

Analysis and Specifications for Appointment System Requirements at Pratama Clinics (Case study at the Indonesian Ministry of Religion Affairs)

Ita Adita¹, Setyawan Widyarto²

Faculty of Information Technology, Master of Computer Science, Budi Luhur University^{1,2}
2311600510@student.budiluhur.ac.id¹, swidyarto@gmail.com²

Abstract — This research discusses the development of a web-based Appointment System (SIJAMU) for the Primary Clinic of the Indonesian Ministry of Religion. Prior to this system, clinics dealt with the problem of registering and scheduling appointments manually, resulting in inefficiencies, errors, and decreased patient satisfaction. SIJAMU is designed to automate this process, including reservations, schedule changes, managing patient and doctor data, and generating reports. This system adopts web-based technology to facilitate access and use by both patients and clinic admins. With SIJAMU, it is hoped that the registration and scheduling process can be carried out more efficiently, reduce errors and increase patient satisfaction. The results of system implementation show that SIJAMU can increase clinic operational productivity and provide better services, in accordance with the clinic's needs and objectives in providing integrated and modern health services.

Keywords: Reservation online, web-based system, SRS.

I. INTRODUCTION

In an increasingly advanced digital era, the health service sector continues to adapt to technology to improve the efficiency and quality of its services. The Pratama Clinic of the Indonesian Ministry of Religion is one of the institutions that seeks to utilize information technology to improve the quality of service to patients. One important step in this effort is the development of an effective and efficient appointment system.

The appointment system is a crucial component in clinic operations, because it functions to organize and manage meetings between patients and medical personnel. Without a structured system, clinics can experience various problems such as conflicting schedules, long waiting times, and scheduling errors. Therefore, we need an appointment system that can overcome this problem and ensure the scheduling process runs smoothly. There are many literature reviews that review appointment systems in clinics, both web-based [1] [2] [3] [4],

there are also reviews of Android-based appointment systems [5] and integration with the Telegram Bot API [6]. It is hoped that this research can make a significant contribution to the development of the appointment system at the Pratama Clinic of the Indonesian Ministry of Religion. The results of this needs analysis will be used as a basis for designing and developing an effective, efficient and reliable system.

The purpose of this research is to analyze and document the needs of the appointment system at the Pratama Clinic of the Indonesian Ministry of Religion. This analysis involves identifying the functional and non-functional requirements of the system, as well as the detailed specifications required to support the development of the system. By understanding these needs, it is hoped that the system developed can meet the expectations of all stakeholders and increase the operational efficiency of the clinic. Apart from that, this research can also be a reference for other clinics that plan to implement a similar appointment system. Thus, this research is not only useful for the Indonesian Ministry of Religion's Pratama Clinic, but also for other health institutions that want to improve their services through information technology.

II. RESEARCH METHODOLOGY

A. Place and Time of Research

In this research, the author identified the need for appointment system software which was carried out at the following place and time:

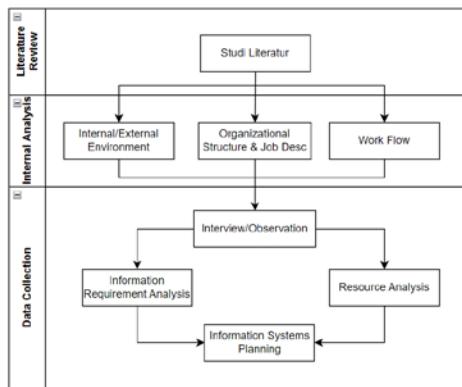
Location : Indonesian Ministry of Religious Affairs
Address : 6th, M. H. Thamrin Street, Jakarta
Time : 6 - 27 May 2024

B. Research Methodology

This research uses a descriptive method [7]. This descriptive method is based on a complete description of mutual activities,

characteristics, changes, relationships, similarities and differences. This method is also a method that attempts to explain and interpret something based on actual facts, such as existing conditions and relationships, developing opinions, and ongoing processes [8]. The stages carried out in this research process are as follows [9]:

1. Literature Review: At this stage the researcher carries out a literature study of related journals.
2. Internal Analysis: This stage is carried out by the researcher so that the researcher understands the software needs based on the internal and external environment of the Pratama clinic, the organizational structure and job desk of each human resource, as well as understanding the workflow that occurs at the Pratama clinic.
3. Data Collection: Data collection was carried out by interviews with resource persons or staff at the clinic as well as direct observation at the Pratama clinic, to analyze information needs and resource analysis. This stage is useful for identifying, analyzing and finding solutions to existing problems. The results of the needs analysis which can be obtained in the form of a system requirements document will be used to design a web-based appointment system at the Indonesian Ministry of Religion's pratama clinic.



Picture 1. Research Metodology

III. RESULT AND DISCUSSION

A. Requirement Analysis

The results of the requirement analysis obtained from interviews and direct observations at the Pratama clinic of the Indonesian Ministry of Religion are as follows:

No	Problem	Impact Analysis
1.	Manual Registration and Appointment Process	a. Inefficiency: Process that takes time and energy for

		<p>patients who have to come directly to the clinic.</p> <p>b. Potential Errors: Errors in recording appointments due to manual input.</p> <p>c. Long Queues: Create long queues and pile up of patients at the clinic</p>
2.	Manual Scheduling of Doctors and Sessions	<p>a. Schedule Chaos: Irregular doctor and session schedules can cause clashes and uncertainty for patients.</p> <p>b. Inefficient: Takes longer to set and check manual schedules.</p> <p>c. Scheduling Errors: Increases the likelihood of errors in scheduling that can cause inconvenience to patients and physicians.</p>
3.	Manual Patient and Doctor Data Management	<p>a. Data Access Difficulty: Data is difficult to access quickly and precisely when needed.</p> <p>b. Data Errors: Increases the risk of errors in recording patient and doctor data.</p> <p>c. Lack of Medical History: Lack of a structured medical history can impact the quality of patient care.</p>
4.	Manual Payment Transaction Recording	<p>a. Time Inefficiencies: Processes that take time for cashiers and patients.</p> <p>b. Poor Documentation: Transaction data is not well documented and is vulnerable to loss.</p> <p>c. Transaction Errors: Increases the risk of errors in recording transactions that can cause financial problems.</p>
5.	Manual Reschedule Appointment Process	<p>a. Time Inefficiencies: Patients have to come directly to the clinic or there may even be cancellations without confirmation</p> <p>b. Potential Errors: Errors in re-registering appointments can occur due to manual input.</p> <p>c. Loss of Information: Schedule change information may be lost or not recorded correctly.</p>
6.	Lack of Reports and Data Analysis	<p>a. Decision Making: Difficulty in making data-</p>

		<p>based decisions due to lack of structured reports.</p> <p>b. Performance</p> <p>Monitoring: Difficulty in monitoring overall clinic performance.</p> <p>c. Planning: Inaccurate planning due to lack of analytical data.</p>
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Table 1. Results of Interview and Observation Analysis

The Indonesian Ministry of Religion's Pratama Clinic faces big challenges in daily operations because its business processes are still manual. This creates a number of significant problems, including time inefficiencies, possible errors during recording, slow communication, loss of information, and patient discomfort. All this has a negative impact on the quality and efficiency of clinical services.

The research conducted revealed that by implementing an integrated management information system, all data related to reservation operations at the clinic can be automated. This automation improves your clinic's overall efficiency by eliminating time-consuming and error-prone manual processes. In addition, clinic companies want to maximize performance productivity. However, currently clinics lack adequate literature regarding the specifications of the information system requirements required. In fact, the specification of system requirements is essential to balance the needs of users (patients and doctors) with the technical solutions being developed. This ensures that the software or system created fulfills its purpose and function.

The clinic appointment process requires effective and efficient information technology tools, such as a web-based appointment information system. The hope is that this information technology will replace manual work and enable a faster, more accurate and better documented reservation process. One of the primary goals is to ensure that accounting and records of patient appointment information are well documented and easily accessible.

B. Scope and Limitations of the Problem

The scope of this software is as follows:

1. The software that is built has 2 types of users, namely Super Admin and User (Patients)
2. The system uses a client-server method connected via an intranet or internet network.
3. The system uses the TCP/IP protocol for data communication.
4. The system can be accessed online from anywhere and at any time via web browsers such as Mozilla Firefox, Google Chrome, Safari, Opera, and others.
5. Some of the features in the system are: Reserving appointments, rescheduling appointments, managing patient data, managing doctor data and doctor schedules, managing session data and poly data, managing

appointments, paying for appointments through the system and creating reports.

Meanwhile, the problem limits in the system are:

1. The system only records patient account registration, doctor data, practice schedule, session schedule, polyclinic data, appointment history, and payment system.
2. The system does not record medical actions, prescriptions and doctor's recommendations to patients when seeking treatment.
3. The system does not handle patient queues at the clinic, only provides notifications to come 15 minutes before the session.

C. User Access Rights

User access rights describe the services provided by the system to the user. In this appointment system there are 2 actors, namely Super Admin and User (Patient).

No.	User	Status	Access Rights
1.	Admin	Super Admin	<ul style="list-style-type: none"> • Manage admin data • Manage doctor data and doctor schedules • Manage patient data • Manage appointments: all appointment information list <ul style="list-style-type: none"> a.l. Patient Name, Doctor Name, Appointment Date, payment status • Manage Payments <ul style="list-style-type: none"> a.l. Payment Type, Date, Payment, Orderer's Name, payment status (Paid/Not Yet) • Manage Reschedule • Manage Reports
2.	Patient	User	<ul style="list-style-type: none"> • Create an account • View the doctor's schedule • Make an Appointment • Make a repeat appointment (Reschedule)

Table 2. User Access Rights

D. Usecase Identification

Identify use cases contained in the software, as follows:

No	Klasification	Use case	Description
1.	Related use cases with an authorization system	Login	Enter the System
2.	Use cases related to appointment management	Manage Doctor Data and Schedules	Manage doctor data and schedules in the system
		Add Doctor Data and Schedule	Add doctor data and schedules databases

		Changing Doctor Data and Schedules	Change existing doctors and schedules and save them back into the database
		Deleting Doctor Data and Schedules	Delete existing doctor data and schedules
3.	Use cases related to managing staff and patient data	Managing Patient Data	Manage patient data in the system
		Adding Patient Data	Add Patient data to the database
		Changing Patient Data	Change existing patient data and save it back into the database
		Deleting Patient Data	Delete existing patient data
4.	Use cases related to managing poly and session data	Manage poly and session Data	Manage poly and session data in the system
		Added poly and session Data	Added Poly and session data to the database
		Changing Poly and session Data	Modify existing poly and session data and save it back into the database
		Deleting Poly and session Data	Delete existing poly and session data
5.	Use cases related to Report management	Make a report	Create annual daily, monthly reports in the system

Table 3. Usecase Identification

E. Usecase Diagram

The following is a use case diagram based on the actors described in table 3. Use case identification:

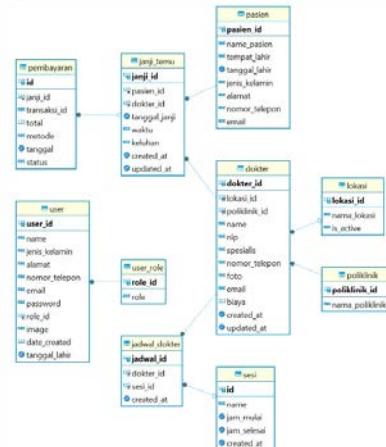


Gambar 2. Usecase Diagram

F. Database Design

The database design will meet the functional and non-functional needs of the Appointment System (SIJAMU). The following are the tables that will be used as the foundation of the SIJAMU database:

- Patient Table; patient_id, patient_name, date of birth, gender, address, telephone number and email. The patient_id column must be the primary key for the patient table.
- Doctor's Table; has columns doctor_id, name, nip, specialist, telephone_number, email, photo, cost. The doctor_id column must be the primary key for the doctor table.
- Polyclinic Table; has columns policlinik_id, nama_poliklinik. The policlinik_id column must be the primary key for the policlinic table.
- Location Table; has columns location_id, location_name, is_active. The location_id column must be the primary key of the location table.
- User Table; has columns user_id, name, email, password, role_id, gender_sex, address, telephone_no, image, data_created, date_of_birth. The user_id column must be the primary key of the user table.
- Role Table; has columns role_id, role. The role_id column must be the primary key of the role table.
- Doctor's Schedule Table; has columns schedule_id, doctor_id, session_id, created_at. The schedule_id column must be the primary key of the doctor_schedule table.
- Session Table; has columns session_id, name, and start_time, end_hour, created_at. The session_id column must be the primary key of the session table.
- Appointment Table; has columns appointment_id, patient_id, doctor_id, appointment_date, time, complaint, created_at, and updated_at. The appointment_id column must be the primary key of the appointment_id table.
- Payout table; has columns id, promise_id, transaction id, total, method, date and status. The id column must be the primary key of the appointment table



Gambar 3. Design Database

G. Hardware Requirements Analysis

- Admin:

- Processor: Minimum Intel Core i3 or equivalent
- RAM: Minimum 4 GB
- Storage: Minimum 256 GB HDD or SSD
- Network Interface: Ethernet/WiFi
- Operating System: Windows 10, macOS, or Linux
- User:
 - Device Type: Desktop, Laptop, Tablet, Smartphone
 - Network Interface: WiFi/Cellular Data

H. Software Requirements Analysis

- Web Browsers:
 - Mozilla Firefox (latest version)
 - Google Chrome (latest version)
 - Safari (latest version)
 - Opera (latest version)
- Web Technologies:
 - HTML5
 - CSS3
 - JavaScript
- Development Tools:
 - IDE/Text Editor: Visual Studio Code
 - Collaboration Tools: Microsoft Teams and Google Meet

IV. CONCLUSION

Prior to this research, the Indonesian Ministry of Religion's Pratama Clinic faced significant problems with manual processes in registering and scheduling patient appointments, which led to inefficiencies and errors. This process makes it difficult to manage schedules and affects patient satisfaction.

The Appointment System design document (SIJAMU) divides the main features based on users, namely admin and patients. This system includes reservation, reschedule, data management and report features, supported by an organized database structure. Analysis shows that manual systems cause inefficiencies and risk of errors.

SIJAMU implementation will overcome this problem by automating the process, reducing errors, and increasing efficiency. The features in SIJAMU will make data management easier, increase patient satisfaction, and provide reports that support decision making. Overall, SIJAMU is designed to optimize clinic processes, improve operational efficiency, and provide better service. This system will help clinics achieve the goal of more modern and integrated health services.

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First Author was born in Bandar Lampung, Lampung, Indonesia in 1995. He earned a Bachelor's Degree in Computer Science (S.Kom) from Mitra Indonesia University, Department of Information Systems in 2016 and is currently pursuing a Master's Degree in Computer Science (M.Kom) at Budi Luhur University. Since 2017 until now she has worked at the Ministry of Religion Affairs, as a Social Media Specialist and in 2023 she will join the State Civil

Service as a Computer Officer. Has an interest in information technology in the fields of Information Systems, Machine learning, data mining and data science.



Second Author was born in Purwokerto, Central Java, Indonesia in 1963. He received first degree from IPB Bogor in 1986 and M.Sc. degrees in Manufacturing System Engineering and Management from University of Bradford (UK) under Chevening Awards (British Council) in 1998. In 2008 he finished his Ph.D. degree in Computer Science from University Teknologi Malaysia and joined University Selangor (Unisel). Since 2012, he has been an Associate Professor with the Computing Department, Unisel Bestari Jaya, Kuala Selangor. He has more than 30 years working experience in industries and academics. He is an editor member and chief editor some journals.