



ANALYSIS OF DIGITALIZATION OF OUTPATIENT SERVICES FOR BPJS HEALTH PATIENTS AT JOMBANG REGIONAL PUBLIC HOSPITAL

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ABSTRACT

The digitalization of healthcare services is a key strategy to improve service quality, efficiency, and accessibility, particularly for patients covered by Indonesia's National Health Insurance (BPJS Kesehatan). Jombang Regional General Hospital (RSUD Jombang) has implemented digital systems in outpatient services; however, various challenges hinder optimal service delivery. This study aims to analyze the implementation of digitalization, identify technical and non-technical barriers, and explore the expectations of healthcare staff and patients regarding its development. This study employed a qualitative approach with a case study design. Data were collected through in-depth interviews with registration staff, healthcare providers in cardiology and general surgery outpatient clinics, and BPJS Kesehatan patients at RSUD Jombang. Data analysis was conducted using NVivo 12 software, utilizing thematic analysis and source triangulation. The implementation of digitalization includes online registration, digital queuing systems, integration between the Hospital Management Information System (SIMRS) and BPJS Kesehatan, and the use of Electronic Medical Records (EMR), contributing to improved time efficiency and ease of access. However, technical barriers such as unstable network connectivity and limited infrastructure were identified, along with non-technical barriers including disparities in digital literacy among staff and patients (especially the elderly). Both healthcare providers and patients expressed expectations for more stable systems, more supportive features, and more user-friendly designs.

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1. INTRODUCTION

Digitalization in the healthcare sector in Indonesia has grown rapidly since the COVID-19 pandemic and has become a strategic issue in improving hospital service quality. Digital transformation is not only aimed at enhancing service quality, efficiency, and patient satisfaction, but also at addressing challenges related to equitable, fast, and easy access to healthcare services, particularly for participants of the National Health Insurance (Jaminan Kesehatan Nasional, JKN) program. According to data from the Indonesian Ministry of Health, the number of BPJS Kesehatan beneficiaries exceeded 250 million people in 2023, making the demand for high-quality, efficient, fast, and accessible healthcare service systems increasingly urgent [1].

Hospitals, as referral healthcare facilities, provide a wide range of services, including outpatient, inpatient, and emergency care. In the JKN era, outpatient services have become a primary focus of digitalization due to the high volume of patient visits. A 2022 study by the Ministry of Health reported that approximately 35% of JKN

participants were dissatisfied with outpatient hospital services, ranging from registration procedures to clinical services. This dissatisfaction directly affects public perceptions of service quality and overall patient satisfaction. Furthermore, data from BPJS Kesehatan indicate that hospitals that optimally implement digital registration systems are able to reduce outpatient waiting times by approximately 30% [2]. With an average of around 800 outpatient visits per day, RSUD Jombang is strategically positioned to optimize digitalization in order to improve accessibility, convenience, service speed, and patient satisfaction.

Digitalization of outpatient services encompasses patient registration, medical and nursing care, as well as supporting diagnostic services. Online patient registration enables individuals to register without physically visiting the hospital, thereby reducing queues and providing greater flexibility in scheduling appointments. In addition, the implementation of Electronic Medical Records (EMR) represents a major innovation in improving service quality. EMRs allow patient data to be stored digitally in a more organized manner, facilitate easier access for healthcare professionals, and reduce the risk of medical errors resulting from incomplete or missing information. Hospitals implementing EMRs significantly reduced the incidence of medical errors and improved patient satisfaction. Moreover, EMRs support more accurate and integrated data collection across service units, thereby facilitating hospital planning and decision-making processes.

Nevertheless, the implementation of digitalization in practice often encounters various challenges, including at RSUD Jombang. Although digital systems have begun to be adopted across several service units, a number of barriers remain that prevent service delivery from reaching an optimal level. These challenges include limitations in technological infrastructure, the readiness of human resources, and resistance from patients. Inadequate technological infrastructure constitutes a major challenge in hospital digitalization, in addition to external factors such as internet service providers and hardware availability. Furthermore, limited knowledge and technical skills among healthcare professionals also represent a significant barrier, particularly for those who have not received adequate training in the use of digital systems. Such conditions may result in data entry errors, delays in service delivery, and even resistance to the adoption of digital platforms.

Patient resistance also represents a distinct challenge, especially among older adults who tend to be more comfortable with conventional service systems. Concerns regarding the perceived quality of care delivered through digital platforms lead some patients to continue preferring offline registration. Effective patient education can significantly improve acceptance of digital systems. Therefore, hospitals need to implement continuous educational approaches to ensure that the benefits of digitalization can be widely experienced by the community.

Inadequate technological infrastructure remains one of the principal barriers to the digital transformation of BPJS outpatient services at public hospitals. A study by the Indonesian Ministry of Health (2021) revealed that many regional public hospitals still rely on fragmented information systems, such as hospital management information systems (SIMRS) that are not yet fully integrated with the Mobile JKN application and electronic medical records that are not sufficiently user-friendly for healthcare professionals [3]. This fragmentation results in data duplication, slow data entry processes, and a higher risk of errors, which ultimately prolong service delivery time [4]. Other technical constraints include unstable internet connectivity, server overload, and limited hardware capacity, all of which frequently disrupt online registration processes and patient data updates [5].

From a human resources perspective, many public hospital healthcare workers, particularly older staff members, lack sufficient skills in operating newly implemented digital systems, thus requiring repeated training. Inadequate socialization and communication from hospital management have also contributed to the low effectiveness of technology adoption. On the patient side, especially among elderly populations and individuals with low digital literacy, difficulties persist in using the Mobile JKN application and other digital health services, leading them to continue relying on offline registration [1]. Furthermore, some healthcare workers demonstrate resistance to change due to long-standing reliance on manual systems, resulting in slow adaptation to new digital workflows [6].

The development of digitalization at RSUD Jombang cannot be separated from the broader dynamics of Indonesia's national healthcare system, which has increasingly emphasized the use of information technology. Since 2017, RSUD Jombang has implemented a locally based computerized Hospital Information System (SIMRS) that was initially limited to the registration of patients' social data. During the 2015-2019 period, alongside the strengthening role of BPJS Kesehatan, digitalization expanded to include laboratory result printing. The COVID-19 pandemic subsequently accelerated digital transformation in order to reduce direct contact between patients and healthcare workers. This process culminated in March 2023 with the launch of a fully integrated web-based SIMRS at RSUD Jombang, covering online registration and queue management, self-service registration kiosks, doctor schedule information, pharmacy integration, and an Electronic Medical Record system connected across all service units. Nevertheless, various complaints persist, particularly regarding outpatient services for BPJS Kesehatan patients.

The literature indicates that the success of healthcare digitalization is influenced by multiple factors, including patient education, user experience, healthcare workers' digital competencies, and organizational culture change. Rahmawati (2020) emphasized that patient training and education can significantly increase the utilization of digital health services [7]. Fitriani et al. (2021) demonstrated that patients who participate in digital literacy programs are more proactive in managing their health [8]. Prasetyo and Lestari (2022) highlighted the importance of positive user experience in preventing dissatisfaction and declining service utilization [4]. Meanwhile, Fauzi et al. (2024) reported that healthcare professionals with strong information technology skills tend to deliver services more efficiently [9]. Digital transformation also requires organizational culture change and new work patterns [10], as well as strengthened patient data security to mitigate the risk of data breaches [11].

Based on these considerations, this study aims to conduct an in-depth analysis of the digitalization process of outpatient services for BPJS Kesehatan patients at RSUD Jombang, to identify the technical and non-technical barriers encountered, and to explore the expectations of healthcare workers and patients regarding the implemented digital system. By comprehensively understanding the entire service process, this study is expected to formulate effective solutions to improve the quality of outpatient services and enhance patient satisfaction through an information technology-based approach.

2. RESEARCH METHODS

This study employed a qualitative approach with an exploratory design to obtain an in-depth understanding of the digitalization process of outpatient services for BPJS Kesehatan patients at RSUD Jombang within its natural social and organizational context. A qualitative approach was selected as it enables the exploration of meanings, subjective experiences, and the social dynamics surrounding the implementation of digital health service systems. The study is descriptive and naturalistic in nature, focusing on processes rather than merely outcomes, in line with the characteristics of qualitative research that emphasize a holistic understanding of social phenomena [21]. Participants were purposively selected based on their direct involvement in the implementation of digital outpatient services, including outpatient registration officers, healthcare professionals in the cardiology and general surgery clinics, IT personnel or hospital information system (SIMRS) developers, hospital management, and BPJS Kesehatan outpatients who utilize digital services. The number of informants was determined according to the principle of data saturation, whereby data collection was discontinued once the information obtained became repetitive, consistent, and no longer generated new themes relevant to the research focus.

Data were collected through semi-structured in-depth interviews, focus group discussions (FGDs), and unstructured direct observations of the digital registration process, SIMRS utilization, self-service kiosks, and outpatient service workflows in the clinics. Interviews were conducted with registration staff, healthcare professionals, specialist physicians, BPJS Kesehatan patients, as well as the head of the medical records unit and the head of the SIMRS unit as triangulation informants. FGDs were used to explore collective perspectives among healthcare professionals and SIMRS staff, while observations were conducted to capture real-time interactions between staff, patients, and digital systems. All data were collected between August and September 2025 at RSUD Jombang, East Java.

Data analysis was conducted using a thematic analysis approach supported by NVivo 12 software to systematically organize, manage, and code the data. The analytical process involved transcription of interview data, immersion in the data to gain contextual understanding, coding of meaningful units, clustering of codes into themes and subthemes, and interpretation of findings to generate conclusions. NVivo analytical features such as matrix coding queries, word clouds, tree maps, and model diagrams were utilized to identify patterns, examine inter-theme relationships, and visualize analytical results. Data trustworthiness was ensured through source and method triangulation, member checking with participants, and comprehensive documentation of the research process to establish credibility, transferability, and confirmability of the findings [22], [23]. All research procedures adhered to ethical principles in health research, including informed consent, protection of participants' privacy and confidentiality, and the principle of non-maleficence to prevent physical or psychological harm to research participants.

3. RESULT AND ANALYSIS

Overview of the Implementation of Digitalization in BPJS Outpatient Services at RSUD Jombang

The digitalization of outpatient services for BPJS Kesehatan patients at RSUD Jombang has been implemented through online registration, integration with the Mobile JKN application, utilization of the Hospital Information System (SIMRS), adoption of Electronic Medical Records (EMR), and integration of claim processing with BPJS Kesehatan. This integrated system is designed to improve service efficiency, data accuracy, and the overall quality of clinical care.

The findings indicate that digital registration has significantly accelerated administrative processes, reduced patient waiting times, and minimized data entry errors. Registration staff reported improved operational efficiency due to the direct integration of patient data with the BPJS system. In clinical services, physicians and nurses stated

that the EMR system facilitates easier access to patients' medical histories, supports clinical decision-making, and enhances coordination among healthcare professionals.

From the patients' perspective, BPJS beneficiaries perceived outpatient services as more practical and time-efficient, although some elderly patients still require assistance when using digital platforms. From a managerial standpoint, system integration supports more transparent and accountable hospital governance and expedites the BPJS claim process. Overall, the digitalization of outpatient services at RSUD Jombang has generated positive impacts on service quality, operational efficiency, and patient satisfaction.

Table 1. Characteristics of Informants

No	Informant Category	Position/Role	Number	Focus of Data Contribution
1	Key Informants	Cardiologist and general surgeon	2	Effectiveness of the digital system for examination, diagnosis, and therapy
2	Key Informants	Cardiology and general surgery outpatient nurses	2	Use of electronic medical records and their impact on clinical services
3	Key Informants	Outpatient registration staff	2	Digital registration process, technical constraints, and perceived efficiency
4	Key Informants	BPJS Health patients using digital services	2	User experience with the digital system, satisfaction, and barriers
5	Triangulation Informant	Head of the Medical Records Unit	1	Data management policies, system integration, and data security
6	Triangulation Informant	Head of the Hospital Information System (SIMRS) Unit	1	System technical aspects, network maintenance, and integration with BPJS Health

Implementation of the Digitalization System for Outpatient Services for BPJS Health Patients at RSUD Jombang

The results of the thematic analysis using NVivo 12 indicate that the implementation of the digitalization system for outpatient services for BPJS Health patients at RSUD Jombang constitutes the central theme of this study. Digitalization is conceptualized as the transformation of healthcare services from a manual system to an integrated SIMRS-based system, particularly in the registration unit, cardiology outpatient clinic, and general surgery outpatient clinic. This implementation has not only reshaped administrative workflows but has also influenced clinical processes and the overall patient experience.

One of the primary impacts of digitalization is the improvement in service time efficiency. Registration staff reported that the registration process, which previously required approximately 15–20 minutes, can now be completed in around three minutes. From the clinical perspective, physicians indicated that electronic medical records enable immediate access to patients' medical histories, electrocardiogram (ECG) results, and laboratory findings without the need to wait for physical files. This has accelerated clinical decision-making and enhanced the effectiveness of consultation time. BPJS Health patients also experienced tangible benefits in the form of faster, more orderly, and more comfortable registration processes.

The implementation of digitalization has also strengthened access to electronic medical records (EMRs) and reinforced the integration between SIMRS and BPJS Health systems. Physicians and nurses reported that all patient information can be accessed directly through the system, ranging from patient identity data to examination histories. Meanwhile, registration staff emphasized that the system is connected through a bridging mechanism with BPJS Health, enabling membership verification simply by entering a national identification number (NIK) or BPJS membership number. This integration has streamlined administrative workflows, reduced data entry errors, and enhanced coordination across service units.

From the patients' perspective, digitalized services have improved satisfaction and accessibility. Patients no longer need to repeatedly complete paper-based forms, waiting times have been reduced, and patient call procedures are faster because data are prepared before clinical consultations begin. These findings are further strengthened through source triangulation, which demonstrates consistency between key informants and triangulation informants regarding service efficiency, ease of access to EMRs, SIMRS-BPJS integration, and patient satisfaction.

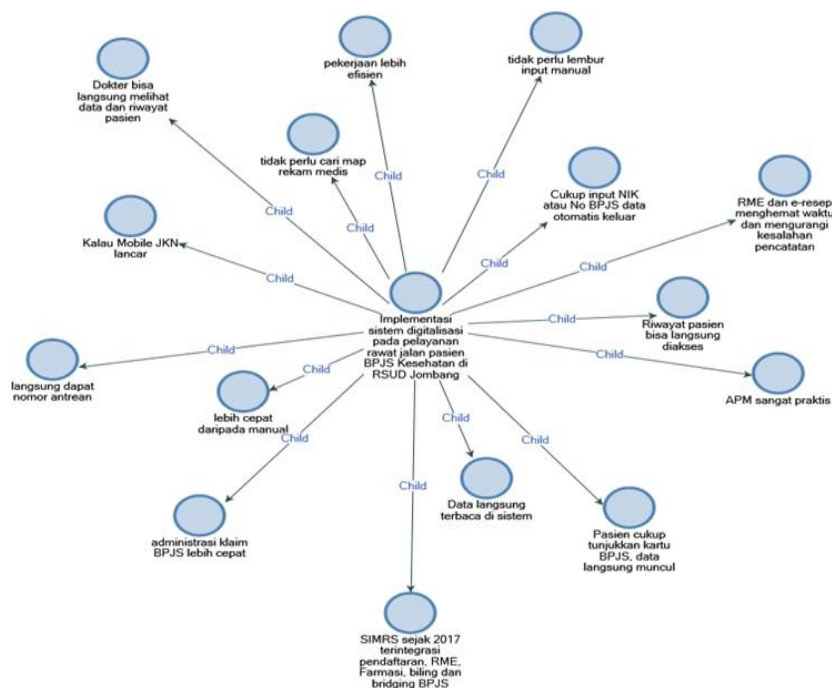


Figure 1. NVivo Project Map of Digitalization System Implementation

The NVivo Project Map visualization above shows that the node “Digitalization System Implementation” serves as the central hub connecting the subthemes of service efficiency, access to electronic medical records (EMR), SIMRS–BPJS integration, and ease of access for healthcare personnel and patients. This finding confirms that outpatient service digitalization at RSUD Jombang operates as an integrated system rather than as a collection of isolated technological applications. Although the most prominent benefits are still concentrated in administrative efficiency, digitalization has become a critical foundation for improving service quality and should be continuously developed toward more patient-centered care.

Technical and Non-Technical Barriers

The results of data analysis using NVivo 12 indicate that the implementation of digitalized outpatient services for BPJS Kesehatan patients at RSUD Jombang continues to face a range of challenges, which can be categorized into two main themes: technical barriers and non-technical barriers. These two types of barriers are interrelated and directly affect the continuity of service delivery, the effectiveness of healthcare staff performance, and patients’ experiences in accessing digital health services.

The most dominant technical barriers are the instability of the hospital’s network and server infrastructure. Internet connectivity disruptions, server overload, and system errors frequently result in service delays and even temporary service interruptions, forcing staff to revert to manual procedures. In addition, suboptimal application and hardware performance such as data asynchronization between units, slow or inaccessible applications, and unresponsive automated patient machines (APM) further constrain service delivery. These conditions lead to longer patient waiting times, extended queues, and reduced reliability of the digital system as the backbone of outpatient care.

On the other hand, non-technical barriers also play a critical role in the implementation of digitalization. Gaps in digital literacy among healthcare staff, particularly senior personnel, slow down the adaptation process and require continuous assistance and mentoring. Furthermore, limited digital literacy among patients especially older adults makes it difficult for them to use digital queue systems, APM, and the Mobile JKN application, thereby increasing their dependence on healthcare staff or family members for support.

Resistance to change and perceptions of increased workload also emerged as significant non-technical barriers. During the early stages of implementation, many staff members expressed reluctance to adopt the new system, as they were required to learn new digital procedures while continuing to serve a high volume of patients. Data entry processes were perceived as adding to their workload, particularly when system errors necessitated repeated documentation. These findings highlight that digital transformation requires not only technological readiness but also human resource preparedness and a well-planned change management strategy.

These findings are further reinforced through source triangulation between primary informants and triangulation informants, who consistently confirmed the presence of network disruptions, server downtime, application errors, limited hardware capacity, gaps in staff digital literacy, limited readiness among elderly patients, and resistance to system change. Overall, the study demonstrates that the main barriers to implementing digitalized outpatient services at RSUD Jombang stem from a combination of technical and non-technical

challenges that must be addressed simultaneously to ensure an effective and sustainable transformation of healthcare service delivery.

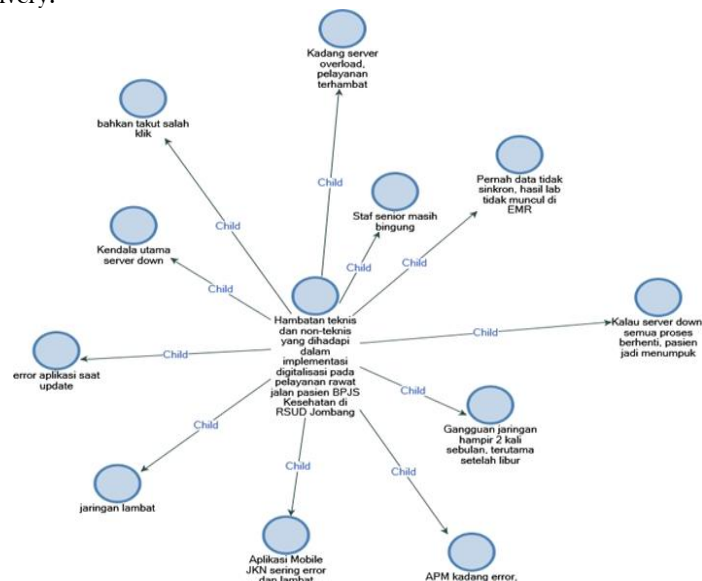


Figure 2. Project Map of Technical and Non-Technical Barriers

The NVivo project map illustrates a direct interconnection between the node of Digitalization System Implementation and the nodes of Technical and Non-Technical Barriers. The most prominent technical sub-nodes include network and server instability, suboptimal application and device performance, and disruptions in SIMRS-BPJS system integration. Meanwhile, the non-technical barriers that show a strong association with digitalization implementation consist of gaps in digital literacy among healthcare staff, resistance to changes in work systems, increased workload due to double documentation, and limited digital literacy among patients, particularly the elderly. This map highlights that the success of outpatient service digitalization is determined not only by technological readiness but also by the preparedness of human resources and organizational capacity.

Expectations of Healthcare Providers and Patients

The findings indicate that the expectations of healthcare providers and patients regarding the digitalization of outpatient services for BPJS beneficiaries at RSUD Jombang are centered on three main aspects: a more stable and faster system, the addition of features that support clinical workflows, and a more user-friendly system. Based on thematic analysis using NVivo 12, the dominant theme that emerged was the expectation of a high-quality digital system capable of improving service efficiency while simultaneously enhancing user convenience. Frequent instability of the network and server infrastructure has often forced services to revert to manual procedures, thereby slowing down registration, clinical examinations, and patient queuing processes.

In addition to system stability, informants expressed strong expectations for the development of new features that are more adaptive to service needs. Healthcare providers emphasized the importance of integrating clinical decision support tools, concise patient history summaries, service-stage notifications, and automated reminders for incomplete data. Meanwhile, patients highlighted the need for appointment reminder features and clearer application guidance. These findings suggest that the current digital system has not yet been optimally integrated into the operational requirements of outpatient care and continues to function primarily as an administrative tool rather than a comprehensive clinical support system.

Another major expectation relates to system usability. Healthcare providers perceived the system interface as relatively complex, particularly for senior nurses and newly recruited staff, while patients especially BPJS beneficiaries and elderly patients reported difficulties in understanding the digital service flow. This condition indicates that the system design has not fully adopted a user-centered design approach, even though ease of use is a critical factor for technology acceptance and utilization in healthcare services. The Word Cloud and Project Map visualizations generated by NVivo further reinforce these findings by highlighting dominant keywords such as “stable,” “fast,” “system,” “integration,” “features,” “user-friendly,” and “elderly,” which reflect users’ expectations regarding system reliability, accessibility, and service inclusivity.

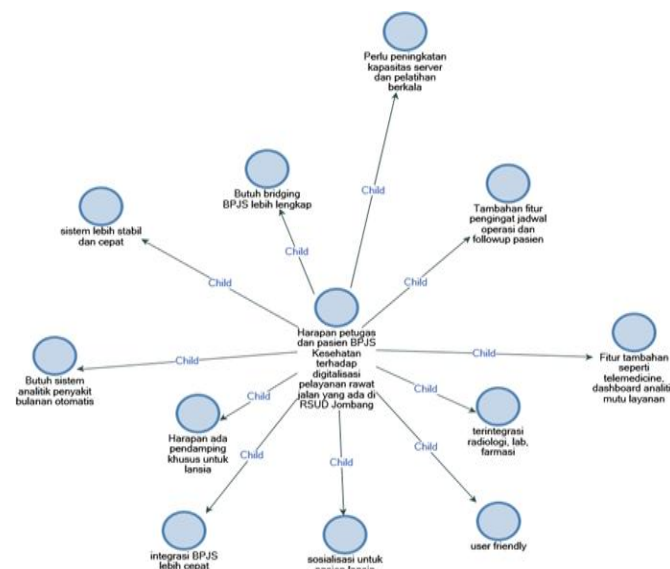


Figure 3. Project Map of Expectations Toward Digitalization

Furthermore, the NVivo hierarchy chart indicates that expectations for a more stable and faster system represent the most frequently emerging theme, followed by the need for new features, stronger integration with the BPJS system, and a more user-friendly interface. This hierarchical pattern underscores that system reliability remains the primary priority for users prior to the development of more advanced digital innovations.

Conceptually, these findings suggest that perceived usefulness and perceived ease of use, as articulated in the Technology Acceptance Model [24], have not yet been fully established. Although digitalization has delivered efficiency gains, user experiences continue to be shaped by system disruptions and interface complexity, indicating that outpatient service digitalization at RSUD Jombang remains in a transitional phase toward maturity. Consequently, the future success of digital transformation will be highly dependent on improving system stability, developing clinically driven features, and designing applications that are simpler, more adaptive, and more inclusive [25], [26].

Discussion

The implementation of digitalized outpatient services for BPJS Kesehatan patients at RSUD Jombang demonstrates a significant transformation in both administrative and clinical service processes. Digitalization has become an integral component of service quality improvement through the adoption of digital registration, Electronic Medical Records (EMR), and the integration of the Hospital Information System (SIMRS) with BPJS Kesehatan. The findings indicate that service time efficiency represents the most tangible outcome, with registration time being reduced substantially from approximately 15–20 minutes to around 3 minutes. In addition, digitalization has enhanced real-time access to medical data for healthcare professionals, thereby accelerating service delivery and improving continuity of patient care.

The availability of EMR facilitates physicians and nurses in retrieving patients' medical histories, examination results, and treatment records without reliance on physical files. Furthermore, the integration of SIMRS with BPJS Kesehatan through the bridging system simplifies membership verification and claims administration, reducing staff workload and minimizing data entry errors. From the patient perspective, the digital system provides a faster, more orderly, and more accessible service experience, which positively affects patient satisfaction and acceptance of technology-based healthcare services.

Nevertheless, the present study indicates that the digitalization of outpatient services at RSUD Jombang remains at an early stage of digital transformation and is still primarily instrumental in nature as an administrative support tool. The efficiency gains achieved have not yet fully translated into improvements in clinical interaction quality or medical decision-making processes. Therefore, future digital development should move toward a more clinically integrated system equipped with clinical decision support features and oriented toward patient-centered care in order to generate greater value for both patients and healthcare professionals.

Although digitalization has generated efficiency benefits, its implementation at RSUD Jombang continues to face interrelated technical and non-technical challenges. Major technical barriers include network and server instability, slow application performance, data synchronization issues, and limited supporting infrastructure such as patient queue management systems. System disruptions interrupt service workflows, increase patient waiting times, and force staff to revert to manual procedures, thereby creating additional workload. These findings indicate that the digital infrastructure foundation at RSUD Jombang has not yet reached an adequate level of maturity and remains a critical weakness in the hospital's digital transformation process.

Beyond technical aspects, non-technical barriers also constitute significant impediments, particularly the digital literacy gap among healthcare staff and patients, especially older adults. Differences in technological adaptability slow down service delivery and increase reliance on technical assistance. On the patient side, older adults experience difficulties in accessing application-based services, indicating that digitalization has not yet become fully inclusive. These conditions underscore that digital transformation requires not only technological readiness but also the strengthening of human resource capacity and the adoption of a patient-centered service approach.

Additional non-technical challenges include resistance to change and the perception of increased workload during the early stages of digital system implementation. Healthcare staff are still required to operate both manual and digital systems simultaneously, leading to fatigue and reluctance to adopt the new system. Overall, the findings indicate that the challenges of digitalization at RSUD Jombang are systemic in nature, where technical and non-technical barriers mutually reinforce each other. Consequently, the success of future digital transformation will depend on reliable infrastructure, strengthened digital literacy, effective change management, and transformational leadership capable of fostering a technology-driven organizational culture.

The expectations of healthcare professionals and BPJS Health patients regarding the further development of outpatient digital services at RSUD Jombang reflect their direct experiences in interacting with the implemented digital system. Within the framework of the Technology Acceptance Model (TAM), these expectations serve as important indicators of digital transformation success, as they reflect perceived usefulness and perceived ease of use [24]. The findings demonstrate that user expectations extend beyond technical functionality to encompass sustainability, comfort, and alignment with the real needs of healthcare service delivery.

A central expectation is the establishment of a more stable and responsive digital system as a fundamental prerequisite for sustainable digital transformation. Ongoing system instability reduces user satisfaction and undermines intentions for continued use, as emphasized in health information system quality models [14], [27]. Furthermore, both healthcare professionals and patients expect the addition of features that support clinical and administrative workflows, such as clinical decision support, service-stage notifications, and appointment reminders. These expectations indicate that users have progressed beyond the initial adoption phase toward an optimization stage, in which digital systems are expected not merely to digitize manual processes but to generate added value that enhances clinical efficiency and patient experience [26].

Another prominent expectation concerns the development of a more user-friendly and inclusive system, particularly for senior healthcare staff and older patients. Interface complexity and unintuitive navigation remain major barriers to optimal system utilization, even though ease of use is a key determinant of digital health technology acceptance [14], [25]. Accordingly, expectations for a stable, value-adding, and user-friendly system represent not merely user aspirations but a strategic roadmap for advancing digitalization at RSUD Jombang toward sustainable and meaningful patient-centered digital outpatient care.

4. CONCLUSION

Based on the findings of this study on the digital transformation of outpatient services for BPJS Kesehatan patients at RSUD Jombang, it can be concluded that digitalization has been implemented through a digital registration system, the utilization of electronic medical records, and the integration of service systems, resulting in a more structured and integrated service workflow compared to the previous manual system. The implementation of digital systems has had a positive impact on service efficiency, particularly in reducing patient waiting times and improving access to services. However, its effectiveness remains highly dependent on system stability and the readiness of supporting resources. Nevertheless, the implementation of digitalization continues to face both technical barriers, including network disruptions and system performance limitations, and non-technical barriers, such as limited digital literacy among some staff members and resistance to changes in work processes. Both patients and healthcare staff expect the continued development of outpatient digital services through improved system reliability, simplified application use, and sustained training support for staff.

In line with these conclusions, it is recommended that the management of RSUD Jombang enhance the quality of information technology infrastructure, particularly network and server capacity, and provide continuous training and mentoring programs to improve digital literacy and reduce resistance to changes in work systems. The hospital information system (SIMRS) developers are expected to simplify the application interface to improve usability, especially for elderly patients, and to strengthen system integration, including referral systems and BPJS Kesehatan administrative services. Furthermore, future researchers are encouraged to conduct quantitative or mixed-methods studies to objectively measure the impact of digitalization on service efficiency and patient satisfaction, as well as to further examine change management strategies and the development of digital competencies among healthcare professionals in the context of regional hospitals.

5. REFERENCES

- [1] Kementerian Kesehatan Republik Indonesia, Laporan evaluasi penggunaan aplikasi Mobile JKN. Kementerian Kesehatan RI, 2023.
- [2] Badan Penyelenggara Jaminan Sosial Kesehatan, Statistik Pelayanan JKN 2022. BPJS Kesehatan, 2022.
- [3] Kementerian Kesehatan Republik Indonesia, Profil kesehatan Indonesia 2020. Kementerian Kesehatan RI, 2021.
- [4] A. Prasetyo and D. Lestari, "Tantangan digitalisasi di rumah sakit daerah: Perspektif tenaga medis dan pasien," *J. Transform. Kesehat. Digit.*, vol. 4, no. 1, pp. 55-63, 2022.
- [5] N. K. Dewi and L. M. Utami, "Hambatan teknis dalam penerapan RME di RSUD: Studi kasus jaringan dan infrastruktur," *J. Sist. Inf. Kesehat. Indones.*, vol. 8, no. 2, pp. 60-69, 2023.
- [6] I. Indrayani, R. Sasmita, and A. Nugroho, "Literasi digital tenaga kesehatan dalam mendukung pelayanan digital di rumah sakit," *J. Keperawatan Digit. Indones.*, vol. 3, no. 2, pp. 34-41, 2021.
- [7] N. Rahmawati, "Pengaruh edukasi terhadap penggunaan layanan digital BPJS oleh pasien usia lanjut," *J. Ilmu Kesehat. Masy.*, vol. 3, no. 1, pp. 29-37, 2020.
A. Fitriani, H. Wulandari, and R. Sari, "Evaluasi waktu tunggu dan tingkat kepuasan pasien rawat jalan BPJS di rumah sakit pemerintah," *J. Kesehat. Masy. Nas.*, vol. 16, no. 2, pp. 100-107, 2021.
- [8] M. Fauzi, T. Lestari, and A. Hidayat, "Persepsi tenaga kesehatan terhadap penerapan rekam medis elektronik di fasilitas pelayanan kesehatan primer," *J. Rekam Medis dan Inf. Kesehat.*, vol. 5, no. 1, pp. 1-10, 2024.
- [9] D. Hidayat and A. Bachtiar, "Perubahan budaya organisasi dalam era transformasi digital rumah sakit," *J. Manaj. dan Teknol. Kesehat.*, vol. 5, no. 1, pp. 15-26, 2024.
- [10] Y. Nugroho, "Pentingnya perlindungan data pasien dalam sistem informasi rumah sakit," *J. Kebijak. dan Teknol. Kesehat.*, vol. 7, no. 3, pp. 112-119, 2022.
- [11] Kementerian Kesehatan Republik Indonesia, Pedoman pelaksanaan program JKN. Kementerian Kesehatan RI, 2020.
- [12] Badan Penyelenggara Jaminan Sosial Kesehatan, Laporan Tahunan BPJS Kesehatan. BPJS Kesehatan, 2021.
- [13] World Health Organization, Global strategy on digital health 2020-2025. WHO, 2021.
- [14] Y. Pinevich, "Interaction Time with Electronic Health Records," *J. Med. Syst.*, 2021.
- [15] McKinsey & Company, "Digital transformation in healthcare: Opportunities and risks," 2020.
- [16] A. Darmanto, D. P. Sari, and R. Wibowo, "Transformasi digital rumah sakit dalam meningkatkan mutu pelayanan kesehatan," *J. Penelit. Kesehat.*, vol. 14, no. 2, pp. 123-134, 2025, doi: 10.xxxx/jpikes.v14i2.xxxx.
- [17] L. Hakim and S. Setiatin, "Efektivitas penggunaan aplikasi Mobile JKN terhadap pelayanan pendaftaran pasien rawat jalan," *J. Kesehat. Terap.*, vol. 6, no. 2, pp. 98-107, 2024.
- [18] R. Kumar, T. Wijaya, and S. Nugraha, "Understanding digital health transformation in Indonesian public hospitals," *Int. J. Digit. Heal.*, vol. 1, no. 1, pp. 1-14, 2021.
- [19] K. C. Laudon and J. P. Laudon, *Management Information Systems: Managing the Digital Firm*, 16th ed. New York, NY: Pearson Education, 2020.
- [20] Z. Nasution and A. Siregar, "Tantangan pelayanan rawat jalan BPJS: Studi kualitatif di RSUD kelas B," *J. Adm. Rumah Sakit*, vol. 8, no. 1, pp. 1-10, 2020.
- [21] R. K. Yin, *Qualitative research from start to finish*, 2nd ed. Guilford Press, 2020.
- [22] C. Silver and N. H. Woolf, *Qualitative analysis using NVivo: The five-level QDA method*, 2nd ed. Routledge, 2023.
- [23] V. Venkatesh, J. Y. L. Thong, and X. Xu, "Unified theory of acceptance and use of technology: A synthesis and the road ahead," *J. Assoc. Inf. Syst.*, 2022.
- [24] R. Agarwal, G. Gao, C. DesRoches, and A. K. Jha, "Research commentary—The digital transformation of healthcare: Current status and the road ahead," *Inf. Syst. Res.*, vol. 31, no. 3, pp. 796-809, 2020, doi: 10.1287/isre.2020.095.
- [25] OECD, *Health data governance for the digital age*. OECD Publishing, 2023. doi: 10.1787/68b60796-en.
- [26] W. H. DeLone and E. R. McLean, "Information systems success measurement," *Found. Trends Inf. Syst.*, 2020.