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# LEVERAGING INFORMATION TECHNOLOGY FOR ENHANCED GOVERNMENT SERVICE EFFICIENCY IN LINGGA REGENCY

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**Abstract**

*This study investigates the impact of information technology on the effectiveness of government services in Lingga Regency, focusing on the role of technological infrastructure, information technology usage, and government policy support. A quantitative approach was employed, using total sampling with 30 employees from the North Lingga District Office as respondents. Data were analyzed using Smart PLS to test the relationships between variables. The results show that both the quality of technological infrastructure and the use of information technology have a significant positive effect on the effectiveness of government services. Furthermore, government policy support was found to moderate the relationship between infrastructure quality and service effectiveness, enhancing the impact of infrastructure investments on public service delivery. However, the moderating effect of policy support on the use of IT was weaker, indicating that IT can directly improve service effectiveness without extensive policy intervention. These findings highlight the importance of investing in both infrastructure and IT, while also developing supportive policies to sustain long-term improvements in government services. This research provides practical insights for policymakers and government officials in optimizing public administration through strategic technology integration.*

Keywords**: Government Service Effectiveness, Information Technology, Technological Infrastructure, Government Policy Support**

## 1. INTRODUCTION

In recent years, the integration of information technology in government services has become increasingly vital for enhancing efficiency and responsiveness to public needs (Access 2022). In Lingga Regency, the implementation of information technology tools is expected to streamline administrative processes, improve communication between government agencies and citizens, and ultimately lead to more effective service delivery (Studies 2021). However, the extent to which these technological advancements have impacted government service effectiveness remains an area of critical inquiry. This research aims to explore the relationship between information technology and the effectiveness of government services in Lingga, examining various factors that may influence this dynamic and providing insights into potential improvements for public administration (Huber, Wicki, and Bernauer 2020).

The effectiveness of government services refers to the ability of public institutions to meet the needs and expectations of citizens efficiently and transparently. It encompasses several dimensions, including accessibility, timeliness, quality of service, and citizen satisfaction (Hubert et al. 2020). In the of Lingga Regency, effective government services are essential for fostering trust and engagement between the government and the community (Social and Issn 2023). By leveraging information technology, government agencies can enhance their operational efficiency, reduce bureaucratic red tape, and provide more timely responses to public inquiries and needs. Moreover,

the use of digital platforms allows for greater transparency in service delivery, enabling citizens to track the progress of their requests and access information easily (Moshood et al. 2024). As such, understanding the factors that contribute to the effectiveness of government services in this region is crucial for identifying areas for improvement and ensuring that public services can adapt to the evolving demands of society (Seta 2023).

The utilization of information technology (IT) in government services has transformed the way public institutions operate and interact with citizens. In Lingga Regency, the adoption of various IT tools—such as online platforms for service requests, digital communication channels, and data management systems—has the potential to streamline operations and enhance the overall quality of service delivery (Das et al. 2020). By automating routine processes and enabling real-time access to information, technology facilitates quicker decision-making and more efficient resource allocation. Furthermore, the integration of IT fosters a more participatory approach, allowing citizens to engage with government services through user-friendly interfaces and mobile applications (Shahid et al. 2022). This increased accessibility not only empowers citizens but also provides government agencies with valuable feedback that can be used to refine services. As such, exploring the role of information technology in improving government service effectiveness is essential for realizing the full benefits of modernization in public administration (Eldow et al. 2021).

The quality of technological infrastructure plays a pivotal role in determining the success of information technology initiatives within government services (Rahardjo, Hanafiah, and Setiawan 2021). In Lingga Regency, robust infrastructure—including reliable internet connectivity, advanced hardware, and secure data storage systems—is essential for facilitating the effective implementation of digital solutions. High-quality infrastructure ensures that government agencies can operate efficiently, minimizing downtime and enhancing the reliability of online services (Högselius 2022). Moreover, well-developed technological frameworks enable the integration of various IT tools, fostering seamless communication and collaboration among different departments (Approach 2021). This interconnectedness is crucial for delivering cohesive and comprehensive services to citizens. Additionally, investing in the continuous upgrade of technological infrastructure not only supports current operations but also prepares government institutions for future advancements (Chege, Wang, and Suntu 2019). By prioritizing infrastructure quality, Lingga Regency can create an environment conducive to innovative service delivery and improved public trust in government capabilities.

Government policy support for human resource development is a critical factor in ensuring the successful implementation of information technology in public services (Sutrisno et al. 2023). In Lingga Regency, strong policy frameworks that prioritize training, professional development, and recruitment of skilled personnel can significantly enhance the capacity of government agencies to leverage technology effectively (Janssen et al. 2018). Policies that promote a culture of continuous learning and provide funding for training initiatives help equip employees with the necessary skills to adapt to rapidly changing technological landscapes. Moreover, supportive policies can facilitate partnerships with educational institutions and technology providers, ensuring that government employees have access to the latest knowledge and tools (Li and Shang 2020). By fostering an environment where human resource development is a key priority, the government can

empower its workforce to maximize the benefits of technology, ultimately leading to improved service delivery and increased citizen satisfaction. Thus, the alignment of HR policies with technological advancements is essential for building a competent workforce capable of navigating the complexities of modern public administration (Shin and Jhee 2021).

In the of Lingga Regency, the variables outlined—effectiveness of government services, information technology usage, quality of technological infrastructure, and government policy support—serve as crucial components of the research framework. The effectiveness of government services reflects how well public institutions respond to the needs of citizens, while the usage of information technology highlights the role of digital tools in enhancing service delivery. Quality of technological infrastructure underpins the functionality and reliability of these IT solutions, ensuring they operate seamlessly (Mensah and Mensah 2019). The support of government policies shapes the environment in which these variables interact, influencing the overall capacity of government agencies to implement technological advancements successfully. Together, these variables form a comprehensive framework for analyzing the impact of information technology on government service effectiveness in Lingga Regency.

The phenomenon under investigation in this research revolves around the increasing reliance on information technology to enhance the effectiveness of government services in Lingga Regency. As public expectations for transparency, efficiency, and accessibility rise, government agencies are compelled to adopt digital solutions that streamline operations and improve citizen engagement. This shift towards technology-driven service delivery presents both opportunities and challenges, as it requires significant changes in infrastructure, human resource capabilities, and organizational policies. Moreover, the success of such initiatives depends on the interplay of various factors, including the quality of technological infrastructure, the level of training provided to staff, and the supportive role of government policies. By examining these dynamics, this research aims to illuminate how effectively integrating technology can transform public administration in Lingga Regency, ultimately leading to better service outcomes and increased public trust.

Despite the growing body of literature on the impact of information technology on government services, there remains a significant gap in understanding how these variables specifically interact within the of Lingga Regency. While studies such as (Business 2020) emphasize the importance of technology adoption for enhancing public service delivery, they often overlook regional nuances that may influence outcomes (Hakim 2021). Additionally, research by (Cuandra 2024) highlights the critical role of human resources in technology implementation, yet fails to explore how local government policies can support or hinder these efforts. Furthermore, (Coffee and Using 2022) discusses the relationship between technological infrastructure and service efficiency, but lacks a detailed analysis of training programs tailored for local government employees. Lastly, (Sarjana et al. 2024) points out the need for comprehensive evaluations of government IT initiatives, indicating that more empirical studies are necessary to capture the unique challenges faced by regions like Lingga. This research aims to fill these gaps by providing a localized examination of the interplay between information technology, human resources, and government policies in improving service effectiveness in Lingga Regency.

The primary aim of this research is to investigate the impact of information technology on the effectiveness of government services in Lingga Regency, with a specific focus on the interplay between various contributing factors. This study seeks to analyze how the usage of information technology, the quality of technological infrastructure, the training and skills of human resources,

and government policy support collectively influence service delivery outcomes. By identifying these relationships, the research aims to provide actionable insights and recommendations for local government agencies to enhance their service effectiveness through strategic technology implementation. Ultimately, this study aspires to contribute to the broader discourse on improving public administration in the digital age, while addressing the unique challenges and opportunities faced by Lingga Regency.

The following is the Conceptual Framework

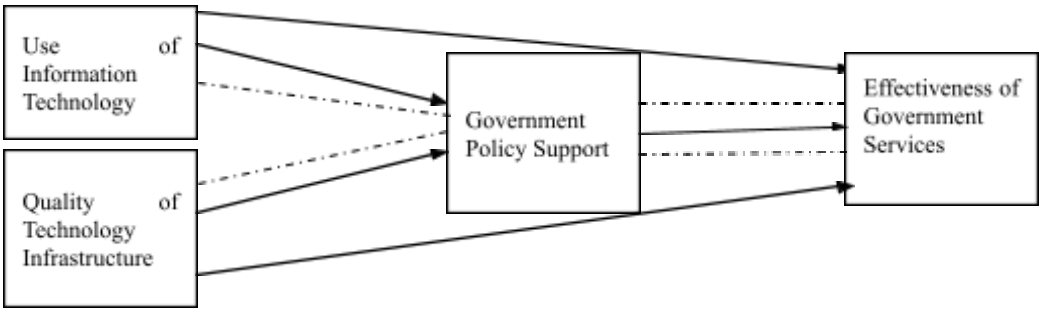


**Figure 1** Conceptual Framework

## 2. IMPLEMENTATION METHOD

This research adopts a quantitative methodology using total sampling, targeting all 30 employees of the North Lingga District Office in Lingga Regency as respondents. Total sampling ensures that the entire population of interest, in this case, the employees involved in government service delivery, is included, providing a comprehensive view of the dynamics within this context. The study focuses on examining the impact of independent variables—Information Technology Usage and Technological Infrastructure Quality—on the dependent variable, Government Service Effectiveness, while considering Government Policy Support as a moderating variable. Data will be collected through structured questionnaires, and Smart PLS (Partial Least Squares) will be employed as the primary analysis tool. This software is particularly suitable for examining complex relationships between variables and testing the moderating effect of government policy on the relationship between technology and service effectiveness. The quantitative design allows for statistical testing and validation of the proposed relationships, offering data-driven insights into how technology impacts service delivery in this government context.

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## 3. RESULTS AND DISCUSSION

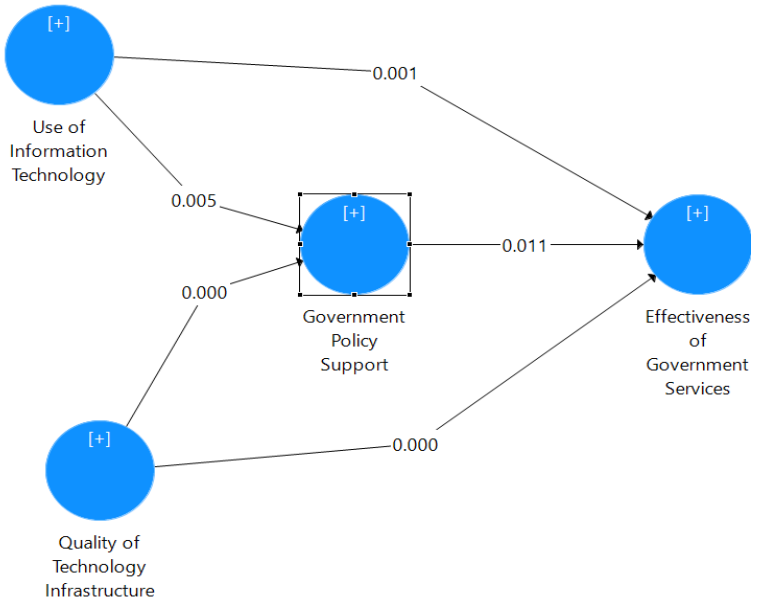


**Figure 2** Hypothesis Testing

The following are the results of hypothesis testing from this research :

**Table 1** Hypothesis Testing

| Path | Original Sample | Sample Mean | Standard Deviation | T Statistic | P Values |
|---|---|---|---|---|---|
| Government Policy Support -> Effectiveness of Government Services | 0,307 | 0,304 | 0,121 | 2,542 | 0,011 |
| Quality of Technology Infrastructure -> Effectiveness of Government Services | 0,369 | 0,371 | 0,104 | 3,544 | 0,000 |
| Quality of Technology Infrastructure -> Government Policy Support | 0,550 | 0,546 | 0,106 | 5,216 | 0,000 |
| Use of Information Technology -> Effectiveness of Government Services | 0,297 | 0,295 | 0,090 | 3,283 | 0,001 |
| Use of Information Technology -> Government Policy Support | 0,273 | 0,289 | 0,098 | 2,802 | 0,005 |
| Quality of Technology Infrastructure -> Government Policy Support -> Effectiveness of Government Services | 0,169 | 0,166 | 0,073 | 2,327 | 0,020 |
| Use of Information Technology -> Government Policy Support -> Effectiveness of Government Services | 0,084 | 0,089 | 0,051 | 1,638 | 0,102 |

The hypothesis testing results in Table 1 provide insightful findings on the relationships between government policy support, quality of technological infrastructure, and the use of information technology, in relation to the effectiveness of government services in Lingga Regency. The first path, Government Policy Support -> Effectiveness of Government Services, demonstrates a significant positive relationship, as indicated by a T statistic of 2.542 and a P-value of 0.011,

which is below the conventional significance level of 0.05. This suggests that government policy support directly influences the effectiveness of government services. Policies that promote the use of technology and emphasize training and infrastructure improvement can empower employees and enhance the overall performance of service delivery, aligning with studies that emphasize the role of policy frameworks in public sector innovation (Ginting 2024). The significance of this relationship highlights the necessity for local governments to actively develop and enforce policies that nurture technological advancements in public services.

The relationship between the Quality of Technology Infrastructure and the Effectiveness of Government Services presents even stronger results, with a T statistic of 3.544 and a P-value of 0.000. This underscores the critical role of a robust and reliable technological infrastructure in improving service effectiveness. Reliable infrastructure ensures smoother operations, minimizes downtime, and enables quicker responses to public inquiries, which is consistent with (Bunga, Mulyani, and Fikri 2023) argument that technological infrastructure is a backbone for digital government transformations. The positive and highly significant result highlights that infrastructure plays a fundamental role in enabling government services to function optimally, particularly in areas where remote or digital services are increasingly becoming essential. This finding suggests that investments in infrastructure, such as better internet connectivity and modern digital systems, are likely to yield substantial improvements in service delivery.

Additionally, the path Quality of Technology Infrastructure -> Government Policy Support is found to be highly significant, with a T statistic of 5.216 and a P-value of 0.000, further highlighting that quality infrastructure not only directly improves service effectiveness but also influences government policy support. This suggests that as technological infrastructure improves, it facilitates the development and enforcement of supportive policies that enhance the use of technology in government operations. This finding aligns with (Miranti 2022)assertion that infrastructure improvements often lead to the adoption of new policies that encourage the integration of technology in public services. It also implies a reinforcing feedback loop: as infrastructure quality improves, it creates a foundation for more robust policies, which in turn further enhance the infrastructure and its application in service delivery.

When examining the path between the Use of Information Technology and Effectiveness of Government Services, we observe a positive and significant relationship with a T statistic of 3.283 and a P-value of 0.001. This demonstrates that the adoption and usage of IT tools contribute significantly to improving service effectiveness. The use of IT can automate many government processes, reduce administrative burdens, and allow for quicker, more efficient service to citizens, supporting the findings of (Nugrafitra and Darmawan 2023), who emphasized the importance of IT in modernizing government services. This result strongly suggests that government offices should prioritize the adoption and effective utilization of IT systems to streamline operations and meet the increasing demands of citizens for more responsive and transparent services.

Furthermore, the relationship between Use of Information Technology and Government Policy Support is also significant, with a T statistic of 2.802 and a P-value of 0.005. This indicates that the adoption of information technology can positively influence the development of supportive government policies. As government agencies integrate more IT tools, the need for policies that promote digital literacy, cybersecurity, and the continuous upgrading of systems becomes more

apparent. This is in line with (Lalinsky 2021) argument that the integration of technology in government necessitates the formulation of policies that support digital transformation. The significance of this path implies that the government's policy-making processes are responsive to the evolving technological landscape, and continued advancements in IT are likely to foster more adaptive and supportive policies.

The indirect effect of Quality of Technology Infrastructure -> Government Policy Support -> Effectiveness of Government Services is also significant, with a T statistic of 2.327 and a P-value of 0.020. This suggests that government policy support plays a moderating role between infrastructure quality and service effectiveness. As infrastructure improves, government policies can amplify its effects on service delivery by ensuring proper governance, promoting digital skills, and safeguarding data security. This moderating effect reinforces the argument that infrastructure alone is not enough; the policy environment must also evolve to maximize the benefits of technological advancements (Liu, Wang, and Hou 2022). This pathway emphasizes the interconnected nature of policy, infrastructure, and service delivery, with policies acting as a key mechanism to ensure that infrastructure improvements lead to tangible service outcomes.

However, the indirect effect of Use of Information Technology -> Government Policy Support -> Effectiveness of Government Services shows a weaker relationship, with a T statistic of 1.638 and a P-value of 0.102, indicating that this path is not statistically significant at the 5% level. While the direct impact of IT use on service effectiveness is clear, its indirect influence through policy support appears less substantial. This could suggest that while IT adoption directly enhances services, the role of policy as a mediator is less pronounced compared to its role in infrastructure improvements. This finding might align with studies that suggest technology adoption often outpaces policy development, meaning that IT innovations can quickly impact service delivery before supportive policies are fully in place (Clipa n.d.). Therefore, while policies are important, IT tools may have a more immediate and direct impact on improving government services without requiring significant policy intervention.

## 4. CONCLUSION

This study concludes that the effectiveness of government services in Lingga Regency is significantly influenced by the quality of technological infrastructure, the use of information technology, and the support of government policies. First, the findings demonstrate that technological infrastructure plays a crucial role in improving service delivery, as it ensures that digital platforms and tools can function optimally. The study shows that government agencies with robust infrastructure are more capable of delivering efficient and reliable services, reducing processing times, and enhancing citizen satisfaction. In addition, technological infrastructure also indirectly influences the effectiveness of services by shaping the development of government policies. This relationship highlights the importance of continual investments in infrastructure, as it not only directly improves service outcomes but also enables the creation of policies that support and enhance the use of technology in government operations. This aligns with previous research, which emphasizes the critical role of infrastructure in public sector digital transformation, as noted by Nguyen (2022). Thus, a strategic focus on upgrading

technological infrastructure can lead to sustained improvements in both the short and long term.

Moreover, the use of information technology has a direct and positive impact on the effectiveness of government services. The adoption of digital tools allows for the automation of administrative tasks, which reduces bureaucratic inefficiencies and enables more timely responses to public needs. However, the research also finds that the effect of IT usage on service effectiveness is more immediate and direct, compared to its interaction with government policy support. While policies that promote the use of technology are important, IT implementation often leads to improvements in service delivery even before comprehensive policies are in place. This finding suggests that government agencies should prioritize adopting IT solutions as a first step towards improving service delivery, while simultaneously developing supportive policies to sustain and optimize these improvements. Furthermore, government policy support is found to be a critical moderating variable, particularly in amplifying the effects of both infrastructure and IT on service effectiveness. Policies that promote digital literacy, cybersecurity, and continuous technology upgrades enhance the benefits of IT and infrastructure investments. Therefore, to achieve maximum effectiveness in government services, Lingga Regency must adopt a holistic approach that integrates infrastructure improvements, IT adoption, and robust policy frameworks.

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