



## Analysis of the Effectiveness of Public Services Based on Patent Application

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### Abstract

*This study aims to analyze the effectiveness of public services based on the PATENT application in Galang District, Deli Serdang Regency. This technology-based public service is expected to increase efficiency, transparency, and accountability in the management of administrative documents. The research method used is a qualitative approach with in-depth interview, observation, and documentation techniques. The study found that PATENT applications have accelerated the process of document management, reduced transportation costs, and increased transparency of service information. However, there are still several inhibiting factors, such as limited technological infrastructure, low digital literacy among the public, technical obstacles to applications, and lack of socialization and training. People who have technological knowledge find it easier to access and use this application, while some people, especially the elderly, are experiencing difficulties. Therefore, efforts are needed to improve digital infrastructure, training for the community, and better system maintenance to increase the effectiveness of these application-based public services. The results of this study provide an overview of the challenges and opportunities in the implementation of technology in public services in the region, as well as provide recommendations to improve service quality.*

## Introduction

Public services are one of the important indicators in the success of the development of a region. Good quality of public services can reflect the government's effectiveness in meeting the needs of the community (Dewi & Suparno, 2022). In today's digital era, governments at various levels are required to be able to innovate, one of which is through the use of information technology in providing public services (Sepriano et al., 2023; Scupola & Zanfei, 2016; Fang, 2022). This is in line with efforts to increase transparency, efficiency, and responsiveness to the needs of the community.

The PATENT application (District Integrated Administrative Service) is one of the innovations implemented by the local government to support more effective and efficient public services (Subroto et al., 2021). This application is designed to make it easier for people to take care of various administrative documents without having to go through a complicated process. By integrating technology-based services, the PATENT application is expected to be able to cut the time, costs, and labor previously needed in administrative management (Choi et al., 2021; Wiederhold et al., 2009; Wahyuni et al., 2025).

Galang District, which is located in Deli Serdang Regency, is one of the areas that has adopted the PATENT application. This sub-district has a fairly dense population with various administrative needs, such as the management of ID cards, birth certificates, and other certificates. The implementation of the PATENT application in Galang District aims to

improve the quality of public services and accelerate the administrative process for the local community.

However, even though the PATENT application has been implemented, there are still various challenges in its implementation (de Freitas et al., 2022; Bamakan et al., 2022). Some of them include the level of public understanding of the use of technology, infrastructure that is not fully adequate, and resistance to changes from conventional to digital service methods. These challenges need to be analyzed to assess the extent to which a PATENT application has successfully achieved its primary objectives (Arsad e al., 2024; Fasi, 2024).

The effectiveness of application-based public services can be seen from various aspects, such as the level of community satisfaction, the time required to complete the service, and the ease of access to the application (Nurrahman et al., 2022). In addition, it is also necessary to evaluate how the PATENT application is able to reach all levels of society, including those in remote areas or have limited access to technology (Marrocu et al., 2023).

In this context, it is important to understand how the PATENT application has had a real impact on public services in Galang District. This analysis not only includes quantitative data, such as the number of documents successfully processed, but also includes qualitative aspects, such as people's experience in using the application. Research on the effectiveness of patent applications in Galang District has high relevance, especially in supporting the agenda of digitizing public services in Indonesia. The results of this study are expected to provide input for local governments to continue to improve technology-based service systems and overcome the obstacles faced.

In addition, this research can also be a reference for other sub-districts that want to adopt similar applications. By understanding the advantages and disadvantages, local governments can develop more effective strategies to improve the overall quality of public services. It is undeniable that the digitization of public services requires a significant investment of time and resources. However, if implemented properly, this step has great potential to improve the quality of life of the community, especially in terms of accessibility and speed of service. Therefore, the study of the implementation of the PATENT application in Galang District is very important.

The existence of this research can also be a basis for evaluating the policies that have been implemented. Is the application of a Patent really able to reduce the convoluted bureaucracy? Are people satisfied with the services provided? These questions are the main focus in analyzing the effectiveness of the application. Thus, this study seeks to answer various fundamental questions related to the effectiveness of PATENT applications. The approach used in this study includes qualitative and quantitative methods to obtain a comprehensive picture of the impact of patent applications on public services.

Galang District was chosen as the research location because of its characteristics that are representative enough to measure the success of the PATENT application. As a developing area, Galang District faces various challenges in terms of public services, so the results of this study are expected to provide relevant insights (Yuniarti et al., 2024). On the other hand, this study also wants to highlight the role of local governments in supporting the successful implementation of the PATENT application. Support in the form of training, socialization, and infrastructure development is an important factor that also determines the effectiveness of application-based public services. In the end, this research is expected to make a real contribution to efforts to improve public services in Indonesia. Through in-depth analysis, this study not only aims to evaluate PATENT applications, but also to provide recommendations for the development of better public services in the future.

With this introduction, it is hoped that readers can understand the background, purpose, and urgency of this research. A holistic and data-based approach is the main foundation in compiling a comprehensive and relevant analysis.

## **Methods**

This study uses a qualitative approach with the aim of understanding and analyzing the effectiveness of public services based on the PATENT application in Galang District (Rachmawati, 2017). The qualitative approach was chosen because it allows researchers to explore the experiences, perceptions, and views of the public and related parties in depth in the context of using the PATENT application.

This research was conducted in Galang District, Deli Serdang Regency. The selection of this location is based on the implementation of a patent application in the region that has been running for some time, making it possible to evaluate its impact on the quality of public services.

### **Research Informant**

The informants in this study were selected by purposive sampling, which is based on certain criteria that are relevant to the focus of the research. Informant criteria include: 1) The community of PATEN application users, especially those who have used services for the management of administrative documents; 2) Galang District Employee, who is directly involved in the operation and management of the PATENT application; 3) The Deli Serdang Regency Government, which plays a role in the supervision and policy of the implementation of the PATENT application; 4) The number of informants is not determined definitively from the beginning, but will be adjusted based on the principle of saturation, which is when the data obtained is sufficient to answer the research question.

### **Data Collection**

The data collection techniques in this study include (Miles & Huberman, 1992): Interviews were conducted directly with informants to obtain data on their experiences, perceptions, and challenges in using the PATENT application. The interview guide is designed in a semi-structured manner to allow for more in-depth exploration. The researcher made direct observations of the public service process using the PATENT application at the Galang District Office. Observation includes interactions between the community and officers, the use of applications, and obstacles that arise during the service process. Documentation in the form of secondary data, such as official government reports, policies related to the PATENT application, and statistical data on the number of application service users in Galang District.

### **Data Analysis**

The data obtained was analyzed using a thematic analysis approach. The analysis steps include (Saleh, 2017): Organize and collect data from interviews, observations, and documentation. The interviews are transcribed, then a coding process is carried out to identify the main themes. The emerging themes are grouped into categories, such as the effectiveness, barriers, and benefits of PATENT applications. The categorized data is interpreted to understand the patterns and relationships between the themes found.

### **Data Validity**

To ensure the validity of the data, this study uses triangulation techniques, namely: 1) Source Triangulation: Comparing data obtained from various informants (community, employees, and government); 2) Triangulation Techniques: Using several data collection techniques (interviews, observations, documentation) to ensure consistency of information.

Member Check: Ask the informant to review the results of the transcribed interview to ensure that the data taken is in accordance with the information provided.

## Results and Discussion

### Effectiveness of Public Services Based on Patent Application at the Galang Sub-district Office, Deli Serdang Regency

The results of the study show that the PATENT application has a positive impact on public services in Galang District. The community feels the convenience in managing administrative documents, especially in terms of time and cost. Most of the informants stated that the PATENT application helps speed up the service process compared to conventional methods.

The services that are most widely used by the public through this application are the management of ID cards, birth certificates, and certificates. Based on observations, the time required to process documents through a PATENT application is on average shorter, which is about 2-3 days, compared to the manual method which takes 5-7 days.

However, the effectiveness of patent applications also depends on the public's understanding of technology. From the interviews, it was found that people who are used to using technology have an easier time accessing applications compared to those who are less familiar with digital devices.

Table 1. Comparison of the effectiveness of public services before and after using a patent application

Service Aspects	Before the Patent Application	After the Patent Application	Percentage Change
Document Processing Hours	5-7 days	2-3 days	40-60% faster
Community Satisfaction	70%	85%	+15%
Transportation Costs	Tall	Low	50% more savings

In addition, the implementation of the PATENT application also increases transparency in document management. Information related to procedures and fees can be accessed directly through the application, thereby reducing the potential for corrupt practices or illegal levies.

The results of the study show that patent applications in general have a positive impact on the quality of public services in Galang District. The time required for the processing of documents such as ID cards, birth certificates, and other certificates is significantly reduced compared to conventional methods. In addition, the public also feels more satisfied because this application provides clear and transparent information regarding procedures and costs.

These findings are in line with the theory of public service effectiveness put forward by Osborne and (Gaebler, 1992) in the concept of reinventing government. They stated that effective public services must be based on the use of technology to increase efficiency, accessibility, and responsiveness to the needs of the community. The application of the PATENT application in Galang District shows that technological innovation can be a catalyst in improving the quality of public services.

Previous research by (Laili & Sophisticated, 2021) about the digitization of public services in Indonesia also found that the application of technology-based systems, such as e-government, is able to speed up the service process while increasing public satisfaction. These findings support the results of research in Galang District, where the use of the PATENT application makes the community feel more helped and services become faster.

However, although PATENT applications are considered effective in improving services, this effectiveness is not fully optimal. Several inhibiting factors, such as limited technological infrastructure and low digital literacy, hinder certain communities from making the most of these applications.

### **Factors Hindering the Implementation of Public Services Based on Patent Applications at the Galang Sub-district Office, Deli Serdang Regency**

Although PATENT applications provide significant benefits, there are several inhibiting factors in their implementation. These factors were identified based on interviews with the community and service officers, as well as field observations.

#### ***Limitations of Technology Infrastructure***

The main problem faced is uneven internet access in all areas of Galang District. Some people living in remote areas have difficulty accessing applications due to weak internet networks.

#### ***Low Digital Literacy Level***

Some people, especially the elderly, still have difficulty using the PATENT application. They prefer to come directly to the sub-district office because they feel less confident in using technology.

#### ***Technical Constraints on Applications***

From interviews with sub-district employees, it is known that the PATENT application sometimes experiences technical problems, such as server downtime or errors during the data input process. This resulted in services being delayed.

#### ***Lack of Socialization and Training***

Socialization regarding the use of the PATENT application is still limited. People who are using this application for the first time often feel confused because there is no adequate guidance.

Table 2. Factors Hindering the Implementation of Patent Applications

<b>Inhibiting Factors</b>	<b>Description</b>
Limitations of Technology Infrastructure	Internet access is uneven, especially in rural areas.
Low Digital Literacy	People do not understand how to use technology-based applications.
Application Technical Glitches	Technical issues such as server downtime or errors that hinder service.
Lack of Socialization	Lack of information and training on the use of the PATENT application.

The limitations of technological infrastructure, such as uneven internet access, are one of the main challenges in the implementation of the PATENT application in Galang District. This is in accordance with research conducted by (Dimas & Fahlevvi, 2024), which found that the digital infrastructure gap in rural areas is the main obstacle in the implementation of e-government in Indonesia. In Galang District, people who live in remote areas often find it difficult to access applications due to weak internet connections.

In addition, the low level of digital literacy, especially among the elderly, is another obstacle in the application of this application. Rogers (2003) In the diffusion theory of innovation, it is explained that the adoption of technology often depends on the level of education, experience,

and ease of use of the technology. These findings are supported by interviews with people in Galang District, which show that those who are used to using technology feel more comfortable using the PATENT application than those who do not.

Technical glitches in the application, such as server downtime or errors, are also an obstacle to the implementation of the service. The results of this study are consistent with the findings (Abbas & Tambunan, 2024), which states that technical weaknesses in digital systems can reduce public trust in technology-based public services. In Galang District, technical problems often result in delays in document processing, thus affecting the public's perception of service quality.

The lack of socialization and training on the use of PATENT applications is also an important issue. Most people feel that they are not adequately informed about how to access and use the application. According to the results of the research from (Nugraha, 2018), effective socialization is the key to the successful implementation of technology in public services. By providing adequate training, the public can be more confident in utilizing the PATENT application, so that its effectiveness can increase.

### **Relevance to Previous Theories and Research**

This research strengthens the theory that the digitization of public services can increase efficiency and transparency. However, the application of technology must consider the local context, including the condition of the infrastructure and the characteristics of the community. The findings in Galang District support previous research by (Saefulrahman et al., 2025), which shows that the effectiveness of digital systems at the local level often faces operational and social challenges.

This research also emphasizes the importance of a holistic approach in the application of technology. In addition to providing a reliable technology platform, the government must ensure that the supporting infrastructure is adequate, provide training to the public, and improve the system to avoid technical disruptions.

### **Recommendations Based on Discussion**

**Strengthening Technological Infrastructure:** The local government needs to expand internet access in the Galang District area, especially in remote areas, so that people can make the most of the PATENT application.

**Increasing Digital Literacy:** Training and mentoring programs for the community, especially vulnerable groups such as the elderly, must be improved to accelerate technology adoption.

**Improved Application Stability:** System maintenance and technology development should be a priority to reduce technical glitches that hinder services.

**More Intensive Socialization:** The government must increase efforts to socialize the PATENT application through local media, such as radio, brochures, and social media, so that information about this application reaches the entire community.

### **Conclusion**

Based on the results of the research and discussion, it can be concluded that the implementation of the PATENT application in Galang District, Deli Serdang Regency, has a positive impact on increasing the effectiveness of public services. This application is able to speed up the time to process documents, increase transparency in the service process, and reduce costs that must be incurred by the community, especially related to transportation. These findings show that technology-based innovation can be a strategic solution in facing complex public service

challenges, in accordance with the theory of public service effectiveness and previous research. However, the effectiveness of patent applications has not been fully optimized. The inhibiting factors found include limited technological infrastructure, such as uneven internet access, and low digital literacy among certain communities, especially the elderly. In addition, technical obstacles to the application, such as system disruptions, as well as a lack of socialization and training on the use of the application are also the main challenges in the implementation of this service. This research emphasizes that the success of technology implementation in public services does not only depend on the superiority of technology, but also on the readiness of infrastructure, community capabilities, and government policy support. Efforts to improve the effectiveness of public services based on the PATENT application must include strengthening digital infrastructure, increasing technological literacy, maintaining the system periodically, and more intensive socialization to the community. With these strategic steps, the PATEN application is expected to become a more inclusive, efficient, and responsive public service model, thereby providing a wider impact on the people of Galang District and becoming an inspiration for other regions that want to adopt similar technology.

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