solutions to support the digital transformation of public services that



are more inclusive, efficient, and sustainable. The focus on industrial estates makes an important contribution in understanding how technological challenges can be overcome to support local economic growth through the implementation of effective digital services.

## RESULT AND DISCUSSION

This study aims to evaluate how the gap in technological infrastructure affects the effectiveness of the implementation of the Cilegon Electronic Licensing Information System (SIPECI) in Cilegon City, especially in the context of public services and their impact on the productivity of MSMEs. The results of the study show that SIPECI has a positive impact in improving time efficiency, reducing administrative costs, and supporting the productivity of micro, small, and medium enterprises. However, challenges such as limited internet access, limited server capacity, and low digital literacy are still significant obstacles. These findings highlight that the success of e-government implementation is highly dependent on the readiness of technological infrastructure and the capacity to utilize services by users.

Limited internet access has emerged as a major obstacle in the implementation of SIPECI, especially in the suburbs of Cilegon City. From the results of the study, 40% of respondents from suburban areas reported difficulties in accessing SIPECI due to unstable internet connectivity and inadequate network infrastructure. In contrast, in urban centers, 85% of respondents stated that they did not experience any problems accessing services. This inequality reflects the digital divide between regions with established infrastructure and underdeveloped regions. This phenomenon is consistent with the study by Dewi et al. (2023) which emphasizes that limited access to technology in developing areas can be a significant barrier to the use of technology-based public services. In the context of Cilegon City as an industrial area, this inequality becomes more critical because the need for fast and efficient licensing services is a priority for business actors. Delayed access not only adds to the time burden for MSME actors but also has the potential to delay greater economic activity in the region.

In further analysis, server capacity limitations are also the main cause of technical disruptions in the implementation of SIPECI. The data shows that 30% of respondents experience technical issues such as login failures, data processing delays, and access disruptions, especially during times of spikes in the number of permit applications, such as at the end of the fiscal year or new policies that trigger higher demand for services. These server disruptions cause delays in the permit completion process, with the average delay reaching 2-3 business days. An informant from the DPMPTSP confirmed that the existing server capacity was not adequate to accommodate the increase in the number of users at the same time.

These findings are in line with the research of Lenak et al. (2021) which showed that the performance of digital-based services is highly dependent on the stability of technological infrastructure, including server capacity and software system reliability. In the case of SIPECI, the technical glitches reduced user trust in digital services and forced some businesses to return to manual licensing, which is contrary to the main goal of implementing



the system. Therefore, increasing server capacity is one of the crucial solutions to ensure the stability and sustainability of the SIPECI system, especially in areas with heavy economic activity such as Cilegon City.

Despite facing various obstacles, the implementation of SIPECI has proven to have a significant positive impact on time and cost efficiency in business licensing management. Based on data, the processing time for business licenses has been drastically reduced from 14 working days to only 3-5 working days. This efficiency reaches 64-78%, which allows MSME actors to start or develop their businesses faster compared to the previous manual system. This reduction in service time is one of the main benefits of digitizing public services, as expressed by Yustina and Zainuri (2022), who stated that e-government is able to speed up administrative processes through a more transparent and efficient system.

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The positive impact of SIPECI on the productivity of MSMEs is one of the important findings in this study. Data shows that 65% of respondents reported an increase in business productivity after using SIPECI. Average monthly turnover increased by 15-25%, which was largely influenced by faster access to licensing and recognized business legality. This legality not only increases the credibility of the business in the eyes of customers but also opens access to formal funding from financial institutions. The study by Dewi et al. (2023) emphasized that business legality obtained through digital systems helps MSMEs to overcome administrative barriers and expand access to markets and business capital. Therefore, SIPECI can be said to have a strategic role in encouraging more sustainable business development for MSMEs in Cilegon City.

However, challenges related to digital literacy are still a serious obstacle in the implementation of SIPECI. The low understanding and digital skills among some MSME actors, especially from the older generation, cause them to have difficulty in using the system effectively. The results of the interview show that some MSME actors still depend on the help of other parties to access SIPECI. The study by Yunus et al. (2023) states that digital literacy is a key factor in the success of e-government implementation, where the use of digital systems will be optimal if users have adequate skills. Therefore, digital training and mentoring programs need to be implemented to increase user capacity, especially among MSME actors who are not familiar with technology.

The implications of these findings have important significance in the context of public policy and the development of e-government services in industrial estates. Equitable distribution of technological infrastructure, such as expanding internet access and increasing server capacity, is a top priority to overcome the technical barriers faced by SIPECI users.



Local governments also need to organize intensive digital literacy socialization and training programs to ensure that all MSME actors can take advantage of this service optimally. This policy will not only increase the effectiveness of SIPECI but also encourage the inclusivity of technology-based public services in Cilegon City.

The theoretical contribution of this study lies in the provision of empirical evidence regarding the implementation of e-government in the context of industrial estates, which have higher economic complexity compared to other regions. This study fills the gap in the literature by evaluating the impact of the technological infrastructure gap on the effectiveness of electronic licensing services. The focus on industrial estates provides a new perspective on how technological challenges can affect the successful implementation of e-government in environments with dense economic activity.

However, this study has some limitations. First, this study only focuses on Cilegon City as an industrial area, so the results may not be generalized to other regions with different economic characteristics. Second, the sample size consisting of 100 respondents can be expanded to improve the representation and accuracy of research results. In addition, this study uses respondent perception data that can be influenced by subjective bias.

For further research, it is recommended to conduct comparative studies in various industrial and non-industrial estates to understand the differences in the implementation of e-government in different contexts. In addition, a longitudinal approach can be used to evaluate the long-term impact of the e-licensing system on the growth of MSMEs and the local economy. Further research can also explore the integration of the electronic licensing system with other supporting services, such as access to funding and digital-based training, in order to provide more comprehensive benefits for business actors.

Overall, this study shows that the implementation of SIPECI provides significant benefits in improving time efficiency, cost savings, and productivity of MSMEs in Cilegon City. However, the success of the implementation of this system still depends on the readiness of the technology infrastructure and the digital literacy of users. By overcoming these obstacles, SIPECI has great potential to support inclusive and sustainable economic growth in Cilegon City as a strategic industrial area. This research provides an empirical basis for local governments to formulate more adaptive policies in supporting the digital transformation of public services and strengthening the local economy through e-government.

## CONCLUSION

This study shows that the implementation of the Cilegon Electronic Licensing Information System (SIPECI) provides significant benefits in improving time efficiency, reducing administrative costs, and supporting the productivity of micro, small, and medium enterprises (MSMEs) in Cilegon City. The use of SIPECI is able to speed up the licensing process from 14 working days to 3-5 working days, save costs by up to 30%, and increase



MSME turnover by 15-25%. However, obstacles such as limited internet access in suburban areas, inadequate server capacity, and low digital literacy are still challenges in optimizing this system.

The findings of this study underscore the importance of adequate technological infrastructure and increasing digital literacy to support the success of technology-based services. Inequality of internet access and technical disruptions point to the need for policy interventions for equitable distribution of infrastructure and user capacity building. In the context of industrial estates such as Cilegon City, the need for fast and efficient services is a priority to support local economic productivity. This research contributes to the e-government literature by highlighting the challenges and opportunities of implementing digital systems in regions with complex economic activities.

The results of this study provide an empirical basis for policy-making to improve the inclusivity of technology-based public services. Further research is recommended to explore the long-term impact of licensing digitalization as well as compare the implementation of e-government in industrial and non-industrial estates to enrich relevant perspectives and solutions. This study confirms that the success of digital transformation requires a holistic approach that includes infrastructure, literacy, and system sustainability to support inclusive economic growth.

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