

Diffusion of Innovation in the Maternal and Child Health Information Program: A Case Study in Probolinggo City

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ABSTRACT

The Maternal and Child Health Information System Program (SISKIA) is an information technology-based public service innovation developed by the Probolinggo City Government to improve the quality of maternal and child healthcare services while supporting efforts to reduce the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR). This study aims to analyze the diffusion process of the SISKIA innovation using the Diffusion of Innovation Theory proposed by Everett M. Rogers. This study employed a descriptive qualitative approach, with data collected through in-depth interviews, observations, and documentation. The collected data were then analyzed using the interactive analysis model developed by Miles and Huberman. The findings indicate that the successful dissemination and adoption of the SISKIA innovation is not determined solely by the quality of the technology employed, but also by the effectiveness of the innovation diffusion process, leader mandatory support, and interpersonal communication. The implementation of SISKIA still faces several challenges, including double data entry, limited internet network access, varying levels of users' digital literacy, constrained available resources, and resistance to change within the organizational work culture. Therefore, continuous efforts to enhance user capacity and strengthen information technology infrastructure are necessary to optimize the utilization of SISKIA in supporting the reduction of maternal and infant mortality rates in Probolinggo City.

Keywords: innovation diffusion, SISKIA program, maternal and child health, public services, Everett M. Rogers.

INTRODUCTION

The Maternal Mortality Ratio (Angka Kematian Ibu, AKI) and the Infant Mortality Rate (Angka Kematian Bayi, AKB) in Indonesia show a declining trend and have not yet met the targets set in the global development agenda. According to Statistics Indonesia (Badan Pusat Statistik, BPS), the national AKB in 2022 was 16.9 per 1,000 live births (BPS, 2023). Meanwhile, the Ministry of Health (2020) projected that Indonesia's AKI would reach 183 per 100,000 live births in 2024 and fall to 131 per 100,000 live births by 2030. In Probolinggo City, six maternal deaths were recorded among 3,679 live births in 2016, and by October 2017 four more mothers had died during childbirth. With respect to infant health, the AKB in Probolinggo City reached 17.43 per 1,000 live births according to the 2020 Population Census Long Form (BPS, 2023), a figure that warrants serious attention. This high rate is often

attributed to delays in the early detection of high-risk pregnancies (ibu hamil risiko tinggi, RISTI) and to weak management of referral data between primary care facilities and hospitals. To curb fluctuations in AKI and AKB, the Probolinggo City Government launched a digital innovation, the SISKIA Pro Cantik application. The name stands for Sistem Informasi Kesehatan Ibu dan Anak Probolinggo yang Cermat, Andal, Teliti, Inovatif, dan Berkualitas (Maternal and Child Health Information System of Probolinggo that is Careful, Reliable, Meticulous, Innovative, and Quality) (Dinkesppkb, 2025). This effort is reflected in the Mayoral Circular Letter (Surat Edaran Wali City) of Probolinggo City on the “Acceleration of the Reduction of Maternal and Infant Mortality”. The letter requires every First-Level Health Facility (Fasilitas Kesehatan Tingkat Pertama, Faskes Tingkat Pertama) and Advanced-Level Health Facility (Fasilitas Kesehatan Tingkat Lanjutan, Faskes Tingkat Lanjutan) to enter pregnant women’s data into the SISKIA Pro Cantik Reborn application in real time. The implementation of SISKIA Pro Cantik has evolved dynamically in response to needs in the field, as information and communication technology (ICT) has become a principal instrument for achieving national targets, particularly those related to AKI and AKB.

SISKIA Pro Cantik is a web-based maternal and child health service application. It was selected as an outstanding work in the Indonesia ICT Entrepreneur (IDENTIK) 2019 competition in the public sector category, advanced to the ASEAN level, and contributed to Probolinggo City’s integration into the Smart City framework. In late 2021, the Probolinggo City Government received an award from the Ministry of Communication and Information Technology in recognition of its Smart City master plan and implementation, in which SISKIA Pro Cantik was a leading innovation in the health cluster, with support from the Office of Communication and Informatics (Dinas Komunikasi dan Informatika, Diskominfo, 2021). However, health workers directly experienced several obstacles in using the initial version of the application: dual workload, limited infrastructure and mobility, and insufficient discipline in data entry. In light of these problems, the government developed SISKIA Pro Cantik Reborn, a new adaptation designed as a response to the constraints of the earlier version.

SISKIA Pro Cantik at the Probolinggo City Health Office (Dinas Kesehatan) was reasonably effective in improving the accuracy of maternal and child health data recording and reporting, accelerating access to information, and supporting decision-making, although it remained constrained by internet connectivity, uneven human resource capacity, and suboptimal socialization. Similarly, Eprilianto et al. (2019) found that SIMPUS, an

administrative process innovation based on information technology, was able to integrate health service data between the Health Office and community health centers (Puskesmas) through collaboration with the Information Technology and Telematics Division (Bagian Teknologi Informasi dan Telematika, TIT). Both studies are relevant because they examine technology-based health service innovations; however, they focus on effectiveness and data integration rather than on the diffusion process, user acceptance, or the factors influencing adoption as conceptualized in Rogers' (2003) Diffusion of Innovations theory. More broadly, previous studies have concentrated on application effectiveness, service quality, user satisfaction, and technical evaluation. They have also observed only a single period of use, without examining how the innovation changed from the initial version to the newer one.

Research applying Rogers' (2003) diffusion of innovations perspective to digital innovations in the health sector remains limited, particularly studies that examine the stages of knowledge, persuasion, decision, implementation, and confirmation together with the four elements of diffusion: the innovation, communication channels, time, and the social system. The researcher also identifies a phenomenon gap. Although SISKIA Pro Cantik has received awards and is rated highly as a system, resistance and technical obstacles persist on the adoption side among health workers, and these hinder the use of data to reduce AKI and AKB. This raises the question of why a technically superior innovation still encounters adoption barriers. The emergence of SISKIA Pro Cantik Reborn indicates a process of evaluation and re-innovation, yet the extent to which this version addresses the constraints of its predecessor has not been examined in depth through the lens of diffusion of innovations theory.

The adoption and utilization of SISKIA Pro Cantik can be understood as a diffusion process involving interactions among the technological innovation, health workers as adopters, communication channels, time, and the social system of health care delivery. Together, these factors determine the effectiveness of an innovation that has the potential to support reductions in AKI and AKB in Probolinggo City. It focuses on the adoption behavior of health workers and identifies the factors that determine the successful diffusion of digital health service innovation. Therefore, this study attempts to analyze the diffusion process in the adoption of the SISKIA Pro Cantik Reborn innovation by health workers based on the stages of knowledge, persuasion, decision, implementation, and confirmation in enhancing digital technology to support maternal and child health services in Probolinggo City.

LITERATURE REVIEW

Innovation in Public Sector

Innovation is closely tied to the theory of the diffusion of innovations; to understand innovation, one must examine how it comes to be accepted. To grasp what innovation means in a public context, it is first necessary to clarify what innovation itself entails. Rogers (2003) defines innovation as an idea, practice, or object perceived as new by an individual or another unit of adoption. In the context of public services, innovation is understood as new ideas that work in practice. Its success is marked by the creation and implementation of new processes, products, services, or modes of delivery that yield significant improvements in efficiency, effectiveness, and quality (Mulgan & Albury, 2003, as cited in Rohayati & Kuryahadi, 2021). Public service innovation may also take the form of reinvention, that is, the adaptation of an idea to a different context, location, or period (Rohayati & Kuryahadi, 2021). The guidelines of the Indonesian Ministry of Administrative and Bureaucratic Reform (PAN-RB) emphasize that public service innovation does not require a new invention; it encompasses contextual approaches that extend and improve the quality of existing innovations (Rohayati & Kuryahadi, 2021). This notion of reinvention is consistent with Rogers's concept, namely the degree to which an innovation is changed or modified by users during adoption and implementation (García-Avilés, 2020).

Public Policy Innovation

In the study of public administration, innovation is a key element in both theory development and the practice of governance. A new policy can be considered innovative when it generates competitive impact and benefits the public interest. Policy innovation requires the creation of new knowledge in the form of creative services for the public interest, involving planning, organizing, mobilizing, and monitoring, as well as the capacity to integrate science and technology (Ohoiwutun & Zacharias, 2024). Theoretically, innovation reflects the evolution of public administration paradigms, while in practice it serves as an instrument for resolving public problems. The development of innovation in public administration can be traced through shifting paradigms that describe the relationships among the state, government, society, and the private sector, from Old Public Administration (OPA), New Public Administration (NPA), and New Public Management (NPM) to New Public Service (NPS). The NPS paradigm is considered the most suitable for realizing the public interest.

In the era of digital transformation, policy innovation involves not only regulatory change but also the adoption of technological solutions such as artificial intelligence, big data analytics, and mobile applications that improve the efficiency, responsiveness, and accessibility of services. Integrated platforms enable collaboration among agencies and the provision of accurate and timely information (Hayat, 2024). Public service innovation is necessary because strengthening the capacity of civil servants and refining regulations alone have not been sufficient to improve service quality to the level expected by the public. Bureaucratic reform itself embodies the principles of being outcome-oriented, measurable, efficient, effective, consistent, synergistic, innovative, compliant with regulations, and monitored (Rohayati & Kuryahadi, 2021).

Diffusion of Innovation

Diffusion of innovation is a concept that explains how a new idea, program, or technology is introduced and adopted within a social system. Rogers compiled diffusion findings from diverse fields, such as agriculture, kindergartens, driving schools, and medicine, and found similar patterns despite the heterogeneity of these fields (Rogers, 2003). These similarities include differences in information sources at each stage of the decision process, an S-shaped adoption curve, and early adopters who are generally experienced and knowledgeable (Guo & Huang, 2024). This view emphasizes that diffusion is not merely a technical process but a social one, involving communication, interaction, and decision-making by individuals and groups. Diffusion is also a form of social change, that is, a process through which the structure and function of a social system are altered. An innovation does not emerge or spread on its own; it is communicated through the social system and adopted gradually. Diffusion is therefore a special type of communication in which the message exchanged concerns a new idea, and its ultimate aim is the adoption of an innovation by a particular social system.

From Rogers's perspective, diffusion is built on four main elements: innovation, communication channels, time, and the social system (Guo & Huang, 2024). These elements underpin the spread of an innovation among members of a social system through particular communication media over a given period, and they largely determine whether individuals or groups accept or reject an innovation. The first element, innovation, refers to an idea, practice, or object perceived as new by the adopting unit. Rogers identifies five characteristics of innovations that influence their rate of acceptance and adoption: relative advantage,

compatibility, complexity, trialability, and observability. The second element, communication channels, is the means by which information about an innovation is conveyed from its source to prospective adopters. The third element, time, describes the period from the introduction of an innovation to its adoption by individuals or groups. The fourth element, the social system, is the set of individuals and groups that interact through various social actions. Four factors shape the diffusion process within a social system: social structure, norms, opinion leaders, and change agents (García-Avilés, 2020)

The innovation-decision process is influenced by many factors and is closely linked to adoption (García-Avilés, 2020). Accepting or rejecting an innovation is a choice made by an individual, and this decision unfolds through several stages that individuals or groups must pass through: knowledge, when a person becomes aware of an innovation and gains a basic understanding of its function and utility; persuasion, when a person forms a favorable or unfavorable attitude toward it; decision, when a person chooses to adopt or reject it; implementation, when the innovation is put into actual practice; and confirmation, when a person seeks reinforcement or validation of the decision already made.

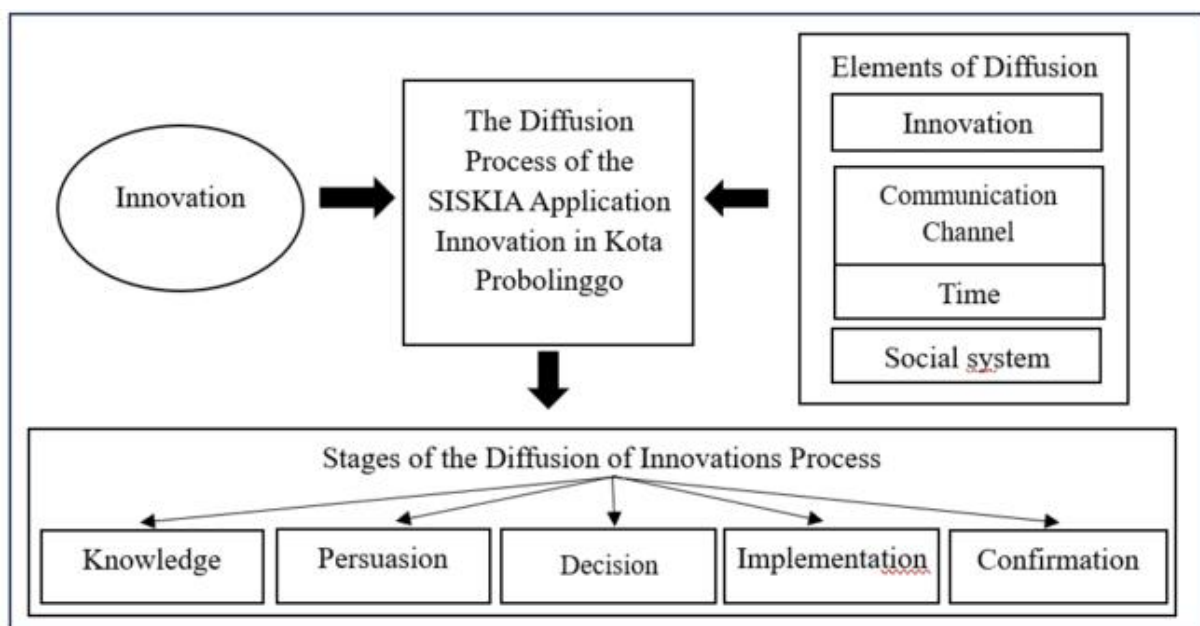


Figure 1 Rogers' Theory (2003) in this research design framework

RESEARCH METHOD

This study employs a qualitative approach with a case study method to obtain a comprehensive understanding of the diffusion process of the SISKIA application, a maternal

and child health information system in Probolinggo City (Sugiyono, 2025). The study focuses on the adoption of the innovation by health workers, using Everett M. Rogers' Diffusion of Innovations Theory from the perspective of public administration and health services. Informants were selected through purposive sampling, that is, by determining informants on the basis of specific considerations aligned with the research objectives (Abdussamad, 2021; Ahmad & Wilkins, 2025). The researcher collected data at the Probolinggo City Health Office (Dinas Kesehatan) through observation and interviews concerning coordination among the Health Office, several community health centers (puskesmas), and several health workers in Probolinggo City. These informants were selected because they possess knowledge, experience, and involvement in the management and implementation of SISKIA Pro Cantik in Probolinggo City, as shown in table 1.

No	Category	Position	Total	Topic
1	Key Informants	Head of the Probolinggo City Health Office (Kepala Dinas Kesehatan Probolinggo City)	1	Understands the policy direction and implementation strategy of the SISKIA application
2		Head of the Division or Section responsible for Maternal and Child Health (Kepala Bidang/Kepala Seksi KIA)	1	Understands the achievements and challenges of the innovation's diffusion
3		Developer or technical team of the SISKIA application	2	Knows the features and modules of the application and how it is communicated
4	Primary informants	Head of the Health Coordination Division at the hospital (Bikor, coordinating midwife/nurse)	1	Supports decision-making in health services
5		Head of the Health Coordination Division at the puskesmas (Bikor, coordinating midwife)	2	Directly provides information to pregnant women and toddlers
6	Additional informants	SISKIA system administrator or operator at health facilities	3	Enters data on pregnant women and toddlers, and monitors pregnancy and childbirth risks

Table 1 List of Research Informants

Source: Research Results, 2026

The collected data were then tested for trustworthiness through source and technique triangulation to ensure their accuracy (Creswell & Creswell, 2018). The researcher used the interactive model of data analysis developed by Miles and Huberman to analyze the data obtained in this study. This technique was chosen because the model can be carried out concurrently with data collection and the writing of findings, which makes the use of research time more efficient. The stages of data analysis in the Miles and Huberman interactive model

comprise data collection, data condensation, data display, and conclusion drawing or verification (Miles et al., 2020).

RESULTS AND DISCUSSION

Dynamics of the SISKIA Pro Cantik Reborn Adoption Process

The findings on Rogers' five stages of the innovation-decision process show that the diffusion of SISKIA Pro Cantik Reborn has progressed from the initial introduction of the innovation to the reinforcement of its continued use. At the knowledge stage, diffusion was marked by the introduction of the innovation through socialization, tutorials, technical guidance (*bimbingan teknis*), and mentoring. Users gained knowledge of the purpose, functions, and operating mechanisms of SISKIA. At the persuasion stage, users began to form positive attitudes toward the innovation based on their experience and the benefits they perceived. Ease of use, data integration, and the ability to monitor risk strengthened positive perceptions of SISKIA. At the decision stage, adoption showed an institutional character. The decision to use SISKIA rested not only on users' own choice but was reinforced by government policy and organizational obligation. This indicates that the adoption of innovations in the public sector can be shaped by authority structures and regulation.

At the implementation stage, SISKIA was used in actual health service delivery. In the field, however, implementation produced several problems, including network constraints, persistent double data entry, delays in data input, and differences in users' digital competence. These problems were addressed through monitoring, evaluation, mentoring, and communication between users and the Health Office (*Dinas Kesehatan*). At the confirmation stage, the decision to use SISKIA was maintained because users continued to perceive the benefits of the innovation. Periodic monitoring and evaluation served as a mechanism for reinforcing use. Users' feedback on training needs and system improvements did not indicate rejection of the innovation; rather, it reflected an evaluation process aimed at improving it.

In the SISKIA context, this process was neither simple nor linear. Each stage was influenced by organizational factors, human resources, policy, communication, technological infrastructure, and user experience. The diffusion of SISKIA thus reveals a relationship between individual user factors and the institutional factors of a public organization. The findings show that the adoption of SISKIA occurred not merely because users considered the innovation useful but also because it gained legitimacy through the policy and institutional support of the Probolinggo City Government. One significant institutional driver was the

Mayoral Circular Letter (Surat Edaran Wali City) requiring all health facilities to use the SISKIA application. At the same time, the tangible benefits users experienced strengthened the continuity of use.

From the perspective of Rogers's diffusion of innovations theory, the diffusion of SISKIA Pro Cantik Reborn can be understood as having entered the adoption and confirmation stages, even though its implementation cannot yet be regarded as fixed or fully stabilized (Yim & Jeong, 2025). This reading aligns with earlier scholarship indicating that digital public-service innovations are typically adopted through a gradual process embedded in communication flows, time, and the wider social system (Guo & Huang, 2024).

However, much of the existing empirical literature on innovation diffusion has focused on settings in which adoption is largely voluntary, with citizens or community members acting as autonomous adopters (Yim & Jeong, 2025). In the case of SISKIA Pro Cantik Reborn, by contrast, adoption was reinforced through a formal municipal directive addressed to health workers, indicating that diffusion in the public sector may be shaped as much by institutional legitimacy and regulatory authority as by perceived usefulness alone (Hadjaratie et al, 2024). This compulsory mode of adoption also helps explain why implementation challenges persist, since effective use of digital systems continues to depend on training, organizational support, infrastructure, and users' digital competence (Hadjaratie et al., 2024; Yim & Jeong, 2025). In this sense, the diffusion of SISKIA Pro Cantik Reborn is best viewed not as a completed administrative transition, but as an ongoing process of institutional adjustment and user adaptation

Mechanisms Explaining Adoption

Based on the analysis of the four elements of diffusion, this study finds that the successful implementation of SISKIA Pro Cantik Reborn in Probolinggo City emerged from mutually reinforcing relationships among the characteristics of the innovation, communication channels, time, and the social system, which were in turn reinforced by stakeholder policy. First, regarding the innovation, SISKIA Reborn has a relative advantage over the previous system. Data integration, real-time monitoring, smartwatches, Posyandu tablets, and a leadership dashboard enable the innovation to deliver greater benefits in service delivery and in monitoring pregnant women. Second, regarding communication channels, diffusion took place through layered and continuous communication. Socialization and technical guidance served as the initial introduction of the innovation, while monitoring,

evaluation, communication groups, and mentoring were the mechanisms for sustaining its use. Interpersonal communication was the dominant channel, and digital media played a supporting role. Third, regarding time, SISKIA reflects a long and evolutionary process of innovation. The journey from SISKIA in 2017 to SISKIA Reborn in 2025 shows that the innovation underwent evaluation, learning, adjustment, and development. Use that has become routine indicates a process of habituation and internalization of the innovation within the organization. Fourth, regarding the social system, the success of the innovation is supported by leadership, cross-sector collaboration, organizational norms, a team work culture, communication networks, and the presence of kader (community health volunteers) as opinion leaders. The implementation of SISKIA Reborn is therefore a collective process involving various actors rather than an individual one.

The analysis shows that the four elements in Rogers' (2003) theory do not work in isolation. The advantages of the innovation encourage users to accept SISKIA, but this acceptance requires effective communication. Communication in turn gives users the opportunity to learn and adapt over a given period. The process is then strengthened when supported by a social system that has leadership, norms, communication networks, and a collaborative work culture. On communication channels, Saputri et al. (2024) found that interpersonal communication had a positive but less effective influence because socialization was not conducted on a massive scale, while Laharu et al. (2025) showed that residents became aware of the innovation through interpersonal channels and mass media. This study finds something different: interpersonal communication was the dominant and effective channel. This difference can be explained by the characteristics of the users, who are health workers belonging to a structured organizational network and receive continuous mentoring from the Health Office, unlike the broad and dispersed general public.

Taken together, the findings show that the diffusion of SISKIA Pro Cantik Reborn is a process of transforming digital technology into a data-driven digital health service work culture. This process occurred not simply because the Health Office created an application with new features, but because the innovation was able to address problems in the previous service system. The relative advantages of data integration and real-time monitoring created benefits that users could experience directly. These benefits were then reinforced through intensive interpersonal communication between the Health Office and puskesmas, hospitals, TPMB (Tempat Praktik Mandiri Bidan, independent midwife practices), kader, and the community.

Diffusion also took place over a long period. The journey of SISKIA from 2017 to SISKIA Reborn in 2025 shows that the innovation developed through evaluation and adjustment. This indicates that innovation in public organizations is not a product completed in a single stage but a continuously evolving process that follows service needs. Ultimately, the sustainability of the innovation is strongly influenced by the social system. Leadership support, cross-sector involvement, the norm of mandatory data input, a team work culture, continuous communication, and the role of kader as change agents are the social mechanisms that sustain the use of SISKIA. The success of its diffusion is determined not merely by technological superiority but by the organization's ability to integrate the advantages of the innovation with continuous interpersonal communication, a process of habituation over time, and a collaborative social system backed by leadership.

The analysis shows that technology in the context of public services produces stronger change when there is a fit between the technological innovation and the organization's needs, users' capabilities, communication patterns, and the social structure that supports it. In the context of SISKIA Reborn, technology is the instrument of change, while communication, time, and the social system are the mechanisms that allow that change to be accepted and sustained. This study shows that Rogers' Diffusion of Innovations theory is relevant for explaining the implementation of SISKIA Reborn. The field findings, however, emphasize that in the context of government health service organizations, the social system and interpersonal communication occupy a highly strategic position in transforming an innovation from a mere application into an institutionalized work practice. A technological innovation without the support of the social system risks producing suboptimal use, whereas support from communication, leadership, collaboration, and organizational norms can strengthen both adoption and the sustainability of the innovation.

On this basis, it can be affirmed that the diffusion of SISKIA Pro Cantik Reborn in Probolinggo City is a process that is technological, organizational, and social at once. In the technological dimension, the innovation offers the advantages of integration and speed of information. In the communication dimension, it is disseminated through interpersonal interaction and digital media. In the temporal dimension, it undergoes development and habituation. In the social dimension, it gains legitimacy and sustainability through leadership, norms, collaboration, and networks among actors.

The findings indicate that the most important factor in the diffusion of SISKIA Reborn lies not only in the innovation itself, but also in the way the innovation is communicated,

routinized, and reinforced within the social system. Studies on innovation diffusion in public and community settings similarly show that adoption is shaped by the interaction between the relative advantage of the innovation, the communication channels used, the time required for adjustment, and the social actors who sustain implementation. This pattern is consistent with family and community-based innovation programs in which implementation becomes effective when communication is organized through local networks, interpersonal interaction, and supporting institutions rather than through technology alone (Aji et al., 2019; Ariyani & Bilqis, 2025).

The strategic role of the social system in sustaining innovation also appears across public-service studies. In community health and family programs, continuity depends on leadership, team development, training, partnership, and cross-sector coordination (Ariyani et al., 2016; Putra & Sasmita, 2025). Other studies likewise show that cadres, local facilitators, and community intermediaries are crucial because they connect formal programs with everyday practice at the user level (Ariyani & Bilqis, 2025).

Taken together, these findings suggest that the success of digital health-service transformation depends less on what the technology is than on how it is embedded in organizational routines, supported through communication, and legitimized by a collaborative social system (Saputri et al., 2025; Irwanto et al., 2023; Damanhuri, 2025). In the case of SISKIA Reborn, technology functions as an instrument of change, but its diffusion becomes sustainable only when organizational support, communication patterns, user capability, and social legitimacy develop alongside it (Saputri et al., 2025; Damanhuri, 2025; Aji et al., 2026).

SISKIA Adaptive-Institutionalized Diffusion Model

The integration of the findings from the five stages of the innovation-decision process, together with the elements of diffusion and their supporting factors, yields an adaptive and institutionalized diffusion model, as shown in Figure 2.

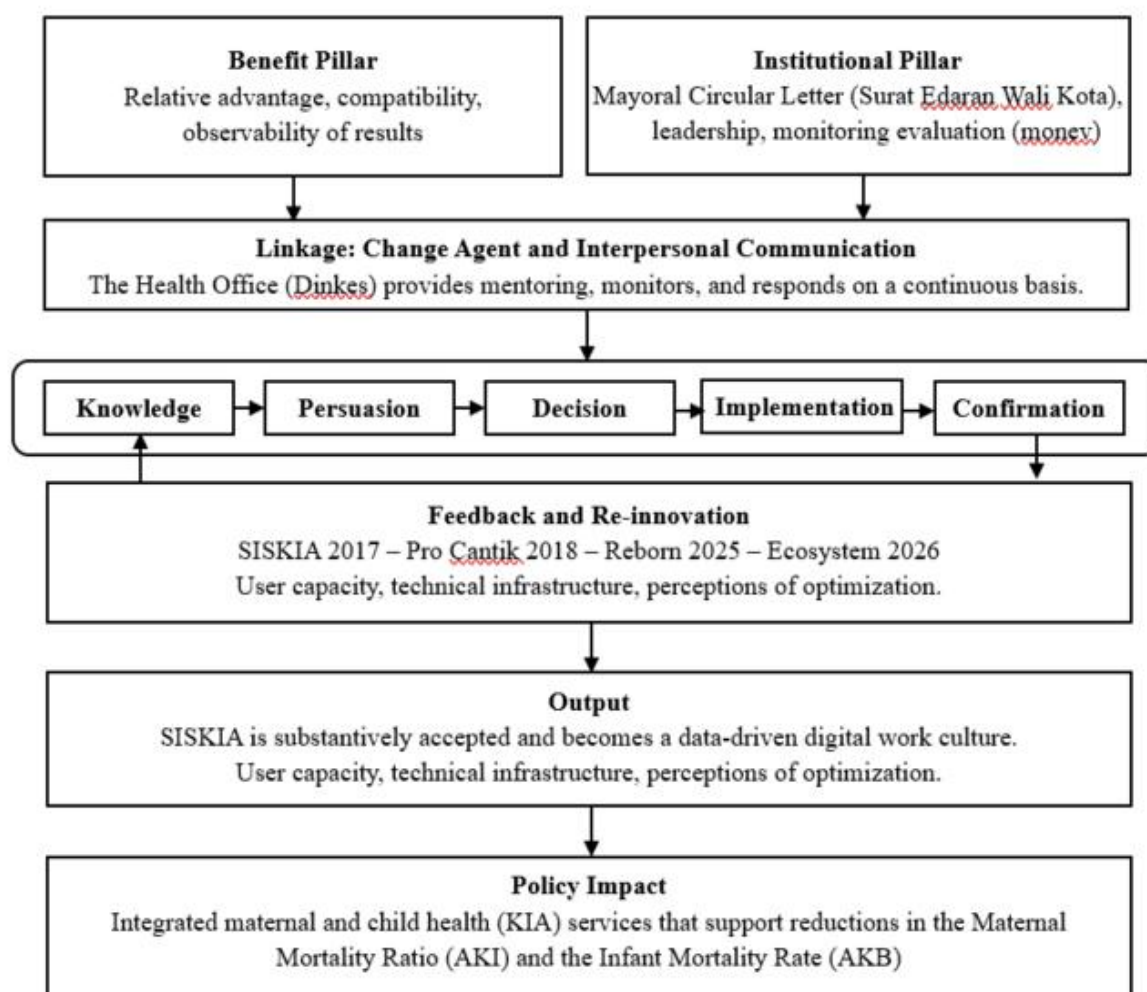


Figure 2 SISKIA Adaptive-Institutionalized Diffusion Model, research result (2025).

This model is designed to explain not only the steps SISKIA has passed through but also the forces that drive and sustain that journey. This driving force comes from two pillars working simultaneously. The benefit pillar is formed by how users perceive the advantages of an innovation, the extent to which it fits their work needs, and how easily its results can be seen through the dashboard, so that the innovation is judged helpful in daily work. The institutional pillar is formed through the Mayoral Circular Letter (Surat Edaran Wali City), the involvement of leaders as structural opinion leaders, and phased monitoring and evaluation that provide certainty and oversight over its use. Neither pillar acts directly on users; both operate through the Health Office (Dinas Kesehatan) as the change agent, by means of direct interpersonal communication and guidance. This mediation is important because benefits without mentoring tend to remain at the level of perception, while obligations without mentoring tend to remain at the level of instruction.

Unlike processes depicted as moving forward in one direction, this model uses feedback and improvement to link the confirmation stage back to the earlier stages. The limitations found in the field, such as differences in user capacity, uneven technical infrastructure, and differing understandings between managers and operators about how to improve guidance, are treated as critical points that affect the quality of diffusion rather than as signs of failed acceptance. These critical points trigger evaluation and improvement, as seen in the development of SISKIA from its initial version in 2017 to SISKIA Pro Cantik Reborn in 2025, and its integration with the digital service ecosystem in 2026. Within this framework, re-innovation demonstrates the organization's capacity to learn so that the innovation remains relevant to service needs. The cycle ends with institutionalization: the shift from formal compliance, initially driven by obligation, to genuine acceptance based on perceived benefits, until the innovation becomes part of the organization's work standards.

Theoretically, this model extends Rogers' (2003) framework with two additional emphases. First, it explains the function of each pillar in a public organization: institutional obligation ensures that use takes place, while perceived benefit sustains it. Second, it positions confirmation as a testing point that drives change, so that the success of diffusion is judged not only by the number of users but also by the organization's ability to manage this critical moment.

This study makes three contributions to the literature. First, it examines internal users who are mandated to use the innovation, which allows a dual decision mechanism of benefit and institutional pressure to be identified. Second, it analyzes the five stages of the innovation-decision process together with the four elements of diffusion and the re-innovation trajectory of SISKIA, whereas previous studies have generally focused on effectiveness, innovation characteristics, or communication channels. Third, it shows that adoption is not identical to optimal implementation, so that obstacles are read as triggers for feedback and re-innovation rather than as failures of diffusion. The adaptive-institutionalized diffusion model thus complements earlier findings by explaining how digital innovations in public service organizations can endure and develop after adoption.

This model also helps clarify why the diffusion of SISKIA should be read as an adaptive institutional process rather than as a simple linear adoption sequence. Prior studies consistently show that diffusion becomes stronger when an innovation offers clear benefits, fits user needs, and produces observable results, as seen in family-service, health, and community programs (Chairunnisa & Sasmita, 2022; Mindarti, 2018). Other studies similarly

find that diffusion depends heavily on interpersonal communication, local facilitators, and organized guidance, whether through cadres, village actors, or institutional outreach structures. This pattern supports the position of the Health Office as the change agent in SISKIA, because the benefit pillar and the institutional pillar do not operate effectively without mediation through mentoring, technical guidance, and repeated communication (Ariyani et al., 2016; Ariyani & Sulandari, 2019).

At the same time, the SISKIA model extends earlier diffusion studies because many previous cases examined adoption among community members, families, or voluntary participants rather than among internal organizational users working under formal administrative obligation (Chairunnisa & Sasmita, 2022; Ulfatiana, 2021). In those earlier studies, success often depended on communication reach, social participation, and local support, but implementation still faced obstacles such as limited staff, uneven participation, funding interruptions, and incomplete targeting (Zahira & Mashur, 2022). Research on digital diffusion likewise shows that technology-based innovation does not spread optimally when communication channels remain poorly matched to users, as in outreach to digital natives, or when user capability and access remain uneven, as in elderly use of digital applications (Aji et al., 2019; Vandiano, 2026). In this respect, SISKIA is distinctive because the innovation is sustained not only by perceived usefulness, but also by a dual mechanism in which formal obligation secures use, while perceived benefit and direct assistance gradually transform compliance into routinized acceptance.

Overall, the diffusion of SISKIA in Probolinggo City is a process that integrates technological, organizational, and social aspects. The five stages of diffusion in Rogers' framework have been passed through and show increasingly strong adoption of the application by users. However, the confirmation stage does not signal the end of the diffusion process; rather, it indicates the emergence of more stable use and the need for continuous development and evaluation. This study shows that the success of digital innovation diffusion in public service organizations is determined not only by technological superiority and ease of use but also by policy support, leadership commitment, interpersonal communication, user mentoring, and continuous evaluation. SISKIA therefore functions not only as a recording application but also as part of the transformation of health services toward a more integrated, data-driven, and sustainable system.

CONCLUSION

The success of SISKIA's adoption is determined not only by technological aspects but also by user readiness and organizational support during implementation. At the knowledge stage, health workers' knowledge of SISKIA was formed through socialization, technical guidance, tutorials, mentoring, and direct experience using the application. At the persuasion stage, positive attitudes toward SISKIA emerged because health workers experienced its benefits: it simplifies data recording and retrieval, provides service histories, allows monitoring of high-risk pregnant women, and speeds up the provision of information. At the decision stage, the decision to adopt came not only from individual awareness but was also influenced by the policy of the Probolinggo City Government and by organizational support. At the implementation stage, SISKIA was used for recording, data updating, monitoring of mothers and children, risk identification, service coordination, and providing information to the Health Office (Dinas Kesehatan). At the confirmation stage, health workers continued to use SISKIA because they judged its benefits to match service needs.

In implementation, SISKIA has had positive effects through real-time monitoring of high-risk pregnant women, faster maternal and child health (Kesehatan Ibu dan Anak, KIA) reporting, better coordination among health facilities, and support for data-driven decision-making. However, its use is not yet optimal because double data entry, limited internet connectivity, and differences in health workers' digital literacy persist. The sustainability of SISKIA's implementation therefore requires improving health workers' digital competence, strengthening technological infrastructure, system integration and interoperability, and periodic monitoring and evaluation. In this way, SISKIA can develop not merely as a technological innovation but as an instrument for transforming the governance of health services toward a sustainable, data-driven system.

This study is limited to the diffusion process of innovation, taking its supporting elements into account, and its scope covers only one of the health support systems in Probolinggo City, namely SISKIA Pro Cantik. Future research could be extended to measure data quality, user satisfaction, system effectiveness, and the impact of SISKIA on the performance of maternal and child health services. Future studies could also broaden the object of research to the implementation of SISKIA in other regions or compare various regional health information systems, in order to develop a more comprehensive model of digital innovation implementation for the public service sector.

Declaration of AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used claude.ai in order to translating the draft into english. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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