

Innovating Public Library Services: A Case Study of the M-Mobilib Development and Implementation

Hermawan¹

¹University of Brawijaya, Indonesia

Correspondence email: hermawanfia@ub.ac.id

Notes

Submitted: 12-07-2024

Revised: 15-09-2024

Accepted: 18-01-2025

How to cite: Hermawan, H. (2025). Innovating Public Services Through Digital Applications: A Case Study of Regional Public Libraries. *Khizanah Al-Hikmah : Jurnal Ilmu Perpustakaan, Informasi, Dan Kearsipan*, 13(1). <https://doi.org/10.24252/v13i1a6>

DOI: [10.24252/v13i1a6](https://doi.org/10.24252/v13i1a6)

Copyright 2025 © the Author(s)

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.



ABSTRACT

This study analyzes the innovation process behind mobile library applications in regional public libraries, focusing on the stages of idea generation, adoption, and implementation. It also explores the factors that support or hinder the success of these technological innovations and evaluates the quality of services provided through such platforms. Using a descriptive qualitative approach and snowball sampling technique, data were collected through interviews, document analysis, and observations. The findings revealed that successful mobile library app development relies on a structured innovation process, including collaborative idea formulation, iterative adoption strategies, and adaptive implementation. Critical success factors included institutional support, user engagement, and technological readiness, while key barriers involve limited digital infrastructure, resistance to change, and inadequate technical skills. The study also underscores the necessity of assessing service quality as an integral part of evaluating mobile innovations. The case of M-Mobilib was presented as a best-practice example, demonstrating how mobile apps can effectively enhance public library services. Overall, this research contributes to the understanding of how digital innovations can expand access to information, stimulate service modernization in the public sector, and address disparities in digital access. Future research is encouraged to examine the long-term outcomes and scalability of mobile library applications across diverse contexts.

Keywords: Library Innovation; Library Services; M-Mobilib; Regional Public Libraries

1. INTRODUCTION

In the era of increasingly rapid globalization and digitalization, the demand for quality, effective, and efficient public services is increasing ([Cagigas et al., 2021](#); [Huong et al., 2022](#); [Tasyah et al., 2021](#)). This encourages various government agencies to continue to innovate in

improving the quality of their services (Hidayat, 2022; Putri & Mutiarin, 2018; Wibawa et al., 2020). Public service innovation is the key to responding to the challenges of the times and realizing good governance (Irawan, 2017; Rusdy & Flambonita, 2023; Wastuhana & Werdiningsih, 2021). The concept of public service innovation has become the main focus in the science of public administration and public management (de Vries et al., 2016; Hamdillah, 2023; Jukić et al., 2019). Various theories and models have been developed to understand and explain the meaning, process, and impact of public service innovation (Marto, 2021; Romy et al., 2022; Setijaningrum, 2017).

Innovation in public services is a crucial aspect in increasing the efficiency, effectiveness, and responsiveness of services provided to the community (Bertot et al., 2016; Gonzalez et al., 2013; Setianingrum & Abritaningrum, 2016). One example where this innovation can be applied significantly is in public libraries. According to Everett M. Rogers in his book *Diffusion of Innovations*, innovation is a process in which a new idea or product is introduced and adopted by members of a social system (Rogers et al., 2014). In the context of public libraries, innovation can take the form of implementing new technology (Gul & Bano, 2019; Scupola & Zanfei, 2016; Suchá et al., 2021), developing creative literacy programs, or restructuring services to meet the growing needs of society. Christian Bason in his book *Leading Public Sector Innovation* emphasizes the importance of using a design-based approach to design innovative solutions in the public sector (Bason, 2010). Public libraries can adopt this approach by involving users in the service design process, ensuring that their needs and preferences are met effectively. For example, developing a digital library application that allows borrowing and returning books online, or organizing community activities that are relevant to local interests and needs.

The research of Ulum (2018) which quotes the theory put forward by Shepherd et al., (2015) underlines the importance of the innovation process which consists of the stages of idea discovery, adoption, and implementation. Based on the results of their research, it was found that: (1) Idea Discovery: Innovative ideas often emerge from identifying opportunities or observing problems in the market. This process involves creative thinking and searching for solutions that can offer new value to users or customers; (2) Adoption: At the adoption stage, ideas that have been discovered are critically evaluated to determine their feasibility and potential benefits. This includes technical, financial, and strategic analysis to ensure that the idea can be implemented successfully; (3) Implementation: Implementation involves putting adopted ideas into actual practice. This process includes careful planning, resource allocation, and change management to overcome obstacles and ensure that innovation can run effectively and efficiently. This research shows that each stage in the innovation process has a crucial role in determining the success of innovation. A systematic and structured approach in undergoing each stage can help increase the chances of successful innovation in various contexts, including in entrepreneurship and the public sector.

Drawing upon the theoretical frameworks outlined above, public libraries face various challenges and opportunities. Key challenges include budget constraints, resistance to change, and the need to accommodate multiple user groups with diverse needs. However, opportunities for innovation also abound, especially with technological advances that can change the way libraries operate and serve the public. By adopting a design-based approach as suggested by Bason (2010) libraries can conduct surveys and feedback sessions with users to understand their needs in depth. This can translate into more relevant and satisfying services. For example, libraries can develop digital skills training programs designed specifically for seniors, who are often underserved in this aspect. To utilize public service

motivation, library management needs to create a work environment that supports and motivates staff. This can be done through rewarding innovative initiatives, training and professional development, and active involvement in decision-making. In this way, public libraries can become innovation centers that not only provide access to information but also empower the community through adaptive and responsive services.

Perry & Hondeghem (2008) shows that the values and attitudes of individuals working in the public sector play an important role in encouraging innovation. In public libraries, staff who are highly motivated to serve the public tend to be more proactive in seeking new ways to improve services. This could include initiatives to improve accessibility for people with disabilities, or digital literacy programs for underserved communities.

This study investigates the innovation process undertaken by the Regional Library and Archives Service of Malang City, Indonesia, through the development and implementation of *M-Mobilib*, a mobile library application. Specifically designed for Android platforms, *M-Mobilib* facilitates user-friendly access to library resources and services via smartphones, thereby redefining the library's role in the digital era. The application enables users to search the catalog and access digital content, promoting inclusivity and convenience for a digitally literate population.

The research focuses on examining the stages of innovation, namely idea generation, adoption, and implementation while also identifying the enabling and constraining factors that shape the innovation trajectory. In addition, the study evaluates the quality of services emerging from the application's deployment, aiming to provide evidence-based recommendations for optimizing the use of digital technologies in public library settings.

Unlike prior studies that tend to offer broad discussions on digital innovation in public sector services, this research presents a focused and systematic exploration of technological innovation within public libraries. Its contribution lies in offering a holistic assessment of the innovation lifecycle, from conceptualization to execution, supported by an analysis of internal and external influences. Furthermore, this study does not stop at evaluating outcomes but proposes actionable strategies for enhancing *M-Mobilib*'s effectiveness. The adoption of adaptive research methods allows for a richer interpretation of how digital solutions can be tailored to improve library service delivery, thereby addressing a critical gap in existing scholarly literature on public library innovation in the digital age.

2. METHODS

This research uses descriptive qualitative methods to analyze and describe the public service innovation process in regional public libraries through *M-Mobilib* technology. This approach was chosen because it can dig up in-depth information about various aspects of innovation, such as idea discovery, adoption, and implementation, as well as supporting and inhibiting factors, and the quality of the services produced (Rogers, 1983). By focusing on the experiences and perspectives of informants such as library leaders, staff, and *M-Mobilib* users, this study offers a more comprehensive understanding of their interactions with technology. This flexible and adaptive approach allows researchers to adapt research methods to the dynamics of the field, which is important in understanding dynamic innovation in public libraries. In addition, this approach also allows a holistic understanding that includes cultural factors and organizational policies that influence the innovation process (Bason, 2010; Perry & Hondeghem, 2008). The following table shows the data of Informants who have their

respective authorities and responsibilities in the planning and development process of *M-Mobilib* technology in Malang City:

Table 1. Informants in the Planning and Development of M-Mobilib

Informant	Authority	Responsibilities
1. Malang City Government	Policy Decisions: Establishing policies and regulations that support the development of M-Mobilib.	Policy Support: Creating and approving policies that support the digitalization initiatives of the library.
	Budget: Providing and allocating funds for the development and maintenance of the M-Mobilib application.	Funding: Providing the necessary funds for the development, implementation, and maintenance of the application.
	Oversight and Evaluation: Monitoring and evaluating the impact of the application on the community and the quality of library services.	Administrative Support: Providing administrative and political support to ensure the project's smooth execution.
2. Head of Malang City Library and Archives Service	Strategic Decision-Making: Leading and making strategic decisions regarding the development and implementation of M-Mobilib.	Planning and Strategy: Setting the vision, goals, and strategy for the M-Mobilib application.
	Oversight: Overseeing all aspects of the application's development and management to ensure alignment with the vision and mission of the Department.	Coordination: Coordinating between various internal and external teams involved in the project.
		Performance Evaluation: Evaluating the results and impact of the application and making strategic adjustments as needed.
3. Developer and Programmer	Technology and Implementation: Determining the technology used and the methods for implementing the M-Mobilib application.	Application Development: Designing, developing, and testing the application according to the specified requirements and needs.
	Technical Problem-Solving: Addressing technical issues that arise during the development and maintenance of the application.	Maintenance and Technical Support: Providing technical support, fixing bugs, and updating the application to enhance functionality.
		Security and Performance: Ensuring data security and application performance according to established standards.
4. Library Staff	Content Management: Managing and updating the digital collection available through the application.	Catalog Management: Entering and updating book and digital resource data in the application.
	User Support: Providing support and guidance to application users.	User Support: Assisting users in using the application, answering questions, and resolving issues related to the application.
		Feedback and Improvement: Collecting user feedback and communicating it to the development team for application improvements.
5. Application Users (Residents of Malang City)	Feedback: Providing feedback on their experience with the application and suggesting improvements.	Application Usage: Using the application according to the provided guidelines and rules.
	Utilization: Using the application to access library resources and digital services.	Providing Input: Providing feedback on features, functionality, and issues encountered while using the application.
		Engagement: Participating in library activities and using the application's

This study investigates the *M-Mobilib* innovation by addressing three core dimensions. First, it explores the idea discovery, adoption, and implementation stages of the innovation, tracing how the idea was conceived, embraced by stakeholders, and operationalized within public service contexts. Second, it examines both the enabling and constraining factors that influence the innovation process, including organizational dynamics, regulatory frameworks, resource availability, and stakeholder involvement. Third, the research evaluates the resulting service quality, particularly in terms of enhanced efficiency, improved accessibility, and increased user satisfaction.

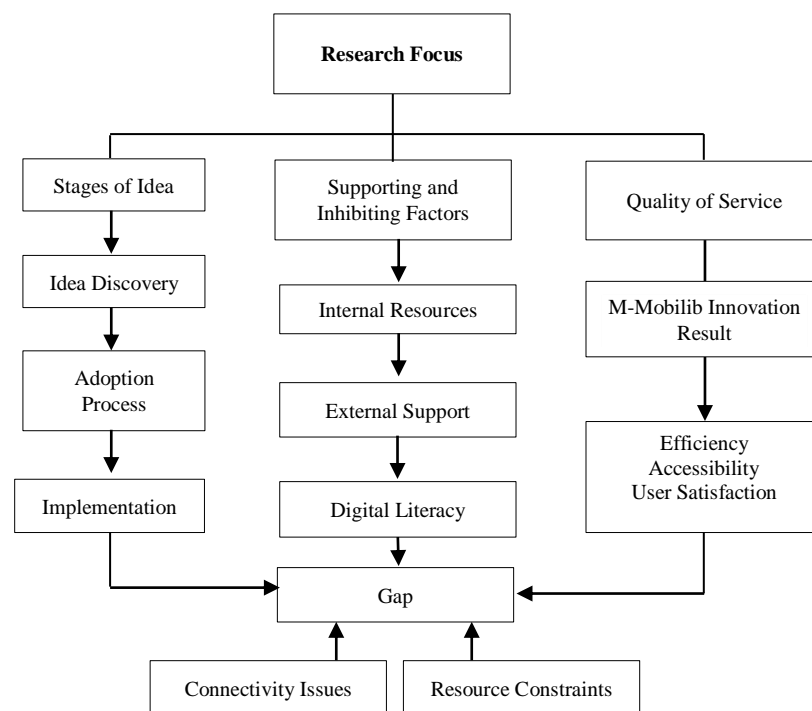


Figure 1. Research focus diagram flow

This study employs a snowball sampling approach to data collection, incorporating interviews, documentation, and observation as primary methods. In-depth interviews were conducted with key informants, including library leaders, staff, and *M-Mobilib* users, to gather detailed insights on the innovation process, influencing factors, and service outcomes. Complementary documentation such as reports, policies, and user manuals provided contextual understanding, while direct observations of *M-Mobilib* use within library settings offered a practical view of its application and user interaction.

The snowballing technique enabled the identification of additional relevant informants, enriching the dataset. Data analysis was carried out through thematic analysis to identify and categorize emerging patterns, supported by data triangulation to ensure validity and credibility across multiple sources. Additionally, ethical considerations included informed consent, confidentiality of informant identities, and objective, transparent reporting of findings. The study is limited by its geographic scope, focused solely on the *M-Mobilib* initiative in Malang City, and acknowledges the potential influence of researcher interpretation. Limited exploration of user complaints presents an area for future

investigation. These limitations help frame the study's contextual boundaries and highlight opportunities for further research.

3. RESULTS AND DISCUSSION

The Mobile Library of Malang (M-Mobilib) is an Android-based application initiated by the Regional Library and Archives Service of Malang, Indonesia aimed at improving public access to library services. This innovation responds to the growing demand for mobile-friendly information access, reflecting the widespread use of smartphones in daily life. Beyond Malang, several other regions in Indonesia have also implemented similar mobile library applications, demonstrating a broader effort to address the evolving and dynamic information needs of their local communities.

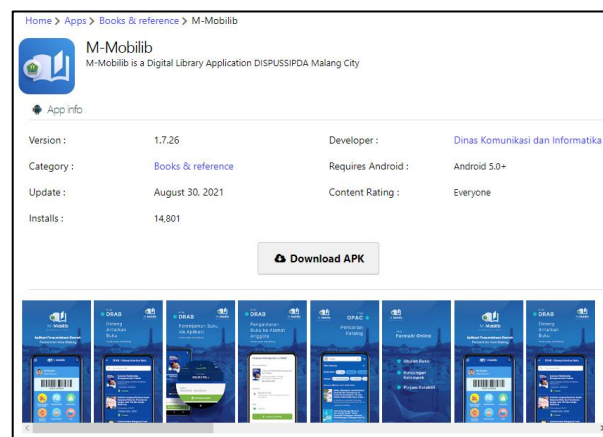


Figure 2. M-Mobilib is a Digital Library Application of the Regional Library and Archives Service of Malang, Indonesia

The application is developed by the Communication and Information Agency of Malang, and is listed under the category Books and References. The current version is 1.7.26, updated on 08/30/2021. According to Google Play M-Mobilib achieved more than 15 thousand installs. It currently has 52 reviews with an average vote rating of 4.4. It is a digital library application offered by the library.

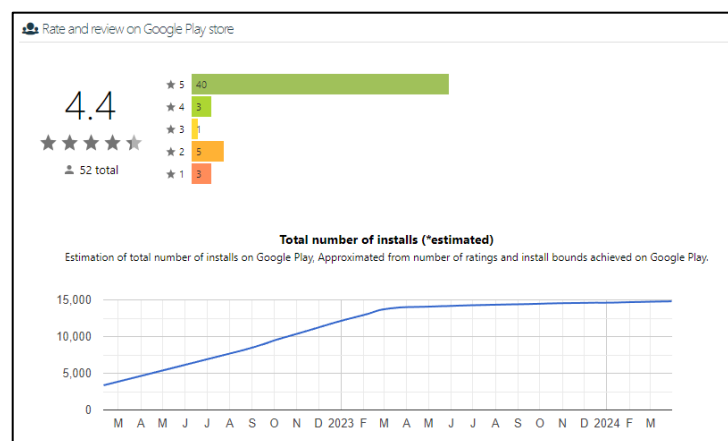


Figure 3. Rate and review on Google Play Store: total installs

M-Mobilib has significantly enhanced public engagement with library services. By enabling users to access library resources anytime and from any location, the application addresses the needs of individuals who may be unable to visit the library physically. It offers advanced features such as comprehensive search functions and interactive e-book reading tools, which contribute to the overall improvement in service quality. Moreover, M-Mobilib has fostered greater community involvement in library-related activities, as reflected in the growing number of users and increased visits to the library.

Public Service Innovation Process

In response to the restrictions imposed by the COVID-19 pandemic few years ago, which significantly limited public access to libraries, the Regional Library and Archives Service of Malang introduced an innovative digital solution: the *M-Mobilib* application. As a public service institution committed to promoting literacy, the library developed this application to ensure continued access to library resources through a mobile, user-friendly platform. Apart from that, the manual system used previously was considered less effective. Innovation in public services is the key to meeting the demands of an increasingly complex and dynamic society (Utami, 2023). In the context of public libraries, information technology has opened up new opportunities to improve efficiency, accessibility, and service quality. One example of innovation in public libraries is the implementation of the M-Mobilib digital application in Malang City. The M-Mobilib innovation process follows the stages proposed by A. Shepherd, described by Ulum (2019), including the stages of idea discovery, adoption, and implementation.

Idea Discovery Stage

The idea discovery stage in the innovation process is a crucial step for identifying problems and formulating appropriate solutions (Kakatkar et al., 2020; Ozcan et al., 2021). The development of digital library applications begins with a thorough understanding of the needs and challenges faced by libraries (Rodin, 2013). This understanding was obtained through surveys, interviews with staff and visitors, as well as analysis of library service data (Jayanti & Arista, 2019). In this context, the development of the *M-Mobilib* application began with the formulation of an initial concept aligned with the library's vision and mission, and designed to enhance the quality of its services. This concept was followed by a structured planning phase that defined the application's goals, objectives, and scope. The planning process actively engaged multiple stakeholders, including library staff, key decision-makers, and information technology consultants to ensure a comprehensive and user-centered design. The inclusion of diverse perspectives played a crucial role in enriching the development process and aligning the application with user needs and expectations. (Fitriyana et al., 2024; Rasjid et al., 2023; Ria & Budiman, 2021). This systematic and collaborative approach provides a solid foundation for building digital library applications that are effective and beneficial for libraries and their visitors (Tajuddin, 2022).

Adoption Stage

The adoption stage involves an ongoing critical evaluation process, assessing the feasibility and potential benefits of *M-Mobilib*. This includes gathering feedback from users, identifying areas for improvement, and making necessary adjustments to improve the overall experience. *M-Mobilib*'s success is also related to the availability of diverse and high-quality digital content. The library realizes that users will be attracted to the application if it offers a variety of interesting and informative resources. Creating a supportive management environment is critical to driving *M-Mobilib* adoption. The institution leadership plays a

critical role in promoting the application within the organization and allocating the necessary resources for its implementation and maintenance.

Implementation Stage

The implementation of *M-Mobilib* begins with a thorough understanding of the existing library landscape. The library initiated a thorough assessment of user needs, challenges, and expectations. This involves surveys, interviews with staff and visitors, and analysis of library service data. This in-depth understanding is the foundation on which *M-Mobilib* will be built. The library has undertaken a strategic and deliberate approach in charting the development roadmap for *M-Mobilib*. Each feature and function of the application has been thoughtfully designed to align with the library's core objectives, ensuring that the platform not only addresses user needs but also supports the broader advancement of library services. The development process represented a collaborative endeavor, uniting library personnel, information technology consultants, and stakeholders from various sectors. This multidisciplinary team worked collectively to ensure that the application adhered to the highest standards of functionality, usability, and accessibility. Such a collaborative model fostered the exchange of diverse ideas and expertise, ultimately laying a strong foundation for an innovative and impactful digital library solution.

Supporting Factors

The success or failure of implementing a service is of course influenced by several things which include supporting and inhibiting factors. Every service change or reform has different supporting and inhibiting factors, which can come from internal or external aspects of the public service bureaucracy (Sumartono & Hermawan, 2020). The successful implementation of *M-Mobilib* cannot be separated from the support and vision of the organization leadership. The institution's investment in strong technology infrastructure, including reliable internet connections, compatible devices, and secure data storage, provides the backbone for smooth *M-Mobilib* operations. *M-Mobilib*'s success is firmly rooted in its user-centered design approach. The organization actively seeks user feedback throughout the development process, incorporating suggestions and refining features to improve the app's usability and accessibility. This commitment to understanding and meeting user needs ensures that *M-Mobilib* suits its target audience. Their commitment to continuous improvement is the driving force behind *M-Mobilib*'s ongoing evolution. The library remains vigilant in monitoring usage patterns, identifying areas for improvement, and introducing updates to keep the application relevant and at the forefront of library innovation. This commitment to continuous improvement ensures that *M-Mobilib* remains a valuable asset for staff and visitors.

Challenges to Implementation

Although enabling factors play an important role in the success of *M-Mobilib*, it is important to acknowledge the inhibiting factors faced by the implementation team. Understanding these challenges and developing strategies to mitigate them is important to ensure the smooth adoption and long-term sustainability of any innovative initiative. The initial implementation of the application faced the challenge of bridging the digital literacy gap among some users. Not all visitors are familiar with smartphones, internet access, or app use, requiring additional training and support to take full advantage of app features. *M-Mobilib*'s reach was initially limited by the availability of reliable internet connections in remote areas. This digital divide creates challenges in ensuring equal access to the benefits of applications for all library visitors.

Impact of M-Mobilib Innovation on Service Quality

The M-Mobilib application can serve the community in their information and literacy needs. This application provides various services, making it easier for library members or users to access library services online. It offers various useful features for users to make it easier for users to access library services online and offline. Users can search for books by title, author, ISBN, or keywords; register as a library member; borrow and return books; as well as extend the loan period online. Apart from that, users can also book reading rooms or meeting rooms, access e-books, and get information and reference services from librarians through this platform. It also provides various features to increase accessibility and comfort in using library services. The quality of the apps services can be measured through several main indicators, namely effectiveness, efficiency, user satisfaction, availability, reliability, and security, as presented in the following table:

Table 2. M-Mobilib service quality indicators

Indicator	Description
Effectiveness	M-Mobilib is effective in increasing the accessibility of library services with the increasing number of application users and library visitors.
Efficiency	M-Mobilib is efficient in reducing library transaction times such as borrowing and returning books, increasing service efficiency.
User satisfaction	M-Mobilib users are generally satisfied with the quality of service, reflected in the high application ratings on the Google Play Store and App Store.
Availability	M-Mobilib is available 24/7, allowing users to access library services anytime and anywhere.
Reliability	M-Mobilib is generally reliable with minimal system disruption, ensuring a user experience in accessing library services.
Security	M-Mobilib implements strict security measures to protect user data and maintain privacy and information security.

In recent years, libraries have been faced with various significant challenges related to increasing accessibility and service quality, especially due to changes in the way people access information and services (Izzah et al., 2021; Juliawan et al., 2021). The limitations of traditional service methods and increasing demand from the public drive the need for innovation in library services. This situation triggers the need for technological solutions that can expand the range of services and increase user interaction with libraries (Siregar & Yasmin, 2024).

This change is also caused by a shift in the needs of society which is more mobile and dependent on digital technology. As a response to this challenge, the institution decided to develop *M-Mobilib*, a digital application that aims to improve library services and answer modernization demands in the delivery of information (Istara, 2023). This initiative not only includes technological development but also involves adjustments in the library's managerial and operational processes, to ensure the application can meet user needs and increase service effectiveness (Jayanti & Arista, 2019; Rodin, 2013).

The implementation of applications such as *M-Mobilib* is expected to provide practical solutions to the problems of accessibility and limited physical interaction faced by many libraries (Chua & Goh, 2010; Higgs et al., 2013). Thus, the development of *M-Mobilib* not only aims to improve overall library services but also serves as an innovative model that can be applied in various locations and other contexts to meet the growing information needs in the digital era.

In the context of public libraries, information technology has opened up new opportunities to improve efficiency, accessibility, and service quality (Chua & Goh, 2010; Higgs et al., 2013). One example of innovation in public libraries is the implementation of the *M-Mobilib* digital application in Malang. The innovation process carried out by the institution through the digital application has proven that the innovation carried out is in line with the definition of innovation which includes new knowledge, new ways, new objects, new technology, and discoveries (Noor, 2013).

The idea discovery stage in the innovation process is a crucial step for identifying problems and formulating appropriate solutions. According to Lestari's (2019), organizational culture plays an important role in fostering innovative ideas. An atmosphere that encourages creativity, risk-taking, and collaboration will be fertile ground for the birth of brilliant ideas. Ridlowi & Himam (2018) added that the dynamics of the idea discovery stage are also influenced by leadership, organizational culture, resources, and the external environment. A comprehensive approach that considers these three pillars and dynamics will increase the chances of successful innovation in government agencies.

The adoption stage involves a critical evaluation of the ideas discovered to determine their feasibility and potential benefits (Judijanto et al., 2024). The success of *M-Mobilib* also requires varied and quality digital content and supportive management policies. The adoption stage involves a critical evaluation of ideas to determine their feasibility and benefits. According to Rogers (1995). The innovation adoption process consists of five stages: Knowledge, Persuasion, Decision, Implementation, and Confirmation. Rogers stated that individuals or organizations that adopt innovation at an early stage tend to be more open to change and have more resources.

Walker's (2006) said that product and process innovations are more easily adopted if the benefits are clear and implementation is easy. Key factors driving adoption include strong leadership, political support, adequate resources, and an organizational culture that supports innovation. Adoption of innovation has a positive impact by increasing efficiency, service quality, and staff job satisfaction. However, this research is based in the UK and needs to be further researched in other country contexts. Public sector organizations adopt innovation to maintain legitimacy and meet external expectations. Mimetic pressure causes organizations to imitate the practices of other organizations that are considered prestigious. Membership in professional networks also encourages the adoption of innovations through the sharing of information and best practices.

The implementation stage is the stage where the ideas that have been adopted are implemented into real practice. Shepherd et al., (2015) describes implementation as a process that includes careful planning, resource allocation, and change management. In the case of *M-Mobilib*, implementation included training library staff to use the application, providing adequate technological infrastructure, and promotional campaigns to increase public awareness of the new service. Technical challenges such as servers and applications that are still simple are faced with continuous improvement efforts and increasing service features.

The implementation of innovation in public services is a complex and multidimensional process, which is influenced by various interrelated factors. According to Rogers et al., (2014), implementation success depends on the characteristics of the innovation, the characteristics of the adopter, and the implementation process itself. These factors include how the innovation is introduced and understood by individuals or organizations, as well as the support available during the implementation process. Meanwhile, Schein (1970) is of the view

that a strong and supportive organizational culture plays an important role in successful implementation. A culture that supports innovation facilitates change and adaptation, while a resistant culture can hinder implementation. [de Ven et al., \(1999\)](#) emphasize the importance of stakeholder involvement in the implementation of innovation. Active involvement of various parties can increase support and reduce resistance to change. Transparent and collaborative communication is key to ensuring effective stakeholder engagement.

The views of these various theories show that the implementation of innovation in public services is a process that requires attention to various interrelated factors. Successful implementation depends on how the innovation is introduced, supported, and integrated into the organization, as well as how all stakeholders are involved in the process. By understanding and applying the principles of these theories, organizations can increase their chances of success in implementing public service innovations that benefit society.

The research results show that the *M-Mobilib* innovation process in the library service is in line with the stages described by the researchers described above. At the idea discovery stage, even though in-depth research on user complaints has not been carried out, observations of technological needs and developments provide a strong basis for developing innovative ideas. The adoption stage involving critical evaluation and feature adjustments based on user feedback ensures that the application is viable and useful. Good implementation, although faced with technical challenges, shows the library's commitment to improving public services through digital technology.

The success or failure of the implementation of a service is influenced by several things which include supporting and inhibiting factors. Every service change or reform has different supporting and inhibiting factors, which can come from internal or external aspects of the public service bureaucracy ([Sumartono & Hermawan, 2020](#)). The smoothness and success of service innovation through the *M-Mobilib* application carried out by the library are influenced by several factors, starting from e-government requirements, innovation processes, collaboration, communication, and community readiness, to human resources in the internal and external environment of public service organizations, ss depicted in Figure 4.

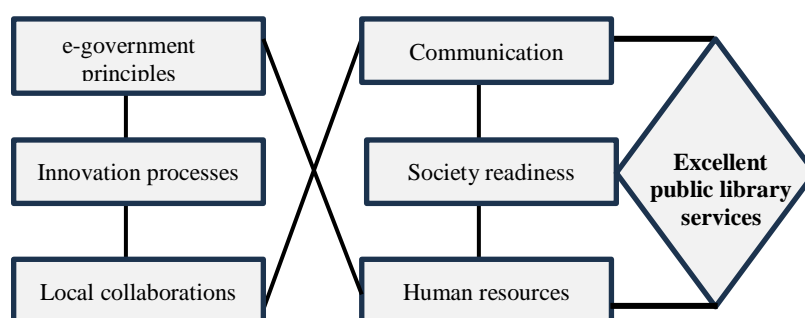


Figure 4. Analysis of success factors for digital service development in public libraries

The diagram above illustrates the factors that influence the success of developing superior public library services, starting from e-government principles which are a strong basis for utilizing information and communication technology effectively, innovation processes that ensure services continue to develop, local collaboration involving various parties to strengthen support and participation, effective communication as a bridge between libraries and the community, the role of skilled human resources in providing quality

services, and increased community readiness through digital literacy programs and socialization of library services.

This study shows that the success of *M-Mobilib* implementation in Malang is influenced by internal and external factors. Leadership support, staff training, innovative culture, and adequate infrastructure and technology are crucial internal factors. Effective management, including planning, budgeting, monitoring, and evaluation, is also important. External support from local governments, collaboration with communities, community readiness in internet access and digital literacy, as well as effective outreach and education also play a role. Competition for similar services motivates the library to continue developing *M-Mobilib*. E-government principles are important for designing and managing effective and efficient digital services.

It highlights a complex interplay of internal and external factors that contribute to its effectiveness. Internally, strong leadership support, comprehensive staff training, a culture of innovation, and robust infrastructure and technology are vital components. These elements not only facilitate the smooth operation of *M-Mobilib* but also ensure that the service is aligned with the broader goals of the institution. For instance, leadership plays a critical role in setting the vision and providing the necessary resources, while staff training ensures that employees are equipped to manage and troubleshoot the digital platform (Istara, 2023).

Management practices, including meticulous planning, budgeting, and regular monitoring and evaluation, are also crucial. These practices ensure that the project stays on track and can adapt to emerging challenges. However, this research reveals that managing such an innovation is not without its challenges. For example, budgeting constraints can limit the extent to which the service can be expanded or enhanced. Monitoring and evaluation processes, while essential, may also be hampered by the lack of real-time data or the complexity of measuring digital service outcomes (Izzah et al., 2021; Juliawan et al., 2021).

Externally, the support from local governments, collaboration with communities, and the readiness of the community in terms of internet access and digital literacy significantly impact the success of *M-Mobilib*. The involvement of local governments can provide the necessary policy backing and additional resources, while community collaboration can help tailor the service to meet local needs. However, challenges such as varying levels of digital literacy and internet access across different regions can hinder the widespread adoption of the service. This disparity necessitates targeted outreach and education efforts to ensure that the benefits of the apps are accessible to all segments of the population (Siregar & Yasmin, 2024).

Competition from similar services also presents a challenge, pushing the institution to continuously innovate and improve the apps. This competition can be a double-edged sword—while it drives innovation, it can also strain resources and create pressure to maintain a competitive edge. Additionally, the integration of e-government principles in the design and management of the *M-Mobilib* is crucial for ensuring that the service is not only effective but also efficient and user-friendly. However, aligning the apps with broader e-government strategies may require significant adjustments to existing processes and frameworks, posing additional challenges (Izzah et al., 2021; Juliawan et al., 2021).

In summary, while the successful implementation of the apps is driven by a range of internal and external factors, the process is fraught with challenges that require careful management. Addressing these challenges, particularly those related to resource constraints, digital literacy, and competition, is essential for sustaining and scaling this innovative service.

However, there are obstacles in implementing the apps. The server managed by the Ministry of Communication and Information of the Republic of Indonesia often experiences obstacles that hinder services. It is still simple and can only be used by people with Malang City ID cards and Android devices. In terms of e-Service quality, the library pays attention to five aspects, namely security maintained by the Ministry, communication that still needs to be improved, reliability of information supported by dedicated staff, responsiveness that increases service speed, and delivery of good solutions through skilled staff and adequate infrastructure, although the server often experiences obstacles. The quality of *M-Mobilib* services can be measured through several main indicators, namely effectiveness, efficiency, user satisfaction, availability, reliability, and security.

Several regions in Indonesia have shown their commitment to developing digital library services to meet the needs of an increasingly dynamic society. DKI Jakarta, for example, has launched *iJakarta*, while the National Library is developing *iPusnas*. These applications, together with *M-Mobilib* in Malang City, represent an increasingly widespread trend in the use of digital technology to improve the accessibility and quality of library services in Indonesia.

The process of developing and implementing these applications generally goes through similar stages, namely idea discovery, adoption, and implementation. However, each case has unique characteristics and challenges. For example, *iPusnas* faces challenges in providing diverse and high-quality digital content, as well as ensuring equal access throughout Indonesia. By comparing *M-Mobilib* with similar initiatives in other regions, we can see that the success of digital innovation in the library sector is strongly influenced by several key factors. Adequate technological infrastructure, active community participation, and policy support from the local government are several crucial factors. The following is a comparison of digital library systems: *iJakarta*, *iPusnas*, and *M-Mobilib* in in-depth analysis table. The following table provides a summary of the similarities and differences of the three systems.

Table 3. Comparison of *iJakarta*, *iPusnas*, & *M-Mobilib*

Features/Aspects	<i>iJakarta</i>	<i>iPusnas</i>	<i>M-Mobilib</i>
The main purpose	Increasing Jakarta people's access to information and knowledge	Providing digital access to the national library collection for all Indonesian people	Increasing digital literacy and access to information for the people of Malang City
Collection	Focus on digital collections relevant to Jakarta, such as history, culture and government	A very extensive digital collection, covering a wide range of scientific disciplines	Digital collections tailored to the needs of the people of Malang City, especially local literature
Feature	Online catalogs, e-books, audio books, scientific articles, digital reference services	Online catalogs, e-books, audio books, scientific articles, digital reference services, online communities	Online catalogs, e-books, audio books, digital reference services, integration with physical libraries
Accessibility	Limited to the Jakarta area	National access via the internet	Focused on the Malang City area, but can be accessed from anywhere
Innovation	Features that are relevant to the needs of the people of Jakarta, such as integration with open data	A very large and complex platform, with many advanced features	A more focused approach on local communities, with features tailored to specific needs

These three systems on the table have the same goal, namely increasing public access to information and knowledge through digital platforms. They also offer similar basic features, such as online catalogs, e-books, and audio books. The main differences lie in scale, focus, and special features. *iJakarta* and *M-Mobilib* have a more local focus, while *iPusnas* has a national reach. *iPusnas* offers a very broad collection, while *iJakarta* and *M-Mobilib* may focus more on collections relevant to their respective regions.

These three digital library systems have made a significant contribution to increasing public access to information. Each system has advantages and disadvantages that are influenced by factors such as scale, resources, and local needs. By continuing to learn from the successes and challenges of each system, we can develop better digital library systems in the future.

4. CONCLUSION

This study highlights the effectiveness of *M-Mobilib*, a digital library application developed the Regional Library and Archives Service of Malang, Indonesia in expanding access to library services during the COVID-19 pandemic. With its 24/7 availability, user-friendly interface, and features supporting both online and offline access, the *M-Mobilib* exemplifies how innovation can transform public service delivery. The application's success is rooted in a user-centred approach, guided by the stages of idea discovery, adoption, and implementation. Key factors include stakeholder engagement, iterative feature refinement, staff training, and robust infrastructure. Despite its success, challenges remain, particularly in digital literacy and internet accessibility. The findings underscore the potential for replicating such innovations elsewhere, while also pointing to areas for further research, including scalability and long-term impact. To sustain and enhance the *M-Mobilib*, future developments should prioritize personalized services, digital literacy initiatives, and strategic partnerships. Embracing gamification, multilingual support, green technology, and continuous evaluation will ensure its relevance and sustainability in advancing literacy across Indonesia.

ACKNOWLEDGEMENT

The authors sincerely thank all participants for their indispensable assistance in this research undertaking. The contributions of their participation and insights have significantly influenced the results of this research.

AUTHORS' CONTRIBUTIONS

Hermawan: Writing original draft preparation. Ideas; formulation or evolution of overarching research goals and aims.

CONFLICT OF INTERESTS

I state that there are no known conflicts of interest linked with this publication, and that there has been no significant financial assistance for this work that could have influenced its outcome.

REFERENCES

- Abubakar, L., Salemcity, A. J., Abass, O. K., & Olajuyin, A. M. (2021). The impacts of COVID-19 on environmental sustainability: A brief study in world context. *Bioresource Technology Reports*, 15, 100713. <https://doi.org/10.1016/j.biteb.2021.100713>
- Bason, C. (2010). *Leading public sector innovation* (Vol. 10). Bristol: Policy Press.
- Bertot, J., Estevez, E., & Janowski, T. (2016). Universal and contextualized public services: Digital public service innovation framework. In *Government Information Quarterly* (Vol. 33, Issue 2, pp. 211–

- 222). Elsevier. <https://doi.org/10.1016/j.giq.2016.05.004>
- Cagigas, D., Clifton, J., Diaz-Fuentes, D., & Fernandez-Gutierrez, M. (2021). Blockchain for Public Services: A Systematic Literature Review. *IEEE Access*, 9, 13904–13921. <https://doi.org/10.1109/ACCESS.2021.3052019>
- Chakraborty, I., & Maity, P. (2020). COVID-19 outbreak: Migration, effects on society, global environment and prevention. *Science of the Total Environment*, 728, 138882. <https://doi.org/10.1016/j.scitotenv.2020.138882>
- Chua, A. Y. K., & Goh, D. H. (2010). A study of Web 2.0 applications in library websites. *Library and Information Science Research*, 32(3), 203–211. <https://doi.org/10.1016/j.lisr.2010.01.002>
- de Ven, A. H., Polley, D., Garud, R., & Venkataraman, S. (1999). *The Innovation Journey*, New York: Oxford Univ. Press.
- de Vries, H., Bekkers, V., & Tummers, L. (2016). Innovation in the public sector: A systematic review and future research agenda. *Public Administration*, 94(1), 146–166. <https://doi.org/10.1111/padm.12209>
- Fitriyana, A., Terttiaavini, T., Mustika, S. P., Friyani, Y., Sianipar, A., & Salbani, S. (2024). Pengembangan Aplikasi Membaca Digital Yassa Sebagai Solusi Praktis Membaca Dimana Saja Menggunakan Metode Devops. *Journal of Information Systems Management and Digital Business*, 1(3), 335–344.
- Gonzalez, R., Llopis, J., & Gasco, J. (2013). Innovation in public services: The case of Spanish local government. *Journal of Business Research*, 66(10), 2024–2033.
- Gul, S., & Bano, S. (2019). Smart libraries: an emerging and innovative technological habitat of 21st century. *The Electronic Library*, 37(5), 764–783.
- Hamdillah, H. (2023). Inovasi Pelayanan Publik dan Transformasi Birokrasi: Pendekatan Administrasi Publik dalam Meningkatkan Good Governance. *Resolusi: Jurnal Sosial Politik*, 6(2), 91–102. <https://doi.org/10.32699/resolusi.v6i2.5672>
- Hidayat, W. (2022). Analisis Inovasi Pelayanan Publik Berbasis Aplikasi Tangerang Live Di Kota Tangerang. *Jurnal Studia Administrasi*, 3(2), 48–57. <https://doi.org/10.47995/jian.v3i2.65>
- Higgs, G., Langford, M., & Fry, R. (2013). Investigating variations in the provision of digital services in public libraries using network-based GIS models. *Library & Information Science Research*, 35(1), 24–32.
- Huong, T. T. L., Thanh, T. T., & others. (2022). Is digitalization a driver to enhance environmental performance? An empirical investigation of European countries. *Sustainable Production and Consumption*, 32, 230–247.
- Irawan, B. (2017). Studi Analisis Konsep E-Government: Sebuah Paradigma Baru Dalam Pelayanan Publik. *Jurnal Paradigma (JP)*, 2(1), 174. <https://doi.org/10.30872/jp.v2i1.351>
- Istara, S. M. (2023). *Manajemen layanan perpustakaan berbasis online dengan aplikasi m-mobilib (studi kasus pada Perpustakaan Umum Kota Malang)* [Universitas Negeri Malang]. <http://repository.um.ac.id/id/eprint/282540>
- Izzah, R. N., Sukaesih, S., Rukmana, E. N., & Saefudin, E. (2021). Inovasi Perpustakaan Daerah Kabupaten Purwakarta Dalam Mengembangkan Layanan Berbasis Inklusi Sosial Saat Pandemi Covid-19. *ACARYA PUSTAKA: Jurnal Ilmiah Perpustakaan Dan Informasi*, 8(1), 53–69. <https://ejournal.undiksha.ac.id/index.php/AP/article/view/2021184>
- Jayanti, F., & Arista, N. T. (2019). Persepsi Mahasiswa Terhadap Pelayanan Perpustakaan Universitas Trunojoyo Madura. *Competence: Journal of Management Studies*, 12(2). <https://doi.org/10.21107/kompetensi.v12i2.4958>
- Judijanto, L., Karmagatri, M., Lutfi, M., Sepriano, Pipin, S., Erwin, Indrayani, N., Nugraha, U., Lukmana,

- H. (2024). Pengembangan Startup Digital: Referensi Sukses Memulai Bisnis Startup Digital Era Industri 4.0 dan Society 5.0.
- Jukić, T., Pevcin, P., Benčina, J., Dečman, M., & Vrbek, S. (2019). Collaborative innovation in public administration: theoretical background and research trends of co-production and co-creation. *Administrative Sciences*, 9(4), 90.
- Juliawan, I. W., Bawa, P. W., & Qondias, D. (2021). Dampak covid-19 terhadap implementasi pembelajaran daring di sekolah dasar. *Jurnal Ilmiah Pendidikan Citra Bakti*, 8(2), 157–169.
- Kakatkar, C., Bilgram, V., & Fuller, J. (2020). Innovation analytics: Leveraging artificial intelligence in the innovation process. *Business Horizons*, 63(2), 171–181. <https://doi.org/10.1016/j.bushor.2019.10.006>
- Lestari, E. R. (2019). Manajemen Inovasi: Upaya Meraih Keunggulan Kompetitif. In *Google Books*. Universitas Brawijaya Press.
- Marto, S. (2021). *Manajemen pelayanan publik*. Yayasan kita menulis.
- Noor, I. (2013). *Desain inovasi pemerintahan daerah*. Universitas Brawijaya Press.
- Orinaldi, M. (2021). Dampak Pembatasan Kegiatan Masyarakat Terhadap Pertumbuhan Ekonomi: Suatu Kajian. *J-MAS (Jurnal Manajemen Dan Sains)*, 6(2), 391. <https://doi.org/10.33087/jmas.v6i2.301>
- Ozcan, S., Suloglu, M., Sakar, C. O., & Chatufale, S. (2021). Social media mining for ideation: Identification of sustainable solutions and opinions. *Technovation*, 107, 102322. <https://doi.org/10.1016/j.technovation.2021.102322>
- Perry, J. L., & Hondeghem, A. (2008). *Motivation in public management: The call of public service*. Oxford University Press, USA.
- Putri, L. D. M., & Mutiarin, D. (2018). Efektifitas inovasi kebijakan publik; Pengaruhnya pada kualitas pelayanan publik di Indonesia. *J. Ilmu Pemerintah*, 3(9). <http://repository.ums.ac.id/bitstream/handle/123456789/29132/C.54.pdf?sequence=1>
- Rasjid, Mappesse, & Natsir. (2023). *Pengembangan Aplikasi E-Library di Sekolah*. Indonesia Emas Group. Indonesia Emas Group.
- Ria, M. D., & Budiman, A. (2021). Perancangan Sistem Informasi Tata Kelola Teknologi Informasi Perpustakaan. *Jurnal Informatika Dan Rekayasa Perangkat Lunak (JATIKA)*, 2(1), 122–133. <http://jim.teknokrat.ac.id/index.php/informatika>
- Ridlowi, R., & Himam, F. (2018). Inovasi pada Organisasi Pemerintah: Tahapan dan Dinamika. *Gajah Mada Journal of Psychology (GamaJoP)*, 2(1), 22–37.
- Rodin, R. (2013). Peluang Dan Tantangan Penerapan Otomasi Perpustakaan Di Indonesia. *Jurnal Kajian Informasi Dan Perpustakaan*, 1(1), 73. <https://doi.org/10.24198/jkip.v1i1.9613>
- Rogers, E. M. (1983). Diffusion of Innovations, A Division of Macmillan Publishing Co. Inc. *Third Edition*, The Free Press, New York.
- Rogers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In *An integrated approach to communication theory and research* (pp. 432–448). Routledge.
- Rogers E, M. (1995). Diffusion of innovations. *New York*, 12, 576.
- Romy, E., Se, B. A., Ardansyah, M., & others. (2022). *Teori dan perilaku Organisasi*. umsu press.
- Rusdy, R. M. I. R., & Flambonita, S. (2023). Penerapan Sistem Pemerintahan Berbasis Elektronik (Spbe) Di Pemerintah Daerah Untuk Mewujudkan Good Governance. *Lex LATA*, 5(2). <https://doi.org/10.28946/lexl.v5i2.2351>
- Schein, E. H. (1970). *Organizational psychology*. Prentice-Hall Englewood Cliffs, NJ.
- Scupola, A., & Zanfei, A. (2016). Governance and innovation in public sector services: The case of the

- digital library. *Government Information Quarterly*, 33(2), 237–249. <https://doi.org/10.1016/j.giq.2016.04.005>
- Setianingrum, T., & Abritaningrum, Y. T. (2016). Mempertanyakan Responsivitas Pelayanan Publik Pada Pengelolaan Pengaduan Kasus Upik Di Kota Yogyakarta. *Populasi*, 24(1), 1. <https://doi.org/10.22146/jp.23692>
- Setianingrum, E. (2017). Inovasi Kebijakan Pelayanan Publik: Best Practice di Indonesia. In *Pusat Penerbitan dan Percetakan UNAIR* (p. 147). Airlangga University Press (AUP). https://repository.unair.ac.id/97698/7/24A_Inovasi_Kebijakan_OK.pdf
- Shepherd, D. A., Williams, T. A., & Patzelt, H. (2015). Thinking About Entrepreneurial Decision Making: Review and Research Agenda. *Journal of Management*, 41(1), 11–46. <https://doi.org/10.1177/0149206314541153>
- Siregar, M., & Yasmin, N. (2024). Peran relawan Perpustakaan STAIN As-Sunnah dalam meningkatkan kualitas pelayanan perpustakaan. *Pustaka Karya: Jurnal Ilmiah Ilmu Perpustakaan Dan Informasi*, 12(1), 129–136.
- Suchá, L. Z., Bartošová, E., Novotný, R., Svitáková, J. B., Štefek, T., & Váňichová, E. (2021). Stimulators and barriers towards social innovations in public libraries: Qualitative research study. *Library & Information Science Research*, 43(1), 101068.
- Sumartono, S., & Hermawan, H. (2020). The reform of public service bureaucracy in the investment sector within the pentahelix perspective: A new hope in the era of autonomy? *Australasian Accounting, Business and Finance Journal*, 14(1 Special Issue), 33–45. <https://doi.org/10.14453/aabfj.v14i1.4>
- Tajuddin, H. (2022). Adaptasi Pemanfaatan Teknologi Berbasis Pelayanan Perpustakaan Di Kabupaten Pinrang [UNIVERSITAS BOSOWA]. In *Repository.Unibos.Ac.Id*. <https://repository.unibos.ac.id/xmlui/handle/123456789/331>
- Tasyah, A., Lestari, P. A., Syofira, A., Rahmayani, C. A., Cahyani, R. D., & Tresiana, N. (2021). Inovasi Pelayanan Publik Berbasis Digital (E-Government) di Era Pandemi Covid-19. *Jurnal Ilmu Administrasi: Media Pengembangan Ilmu Dan Praktek Administrasi*, 18(2), 212–224. <https://doi.org/10.31113/jia.v18i2.808>
- Ulum, M. C. (2018). *Public Service: Tinjauan Teoretis dan Isu-Isu Strategis Pelayanan Publik* (Cetakan 1). Universitas Brawijaya Press. <http://www.ubpress.ub.ac.id>
- Utami, P. (2023). Transformasi Administrasi Publik: Inovasi Dan Adaptasi Menuju Efisiensi Dan Pelayanan Publik Berkualitas. *PAPATUNG: Jurnal Ilmu Administrasi Publik, Pemerintahan Dan Politik*, 6(2), 1–9. <https://doi.org/10.54783/japp.v6i2.726>
- Walker, R. M. (2006). Innovation type and diffusion: An empirical analysis of local government. *Public Administration*, 84(2), 311–335.
- Wastuhana, Y., & Werdiningsih, R. (2021). Reformasi Birokrasi Era Informasi Teknologi. *Jurnal Media Administrasi*, 3(1), 8–15.
- Wibawa, G. A., Antarini, L., & Jurusan. (2020). Sistem Digital Tata Kelola Pemerintahan Daerah (Digital Local Government) I Gede Agus Wibawa dan Lilik Antarini. *Public Inspiration: Jurnal Administrasi Publik*, 5(1), 57–71. <https://ejournal.warmadewa.ac.id/index.php/public-inspiration>