

Transformation of Patient Queuing System at Medika Saintika Clinic based on Web

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ABSTRACT

This study aims to conduct Transformation of Patient Queuing System at Medika Saintika Clinic by implementing a web-based solution to improve efficiency and patient experience. The conventional queuing system used today often causes various problems, such as long waiting times and inconvenience for patients due to irregular queues. In an effort to address these issues, this research develops a web-based queuing system that allows patients to register and monitor queue status in real-time through a digital platform. The system is designed with a simple and accessible user interface, as well as efficient backend integration for queue data management. The research methodology involved system design, testing, and implementation evaluation to ensure that this solution can speed up the queuing process, reduce crowds at the clinic, and improve patient satisfaction. The results of the implementation showed a significant decrease in patient waiting time and an increase in patient satisfaction. This study concludes that a web-based solution can effectively transform a traditional queuing system into a more modern and efficient one, and provide long-term benefits to clinic operations and patient experience.

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1. INTRODUCTION

In today's digital era, information technology transformation is key to improving operational efficiency in various sectors, including healthcare. One area that has received special attention is the patient queuing system at clinics. With the increasing number of patients and complexity of services, conventional queuing systems often face various challenges such as long waiting times and sub-optimal resource management [1]. To overcome these problems, many clinics are turning to web-based solutions that offer more efficient and transparent queue management [2].

Klinik Medika Saintika is one such healthcare facility that is undergoing significant changes in its queuing system through the implementation of web-based technology. This transformation aims to improve the patient experience and operational efficiency of the clinic. By using a web-based queuing system, it is expected that waiting times can be minimized and the patient registration process becomes simpler and more structured [3]. This technology allows real-time monitoring as well as more flexible schedule settings, reducing the possibility of administrative errors.

For example, a study by Smith et al. showed that the use of a web-based queuing system can reduce patient waiting time by 30% and significantly improve patient satisfaction [4]. This shows that the implementation of this technology can provide substantial benefits, not only in terms of efficiency but also in improving the quality of health services. The implementation of web-based queuing systems can also facilitate integration with other clinic management systems, such as electronic medical records and payment systems [5].

However, the transition from a conventional queuing system to a web-based system is not without challenges. Aspects such as staff training, integration with existing infrastructure, and the need for the system to be stably accessible to patients are key factors to consider [6]. In this context, an in-depth analysis of the implementation of a web-based queuing system at Klinik Medika Saintika will provide valuable insights into how these challenges can be overcome and how maximum benefits can be achieved.

This study aims to evaluate the transformation of the patient queuing system at Klinik Medika Saintika and analyze its impact on efficiency and patient satisfaction. By exploring the technical and operational aspects of the new system, it is hoped that this research can make a significant contribution to the development of web-based queuing systems in the healthcare sector [7].

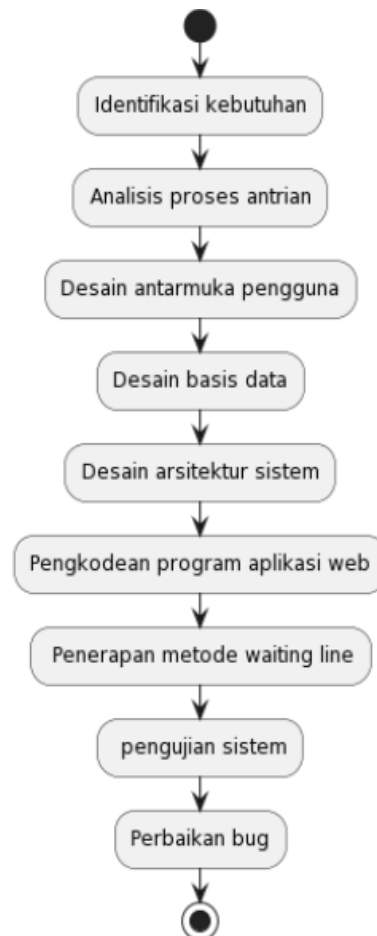
2. METHOD

This study used a mixed methodological approach to evaluate the transformation of the web-based patient queuing system at Klinik Medika Saintika. This method includes both qualitative and quantitative data collection to gain a thorough understanding of the effectiveness and impact of the newly implemented queuing system. The following are the steps taken in this study:

- (1). Research Design: This study followed a case study design with an evaluative approach. The main focus was to analyze the implementation and outcomes of the web-based queuing system at Klinik Medika Saintika. This design allowed the researcher to investigate in depth how the system changes affected various aspects of clinic operations and patient experience.
- (2). Quantitative Data Collection: To collect quantitative data, surveys and statistical analysis were used. Data was collected from two main sources:
 - a) Web Queuing System: Data from the new queuing system was collected to evaluate the average patient waiting time, satisfaction levels, and frequency of use of certain features. This data was analyzed to identify trends and changes in operational efficiency before and after the implementation of the new system [8].
 - b) Patient Questionnaire: A questionnaire was distributed to patients who used the clinic's services during the study period. The questionnaire was designed to measure patient satisfaction, perceived waiting time, and overall experience with the web-based queuing system. The questionnaire was designed with a Likert scale to enable valid and reliable statistical analysis [9].
- (3). Qualitative Data Collection: Qualitative data was collected through in-depth interviews and observations:
 - a) Interviews with Clinic Staff: Interviews were conducted with clinic staff, including administration and medical personnel, to understand their views on the effectiveness of the new queuing system and the challenges faced during the transition. These interviews also provided insights into how the new system affected their daily work [10].
 - b) Direct Observation: Observations were conducted at the clinic to assess how the web-based queuing system was used in daily practice. These observations helped the researcher understand the interaction between patients and the system as well as how the system integrates with the clinic's workflow [11].
- (4). Data Analysis: Quantitative data was analyzed using statistical software to determine significant changes in patient waiting time, satisfaction levels, and operational efficiency. Statistical hypothesis tests such as t-test or ANOVA were used to compare data before and after system implementation [12]. Qualitative data was analyzed using thematic analysis techniques to identify patterns and key themes in interviews and observations [13].
- (5). Evaluation and Recommendation: Based on the quantitative and qualitative data analysis, the researcher evaluated the effectiveness of the web-based queuing system and provided recommendations for further

improvement. This evaluation includes an assessment of the achievement of system objectives, identification of areas for improvement, and suggestions for continuous improvement [14].

The system development method used is the waterfall development method. The process in the waterfall method is as follows [15]:



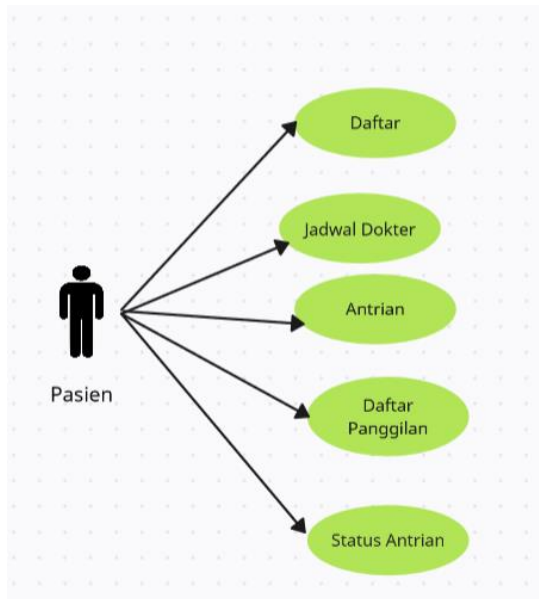
Picture 1 Model Waterfall

3. RESULTS AND DISCUSSION

Medika Saintika Clinic faces challenges in managing patient queues that are increasing every day. To overcome this problem, the clinic decided to implement a web-based queuing system that allows patients to register online, manage queues, and update doctor schedules more efficiently.

1) Use Case

The following is a use case design for a journal entitled "Transformation of the Patient Queuing System at the Web-based Medika Saintika Clinic":



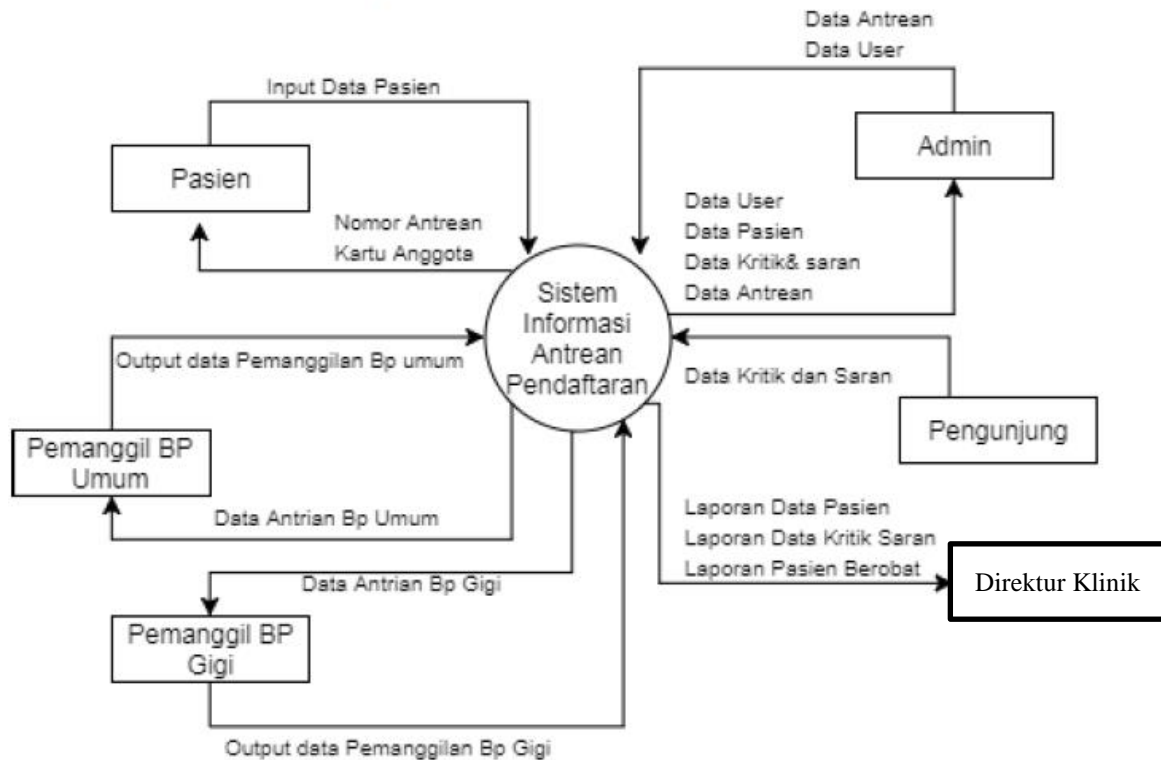
Picture .2 Use Case

Medika Saintika Clinic faces challenges in managing patient queues that are increasing every day. To overcome this problem, the clinic decided to implement a web-based queuing system that allows patients to register online, manage queues, and update doctor schedules more efficiently.

- (1). Patient Queue Registration Patients now no longer need to come to the clinic early just to get a queue number. Through a web-based queuing system, patients can register from home or any other place that has internet access. Patients only need to visit the clinic's website, enter personal information such as name, phone number, and select the type of service needed. After that, the patient can select the desired doctor based on the available schedule. The system will then automatically assign a queue number to the patient, which can be accessed via the web or sent via SMS. In this way, patients can avoid long queues at the clinic and arrive on time according to the estimated service.
- (2). Doctors' Schedule Management To ensure that information regarding doctors' schedules is always up-to-date, the Clinic Admin is given the responsibility to manage doctors' schedules through this web-based system. Admins can add, change, or delete doctor schedules easily, so that patients always get accurate information about when a particular doctor is available. With this feature, errors in scheduling can be minimized, and the flow of patient queues can run more smoothly.
- (3). Managing Patient Queues The system also allows Clinic Admins to manage patient queues in real-time. After a patient registers online, the Clinic Admin can monitor and manage the queue order through a simple interface. If there are any sudden changes, such as a doctor having to attend an emergency situation or a patient canceling their visit, the Admin can update the queue immediately. With good management, patient waiting time can be minimized, and healthcare services can be provided more efficiently.
- (4). Queue Calling When it is time for the patient to be served, the Clinic Admin or Doctor can call the patient according to the registered queue number. Through the system, the Admin or Doctor can see the complete information of the called patient and announce the queue number automatically. This system helps minimize confusion that may occur if the queue is managed manually, and ensures that patients are served according to the correct order.
- (5). Viewing Queue Status Patients also have the ability to monitor their queue status in real-time. After registering, patients can login to the system to view their position in the queue as well as the estimated time until their turn arrives. With this feature, patients do not have to wait at the clinic for too long and can better plan their arrival. This not only improves patient convenience but also reduces overcrowding in the clinic's waiting area.

2) Contax Diagram

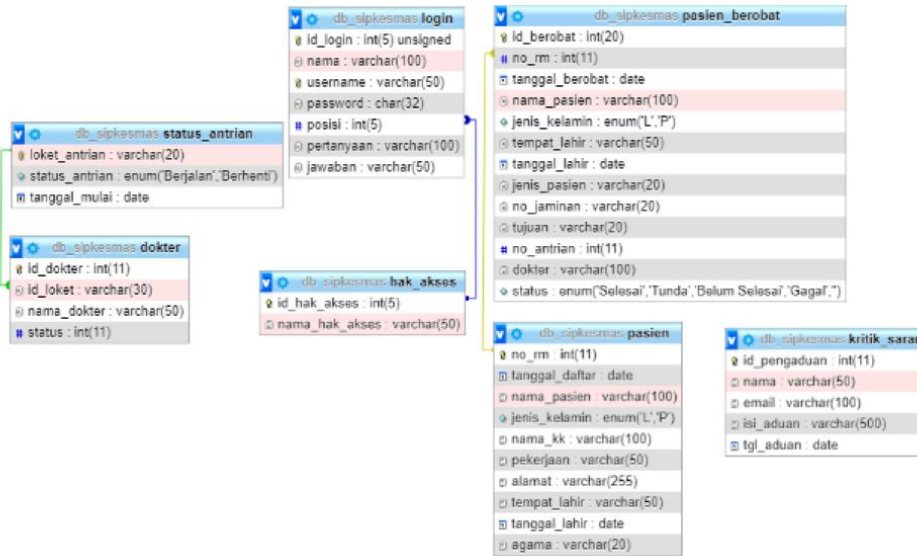
In the context of designing the Transformation of the Patient Queuing System at the Web-based Medika Saintika Clinic, the context diagram will describe the interaction between the information system and users such as medical personnel, hospital management, and external parties involved in medical record management. This diagram provides an overview of the scope and limits of the system being developed.



Picture 3. Contax Diagram

3) Table Relation

Table relations in the Web-based Medika Saintika Clinic Patient Queue System Transformation application serve to link patient data with their queue status, manage clinic staff schedules and allocations, and integrate various components such as payments and medical records. With these relations, the system can ensure that each patient is processed in the correct order, staff are available as scheduled, and queue status notifications can be sent automatically, thus improving operational efficiency and patient convenience.



Picture 4. Table Relation

4) User Interface

a. User Login

Picture 5. Form Login

b. Form Registration

Picture 6. Form Registration

c. Form Queue



The screenshot shows a queue form for 'KLINIK MEDIKA SAINTIKA'. The form displays the patient's name 'Herman' and RM number 'RM08002'. The current queue number is '2', and the date is '23 Januari 2024'. There is a 'Refresh' button at the bottom.

KLINIK MEDIKA SAINTIKA
Nomor Antrian
Nama Pasien : Herman
No. RM : RM08002
2
23 Januari 2024
Nomor Antrian sekarang
Refresh

Picture 7. Form Queue

d. Check Queing Status



The first screenshot shows the 'Cek Status Antrian' interface with a text input field for the RM number and 'Cek' and 'Lupa No RM' buttons. The second and third screenshots show the queue status for 'Antrian BP Umum' and 'Antrian BP Gigi' respectively, both displaying a queue number of '0' and a 'Refresh' button.

Cek Status Antrian
Silahkan masukkan No. RM Anda
RM000 Nomor RM Anda
Cek Lupa No RM
Antrian BP Umum
Antrian saat ini
0
Refresh
Antrian BP Gigi
Antrian saat ini
0
Refresh

Picture 8. Check Queing Status

4. CONCLUSION

This research shows that the implementation of a web-based queuing system significantly improved the clinic's operational efficiency and patient experience. The system successfully reduced patient waiting time and improved queue regularity through a digital platform that enabled real-time queue registration and monitoring. The simple interface design and efficient backend integration contributed to ease of use and better queue data management, which in turn decreased the number of crowds at the clinic and improved overall patient satisfaction.

This transformation proves that web-based solutions can effectively transform traditional queuing systems into more modern and efficient ones. By adopting this technology, clinics are able to optimize resources and provide services that are more responsive to patient needs. In addition, the web-based queuing system also allows the clinic to leverage digital technology to create a more organized and comfortable environment for patients.

The process of designing, testing, and evaluating the implementation conducted in this study provides a strong foundation for the implementation of similar systems in other healthcare facilities. The success of this transformation opens up opportunities for further development, including integration with other health information systems and adaptation to various clinic operational scenarios. Thus, this study not only provides a practical solution to the queuing problem, but also provides guidance for the development of similar innovations in the future.

Overall, this study confirms that the transformation of conventional queuing systems into technology-based systems can be a strategic step in improving the quality of health services and patient satisfaction in the digital era. Technological innovation in the healthcare sector, particularly in patient flow management, has been proven to bring long-term benefits to clinic operations and patient experience.

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