

The Impact of the Digitalization of Health Services on the Accessibility and Quality of JKN Services in Klaten Regency

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Abstract : This study examines the impact of digital health service implementation through the Mobile JKN platform on the accessibility and quality of National Health Insurance (JKN) services in Klaten Regency. The study was motivated by the low utilisation of the application, which is influenced by technological acceptance, infrastructure readiness, and user capabilities. A quantitative approach was employed using a survey method involving 156 JKN participants selected through simple random sampling. Data were analysed using Structural Equation Modelling (SEM) with SmartPLS to examine the relationships among research variables. The findings reveal that Mobile Technology Acceptance, Government Needs, and the Role of Service Providers significantly influence the accessibility and quality of JKN services. The Role of Service Providers was identified as the most dominant factor in supporting the effectiveness of digital health service implementation. Meanwhile, infrastructure and telecommunications readiness did not show a significant effect. These findings indicate that non-technical factors, particularly service provider capacity and user assistance, play an important role in improving digital health service effectiveness and user satisfaction. The study recommends strengthening healthcare workers' competencies and providing user support for Mobile JKN utilisation.

Keywords : Digitalization Of Health Services; Mobile JKN; Service Accessibility; Service Quality; Technology Adoption

Abstrak : Penelitian ini mengkaji dampak implementasi layanan kesehatan digital melalui platform Mobile JKN terhadap aksesibilitas dan kualitas layanan Jaminan Kesehatan Nasional (JKN) di Kabupaten Klaten. Penelitian ini dilatarbelakangi oleh rendahnya pemanfaatan aplikasi yang dipengaruhi oleh penerimaan teknologi, kesiapan infrastruktur, dan kemampuan pengguna. Penelitian menggunakan pendekatan kuantitatif dengan metode survei terhadap 156 peserta JKN yang dipilih melalui teknik simple random sampling. Analisis data dilakukan menggunakan Structural Equation Modelling (SEM) dengan bantuan SmartPLS untuk menguji hubungan antarvariabel penelitian. Hasil penelitian menunjukkan bahwa variabel Penerimaan Teknologi Mobile, Kebutuhan Pemerintah, dan Peran Penyedia Layanan berpengaruh signifikan terhadap aksesibilitas dan kualitas layanan JKN. Peran Penyedia Layanan menjadi faktor paling dominan dalam mendukung efektivitas implementasi layanan kesehatan digital. Sementara itu, kesiapan infrastruktur dan telekomunikasi tidak menunjukkan pengaruh yang signifikan. Temuan ini menunjukkan bahwa faktor

nonteknis, khususnya kapasitas penyedia layanan dan pendampingan pengguna, memiliki peran penting dalam meningkatkan efektivitas layanan kesehatan digital dan kepuasan pengguna. Penelitian ini merekomendasikan penguatan kompetensi tenaga kesehatan serta pemberian dukungan kepada pengguna dalam pemanfaatan aplikasi Mobile JKN.

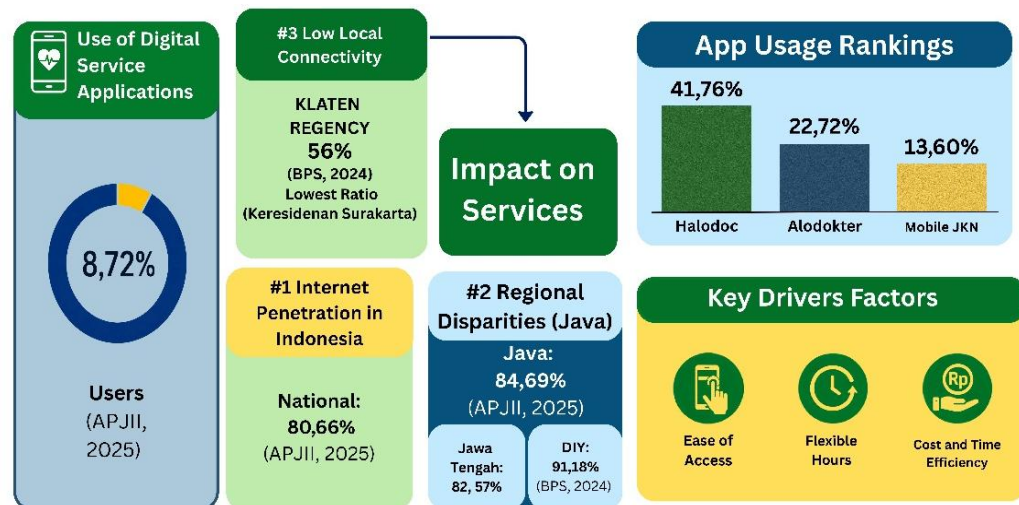
Kata kunci: *Layanan Kesehatan Digital, Mobile JKN, Aksesibilitas Layanan, Kualitas Layanan, Adopsi Teknologi.*

INTRODUCTION

Advances in Information and Communication Technology (ICT) have driven significant changes across various areas of public service, particularly in the healthcare sector. The public's access, efficiency, and transparency are all greatly enhanced by the digitization of healthcare services (Choirunnissa *et al.*, 2025). The public can obtain services without physically visiting healthcare facilities because to the use of digital technology, which also speeds up administrative procedures and improves health data integration (Firdaus *et al.*, 2025). Digitalization also improves the program's sustainability and the efficacy and quality of services. (Hesti Melliasari, 2024; Maghfiroh, 2025). Public health policy in Indonesia is driving digital transformation through the National Health Insurance (JKN) program. This program aims to provide equitable, high-quality, and easily accessible health services to the general public and serves as a strategy for achieving Universal Health Coverage (UHC) (Adiyanta, 2020). Since its nationwide implementation in 2014, the JKN program has become a cornerstone of Indonesia's national health system. The JKN program provides financial protection for the public against the costs of health care services (Nugraha *et al.*, 2025).

The implementation of the JKN program is based on Law No. 36 of 2009 on Health and Law No. 40 of 2004 on the Social Security System (Agustin Eva Nur *et al.*, 2023). The regulation emphasizes the urgency of health insurance as a key component in achieving public welfare. Over the past decade, JKN has made a significant contribution to improving health care services (Alayda *et al.*, 2024). This trend indicates an increase in the number of participants and the frequency of healthcare service utilization. In line with this, the number of users of the Mobile JKN digital innovation continues to grow through 2024 (Dela Andika Ahmadi *et al.*, 2024). Although the number of JKN participants continues to increase year after year, the JKN program still faces various challenges in its implementation. Limited healthcare infrastructure and medical personnel in rural and remote areas, as well as disparities in distribution, remain barriers to equitable access to healthcare services (Maghfiroh, 2025). The digital transformation through Mobile JKN has not yet been fully optimized, so improvements in the efficiency and effectiveness of healthcare services are needed (Hesti Melliasari, Isa Dwiyo, Purwadhi, 2024). This situation has led some members of the public to prefer accessing services in person rather than using digital services (Nurjayanti & Novratilova, 2025).

Therefore, from the Indonesian Internet Service Providers Association (APJII) and the Central Java Provincial Central Statistics Agency (BPS) can be used to assess the different obstacles to the adoption of digital health services. Based on this data, the adoption of digital health apps in Indonesia remains low at 8.72% of users, even though national internet penetration has reached a significant 80.66%. The main issue stems from the digital divide for example, connectivity in Klaten Regency stands at only 56%, which directly hinders the effectiveness of services. Nevertheless, users can access these services easily, flexibly, and efficiently, with Halodoc leading the market at 41.76%, followed by Alodokter at 22.72%, and Mobile JKN at 13.60%. Furthermore, figure 1 show the following is a representation of the data on the challenges facing the adoption of digital health services in Indonesia:

Figure 1. Challenges in the Adoption of Digital Health Services in Indonesia

Source: APJII (2025) and (Badan Pusat Statistik, 2024)

This phenomenon indicates that challenges in the adoption of digital health services are encountered at both the national and regional levels due to disparities in technological readiness, infrastructure, and users' ability to access health services (Hidayat et al., 2025). In Central Java Province, the implementation of digital health services is still hampered by system complexity, low digital literacy, and suboptimal coordination among agencies (Rizfaera Aulia et al., 2024). This situation is linked to public health indicators showing that Klaten Regency has the highest morbidity rate (12.85%). This finding points to limited access to and poor quality of health services due to infrastructure and system readiness issues in Klaten Regency. Furthermore, table 1 show the following are the morbidity rates for the Surakarta Residency:

Table 1. Morbidity rates

County/City	Male (%)	Women (%)	Total (%)
Klaten	11,52	14,14	12,85
Boyolali	11,54	11,52	11,53
Sukoharjo	9,22	10,07	9,65
Wonogiri	8,91	12,89	10,96
Karanganyar	7,92	8,28	8,1
Sragen	11,72	11,7	11,71

Source: Central Java Province Health Profile (2024), page 56

In contrast, Klaten Regency had the highest JKN enrollment rate at 78.33%, compared to Sukoharjo (74.02%), Boyolali (70.55%), Karanganyar (69.94%), Wonogiri (65.74%), and Sragen (59.84%) (Badan Pusat Statistik Provinsi Jawa Tengah, 2024). The high enrollment rate in the National Health Insurance (JKN) program has not been matched by adequate service quality, as evidenced by high morbidity rates and low adoption of digital technology. This is also influenced by limitations in health infrastructure and information technology networks, particularly in rural areas, which hinder efforts to optimize service quality (Widjaja, 2025). In light of these conditions, a thorough analysis is required to assess how digitization has improved the National Health Insurance (JKN) program's accessibility and efficacy in Klaten Regency. This circumstance suggests that attempts to raise health care quality and accessibility are a complex issue that must be addressed locally and globally (Uly & Alim, 2025). The growing demand for public health services has not kept pace with infrastructure development and the optimal use of technology (Amallia, 2024). This situation has resulted in healthcare services not yet being optimally accessible to all

of the relationship between the digitization of healthcare services and user satisfaction (Diana & Sari, 2024).

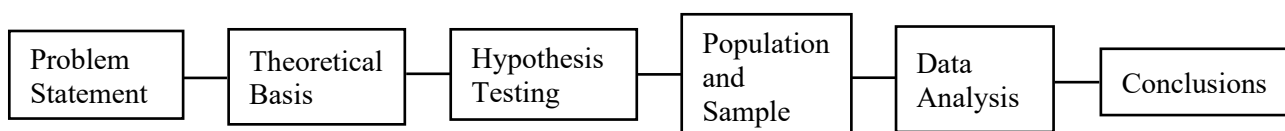
Given this research gap, a theoretical framework is needed to comprehensively explain the relationships among technology acceptance, digital service implementation, and user satisfaction. Thus, the Drivers of M-Government theory (Davis, 1989) is used in this study, which is further expanded by the Mobile Service Acceptance Model (MSAM) and enhanced by the Technology Acceptance Model (TAM) (Davis, 1989; M.Arief Algiffary, 2023). This model is considered the most relevant for understanding patterns of mobile technology adoption based on perceived usefulness and perceived ease of use, and supports empirical testing through a quantitative approach (Putra *et al.*, 2024). In the public service sector, the implementation of digital technology not only supports the effectiveness of government administration but also improves the accessibility and quality of services for the public (Novita2, 2025). External variables such as infrastructure readiness, policy support, vendor roles, and telecommunications infrastructure influence the adoption, accessibility, and quality of the Mobile JKN digital service. This framework is reinforced by the concepts of accessibility and E-SERVQUAL, thereby enhancing participant satisfaction and loyalty, and delivering digital health services effectively and in alignment with community needs (Anastasya *et al.*, 2024). Question: How has the digitization of healthcare services improved the accessibility and quality of JKN services in Klaten Regency?

METHOD

The impact of health service digitization (X) on the quality and accessibility of JKN services (Y) in Klaten Regency was investigated in this study utilizing a quantitative approach and an analytical survey design. A standardized Likert-scale questionnaire was used to gather data, which was then statistically examined to look for correlations between the variables. (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree are the five choices on the scale. In Klaten Regency, there will be 1,218,778 JKN participants overall in 2024. 156 JKN members in Klaten Regency were chosen as the research sample using the Slovin formula ($e=8\%$).

Two Community Health Centers (Puskesmas), namely Bayat Puskesmas and Gantiwarno Puskesmas, were the focus of the study. Simple random selection was utilized to distribute surveys via Google Forms in Klaten Regency. SmartPLS was used for data analysis in order to look at the correlations between the variables. This process is essential to avoiding misunderstandings regarding the effects of JKN services' digitalization in Klaten Regency. Instrument reliability was evaluated using means, standard deviations, Cronbach's Alpha (>60), and hypothesis testing. Descriptive study also showed that digitization is linked to better JKN service accessibility. Additionally, Figure 3 below shows the flowchart for the entire research technique. Furthermore, figure 3 show the overall research methodology flowchart is illustrated.

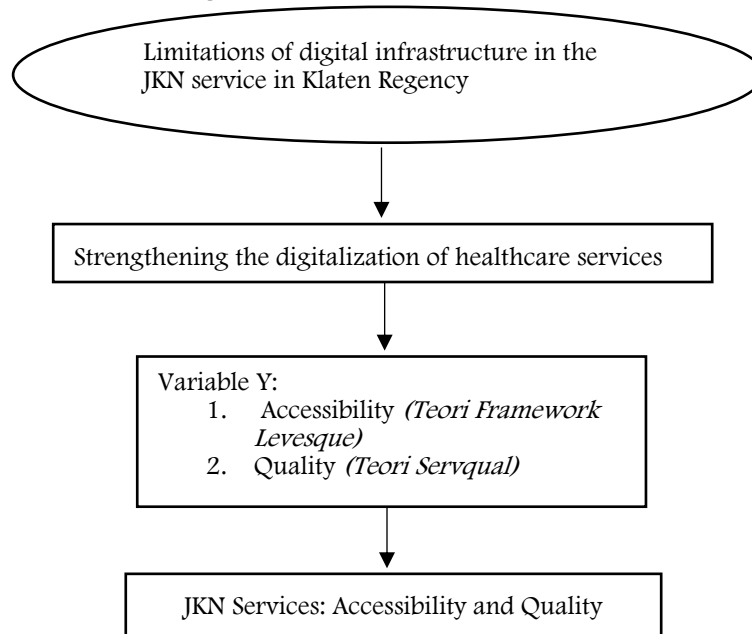
Figure 3. Research stages



Referring to the conceptual framework, digital infrastructure constraints are at the root of the challenges in implementing the National Health Insurance (JKN) program in Klaten Regency, prompting the initiative to strengthen digitalization as a strategic step. This study's analysis adopts three main theoretical frameworks the Drivers of M-Government, the Levesque Framework (2013), and SERVQUAL to examine digitalization, accessibility, and service quality (Davis, 1989; M.Arief Algiffary, 2023; Fatimah *et al.*, 2025). The integration of these three approaches provides empirical evidence regarding the effectiveness of digitalization in improving JKN services. Meanwhile, the relationship between the Drivers of M-Government theory and SERVQUAL forms a cohesive framework for identifying ways to optimize the digital transformation of Mobile JKN-based health services. The Drivers theory maps the several factors that affect the adoption and use of digital

technology, and SERVQUAL is used to evaluate how that use affects public satisfaction and service quality (Saimi, 2025; Anastasya et al., 2024). The integration of these two theories provides a comprehensive analytical framework for examining the role of healthcare digitization in improving service quality and accessibility. Figure 4 illustrates the conceptual framework developed for this study. Furthermore, figure 4 show illustrates the conceptual framework developed for this study.

Figure 4. Kerangka Konseptual



The analysis is based on two main variables: the digitization of healthcare services (X) and the accessibility and quality of JKN services (Y). This demonstrates the extent to which digitization contributes to expanding the reach and improving the quality of JKN services.

Figure 5. Hypothesis

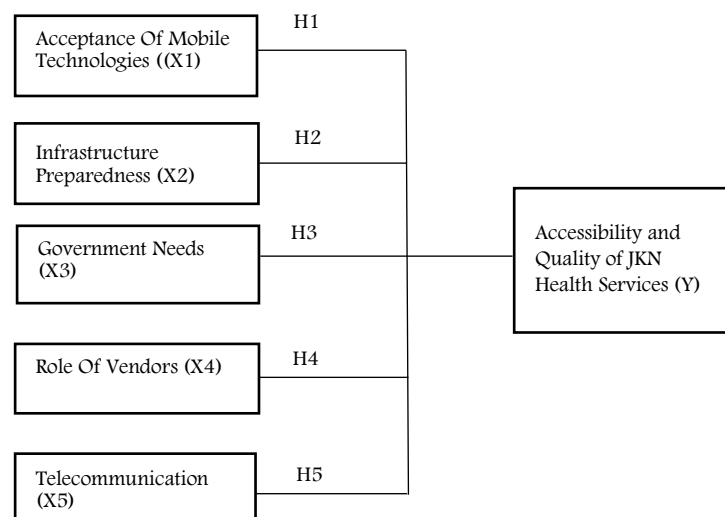


Table 2 provides a complete description of the parameters for each indicator. Furthermore, table 2 shows a complete description of the parameters for each indicator.

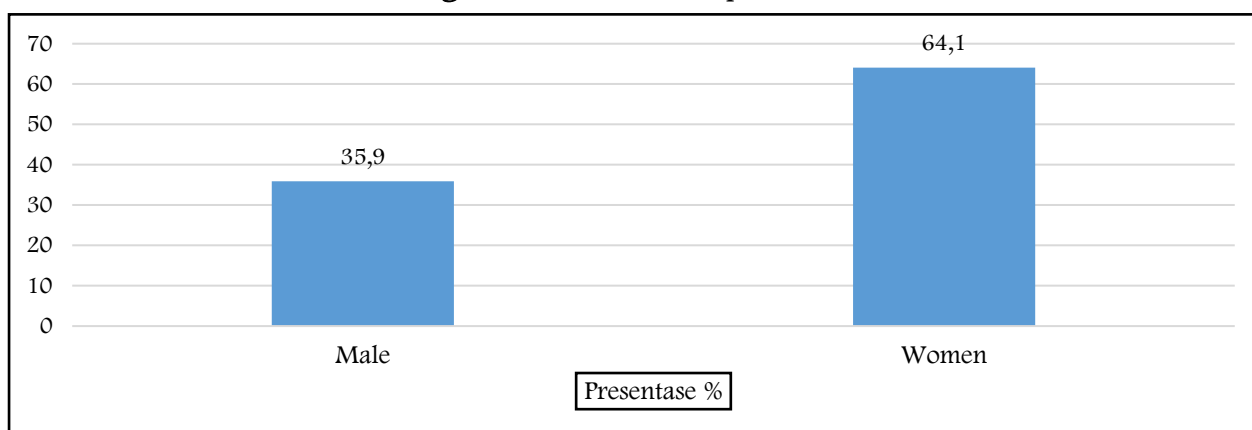
Table 2. Indicators and Parameters

No.	Indicator	Parameter
1.	Acceptance of Mobile Technologies	JKN's digital services help me access healthcare more quickly. The use of JKN's digital technology streamlines administrative processes, making them more efficient. JKN's digital services are simple to use and easy to understand. The internet connection at healthcare facilities is stable enough to support the use of JKN digital services.
2.	Infrastructure Preparedness	The JKN data management system can process digital data quickly, securely, and reliably. Healthcare facilities have backup power sources to ensure that JKN digital services continue to operate in the event of an outage. Government regulations regarding digital JKN services are clear and easy for staff and participants to understand.
3.	Government Needs	I frequently receive information about policies and procedures related to digital services. Digital health facilities already have clear standard operating procedures (SOPs). The vendor has updated the JKN digital service system to improve service efficiency.
4.	Role of Vendors	The vendor's system is connected to the government's system, ensuring that service processes run smoothly. The vendor routinely performs maintenance on the JKN digital service system. The signal quality and data access speed in my area are sufficient to use the JKN mobile app without any issues.
5.	Telecommunication	Internet coverage in the Klaten area is good enough to access JKN services digitally. The network capacity in the area is sufficient to support real-time JKN data exchange. The ease with which the public can access health facilities and obtain clear information about the National Health Insurance (JKN).
6	Accessibility	Adequate operating hours and the availability of health facilities. Conditions that support mobility, the availability of transportation, and the quality of infrastructure. The speed and ease of use of an app are reflected in its loading time and navigation.
7	Quality	The speed at which the service responds to user needs through customer service. The level of user trust in data security and privacy, as well as the quality of customer service.

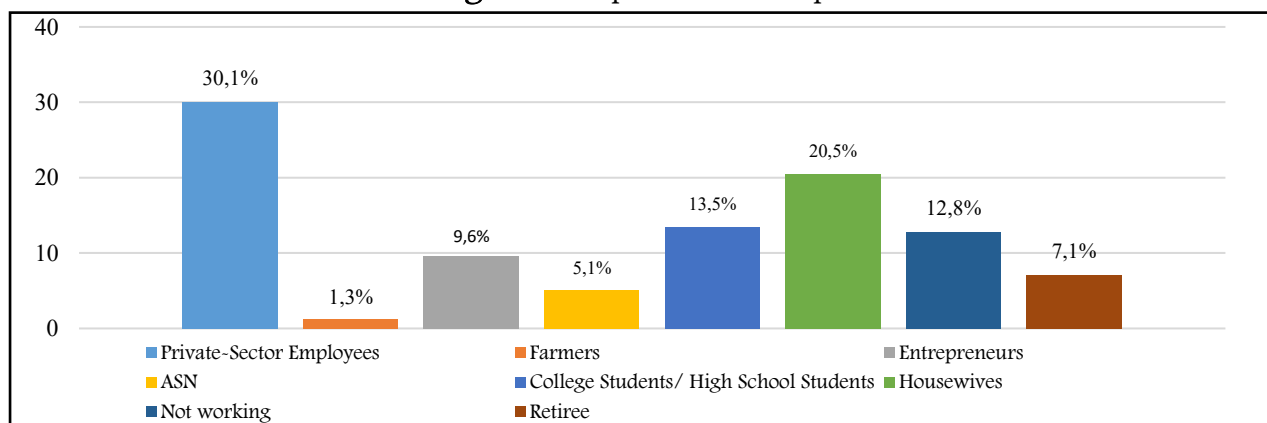
RESULTS AND DISCUSSION

Respondent Profile

The profiles of the respondents and the outcomes of the hypotheses based on the independent and dependent variables were derived from the study's findings. According to the respondent profile, 35.9% of respondents were men and 64.1% of respondents were women. Furthermore, figure 6 show respondent profile, 35.9% of respondents were men and 64.1% of respondents were women.

Figure 6. Gender of Respondents

Referring to Figure 5, respondents' occupational profiles vary widely, as shown by the results of the Mobile JKN participant survey: private-sector employees constitute the largest group (30.1%), followed by homemakers (20.5%) and college/high school students (13.5%). Other categories, such as entrepreneurs (9.6%), civil servants (5.1%), farmers (1.3%), and other occupations (7.1%), account for a lower percentage. Furthermore, figure 7 show illustrated the data.

Figure 7. Respondent's Occupation

Average, Standart Deviation, and Alpha Cronbach

The mean reflects respondents' views on indicators of digitalization and accessibility of JKN services. At the same time, the standard deviation indicates the degree of variation in the data from 156 respondents representing a population of 1,218,778 JKN participants in Klaten, thereby ensuring the stability of the findings. On the other hand, Cronbach's Alpha (>0.60) was used to assess the reliability of each latent variable, ensuring the questionnaire instrument was adequate before proceeding to the stage of analyzing relationships between variables. These three measures form an initial descriptive foundation, reinforcing the indication that digitalization is associated with an increase in average accessibility, as evidenced by the relatively low data dispersion in the representative sample.

Table 3. Results of Convergent Validity Test Based on Outer Loading Values

Varia ble	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Value s
ACM1	0,769	0,768	0,056	13,643	0,000
ACM2	0,817	0,818	0,037	21,905	0,000
ACM3	0,784	0,785	0,037	21,309	0,000
AK1	0,707	0,707	0,048	14,597	0,000

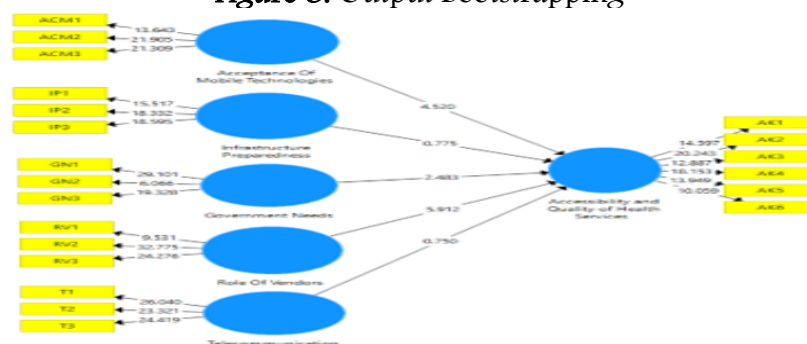
AK2	0,783	0,784	0,039	20,243	0,000
AK3	0,697	0,698	0,054	12,887	0,000
AK4	0,751	0,751	0,041	18,153	0,000
AK5	0,728	0,723	0,052	13,949	0,000
AK6	0,649	0,650	0,065	10,059	0,000
GN1	0,830	0,830	0,029	29,101	0,000
GN2	0,611	0,601	0,101	6,066	0,000
GN3	0,789	0,788	0,041	19,328	0,000
IP1	0,770	0,766	0,050	15,517	0,000
IP2	0,764	0,765	0,042	18,332	0,000
IP3	0,787	0,788	0,042	18,595	0,000
RV1	0,727	0,718	0,076	9,531	0,000

The first indicator, for the Acceptance of Mobile Technologies variable, shows outer loadings of 0,769 for ACM1, 0,817 for ACM2, and 0,784 for ACM3. All indicators have values above 0.70 and are supported by T-Statistics > 1.96 and P-Values = 0,000, thus they are deemed valid and significant. Next, the second indicator for the accessibility and quality variable shows outer loading values for AK1 (0,707), AK2 (0,783), AK3 (0,697), AK4 (0,751), AK5 (0,728), and AK6 (0,649). Most indicators showed values above 0.70; although variables AK3 and AK6 fell within the 0.60–0.70 range, these parameters remain statistically justified. The model's eligibility for hypothesis testing is confirmed by the substantial P-values (0,000) and T-statistics that satisfy the threshold.

The third indicator, the Government Needs variable, shows outer loadings of 0,830 for GN1, 0,611 for GN2, and 0,789 for GN3. The test results for variables GN1 and GN3 are above 0.70. In contrast, indicator GN2 has a lower value of 0,611 but still meets the criteria because its statistical significance remains within the tolerance limit. In the meantime, outer loading values for IP1 (0,770), IP2 (0,764), and IP3 (0,787) are displayed in the fourth indicator of the Infrastructure Preparedness variable; all IP indicators have values above 0.70 and are statistically significant. As a result, the indicators for this variable successfully measure the construct and satisfy the requirements for convergent validity. With an outside loading of RV1 (0,727), the fifth indication in the Role of Vendors variable satisfies the requirements for convergent validity. This indicator's validity and significance as a measure of the construct are demonstrated by a T-statistic of 9,531 and a P-value of 0,000.

Hypothesis Testing

Figure 8. Output Bootstrapping



Furthermore, figure 5 show the Output Bootstrapping method. Hypothesis testing was analyzed using the bootstrapping method in SmartPLS 3, which was applied to the independent and dependent variables to test their validity and reliability. According to Ghazali's (2018:99) theory, the test results were calculated using T-Statistics and P-Values and presented in table form. A hypothesis is deemed significant if the T-statistic is greater than 1.96 and the P-value is less than 0.05 (Suhaemi, 2020).

Table 4. Means, Standard Deviation, and Cronbach's Alpha.

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Value
Acceptance Of Mobile Technologies	0,314	0,316	0,070	4,520	0,000
Government Needs	0,188	0,186	0,076	2,483	0,013
Infrastructure Preparedness	0,069	0,063	0,089	0,775	0,438
Role Of Vendors	0,357	0,365	0,060	5,912	0,000
Telecommunication	0,057	0,064	0,076	0,750	0,454

The Acceptance of Mobile Technologies variable has a coefficient of 0,314, a T-statistic of 4,520, and a P-value of 0,000, according to the test results. This variable has a positive and significant impact on the dependent variable if the T-Statistic value is greater than 1.96 and the P-Value is less than 0.05. The efficiency of digital services in relation to the variables under investigation will be impacted by a high degree of public adoption of mobile technology. The Government Needs variable has a coefficient of 0,188, a T-statistic of 2,483, and a P-value of 0,013, according to hypothesis testing. Government needs drive an increase in the variable under study since this variable was found to meet the significance criteria ($T > 1.96$ and $P < 0.05$) and has a positive effect on the dependent variable. The Infrastructure Preparedness variable has a coefficient of 0,069, a T-statistic of 0,775, and a p-value of 0,438, according to hypothesis testing. Although this variable has an impact on the dependent variable, it is too small to result in a discernible change in the tested variable, hence thus does not satisfy the requirements for statistical significance. The "Role of Vendor" variable has a coefficient of 0,357, a T-statistic of 5,912, and a P-value of 0,000, according to hypothesis testing. This shows that the variable has a positive effect on the dependent variable and causes an increase in the tested variable because it satisfies the significance criterion ($T > 1.96$ and $P < 0.05$).

The "Role of Vendor" variable does not match the significance criteria ($T > 1.96$ and $P < 0.05$), according to the analysis results, which show a coefficient of 0,057, a T-statistic of 0,750, and a P-value of 0.454. This result suggests that this variable's capacity to influence the dependent variable is restricted. This study looks at the variables that affect healthcare consumer satisfaction when digital services are successfully implemented. According to the first hypothesis, acceptance of mobile technologies is a critical component that determines the quality of digital service implementation and improves effectiveness. This finding is inconsistent with previous research by Kwee & Widjojo, (2022); Hoque & Sorwar, (2017) that user pleasure is not always significantly impacted by technology use, particularly for those who are less accustomed to digital technology. The findings of the investigation in Klaten Regency, on the other hand, show a distinct scenario in which the user-friendliness of health apps can greatly raise satisfaction with JKN services.

The significance of mobile technology acceptance found in this study is consistent with the broader literature on mobile health (mHealth) adoption. A systematic review of fourteen studies using Technology Acceptance Model (TAM)-based frameworks confirmed that perceived usefulness and perceived ease of use remain the strongest predictors of sustained mHealth app engagement across diverse healthcare settings (Jannah et al., 2026). This aligns with the present finding that Mobile JKN's perceived usefulness in accelerating administrative processes is the primary driver of user acceptance. Similarly, a bibliometric analysis of mHealth user-experience research spanning 2007–2023 reported that interface simplicity and navigational efficiency

consistently emerged as dominant themes explaining user satisfaction with health applications (Rahmawati & Hsieh, 2024).

The second hypothesis, Government Needs, was found to have a significant positive effect on the accessibility and quality of JKN services. This finding indicates that government support through regulatory frameworks, policy implementation, and institutional commitment is an important role in improving digital health service performance. Previous studies have largely focused on macro-level governance, with less attention to how this directly shapes user experience Nugroho, A., & Kurniawan, (2024) ;Chopvitayakun et al., (2025)The present study addresses this gap: government support is shown to directly affect how users perceive service quality and accessibility. This result aligns with several international studies (Ridwan, 2026) found that institutional support improves service quality in e-government health platforms. (Mishra et al., 2025) showed that clear regulations and coordinated governance help digital health systems remain sustainable and equitable. Fava and Lapão (2024) added that supportive national policy is essential for aligning digital services with users' needs. Together, these studies support Hypothesis 2: regulatory clarity and institutional support are key enablers of digital health service performance.

The third hypothesis, which proposed that Infrastructure Preparedness positively influences the accessibility and quality of JKN services, was not supported. The findings indicate that infrastructure readiness does not significantly affect users' perceptions of service accessibility and quality. This result suggests that the existing infrastructure in the study area has likely reached a sufficient operational standard, making it less influential as a determinant of user satisfaction. Previous studies have generally reported that infrastructure readiness plays a critical role in the successful implementation of digital health services Alfidyah, (2025);Indra Krisnadi1, (2023). International evidence similarly highlights infrastructure limitations as a major barrier to digital health adoption, particularly in rural and underserved areas. (Ainy & Pujiyanto, 2025) identified inadequate connectivity as a persistent challenge for digital health implementation in remote regions, while (Cheng et al., 2025) found that healthcare facilities with limited technological infrastructure experienced lower levels of health information technology adoption.

Furthermore, (Nurul et al., 2020) reported that digital health infrastructure remains a significant challenge across many regions in Indonesia. However, the present findings suggest that infrastructure in the observed healthcare facilities has already met the minimum requirements necessary for routine digital service delivery. Consequently, users may place greater emphasis on non-technical factors, such as service usability, responsiveness, digital literacy, and institutional support, rather than on infrastructure availability itself. This interpretation is supported by (Wang et al., 2026), who argued that once a basic infrastructure threshold has been achieved, user satisfaction is increasingly influenced by service design and organizational factors rather than further infrastructure expansion. Therefore, infrastructure preparedness appears to function as a foundational requirement rather than a direct determinant of JKN service accessibility and quality in Klaten Regency (Yazid et al., 2024) ,explaining the rejection of Hypothesis 3.

The most important component was determined to be the fourth hypothesis, "Role of Vendors," which had a positive and significant impact on the dependent variable. This finding supports previous research in reinforcing the role of technology vendors in contributing to system stability and the success of digital services, thereby establishing that collaboration with technology providers is a critical element in the successful implementation of digital systems (Omo A. Madjid, Arietta R.D. Pusponegoro, 2019).Regarding the gaps in previous research by Fitriansyah et al., (2025); Panggabean, Kriston, Herawati, Aty, Kanto, (2023) Support from technology vendors is crucial for system maintenance and development, not merely for the organization's international relations.

A cross-sectional evaluation of health information system implementation in Ghana found that vendor-related factors including system maintenance reliability, data security assurance, and responsiveness to technical issues significantly shaped user and provider satisfaction with digital health platforms (Nadav et al., n.d.). This finding directly parallels the present study's result that routine system maintenance and integration between vendor and government systems (RV1) are the most decisive elements supporting Mobile JKN's operational stability (Cheng et al., 2025). Complementary evidence from a comparative study of information system implementation among

healthcare and social welfare professionals demonstrated that close collaboration with software providers and continuous incorporation of user feedback were significant predictors of both implementation success and reduced workplace stress among system users (Nadav et al., n.d.). Hypothesis 5, which proposed that telecommunications positively influence the accessibility and quality of JKN services, was not supported. The findings indicate that telecommunication infrastructure does not significantly affect users' perceptions of JKN service accessibility and quality. This suggests that internet connectivity and network availability are no longer considered critical differentiating factors by users, but rather basic requirements that are expected to function adequately. Previous studies have emphasized the importance of telecommunications infrastructure in supporting digital healthcare services Tan et al., (2025); Gruber, (2022)

However, the present findings suggest that in areas with relatively established network coverage, users tend to focus more on service usability, ease of navigation, and the quality of health information provided through digital platforms. This interpretation is supported by the International Telecommunication Union, which reported that internet connectivity has become increasingly widespread in many regions, reducing its role as a primary determinant of service satisfaction. Similarly, (MoTSoAleDI, 2024) found that the benefits of connectivity tend to diminish once adequate baseline access has been achieved, while other factors become more influential in shaping user experiences. Furthermore, (Wulandari et al., 2019) highlighted that after minimum connectivity thresholds are met, digital inclusion outcomes are driven more by digital literacy, affordability, and service design than by improvements in network capacity alone. Therefore, telecommunications infrastructure appears to function as a prerequisite rather than a determining factor of JKN service accessibility and quality in Klaten Regency, explaining the rejection of Hypothesis 5

Nevertheless, this study has several limitations that should be considered when interpreting the findings. First, the research was conducted in only two Puskesmas in Klaten Regency (Bayat and Gantiwarno), which may limit the generalizability of the results to other regions with different infrastructural, socioeconomic, and cultural characteristics. Second, the cross-sectional design captured respondents' perceptions at a single point in time and therefore could not assess changes in user experiences or satisfaction as digital health services continue to evolve. Third, the use of a quantitative self-reported questionnaire, based on indicators developed from the Technology Acceptance Model and related digital health service constructs, may not fully explain why certain variables particularly Infrastructure Preparedness (IP) and Telecommunication (TC) were found to be statistically insignificant despite being theoretically expected to influence service accessibility and quality.

As suggested by (Wang et al., 2026) qualitative or mixed-methods approaches could provide deeper insights into how users in real-world Puskesmas settings actually experience and interpret indicators such as IP1–IP3 and TC1–TC3, beyond what a Likert-scale instrument can capture. Therefore, future studies are encouraged to expand the geographical scope of the research, adopt longitudinal or mixed-methods designs, and incorporate additional variables such as digital literacy, trust in data security, and perceived usefulness consistent with the technology acceptance framework used in this study to develop a more comprehensive understanding of the determinants of digital health service accessibility and quality within the JKN system.

The findings of this study also provide important implications for achieving the Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-Being), SDG 9 (Industry, Innovation and Infrastructure), and SDG 10 (Reduced Inequalities) (14). The results demonstrate that the digitalization of JKN services driven by the Acceptance of Mobile Technologies (ACM), Government Needs (GN), and the Role of Vendors (RV) confirmed as significant in this study can improve the accessibility and quality of healthcare services. These findings provide empirical evidence that digital health innovation, when accepted and actively used by the community as explained by the technology acceptance framework underlying this study, can support the realization of Universal Health Coverage (UHC) by facilitating more efficient, accessible, and user-centered healthcare delivery (1).

Furthermore, the significant roles of GN and RV highlight the importance of institutional capacity and cross-sector collaboration between government and technology vendors in

strengthening digital health ecosystems, which are central objectives of SDG 9 (11). In addition, the non-significant influence of Infrastructure Preparedness (IP) and Telecommunication (TC) found in this study suggests that future healthcare digitalization policies should focus not only on physical infrastructure, but also on enhancing digital literacy, service usability, regulatory clarity, and stakeholder collaboration. Such efforts can help ensure that the benefits of healthcare digitalization are distributed more equitably across populations, in line with SDG 10, and contribute to sustainable healthcare development in Indonesia.

CONCLUSION

This study focuses on examining the variables that affect user satisfaction and the deployment of digital health services. The success of implementation and customer satisfaction are significantly influenced by the involvement of service providers, according to empirical data. On the other hand, telecommunications preparedness and infrastructure were not found to be technological element that had a major influence. The results show that government organizations can maximize the efficiency of public administration services and the standard of healthcare by implementing digital transformation. The quality and accessibility of JKN services in Klaten Regency have been demonstrated to be greatly enhanced by the digitization of health care. The variables "Acceptance of Mobile Technologies," "Government Needs," and "Role of Vendor" have a favorable and significant impact on optimizing the quality of JKN services, according to statistical test results. These results show that elements including government policy support, public acceptance of technology, and the strategic role of technology service providers in sustaining digital services have a greater impact on the effectiveness of digital service implementation.

Among the three factors with significant influence, the vendors' role emerged as the primary factor in service optimization. This finding suggests that social, policy, and governance aspects are key determinants of the successful implementation of digital services, rather than the mere availability of technological infrastructure. On the other hand, the variables "Infrastructure Preparedness" and "Telecommunications" were not found to have a significant influence; therefore, the hypotheses regarding these two variables were rejected. The analysis results show that the availability of technological infrastructure is not a primary factor in the public's perception of digital services. Therefore, the recommendations of this study indicate that BPJS Kesehatan and the Klaten Regency Government need to improve the service skills of healthcare facility staff and provide direct to users of the Mobile JKN app. Therefore, BPJS Kesehatan and the Klaten Regency Government are advised to focus on improving the public's digital literacy and providing technical assistance in using the Mobile JKN app.

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REFERENCES

- Adiyanta, F. C. S. (2020). Urgensi Kebijakan Jaminan Kesehatan Semesta (Universal Health Coverage) Bagi Penyelenggaraan Pelayanan Kesehatan Masyarakat Di Masa Pandemi Covid-19. 3(2), 272–299.
- Agustin Eva Nur, Madani Jahira Fajri, Azzahra Kazhima Alma, & Istanti Novita Dwi. (2023). Evaluasi Pelaksanaan Program Jaminan Kesehatan Nasional (Jkn) Dalam Upaya Meningkatkan Akses Kesehatan Masyarakat Di Indonesia. *Jurnal Anestesi: Jurnal Ilmu Kesehatan Dan Kedokteran*, 1(3).
- Ainy, A., & Pujiyanto, P. (2025). Open Access Active Membership In Indonesian National Health Insurance : A District Level Analysis. 77–86. <https://doi.org/10.56338/jphp.v6i1.6036>
- Al Wafi Rahmaputri, Eta Sabila Zein, R. D. F. (2025). Edukasi Dan Sosialisasi Komprehensif Aplikasi

- Mobile Jkn Untuk Peningkatan Aksesibilitas Dan Pengetahuan Layanan Kesehatan. Iv, 126–136.
- Alayda, N. F., Aulia, C. M., Ritonga, E. R., & Purba, S. H. (2024). Analisis Dampak Kebijakan Jaminan Kesehatan Nasional (Jkn) Terhadap Akses Dan Kualitas Pelayanan Kesehatan Literature Review : Analyzing The Impact Of The National Health Insurance (Jkn) Policy On Access And Quality Of Health Services. *Kolaboratif Sains*, 7(7), 2616–2626. <https://doi.org/10.56338/Jks.V7i7.5573>
- Alfidyah, M. (2025). Efektivitas Pelayanan Publik Berbasis Digital Dalam Meningkatkan Kepuasan Masyarakat. 1(1), 9–16.
- Amallia, A. (2024). Digitalisasi Kesehatan Dalam Peningkatan Kualitas Layanan Kesehatan. 3(3), 151–158. <https://doi.org/10.55080/Mjn.V3i3.1103>
- Anastasya, D., Husaein, A., & Aryani, L. (2024). Analisis Pengaruh Kualitas Layanan Aplikasi Mobile Jkn Menggunakan Metode E-Servqual Untuk Pengguna Di Kota Jambi *Jurnal Manajemen Teknologi Dan Sistem Informasi (Jms)*. 4(September), 793–802.
- Apjii. (2025). Survei Penetrasi Internet Dan Perilaku Penggunaan Internet Sebagai Perwakilan Pengurus Apjii , Kami Dengan Bangga Memperssembahkan Profil Internet Indonesia 2025. Asosiasi Penyelenggara Jasa Internet Indonesia. <https://survei.apjii.or.id/>
- Badan Pusat Statistik. (2024). Persentase Penduduk Berumur 5 Tahun Ke Atas Yang Mengakses Internet Dalam 3 Bulan Terakhir Menurut Kabupaten. <https://banten.bps.go.id/id/statistics-table/2/ndy3izi=/persentase-penduduk-berumur-5-tahun-ke-atas-yang-mengakses-internet-dalam-3-bulan-terakhir-menurut-kabupaten-kota-di-provinsi-banten--persen-.html>
- Badan Pusat Statistik Provinsi Jawa Tengah. (2024). Profil Kesehatan Provinsi Jawa Tengah. Profil Kesehatan Provinsi Jawa Tengah 2023. <https://jateng.bps.go.id/id/publication/2024/05/31/56aabdd7a9151eda1979dd50/Profil-Kesehatan-Provinsi-Jawa-Tengah-2023.html>, 14, 100.
- Billon-Denis, E., & Tournier, J.-N. (2020). Covid-19 And Vaccination: A Global Disruption. *Medecine/Sciences*, 36(11), 1034–1037. <https://doi.org/10.1051/medsci/2020203>
- Cheng, Q., Fattah, R. A., Susilo, D., Satriya, A., Haemmerli, M., Kosen, S., Novitasari, D., Puteri, G. C., Adawiyah, E., Hayen, A., Mills, A., Tangcharoensathien, V., Jan, S., Thabrany, H., & Asante, A. (2025). Determinants Of Healthcare Utilization Under The Indonesian National Health Insurance System – A Cross - Sectional Study. *Bmc Health Services Research*. <https://doi.org/10.1186/s12913-024-11951-8>
- Choirunnissa, N. F., Oktarina, N., Studi, P., Ekonomi, P., Perkantoran, A., & Semarang, U. N. (2025). Peran Digitalisasi Dalam Meningkatkan Pelayanan Administratif Kantor. 77–95.
- Chopvitayakun, S., Rattanasiriwongwut, M., & Ketcham, M. (2025). Journal Of Open Innovation : Technology , Market , And Complexity Factors Influencing Mobile Platform Adoption For Nutritional Tracking Among Thai Elderly : A Unified Utaut And Stam Approach. *Journal Of Open Innovation: Technology, Market, And Complexity*, 11(3), 100606. <https://doi.org/10.1016/j.joitmc.2025.100606>
- Davis, F. . (1989). Perceived Usefulness, Perceived Ease Of Use, And User Acceptance Of Information Technogy. *Perceived Usefulness, Perceived Ease Of Use, And User Acceptance Of Information Technogy*. *Mis Quarterly*, 319–340, *Mis Quarte*, 319–340.
- Dela Andika Ahmadi, Rifa Annisa, Revail Refiana, & Sri Hajjah Purba. (2024). Tantangan Dan Peluang Penggunaan Jkn Di Indonesia. *Vitamedica : Jurnal Rumpun Kesehatan Umum*, 3(1), 85–92. <https://doi.org/10.62027/Vitamedica.V3i1.258>
- Diana, B. A., & Sari, J. A. (2024). Dampak Transformasi Digitalisasi Terhadap Perubahan Perilaku Masyarakat Pedesaan. 9(2), 88–96.
- Dr. Saimi., Skm., M. K. (2025). Smart Health Promotion :
- Fatimah, N. A., Ilmaskal, R., Pratiwi, D. R., Darmawan, D., & Kartika, I. I. (2025). Bunga Rampai Kesehatan Masyarakat Dan Perilaku Kesehatan.
- Firdaus, R., Khaerani, S., & Wijaya, N. (2025). Transformasi Digital Sistem Informasi Kesehatan Menujulayanan Kesehatan Yang Terkoneksi Dan Berpusat Padapasien. *Economics And*

- Digital Business Review, 6(2), 1045–1055.
- Fitriansyah, D. A., Roekminiati, S., & Devy, I. (2025). Collaboration-Based Public Services : The Role Of The Surabaya City Civil Service Police Unit And. 01(0), 468–477.
- Gruber, H. (2022). No Title. March, 1–28.
- Hakim, Agung Edi, Deddy Supriady, A. H. (2024). Analisis Efektivitas Penggunaan Aplikasi Mobile Jkn Sebagai Bagian Pelayanan Publik Pada Bpjs Kesehatan Di Kota Bekasi. 5(2), 1087–1095.
- Hesti Melliasari, Isa Dwiyono, Purwadhi, Y. R. W. (2024). Digital Leadership Skill Dan Peranannya Bagi Kepemimpinan Institusi Pelayanan Kesehatan Di Era Digital. 6(09).
- Hidayat, A. S., Lestari, P., Hasibuan, N., & Nazuha, S. (2025). Pengaruh Sistem Informasi Kesehatan Terhadap Peningkatan Kualitas Pelayanan Medis Di Puskesmas (Literature Review) Influence Of Health Information Systems On Improving The Quality Of Medical Services At Community Health Centers (Literature Review). Jurnal Manajemen Informasi Kesehatan, 10(1), 1–10.
- Hoque, R., & Sorwar, G. (2017). International Journal Of Medical Informatics Understanding Factors Influencing The Adoption Of Mhealth By The Elderly : An Extension Of The Utaut Model. International Journal Of Medical Informatics, 101(September 2015), 75–84. <https://doi.org/10.1016/j.ijmedinf.2017.02.002>
- Iglesias-Osores, S., & Saavedra-Camacho, J. L. (2020). Covid-19 In Indigenous Communities Of Peru: Cases And Accessibility To Health Services. Anales De La Facultad De Medicina, 81(2), 250–251. <https://doi.org/10.15381/Anales.V81i2.18057>
- Indra Krisnadi1, N. A. (2023). 1 , 2 1,2. 5(10).
- Jannah, A., Suardi, S., Samsiana, S., Kalsum, U., & Mirnawati, A. (2026). Analysis Of Mobile Jkn Application Utility Acceptance On Behavioral Intention Of Bpjs Kesehatan Participants In Minasate ' Ne Primary Health Center Using The Unified Theory Of Acceptance And Use Of Technology (Utaut). 03001, 1–11.
- Kis, A., & Augustin, J. (2022). Access To Health Care Throughout The Country. Hautarzt, 73(1), 40–46. <https://doi.org/10.1007/S00105-021-04916-Z>
- Kwee, V., & Widjojo, H. (2022). Understanding The Determinants Of M-Health Adoption In Indonesia. O.
- Lisnawati, Yuliana, E. P. H. (2025). Perkembangan Sistem Dan Informasi Administrasi Kesehatan Di Era Digital : Systematic Review. 2, 13–21.
- M.Arief Algiffary, T. S. (2023). Analisis Tingkat Kualitas Layanan E-Lapkin. 5(1), 21–31.
- Maghfiroh, L. (2025). Mewujudkan Justice As Fairness : Analisis Ketidakmerataan Pelayanan Kesehatan Di Indonesia Menurut Teori John Rawls. 3(4), 225–232.
- Masudi, S. N. A., Efkelin, R., & Lamba, H. (2025). Gambaran Persepsi Peserta Badan Penyelenggara Jaminan Sosial (Bpjs) Terhadap Efektivitas Dan Peningkatan Layanan Mobile Jkn Di Kantor Bpjs Kesehatan Cabang Jakarta Utara. September, 233–246.
- Mishra, S. R., Ghimire, K., Khanal, V., Aryal, D., Shrestha, B., & Khanal, P. (2025). Transforming Health In Nepal : A Historical And Contemporary Review On Disease Burden , Health System Challenges , And Innovations. Health Research Policy And Systems. <https://doi.org/10.1186/S12961-025-01321-Z>
- Motsoaledi. (2024). National Digital Health Strategy For South Africa 2019 - 2024 1.
- Multazam, Andi Muhammad, E. A. (2024). Kesehatan Masyarakat.
- Nadav, J., Kaihlanen, A., Kujala, S., Keskimäki, I., & Med, P. (N.D.). Factors Contributing To Successful Information System Implementation And Employee Well-Being In Health Care And Social Welfare Professionals : Comparative Cross- Sectional Study. 12, 1–13. <https://doi.org/10.2196/52817>
- Novita2, E. H. M. (2025). Publika : Adopsi Inovasi Kebijakan Digital Yang Inklusif : Studi Kasus Aplikasi Sipintar Peduli Di Kota Pekanbaru. 11(1). <https://doi.org/10.25299/Jiap.2025.21882>
- Nugraha, J., Pujiasih, R., Kurniasih, Y., & Mukti, A. (2025). Efektivitas Aplikasi Mobile Jkn Terhadap Pemberian Pelayanan Pengguna Bpjs Puskesmas Magelang Tengah. Dialogue : Jurnal Ilmu Administrasi Publik, 7(1), 001–016.

- <https://ejournal2.undip.ac.id/index.php/dialogue/article/view/23787>
- Nugroho, A., & Kurniawan, T. (2024). Dampak Sistem E-Government Terhadap Kualitas. 1(3), 25–34.
- Nurjayanti, R., & Novratilova, S. (2025). Evaluasi Penggunaan Aplikasi Mobile Jaminan Kesehatan Nasional (Mjkn) Pada Pendaftaran Rawat Jalan Menggunakan Metode Tam Politeknik Indonusa Surakarta Menurut Peraturan Pemerintah Republik Indonesia Nomor 46 Tahun 2014 Sistem Merupakan Bagian Dari Sist. 03, 161–173.
- Nurul, S., Razak, A., Daud, A., & Mallngi, A. (2020). Economic Status Of Community Interest In Membership Of Bpjs Health In Duampanua District , Pinrang Regency. 8, 36–40.
- Omo A. Madjid, Arietta R.D. Pusponegoro, I. S. M. (2019). Evaluation Of The Accuracy Of Implementation Of Obstetric Referral Cases To The Emergency In The Jaminan Kesehatan Nasional (Jkn) Era. 7(3).
- Panggabean, Kriston, Herawati, Aty, Kanto, R. D. S. (2023). Analisis Kualitas Sistem, Kualitas Informasi Dan Kualitas Layanan Terhadap Kepuasan Pengguna Pada Sistem Aplikasi Keuangan Tingkat Instansi Satuan Kerja. 20(1), 18–37.
- Perafán, C. I. S., Rojas, D. L. M., Henao, V. M. B., & Estrada, V. E. (2021). Access To Health Services: Household Study In Palmira, Valle, Colombia 2017. Revista Gerencia Y Politicas De Salud, 20. <https://doi.org/10.11144/Javeriana.Rgps20.Asse>
- Pomeo, W. R. R., & Winarti, E. (2024). Dinamika Implementasi Kebijakan Penempatan Tenaga Kesehatan Di Daerah Terpencil: Tantangan Dan Realitas Lapangan. Jurnal Kesehatan Tambusai, 5(1), 2309–2329.
- Putra, G. M., Farid, M., Informatika, J., Teknik, F., & Mulawarman, U. (2024). Penerapan Metode Technology Acceptance Model (Tam) Untuk Menganalisis Penerimaan Aplikasi Brimo (Studi Kasus : Bri Wilayah Tana Paser). 8(2).
- Rahmadi, M. H. (2023). Petanda : Jurnal Ilmu Komunikasi Dan Humaniora Pelayanan Publik Digital Sebelum Dan Setelah Pandemi Covid-19 Di Indonesia. 30–43.
- Rahmawati, T., & Hsieh, H. (2024). Appraisal Of Universal Health Insurance And Maternal Health Services Utilization: Pre- And Post-Context Of The Jaminan Kesehatan Nasional Implementation In Indonesia. March, 1–9. <https://doi.org/10.3389/fpubh.2024.1301421>
- Ridwan, M. H. (2026). Unlocking Healthcare Access Through Mobile Health : Task-Technology Fit And User Engagement In Indonesia. 15(1), 1–25. <https://doi.org/10.4018/Ijrqeh.396959>
- Riyanto, O. S., Chrisjanto, E., Tinggi, S., Kesehatan, I., Yakkum, B., Widya, U., Yogyakarta, M., Kesehatan, T., & Pasien, H. (2023). Pelayanan Kesehatan Yang Berkeadilan: Peran Tenaga Kesehatan Dalam Menjamin Hak Setiap Pasien. 77–87.
- Rizfaera Aulia, S., Tiara, T., Indrianti, D., & Umam, K. (2024). Efektivitas Penggunaan Jkn Mobile Terhadap Peningkatan Kualitas E-Layanan Dalam Sektor Kesehatan Di Era Digitalisasi. Prosiding Seri Praktikum Ilmu-Ilmu Sosial-Politik, 1(1), 160–167. <https://fisip.uinsgd.ac.id/conferences/index.php/pspisp/article/view/149>
- Suhaemi, M. (2020). (Management And Business Strategy) Pengaruh Citra Merek Dan Potongan Harga Terhadap Minat Beli (Studi Kasus Pada Distro Three Second Di Kota Cilegon) Muhamad Suhaemi Fakultas Ekonomi Dan Bisnis Universitas Serang Raya Pendahuluan Produk Three Second M. 1(November).
- Tan, C., Putra, E. Y., & Purwianti, L. (2025). Bertolak Dari Pengalaman Menuju Kesetiaan : Kepuasan Pelanggan Sebagai Jembatan Penghubung. 14(September), 351–372.
- Uly, N., & Alim, A. (2025). Stigma , Layanan , Dan Intervensi Hiv : Kajian Literature Review Terhadap Tantangan Dan Strategi Global. 8, 317–327.
- Wahidah, M., Syaiful, A. R., Najib, R. O., Prasetya, I., Bakhri, A. S., Rifka, A., Sari, Y., Sahraini, L. A., Fiqri, M., Bayu, I. G., Januar, E., & Rezki, M. (2023). Efektivitas Implementasi Monitoring Intensif Pemanfaatan Antrean Online Melalui Mobile Jkn Di Fasilitas Kesehatan Rujukan Tingkat Lanjutan (Fkrtl) Champion Kantor Cabang Bulukumba Tahun 2022. 3(1), 116–129.

- Wang, Q., Zhang, Z., & Han, G. (2026). Digital Technology Empowers Model Innovation In Chronic Disease Management In Chinese Grassroots Communities. January, 1–10. <https://doi.org/10.3389/fdgth.2025.1726932>
- Widjaja, G. (2025). Regulasi Administrasi Kesehatan Dalam Rangka Meningkatkan Keadilan Akses Layanan Kesehatan. *Administrasi Negara*, 3(3), 109–116.
- Wulandari, R. D., Ridho, I. A., Supriyanto, S., Qomarrudin, M. B., Penelitian, B., & Ri, K. K. (2019). Pengaruh Pelaksanaan Akreditasi Puskesmas Terhadap Kepuasan Pasien The Influence Of Primary Health Care Accreditation On Patient Satisfaction. 228–236.
- Yazid, M., Qahar, A., Ruldeviyani, Y., Mukharomah, U. N., Fidyawan, M. A., & Putra, R. (2024). Factor Analysis Influencing Mobile Jkn User Experience Using Sentiment Analysis. 13(2), 1782–1793. <https://doi.org/10.11591/ijai.V13.I2.Pp1782-1793>
- Yunus, M. F. (2025). Correlation Between Service Quality And Mobile Jkn User Satisfaction Among Outpatients At Otanaha Regional Public. 6(2), 64–71.