JLPH: Journal of Law, Politic and Humanities
E-ISSN: 2962-2816
P-ISSN: 2747-1985
https://dinastires.org/JLPH dinasti.info@gmail.com +62 811 7404 455
DOI: https://doi.org/10.38035/jlph.v6i6
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Received: 18 September 2026 | **Revised:** 02 Oktober 2026 | **Accepted:** 12 Oktober 2026

Population Administration Service Policy Innovation Through E-SPASI in the City of Bandung

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Abstract: This research is motivated by the ongoing problem of queues in population administration services even though the E-SPASI (Electronic Queue Registration System Via SMS) program has been implemented by the Population and Civil Registration Office of the City of Bandung since 2016. The research gap was identified because previous studies on similar digital innovations in population administration generally only examined one stakeholder perspective and rarely integrated the perspectives of policy makers, technical implementers, system managers, and service users at the same time. This study aims to analyze the implementation of E-SPASI using the theory of Rogers Innovation Diffusion (2003), including relative advantage, compatibility, complexity, trialability, and observability. The method used is qualitative descriptive, with data obtained through in-depth interviews with the Head of Service, service staff, system managers, and the service user community, supported by observation and documentation. The results of the study show that E-SPASI provides real benefits in the form of ease of registration, efficiency of waiting times, and service effectiveness, and has adapted to technological developments through the switch from SMS to WhatsApp. However, its implementation still faces dependence on third-party technical infrastructure, limited access for digitally vulnerable groups, limited daily quotas, and uneven socialization. As a novelty, this multi-stakeholder analysis reveals that the main obstacle to innovation lies not in the complexity of the system, but in the reliability of technical infrastructure and the dissemination of official information that is not yet optimal.

Keywords: Policy Innovation, Public Services, Population Administration, E-SPACE, Diffusion of Innovation

Abstrak: *Penelitian ini dilatarbelakangi oleh masih berlangsungnya persoalan antrean pada pelayanan administrasi kependudukan meskipun program E-SPASI (Elektronik Sistem Pendaftaran Antrean Via SMS) telah diterapkan oleh Dinas Kependudukan dan Pencatatan Sipil Kota Bandung sejak tahun 2016. Kesenjangan penelitian (research gap) diidentifikasi karena penelitian-penelitian terdahulu mengenai inovasi digital serupa dalam administrasi kependudukan umumnya hanya mengkaji satu perspektif pemangku kepentingan dan jarang mengintegrasikan sudut pandang pembuat kebijakan, pelaksana teknis, pengelola sistem, dan*

pengguna layanan secara bersamaan. Penelitian ini bertujuan menganalisis implementasi E-SPASI menggunakan teori Difusi Inovasi Rogers (2003), meliputi relative advantage, compatibility, complexity, trialability, dan observability. Metode yang digunakan adalah deskriptif kualitatif, dengan data diperoleh melalui wawancara mendalam bersama Kepala Dinas, staf pelayanan, pengelola sistem, dan masyarakat pengguna layanan, didukung observasi dan dokumentasi. Hasil penelitian menunjukkan bahwa E-SPASI memberikan keuntungan nyata berupa kemudahan pendaftaran, efisiensi waktu tunggu, dan efektivitas pelayanan, serta telah beradaptasi dengan perkembangan teknologi melalui peralihan dari SMS ke WhatsApp. Namun, implementasinya masih menghadapi ketergantungan pada infrastruktur teknis pihak ketiga, keterbatasan akses bagi kelompok rentan digital, kuota harian yang terbatas, serta sosialisasi yang belum merata. Sebagai kebaruan, analisis multi-pemangku kepentingan ini mengungkap bahwa hambatan utama inovasi bukan terletak pada kompleksitas sistem, melainkan pada keandalan infrastruktur teknis dan penyebaran informasi resmi yang belum optimal.

Kata Kunci: *Inovasi Kebijakan, Pelayanan Public, Administrasi Kependudukan, E-SPASI, Difusi Inovasi*

INTRODUCTION

Public services are a form of government responsibility in meeting the needs of the community, and in the era of information technology, the government is required to provide services that are fast, effective, efficient, transparent, and easily accessible. One form of public service that has an important role is population administration services, because they are directly related to people's legal identities, such as Identity Cards (KTP), Family Cards (KK), birth certificates, and death certificates. Based on (Law Number 24, 2013) About Population Administration, population administration is a series of activities for structuring and issuing documents and population data through population registration, civil registration, and utilization of the results for public services and development.

In practice, population administration services often face problems such as long queues, slow administrative processes, limited access, and low bureaucratic effectiveness. The development of digital technology encourages local governments to innovate electronic-based public services (e-government), in line with Government Regulation Number 38 of 2017 concerning Regional Innovation which encourages local governments to create innovations in the implementation of government and public services (Government Regulation Number 38 of 2017, 2017). The Bandung City Government, through the Population and Civil Registration Office (Disdukcapil), responded to this by developing the Electronic Queue Registration System Via SMS (e-SPASI) program since 2016 as a solution to the high service queue, which was then expanded to the WhatsApp channel to make it more accessible to the public. The implementation of this service is guided by the Bandung Mayor Regulation Number 1410 of 2022 concerning Requirements and Procedures for the Implementation of Population Administration (Regulation of the Mayor of Bandung Number 1410 of 2022, 2022).

Studies on digital-based population administration service innovations have been carried out in various locations. E-SPASI innovations at the Bandung City Disdukcapil itself have been studied since the early stages of its implementation, which shows that the SMS-based queue system is effective in reducing the accumulation of visitors and creating a more orderly service environment (Elkesaki, R. A., Oktaviani, R. D., & Setyaherlambang, 2021). Research on the "Dukcapil Goes to School" program in Bandung Regency found that the pick-up innovation was able to increase the effectiveness of services and accelerate the ownership of population documents for students (Munawaroh, N., & Riaji, 2024). Research on digital-

based population administration service innovations in Bekasi City shows an increase in efficiency and access to public services, but there are still obstacles in the form of technological adaptation and limited public understanding (Nugraha, K. A., & Rostyaningsih, 2024). Research on the effectiveness of the SALAMAN application at the Bandung City Disdukcapil found that the application was able to increase the efficiency and accessibility of services, although its effectiveness was still constrained by server stability and low digital literacy of the community (Frying, 2025). Similar findings were also reported on the Poedak application innovation in Gresik Regency (Kartika, D. F., & Oktariyanda, 2022), Digital Population Identity in Samarinda City (Dewi Ramadhani, K. P., & Prakoso, 2025), wider use of IKD (Yonatan Adam, Tobirin, Rokhman, A., & Kurniasih, 2024), as well as digital-based population service innovations in general (Akib, H., Syamsiar, S., Halim, D., Baharuddin, A., & Jonsa, 2024).

As an analytical framework, the theory of Innovation Diffusion Rogers (2003) has been widely used to examine the acceptance of government digital service innovations by the public. Research on the use of the PeduliLindungi application by the elderly group shows that the limitations of digital literacy are the main obstacle to the process of diffusion of innovation in vulnerable groups (Malik, C. H., Auliya, N. F., & Iqbal, 2022), in line with the findings on the innovation of the Sobat Dukcapil Website in Tangerang City which also highlights the importance of socialization in encouraging the acceptance of population service innovations (Lola Alyaning, Budiati, A., & Prafitri, 2026).

On a broader level, the implementation of E-SPASI is part of the Bandung City Government's efforts to realize the concept of smart city through the optimization of information technology-based services (Wahyudin, C., Munjin, R. A., Rafi, M., & Zidane, 2025). The study on the influence of management information systems on public services emphasizes that the success of service digitization is highly dependent on the readiness of infrastructure and human resources of system managers (Laia, O., Halawa, O., & Lahagu, 2022), in line with the findings regarding the implementation of digital governance in regional tax services (Wahyudin, C., Munjin, R. A., Rafi, M., & Zidane, 2025) and e-government applications in public services in Yogyakarta (Wahyudi, A. A., Firdausy, B. M., & Sari, 2022). The evaluation of the digital transformation of public services in Indonesia in general also confirms that the success of e-government implementation is largely determined by institutional support and user acceptance (Dewi, E. K., Muhaemin, Y., Sitompul, G. A., Parinduri, R. Y., & Rika, 2025), as also found in the evaluation of the SIPADU application in the city of Denpasar (Widanti, 2024).

Some studies of digital-based public service innovation also use a service quality approach such as the SERVQUAL model to assess user perceptions (Parasuraman, A., Zeithaml, V. A., & Berry, 1988), but this approach tends to stop at the assessment of the final results without explaining the process of accepting the innovation itself. In general, the studies on population administration service innovation above have similarities with this study, which is that they both examine digital-based public service innovations (e-government) in improving the quality of services to the community. However, these studies generally discuss innovation from one point of view, both from the policy manager's side, the technical side of the system, and the user acceptance side alone, without simultaneously integrating the perspectives of policy makers, technical implementers in the field, system managers, and service user communities in one analytical framework. This gap is the research gap that underlies this research, namely the need for an analysis of the implementation of population administration service innovations that capture in a balanced manner how a program is perceived by all stakeholders involved, not just one party.

METHODS

This research uses a descriptive method with a qualitative approach, which was chosen because it aims to understand in depth the implementation of population administration service policy innovations through the E-SPASI program in the city of Bandung. Qualitative research is intended to understand the phenomenon of what the research subject experiences holistically through the description of words in a natural context (Moleong, 2017), and is used to explore the meaning of individuals or groups to a social problem (Creswell, 2014).

The object of the research is the implementation of population administration service policy innovations through the E-SPASI program at the Bandung City Disdukcapil, with the object of research understood as the attributes or traits of people, objects, or activities that have certain variations to be studied and conclusions drawn (Scott, 2017). The data source consists of primary data, which is a data source that directly provides data to the data collector (Scott, 2014), which was obtained through interviews with the Head of Disdukcapil, population registration service staff, population administration information management staff, and service user communities; as well as secondary data in the form of documents, archives, books, and scientific journals (Moleong Lexy, 2017).

The data collection technique was carried out through direct observation of the implementation of services, in-depth interviews with the four categories of informants, documentation, and literature studies. The analysis instrument refers to the five dimensions of innovation diffusion, namely relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2005), which is operationalized into a number of parameters in each dimension. Data analysis is carried out with an interactive model consisting of data reduction, data presentation, and conclusion/verification (Miles, Matthew B., & Huberman, 1984). The research was carried out at the Bandung City Disdukcapil, which was chosen because it actively develops digital-based public service innovations and applies the concept of smart city in government administration.

RESULTS AND DISCUSSION

The E-SPASI program is an electronic-based service innovation developed by the Bandung City Disdukcapil since 2016 as a solution to the high queue for population administration services, which was then expanded to the WhatsApp channel to make it more accessible to the public. This section analyzes the implementation of the program based on the five dimensions of innovation diffusion (Rogers, 2005), by presenting the perspective of the Head of Disdukcapil as a policy determinant, population registration service staff as technical implementers, population administration information management staff as system managers, and the community as service users in each dimension.

Relative Advantage

This dimension is assessed through three parameters, namely ease of service, time efficiency, and service effectiveness. The Head of Disdukcapil explained that E-SPASI makes it easier for people because they don't need to come early in the morning to get a queue number, just register from home via SMS or WhatsApp. The service staff emphasized that the counter is more helpful because the people who come already have a clear queue number and type of service, while the system management staff explained that registration through a simple message format automatically enters the queue database. The service user community also feels these benefits, because they no longer need to come from dawn to get the initial queue.

In terms of time efficiency, all informants agreed that the waiting time of the community is reduced because the arrival has been scheduled per time slot, although this efficiency can be disrupted if the community does not come according to the registered schedule. In terms of effectiveness, the Head of Disdukcapil stated that complaints related to queues have decreased significantly since E-SPASI was implemented, but the service staff

noted that the effectiveness is still affected by the limited daily registration quota, so people who are urgent but late to register must wait for the next schedule. These findings show that E-SPASI provides a relative advantage that is felt by all stakeholders compared to the previous manual queue system, in line with the concept of relative advantage in the theory of innovation diffusion.

Compatibility

This dimension is assessed through suitability with community needs, suitability with technological developments, and ease of access. The Head of Disdukcapil explained that E-SPASI is designed to directly answer public complaints about long queues, while service staff observed that people who register through E-SPASI come with more prepared documents. In terms of technology, all informants highlighted the shift in channels from SMS to WhatsApp as a form of adaptation to people's habits, with plans to further integrate with the Digital Population Identity (IKD).

However, in terms of ease of access, the service staff revealed that some elderly people still have difficulty registering themselves and need the help of family or officers, while the system management staff noted that residents in areas with less stable mobile signals face their own obstacles. Thus, in terms of compatibility, the E-SPASI program is considered to be in accordance with the needs of the community and is quite adaptive to technological developments, but the ease of access is not completely even for all community groups.

Complexity

This dimension is assessed through the level of ease of use of the system, barriers to use, and the level of public understanding. The E-SPASI registration format has basically been designed simply by the Disdukcapil, but the service staff revealed that some people are still in the wrong format when they first register. The more significant obstacles stem from technical factors: the Head of the Disdukcapil and the system management staff both highlighted the dependence on third-party SMS gateways that caused message delays to be beyond the full control of Disdukcapil, while the public experienced first-hand the uncertainty of registration status due to this.

In terms of understanding, all informants admitted that the level of public understanding of E-SPASI still varies, and information about this program is more widely disseminated through communication between residents than official socialization from Disdukcapil. These findings show that the complexity felt does not lie in the complexity of the system itself, but in the reliability of the technical infrastructure and the limited reach of socialization.

Trialability (Kemungkinan Dicoba)

This dimension is assessed through program development, socialization, and implementation stages. E-SPASI has undergone a gradual development since its launch in 2016 as an SMS-based service, then expanded to WhatsApp, with a separate application development plan that is more integrated. The implementation is also carried out in stages, piloted first on KTP services before being expanded to KK services, birth certificates, and other types of services.

In terms of socialization, Disdukcapil has taken various channels, such as social media, banners, and direct explanations at the counter, but the service user community stated that they had never seen official socialization in their environment and knew that E-SPASI was from neighbors who tried it first. This gradual implementation pattern shows that Disdukcapil provides adequate testing space before the innovation is fully implemented, in line with the principle of trialability, although the scope of official socialization still needs to be expanded.

Observability

This dimension is assessed through program benefits, improved service quality, and community satisfaction. All informants agreed that the benefits of E-SPASI can be observed in real terms, especially in the form of reduced visitor accumulation and more even distribution of arrivals throughout the day. The improvement in service quality is also felt, both in terms of the comfort of work of officers and the experience of the community who are no longer chased by long queues.

Satisfaction survey data managed by Disdukcapil shows an increasing trend of public satisfaction since E-SPASI was expanded, in line with the experience of service users who expressed their satisfaction, although they still hope for a real-time queue status transparency feature. The ease of observing these benefits is one of the factors that supports the acceptance of E-SPASI by the wider public, in accordance with the principle of observability in the theory of innovation diffusion.

Based on the five dimensions above, the supporting factors for the implementation of E-SPASI include the commitment of the Disdukcapil leadership to continue to develop programs to keep up with technological developments, the simplicity of the registration format, active support for counter officers, and the dissemination of informal information between residents. The inhibiting factors include limited official socialization, dependence on third-party SMS/WhatsApp gateways, digital skills gap between community groups, especially the elderly and residents in areas with weak signals, and limited daily registration quotas.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The implementation of population administration service policy innovations through the E-SPASI program in the city of Bandung has gone quite well and has a positive impact on service quality. In the relative advantage dimension, this program provides real advantages in the form of ease of registration, waiting time efficiency, and service effectiveness, although it is still affected by daily quota limitations. In the compatibility dimension, E-SPASI is in accordance with the needs of the community and adaptive to technological developments, but the ease of access is not completely evenly distributed, especially for the elderly and areas with weak signals. In the complexity dimension, the registration format is relatively simple, while the main obstacles come from the reliability of technical infrastructure and the limitations of socialization, not from the complexity of the system. In the trialability dimension, the program has gone through gradual development and trials since 2016, although official socialization has not reached all levels of society. In the observability dimension, the benefits and improvement of service quality can be observed in real terms and the level of community satisfaction tends to be good.

The novelty of this research lies in an analysis that integrates the perspectives of policy makers, technical implementers, system managers, and service users at the same time, which reveals that the main obstacle to innovation is not the complexity of the system, but in the reliability of third-party technical infrastructure and the dissemination of official information that is not yet optimal. Thus, this study answers the formulation of problems regarding the implementation of E-SPASI while showing that the improvement of public service innovation needs to target the infrastructure and public communication dimensions at the same time.

Limitations

This research has a number of limitations. First, the research was only conducted on one agency, namely the Bandung City Disdukcapil, so the findings could not be generalized to all regions that implemented similar innovations. Second, the descriptive qualitative approach used focuses on exploring the meaning and experience of informants so that it does not

statistically measure the strength of influence between dimensions of innovation diffusion. Third, the number of community informants interviewed is relatively limited so that the variation in service user experiences has not been fully portrayed.

Recommendations

Practically, the Bandung City Disdukcapil is advised to strengthen the socialization of the program officially and sustainably through various channels, including cooperation with urban villages/sub-districts; improve the reliability of technical infrastructure by exploring more than one gateway provider and developing its own applications; providing special assistance for digitally vulnerable groups such as the elderly; evaluating and adjusting the daily registration quota periodically; developing a real-time queue status transparency feature; and accelerating the integration of E-SPASI with other digital services such as Digital Population Identity.

Academically, further research is recommended to use a quantitative approach to measurably measure the level of public satisfaction and acceptance of E-SPASI, as well as conduct comparative studies with digital-based population administration service innovations in other regions to enrich the study of innovation diffusion in public services in Indonesia.

Author Contributions

The author is fully responsible for the entire research process, including conceptualization, data collection, data analysis, interpretation of results, preparation of manuscripts, and final approval of manuscripts for publication.

AI Disclosure Statement

In the preparation of this manuscript, the author uses an artificial intelligence (AI) tool in the form of Claude (Anthropic) which is specifically used to help tidy up the grammar and writing of the manuscript. The use of AI does not include the preparation of ideas, analysis, data, or research conclusions. The author has studied, examined, and edited all the results obtained, and is fully responsible for the entire content of this manuscript, including its accuracy, authenticity, and scientific integrity.

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