http://journal.uir.ac.id/index.php/JIAP
E-ISSN : 2622-934X
P-ISSN : 2502-9757

PUBLIKA :
Jurnal Ilmu Administrasi Publik
Vol. 12, No. 1 / 2026

Adoption of Digital Population Identity Innovation in Pekanbaru City

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Received : January 5, 2026; Accepted : April 28, 2026
DOI 10.25299/jiap.2026.26828

Abstract

Innovation adoption is the process through which individuals or groups accept and use new ideas, technologies, or policies within a social system. This research focuses on the adoption of the Digital Population Identity as an effort to enhance population administration services through digitalization, with the aim of analyzing the adoption process and its inhibiting factors in Pekanbaru City. The study focuses on community behavior in accepting and using Digital Population Identity (IKD) based on the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) framework. This research employs a quantitative method with a survey approach targeting residents of Pekanbaru City as Digital Population Identity (IKD) users, and the data were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results of this study show that the adoption of Digital Population Identity in Pekanbaru City remains suboptimal, where performance expectancy and price value significantly affect behavioral intention, while effort expectancy, social influence, facilitating conditions, hedonic motivation, and habit don't show significant effects. The barriers to Digital Population Identity adoption include the low utilization of its functions in population administration services, the underdevelopment of IKD usage as a habit and social norm, and limited public trust in digital-based population administration services. To strengthen the adoption of this innovation, continuous socialization, optimization of IKD functions and strengthening public trust in the security and benefits of Digital Population Identity usage are required.

Keywords : Technology Adoption, Diffusion, Innovation, Digital Identity

Introduction

Digital transformation in public services has become a strategic agenda for the government to improve the quality, efficiency, and accessibility of services for the community. One of the digital innovations in the field of population administration is the Digital Population Identity (IKD) as a digital representation of citizens' identity designed to simplify administrative processes, enhance data security, and support cross-sector service integration. The success of digital innovation is not only determined by technological readiness and policy frameworks, but also by the level of public acceptance and usage. Therefore, the issue of innovation adoption becomes a crucial aspect in the utilization of IKD.

As part of the national digital transformation, the Directorate General of Population and Civil Registration of the Ministry of Home Affairs has developed the Digital Population Identity (IKD) application to improve accessibility, effectiveness, and flexibility in population administration services for the public. Through the IKD application, citizens are able to present their identity digitally while also accessing various population administration services online, thereby simplifying service procedures.

The implementation of Digital Population Identity (IKD) is based on the Regulation of the Minister of Home Affairs Number 72 of 2022 as well as Law No. 11 of 2008 concerning Electronic Information and Transactions, including its amendment through Law No. 19 of 2016. Thus, IKD has a strong legal foundation and has been implemented in various regions, including Pekanbaru City.

However, the adoption of Digital Population Identity in Pekanbaru City has not been optimal, as indicated by the activation rate in 2024, which has only reached 13.6% and has not met the national target of 30%. Various challenges, such as digital literacy, perceived complexity, trust issues, and activation mechanisms that are not yet fully practical, have influenced the utilization of the service. This indicates that the adoption process of IKD in Pekanbaru City still faces several challenges.

The success of digital innovation is determined by the effectiveness of the diffusion process, user trust, as well as supporting resources and systems (Veronica et.al, 2023), and requires a holistic approach that considers the balance between technological and social aspects (Handrian and Novita, 2025). In addition, technology adoption is influenced by differences in generational characteristics, habits, and digital literacy of the community (Rafi et.al, 2024), and still faces challenges related to technical understanding and user satisfaction (Antania and Bedasari, 2025).

On the other hand, public service innovations tend to be more easily adopted when they are perceived as practical, fast, and aligned with community needs (Zubaidah and Fitri, 2021). Previous studies have extensively examined digital public service innovations and the implementation of sectoral e-government. These findings indicate that the success of digital innovation largely depends on public acceptance and usage, while studies on the adoption of Digital Population Identity at the local government level remain limited. Therefore, this study is important to analyze the adoption of IKD in Pekanbaru City.

According to Everett M. Rogers, innovation is anything perceived as new by individuals or groups that adopt it, whether in the form of ideas, methods, or physical objects. The element of novelty is subjective, as it depends on each individual's perception as a potential adopter, regardless of when or where the innovation was first widely introduced. In line with this, Stephen P. Robbins defines innovation as the implementation of new ideas aimed at improving

or refining products and services. Thus, innovation in public services can be understood as a form of renewal that brings changes in the way services are delivered to the community.

Rogers (2003) further explains that diffusion is a process through which an innovation is communicated over time among members of a social system through certain channels. This diffusion process determines the extent to which an innovation can be accepted and used by individuals. In the context of digital-based public services, the success of innovation depends not only on the availability of technology but also on the adoption process by the community as users.

Technology adoption refers to the individual decision-making process in accepting and using technology (Venkatesh et.al, 2012). To measure the factors influencing technology acceptance and use in terms of behavioral intention and usage behavior, this study employs the Unified Theory of Acceptance and Use of Technology (UTAUT 2) framework developed by Venkatesh et.al (2012). This model consists of several main constructs, namely:

1. Performance Expectancy, refers to the degree to which users believe that using a technology will provide benefits and help them accomplish tasks more effectively and efficiently.
2. Effort Expectancy, refers to the degree to which users perceive that a technology is easy to use and does not require significant effort to learn.
3. Social Influence, refers to the degree to which users perceive that people around them play an important role in influencing their intention to adopt and use the technology.
4. Facilitating Conditions, refer to the degree to which users believe that the resources and support needed to use the technology are available and adequate.
5. Hedonic Motivation, refers to the degree of enjoyment or satisfaction experienced by users when using a technology.
6. Price Value, refers to the degree to which users perceive that the benefits gained from using a technology are proportional to the costs incurred.
7. Habit, refers to the extent to which the use of technology has become an automatic behavior or routine with little conscious thought.

This study fills the gap by empirically analyzing the adoption of IKD innovation from the user perspective, aiming to expand and deepen the literature on the adoption of digital public service innovations, particularly Digital Population Identity. It is expected that this research can encourage broader adoption of IKD among the community in Pekanbaru City and serve as a reference in formulating strategies to enhance IKD utilization so that it becomes more responsive to community needs and characteristics.

The novelty of this study lies in the analysis of the innovation adoption process of Digital Population Identity as a digital population administration service innovation, with an emphasis on user intention and behavior based on the UTAUT 2 framework, as well as the supporting conditions for its implementation at the local level. Unlike previous studies that tend to focus on technical or macro-level policy aspects, this study offers a more integrated understanding of the dynamics of IKD adoption in Pekanbaru City from the community perspective. Thus, this study contributes to enriching the literature on the adoption of digital-based public service innovations at the local government level.

This study aims to analyze the adoption of the Digital Population Identity (IKD) innovation in Pekanbaru City by focusing on the factors influencing public acceptance and use of IKD based on the UTAUT 2 framework, including perceived usefulness, ease of use, social

influence, price value, habit, and facilitating conditions. Technology adoption is understood as a process of acceptance and use of information systems that determines the sustainability of innovation utilization. Data were collected through the distribution of questionnaires to IKD users and interviews with the Department of Population and Civil Registration (Disdukcapil) of Pekanbaru City as supporting data to provide a comprehensive overview of the dynamics of IKD adoption in the context of digital public services.

Method

This study employs a quantitative approach using a survey method to describe the characteristics and issues related to the adoption of the Digital Population Identity innovation in Pekanbaru City in numerical terms. This approach is chosen to systematically and objectively examine the factors influencing the adoption process, thereby identifying the level of behavioral intention in accordance with the research objectives.

This research was conducted in Pekanbaru City due to its high population mobility and diverse socio-economic dynamics, making it relevant for examining the adoption of Digital Population Identity. The city also demonstrates a relatively low level of IKD utilization, with data obtained from the Department of Population and Civil Registration (Disdukcapil) and the community as research sources.

Primary data were obtained through the distribution of questionnaires as the main instrument, developed using a 1–5 Likert scale (Meiliztira et.al, 2025), and supported by interviews and observations. The sampling technique employed purposive sampling with a total of 101 respondents, consisting of one representative from the agency, namely the Head of the General Subdivision, and 100 users of the Digital Population Identity application. Secondary data were obtained from publications, reports, and official documents of the Department of Population and Civil Registration (Disdukcapil) of Pekanbaru City.

After the data were collected, the analysis was conducted using the *Partial Least Squares-Structural Equation Modeling* (PLS-SEM) approach with the assistance of SmartPLS software. The analysis included the evaluation of the measurement model *(outer model)* and the structural model *(inner model)* to examine the relationships among variables in the study. The hypotheses tested in this research are as follows:

H1 : *Performance Expectancy* has a significant effect on *Behavioral Intention* to use Digital Population Identity.

H2 : *Effort Expectancy* has a significant effect on *Behavioral Intention* to use Digital Population Identity.

H3 : *Social Influence* has a significant effect on *Behavioral Intention* to use Digital Population Identity.

H4 : *Facilitating Conditions* have a significant effect on *Behavioral Intention* to use Digital Population Identity.

H5 : *Hedonic Motivation* has a significant effect on *Behavioral Intention* to use Digital Population Identity.

H6 : *Price Value* has a significant effect on *Behavioral Intention* to use Digital Population Identity.

H7 : *Habit* has a significant effect on *Behavioral Intention* to use Digital Population Identity.

Result and Discussion

The analysis begins with an overview of the characteristics of the research respondents, which shows that the respondents are predominantly female, aged 21–30 years, with secondary to higher education, and mostly students or economically active individuals. Most respondents are still at the early stage of using the Digital Population Identity, thus representing early users with good potential for technology adaptation.

Furthermore, the analysis proceeds to testing the research model using the *Partial Least Squares-Structural Equation Modeling* (PLS-SEM) approach to determine the effect of each variable on Behavioral Intention in the use of Digital Population Identity.

Tabel 1. Results of Hypothesis Testing

	Sample Original (O)	*Sample Mean (M)*	*Standard Deviation* (STDEV)	*T Statistics* (|O/STDEV|)	P *Values*	Interpretasi
PE-> BI	0,282	0,291	0,111	2,542	0,011	Positive Effect
EE-> BI	0,001	0,014	0,098	0,009	0,993	Not Significant
FC-> BI	0,060	0,075	0,146	0,407	0,684	Not Significant
HB-> BI	0,086	0,053	0,143	0,602	0,548	Not Significant
HM-> BI	0,012	0,047	0,135	0,091	0,927	Not Significant
PV-> BI	0,308	0,273	0,129	2,396	0,017	Positive Effect
SI-> BI	0,156	0,161	0,114	1,369	0,172	Not Significant

Source: Author's analysis using SmartPLS, 2025.

Based on Table 1, not all constructs in the UTAUT 2 model have a significant effect on *Behavioral Intention* in the use of Digital Population Identity in Pekanbaru City. These findings illustrate the factors that play a role, as well as those that are not yet optimal, in encouraging technology adoption. The results of testing each construct are as follows:

Performance Expectancy

The performance expectancy construct has a significant effect on the behavioral intention to use Digital Population Identity in Pekanbaru City, indicating that perceived usefulness, efficiency, and security are key factors in driving adoption. The public tends to use IKD when it is perceived as capable of facilitating access to services, accelerating administrative processes, reducing dependence on physical documents, and ensuring data security. This condition is relevant to the characteristics of Pekanbaru City as an area with high mobility that requires practical and flexible digital identity solutions. These findings are consistent with the UTAUT 2 theory (Venkatesh et.al, 2012) and are supported by studies conducted by Annisaa et.al (2024), Alberto et.al (2023), and Akhtar Shareef et.al (2014), which

emphasize that perceived usefulness, efficiency, and security play an important role in encouraging the acceptance of e-government services.

Effort Expectancy

The effort expectancy construct does not have a significant effect on the behavioral intention to use Digital Population Identity in Pekanbaru City, indicating that perceived ease of use and simplicity of interaction have not yet become the main determinants in shaping adoption intention. The public, who are relatively accustomed to using digital applications, tend to perceive the installation and activation process as a normal administrative procedure, even though it still requires face-to-face verification at the initial stage. In addition, the simplicity of features and the user interface has not been fully perceived as optimal by all user groups, particularly those with varying levels of digital literacy, thus not directly encouraging usage intention. These findings suggest that perceived usefulness is more dominant than ease of use considerations and are in line with the view of Ubaldi (2016) which emphasizes the importance of simplifying interactions in digital government services, although in the context of this study it has not yet become a determining factor in the adoption of IKD.

Social Influence

The social influence construct does not have a significant effect on the behavioral intention to use Digital Population Identity in Pekanbaru City, indicating that adoption decisions are more based on individual considerations and needs rather than recommendations or social pressure. Recommendations for use remain personal and depend on perceived benefits, while government support and private sector involvement are still limited and not yet widely integrated into public service practices, thus failing to establish collective legitimacy and social encouragement. In addition, IKD is still at an early stage of adoption and has not yet developed into a social norm, with variations in usage influenced by age and individuals' ability to utilize technology. These findings are consistent with the UTAUT 2 framework proposed by Venkatesh et.al (2012), and are supported by studies conducted by Anggraeni and Antonius (2025), Hery et.al (2025), Arista and Pribadi (2024) which suggest that social influence in e-government adoption depends on context, user readiness, and cross-sector support.

Facilitating Conditions

The facilitating conditions construct does not have a significant effect on the behavioral intention to use Digital Population Identity in Pekanbaru City, indicating that the availability of devices, network access, and technical support are not the primary factors driving adoption. Most people already possess smartphones and have adequate network access, further supported by Wi-Fi facilities during the activation process, making technical aspects perceived as basic prerequisites rather than drivers of intention. However, differences in the ability to operate devices, particularly among older age groups, as well as technical support that remains largely face-to-face, indicate that these facilities play a greater role in supporting actual usage rather than shaping usage intention. These findings are consistent with studies by Susila et.al (2024) and Syafitri et.al (2025), which emphasize that device access and technical support function as operational supporting factors rather than primary determinants in shaping the intention to adopt digital services.

Hedonic Motivation

The hedonic motivation construct does not have a significant effect on the behavioral intention to use Digital Population Identity (IKD) in Pekanbaru City, indicating that the use of IKD is not driven by enjoyment or emotional experience, but rather by functional considerations. Although respondents reported satisfaction and relatively positive experiences, such satisfaction is interpreted as the successful completion of administrative tasks in a fast and practical manner. Positive experiences are more closely related to ease of use and usefulness rather than perceptions of the technology as modern and innovative. These findings are consistent with the UTAUT 2 framework proposed by Venkatesh et.al (2012) which emphasizes the dominance of utilitarian motivation in public services, and are further supported by studies by Saepudin (2025) and Mundzir (2025), indicating that satisfaction and user experience in e-government in Indonesia tend to be functional rather than emotional.

Price Value

The price value construct has a significant effect on the behavioral intention to use Digital Population Identity (IKD) in Pekanbaru City, indicating that cost–benefit considerations are important factors in shaping adoption intention. The public perceives IKD as efficient because it can be accessed via smartphones without installation or printing costs, while also reducing indirect costs such as time, effort, and mobility. The benefits obtained—namely convenience, practicality, and flexibility in accessing population documents digitally—are perceived as proportional to, or even greater than, the effort required. In the context of an urban society with high mobility, IKD is considered relevant to daily administrative needs and provides tangible functional value; these findings are consistent with the UTAUT 2 framework proposed by Venkatesh et.al (2012), which states that price value positively influences usage intention when a technology delivers substantial benefits at minimal cost, thereby strengthening the public's tendency to adopt IKD.

Habit

The habit construct does not have a significant effect on the behavioral intention to use Digital Population Identity (IKD) in Pekanbaru City, indicating that the use of IKD has not yet become a routine and automatic behavior. The low frequency of use, the dominance of physical ID cards, and the preference for conventional identification indicate that IKD is still at an early stage of adoption and has not yet formed a sustainable habit. Usage is also not yet spontaneous, as it still depends on situational factors and service acceptance. These findings are consistent with the frameworks proposed by Venkatesh et.al (2012), Rogers (2003), and Mensah et.al (2020) , which state that habits and preferences toward innovation are formed through repeated use and implementation maturity. However, the results of the *Multi-Group Analysis* indicate that among respondents with higher levels of experience, habit begins to have a stronger influence on usage intention, and vice versa, in line with the UTAUT 2 framework.

Conclusion

Based on the results of the study on the adoption of the Digital Population Identity (IKD) innovation in Pekanbaru City, it can be concluded that IKD adoption is primarily influenced by perceived usefulness and value, particularly in terms of convenience, time efficiency, and the practicality of population administration services. Behavioral intention tends to arise when

services support the use of digital identity in a simpler and faster manner compared to conventional procedures. The Department of Population and Civil Registration (Disdukcapil) of Pekanbaru City has contributed through the provision of digital-based services, activation assistance, and supporting facilities to ensure data security and validity as part of its digital transformation commitment, although its implementation remains at the stage of introduction and adaptation. However, IKD adoption still faces several challenges, including limited technological capability among certain segments of the population, especially older adults, the absence of strong collective social influence, limited utilization across institutions resulting in the continued dominance of physical electronic ID cards, and the lack of habitual use due to low usage frequency and insufficient outreach. These conditions indicate that IKD adoption is occurring gradually, has not yet become a common practice, and remains situational and reactive to administrative needs.

To encourage more optimal IKD adoption in Pekanbaru City, Disdukcapil may implement structured and continuous user assistance, not only during the activation stage but also integrated into routine services through collaboration with urban villages, sub-districts, and neighborhood units (RT/RW), accompanied by simple and practical training programs. Initiatives such as a *Digital Buddy* program for older adults and individuals with limited digital skills can support sustained and independent use of IKD. In addition, normalization of IKD usage should be carried out through consistent and practical application in public services by positioning IKD as a recognized and directly utilized supporting identity by service officers, thereby fostering natural social encouragement. Expanding the integration of IKD across various public service sectors, such as healthcare (BPJS), education, and banking, is also essential to ensure that users experience tangible benefits in terms of convenience, efficiency, and faster service compared to physical electronic ID cards. Furthermore, increasing the consistency and frequency of IKD use in all population administration service processes is necessary to build sustainable usage habits. Socialization strategies should also be reoriented toward experiential approaches, including demonstrations, simulations, IKD ambassador programs, *multi-channel* communication, community-based training, and strengthened cross-sector collaboration, in order to enhance public understanding and promote active, collective, and sustainable adoption of IKD.

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