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E-Government Innovation: Digital Identity Services in Cirebon Regency

Nabila Putri Salsabila, Rd. Mahendra Haryo Bharoto*
Universitas Swadaya Gunung Jati, Indonesia
Email: putrinabila.salsa79@gmail.com, haryo.bharoto@ugj.ac.id*

ABSTRACT

The development of information technology has encouraged the government to innovate public services through the implementation of e-government, one of which is the Digital Population Identity (*Identitas Kependudukan Digital*/IKD) by the Cirebon Regency Population and Civil Registration Office (*Dinas Kependudukan dan Pencatatan Sipil*). IKD was implemented as an effort to transform digital-based population administration services to be more practical, fast, and efficient. However, the implementation of IKD still faces several obstacles, such as low public understanding of digital technology, inadequate socialization, limited internet access, and technical difficulties during the activation and use of the application. Some people also still prefer physical documents, as these are considered easier to use. This study aims to analyze the implementation of IKD in public services in Cirebon Regency, identify the obstacles faced, and determine the role of IKD in improving the quality of public services. The study employed a qualitative method using interview and document analysis techniques. The research informants were community members who use the IKD application. The results showed that IKD makes it easier for the public to access population administration services digitally. IKD is considered practical and efficient and is able to reduce the need for people to come directly to service offices. Although there were obstacles in the initial stages of use, assistance from officers helped the community understand how to use the IKD application.

Keywords: e-government, public services, digital population identity, IKD, innovation

INTRODUCTION

Advances in information and communication technology have driven changes in the way government is run, including in public services (Trisantosa et al., 2022). E-government is defined as activities carried out by the government using information technology to provide services to the public. One concrete example of e-government implementation at the local level is the development of digital civil registration services. The Population and Civil Registration Office (*Dinas Kependudukan dan Pencatatan Sipil*/*Disdukcapil*) of Cirebon Regency, as the agency responsible for managing population data, is working to improve the quality of its services through digital innovation. Innovation can be understood in the context of behavioral change and is typically closely related to a dynamic and evolving environment (Camagni, 2017). According to Rogers (Meti, 2023), innovation can be defined as an idea, practice, or object that is considered new by one group of people compared to another, and thus serves as a driver of change.

The implementation of e-government is regulated by Presidential Regulation No. 95 of 2018 on the Electronic-Based Government System (*Sistem Pemerintahan Berbasis Elektronik*/SPBE), which aims to create a clean, effective, efficient, and trustworthy system of government. One such effort is the development of the Digital Population Identity (*Identitas Kependudukan Digital*/IKD) (Ahad & Barsei, 2023; Hadi & Widnyani, 2024; Wardana et al., 2026). This program is part of a national policy aimed at making it easier for the public to access population documents quickly and securely through digital devices (*Peraturan Daerah*/PERDA Kabupaten Cirebon No. 3, 2014).

The implementation of e-government innovations through the IKD service in Cirebon Regency represents one of the government's efforts to improve the quality of public services, making them more effective, efficient, transparent, and digital-based. In practice, population administration services have transitioned from manual to digital systems to make it easier for the public to access population services. However, the implementation of IKD services still faces various challenges, such as limited technological infrastructure, network disruptions, low

digital literacy among the public, as well as insufficient outreach and human resource capacity to support digital services. These conditions indicate that the application of e-government innovations in population services still requires further evaluation to ensure that the goals of digital-based public services can be optimally achieved (Al-Muttaqin & Nugroho, 2025; Harsoyo & Amanatin, 2025). Therefore, further research is needed to comprehensively understand the implementation of these digital service innovations. Based on this, the research problem in this study focuses on the implementation of e-government innovations through IKD services at the Cirebon Regency Population and Civil Registration Office. This study examines how the implementation of IKD services functions as a form of digital innovation in population administration in Cirebon Regency. Additionally, this study discusses the supporting and inhibiting factors in the implementation of the IKD service from the perspectives of technology, human resources, and community participation. Furthermore, this study analyzes the impact of the IKD service implementation on improving the quality of public services, particularly in creating services that are more effective, efficient, easily accessible, and responsive to community needs (Diwanti et al., 2025).

Based on the current state of civil registration services in Cirebon Regency, several key issues can be identified. The previously manual civil registration process resulted in long wait times and overall inefficiency. A lack of data integration meant that residents had to visit the *Disdukcapil* office in person to process their documents. Limited public understanding of digital services hinders the optimal use of the e-government system. Technical challenges in implementing digital service applications — such as network disruptions, limited ICT infrastructure, and a shortage of competent human resources in the field of technology — further compound these difficulties. Insufficient public outreach and guidance have resulted in many residents remaining unaware of how to utilize digital civil registration services.

These issues underscore the need for digital-based public service innovations that can enhance the effectiveness, efficiency, and transparency of civil registration services in Cirebon Regency. This requires serious attention from the local government, particularly in terms of outreach, training, and capacity building for civil servants to support the advancement of digital transformation in public services. Etymologically, the term "public service" is derived from two words: "service" and "public." According to Poerwadarminta, the definition of "service" originates from the Indonesian word "*layan*," which means to assist in preparing or managing anything that pertains to a person (Trisantosa et al., 2022).

With the introduction of innovations in digital identity services, public services are expected to become more modern, faster, and more efficient, thereby supporting the achievement of good governance (Obiageli et al., 2020). Research on e-government innovations in digital identity services in Cirebon Regency is important for understanding the extent of their successful implementation (Ap et al., 2021).

Social dynamics in Cirebon Regency continue to evolve due to improvements in infrastructure and digital literacy. However, disparities in access remain, particularly in rural areas. Digital infrastructure is helping to transform how communities communicate, access public services, and engage in economic activities, such as the use of digital media by small and medium-sized enterprises and the digitization of village government operations. Nevertheless, limited access and low levels of digital literacy among certain segments of the population remain major obstacles to this transformation. Therefore, in addition to improving infrastructure, the government must also enhance the public's ability to understand and use technology appropriately, wisely, and responsibly.

This study thus aims to address this gap through an analysis of e-government innovations in digital identity services in Cirebon Regency, covering aspects of innovation, obstacles, and benefits for the public and implementing agencies. One such innovation developed by the

central government through the Ministry of Home Affairs is the Digital Population Identity (*Identitas Kependudukan Digital*/IKD).

While previous research, such as the study by Bharoto et al. (2023), examined the implementation of the *E-Surat* application for electronic records management in Palimanan Timur Village, that study primarily focused on administrative document archiving at the village level. There remains a significant gap in understanding the implementation of individual digital identities (IKD) at the broader regency scale, which involves more complex data integration and wider community adoption challenges. Therefore, this study aims to comprehensively analyze the implementation of e-government innovations through the IKD service at the Cirebon Regency Population and Civil Registration Office. Specifically, this study seeks to: (1) assess the extent to which IKD improves the efficiency and quality of civil registration services; (2) identify technical, human resource, and digital literacy barriers hindering its implementation; and (3) evaluate its overall impact on creating a more transparent, efficient, and accessible public service ecosystem.

Relevant prior research was conducted by Bharoto et al. (2023), which examined the implementation of the *E-Surat* application in electronic records management to support e-government in Palimanan Timur Village. However, its implementation has not been optimal due to limited human resources, a lack of training, and insufficient technological infrastructure. The success of public service digitization is highly dependent on the readiness of civil servants and the adequacy of supporting infrastructure.

Literature Review

E-Government

E-Government is short for Electronic Government, or "Pemerintahan Elektronik" in Indonesian. E-Government refers to digital government. (Amy Y.S Rahayu, Visnu Juwono, 2020) E-government refers to the government's use of information and communication technology (such as wide area networks, the Internet, and mobile computing) to transform its relationships with the public, the business community, and other stakeholders in the delivery of public services.

E-government has become a global phenomenon that naturally attracts the attention of various stakeholders, including governments, policymakers, politicians, the business community, researchers from various disciplines, and the general public (Amy Y.S Rahayu, Visnu Juwono, 2020) E-government refers to the use of technology, communication, and information particularly the internet by the government to provide services and share information. E-government enables the government to deliver services through data-driven technology networks for various purposes, with the aim of assisting the general public (Sinthawati et al., 2021) The implementation of e-government in public services at the local government level is expected to create faster, more effective, and more efficient services, as well as support the application of the principles of good governance. Local governments can operate more effectively and transparently toward the public, thereby accelerating the realization of the government's vision to provide excellent service to all citizens. (Juliarso, 2019) The implementation of e-government in public services is believed to be capable of improving the performance of government agencies in organizing administrative systems, services, and civil service work processes through the use of information technology. In the civil registration sector, technological advancements have driven a shift from a previously manual service system to a digital-based one. Advances in information and communication technology have also brought changes to the delivery of public services by the government. Consequently, the focus of public service is no longer solely on cost efficiency but also on enhancing flexibility, ease of oversight, and public satisfaction as service users.(Anryana et al., 2024).

Innovation Concept

Innovation is a new change that leads to improvement. By introducing new approaches or methods from input to output innovation brings about tangible changes in both the social and economic spheres. According to Regulation of the Minister of State Apparatus Empowerment and Bureaucratic Reform No. 30 of 2014 (Reformasi & Republik, 2014) , Public service innovation refers to breakthroughs in public service delivery whether in the form of creative ideas or modifications that provide benefits to the community, either directly or indirectly. The goal is to solve problems, improve performance, and add value to an organization or the community. Innovation does not only involve creating something entirely new but can also take the form of improvements or updates to existing systems, methods, or services. The goal is to make these more effective, efficient, and beneficial for the people who use or receive the services. According to Everett Rogers' theory (2003) (Meti, 2023) the attributes of innovation are relative advantage, compatibility, complexity, trialability, and observability. These attributes influence the speed at which an innovation is adopted by the public. Relatively Advantageous: The perceived benefits of the innovation compared to existing ideas or methods. Compatibility: The degree to which the innovation aligns with users' values, past experiences, and needs.Complexity: The level of difficulty in understanding and using an innovation. Trialability : The opportunity to try the innovation on a limited scale before full adaption. Observability: The likelihood that others will see the results or benefits of the innovation.

IKD Application

Digital transformation in public services is not limited to converting data into digital form, but also involves updating outdated information technology systems to adapt to the increasingly dynamic development and needs of public services. This transformation aims to create a more modern, effective, and efficient administrative system that focuses on improving the quality of services provided to the public. To support this digital transformation, the Directorate General of Population and Civil Registration (Dukcapil) of the Ministry of Home Affairs of the Republic of Indonesia is introducing an innovation in the field of population administration through the implementation of the Digital Population Identity (IKD) as an evolution of the electronic ID card. The electronic ID card, as a physical identity document, is still considered to carry risks of data misuse and forgery. In addition, there are still various cases of the use of false identities carried out by manipulating information or using other people's personal data. Therefore, the implementation of the IKD is expected to improve the security of population data while providing the public with easy access to administrative services digitally, (Zahro, 2024)

The Digital Civil Registration Identity (IKD) is an electronic representation of civil registration data and documents that can be viewed or accessed via digital devices (such as smartphones) and typically includes verification features such as QR codes. The IKD was designed as part of a strategy to digitize civil registration services in orde to facilitate public acces and support paperless services.

The Digital Population Identity (IKD) is digital information regarding a resident's identity, intented to replace the physical e-ID card. The purpose of the IKD is to integrate information and communication technology as a key component of population digitization efforts, thereby making transactions and public services easier and faster. (Amy Y.S Rahayu, Visnu Juwono, 2020)

METHOD

This study employed a qualitative approach, using observation as the primary data collection strategy. Data were obtained through document analysis, direct field observations, and in-depth interviews with various relevant informants. Data analysis was conducted in stages through the processes of data reduction, data presentation, and drawing conclusions to gain a comprehensive understanding of the phenomenon under study. Additionally, this study was supported by an analysis of various relevant literature as a source of secondary data to strengthen the findings from the field. According to Sugiyono (Harbani, 2012), is a research method used to study natural phenomena; its counterpart is the experiment, in which the researcher serves as the key instrument. Data collection techniques are used in combination, data analysis is inductive, and the results of qualitative research emphasize meaning over generalization.

The informants in this study were selected using a purposive sampling technique to ensure data was collected from individuals with direct involvement and relevant experience. The key informants consist of [isi jumlah] officials from the Cirebon Regency Population and Civil Registration Office (Disdukcapil) who are directly responsible for the management and technical implementation of the IKD application. Furthermore, the study includes [isi jumlah] residents of Cirebon Regency who have actively used the IKD service, selected to provide user-end perspectives on service quality, efficiency, and accessibility." (Catatan: Isi bagian dalam kurung siku dengan angka/jumlah yang sebenarnya).

This study was conducted in Cirebon Regency, which was selected as the research site because the region has actively implemented a Digital Identity application system but still faces various challenges in optimizing the use of this technology.The study is scheduled to take place from January to Februay 2026 and will include phases of observation, interviews, data analysis, and the compilation of research findings.

RESULTS AND DISCUSSION

This study involved members of the public who use the Digital Population Identity (IKD) app to gain insight into their experience with the service. Interview results indicate that the implementation of IKD is seen as facilitating population administration service. The use of the IKD app is considered practical because it saves time and reduces the need for people to visit the Population and Civil Registration Office in person.

In terms of ease of use, the informant stated that the IKD app is relatively easy to operate. The activation process is carried out with the assistance of Disdukcapil staff through stages of population data verification using an electronic ID card, facial verification, QR code scanning, and PIN creation. Once the activation process in complete, users can access their digital identity data through the IKD app. Although some adjustment is required in the early stages, once users understand the app’s workflow, the IKD service can be used without significant issues.

Informants reported that the benefits of using the IKD app are immediately apparent, particularly in terms of the ease of accessing civil registration services. This innovation meets the needs of the community and supports the development of more modern and efficient public services.

Based on interviews with officials from the Cirebon Regency Population and Civil Registration Office-specifically, an informant serving as the Population Administration Information Manager and members of the public service users the implementation of the Digital Population Identity (IKD) has led to significant changes in population administration services. The IKD also provides various population administration services that can be accessed directly through the app. These services include requests for Family Card printing, requests for personal data printing (Indonesian citizens), blood type changes (Indonesian

citizens), education level changes (Indonesian citizens), Certificates of Relocation (Individuals), Spliting a Family Card (Individual), Birth of an Indonesian Citizen (Child without an NIK), Birth of an Indonesian Citizen (Personal Data with an NIK), Death, and Application for Non-Permanent Residents.

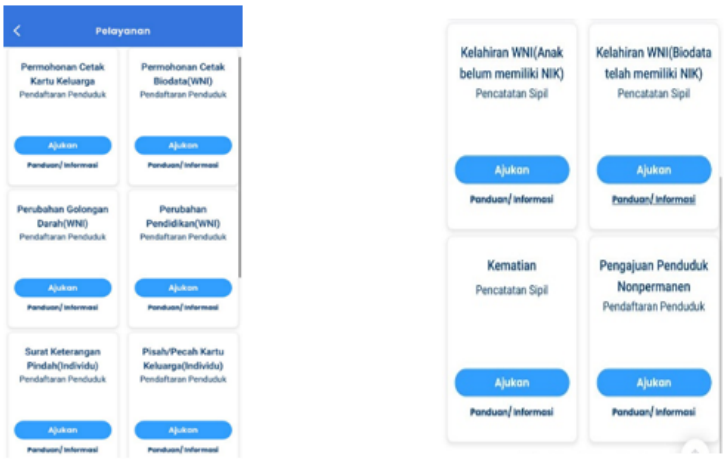

Figure 1. IKD Service Application
Source: IKD Application of the Population and Civil Registration Office

Based on the results of the research conducted, the implementation of the Digital Population Identity (IKD) innovation in Cirebon Regency can be analyzed using Everett M. Rogers' theory of innovation diffusion, which includes relative advantage, compatibility, complexity, trialability, and observability. These five indicators are used to assess the extent to which digital service innovations through the DCI are accepted and adopted by the public and support improvements in the quality of population administration services in Cirebon Regency. Based on the results of interviews and observations conducted by the researchers, the implementation of the DCI indicates a shift toward more, practical, and digital-based services. Furthermore, the research findings for each can be explained as follows :

Relative advantage

Using the IKD app is highly beneficial because it makes services more convenient and saves time. Citizens can submit civil registration applications independently from home without having to wait in line. This demonstrates that the IKD innovation offers tangible advantages over previous service systems, and that it is more readly accepted when it provides clear benefits to its users. From the public's perspective, using the service app has become more efficient and convenient. With IKD. I no longer need to visit the Disdukcapil office because several civil registration services can be accessed through the app, thereby saving time and effort.

This efficiency is strongly echoed by the users. As one of the community informants stated: *'Since using IKD, I no longer need to take a day off work to queue at the Disdukcapil office. I can check my family card status directly from my phone, which is incredibly time-saving.'* This verbatim feedback confirms that the relative advantage of the application directly addresses the community's primary administrative burdens.

Compatible

The interview results also indicate that the IKD system is considered compatible with the service procedures in place at the Population and Civil Registration Office in Cirebon Regency. The IKD supports the existing service system without replacing it entirely. One example of this compatibility is the use of the IKD as a substitute for a physical ID card when

people do not have their electronic ID cards with them. Additionally, the IKD registration and activation process can be conducted through village offices, sub-district offices, or directly at the Population and Civil Registration Office, particularly in areas that have established partnerships. According to the public, the IKD aligns with current community needs, especially in the digital age. The use of smartphone-based applications has become commonplace, making the IKD service feel relevant and supportive of the need for fast and practical services. Regarding public acceptance, the public has generally adapted to using the IKD. However, challenges still arise among the elderly or those less familiar with digital technology. Nevertheless, these obstacles can be overcome through guidance provided by village or subdistict staff, as well as Disdukcapil officials, during the activation process. This demonstrates that despite varying levels of digital literacy, the IKD innovation remains acceptable to the public with adequate support and guidance.

Complexity

The use of the IKD is considered relatively easy, especially for people who are already accustomed to using smarthphone and digital technology. The IKD can be accessed via a smarthphone, making it easier for people to verify their identity without having to carry physical documents. However, using the IKD also requires an internet connection and basic skills in operating digital devices, which poses a challenge for some members of the public. To adderss this, the Population and Civil Registration Office provides assistance during the activation process to minimize the complexity of the innovation.

Avaible for Trial

In terms of trialability, the IKD application allows the public to experience and test the digital service under the direct guidance of Disdukcapil staff before fully adopting it. During the initial activation phase at the village or sub-district office, residents are guided through the processes of data verification, facial recognition, and QR code scanning. This assisted trial period significantly reduces user anxiety regarding data security and system complexity, allowing them to experience the application's benefits firsthand before utilizing it independently from their smartphones.

Observability

In terms of observability, the results of the IKD implementation can be directly observed by the public. The public experiences benefits in the form of convenient and fast services; in fact, some civil registration applications can be processed within a single day. The high level of visibility of these service outcomes strengthens public acceptance of the IKD innovation as part of the implementation of e-government in the field of civil registration. According to the public, this is evident in the ease of using the service using the IKD application digitally and more quickly.

Feedback from relevant parties regarding the implementation of the IKD also indicates fairly widespread support. Several institutions, such as banks and hospitals, have accepted the IKD as a substitute for physical ID cards in their service processes. However, there remain challenges in the form of missue by individuals impersonating Disdukcapil staff through digital fraud scemes. In response, Disdukcapil is actively conducting public education and outreach through social media to prevent the public from being easily deccived by false information.

Overall, the findings of this study indicate that the Digital Identity Innovation in Cirebon Regency has meet the attributes of innovation as outlined in the theory of innovation diffusion. Although challenges remain, particularly regarding digital literacy and information security, the implementation of the Digital Identity Innovation has provided tangible benefits to the community and supported improvements in the quality of e-government based public services.

CONCLUSION

Based on the results of the research and discussions conducted, it can be conclude that the implementation of E-Government innovations through the Digital Population Identity (IKD) service at the Cirebon Regency Population and Civil Registration Office has had a positive impact on improving the quality of population administration services in Cirebon Regency. The implementation of IKD is form of digital-based public service transformation aimed at making it easier for the public to access population administration administration services more effectively and efficiently. With the IKD system, the public is no longer entirely dependent on physical documents, as various demographic data can be accessed through a digital app. Addditionally, the implementation of this service has made it more convenient and time-saving for the public, reducing the need to visit service offices in person. In terms of usability, the IKD app is considered relatively easy for the public to understand and use, particularly for those already familiar whith digital technology. Although some users who are less familiar with technology may still face challenges, these obstacles can be minimized through assistance from staff during the app's activation and usage process. This indicates that the complexity of using the IKD is not a major obstacle to its implementation. It suggests that the adoption of the IKD has been gradually accepted by the community in Cirebon Regency. The increase in the number of residents activating the IKD is an indicator that this service innovation is beginning to be widely utilized by the public. Thus, the implementation of IKD is considered capable of supporting the realization of puvlic service that are more modern, effective, efficient, and digital-based. Therefore, continuous efforts are needed from the government and relevant parties to improve public awareness, community digital literacy, and service feature development so that the benefits of IKD can be optimally felt by all segments of the community in Cirebon Regency.

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