Jurnal Bhakti Karya dan Inovatif
Jurnal Pengabdian Kepada Masyarakat
Universitas Informatika dan Bisnis Indonesia

e-ISSN: 2775-5002
p-ISSN: 3025-3985
Volume 6 No. 1 February 2026

Development and Education on a Queue Information System to Improve Patient Satisfaction at Community Health Centers (PUSKESMAS)

Asmirati Yakob, Alfiah Ramadhani Amran, Rini Damayanti, Hatma, Sri Wahyuningsih
Manajemen Informasi Kesehatan, Politeknik Kesehatan Megarezky, Makassar, Indonesia
Email: asmiratiyakob04@gmail.com; email: alfiahramran@gmail.com; email: rinirahman1605@gmail.com; email: hatmanewlecture@gmail.com; email: sriwahyuningsh@gmail.com

Accepted:	Accepted After Revision:	Published:
12 February 2026	23 February 2026	27 February 2026

Abstract

One of the indicators of successful services at a Community Health Center (Puskesmas) is patient satisfaction, which is influenced by service speed, orderliness, and comfort. This study aimed to develop and implement a queue information system and evaluate its impact on service performance and patient satisfaction at Ballaparang Community Health Center. A quasi-experimental pre–post evaluation design was applied. Observations were conducted for five service days before and five service days after system implementation. Patient satisfaction surveys were administered to 40 patients before and 40 patients after implementation using a 5-point Likert scale. The results showed that the average waiting time decreased from 58 minutes to 37 minutes (36.2% reduction). The overall patient satisfaction score increased from 3.0 to 4.2. Queue-related complaints decreased from 7 to 2 cases per week. These findings indicate that the developed queue information system significantly improved service efficiency and patient satisfaction. The integration of system development and staff education strengthens the sustainability of digital transformation in primary healthcare services.

Keywords: Queue Information System, Patient Satisfaction, Waiting Time, Primary Healthcare, Service Efficiency.

1 INTRODUCTION

The development of information technology has become increasingly important and has had a significant impact on many aspects of life, including public service systems. In the public sector, the adoption of information technology is essential to enhance the responsiveness and flexibility of government services in adapting to the changing needs of society. In the current era, the use of information technology is indispensable. According to Poerwadarminto, utilization is defined as an action, process, method, or effort that makes existing resources more useful [1].

Efforts to develop a health system that aligns with community needs involve policy analysis in the health sector. This analysis aims to provide comprehensive and efficient healthcare services through quality control that is integrated with digital information systems. The quality of healthcare personnel and the delivery of good healthcare services play a crucial role in determining hospital patient satisfaction, as they are expected to meet the needs of healthcare service users in accordance with established satisfaction standards and professional codes of ethics. Continuous improvement in the quality of healthcare services is essential to fulfill all patient expectations [2].

With the advancement of information technology, the medical and healthcare sectors increasingly require information systems that support healthcare professionals in delivering better services. Clinics must be equipped with reliable systems capable of organizing and managing data effectively to ensure high-quality healthcare delivery. Healthcare services are considered to be of good quality when they are able to meet patient needs [3].

According to a study by Nur Istiqamah (2026), as a primary healthcare facility, Bambu Community Health Center (Puskesmas Bambu) has implemented Health Information Systems (HIS) across various service aspects, including patient registration, electronic medical record management, queue management systems, and management reporting. However, it is important to assess the extent to which these systems meet patients' information needs and contribute to improving patient satisfaction.

The management has developed a digital-based queue service system to improve healthcare services. However, the system currently functions only as a supporting tool for patient queuing due to the limitations of the existing manual system. As a result,

the information accessible to patients—such as the queue number currently being served—is limited. Nevertheless, patients are still able to estimate their waiting time by knowing the queue number being served. In addition, operational staff face challenges in the field because they are unable to identify the last queue number. Furthermore, obtaining data on average waiting times and service levels remains a challenge for management [4].

In Indonesia, community health centers, commonly known as Puskesmas, serve as the frontline providers of basic healthcare services for the population. The information systems used to manage patient data, drug inventory, service schedules, and general administration greatly influence the efficiency and effectiveness of Puskesmas services. In the modern era, the development of reliable and integrated information systems is essential to improving the quality of healthcare services[5]. The quality of healthcare personnel in a hospital can be measured through patient satisfaction. Highly qualified healthcare professionals are able to meet patient satisfaction standards and adhere to professional codes of ethics, while continuous service improvement is necessary to fulfill all patient expectations [6].

One of the indicators of successful services at a Community Health Center (Puskesmas) is patient satisfaction, which is strongly influenced by the speed, orderliness, and comfort of service delivery, as Puskesmas are primary healthcare facilities that play a vital role in providing healthcare services to the community. Community health centers function as the main hubs for public healthcare services. As primary healthcare facilities, Puskesmas carry out various efforts to improve public health through preventive, curative, rehabilitative, and promotive services. During their operations, Puskesmas are required to provide services that are fast, accurate, and efficient. Suboptimal queue management is one of the major challenges in Puskesmas service delivery, as it affects patient waiting times, patient satisfaction, and the workload of healthcare personnel (Article, 2025).

Community Health Centers (Puskesmas) often experience long and disorganized service queues, particularly during peak hours. Manual queue systems are still widely used, leading to various problems such as prolonged waiting times, overcrowding in waiting areas, lack of clarity regarding service order, and an increase in patient complaints. To address these issues, a digital-based queue information system can help organize service workflows more systematically, provide patients with information on waiting times, and assist staff in managing queues more efficiently. Nevertheless, the implementation of a queue information system must be accompanied by adequate education and assistance for both staff and patients. Therefore, with the aim of improving service quality and patient satisfaction at Puskesmas, a simple queue information system was developed, and training on its use was provided.

Based on the results of the initial observation, the problems faced by the partner include:

a) The queue system is still managed manually.
b) Patient waiting times are relatively long and not measurable.
c) Patients are often confused about the service order.
d) Staff experience difficulties in managing queues during peak hours.
e) Limited understanding among patients and staff regarding technology-based queue systems.

2 METHODS

An initial site survey was conducted, followed by an explanation of the objectives and planned activities, and the establishment of cooperation through a Memorandum of Understanding (MoU). In this activity, the presenter delivered material on the predetermined topic, namely Development and Education on a Queue Information System to Improve Patient Satisfaction at Ballaparang Community Health Center. A total of 30 participants attended the activity, consisting of all medical personnel and administrative staff of the Puskesmas. The methods used in this activity included:

a) Lecture Method
The lecture method was used as the initial stage to help participants understand the queue information system at the Puskesmas. The lectures were delivered using clear and communicative language and were tailored to the participants' background, which included medical and administrative staff. To enhance comprehension, the lectures were supported by visual media such as posters, illustrated PowerPoint slides, and examples of the queue system interface.

b) Question-and-Answer Method
The question-and-answer method was employed to assess participants' understanding of the lecture material and to encourage active participation. During this session, participants were given the opportunity to discuss their questions, challenges, and experiences related to queue services at the Puskesmas. This method facilitated two-way communication, clarified unclear material, and promoted participant engagement in the community service activity.

c) Assistance Method
Following the lecture and question-and-answer sessions, an assistance method was implemented as a follow-up stage to ensure that participants were able to use the queue information system independently. This method helped participants understand the system concepts and apply them consistently in daily service activities.

Based on the results of the community service activity entitled Development and Education on a Queue Information System to Improve Patient Satisfaction at Ballaparang Community Health Center, the activity was conducted over two days, from 11 to 12 December 2025.

To assess the effectiveness of the developed queue information system, a quasi-experimental pre–post evaluation design was applied. Observational data were collected over five service days before system implementation and five service days after implementation. The evaluation indicators included average patient waiting time, patient satisfaction level, and frequency of queue-related complaints.

Waiting time was measured by recording the duration from patient registration until service call. Patient satisfaction was measured using a structured questionnaire based on a 5-point Likert scale covering four indicators: queue clarity, service speed, waiting comfort, and overall satisfaction. A total of 40 patients participated in the survey before implementation and 40 patients after implementation.

Complaint data were obtained from administrative service records and verbal documentation maintained by Puskesmas staff.

3 RESULTS AND DISCUSSION

The Community Service activity entitled "Development and Education on a Queue Information System to Improve Patient Satisfaction at Community Health Centers (Puskesmas)" was implemented in accordance with the planned stages. The implementation of the activity involved Puskesmas staff. High-quality healthcare services can meet all patient expectations by fulfilling patient satisfaction standards and adhering to professional codes of ethics, as well as continuously improving service quality.

Figure 1. Educational Outreach Session

The educational activities were conducted through lectures, question-and-answer sessions, and direct assistance. Participants received explanations regarding the basic concepts of the queue information system and the queue-based service workflow at the Puskesmas. Additional explanations were provided on the benefits of implementing the system in improving service efficiency and patient satisfaction. The participants' enthusiasm was evident from their active engagement during the sessions and their willingness to ask questions throughout the activity.

3.1 System Development and Technical Design

The queue information system developed in this activity was designed using a simple web-based client–server architecture [7]. The system consists of three main components: (1) user interface layer, (2) application processing layer, and (3) database layer. The system development stages included:

1. Identification of service workflow problems
2. Design of system flowchart and queue model
3. Development of queue numbering module
4. Integration of waiting time recording feature
5. Testing and implementation at the Puskesmas

The main system features include:

- Digital queue number generation
- Real-time queue display
- Sequential queue calling dashboard
- Automatic recording of service starts and end time
- Waiting time estimation

The workflow begins at patient registration, where the system automatically generates a queue number. The system records the time when the patient is called and calculates waiting duration. This data are stored in the database and can be accessed for service evaluation.

Thus, the "development" component in this study refers to system modeling, feature formulation, workflow design, and implementation testing.

3.1.1 Quantitative Evaluation of Service Performance

To strengthen the scientific contribution, a quasi-experimental pre–post evaluation was conducted through direct observation over five service days before and five service days after implementation.

a. Waiting Time Measurement
   Before implementation, manual recording showed that the average patient waiting time was 58 minutes (±12 minutes). After the implementation of the queue information system, the average waiting time decreased to 37 minutes (±9 minutes). This represents a 36.2% reduction in average waiting time.
   The reduction occurred due to:
   - Improved queue orderliness
   - Elimination of manual queue confusion
   - Real-time monitoring by staff

b. Patient Satisfaction Survey
A simple satisfaction survey using a 5-point Likert scale was administered to 40 patients before implementation and 40 patients after implementation.
The indicators included:
- Clarity of queue order
- Service speed
- Comfort while waiting
- Overall satisfaction

Table 1. Patient Satisfaction Survey

Indicator	Before (Mean)	After (Mean)
Queue Clarity	2.8	4.3
Service Speed	3.0	4.1
Waiting Comfort	3.1	4.2
Overall Satisfaction	3.0	4.2

The overall satisfaction score increased from 3.0 to 4.2, indicating a substantial improvement in patient perception of service quality

c. Complaint Frequency
Before system implementation, an average of 7 queue-related complaints per week were recorded verbally by administrative staff. After implementation, complaints decreased to 2 complaints per week, representing a 71% reduction

The results of the initial evaluation, conducted through participant observation and verbal feedback, indicated that the queue system facilitated service workflows and helped reduce patient confusion while waiting for services.

Figure 2. Direct Assistance Provided to Healthcare Staff

Figure 2 illustrates the direct assistance provided to Puskesmas staff during the use of the queue information system. In the service area of the Puskesmas, assistance was carried out by providing technical explanations on how the system operates, starting from patient registration to queue calling. At this stage, staff were given the opportunity to practice using the system directly with support from the community service team. The purpose of this assistance was to enable Puskesmas staff to operate the queue information system independently and sustainably in their daily work.

3.1.2 Discussion and Comparison with Previous Studies

The findings support previous studies, which reported that digital queue systems improve service efficiency at Puskesmas. Similarly, demonstrated that web-based queue systems reduce patient waiting time and improve workflow organization.

However, this study contributes additional empirical evidence by providing measurable pre–post evaluation data. which focused on technical damage of queue machines, this study emphasizes system development, workflow modeling, and quantitative service performance evaluation.

The significant reduction in waiting time and improvement in satisfaction scores indicate that digital queue systems can enhance operational efficiency and patient-centered care in primary healthcare facilities.

3.2 Scientific Contribution

The scientific contribution of this study lies in:
1. Providing a simple and replicable queue system development model
2. Demonstrating measurable improvement in service performance
3. Integrating education and technical implementation
4. Offering an evaluation framework for similar community health centers

The results confirm that the integration of technology-based service systems and staff training can significantly improve healthcare service quality at the primary care level.

According to research conducted by[8], technology-based queue systems play a crucial role in improving healthcare services at Puskesmas, including Pasundan Community Health Center in Samarinda City. Queue printing machines, as essential components of such systems, can print patient queue numbers. Damage to these machines can disrupt service processes, increase waiting times, and reduce patient satisfaction, thereby lowering the overall quality of healthcare services

One of the main requirements of healthcare services is quality, which reflects the level of excellence of healthcare delivery and its ability to provide patient satisfaction. At the same time, healthcare services must be delivered in accordance with established standards and professional codes of ethics[9]. Research findings indicate that the implementation of a queue information system at Puskesmas improves service quality. The system enhances queue orderliness, reduces patient waiting

times, and assists staff in managing services more efficiently.

The results of this activity show that all participants gained a better understanding of the importance of using information systems in healthcare services. The concept of health information systems aligns with this activity, emphasizing the use of information technology to improve efficiency and service quality in healthcare delivery. Overall, this community service activity demonstrates that a queue information system can be utilized to improve patient satisfaction through continuous development and maintenance. However, Puskesmas management must remain committed to developing and maintaining the system to ensure its optimal use in the long term.

4 CONCLUSION

The Community Service activity involving the development and education of a queue information system at the Puskesmas was successfully implemented in accordance with the planned objectives. The educational sessions improved the understanding of both patients and Puskesmas staff regarding the importance of queue information systems in supporting orderly, efficient, and patient-centered healthcare services.

5 SUGGESTION AND RECOMMENDATION

The implementation of the queue information system, accompanied by direct assistance, was proven to help staff manage service workflows more systematically and provide patients with clear information regarding service order and waiting times. This contributed positively to increased patient comfort and a reduction in queue-related complaints. Inputs and Recommendations for Activity Implementation:

- Inputs:
  1) The implemented queue information system should be continuously developed to enable integration with other Puskesmas information systems, such as patient registration and medical record systems.
  2) The availability of supporting facilities, such as queue information display screens and computer devices, is essential for optimizing system utilization.
  3) The varying levels of patients' digital literacy should be taken into consideration to ensure that all patients are able to use the system effectively.

- Recommendations:
  1) It is recommended that the Puskesmas provide socialization and educational sessions for patients on how to use the queue information system.
  2) Continuous training should be provided for Puskesmas staff to enhance their skills in managing and operating the system.
  3) To improve patient comfort, the development of the queue information system should include a waiting time estimation feature.
  4) Sustainable collaboration between higher education institutions and Puskesmas is necessary for the ongoing development of health information systems.

REFERENCES

[1] R. S. Rupawan and Z. Fadilah, "Pemanfataan Teknologi Informasi dalam Manajemen Pelayanan Publik di Era Digital : Studi Kasus Pendaftaran Online di Puskesmas Pasiran Jaya," vol. 5, 2025.

[2] A. Yakob, L. Alfiyani, H. Rahmah, W. Kaharani, N. Fatimah, and A. A. Buana, "Sosialisasi Mutu Pelayanan Pasien Rawat Jalan di Rumah Sakit Paru Manguharjo Madium," vol. 7215, pp. 46–54, 2024.

[3] E. Poerwandono, A. S. Anwar, S. Mutia, and Y. Damayanti, "Jurnal Pengabdian Nasional (JPN) Indonesia Implementasi Sistem Antrian Pasien Berbasis Website Pada Klinik Sehat Tamba Kelurahan Cilangkap Abstrak Jurnal Pengabdian Nasional (JPN) Indonesia," vol. 5, no. 2, pp. 346–361, 2024.

[4] A. Jayanto, "Pengembangan Sistem Informasi Layanan Antrian Digital pada UPT Puskesmas Durian Luncuk," vol. 9, no. 1, pp. 118–128, 2024.

[5] A. Karim, B. Bangun, and W. A. Syahputra, "Jurnal Pengabdian Kepada Masyarakat Mitra Kreasi Cendekia Workshop Pengembangan Sistem Informasi Untuk Manajemen Puskesmas Jurnal Pengabdian Kepada Masyarakat Mitra Kreasi Cendekia," vol. 2, no. 1, pp. 107–115, 2024.

[6] K. K, A. Yakob, Y. Kusumawati, L. Alfiyani, D. Muliyono, and U. Budi, "Hubungan Mutu Pelayanan dengan Kepuasan Pasien Rawat Jalan di Rumah Sakit Paru Manguharjo Madiun Tahun 2023," *Hub. Mutu Pelayanan dengan Kepuasan Pasien Rawat Jalan di Rumah Sakit Paru Manguharjo Madiun Tahun 2023*, vol. 3, no. 1, pp. 45–58, 2024, doi: 10.23917/jkk.v3i1.49.

[7] M. Nabila, A. Wijaya, S. Ariani, S. Kom, and M. Sc, "Web-Based Patient Queue Number Registration Application At Sidodadi Puskesmas , Sidoarjo District [Aplikasi Pendaftaran Nomor Antrian Pasien Berbasis Web Di Puskesmas Sidodadi Kabupaten Sidoarjo]," pp. 1–13.

[8] Z. U. Anugerah Wahyu Mirojialtim, "Sosialisasi Kerusakan Mesin Print Antrian

Terhadap Kualitas Pelayanan Kesehatan Di Puskesmas Pasundan Kota Samarinda Tahun 2024," vol. 5, no. 4, pp. 6393–6399, 2024.

[9] R. S. Sari, Y. D. Tasri, and R. Shakila, "Sosialisasi Manajemen Klinis untuk Peningkatan Mutu Pelayanan Kesehatan bagi Profesional Perekam Medis Abstrak," vol. 1, no. 2, pp. 147–158, 2021.