Web-based Patient Queuing System and Automatic Notification via WhatsApp Framework Codeigniter

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Abstrak

Pada masa sekarang manfaat dari sistem informasi berbasis website sudah banyak dirasakan namun masih banyak instansi yang belum memanfaatkan betul adanya teknologi. Salah satu sistem yang perlu dikembangkan dalam bidang kesehatan yakni sistem pemberian nomer antrian pada pasien. Adapun tujuan dari penelitian ini adalah untuk mengetahui keefektifan sistem antrian pasien berbasis web dan notifikasi otomatis melalui whatsapp framework codeigniter. Subjek yang terlibat dalam penelitian ini adalah para pasien yang akan mengambil nomer antrian di klinik. Pengumpulan data dalam penelitian dilakukan dengan metode observasi dan wawancara. Data hasil penelitian kemudian dianalisis dengan menggunakan teknik analisis deskriptif, yakni dengan mendeskripsikan berbagai temuan di lapangan yang kemudian dikaitkan dengan hasil penelitian terdahulu. Hasil pengembangan sistem menunjukkan hasil bahwa tingkat keberhasilan sistem pemberian nomer antrian kepada pasien mencapai persentase 100%, dan sistem pengingat nomer natrian juga mendapat persentase keberhasilan sebesar 100%. Hasil ini menunjukkan bahwa sistem nomer antrian telah berhasil di kembangkan, dan dapat membantu mempermudah pasien dalam proses pencarian nomer antrian.

Keywords: *Sistem Nomer Antrian, Framework Codeigniter*

Abstract

At present, the benefits of website-based information systems have been widely felt, but there are still many agencies that have not properly utilized the existence of technology. One of the systems that need to be developed in the health sector is giving queue numbers to patients. This study aimed to determine the effectiveness of the web-based patient queuing system and automatic notifications through the WhatsApp framework Codeigniter. The subjects involved in this study were patients who would take a queue number at the clinic. Data collection in the study was carried out by observation and interview methods. The research data were then analyzed using descriptive analysis techniques, namely by describing various findings in the field, which were then linked to the results of previous studies. The system development results show that the system's success rate for giving queue numbers to patients reaches 100%, and the natrian number reminder system also gets a success percentage of 100%. These results indicate that the queue number system has been successfully developed to help patients search for queue numbers.

Keywords: Queue Number System, Framework Codeigniter

1. INTRODUCTION

The current era of globalization makes technological developments more advanced and rapid, where we know nowadays the use of the internet has spread in various circles, with the internet it can make it easier for someone to get information from various parts of the world (Astria, 2019; Eprilianto et al., 2019; Yani, 2018). The internet has also helped facilitate work in various fields: government, business people, or the health sector (Cholik, 2021). The role of the internet today is very much needed because it can provide more accurate information and can be accessed anywhere and anytime (Fadhlillah et al., 2021). At this time, the benefits of technology and website-based information systems have been widely felt (Julianti et al., 2018; Leksono & Nita, 2018). However, many agencies have not properly utilized technology to provide relief for their users in today's technological developments. Utilizing technology in various fields in Indonesia's big cities is sufficient and

can help work. For example, in the health sector, using this technology is the right solution for public service problems to run optimally (Hidayat et al., 2021; Sapada & Ikbal, 2020; Yani, 2018). On the other hand, health science is also growing rapidly. I make actors in the health sector must be able to balance so that public services can run well to improve the quality of public health (Antoni & Suharjana, 2019; Fadhila & Afriani, 2019; Surayya, 2018). Technology like this can help the effectiveness of health services; medical personnel can reach a wider range of patients and make it easier for patients to receive consultation services (Nadhiro et al., 2021; Priambodo, 2019; Sari et al., 2020).

Based on the many benefits that can be obtained from this technology, it turns out that it has not been properly utilized by regional health clinics, especially those in Salatiga. So far, health clinics in Salatiga are still doing patient registration manually. Patients who want to take a queue number for examination must come directly to the clinic, so many of the patients are bored because their time is up waiting for their queue number to get service. During the current pandemic, taking queue numbers directly can result in overcrowding of visitors. It violates the Covid-19 health protocol and can also quickly spread the coronavirus. Technological innovation is needed to simplify the process of taking queue numbers to overcome these problems. One of the technologies that can be developed is the Web-Based Patient Queue System (Melyanti et al., 2020)**.** Through this system, prospective patients can register in real-time, and the system will be tasked with providing information about the queue number to prospective patients who will carry out examinations via WhatsApp chat notifications without having to wait at the clinic (Rosadi et al., 2020; Roziqin et al., 2021). In addition, this queuing system can also make it easier for patients to register and be more effective in reducing physical contact. We know that the current period is a pandemic. (Oktaviani et al., 2020; Susilowati, 2020; Zulfikar & Supianto, 2018).

In the online queuing system, there are three "Pop Up Notifications" that can be used, including "Website Admin and Clinic," which serves as an interface for clinics to post all clinical information, "patient android application," which serves as an interface for patients to view running queue numbers, ordering queue numbers online, getting notifications in the form of pop up notifications and maps for real-time directions to the clinic location, and a "Web Server" which functions to integrate data from the clinic admin website into the patient's android application. Several studies that have been carried out previously revealed that the use of an Android-based SMS gateway regarding an online queuing data system for patients can make it easier for patients to obtain data about the doctor's practice agenda and make it easier for patients to take queue serial numbers using an Android-based SMS Gateway with a more attractive appearance until the design of an online queue data system using an Android-based Short Message Service (SMS) gateway (Lubis et al., 2020). Other research also revealed that making a registration system and giving queue numbers and results from online-based medical records can make it easier for patients to take queue numbers or their family members without having to queue long when they want to take queue numbers, besides that the online queuing system can also increase time efficiency. In terms of serving patients, it is easier for patients to recognize the results of their medical records and make it easier for clinic staff to serve queue numbers (Suprianto & Matsea, 2018). The third study also revealed that the queue number notification system through the telegram application could make it easier for patients to register online checks so that patients no longer need to wait long, in the development of this application using the PHP programming language and the database using MySQL (Fithri et al., 2020).

Based on some of the results of these studies, it can be said that the online queuing system can make it easier for patients to find queue numbers at the clinic. Besides that, this system is also more efficient at the patient time, thereby reducing crowds in the clinic environment. It's just that in previous studies, there have been no studies that focus on the use

of a web-based patient queuing system and automatic notifications via the WhatsApp framework Codeigniter. So this research is focused on this study to know the effectiveness of the web-based patient queuing system and automatic notifications through the WhatsApp framework Codeigniter.

2. METHOD

This research is classified as development research, which is carried out in five stages of research. The research stages include problem identification, needs analysis, development, testing, and report generation. The problem identification stage is carried out to determine the research objectives and find out the problems that exist in the clinics. Needs analysis is carried out after the problem is completed to determine the user's needs for the patient queue application that will be made. It is done so that the application is made according to user needs. In this stage, system development is carried out where this stage is carried out after completing the needs analysis on the web application based on the needs and problems that exist in the application. The system testing phase is carried out to ensure whether the patient queuing system application is by user needs. In making reports, it is done after all stages in the patient queue research are completed. This report will contain everything that has been done during the research process. The study was carried out in Salatiga, with the research subjects being patients who would take the queue number at the clinic. Data collection in the study was carried out by observation and interview methods. The research data were then analyzed using descriptive analysis techniques, namely by describing various findings in the field, which were then linked to the results of previous studies.

3. RESULT AND DISCUSSION

Result

In research on developing an online queuing system, the first stage was to identify the most common problems experienced by nurses or patients in health clinics. The identification results show that several clinics in Salatiga have problems in providing patient queue numbers. Patients must compete to arrive early at the clinic not to get a queue number that is too far away. It resulted in long queues at the clinic. During a pandemic like today, of course, this is not a good thing to do. After obtaining the problems experienced by patients and nurses, the research continued in the second stage, namely identifying needs. Based on the problem, it is known that clinics and patients need an application system that can provide online queues for patients. In addition, clinics and patients also need an application system to remind patients about the control schedule, so they don't forget and don't lose their queue numbers. After knowing the problems and needs of the clinic and patients, the research then continued in the third stage, namely the development of a queuing application system. The application is developed using the Codeigniter framework system. The queue flowchart can be seen in Figure 1.

The flowchart of the patient queuing system application shows the process passed when the application is first to run until its completion. Queue numbers and queue reminders will be sent via WhatsApp to provide convenience to patients. The patient queue number system is designed by using the WhatsApp chat API coding to send automatic notifications to the registered patient's WhatsApp number when registering. In addition, the WhatsApp Chat API coding is also designed so that patients only need to wait for their queue number, where when the patient's queue number is approaching, the system will automatically send a notification to the patient that the queue number is approaching.
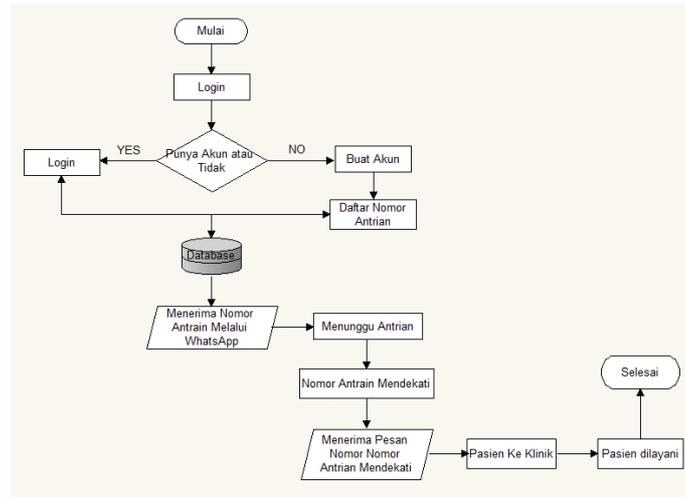
Figure 1. Flowchart of patient queue application

After the queue number system was designed, the research proceeded to the fourth stage, namely the system trial stage. The trial was carried out on the queue number notification system and closed the queue number notification system. The queue number notification trial was carried out 14 times to all prospective clinical patients in the city of Samarinda. The test results show that the system's success in providing queue numbers to patients reaches a percentage of 100%, where there are no errors in the trial process. Furthermore, in the trial process of the queue notification (when it is approaching), after the patient gets the queue number, the patient only needs to wait for the notification via WhatsApp, where when the queue number is approaching, the patient will receive a notification via WhatsApp. From the trials carried out 20 times, the success rate is 100%, which means there are no system errors. The fifth development stage is preparing a report carried out by presenting the research results. The research results presented are related to several other relevant studies to strengthen the research results.

Discussion

The results showed that the web-based patient queuing system and automatic notifications via the WhatsApp framework Codeigniter were feasible to develop and use. Several factors influence the success of developing the queue number system obtained in this study. The first factor is that the system developed has been following the needs of nurses and patients as it is well known that one of the most common obstacles experienced by clinics in the patient management process is being constrained in the process of providing queue numbers (Maulana, 2019; Roziqin et al., 2021). Provision of queue numbers is generally made by directing patients to take queue numbers directly when they come to the clinic (Mustofa et al., 2019). It's just that a manual system like this creates many obstacles, such as the number of patients at a time and the possibility of missing queue numbers. (Afriantoro et al., 2020; Salim et al., 2019). In the manual queue number collection system, the patient arrives early to get the queue number and waits for hours for their turn (Junirianto & Fadhliana, 2019; Wijaya, 2019). Such a system is certainly less effective and takes a lot of time (Hanifah et al., 2018). The queue number system is needed to streamline time and avoid crowds, especially during a pandemic like today.

The second factor is that the developed system can facilitate patient queue numbers. The queue number system can provide queue numbers to customers without bringing in the customer directly (Aziz et al., 2016; Zulfikar & Supianto, 2018). It is certainly more efficient, so patients don't have to wait for hours at the clinic (Risanto, 2019). Patients can come to the

clinic through the queue number system after getting a WhatsApp notification that the queue number is near (Suryani et al., 2021; Syam & Wahyuningsih, 2020). Giving notification that the queue number is near will also remind the patient to complete the control on time. It will also reduce the crowd in the clinic (Muhammad & Ananda, 2020).

The third factor is that the system developed is practical and easy to use. The queue number system was developed using the CodeIgniter framework and MySQL database. The Codeigniter framework is a framework that uses the MVC model (model, view, and controller) that uses PHP to build dynamic websites (Megantar et al., 2020; Sentosa, 2018). In coding, the framework is not much different from PHP, where the framework is derived from PHP. In building a website application, view controller users are made easier because the framework has a structured appearance and easy-to-use website maintenance (Putra & Putera, 2019). The CodeIgniter framework already provides best practices, coding standards, design patterns, and common functions (Julianti et al., 2018). Website creation can be done in an open source way using PHP as a framework with an MVC model (model, view, and controller), commonly called Codeigniter (Endra et al., 2021). Frameworks speed up and simplify the work of a programmer; besides that, the framework has various functions, including classes and procedures that are ready to use without having to create functions and classes from scratch (Fitriana et al., 2020; Ningtyas & Setiyawati, 2021).

In addition to using the CodeIgniter Framework, system development is also carried out using MySQL, a popular open-source database server used by various applications, especially for servers or web development (Tabrani, 2018). MySQL is a multi-user data storage program that can quickly receive and send data and has a fairly good security system (Gultom & Oktarina, 2019). MySQL itself uses the basic SQL (Structured Query Language) commands. MySQL is a free database under the GNU / GPL (General Public License), so we can use the database. Using the CodeIgniter Framework and MySQL in system development can simplify using the system itself (Quran. In this case, the use of the queue number system by the patient only needs to be done by clicking on the link on the website that has been provided. The patient will be immediately directed to the registration form and get a queue number via WhatsApp message through this link.

The results obtained in this study are in line with several previous research results which also revealed that the use of an Android-based SMS gateway about an online queuing data system for patients could make it easier for patients to obtain data about the doctor's practice plan and make it easier for patients to take queue serial numbers using the SMS Gateway. Android-based with a more attractive appearance until an online queue data system is designed using an Android-based Short Message Service (SMS) gateway (Lubis et al., 2020). Other research also revealed that making a registration system and giving queue numbers and results from online-based medical records can make it easier for patients to take queue numbers or their family members without having to queue long when they want to take queue numbers, besides that the online queuing system can also increase time efficiency. In terms of serving patients, it is easier for patients to recognize the results of their medical records and make it easier for clinic staff to serve queue numbers (Suprianto & Matsea, 2018). The third study also revealed that the queue number notification system through the telegram application could make it easier for patients to register online checks so that patients no longer need to wait long, in the development of this application using the PHP programming language and the database using MySQL (Fithri et al., 2020). Based on the results of research supported by the results of previous studies, it can be said that the use of the queue number system is beneficial in the patient registration process. This system is also more efficient inpatient time to reduce crowds in the clinic environment.

4. CONCLUSION

Based on the results of designing a Web-Based Patient Queuing System and Automatic Notifications Via Whatsapp using the CodeIgniter Framework, the results show that after 14 trials starting from sending messages to notifications when the queue number approaches, the success rate is 100%, and also patients no longer need to come directly the place to take the queue number, so this application is considered suitable for use. In addition, the test results of the queue reminder system also show a success percentage of 100%. It shows that the system has been appropriately developed and there are no errors.

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