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# Antecedents of Mobile JKN Satisfaction and Continuance in Surabaya

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**Abstract**

**Purpose:** This study aims to examine how performance expectancy, perceived need, value, usefulness, and ease of use affect patient satisfaction and their continued use of the Mobile JKN app in Surabaya.

**Methodology/approach:** Using a quantitative approach and purposive sampling, data were collected from 212 Mobile JKN users in Surabaya and analyzed with Smart-PLS (SEM).

**Results/findings:** Perceived Value, Usefulness, and Ease of Use significantly influenced Patient Satisfaction, which positively affected Continuance Intention. Performance Expectancy and Perceived Need had no significant effect.

**Conclusions**: Enhancing service quality, especially user satisfaction and perceived value, is key to encouraging long-term use of the Mobile JKN app.

**Limitations:** This research used a cross-sectional design and was limited to the city of Surabaya, which restricts generalizability. The use of a quantitative approach with Likert scales also limited the depth of insights. Future studies should consider longitudinal approaches, expand geographic coverage, and include qualitative or mixed-methods to gain deeper understanding.

**Contribution:** This study contributes to the literature by integrating contextual factors into the TAM framework within the healthcare service context. It provides actionable insights for service providers to enhance user experience, thereby increasing patient satisfaction and long-term usage intention of the Mobile JKN application.

**Keywords:** *Continuance Intention, Mobile JKN, Patient Satisfaction, Surabaya.*

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## 1. Introduction

In the rapidly evolving digital era, information and communication technology (ICT) plays a crucial role in facilitating public access to various services, including health care. The increasing adoption of smartphones in Indonesia. Harsono, Sugiharto, and Rinayati (2021) presents a significant opportunity to enhance the performance and quality of public services through mobile application technology. The digital transformation of public services aims to provide greater convenience, speed, and accessibility to the community.The Mobile JKN application is one of the key implementations of digital transformation in healthcare services. This software innovation, developed by the Social Security Administration for Health (*Badan Penyelenggara Jaminan Sosial Kesehatan or BPJS Kesehatan*), aims to simplify access to healthcare services for participants in the National Health Insurance (*Jaminan Kesehatan Nasional or JKN*) program.

Through Mobile JKN, participants can register, view membership information, update personal data, and access various other features online. According to Ali Ghufron M., President Director of BPJS Kesehatan, as of May 1, 2024, the total number of people participating in the National Health Insurance

Program has reached more than 272 million, or approximately 97.27% of Indonesia's total population since its implementation in 2014 (Supingah, 2024). An essential indicator to consider in the implementation of online registration through this application is patient satisfaction when using the Mobile JKN platform to ensure its sustainability. Satisfaction can be classified into two types: functional satisfaction, derived from the tangible benefits of a product, and psychological satisfaction, which arises from the user's experience with product features that are often intangible (Herwando & Sitompul, 2021). The level of satisfaction in using software-based services is influenced by several factors, such as performance expectations, perceived needs, perceived value, and ease of use (S. Alam, Omar, Ariffin, & Hashim, 2018; Grout, Cheng, Carroll, Bauer, & Downs, 2018; Jimenez, Lum, & Car, 2019).

Although it offers various conveniences, the adoption of the Mobile JKN application has not been without challenges. Several factors can influence participants' interest in and behavior when using this application. Previous studies have shown that technology adoption is influenced by users' perceptions of its usefulness, ease of use, value, and necessity (Al Aufa, Renindra, Putri, & Nurmansyah, 2020). In addition, factors such as performance expectancy and facilitating conditions play an important role (Ferbia & Santoso, 2019). The utilization of the Mobile JKN application for online registration in hospitals across Surabaya has demonstrated a positive impact on reducing patient queues. *The BPJS Kesehatan* Regional Office in Surabaya has implemented strategic initiatives to strengthen the use of online queues through the Mobile JKN system in all Advanced Healthcare Facilities (*Fasilitas Kesehatan Tingkat Lanjutan or FKTL*) within the region. These efforts aim to improve service efficiency and minimize patient congestion in hospitals.

Despite the increase in utilization, challenges remain in promoting the wider adoption of the Mobile JKN app among JKN participants. Some users may face difficulties in operating the application or have limited Internet access. Furthermore, not all participants were aware of the app's features, highlighting the need for broader socialization and public outreach. This situation is reflected in the 2024 utilization data for Mobile JKN online queues in advanced healthcare facilities: of the 58 FKTLs in Surabaya, only 20 (34.48%) achieved the minimum target of 25% online queue utilization via Mobile JKN, while the remaining facilities have yet to meet the target.

Given this evident gap, the use of the Mobile JKN software has not been fully optimized to support the hospital registration process. Therefore, an in-depth analysis is needed to identify strategies for improving service optimization and enhancing user satisfaction, encouraging the community to continue using the Mobile JKN registration service sustainably. It is essential to understand the various factors influencing user satisfaction and their decisions to continue using applications. Accordingly, this study aims to analyze the factors affecting individuals' intention to continue using the Mobile JKN registration application in Surabaya in 2025. The findings of this study are expected to be utilized by Mobile JKN registration service providers to foster continuous innovation, with the goal of strengthening users' intention to sustain their use of the service, thereby ensuring the program's long-term continuity.

## 2. Literature Review and Hypothesis Development

The implementation of digital technology in healthcare services, such as the Mobile JKN application, requires a thorough understanding of the factors that drive users'satisfaction and continued use of the application. One of the most widely used theoretical models for explaining technology acceptance is the Technology Acceptance Model (TAM), which has been expanded and strengthened by numerous contemporary studies. The two main constructs of TAM—Perceived Usefulness and Perceived Ease of Use—have been proven to significantly influence user satisfaction and the intention for continued use in the context of digital services (Alalwan, Dwivedi, Rana, & Williams, 2016). In this study, each of these variables is discussed in detail to provide a comprehensive understanding of their roles and relationships in influencing user satisfaction and the intention to continue using the Mobile JKN application.

### *2.1 Performance Expectancy*

Performance expectancy serves as a benchmark for the belief that an information technology system provides substantial benefits to its users. It aims to motivate positive behavior toward user satisfaction and system utilization by enhancing efficiency when a particular technology is required (Ramadhan, Arso, & Nandini, 2021). Numerous studies have examined the use of technology in the healthcare sector, such as those conducted by Woldeyohannes and Ngwenyama (2017); Wei, Vinnikova, Lu, and Xu (2021); and Samoggia and Riedel (2020), who utilized the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to measure the extent of technological benefits in healthcare applications. Within the UTAUT framework, one of the key factors influencing user behavior is the performance expectancy. This construct reflects an individual's belief that a given technology can help simplify daily activities, which, in turn, enhances user satisfaction when these expectations are met.

A study on health information technology adoption in mobile emergency services (MECS) by Wendland, Lunardi, and Dolci (2019) found a significant and positive influence of performance expectancy on user satisfaction with the Primary Health Care (PHC) mobile system in MECS. Similarly, Andry and Herlina (2023) demonstrated that performance expectancy positively affects the satisfaction of users. Ramadhan et al. (2021) also reported a positive relationship between performance expectancy and user satisfaction in the implementation of an online referral system in Indonesia. Based on the above discussion, the following hypothesis is proposed.

H1**:** Performance expectancy positively affects patient satisfaction.

### *2.2 Perceived Need*

In the context of healthcare digitalization, perceived need refers to the extent to which individuals feel the necessity of using online application-based health services, for example, to simplify registration, obtain medical information, or conduct online consultations. When individuals perceive that their healthcare needs are significant and that the application effectively addresses those needs, their satisfaction level is likely to increase. Recent studies indicate that patient satisfaction is strongly influenced by their perception of the relevance and benefits of the healthcare technology being used, particularly in the context of remote services (telemedicine) (Scott Kruse et al., 2018). Furthermore, individuals who feel that their healthcare needs are adequately met through digital access demonstrate higher satisfaction levels than those whose needs are not sufficiently fulfilled (Goulabchand, Claret, & Lattuca, 2020). This is supported by another study that showed that perceived need and the ability to use online health applications are key predictors of patient satisfaction (Zeng & Yen, 2016). Based on the above discussion, the following hypothesis is proposed.

H2**:** Perceived need positively affects patient satisfaction.

### *2.3 Perceived Value*

Perceived value refers to the consumer's overall assessment of the benefits obtained from a product or service based on their perception of what is received compared to what is sacrificed. When customers feel that they receive high value relative to the price or effort expended, their satisfaction with the service tends to increase (Xie, 2016; Zeithaml, Bitner, & Gremler, 2000). In the context of online healthcare applications, perceived value reflects how users evaluate the benefits they gain compared to the costs or efforts they invest. As the perceived value increases, user satisfaction with the service is also likely to increase.

A study by Bernarto (2024) found that perceived value has a positive and significant influence on patient satisfaction with the use of telemedicine services such as Halodoc in the Greater Jakarta (Jabodetabek) area. Similar findings were reported by Bea, Pasinringi, and Zulkifli (2018) at Makassar City Hospital (RSUD Kota Makassar) and Nurhayani, St, and Inayatul (2024), who revealed a significant positive correlation between perceived value and patient satisfaction. Furthermore, Suryadana (2017) discovered that perceived value not only affects satisfaction but also fosters the development of long-term relationships between patients and service providers. Based on the above discussion, the following hypothesis is proposed.

H3**:** Perceived value positively affects patient satisfaction.

### *2.4 Perceived Usefulness*

In the context of online healthcare applications, perceived usefulness refers to the extent to which users believe that an application can enhance the effectiveness and efficiency of managing their health. When users feel that an application provides significant benefits and tangible results, they tend to experience greater satisfaction with the service provided. A study by Ningrum and Budiani (2023) demonstrated a positive and significant relationship between perceived usefulness and patient satisfaction among users of a health application (App X). Similarly, research by SHOLEHAH (2023) on the SehatQ E-Health platform in West Jakarta found that perceived usefulness has a positive and significant influence on customer satisfaction—indicating that the higher the users' perception of an application's usefulness, the higher their level of satisfaction. Based on the above discussion, the following hypothesis is proposed.

H4**:** Perceived usefulness has a positive effect on patient satisfaction.

### *2.5 Perceived Ease of Use*

Research on the relationship between computer self-efficacy and perceived ease of use within the Technology Acceptance Model (TAM) framework reveals that perceived ease of use refers to users' perceptions of how effortless and straightforward it is to operate a system (Venkatesh & Bala, 2008; Yan & Kull, 2015). It represents the user's subjective evaluation of the simplicity of the interaction with a technological system. The higher the perceived ease of use, the greater the likelihood that users will accept and feel satisfied with the system. According to Albashrawi and Motiwalla (2019), the perceived ease of use is a key determinant in the adoption of digital-based systems, as it provides a sense of efficiency and convenience. This aligns with findings by Barus (2020); Patil, Tamilmani, Rana, and Raghavan (2020) who reported that ease of use significantly affects customer satisfaction in the utilization of digital service applications.

Furthermore, studies by Kania, Rama, Didit, and Madhakomala (2025) dan Tawafak et al. (2023) also demonstrate that perceived ease of use has a positive impact on e-satisfaction, particularly in online-based systems. These findings reinforce the notion that the ease of digital technology not only enhances adoption but also strengthens users' positive experiences with the system. Based on the above discussion, the following hypothesis is proposed.

H5**:** Perceived ease of use has a positive effect on patient satisfaction.

### *2.6 Performance Expectancy with Continuance Intention*

Performance expectancy refers to the extent to which an individual believes that using a system will help them achieve enhanced performance or efficiency in their tasks (Venkatesh, Thong, & Xu, 2016). This concept is a crucial element of the Unified Theory of Acceptance and Use of Technology (UTAUT) framework and is frequently applied to explain the adoption of new technologies, including digital healthcare services. In the context of digital service adoption, Zhou (2014) found that performance expectancy significantly influenced the intention to continue using e-service platforms, particularly when users perceived tangible benefits from the technology. Shiferaw and Mehari (2019) further noted that in developing countries, performance expectancy is one of the most dominant factors influencing the sustained use of health information systems.

In Indonesia, demonstrated that performance expectancy positively affects the intention to use telemedicine services in Indonesia. This finding is also supported by M. Z. Alam, Hu, and Barua (2018) , who discovered a significant effect of performance expectancy on both intention and actual behavior in using mHealth applications. Similarly, Hutabarat, Suryawan, Andrew, and Akwila (2021) stated that the higher the users' performance expectations of an application, the stronger their intention to continue using it. Based on the aforementioned discussion, the following hypothesis is proposed:

H6**:** Performance expectancy positively affects continuance intention.

### *2.7 Perceived Usefulness with Continuance Intention*

Perceived usefulness refers to the extent to which users believe that an application provides tangible benefits, such as time efficiency, ease of access, and improved service accuracy. In the context of healthcare digitalization, the perceived usefulness of an application plays a crucial role in motivating

users' continuous intention to use the system. According to Expectation-Confirmation Theory (ECT), the perception of usefulness formed after initial use influences both user satisfaction and intention to continue using the technology (Venkatesh et al., 2016). When users feel that an application genuinely helps them complete tasks faster and more effectively than conventional methods, they are more likely to continue using it.

Within the Unified Theory of Acceptance and Use of Technology (UTAUT) framework, performance expectancy, conceptually equivalent to perceived usefulness, is identified as a significant predictor of the behavioral intention to use technology (Venkatesh et al., 2016). A study by Zhang, Liu, Wang, Zhang, and Wang (2020) in the context of online healthcare services revealed that perceived usefulness has a positive effect on users' intention to continue engaging with online communities. Similarly, Vuokko, Mäkelä-Bengs, Hyppönen, Lindqvist, and Doupi (2017) found that the perceived usefulness of mobile health (mHealth) systems strongly determines patients' sustained usage. Therefore, it can be concluded that the greater the perceived usefulness of a system, the higher the likelihood that users will maintain its long-term use. Based on this discussion, the following hypothesis is proposed.
H7**:** Perceived usefulness has a positive effect on continuance intention.

### *2.8 Perceived Ease of Use with Continuance Intention*

Perceived ease of use is defined as the degree to which users believe that using a system will be free of effort, that is, characterized by simple interaction without significant technical barriers (Venkatesh et al., 2016). Continuance intention refers to the extent of users' intention to continue using a technology after its initial adoption (Maqableh et al., 2021). Understanding continuance intention is essential because it drives user loyalty and long-term engagement with technology.

Within the Technology Acceptance Model (TAM) framework, perceived ease of use plays a crucial role in influencing both initial and continued usage intention (Venkatesh et al., 2016). When users perceive a technology to be easy to use, their positive attitudes and intentions toward continued use tend to increase. For instance, in the adoption of e-health systems, Hoque, Bao, and Sorwar (2017) found that perceived ease of use significantly affects both initial and ongoing usage intentions. Zhao, Ni, and Zhou (2018) reported a strong positive relationship between perceived ease of use and users' behavioral intentions in their study of health information systems. Based on the above discussion, the following hypothesis is proposed.
H8**:** Perceived ease of use positively affects the intention to continue using the system.

### *2.9 Patient Satisfaction with Continuance Intention*

Satisfaction with technology use refers to the extent to which users feel content with their interactions with a system and plays a crucial role in fostering greater usage intensity. Recent studies have confirmed that user satisfaction exerts a significant positive effect on both usage intensity and continuance intention (Masri, You, Ruangkanjanases, Chen, & Pan, 2020; Mellikeche et al., 2020; Yulihapsari, Indrawan, Simarmata, & Zainal, 2025). Hsiao, Chang, and Tang (2016) emphasized that satisfaction, together with continuance intention, is key to maintaining long-term user loyalty in digital application usage.

Hadji and Degoulet (2016), in their research on the implementation of the *Clinical Information System (CIS)* project, stated that user satisfaction refers to the level of contentment experienced by users in their interactions with an information system (IS). This encompasses the overall user experience and perception of the IS, considering aspects such as information, system, and service quality. User satisfaction plays a vital role in determining whether users will continue using the system or seek to enhance their proficiency. In essence, when users are satisfied with their experience, they are more likely to continue using IS in the future. This satisfaction is influenced by factors such as expectation confirmation and perceived benefits of use.

Furthermore, Wendland et al. (2019) examined the relationship between user satisfaction and usage intensity, finding a strong and significant positive correlation, indicating that higher satisfaction among healthcare professionals using Mobile PHC leads to more intensive system use. Similarly, Alalwan

(2020) found a strong positive correlation between e-satisfaction and continuance intention, as an individual's willingness to reuse an application in the future largely depends on their satisfaction with prior experiences using the system. Supporting this, studies by Kaium, Bao, Alam, and Hoque (2020) and Noventa (2024) identified satisfaction as a significant determinant of continuance intention in the contexts of online healthcare services and digital banking systems. Based on the above discussion, the following hypothesis is proposed.
H9**:** Patient satisfaction positively affects the intention to continue using the service.

According to the hypotheses presented above, the proposed research model is illustrated as follows.

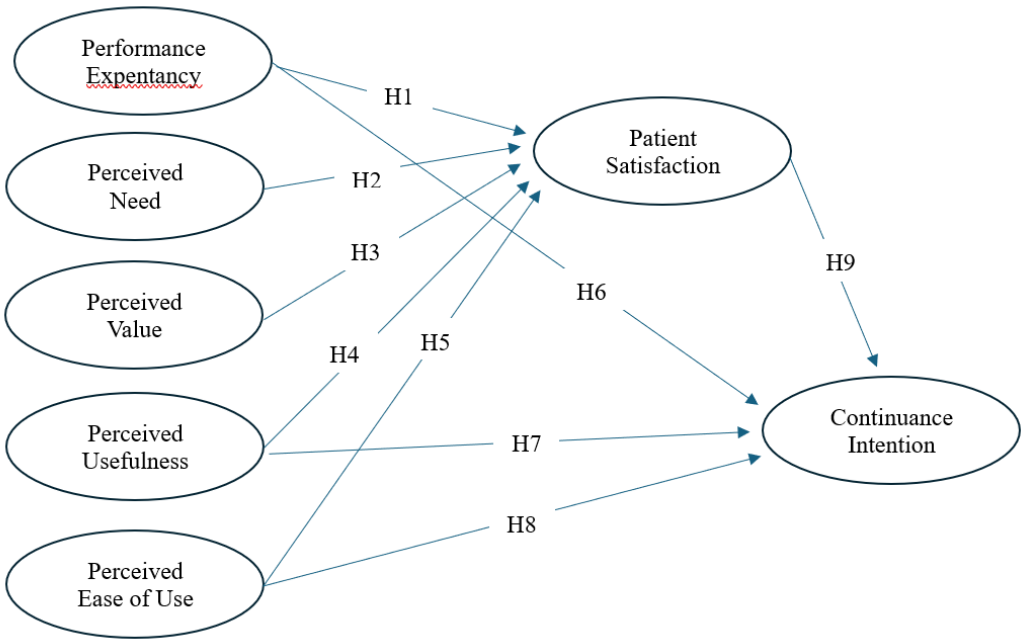


Figure 1. Research Model

## 3. Research Methodology

This study employs a quantitative research method, with data collected through a cross-sectional survey using a questionnaire measured on a five-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. This study aimed to examine the influence of performance expectancy, perceived need, perceived value, perceived usefulness, and perceived ease of use on patient satisfaction and continuance intention in the use of the Mobile JKN registration application in Surabaya.

The target population of this study consisted of all Mobile JKN application users in Surabaya who were at least 18 years old and had used the Mobile JKN application at least once. A total of 212 respondents participated in this study. The sampling technique employed was purposive sampling, which involved selecting participants based on specific criteria relevant to the research objectives. The data analysis procedure began with descriptive statistical analysis to examine data characteristics, followed by hypothesis testing using the Partial Least Squares (PLS) method with SmartPLS version 4.1.0.9 software. This method was chosen to evaluate both the measurement and structural models, allowing for a comprehensive assessment of the relationships among variables within the proposed research framework.

## 4. Results and Discussion

### *4.1 Respondent Profile*

After distributing the questionnaire via Google Forms, 212 respondents met the research criteria. Their demographic profiles served as the basis for data analysis in this study.

Table 1. Respondent Profile

| Demographic Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Gender | Female | 152 | 71,68 |
| | Male | 60 | 28,32 |
| Age | 18-26 years | 15 | 7,08 |
| | 27-42 years | 124 | 58,41 |
| | >43 years | 73 | 34,51 |
| Education Level | Elementary School | 2 | 0,89 |
| | Junior High School | 2 | 0,89 |
| | Senior High School | 32 | 15,04 |
| | Diploma (D3) | 32 | 15,04 |
| | Bachelor's Degree (S1) | 122 | 57,52 |
| | Master's Degree (S2) | 22 | 10,62 |
| Occupation | Student | 4 | 1,77 |
| | Private Employee | 124 | 58,41 |
| | Civil Servant | 6 | 2,66 |
| | Professional | 21 | 9,73 |
| | Housewife | 36 | 16,81 |
| | Entrepreneur | 23 | 10,62 |
| | Unemployed | 0 | 0 |
| Monthly Income | ≤ 1.000.000 | 9 | 4,43 |
| | 1.000.000 - 5.000.000 | 58 | 27,43 |
| | 5.000.000 - 10.000.000 | 90 | 42,48 |
| | ≥ 10.000.000 | 55 | 25,66 |
| Mobile JKN App Usage Frequency | 1x | 137 | 64,60 |
| | 2x | 17 | 7,97 |
| | 3x | 15 | 7,08 |
| | >3x | 43 | 20,35 |
| Total Respondents | | 212 | 100 |

(Source: Processed Research Data, 2025)

Based on Table 1, the respondent profile can be described as follows: Of the 212 respondents, 152 (71.68%) were female and 60 (28.32%) were male. Thus, it can be concluded that most of the respondents in this study were female. In terms of age, 15 respondents (7.08%) were aged 18–26 years, 124 respondents (58.41%) were aged 27–42 years, and 73 respondents (34.51%) were above 43 years. This indicates that the majority of respondents were in the 27–42 year age group, which represents the productive working-age population.

Regarding educational background, there were 2 respondents (0.89%) with an elementary school education, 2 respondents (0.89%) with a junior high school education, 32 respondents (15.04%) with a senior high school education, 32 respondents (15.04%) with a diploma (D3), 122 respondents (57.52%) with a bachelor's degree (S1), and 22 respondents (10.62%) with a master's degree (S2). Therefore, it can be concluded that most respondents held a bachelor's degree (S1), indicating that Mobile JKN application users generally have a relatively high educational background. In terms of occupation, 4 respondents (1.77%) were students, 124 respondents (58.41%) were private employees, 6 respondents (2.66%) were civil servants, 21 respondents (9.73%) were professionals, 36 respondents (16.81%) were

housewives, and 23 respondents (10.62%) were entrepreneurs. These findings show that most respondents were private employees, indicating that Mobile JKN users are predominantly working individuals who value efficiency in accessing healthcare services.

Regarding monthly income, 9 respondents (4.43%) earned ≤ Rp 1,000,000, 58 respondents (27.43%) earned between Rp 1,000,000–Rp 5,000,000, 90 respondents (42.48%) earned between Rp 5,000,000–Rp 10,000,000, and 55 respondents (25.66%) earned ≥ Rp 10,000,000. Therefore, the majority of respondents had a monthly income between Rp 5,000,000 and Rp 10,000,000, suggesting that most users belong to the middle-income group. In terms of Mobile JKN application usage frequency within the last six months, 137 respondents (64.60%) used the application once, 17 respondents (7.97%) used it twice, 15 respondents (7.08%) used it three times, and 43 respondents (20.35%) used it more than thrice. Hence, it can be concluded that most respondents used the Mobile JKN application only once in the past six months, indicating that while the awareness level is relatively high, the frequency of continued use remains limited, highlighting the importance of improving user engagement and perceived value in future service enhancements.

### *4.2 Measurement Model Analysis*

The Model Fit Test (Goodness of Fit Model) includes both outer and inner model evaluations. The outer model assessment was conducted by examining several indicators, such as convergent validity, discriminant validity, composite reliability, and Average Variance Extracted (AVE) value.

#### *4.2.1 Convergent Validity*

Convergent validity was assessed by examining item reliability (validity indicators), as indicated by the loading factor values. The loading factor represents the correlation between the score of an item (question) and the score of the construct that it is intended to measure. A loading factor greater than 0.7 was considered valid. However, according to HairHair, Risher, Sarstedt, and Ringle (2019), in the initial assessment of the loading factor matrix, a value of approximately 0.3 is considered to meet the minimum acceptable level; a value of around 0.4 is considered better, and a value greater than 0.5 is generally regarded as significant. In this study, the threshold loading factor was set to 0.5. After processing the data using SmartPLS 4.0.9, the resulting loading factor values are presented below:

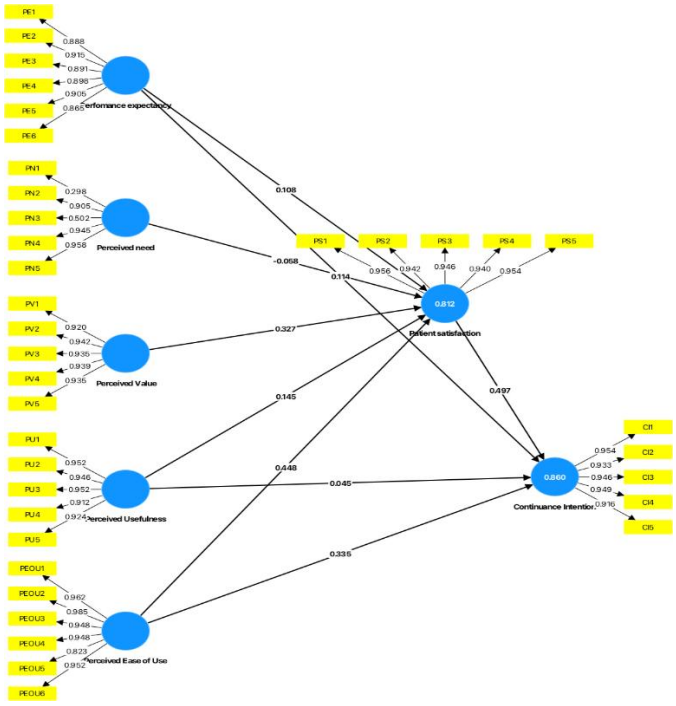


Figure 2. Loading Factor Values of All Research Items (Iteration 1)

From the outer model results, 37 indicators were used in this research model. The data analysis results obtained using SmartPLS, as shown in Figure 2, indicate that most indicators for each variable in this study have loading factor values exceeding 0.70. Indicators with loading factor values above 0.70 demonstrated a high level of validity, thus fulfilling the requirements for convergent validity. However, there are still two items with loading factor values below 0.70, meaning that these indicators are considered invalid and will be removed from the model. Subsequently, testing was conducted on the remaining 35 valid indicators, and the resulting outer model is presented in Figure 3.

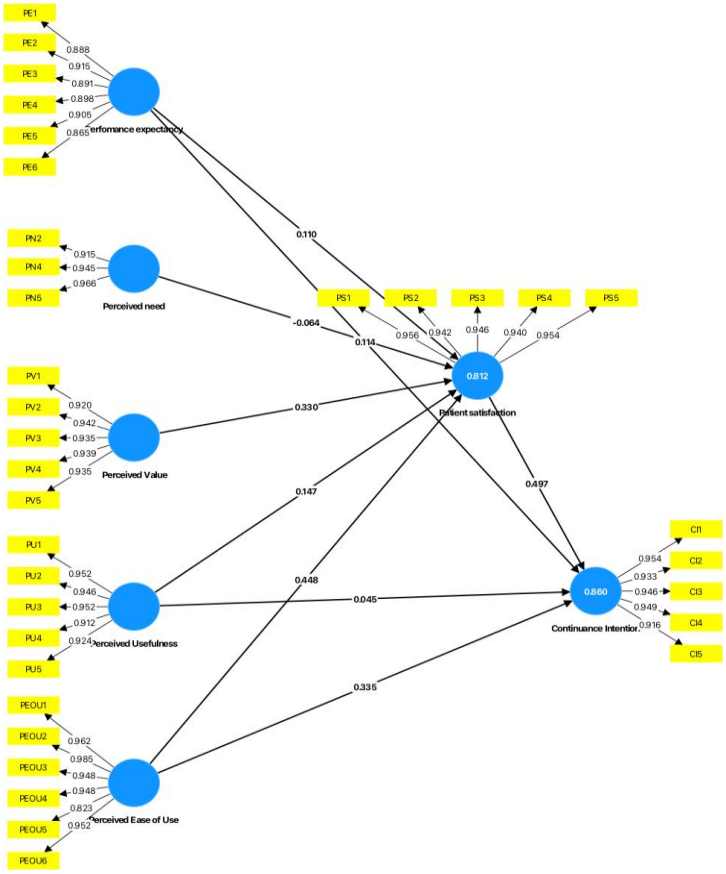


Figure 3. Loading Factor Values of All Research Items (Iteration 2)

The figure above is summarized in the following table:
Table 2. Results of the Second Outer Loading Validity Test

| Variable | Indicator | Outer Loading | Description |
|---|---|---|---|
| *Performance Expectancy* | PE1 | 0,888 | Valid |
| | PE2 | 0,915 | Valid |
| | PE3 | 0,891 | Valid |
| | PE4 | 0,898 | Valid |
| | PE5 | 0,905 | Valid |
| | PE6 | 0,865 | Valid |
| *Perceived Need* | PN2 | 0,915 | Valid |
| | PN4 | 0,945 | Valid |
| | PN5 | 0,966 | Valid |
| *Perceived Value* | PV1 | 0,920 | Valid |
| | PV2 | 0,942 | Valid |
| | PV3 | 0,935 | Valid |
| | PV4 | 0,939 | Valid |
| | PV5 | 0,935 | Valid |
| *Perceived Usefulness* | PU1 | 0,952 | Valid |

| | | | |
|---|---|---|---|
| | PU2 | 0,946 | Valid |
| | PU3 | 0,952 | Valid |
| | PU4 | 0,912 | Valid |
| | PU5 | 0,924 | Valid |
| *Perceived Ease of Use* | PEOU1 | 0,962 | Valid |
| | PEOU2 | 0,985 | Valid |
| | PEOU3 | 0,948 | Valid |
| | PEOU4 | 0,948 | Valid |
| | PEOU5 | 0,823 | Valid |
| | PEOU6 | 0,952 | Valid |
| *Patient Satisfaction* | PS1 | 0,956 | Valid |
| | PS2 | 0,942 | Valid |
| | PS3 | 0,946 | Valid |
| | PS4 | 0,940 | Valid |
| | PS5 | 0,954 | Valid |
| *Continuance Intention* | CI1 | 0,954 | Valid |
| | CI2 | 0,933 | Valid |
| | CI3 | 0,946 | Valid |
| | CI4 | 0,949 | Valid |
| | CI5 | 0,916 | Valid |

Source: Processed Data Results using SmartPLS 4.1.0.9

Based on the data processing results using SmartPLS, as shown in the table above, after removing the two invalid indicators from the system, all indicators for each variable in this study showed loading factor values above 0.70. This indicates that the indicators have a high level of validity and meet the convergent validity criteria.

Table 3. Results of the Composite Reliability and AVE Validity Test

| | **Cronbach's alpha** | **Composite reliability (rho_a)** | **Composite reliability (rho_c)** | **Average variance extracted (AVE)** |
|---|---|---|---|---|
| Continuance Intention | 0,967 | 0,967 | 0,974 | 0,883 |
| Patient Satisfaction | 0,972 | 0,972 | 0,978 | 0,898 |
| Perceived Ease of Use | 0,972 | 0,977 | 0,978 | 0,879 |
| Perceived Usefulness | 0,965 | 0,966 | 0,973 | 0,879 |
| Perceived Value | 0,963 | 0,964 | 0,972 | 0,873 |
| Perceived Need | 0,937 | 0,948 | 0,959 | 0,887 |
| Perfomance Expectancy | 0,950 | 0,951 | 0,960 | 0,799 |

Source: Processed Data Results using SmartPLS 4.1.0.9

According to the results shown in the table above, all research variables meet the required criteria, where the minimum threshold for Composite Reliability is 0.70, and the Average Variance Extracted (AVE) value must be greater than 0.50. Since all variables had Composite Reliability (CR) values greater than 0.70, they were considered reliable. Furthermore, as each variable also shows an AVE value greater than 0.50, we can conclude that all variables are valid. Therefore, the data were deemed suitable for further analysis.

*4.2.2 Discriminant Validity*

The discriminant validity test was conducted using the Heterotrait-Monotrait Ratio (HTMT) method, as presented in Table 4. The results show that The HTMT correlation values were below 0.900 for almost all research variables, with only one variable slightly exceeding 0.900. This indicates that, empirically, each variable used in this study is distinct and possesses a meaningful level of differentiation. Based on these results, all indicators were declared valid, as shown in Table 4.

Table 4. Results of Discriminant Validity Test – HTMT

| | CI | PS | PEOU | PU | PV | PN | PE |
|---|---|---|---|---|---|---|---|
| CI | | | | | | | |
| PS | 0,931 | | | | | | |
| PEOU | 0,892 | 0,869 | | | | | |
| PU | 0,811 | 0,825 | 0,781 | | | | |
| PV | 0,877 | 0,873 | 0,815 | 0,866 | | | |
| PN | 0,832 | 0,754 | 0,761 | 0,753 | 0,869 | | |
| PE | 0,777 | 0,779 | 0,693 | 0,792 | 0,874 | 0,795 | |

Source: Processed Data Results using SmartPLS 4.1.0.9

### *4.3 Inner Model Testing (Structural Model)*

After completing the outer model measurement, the next stage was to conduct an analysis of the inner model. Inner model analysis can be performed once the constructs are confirmed to be reliable and valid. The inner (structural) model is assessed through several tests, including the Collinearity Test (Variance Inflation Factor/VIF), Coefficient of Determination ($R^2$), Effect Size ($F^2$), Predictive Relevance ($Q^2$), and Path Coefficient analysis.

#### *4.3.1 Collinearity Test (VIF)*

The collinearity test (VIF) examines the correlation among variables in a study to determine whether the variables are independent or interrelated. This relationship was assessed based on the Variance Inflation Factor (VIF) value. In PLS-SEM, the VIF value is used, as suggested by (Hair et al., 2019). If the VIF value is less than 5, it indicates that there is no multicollinearity problem or that the model is still within the acceptable tolerance range.

Table 5. Results of Collinearity Test (VIF)

| Variabel | Patient Satisfaction | Continuance Intention |
|---|---|---|
| Patient Expectancy | 3,633 | 2,735 |
| Perceived Need | 3,465 | |
| Perceived Value | 6,653 | |
| Perceived Usefulness | 3,771 | 3,514 |
| Perceived Ease of Use | 3,069 | 3,797 |
| Patient Satisfaction | | 4,898 |

Source: Processed Data Results using SmartPLS 4.1.0.9

As shown in the table above, the VIF values among the research variables mostly met the required threshold of < 5. This indicates that the research model is acceptable because it does not present any multicollinearity issues.

#### *4.3.2 Coefficient Determinant ($R^2$)*

The coefficient of determination ($R^2$) test measures the proportion of variance in the endogenous (dependent) variable that can be explained by exogenous (independent) variables. In other words, the R-squared value reflects the ability of exogenous variables to explain variations in the endogenous variable. The $R^2$ value ranges from 0 to 1, where 0.75 indicates a strong level of explanatory power, 0.50 indicates a moderate level, and 0.25 indicates a weak level. The higher the coefficient of determination, the greater the influence of the independent variables on the dependent variable.

Table 6. Results of R-Square Test

| | R-square | R-square adjusted |
|---|---|---|
| Continuance Intention | 0,860 | 0,857 |
| Patient satisfaction | 0,812 | 0,808 |

Source: Processed Data Results using SmartPLS 4.1.0.9

The table above shows that patient satisfaction has an R-squared score of 0.808, indicating that performance expectancy, perceived need, perceived value, perceived usefulness, and perceived ease of use collectively explain 80.8% of the variance in patient satisfaction. Furthermore, the continuance intention variable has an R-square score of 0.857, demonstrating that performance expectancy, perceived usefulness, perceived ease of use, and patient satisfaction together explain 85.7% of the variance in the continuance intention. These findings indicate that the explanatory capability of the independent variables in describing patient satisfaction and continuance intention falls into a strong category.

*4.3.3 Effect Size* ($F^2$)

The effect size ($F^2$) indicates the magnitude of the influence exerted by an independent variable on a dependent variable. According to Hair et al. (2019), the $F^2$ value can be interpreted as follows: 0.02 = weak effect, 0.15 = medium effect, and 0.35 = strong effect.

Table 7. Results of F-Square Test

| | f-square |
|---|---|
| Patient satisfaction -> Continuance Intention | 0,360 |
| Perceived Ease of Use -> Continuance Intention | 0,210 |
| Perceived Ease of Use -> Patient satisfaction | 0,349 |
| Perceived Usefulness -> Continuance Intention | 0,004 |
| Perceived Usefulness -> Patient satisfaction | 0,030 |
| Perceived Value -> Patient satisfaction | 0,087 |
| Perceived need -> Patient satisfaction | 0,006 |
| Perfomance expectancy -> Continuance Intention | 0,034 |
| Perfomance expectancy -> Patient satisfaction | 0,018 |

Source: Processed Data Results using SmartPLS 4.1.0.9

Based on the table above, which presents the F-square values of the model, it can be concluded that the Patient Satisfaction variable has a very strong influence on Continuance Intention, with an F-square value of 0.360. In addition, the PU contributed significantly to Patient Satisfaction (F-square = 0.349) and showed a moderately strong influence on Continuance Intention (F-square = 0.210). Meanwhile, other variables, such as Perceived Usefulness, Perceived Value, Perceived Need, and Performance Expectancy, exhibited weak effects on both Patient Satisfaction and Continuance Intention, with F-square values below 0.1. As shown in the table, the effect of Performance Expectancy on Continuance Intention is only 0.034, and on Patient Satisfaction is 0.018. This indicates that, although these relationships may be statistically significant, their relative contributions to changes in the dependent variables are minor within the context of this model. Overall, these results suggest that enhancing Patient Satisfaction and Perceived Ease of Use are key factors in strengthening Continuance Intention in the context of Mobile JKN registration services.

*4.3.4 Predictive Relevance* ($Q^2$)

The Predictive Relevance ($Q^2$) test is part of the structural model assessment used to measure the extent to which the observed values generated by the model and its parameter estimates demonstrate good predictive quality. If the Q-square value is greater than 0, the model is considered to have a good predictive capability. Conversely, if the Q-square value is less than or equal to zero, the model is regarded as having poor predictive ability (Hair et al., 2019). As a measure of the predictive relevance of exogenous constructs, a value between 0 and 0.25 indicates small predictive relevance, a value between 0.25 and 0.50 indicates moderate predictive relevance, and a value greater than 0.50 indicates strong predictive relevance (Hair Jr, Howard, & Nitzl, 2020).

Table 8. Results of Q-Square Test

| | $Q^2$ | Description |
|---|---|---|
| ***Continuance Intention*** | 0,751 | Strong |
| ***Patient satisfaction*** | 0,721 | Strong |

Source: Processed Data Results using SmartPLS 4.1.0.9

The results indicate that both variables, Continuance Intention and Patient Satisfaction, have $Q^2$ values greater than 0.50, which demonstrates that the model possesses high predictive relevance. This means that the exogenous constructs have a strong predictive ability to explain variations in the endogenous variables within the model.

*4.3.5 Path Coefficient Analysis*

The purpose of hypothesis testing is to determine the level of significance of the correlations among variables hypothesized in a study. The significance assessment is based on the p-value and t-statistic obtained from the path coefficient test. In the Path Coefficient Test, the coefficient values illustrate the direction and strength of the relationships within the structural model. The path coefficient ranges from -1 to 1, and all variables should have values greater than 0.1 to be considered as having a meaningful effect on the model. Using a one-tailed hypothesis test, where the coefficient direction follows the proposed hypothesis, the results are interpreted based on the p-value and t-statistic. If the p-value was $< 0.05$ and the t-statistic $> 1.645$, the hypothesis was considered significant. The results of the Path Coefficient analysis are presented in Table 9.

Table 9. Hypothesis Testing Results

| Hypothesis | *Standar Coefficient* | T-*Statistics* | P-*Values* | Decision |
|---|---|---|---|---|
| **H1:** Performance expectancy has a positive effect on patient satisfaction | 0,110 | 1,585 | 0,113 | Not supported |
| **H2:** Perceived need has a positive effect on patient satisfaction | -0,064 | 0,746 | 0,456 | Not supported |
| **H3:** Perceived value has a positive effect on patient satisfaction | 0,330 | 2,593 | 0,010 | Supported |
| **H4:** Perceived usefulness has a positive effect on patient satisfaction | 0,147 | 2,328 | 0,020 | Supported |
| **H5:** Perceived ease of use has a positive effect on patient satisfaction | 0,448 | 4,524 | 0,000 | Supported |
| **H6:** Performance expectancy has a positive effect on continuance intention | 0,114 | 1,709 | 0,087 | Not supported |
| **H7**: Perceived usefulness has a positive effect on continuance intention | 0,045 | 0,516 | 0,606 | Not supported |
| **H8:** Perceived ease of use has a positive effect on continuance intention | 0,335 | 5,132 | 0,000 | Supported |
| **H9:** Patient satisfaction has a positive effect on continuance intention | 0,497 | 6,529 | 0,000 | Supported |

Source: Processed Data Results using SmartPLS 4.1.0.9

Based on the data presented in Table 9, it can be seen that four hypotheses out of the nine tested in this study are not supported.

4.3.5.1 The Effect of Performance Expectancy on Patient Satisfaction
The results of the hypothesis test indicate that performance expectancy does not have a significant effect on patient satisfaction, as shown by a t-statistic score of 1.585, which is below the threshold of 1.65, and a p-value of 0.113, which exceeds 0.05. However, the path coefficient value of 0.110 suggests a positive directional relationship, as the value lies between 0 and 1. This finding is consistent with the results of studies conducted by Gunasinghe, Hamid, Khatibi, and Azam (2020) dan Merhi, Hone, and Tarhini (2019), which also found that the relationship between performance expectancy and behavioral intention was not significant. The results of this study may be influenced by the responses of Mobile JKN application users, who indicated that the application does not always improve their performance. Some users even reported that using Mobile JKN increased their workload, despite the application's original purpose of enhancing efficiency and performance in healthcare service processes.

4.3.5.2 The Effect of Perceived Need on Patient Satisfaction
The hypothesis testing results show that perceived need does not have a significant effect on patient satisfaction, as indicated by a t-statistic value of 0.746, which is lower than 1.65, and a p-value of 0.456, which is higher than 0.05. These results differ from those of Fatimah, Setiawan, and Rizany (2022), who stated that there is a positive relationship between the fulfillment of basic human needs and patient satisfaction. However, this result aligns with the study by Ma'arif, Kurniawan, and Sisdianto (2025), which emphasized the importance of positive emotional experiences in shaping supportive attitudes toward products, social norms that drive behavior, and perceived control over repeated purchase actions. This condition may be influenced by the demographic characteristics of the patients, most of whom are in their productive age, possess higher education levels, have stable employment, and belong to the middle-to-upper income groups. This indicates that their satisfaction is not merely driven by the need for services but by their expectations of quality, comfort, and efficiency. Thus, they tend to demand that their service experience aligns with their higher standards and expectations for satisfaction.

4.3.5.3 The Effect of Perceived Value on Patient Satisfaction
The hypothesis testing results revealed that perceived value had a significant effect on patient satisfaction, as shown by a t-statistic value of 2.593 (greater than 1.65) and a p-value of 0.01 (less than 0.05). The original sample value of 0.330 indicates a positive direction of influence, as it falls within the range of $0 < 1$. This means that an increase in perceived value will raise patient satisfaction by 0.330, whereas a decrease in perceived value will reduce patient satisfaction by the same proportion. These findings are consistent with Fitriani, Pasinringi, Irwandy, and Amqam (2020) who found that perceived value significantly influences patient satisfaction, which in turn affects patient loyalty. Similarly, Zulkifli et al. (2024) confirmed that perceived value has a significant positive impact on patient satisfaction.

4.3.5.4 The Effect of Perceived Usefulness on Patient Satisfaction
The hypothesis testing results indicate that perceived usefulness has a significant effect on patient satisfaction, as evidenced by a t-statistic value of 2.328 (greater than 1.65) and a p-value of 0.02 (less than 0.05). The original sample value of 0.147 indicates a positive direction of influence, as it lies between 0 and 1. This result can be interpreted to mean that an increase in perceived usefulness will lead to an increase in patient satisfaction by 0.147, whereas a decrease in perceived usefulness will cause a decrease in patient satisfaction by the same proportion.

These findings are consistent with those of Song et al. (2021), who found that perceived usefulness significantly and positively impacts user satisfaction and the intention to continue using mobile health services among patients with chronic conditions. Similarly, Johansen and Keni (2025) found that perceived usefulness significantly influences patient satisfaction, reinforcing the view that users' perceptions of usefulness play a key role in determining their satisfaction levels in healthcare digital service adoption.

4.3.5.5 The Effect of Perceived Ease of Use on Patient Satisfaction
The hypothesis testing results show that perceived ease of use has a significant influence on patient satisfaction, with a t-statistic value of 4.524 (greater than 1.65) and a p-value of 0.000 (less than 0.05).

The original sample value of 0.448 indicates a positive directional relationship, as the value is between 0 and 1. This means that an increase in the perceived ease of use will lead to a 0.448 increase in patient satisfaction, whereas a decrease in the perceived ease of use will result in a 0.448 decrease in satisfaction. This finding aligns with that of Manurung, Zulaika, and Erawati (2022), who found that the perceived ease of use significantly affects customer satisfaction. Similarly, Wang, Zhou, Liu, and Han (2024) found that the perceived ease of use has a significant positive effect on behavioral intention, which subsequently influences user satisfaction. These findings suggest that users who find the Mobile JKN application easy to operate are more likely to feel satisfied with their experience, as usability plays a crucial role in shaping positive perceptions of digital health services.

4.3.5.6 The Effect of Performance Expectancy on Continuance Intention

The hypothesis testing results indicate that performance expectancy does not have a significant effect on continuance intention, with a t-statistic value of 1.709 (slightly above 1.65) and a p-value of 0.087, which exceeds the significance level of 0.05. This finding is consistent with that of Odelia and Ruslim (2023), who found that performance expectancy does not significantly influence the continuance intention of Tokopedia application users. Similarly, (Hutabarat et al., 2021) found that performance expectancy had no significant effect on the continuance intention of OVO e-wallet users. This outcome suggests that performance expectancy does not significantly influence users' intention to continue using the Mobile JKN application, possibly due to factors such as habit and social influence. The demographic data also support this interpretation, as the majority of respondents reported using Mobile JKN only once, indicating limited habitual engagement that may weaken the performance-related expectations of its continued use.

4.3.5.7 The Effect of Perceived Usefulness on Continuance Intention

The hypothesis testing results demonstrate that perceived usefulness has no significant effect on continuance intention, as indicated by a t-statistic value of 0.516 (below 1.65) and a p-value of 0.606 (above 0.05). This finding is consistent with that of Hafidhuddin and Azizah (2023), who revealed that perceived usefulness does not significantly influence the continuance intention of Indrive application users in Surabaya. Similarly, Akhsan and Firmialy (2024) found that perceived usefulness has no significant impact on continuance intention among Dana application users. These results suggest that although users may acknowledge the benefits of the Mobile JKN application, these perceived advantages alone do not necessarily translate into an intention to continue using the app. This implies that other factors, such as user experience, ease of use, and emotional satisfaction, may play a more crucial role in determining users' long-term engagement with the Mobile JKN platform.

4.3.5.8 The Effect of Perceived Ease of Use on Continuance Intention

The hypothesis testing results indicate that perceived ease of use has a significant effect on continuance intention, as evidenced by a t-statistic value of 5.132 (greater than 1.65) and a p-value of 0.000 (less than 0.05), confirming a statistically significant relationship. The original sample value of 0.335 demonstrates a positive direction of influence, as it lies within the range of $0 < 1$. This means that an increase in the perceived ease of use will lead to an increase in the continuance intention by 0.335, while a decrease in the perceived ease of use will reduce the continuance intention by the same magnitude. These findings are consistent with those of Ardila, Wibasuri, and Lestari (2025) and Irsyad and Hapsari (2023), who found that the perceived ease of use has a positive and significant influence on the continuance intention of QRIS and Traveloka users. Similarly, Novira, Utomo, and Mulyanto (2024) reported that perceived ease of use significantly affects the continuance intention of e-wallet users in startup companies. These results highlight that the ease of system use plays a crucial role in encouraging users to maintain continuous engagement with digital platforms such as Mobile JKN.

4.3.5.9 The Effect of Patient Satisfaction on Continuance Intention

The hypothesis testing results show that patient satisfaction has a significant effect on continuance intention, as indicated by a t-statistic value of 6.529 (greater than 1.65) and a p-value of 0.000 (below 0.05). The original sample value of 0.497 suggests a positive directional relationship, as it is between 0 and 1. This implies that an increase in patient satisfaction will raise the continuance intention by 0.497, whereas a decrease in satisfaction will lower the continuance intention by the same proportion. This

result corroborates previous research by Alalwan (2020), Kaium et al. (2020), Wendland et al. (2019), and Lestari, Isnurhadi, and Maulana (2025), all of which found a positive and significant relationship between patient satisfaction and continuance intention. Collectively, these findings underscore that satisfied users are more likely to continue using Mobile JKN, reinforcing the importance of service quality, user experience, and trust in sustaining long-term app engagement.

*4.3.6 Mediation Analysis*

Table 10. Mediation Analysis Test Results

| | **Original sample (O)** | **Standard deviation (STDEV)** | **T statistics** | **P values** | **Decision** |
|---|---|---|---|---|---|
| Perceived Ease of Use -> Patient satisfaction -> Continuance Intention | 0,223 | 0,057 | 3,917 | 0,000 | Partial Mediation |
| Perceived Usefulness -> Patient satisfaction -> Continuance Intention | 0,073 | 0,035 | 2,086 | 0,037 | Partial Mediation |
| Perceived Value -> Patient satisfaction -> Continuance Intention | 0,164 | 0,070 | 2,344 | 0,019 | Partial Mediation |
| Perceived need -> Patient satisfaction -> Continuance Intention | -0,032 | 0,043 | 0,737 | 0,461 | No Mediation |
| Perfomance expectancy -> Patient satisfaction -> Continuance Intention | 0,055 | 0,034 | 1,613 | 0,107 | No Mediation |

Source: Processed Data Results using SmartPLS 4.1.0.9

The results of the mediation analysis, as shown in Table 10, indicate that patient satisfaction acts as a partial mediator in the relationship between perceived value, perceived usefulness, and perceived ease of use with continuance intention, as evidenced by t-statistic values exceeding 1.65 and p-values less than 0.05. Meanwhile, for performance expectancy and perceived need, patient satisfaction does not mediate the relationship with continuance intention, as their t-statistic values are below 1.65 and p-values exceed 0.05. This suggests that while satisfaction plays an important mediating role in strengthening the effects of perceived value, usefulness, and ease of use on users' intention to continue using Mobile JKN, it does not significantly mediate the influence of performance expectancy and perceived need.

## 5. Conclusions

This study analyzes the effects of Performance Expectancy, Perceived Need, Perceived Value, Perceived Usefulness, and Perceived Ease of Use on Patient Satisfaction, as well as their impact on the Continuance Intention of Mobile JKN application users in Surabaya. The results show that Perceived Value, Perceived Usefulness, and Perceived Ease of Use significantly enhance patient satisfaction, whereas performance expectancy and perceived need have no significant effect. Furthermore, Patient Satisfaction and Perceived Ease of Use positively influenced Continuance Intention, whereas Performance Expectancy and Perceived Usefulness did not. Therefore, user satisfaction is a key factor in encouraging the sustained use of the Mobile JKN application.

The findings indicate that Patient Satisfaction and Perceived Value are crucial yet under-optimized factors, thus requiring strategic improvement. The Mobile JKN management team is advised to enhance service quality through improved comfort, system stability, and user experience. Routine evaluations based on user feedback are also essential for increasing satisfaction and promoting long-term

application use. This study reinforces the Technology Acceptance Model (TAM) framework by demonstrating that Perceived Usefulness and PEU significantly influence both patient satisfaction and Continuance Intention. However, the lack of influence from Performance Expectancy underscores the importance of user experience factors in digital health services. Moreover, this study extends the TAM framework by incorporating contextual variables such as Perceived Need and Perceived Value, providing a broader understanding of technology adoption in healthcare applications.

## Limitations and Future Research

This study had several limitations that should be considered in future research. First, the cross-sectional design only captures data at a single point in time; thus, it cannot fully describe changes in users' perceptions and behaviors toward the Mobile JKN application over the long term. Therefore, a longitudinal study is recommended to observe the evolution of users' continuous intentions over time. The research location limitation, which only covers Surabaya, also constrains the generalizability of these findings. Demographic, social, and economic characteristics in other Indonesian cities may differ; thus, future studies should include more diverse regional samples to achieve broader national representation.

The use of a quantitative approach limits the depth of understanding because it relies solely on closed-ended (Likert-scale) responses. Future studies should adopt qualitative or mixed-method approaches, such as in-depth interviews or focus group discussions (FGDs), to explore users' perceptions and experiences more comprehensively. Additionally, including open-ended questions in future questionnaires could help uncover the deeper reasons behind users' satisfaction or dissatisfaction with the application. Future research is expected to provide a more holistic understanding of the factors influencing the continuance intention of digital health services such as Mobile JKN.

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