



Analysis of the Usability Level of the JKN Mobile Application Using the User Experience Questionnaire (UEQ) and Importance–Performance Analysis (IPA) Methods

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Abstract— The JKN Mobile application, developed by BPJS Kesehatan, serves as a cornerstone of Indonesia’s digital health transformation, providing National Health Insurance (JKN) participants with convenient access to essential healthcare services. Through this application, users can verify their membership status, register for online queues at healthcare facilities, and submit complaints or feedback without the need for in-person visits. This digital innovation aims to streamline administrative processes, reduce waiting times, and enhance the overall accessibility of healthcare services across diverse regions in Indonesia. However, despite its strategic potential and wide adoption, a growing number of users have expressed dissatisfaction, particularly regarding the app’s usability, interface design, and navigation flow, which directly affect their overall experience. To address these concerns, this study conducts a detailed usability evaluation using two analytical frameworks: the User Experience Questionnaire (UEQ) and Importance Performance Analysis (IPA). The UEQ assesses six key dimensions of user experience attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty while IPA categorizes features based on their perceived importance and actual performance. Findings indicate notable discrepancies between user expectations and actual experiences. Attributes such as clarity (1.1056, 0.4021), efficiency (1.0181, 0.0026), and appeal (1.0946, -0.019) fall under the “maintain performance” quadrant, implying that these areas meet user needs but require consistent quality assurance. Conversely, novelty (0.0965, 0.4113) emerges as a “top priority,” highlighting the need for innovation and modern design updates. The results underscore the necessity for continuous user-centered design improvements, iterative testing, and feedback-based refinement. Strengthening digital literacy, ensuring technical stability, and implementing agile development methodologies can further enhance satisfaction and promote user engagement. Ultimately, cross-platform optimization and data-driven innovation are crucial to ensure that JKN Mobile remains relevant, efficient, and adaptive to the evolving landscape of healthcare service delivery in Indonesia.

Keywords—User Interface; Importance Performance Analysis; Mobile JKN; Usability; User Experience Questionnaire;

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I. INTRODUCTION

The rapid advancement of technology in the digital era continues to transform various aspects of human life, particularly in communication, which has become increasingly unrestricted by time and space [1]. In Indonesia, internet usage has grown significantly. According to a survey by the Indonesian Internet Service Providers Association (APJII) conducted in February 2024, a total of 221,563,479 individuals out of a population of 278,696,200 were identified as internet users [2]. This data illustrates the profound impact of digital technology on multiple sectors, including the healthcare sector.

One of the major digital transformations in healthcare is implemented by the Badan Penyelenggara Jaminan Sosial Kesehatan (BPJS Kesehatan), a public legal entity responsible for managing the national health insurance program in

accordance with Law No. 24 of 2011. BPJS Kesehatan officially began operation on January 1, 2014, with the goal of providing universal health coverage for all Indonesian citizens [3]. As of December 31, 2022, the National Health Insurance (JKN) program had reached 248.77 million participants, equivalent to 90.73% of the total population [4].

As part of its digital transformation efforts, BPJS Kesehatan launched the Mobile JKN application on April 17, 2016, available on both the Play Store and App Store platforms [5]. The application enables users to conveniently access various healthcare services anytime and anywhere. As of November 9, 2023, Mobile JKN had been downloaded over 10 million times and offered features such as membership status checking, hospital directory browsing, appointment scheduling, prescription retrieval, and more [6].

Despite the growing number of users, numerous negative reviews have been recorded regarding the Mobile JKN application. Out of 57,000 total reviews as of November 27, 2023, 30,042 were one-star ratings, highlighting various issues, particularly those related to the suboptimal user interface (UI) design [6]. This indicates that the application's UI still requires significant improvement.

Previous studies have evaluated the usability of the Mobile JKN application using various methods. Study [7] employed the Use Questionnaire and found that the application achieved a "Good" usability rating. Study [8] utilized the Heuristic Evaluation and System Usability Scale (SUS) methods, identifying several design issues that improved after revisions. Meanwhile, study [9] applied Importance–Performance Analysis (IPA) and identified specific variables and dimensions that should be prioritized for future development of the Mobile JKN application.

The most relevant study was conducted by [10], which analyzed the usability and ease of use of Mobile JKN services in Depok's community health centers using the Use Questionnaire and IPA methods. The findings revealed that users were not yet fully satisfied with the application, and the IPA method identified specific areas requiring improvement. However, previous studies primarily focused on usability and ease of use, without providing a comprehensive understanding of the overall user experience.

Therefore, this study adopts a combination of the User Experience Questionnaire (UEQ) and Importance–Performance Analysis (IPA) methods to conduct a more comprehensive evaluation. UEQ is chosen for its ability to efficiently measure user experience across six key dimensions: attractiveness, clarity, efficiency, dependability, stimulation, and novelty [7]. IPA is employed to analyze the relationship between the importance and performance of each application attribute [10]. The integration of these two methods enables a holistic assessment, capturing not only user perceptions but also improvement priorities based on user needs.

Based on the aforementioned background, this study aims to measure the usability level of the Mobile JKN application using the UEQ method and to identify critical aspects of the application through IPA to better understand user needs and application performance. Furthermore, this study integrates the UEQ and IPA findings to comprehensively evaluate user experience and the overall performance of the Mobile JKN application.

This research is expected to provide valuable insights for enhancing the application's interface and overall service quality, thereby contributing to the advancement of digital healthcare service delivery in Indonesia.

II. LITERATURE REVIEW

A. BPJS Kesehatan

BPJS Kesehatan (Social Security Agency for Health) is a public legal entity that manages Indonesia's national health insurance program in accordance with Law No. 24 of 2011. Since commencing operations in 2014, BPJS Kesehatan has aimed to provide comprehensive health protection for all Indonesian citizens. As of the end of 2022, the total number of participants reached 248.77 million individuals [4].

B. Mobile JKN Application

The Mobile JKN application, developed by BPJS Kesehatan since 2016, facilitates participants in accessing healthcare services digitally. The application offers features such as membership verification, doctor scheduling, premium payment, and online medical consultations. This digital platform significantly improves administrative efficiency, which was previously conducted manually [6].

C. Usability

Usability refers to the ease of use of a system that minimizes user errors and enhances user satisfaction [11]. According to Jakob Nielsen, usability consists of five key aspects: learnability, efficiency, memorability, errors, and satisfaction [12]. These dimensions are widely recognized as the foundation for evaluating the effectiveness and user-friendliness of interactive systems.

D. User Experience Questionnaire (UEQ)

The User Experience Questionnaire (UEQ) is a fast and quantitative evaluation method designed to measure user perceptions of a system. It assesses six primary dimensions of user experience: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty [7], [13], [14]. The UEQ is widely used in usability and user experience research because of its ability to efficiently capture users' affective and cognitive responses toward a digital product.

E. Importance–Performance Analysis (IPA)

Importance–Performance Analysis (IPA) is an analytical method that maps product attributes based on their importance and performance using a four-quadrant matrix.

- Quadrant I indicates attributes that require top-priority improvement,
- Quadrant II represents attributes that should be maintained,
- Quadrants III and IV correspond to attributes with lower priority levels [15].

This method helps identify strategic priorities for improving service quality and resource allocation.

F. Population and Sampling Techniques

A population refers to the entire set of objects or subjects that possess certain characteristics relevant to the research objectives. Sampling techniques are generally categorized into probability sampling and non-probability sampling.

Probability sampling provides equal chances for every member of the population to be selected, including methods such as simple random, systematic random, stratified random, and cluster sampling. This approach is considered more objective and minimizes bias, although it does not always guarantee full representativeness.

Non-probability sampling, on the other hand, does not offer equal selection opportunities for all members. It includes purposive, snowball, accidental, and quota sampling methods. While easier to implement, non-probability sampling carries a higher risk of bias [16].

G. Research Sample

A sample is a subset of the population selected through specific procedures to represent the population's

characteristics. Sampling is necessary when the population size is too large to study comprehensively due to limitations in time, cost, and resources. Therefore, it is essential to ensure that the selected sample is truly representative so that the research findings accurately reflect the characteristics of the overall population [17].

III. RESEARCH METHODOLOGY

The research methodology employed in this study is illustrated in Figure 1.

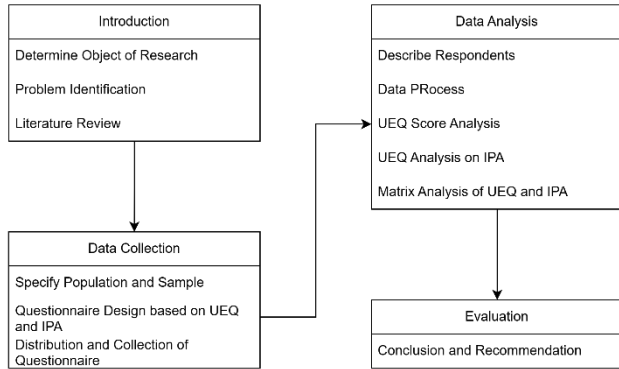


Fig. 1 Research Stages

A. Introduction

The preliminary stage of this study includes the identification of the research object, namely the JKN Mobile application, followed by problem identification through usability evaluation using questionnaires to explore users' experiences and encountered challenges. Data analysis was conducted to define the research focus and formulate recommendations for improvement. Additionally, a literature review was carried out to strengthen the theoretical foundation and support the interpretation of research findings.

B. Data Collection

The data collection phase was conducted using the User Experience Questionnaire (UEQ) and Importance–Performance Analysis (IPA) methods. The research population consists of JKN Mobile users in Indonesia, with samples determined through random sampling based on Yamane's formula to obtain representative respondents.

The research instruments comprise a UEQ questionnaire using a 7-point Likert scale, consisting of 26 pairs of attributes, followed by an IPA questionnaire designed to measure the importance level of each attribute and identify improvement priorities. The questionnaires were distributed to respondents according to the determined sample size, and the collected data were then analyzed to assess usability and determine the aspects requiring enhancement.

C. Data Analysis

The data analysis phase involved describing respondent characteristics, processing the UEQ questionnaire data, and analyzing scores to evaluate usability aspects. The results of the UEQ were subsequently integrated into the IPA method to measure the importance, performance, and gap of each attribute. These values were then mapped into a UEQ–IPA matrix to identify improvement priorities and formulate recommendations for the application's development.

D. Evaluation

The final stage of this research is the evaluation phase, which involves drawing conclusions and formulating recommendations. The conclusions summarize the usability level of the JKN Mobile application and identify the critical aspects influencing user experience. The recommendations focus on improving low-performing aspects to serve as a reference for future development and enhancement of the application.

IV. Results and Discussion

A. Introduction

This study examined the JKN Mobile application, developed by BPJS Kesehatan, due to its significant role in the digitalization of healthcare services and its broad user base. The questionnaire results revealed several complaints regarding the user interface, feature accessibility, and application response speed, indicating a noticeable gap between user expectations and actual experience.

The analysis employed the User Experience Questionnaire (UEQ) method to assess usability aspects and the Importance–Performance Analysis (IPA) method to identify improvement priorities. A review of related literature supports the use of these two methods, as both have proven effective in evaluating user perception, identifying interface weaknesses, and determining essential yet underperforming service attributes.

B. Data Collection

1) Population and Sample

The research population comprised BPJS Kesehatan participants who use the Mobile JKN application, totaling 16,346,826 users across Indonesia [18]. The sample size was determined using random sampling and the Yamane formula with a 5% margin of error, resulting in 386 representative respondents with a 95% confidence level.

2) Questionnaire Instrument Development

The questionnaire was administered in two stages: UEQ and IPA. The first stage used the UEQ to evaluate user experience across parameters such as attractiveness, perspicuity, efficiency, and creativity. The UEQ results served as the basis for the IPA questionnaire, which measured the importance of each attribute and compared it with the product's performance. Table 1 presents the UEQ questionnaire items.

TABLE I
UEQ QUESTIONNAIRE ITEMS
1 23 45 67

Troublesome	○ ○ ○ ○ ○ ○	Fun	1
Unintelligible	○ ○ ○ ○ ○ ○	Under stable	2
Creative	○ ○ ○ ○ ○ ○	Monotonous	3
Easy to Learn	○ ○ ○ ○ ○ ○	Difficult to Learn	4
Useful	○ ○ ○ ○ ○ ○	Less Useful	5

	1	23	45	67		
Boring	○	○	○	○	○	Exciting 6
Uninteresting	○	○	○	○	○	Interesting 7
Unpredictable	○	○	○	○	○	Predictable 8
Fast	○	○	○	○	○	Slow 9
Creative	○	○	○	○	○	Conventional 10
Hindering	○	○	○	○	○	Supportive 11
Good	○	○	○	○	○	Bad 12
Complex	○	○	○	○	○	Simple 13
Disliked	○	○	○	○	○	Encouraging 14
Common	○	○	○	○	○	At The Forefront 15
Uncomfortable	○	○	○	○	○	Comfortable 16
Safe	○	○	○	○	○	Unsafe 17
Motivating	○	○	○	○	○	Not Motivating 18
Meets Expectation	○	○	○	○	○	Doesn't Meet Expectation 19
Inefficient	○	○	○	○	○	Efficient 20
Clear	○	○	○	○	○	Confusing 21
Impractical	○	○	○	○	○	Practical 22
Organized	○	○	○	○	○	Cluttered 23
Attractive	○	○	○	○	○	Unattractive 24
User-friendly	○	○	○	○	○	Not User-friendly 25
Conservative	○	○	○	○	○	Innovative 26

C. Data Analysis

1) Describe Respondent

Data were collected from 386 randomly selected users of the JKN Mobile application. Most respondents were aged 18–24 years (42.75%) and 25–34 years (38.08%), indicating a predominance of young, productive users. In terms of membership categories, the largest group comprised Wage-Earning Workers (199 respondents), followed by Non-Wage or Independent Workers (127 respondents).

Regarding frequency of use, most respondents used the app infrequently (173 respondents), while daily users were few (13 respondents). The majority (48%) had used the app for more than one year, indicating a relatively high level of trust. The most common reasons for using the application were to obtain health information (59.8%) and manage personal data and service history (42.5%), while features such as online consultation, claims, and assistance requests were less frequently used.

2) Data Processing

The raw survey data consisted of Likert scale (1–7) responses representing users' agreement levels with each questionnaire item. Each UEQ item contained both positive and negative wordings, randomized to reduce bias.

TABLE II
UEQ QUESTIONNAIRE RESULTS RAW DATA

Items																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
4	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	3	4	4	6	3	4	3	5	4	5	4	5	4	3	4	3	3	5	4	3	5	4	3	3	3
1	1	1	1	7	1	1	1	1	1	1	7	7	1	1	1	7	7	1	7	1	7	1	7	7	7
7	7	7	1	1	3	6	4	4	4	6	1	5	4	5	6	2	2	3	6	3	6	2	4	2	6
7	7	4	1	1	7	7	7	1	1	7	1	7	1	7	1	7	1	1	7	1	6	3	3	1	5
4	5	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
7	7	4	7	7	5	4	7	2	1	7	1	7	6	5	6	3	3	2	6	1	6	2	3	2	6
3	4	3	5	6	3	3	4	5	5	5	5	4	3	3	3	4	5	5	5	3	2	3	5	4	3
4	5	3	4	2	3	4	6	3	3	6	2	4	5	5	6	1	2	4	5	2	6	3	3	3	3
3	3	5	3	2	3	3	3	4	4	3	5	3	4	4	4	4	3	5	3	4	4	4	4	2	4
6	6	2	2	1	6	6	6	2	5	6	2	6	6	2	6	2	3	2	7	2	7	3	3	2	2
5	5	4	2	2	4	6	4	4	5	5	3	5	5	4	5	4	4	3	5	3	6	1	2	1	1
5	6	7	3	3	2	2	5	4	4	6	3	5	6	2	6	2	4	4	5	3	5	3	5	3	2
2	3	3	1	3	3	3	5	6	6	2	4	2	2	5	4	4	4	3	5	5	3	3	3	3	3
1	1	1	5	7	3	1	2	1	1	2	1	4	1	3	1	5	6	4	2	1	6	4	4	1	1
6	6	5	6	6	4	4	5	6	5	7	3	6	6	4	5	2	3	2	6	2	6	2	2	2	6
5	6	4	3	2	4	5	3	5	6	6	2	5	5	2	6	5	2	3	5	5	4	3	3	4	4
5	3	2	6	3	5	3	2	6	6	6	1	1	5	3	6	3	2	1	6	1	1	6	2	5	2
7	7	1	1	1	7	7	7	1	1	7	1	7	7	7	7	1	1	1	7	1	7	1	1	1	7
2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

The Likert values were then transformed into a range from –3 to +3, where +3 indicated full agreement and –3 indicated full disagreement. The transformed values formed the basis for statistical analysis.

TABLE III
THE TRANSFORMED UEQ QUESTIONNAIRE RESULTS

Items																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	-1	0	0	-2	-1	0	-1	-1	0	1	0	1	0	-1	0	1	1	-1	-1	-1	0	1	1	1	-1
-3	-3	3	3	-3	-3	-3	-3	3	3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
3	3	-3	3	3	-1	2	0	0	0	2	3	1	0	1	2	2	1	2	1	2	1	2	2	0	2
3	3	0	3	3	3	3	3	3	3	3	3	3	3	-3	3	3	3	3	3	2	1	1	1	3	1
0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
3	3	0	-3	-3	1	0	3	2	3	3	3	3	2	1	2	1	1	2	2	3	2	2	1	2	2
-1	0	1	-1	-2	-1	-1	0	-1	-1	-1	-1	0	-1	-1	0	-1	-1	1	1	-2	1	-1	0	-1	-1
0	1	1	0	2	-1	0	2	1	1	2	2	0	1	1	2	3	2	0	1	2	2	1	1	1	-1
-1	-1	-1	1	1	-2	-1	-1	1	0	0	1	1	-1	0	0	0	0	1	1	1	0	0	0	0	2
2	2	2	2	2	2	2	2	-1	2	2	2	2	-2	-2	2	2	1	2	3	2	3	1	1	2	-2
1	1	0	2	2	0	2	0	-1	1	1	1	1	0	1	0	0	1	1	1	2	3	2	3	3	-3
1	2	-3	1	1	-2	-2	1	0	0	2	1	1	2	-2	2	0	0	1	1	1	1	1	-1	1	-2
-2	-1	1	1	3	-1	-1	-1	-1	-2	2	2	0	-2	-2	-1	-1	0	0	1	1	-1	1	-1	1	-1
-3	-3	3	-1	-3	-1	-3	-2	3	3	-2	3	0	-3	-1	-2	0	-2	3	2	0	0	0	3	3	3
2	2	-1	-2	-2	0	0	1	-2	-1	3	1	2	2	0	1	2	1	2	2	2	2	2	2	2	2
1	2	0	1	2	0	1	-1	-1	-2	2	2	1	1	-2	2	-1	2	1	1	1	1	0	1	1	0
1	-1	-2	-2	1	1	-1	-2	-2	-2	2	3	-3	-1	-2	1	2	3	2	3	-2	3	-2	-2	-1	-2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

D. UEQ Scoring Analysis

After transformation, the mean score of each item was calculated to reflect general respondent tendencies. Values between –0.8 and 0.8 were categorized as neutral, above 0.8 as positive, and below –0.8 as negative.

The average score for each UEQ scale (e.g., Attractiveness, Efficiency) was derived from its corresponding items.

Response distributions were also analyzed to identify potential polarization among user groups. Reliability was tested using Cronbach's Alpha, where a value above 0.6 was considered reliable.

Based on UEQ benchmark classifications, the results fell into the Below Average category across all scales, indicating significant weaknesses in the user experience. These findings form a critical basis for future feature improvements and interface redesign.

E. UEQ and IPA Analysis

1) UEQ Dimensions in Performance

The Attractiveness scale showed the highest score for Comfortable (1.31) and the lowest for Attractive (0.66). In Perspicuity, Understandable obtained the highest mean (1.44) and confusing the lowest (0.74). For Efficiency, Easy to Use ranked highest (1.32) and Time-Consuming lowest (0.59). In Dependability, Accurate scored highest (1.41) and Inaccurate lowest (0.66). In Stimulation, Interesting achieved the top scorer (1.02), while Boring scored the lowest (0.83). For Novelty, Innovative had the highest mean (0.76) and outdated the lowest (0.04). These findings indicate that comfort, clarity, ease of use, accuracy, and engagement performed relatively well, whereas novelty remained the weakest aspect.

2) UEQ Dimensions in Importance

In the Attractiveness dimension, Comfortable (1.90) was rated as most important, while Attractive (−1.59) was least important. For Perspicuity, Understandable (1.96) had the highest importance, while Confusing (−1.87) was the lowest. In Efficiency, Efficient (1.93) ranked highest, and Time-Consuming (−1.93) lowest. For Dependability, Accurate (1.76) was the most valued, and Inaccurate (−2.03) the least. In Stimulation, Interesting (1.51) was considered important, whereas Boring (−1.92) was not. Lastly, Novelty showed Innovative (1.76) as the highest and Outdated (−1.62) as the lowest. These results demonstrate that respondents place strong emphasis on clarity, efficiency, accuracy, and innovation, while negative attributes such as confusion, slowness, and monotony are rated less important.

F. UEQ–IPA Matrix Analysis

1) Gap Analysis Results

The **IPA matrix** revealed variations in performance and importance across indicators.

- **Attractiveness** had a good performance score (1.094) with a **gap of 1.113**, suggesting that although it is important, further improvement is needed.
- **Perspicuity** (1.106; gap 1.065) performed satisfactorily but could benefit from enhanced clarity.
- **Efficiency** (1.018; gap 1.016) approached optimal levels, indicating efficient processes with minor improvement opportunities.
- **Dependability** (0.951; gap 1.074) and **Stimulation** (0.876; gap 0.995) remained weak and required substantial attention.
- **Novelty** showed the lowest performance (0.411; gap 0.315), emphasizing the lack of innovation to engage users.

These findings highlight the need to focus improvement efforts on **accuracy, stimulation, and innovation** to enhance overall user experience.

2) Significance Test

The Paired Sample t-test showed a significant difference ($p < 0.001$) between Importance and Performance, confirming that user expectations exceeded perceived

application performance. This mismatch underscores the necessity for targeted improvements in key usability dimensions to align the application's quality with user expectations.

G. Evaluation

The results indicate a substantial gap between user expectations and actual performance in the JKN Mobile application. Several critical aspects remain suboptimal, particularly those within Quadrant I (High Priority), which require enhancement through interactive and user-centered innovation. Meanwhile, attributes in Quadrant II (Maintain Performance) should be preserved to sustain current satisfaction levels.

Features in Quadrants III and IV should be re-evaluated to optimize resource efficiency. Continuous application improvement should incorporate user feedback, periodic surveys, and agile development methods to ensure flexibility and responsiveness in system updates.

Such a strategy is expected to help JKN Mobile deliver services that align with user expectations, while simultaneously improving user satisfaction and engagement.

V. CONCLUSION

Based on the findings and discussion presented in this study, the following conclusions can be drawn:

- The usability analysis of the JKN Mobile application using the User Experience Questionnaire (UEQ) revealed that the dimensions of clarity (1.1056), efficiency (1.0181), and attractiveness (1.0946) achieved scores above 1, indicating a positive user experience. However, the novelty dimension scored only 0.0965 (< 0.5), suggesting that innovation remains an area requiring significant improvement.
- The Importance–Performance Analysis (IPA) results showed that novelty (0.0965; 0.4113) falls within Quadrant I (Top Priority), while clarity (1.1056; 0.4021), efficiency (1.0181; 0.0026), and attractiveness (1.0946; −0.019) are categorized under Quadrant II (Maintain Performance). The stimulation dimension (0.8763; −0.1192) lies in Quadrant III (Low Priority), and accuracy (0.9514; −0.1224) is classified under Quadrant IV (Possible Overperformance).
- The integrated UEQ and IPA analyses confirm a noticeable gap between user expectations and actual experiences, with innovation identified as the primary weakness, whereas clarity and efficiency have largely met user expectations.

For future research, it is suggested to expand the study by comparing JKN Mobile with other national health applications or conducting longitudinal analyses to observe user satisfaction trends over time. Integrating qualitative interviews and behavioral analytics could also provide deeper insights into user motivation and engagement patterns.

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