

## **IMPLEMENTATION OF THE RAPID APPLICATION DEVELOPMENT METHOD FOR DESIGNING AN OUTPATIENT ONLINE REGISTRATION SYSTEM IN AN INDEPENDENT DOCTOR'S PRACTICE**

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### **ABSTRACT**

The use of the website has become a necessity in health services and makes it easier to work in health care facilities. Doctors' independent practice as a health service facility can use the website to assist the outpatient registration process. Outpatient registration services at independent doctor's practices still use a manual system, patients must come to registration, take a queue card printed by the officer, wait according to the queue number obtained so that the process causes patient waiting time at the service to be long. The purpose of this study is to produce an outpatient online registration system in independent doctor's practices that is able to assist outpatients to register online for outpatients. Development of an Outpatient Online Registration System at this Independent Doctor's Practice using the Rapid Application Development (RAD) method, this development model is used because this model is considered a time-honored model, so the process is relatively faster. This study applies the Rapid Application Development method to produce an outpatient online registration system at independent Practitioners that is able to manage patient data, doctor data, polyclinic queue data, polyclinic data, queue data and outpatient registration data. The Rapid Application Development method has been able to streamline the processing time for making the system to produce an Outpatient Online Registration System.

Keywords: medical record, patient registration, outpatient, website, rapid application, independent doctor practice

### **INTRODUCTION**

Health services are demanded to be more dynamic in the current era, because of the increasing mobility of humans. For example, in registering a patient at a health care facility, the patient does not need to come directly to the location, just register online. This research is a system development research in doctor X's practice in the city of Surakarta, Central Java Province. Independent medical practice consists of polyclinics that serve general health services. In its business process, Doctor X's independent doctor practice does not yet have a computerized system to manage patient registration and medical history. Patients who have complaints have to come to the practice location to register after that they are still queuing for a long time to get services. Given these problems, it is necessary to do this research.

The development of this information system applies the Rapid Application Development (RAD) method which can streamline system development time and resources. Previous research has shown that the RAD method can streamline system development time (Wijaya, 2020). The RAD method involves the user or end user as part of the overall system development process and acts as a decision maker at each stage of system development (Noertjahyana, 2002). Systems that have a high level of dynamics, the availability of limited time and budget for development, for the needs of the latest information quickly, and the need for close personal interactions with the

characteristics of the users are more appropriate to apply the RAD method.(Irnawati and Listianto, 2018).

The online outpatient registration system is able to improve the quality of registration services, increase patient and family satisfaction, as well as the effectiveness and efficiency of outpatient/polyclinic services.(Solihah and Budi, 2018). By planning to make an online registration application in the form of a website in terms of registering a queue for medical services, it is hoped that this problem can be resolved because there is information on when the estimated turn time of the patient is according to the registration number so that patients who have become members of the clinic can estimate the time to come without having to wait long at the clinic. Clinics, besides that, it can facilitate the delivery of information to patients and the public at large about the medical services offered by the Clinic with an attractive web(Abdullah and Iswandi, 2015).

## METHOD

The system development method with Rapid Application Development consists of 4 stages as shown in Figure 1:

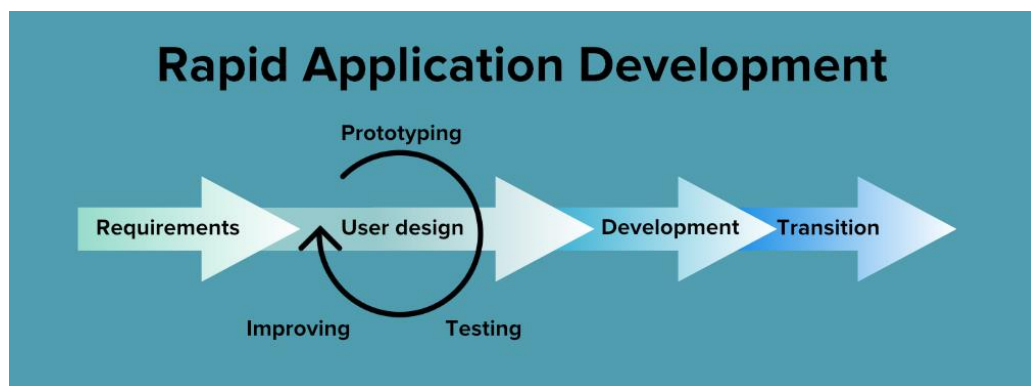


Figure 1 Stages of System Development with Rapid Application Development(Demchenko, 2020).

### 1. Requirements Planning.

At the planning stage of needs identification of problems encountered in the outpatient registration process in independent doctor's practices. In addition, data collection from system users regarding the purpose of the system and identification of system requirements is also carried out.

### 2. System Design.

At the system design stage, data flow design is carried out using use case diagrams, database design and interface design for user interaction with the system.

### 3. Process of developing and gathering feedback.

In this process, the design is changed to the form of an application program. System programmers need to carry out system development and integration with other components while constantly receiving input from users..

### 4. Implementation or completion of the product.

At this stage the programmer applies an online outpatient registration system in independent doctor's practices. Before the system is implemented, the program testing process is carried out first to detect errors that exist in the developed system. At this stage it is customary to provide feedback on the system that has been made and get approval for the system. The final result obtained is an online outpatient registration system in a doctor's independent practice.

## RESULTS

### Requirements Planning.

Identification of problems encountered in the outpatient registration process at independent doctor's practices, namely (1) Outpatient registration services still use a manual system by means of the patient having to come to registration then take the queue card printed by the officer first and wait according to the queue number obtained so that The process causes patient waiting time at the service to be long. For officers, this results in work inefficiency when they have to simultaneously write patient data and print queue cards for patients; (2) processing of patient data is less effective and efficient because it poses a risk of incompleteness or errors in writing the patient's identity; (3) Registration has not been computerized, making it difficult for officers to search for patient medical record documents at the same time as registering patients. And also there is no computerized data management when officers serve patients, especially when inputting data and collecting daily patient data reports.

Identification of the need for an outpatient registration system was obtained from the results of observations and interviews with system users. System user requirements consist of:

Table 1 Analysis of the Requirement for Outpatient Online Registration System

No	User	Facilities
1	TPPRJ	Login, view doctor data, view polyclinic data, view registration data, view poly queue data, create doctor data, create polyclinic data, create registration data, create poly queue data, edit doctor data, edit poly data, edit registration data, edit poly queue data, delete doctor data, delete poly data, delete registration data, delete poly queue.
2	Patients	Login, view patient data, view queue data, create patient data, create queue data, edit patient data, edit queue data, delete patient data, delete queue data
3	Leaders	View patient data reports, view polyclinic data reports, view doctor data, poly queue reports, registration data reports, queue data reports.

## 2. System Design.

System design consists of designing using use case diagrams

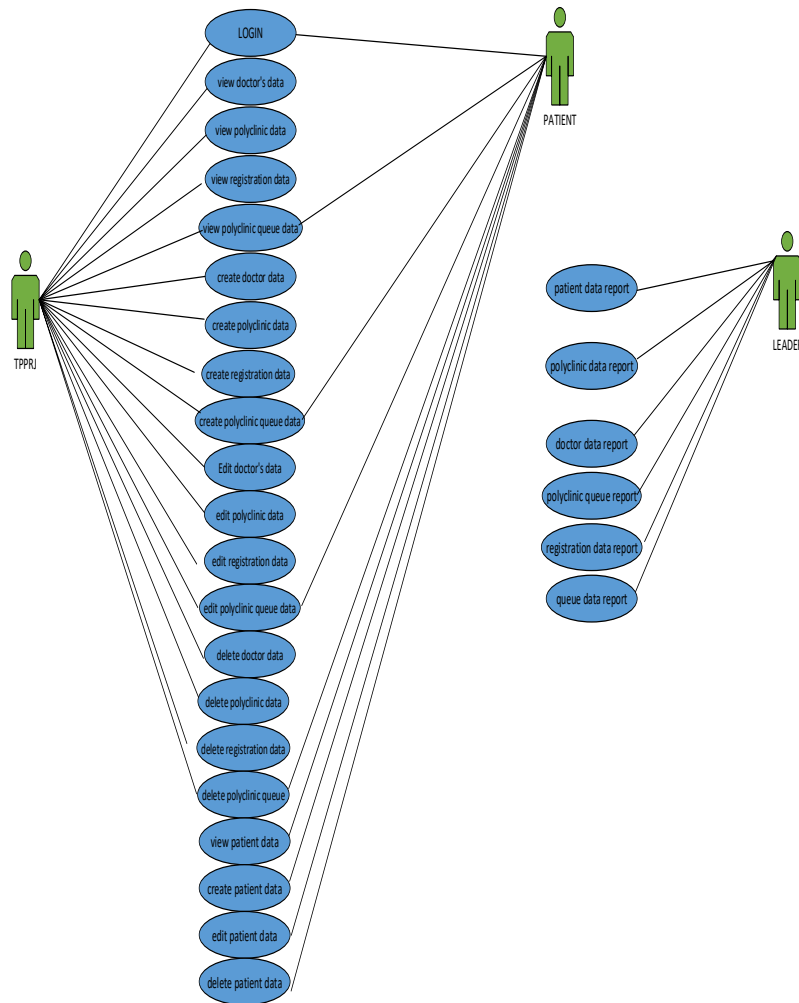


Figure 2 Use Case Diagram of an Outpatient Online Registration System at an Independent Doctor's Practice

The database design and system table structure is presented in Figure 3.

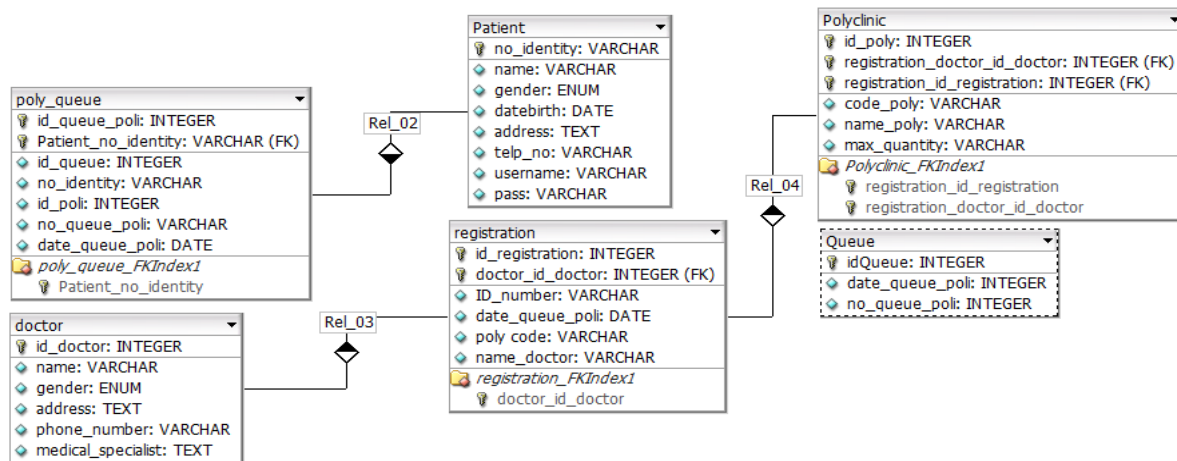


Figure 3 Relationships Between Tables of Outpatient Online Registration System

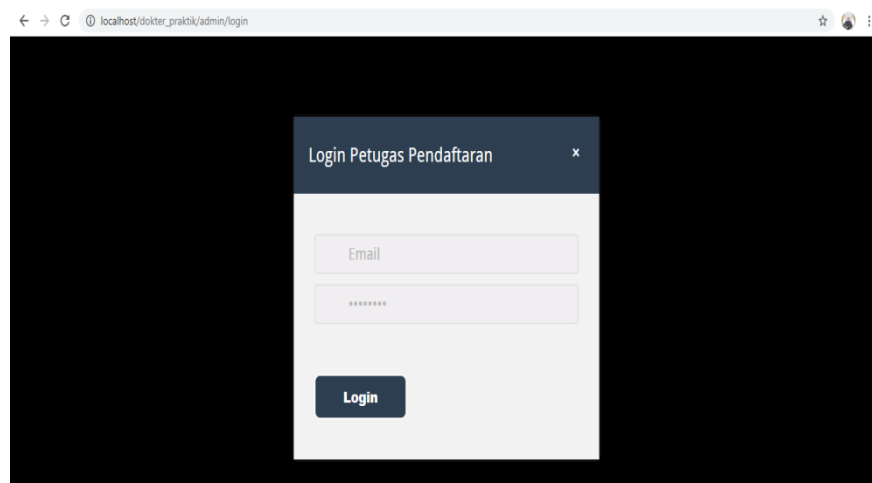
### 3. The process of developing and collecting feedback.

The design carried out at the design stage is realized in the form of an outpatient online registration system. Opinions and input from system users are taken into account when developing the application. Feedback from users is obtained from the results of interviews with users.

### 4. Implementation or completion of the product.

The results of the implementation of the online registration system for outpatients in independent doctor's practices

Figure 4 registration officer login



After the username and password are known and successfully logged in, it will go to the registration officer's web menu display

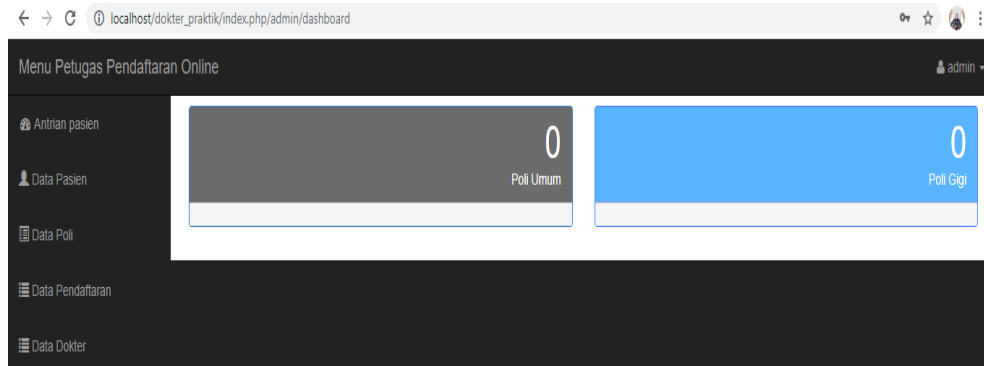


Figure 5 registration menu

The patient page can accommodate patient data entered by the patient when registering online, it can also be filled in by the TPRJ admin via the patient data input page.

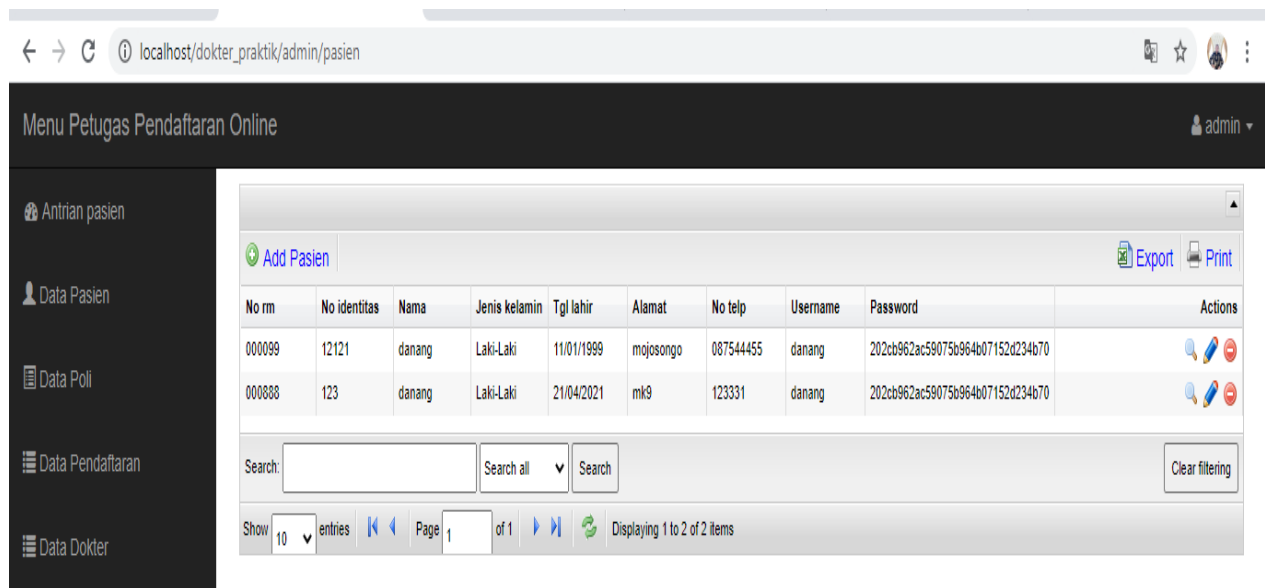


Figure 6 Patient Data Menu

The patient input page is used to store patient data, delete patient data, edit patient data, and view or recheck patient data, connect patient data output reports to ms.excel, print reports and search for patient data.

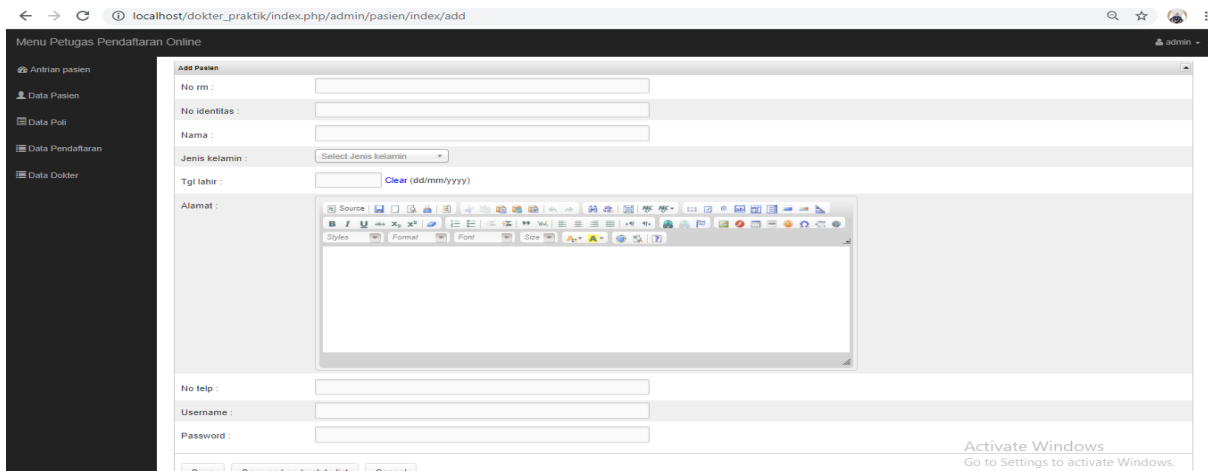
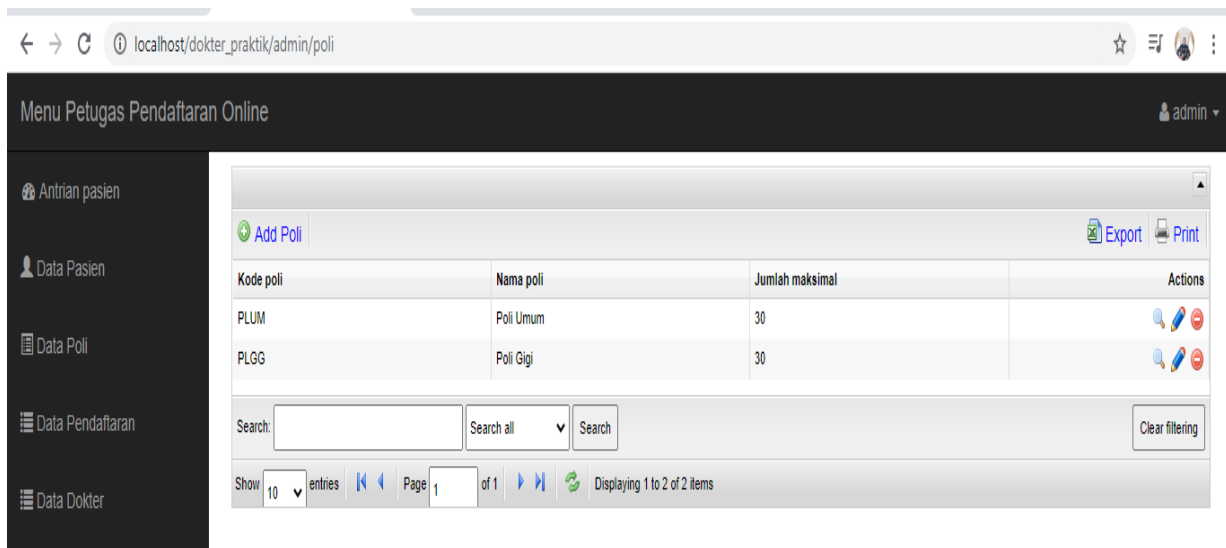


Figure 7 patient data input menu

The polyclinic input page is used to store polyclinic data, delete polyclinic data, edit polyclinic data, view polyclinic data, connect polyclinic data output reports to ms.excel, print polyclinic reports and search for polyclinic data.

Figure 8 polyclinic data menu



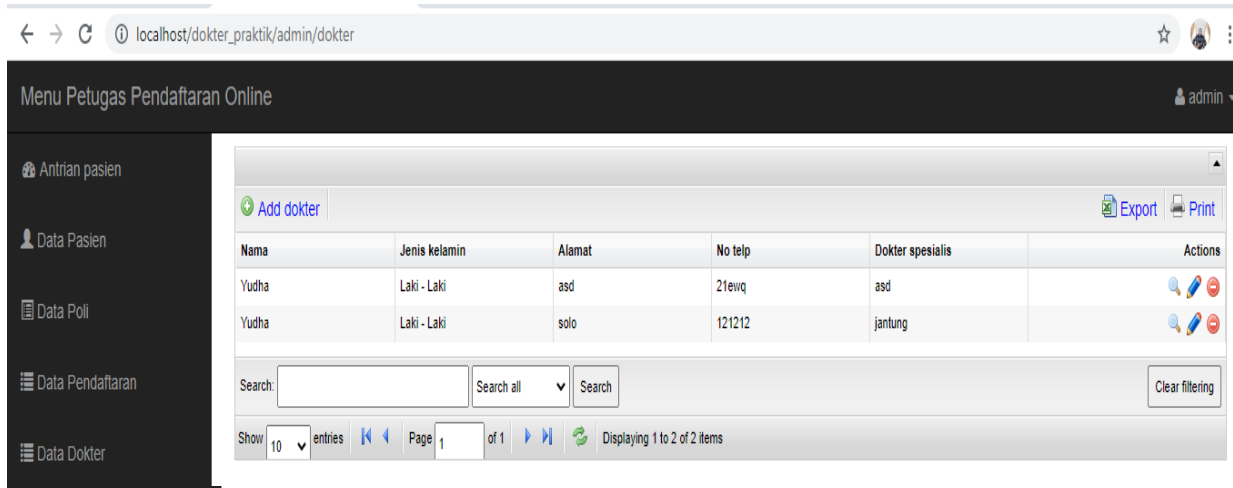
The polyclinic queue page can be filled in 2 ways, firstly when patients register in the online registration system by filling in fields such as patient data tables, the patient data who registers will automatically be inputted in the polyclinic data menu with the results of inputting the polyclinic to which the patient is addressed and the queue number obtained by the patient. patient. The second way the admin or registration officer can input patient polyclinic queue data by clicking add polyclinic queue. The polyclinic queue page is used to store queue data, delete polyclinic queue

data, edit polyclinic queue data, view polyclinic queue data, connect polyclinic queue data output reports to ms.excel, print queue data reports, look for polyclinic queue data.

Figure 9 patient polyclinic queue input menu

The doctor data menu is used to store doctor data, delete doctor data, edit doctor data, view doctor data, connect doctor queue data output reports, print doctor data reports, search doctor data by typing doctor's name.

Figure 10 Doctor data menu



The patient registration page can be filled in 2 ways, the first way is the data is obtained by the patient when registering in the online registration system by filling in fields such as the patient data table so that data such as identity number, name, poly queue date, poly code are obtained. The second way the admin or registration officer can input patient registration data by clicking add data\_registration. The registration data page can save registration data, delete one of the registration data entry items, edit registration data entry item data, or registration data, connect registration data output reports and print outpatient registration reports.

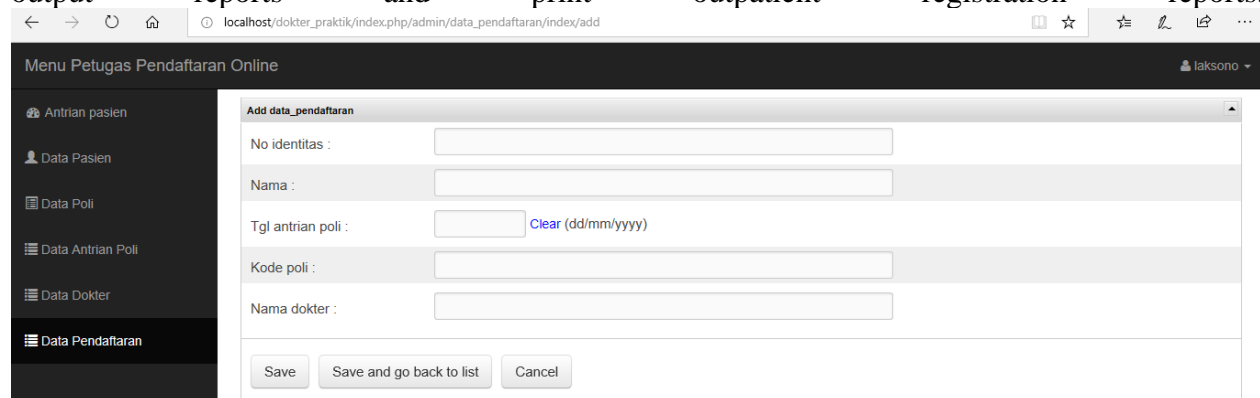


Figure 11 Registration data input menu

The activation of the online registration system for outpatients at independent doctor practices is done by opening the web and then the patient registration home page appears .



Figure 12 Patient registration homepage menu

In this menu there is a login and help button in the header above with the aim that when the patient wants to enter the system, the patient must first log in to enter the username and password, for the help button when the patient first enters the system homepage, the patient can see the flow of how to register a treatment account. . There is a "queue number 2" notification with the aim of informing the patient that the current queue number on this date is 2 queues. The registration button is used by the patient to register for the first time for treatment by entering the patient's personal data.

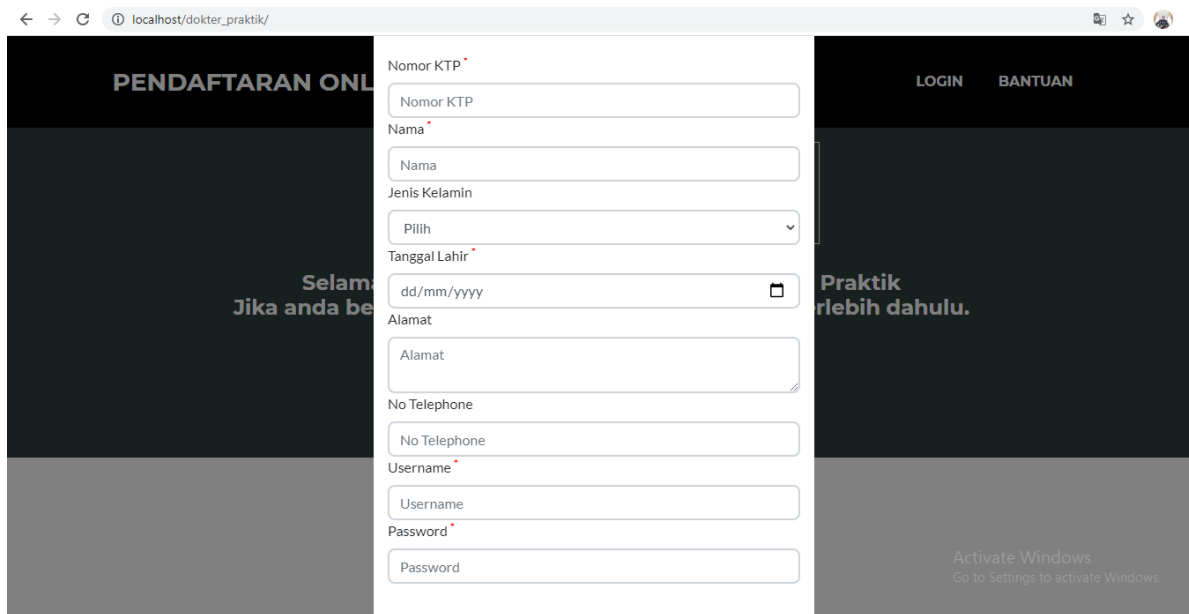


Figure 13 patient registration input

After the patient registers and enters personal data in the registration table, the patient then enters the username and password that has been created into the LOGIN table. In this menu, when the patient enters the homepage for the first time, they are required to go to the take queue menu in order to be able to queue according to the intended polyclinic, click the polyclinic button to select the polyclinic to be queued, then click take queue. If you are already queuing, the patient is notified

that the patient's current queue number is in accordance with the queue number in the bar "Current Queue NUMBER". After that, the patient is required to print a queue card to be taken at the time of treatment and the queue card is handed over to the patient registration officer

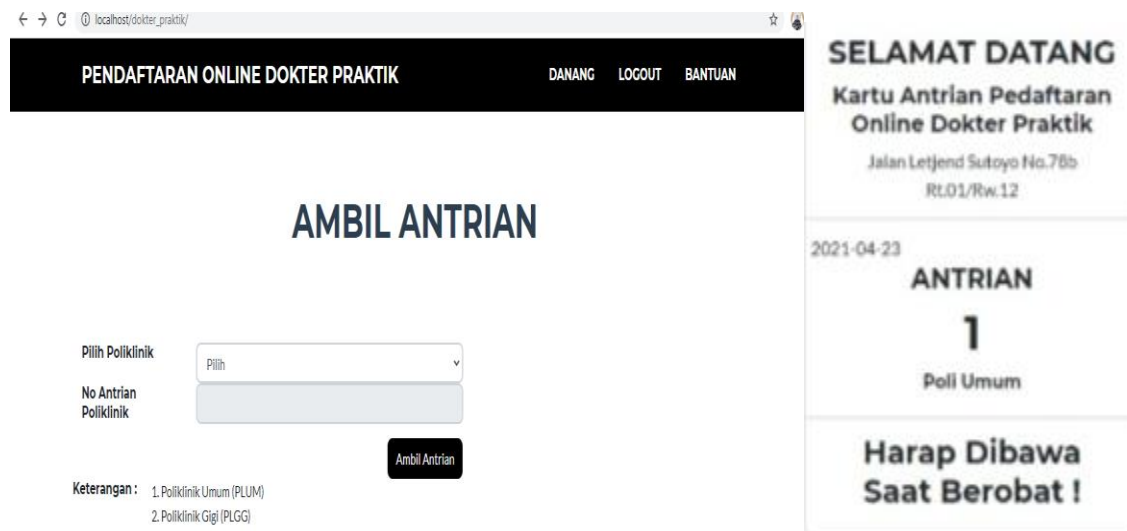


Figure 14 Patient queue page and queue card

## DISCUSSION

The application of the Rapid Application Development (RAD) method in the development of an outpatient online registration system in independent physician practices provides benefits for users and system developers. The system design developed by the programmer can be accepted by the user and facilitates system development. Because before the implementation is made a prototype system that provides a clear picture of the system to be developed, making it easier for users to provide feedback on system development. The RAD method can also provide clear system boundaries so that the system developed is in accordance with the agreement and does not undergo changes. System development using the RAD method saves more time than conventional systems, because the system development process can be divided into several teams that manage several program modules. Other savings besides saving time are saving costs and still producing quality products.

## CONCLUSION

The Rapid Application Development method has been able to streamline time, resources and the process of creating a system to produce an outpatient online registration system in independent physician practices. The features developed have been able to meet user needs for data management and reports.

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