



Research Article

DESIGN OF AN ANDROID-BASED ONLINE REGISTRATION APPLICATION FOR OUTPATIENT SERVICE AT THE NUR ILAHI MENTAL HEALTH CLINIC

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ABSTRACT

Background: Nur Ilahi Mental Health Clinic is a health care facility that has implemented service digitization. Currently, patient who are registered as health insurance (JKN) participants can register online through the Mobile JKN application provided by BPJS Health. This condition creates inequality in the queuing service experience of general patients an BPJS patients, especially in terms certainty of queue numbers and estimated service time received. Based on these problems, this study aims to design an android-based outpatient registration application that is easy to use by general patients (Non-BPJS).

Methods: The research method used in this research in the prototyping method which is a software method in the form of a physical model directly involving the creation of an initial model of the software to feedback before final development begins.

Results: The results showed a percentage of 100% on ease of use as well as satisfaction and availability of using the application. With the design of this android-based general patient registration application, it is hoped that it will be able to provide solutions to patients who do not have BPJS insurance to register for queues online.

Conclusion: So that there is no gap between BPJS patient and Non-BPJS patients in registering at the Nur Ilahi Mental Clinic.

Keywords: Android, Application, Online, Registration, Health Service, Outpatient

INTRODUCTION

The rapid development of information technology has brought significant changes to various sectors, including the health sector. Digital transformation in the health sector has become a strategic step in improving the efficiency and quality of services to the community (1). One of the implementations of digital transformation is the application of an online registration system for outpatients, which can reduce waiting times, provide certainty regarding queue numbers, and reduce the burden of manual administration in healthcare facilities (3). In line with these developments, the implementation of digital transformation has become one of the tools to help improve services for healthcare facilities so that patients receive better and more clearly directed care. Here, an information system is technically defined as a set of interconnected components that collect, process, store, and distribute information to support decision-making and decision control within an organization in healthcare facilities (Purwati et al., 2023).

Nur Ilahi Mental Health Clinic is one of the healthcare facilities that has implemented digitalization of its services. Currently, patients registered under the National Health Insurance Program (JKN) can register online through the Mobile JKN app provided by the Indonesian Health Insurance Agency (BPJS Kesehatan). This situation has created disparities in the service experience between general patients and JKN patients, particularly regarding the certainty of queue numbers and estimated waiting times. Many non-BPJS patients have complained that they also want to register and book their queue online to reduce the time spent during each medical visit.

The uncertainty of queues for non-BPJS patients not only affects patient

satisfaction, but can also disrupt the operational efficiency of the clinic. The accumulation of patients at certain times, unstructured queues, and uncertain waiting times pose a particular challenge in the management of outpatient services. In line with previous research indicating that the implementation of a mobile-based online registration system significantly improves patient service comfort, clinic operations, and patient satisfaction(5).

Therefore, the development of an Android-based online registration application for general patients at the Nur Ilahi Mental Health Clinic is considered an appropriate solution. This application is expected to bridge the service gap between BPJS and non-BPJS patients, while also improving the accuracy of registration data, speeding up administrative processes, and supporting a more integrated and transparent service system.

Based on the problems encountered, this study aims to design a mobile-based outpatient registration application that is easy to use for various groups of people in order to make the registration process more efficient. It is hoped that the results of this study can contribute to improving the quality of services at the Nur Ilahi Mental Health Clinic.

MATERIAL AND METHODS

Software Development Method

The prototyping method is a software development approach that involves creating a physical model of the software, from the initial design to obtaining feedback before final development begins (6). This prototype displays simulated software that behaves like a finished program, where interactions occur during the system development process so that it can be evaluated by users until the

user's specification are met (7). The following are the stages:

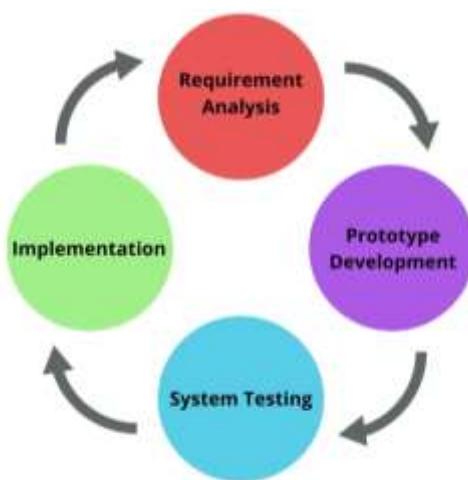


Figure 1. Software Development Method

Requirement analysis

This initial process involves intensively defining the system requirements to ensure they align with user needs.

Prototype Development

This is the next process where the analyzed requirements are then built into a prototype by creating a temporary design focused on user review.

System Testing

System testing aims to identify errors in the system and evaluate and improve the system.

Implementation

This process is carried out on a ready-to-use system, where there is a review process for the new system. This process is carried out technically and operationally, including between systems, users, and information technology. In addition, an open questionnaire consisting of 13 questions with "yes" and "no" answers is conducted for users.

Data Collection Method

Observation

The researcher conducted direct observations at the Nur Ilahi Mental Health Clinic to observe the issues being faced and how the outpatient registration process is conducted

Interview

The author used this method to obtain comprehensive information from staff members involved in outpatient registration at the Nur Ilahi Mental Health Clinic.

Literature Review

In addition to observation and interviews, the author also conducted a literature review to gather supporting theories, documents, and references related to the research.

RESULTS

Requirement Analysis

The results of the analysis and requirements for outpatient registration services at Nur Ilahi Clinic are described below:

1. The registration process for non-BPJS patients still uses a manual system without the assistance of an online application, causing patients to lack a definite time estimate.
2. An online registration system is needed to facilitate patients in registering for outpatient services, enabling patients to obtain a queue number, an estimated waiting time, and select a doctor according to their preference.

Prototype Development

Prototype development using the UML (Unified Modeling Language) method is a modern information system modeling and design approach that enables the visualization of components, workflows, and

interactions in a structured and detailed manner(8) (8). By utilizing several primary UML diagrams:

1. Use Case Diagram

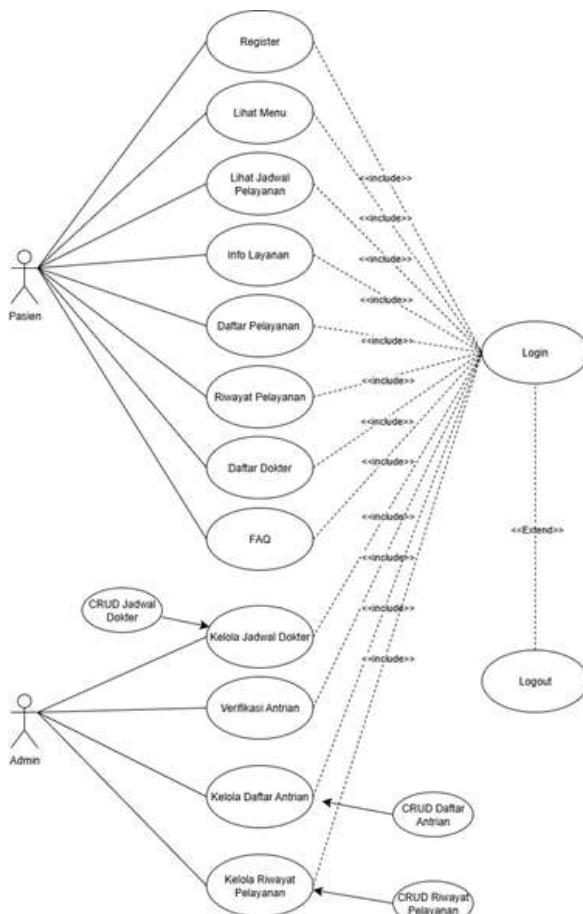


Figure 2. UseCase Diagram

A UseCase is a visual representation of the interaction between actors and the system, aimed at illustrating the primary functions to be implemented in the development process (9).

2. Activity Diagram

An Activity Diagram that illustrates the system process flow depicted by the Actor and Admin in the UseCase (10)

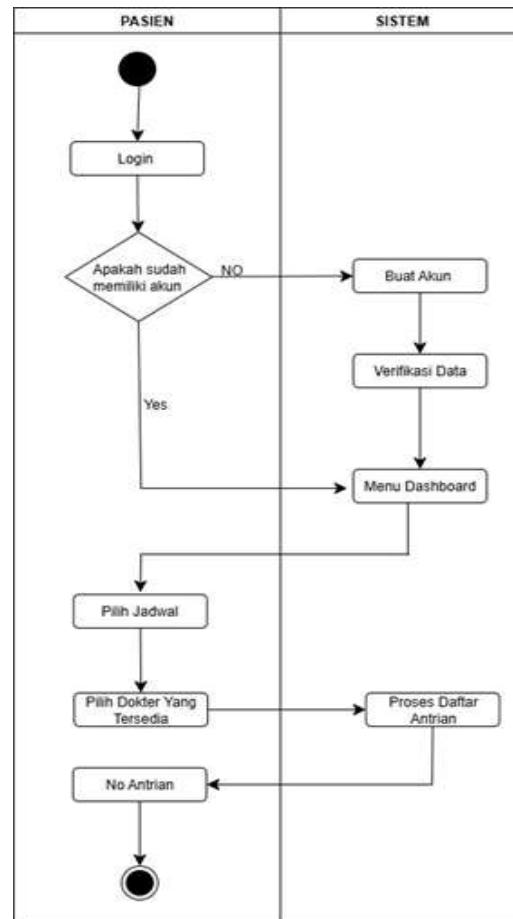


Figure 3, Activity Diagram

3. Class Diagram System

Models the data structure between entities in the system. The application of a system class diagram can help application development to understand the dependencies and basic structure of the system before implementation. This system class diagram is capable of improving understanding of the system architecture and facilitating integration between modules (11).

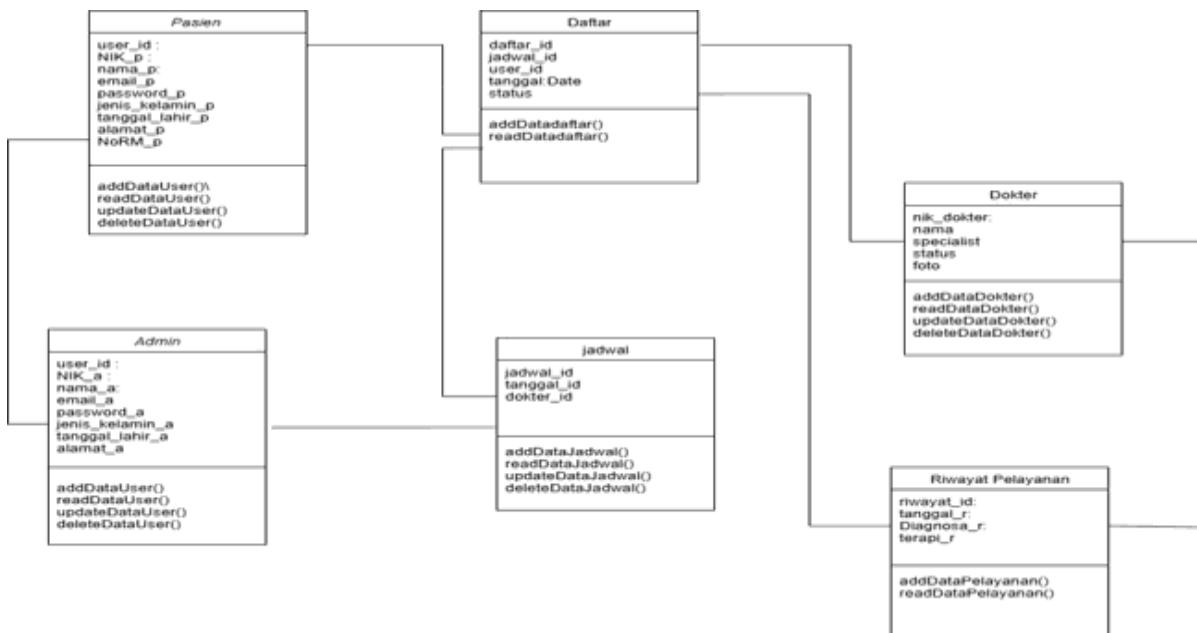


Figure 4. Class Diagram System

System Testing

Mock-Up System Testing

The following are the results of testing based on activities and the results received from the clinic.

Table 1. Mock-Up System Testing

No	Activity	Process					Result
		-	Registration	with	correct	data	
1	User Registration	-	Registration	with	correct	data	As expected
		-	Registration	with	incorrect	data	
2	Login	-	incorrect/incomplete	(incorrect)			
		-	User and Password valid	(system	As expected		
3	Service List	-	redirects to dashboard	according	to		
		-	role).				
4	Manage information	-	Incorrect username	or	password		
		-	(Login Failed)				
5	Manage Schedule	-	Actor clicks the 'general patient				As expected
		-	registration' button (the system				
		-	directs to the complete 'No Antrian'				
		-	queue form) and fill in "No Queue".				
		-	Actor clicks the "BPJS Patient				
		-	Registration" button, the actor will				
		-	be directed to the Mobile JKN.				
		-	The data entered is incorrect				As expected
		-	The data entered is correct (correct)				
		-	The availability data entered does				As expected
		-	not meet the criteria (incorrect)				
		-	Data entered is correct criteria				
		(correct)					

Application Interface Design

After designing the flowchart, use case, and class diagram of the system, it was then implemented with the design of an Android-based application interface with the following display.

Login Page Display

On the Login page, users are directed to enter their email and password to access the online registration application. If the user does not have an account, they will be directed to the registration form to create an account.

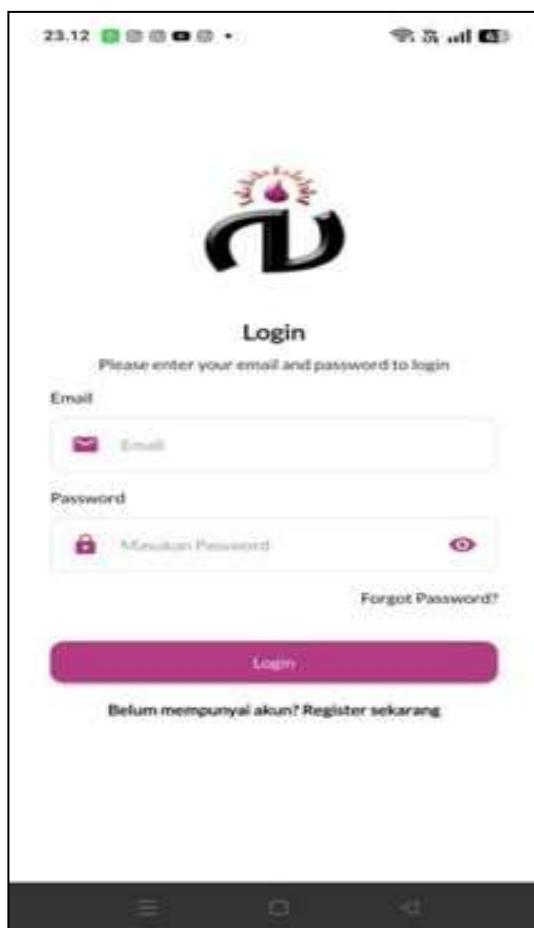


Figure 5. Login Display

a. Registration Page Display

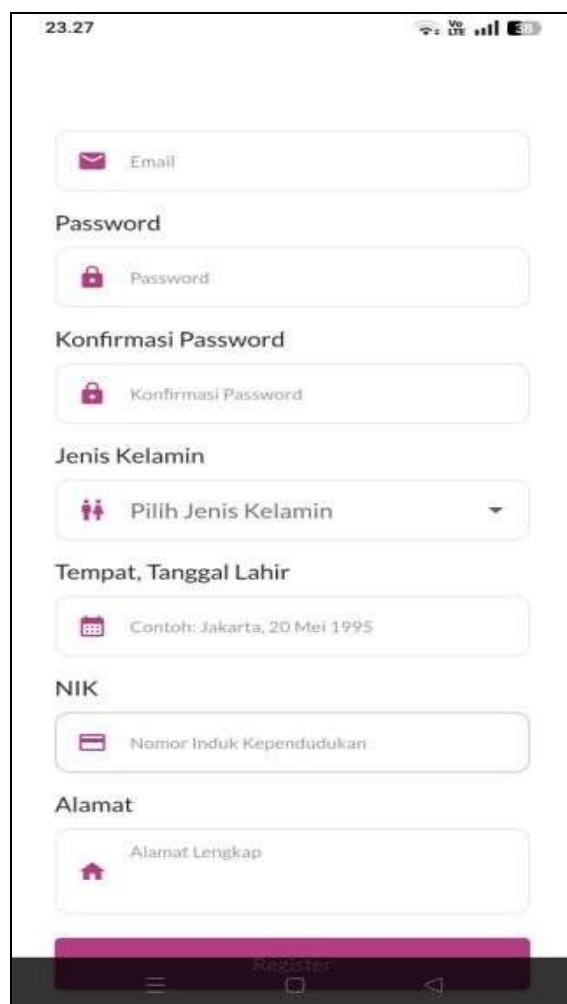


Figure 1. Registration Page

On the account registration page, users are directed to fill out a form to register themselves in the application system. This is because users who do not have an account in the application will not be able to access the dashboard page and features available in the application.

b. Dashboard Page Display

The dashboard is the main menu page that users will see when they first log in to the application, and it contains navigation menus for the features available in the application.

c. Service List Page Display



Figure 2. Service List Display

On the Service List page, users will be directed to select a service if

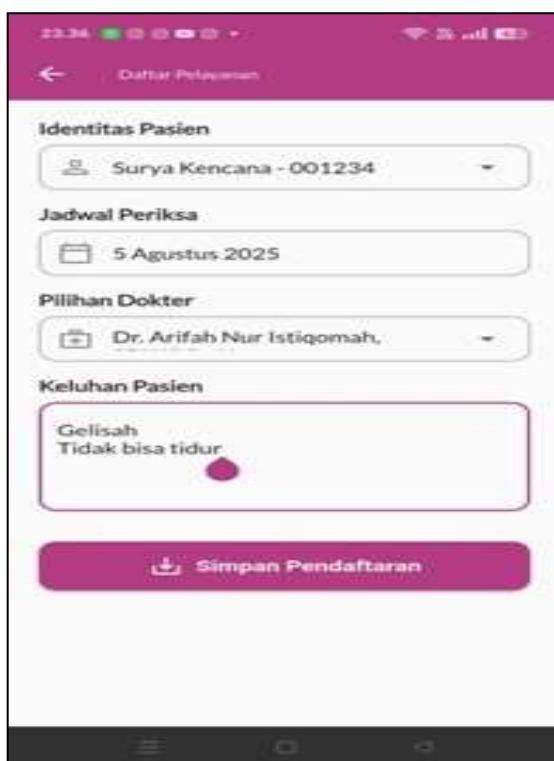


Figure 9. Service List Display



Figure 10. Queue Display

Patients with self-payment will be directly directed to take a queue in the application, and if the patient is a BPJS health insurance beneficiary, they will be directed to the Mobile JKN application.

The view when the user is taking a service queue in the application, and next to it is the view when the user has obtained a queue according to the date and doctor selected.

d. Doctor List Page Display

This display shows a list of psychiatrists providing healthcare services, along with their service hours.



Figure 11. Doctor List View

e. Service Information Page Display

This service information display is one of the pieces of information available in the application to obtain information about the services available at the clinic.



Figure 12. Service Information Display

f. History Page Display

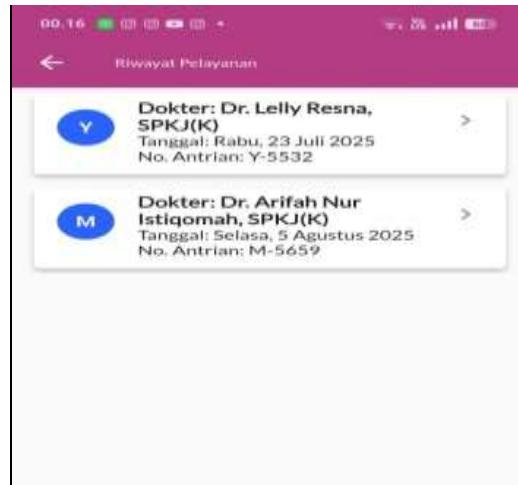


Figure 3. History Display

This history display is a menu that provides information about the service history at the Clinic.

g. Doctor Schedule Page Display

The Doctor Schedule View is designed in a calendar format to help patients easily find the available doctor's schedule on the booking date.



Figure 4. Doctor Schedule Display

h. FAQ Page Display

The FAQ display is a feature provided for Frequently Asked Questions, serving as a

quick information center for users. Its purpose is to answer common questions without having to contact customer support.



Figure 5. FAQ Display

i. Add Member Page Display

The Add Member Page is used to add family members, where a single Nurilahi Mobile App account can be used for one.

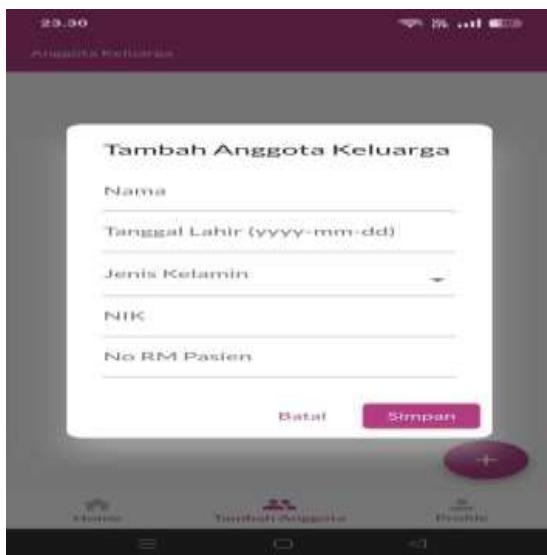


Figure 6. Add Member Display

Implementation

The Online Registration Application that has been designed was disseminated to the staff of Nur Ilahi Clinic and to general patients, then implemented starting from

account creation, service queue selection, until patients receive their queue number on the selected service date. Furthermore, the author conducted a survey, and the research results indicate that the testing of the mobile registration interface for general patients was satisfactory, with a 100% satisfaction rate in the "Ease of Use" section, where all patients agreed that the application interface was easy to understand and the menu navigation was intuitive. In the Design and Aesthetics Section, 90% of patients agreed, while 10% found the menu layout and buttons on the application interface confusing. In the Functionality and Performance Section, 90% of patients agreed, while 10% found the system notifications after successful registration unclear. Regarding satisfaction, 100% of patients were satisfied and willing to use the app again, even recommending it to others.

CONCLUSION

With the proposed mobile-based general patient registration system, this design is expected to provide a solution for patients who do not have BPJS insurance to register and book appointments online. This will eliminate disparities and ensure that both BPJS and non-BPJS patients can register at the Nurilahi Mental Health Clinic with the same ease and efficiency. Based on the implementation results, where patients expressed satisfaction with the application design, it is anticipated that the interface design can be implemented in the future.

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