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TECHNOLOGY-BASED POPULATION ADMINISTRATION SERVICE INNOVATION: AN ANALYSIS OF IMPLEMENTATION AND CHALLENGES IN LOCAL GOVERNMENTS

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Abstract

Public service innovation through technology adoption has become imperative for local governments in Indonesia. This study examines the implementation of a self-service kiosk technology for population administration services in Jepara Regency, Central Java. Using qualitative methods with interviews and document analysis, this research evaluates implementation effectiveness through five key dimensions: policy content appropriateness, implementer suitability, target precision, environmental compatibility, and process adequacy. Findings reveal that while the innovation successfully addresses long queuing issues and improves service efficiency, significant challenges persist including limited infrastructure readiness in remote areas, digital literacy gaps among citizens, and incomplete standard operating procedures for support staff. The study demonstrates that technology-driven public service innovations require comprehensive planning beyond procurement, including human resource development, infrastructure support, and formal institutional arrangements. This research contributes to understanding e-government implementation at local level and provides practical recommendations for policymakers pursuing digital transformation in public services.

Keywords: Public Service Innovation, E-Government, Population Administration, Technology Adoption, Local Government

INTRODUCTION

Digital transformation in public services has become an important agenda for the Indonesian government in the last decade. The development of information and communication technology opens up opportunities for the government to improve the quality of services through the implementation of e-government (Hartono & Mulyanto, 2010). E-government is a government system that utilizes information and communication technology as a tool to provide ease of communication and transaction processes to the public, business organizations, and government agencies and their staff. In the context of population administration services, the need for innovation is becoming increasingly urgent given the high volume of services and the complexity of procedures that must be faced by the community. Population administration regulated in Law Number 24 of 2013 includes various types of important documents such as Identity Card (KTP), Family Card (KK), Child Identity Card (KIA), and birth and death certificates. Conventional handling of these documents often poses the problem of long queues, convoluted processes, and uncertainty of completion time.

Before the implementation of technology-based systems, population administration services in various regions faced serious challenges. People have to come directly to the official office, queue for a long time, and face uncertainty related to the completeness of the requirements. This condition not only causes discomfort for the community, but also lowers the image of the local government as a public servant. Furthermore, conventional paper-based systems create inefficiencies in data management and open up opportunities for fraudulent practices. Responding to these problems, the Ministry of Home Affairs issued Regulation of the Minister of Home Affairs Number 7 of 2019 concerning Online Population Administration Services. This regulation encourages local governments to adopt technology in population administration services, including through the provision of self-service kiosks. In line with these regulations, various local governments have begun to implement technology-based service innovations. Public service innovation is defined as the government's efforts to improve the quality of services through new approaches, methods, or technologies that are more effective and efficient (Yanuar, 2019). In the context of local government, innovation is an important instrument in implementing decentralization and improving

community welfare. However, the implementation of technological innovations in public services does not always run smoothly and faces various challenges, both technical and non-technical. Previous research shows that the implementation of public service innovation faces various obstacles. Jati (2011) found that public service innovation is often "half-hearted" due to a lack of commitment and comprehensive support. Oktamia and Fauziah (2018) in a study on the implementation of electronic ID cards identified technical, administrative, and socialization problems as the main obstacles. Meanwhile, Haqie et al. (2020) show that the success of public service innovation is highly dependent on mature implementation design and the support of all stakeholders. This study examines the implementation of self-service kiosk technology for population administration in Jepara Regency, Central Java. This technology allows people to print their own population documents without having to go through officers and conventional queuing processes. This study is important considering that there is still limited research that examines in depth the implementation of self-service technology at the local government level, especially in the context of population administration. The research questions asked are: (1) How is the implementation of self-service technology innovation for population administration in local governments? (2) What are the challenges faced in the implementation of these innovations? This research aims to explore the implementation process and identify the factors that affect the success and obstacles to the implementation of technology-based public service innovation.

LITERATURE REVIEW

Public Policy and Implementation

Public policy is a decision made by the government to overcome public problems and achieve certain goals (Winarno, 2012). The policy process does not stop at the formulation stage, but continues at the implementation stage that determines the success or failure of a policy. Policy implementation is the process of implementing policy decisions that have been made (Agustino, 2014). Various policy implementation models have been developed by experts. One relevant approach to analyzing policy implementation is the model developed by Nugroho (2021) which emphasizes five criteria for accuracy: right load, right to implement, right target, right environment, and right process. This model recognizes that the success of implementation is determined not only by sound policy design, but also by the suitability between the various elements of implementation. The right content refers to the relevance of the substance of the policy to the problem to be solved. The right implementation is related to the ability and suitability of the organization or individual who implements the policy. The right target considers whether the policy goals are in accordance with what is planned. Environmental Appropriateness analyzes the suitability of policies with the political, economic, social, and cultural contexts in which policies are implemented. Meanwhile, the process is appropriate to evaluate whether the implementation stages have been carried out systematically and according to procedures.

E-Government and Public Service Innovation

E-government is defined as the use of information and communication technology by the government to increase efficiency, effectiveness, transparency, and accountability in providing services to the community (Hartono & Mulyanto, 2010). The concept of e-government encompasses three main dimensions of relationships: Government to Government (G2G), Government to Business (G2B), and Government to Citizens (G2C).The implementation of e-government requires readiness in various aspects including human resources, regulations, budgets, and facilities and infrastructure. The success of e-government is not only measured by the sophistication of the technology used, but also by the extent to which the technology is able to improve service quality and community satisfaction. Public service innovation is an effort to introduce new ways or significant improvements in providing services to the community (Yanuar, 2019). In the context of local government, innovation is an important instrument to improve service performance and regional competitiveness. Regulation of the Minister of State Apparatus Empowerment and Bureaucratic Reform Number 15 of 2014 concerning Service Standard Guidelines provides a normative framework for the implementation of quality public services. Jati's research (2011) shows that the implementation of public service innovation in Indonesia often faces obstacles due to inconsistent commitment from stakeholders. Meanwhile, Haqie et al. (2020) found that the success of public service innovation is highly dependent on comprehensive design, leadership support, and community participation.

Population Administration

Population administration is a series of structuring and regulating activities in the issuance of population documents and data through population registration, civil registration, and information management (Law Number 24 of 2013). A good population administration system is an important foundation for the implementation of government, development, and public services.

Regulation of the Minister of Home Affairs Number 7 of 2019 concerning Online Population Administration Services encourages digital transformation in population services. This regulation is the legal basis for local governments to develop various technology-based service innovations, including a self-service system that allows people to access services without going through officers. The implementation of technology in population administration is expected to overcome various classic problems such as long queues, convoluted processes, uncertainty of completion time, and the potential for illegal levies. However, as shown by Oktamia and Fauziah (2018) in a study on electronic ID cards, the implementation of new technologies in population administration faces various technical, administrative, and social challenges that need to be anticipated and mitigated.

RESEARCH METHODS

This study uses a qualitative approach with a descriptive type of research. The qualitative approach was chosen because this study aims to deeply understand the process of implementing public service innovations and explore various factors that affect them (Sugiyono, 2016). Qualitative methods allow researchers to capture the complexity of social phenomena and understand the perspectives of the actors involved. The location of the research is the Population and Civil Registration Office of Jepara Regency, Central Java. The selection of the location was based on the consideration that this district has implemented self-service technology innovations and received a national-level excellent service award from the Ministry of State Apparatus Empowerment and Bureaucratic Reform in 2023. The research informants were selected by purposive sampling, which is a sampling technique with certain considerations (Sugiyono, 2016). Key informants include: (1) Head of the Population and Civil Registration Office; (2) Head of Population Administration Information Management; and (3) users of the Service. The selection of informants takes into account their knowledge and involvement in the implementation of innovation.

The data collection techniques used were in-depth interviews and documentation studies. In-depth interviews are conducted with semi-structured interview guidelines to provide flexibility in digging up information (Siyoto & Sodik, 2015). Documentation studies are carried out on various relevant documents such as laws and regulations, budget documents, service statistical data, and other policy documents.

Data analysis uses an interactive analysis model which includes data reduction, data presentation, and conclusion drawing (Sugiyono, 2016). Data reduction is carried out by summarizing and selecting the main things from the collected data. The presentation of data is carried out in the form of a descriptive narrative. Conclusions are drawn in stages by considering the overall data that has been analyzed. The validity of the data was tested using the triangulation technique, which is comparing data from various sources and data collection methods (Widoyoko, 2014). Source triangulation is carried out by comparing information from various informants. The triangulation method was carried out by comparing the interview results with the documentation data. The research analysis framework uses the concept of five criteria for the accuracy of policy implementation developed by Nugroho (2021), including: (1) appropriate content; (2) the right implementation; (3) Right on target; (4) environmental correctness; and (5) proper process. This framework was chosen because it provides a comprehensive approach to evaluating policy implementation by considering various interrelated dimensions.

RESULTS AND DISCUSSION

Implementation Context

Before the implementation of self-service technology, population administration services in Jepara Regency faced various serious problems. Based on the data collected, the main problems include: (1) long queues that start early in the morning; (2) limited human resources compared to the volume of applications; (3) inefficient paper-based system; (4) errors in the completeness of the file due to lack of public understanding; (5) the practice of prostitution; and (6) long delivery time of documents by mail. Statistical data shows a high volume of services. In the 2015-2020 period, the average printing of ID cards ranged from 53,000-82,000 documents per year, Family Cards 53,000-84,000 documents, and Birth Certificates 17,000-27,000 documents per year. The volume of these services decreased in 2019-2020 due to the COVID-19 pandemic, which actually accelerated the need for digital transformation in public services. Responding to these problems and in line with the Regulation of the Minister of Home Affairs Number 7 of 2019, the Jepara Regency Government implemented a self-service kiosk technology innovation which was launched on July 28, 2021. This technology allows people to print their own population documents such as ID cards, KK, and KIA without going through conventional officers and queues. The total investment for the procurement of 17 units of machines reached IDR 3.4 billion, which was sourced from the 2021 Regional Revenue and Expenditure Budget. The implementation of this technology is part of a comprehensive strategy for the digital transformation of population administration services which is given the tagline "Dukcapil Go Digital". In addition to self-service kiosks, the Jepara

Regency Population and Civil Registration Office also develops online services through the website and diversifies document distribution methods to provide options to the public according to their needs.

Implementation Analysis Based on Five Accuracy Criteria

1. **Precise Load**

Evaluation of the policy content shows that self-service kiosk technology has high relevance to the problems faced. This technology provides a solution to the problems of long queues, long waiting times, and inefficiencies of conventional service processes. Unlike other distribution methods that still require intermediaries (POS, village couriers, or expeditions), self-service kiosks provide end-to-end services that are directly accessible to the public. This innovation also answers the needs of modern society who want fast, easily accessible, and independent services. Data shows that the method of distributing documents has evolved since 2021. In 2021, most of the documents (28,860 documents) were distributed through POS Indonesia, but this method was discontinued as many documents did not reach the recipients. In 2022, the delivery method to the village office was used (19,119 documents), which was then replaced by the Cash on Delivery system through JNT in 2023 (6,425 documents). Self-service kiosks are becoming a non-shipping alternative, with 212 documents printed in 2021, increasing to 3,319 documents in 2022, although declining to 1,232 documents in 2023. From the content aspect, this policy can be considered appropriate because it provides concrete solutions to existing service problems. However, the decline in usage in 2023 indicates the need to evaluate other aspects of implementation.

2. **Right Implementer**

The implementation of self-service kiosk technology is carried out by the Jepara Regency Population and Civil Registration Office, especially the Population Administration Information Management Division. Based on the analysis, the selection of implementers is appropriate considering the following: (1) this policy involves population data that is confidential and requires high security; (2) The Population and Civil Registration Office has the authority and responsibility in the management of population administration; and (3) there is good coordination between the Regional Government and the Directorate General of Population and Civil Registration of the Ministry of Home Affairs. Vertical coordination with the central government and horizontal with the Regional Government is the key to smooth implementation. However, there are weaknesses in the implementation aspect at the operational level. Although an accompanying officer has been appointed in each sub-district to help people who have difficulty operating the machine, this officer does not have an official letter of assignment and there is no clear Standard Operating Procedure (SOP) for assistance. This condition has the potential to reduce the effectiveness of services and officer accountability.

3. **Right on Target**

The main target of this policy is the entire community of Jepara Regency, with a special focus on people who are technologically literate and have high mobility. The placement of machines in each sub-district office (16 units) and Public Service Mall (1 unit) is intended to facilitate public access. From the reception aspect, the community showed a positive response to this innovation. Based on interviews with users, they appreciated the speed of the service which only takes 2-4 minutes, the ease of operation similar to an ATM, and the absence of long queues. Socialization is carried out through various communication channels including social media (TikTok, Instagram, Twitter), WhatsApp, pamphlets, and banners. This multimedia socialization strategy is effective in reaching various segments of society, especially the younger generation who are active on social media. However, there is a gap in the accuracy of the target. Based on data from the Central Statistics Agency in 2021, the population of Jepara Regency aged 15 years and above with the highest elementary school diploma reached 27.84% and those who did not graduate from elementary school reached 11.42%. This condition indicates that some people may face difficulties in operating self-service technology, even though escort officers have been provided.

4. **Right Environment**

Analysis of the policy environment shows conducive conditions. Internally, there is strong support from the Regional Government, which is reflected in a significant budget allocation of Rp 3.4 billion for the procurement of machinery. This leadership support is an important factor in the successful implementation of public service innovation, in line with the findings of Haqie et al. (2020).

Coordination between policy implementers (Population and Civil Registration Office) and policy formulators (Directorate General of Population and Civil Registration) is communicative. The dual reporting system to the Regent and the Director General of Dukcapil creates an effective coordination mechanism in overcoming implementation problems. From the aspect of public opinion, public acceptance is relatively high without any rejection or conflict. The ease of access to information through social media makes people quickly understand how this technology works. However, geographical and demographic conditions create environmental challenges. Jepara Regency, which covers the archipelago (Karimunjawa), faces technological infrastructure constraints that will be discussed further in the implementation challenges section.

5. **Precise Process**

Policy implementation goes through three main stages that are systematic. First, the policy acceptance stage where the Central Government through the Ministry of Home Affairs issued Minister of Home Affairs Regulation Number 7 of 2019 in response to the need for digital transformation of population administration services. Second, the policy adoption stage where the Jepara Regency Government responds to the regulation by allocating a budget and procuring machinery. Starting with one unit launched on July 28, 2021 at the Public Service Mall, then added 16 units to be placed in each sub-district. This stage also involves intensive socialization through various media. Third, the strategic readiness stage where the Population and Civil Registration Office prepares human resources, ensures the readiness of infrastructure (internet network, hardware), and synchronizes data. Until the time the research was conducted, 4,763 documents had been printed through self-service kiosks. Although the implementation process has gone through systematic stages, there are weaknesses in the aspect of institutional formalization. There is no official letter of assignment for accompanying officers and clear SOPs indicate that the institutionalization process has not been fully completed. This condition can affect the sustainability and consistency of service quality.

Implementation Challenges and Barriers

This study identifies two main categories of challenges in the implementation of self-service kiosk technology:

1. **Infrastructure and Technical Challenges**

The most serious infrastructure problem occurred in Karimunjawa District where the machines could not operate because they were unable to capture internet signals. The geographical condition of the archipelago far from the district center creates connectivity obstacles that have not been resolved. This problem indicates a lack of infrastructure readiness assessment before machine placement. In the context of the implementation of e-government, the readiness of information technology infrastructure is a fundamental prerequisite that must be met (Hartono & Mulyanto, 2010). Failure in this aspect causes investment not to provide benefits to the people in the region. Improvement efforts are being carried out by the Agency independently, but until the research is carried out, there is no definitive solution from the center. This situation demonstrates the importance of responsive technical support mechanisms in the implementation of new technologies.

2. **Capacity and Digital Literacy Challenges**

The digital literacy gap among the public is a significant obstacle in the use of self-service technology. Based on statistical data, most of the population of Jepara Regency has a relatively low level of education, which correlates with the ability to adopt new technologies. Even though an accompanying officer has been provided, the assistance service is not optimal due to the absence of formalization of duties and clear SOPs. These findings are in line with the research of Oktamia and Fauziah (2018) which shows that the implementation of new technologies in population administration requires serious attention to community capacity and structured mentoring strategies. The absence of assistance SOPs has the potential to create inconsistencies in the quality of services between locations.

Theoretical and Practical Implications

From the perspective of policy implementation theory, this study confirms the relevance of multidimensional approaches in evaluating implementation. An analysis of the five precision criteria shows that the success of implementation is determined not only by the technical design of the technology, but also by its suitability with the local context, the readiness of implementers, and the support of the policy environment.

This study enriches the literature on the implementation of e-government at the local level by showing that: (1) technology adoption requires comprehensive planning that goes beyond the procurement aspect; (2) local context analysis (geographical, demographic, infrastructure) should be the basis for implementation planning; (3) institutional formalization through SOPs and official assignments that are important for sustainability; and (4) effective multimedia socialization strategies in building public acceptance. Practically, this study provides an important lesson for other local governments planning the implementation of similar technologies. First, the need for a comprehensive readiness assessment before technology deployment, including evaluation of infrastructure, human resource capacity, and community readiness. Second, the importance of developing SOPs and structured mentoring mechanisms to ensure accessibility for all segments of society. Third, the need for responsive technical support to overcome operational problems. The findings of this study also confirm Jati's (2011) observation about "half-hearted" public service innovations in different contexts. Despite large budget commitments, incompleteness in the institutionalization aspect (SOP, letter of assignment) and unpreparedness of infrastructure in some locations indicate that implementation is not yet fully mature.

Research Limitations

This research has several limitations. First, the research was conducted in a limited time span so that it could not capture the dynamics of implementation in the long term. Second, the number of user informants is relatively limited so that it cannot represent the overall diversity of service users. Third, this research focuses more on the perspective of policy implementers, while the perspective of the wider community needs to be explored more deeply in future research. Nevertheless, this research makes an important contribution in understanding the dynamics of the implementation of technology-based public service innovations at the local government level. The research findings can be the basis for improving implementation and learning for other regions planning similar innovations.

CONCLUSION

This study concludes that the implementation of self-service kiosk technology for population administration in Jepara Regency shows mixed results. From the aspects of right content, right implementation, right target, right environment, and right process, this policy basically has a solid foundation with clear regulatory support, large budget commitments, and positive public acceptance. This technology has succeeded in providing a solution to the problem of long queues and convoluted services by providing fast (2-4 minutes), easily accessible, and can be done independently. Data shows that until 2023, 4,763 documents have been printed through self-service kiosks, indicating that there is utilization by the community. However, implementation faces two significant challenges. First, the limitations of infrastructure in certain areas, especially Karimunjawa District which does not have adequate internet connectivity so that machines cannot operate. Second, the digital literacy gap among the community that limits the range of technology utilization, even though accompanying officers have been provided. More fundamentally, the research identifies weaknesses in the institutionalization aspect. The absence of a clear SOP for assistance and an official letter of assignment for accompanying officers indicates that institutional formalization has not been completed. This condition has the potential to affect the consistency and sustainability of service quality.

ADVICE

For the Regional Government of Jepara Regency

1. Conduct a comprehensive infrastructure readiness assessment before deploying technology in the new location, including evaluation of internet connectivity, electricity availability, and geographical conditions.
2. Coordinating with the Directorate General of Population and Civil Registration of the Ministry of Home Affairs to obtain technical support in overcoming infrastructure problems in Karimunjawa District.
3. Prepare and establish clear Standard Operating Procedures (SOPs) for assistance services, including service standards, complaint handling mechanisms, and officer performance indicators.
4. Issue official letters of assignment and clear employment agreements for accompanying officers to ensure accountability and professionalism in service.

For the Population and Civil Registration Office

1. Develop structured digital literacy programs for the community, especially segments with low education levels, through collaboration with village/sub-district governments.
2. Conduct periodic evaluations of the utilization of self-service kiosks in each location and identify factors that affect the utilization rate.

3. Build a systematic monitoring and evaluation system to measure technology performance, user satisfaction, and identify operational problems early.
4. Optimizing socialization strategies by focusing on direct demonstrations and intensive mentoring, not just relying on social media.

For further research

1. Conducting a comparative study of the implementation of self-service technology in several districts/cities to identify best practices and lessons learned.
2. Examine in depth the factors that affect the level of utilization of self-service technology from the perspective of the user community.
3. Examining the economic impact of the implementation of self-service technology on the efficiency of local government budgets and costs incurred by the community.

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