



Web-Based Information System for Medan Sunggal Public Health Center Using Web Engineering Methods

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ABSTRACT

The Medan Sunggal Health Center Service Center is one of the healthcare facilities that is highly needed by everyone, as there are many patients seeking medical treatment every day. Therefore, it requires efficient work, especially in data management (registration data, medical history data, referral data, and queue data). Currently, the Medan Sunggal Health Center still uses a manual data management system or manual information system in the fields of General, Elderly, and Maternal and Child Health (KIA). This method is time-consuming and the data processing is slow. The system development method used is Web Engineering with stages including Communication, Planning, Modelling, Construction, and Deployment. The use of a website with computer technology for patient data processing is essential, as it offers several advantages and conveniences in patient services, including speeding up service, providing more accurate information, faster data retrieval, quicker report generation, and uniformity in the Medan Sunggal Health Center Management Information System. With the existence of this website, it is hoped that the performance and quality of the Medan Sunggal Health Center will improve rapidly

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1. INTRODUCTION

Health care facilities are places that are used to provide health care services, whether promotive, preventive, curative, or rehabilitative, that are carried out by the government, local governments, and/or the community. Public health centers are one of the services of health care facilities that provide public health and primary health care services, with a focus on promotive and preventive efforts, to achieve the highest level of public health in their working areas.

In today's world, flexibility in healthcare is essential to support the probability of all healthcare workers. This requires sufficient resource support that can meet all the needs of healthcare workers, reducing the difficulty in making the right decisions due to the limitation or unavailability of accurate, timely and fast data and information. Data and information are strategic resources in health development management, namely in the management process, decision making, governance, and accountability implementation. Therefore, the web is one of the tools to help the probability of healthcare work, where the web can include all the data and information needed in a public health center [1].

Data management that is still carried out with a simple method provides a heavy workload for workers at the Public Health Center. Therefore, the method in this study uses the Web Engineering method, with this method data collection, analysis, and display are easier and more flexible, thus all the needs and work

of health services can be simplified [2].

Therefore, the web is very needed. This is very important because the existence of a web can help, especially in the field of data collection and the delivery of detailed information to the public or those who are in the environment of the Public Health Center.

2. RESEARCH METHODE

2.1. Website

Website is a term that is no longer unfamiliar today. In general, a website can be defined as a page available on a server that can be accessed using the internet network, which contains various information about specific content. A web page that appears on the network [3].

2.2. Information

Information is data that has been processed into a meaningful form for its recipient and is useful in making decisions in the present or in the future. This definition represents the concept of information in the context of information systems [4].

2.3. Data Collection

The data collection methods used in this research are interviews, observations, and literature studies [5]:

a. Observation

To conduct observations and directly engage in field activities related to the subject of research, gather as much data and information as possible related to the issue under investigation."

b. Interview

Data collection involves direct questioning of public health center staff who are knowledgeable about the case being studied within the existing system framework.

c. Literature review

Studying theories by collecting data, information, and references through citations of scholarly works such as books or literature related to the case being researched.

2.4. System Development Method

Web engineering is a web-based engineering approach that aligns software engineering with fundamental concepts that emphasize technical and managerial activities. System development aims to create a new system, either to replace an entire old system or to improve an existing one [6]. Web engineering greatly assists system developers, reduces the risks that may occur, and enhances quantity and quality. The stages in web engineering include:

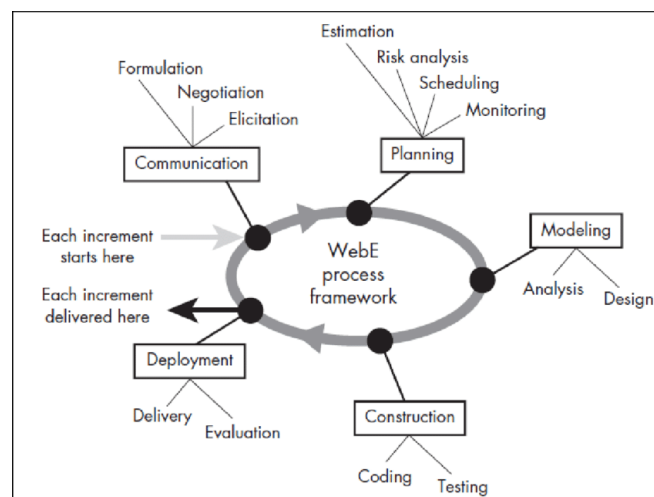


Figure 1. Web Engineering Process Framework

1. Communication

This is the stage of communicating with users to find out what they want in order to formulate the goals and scope of this web-based application.

2. Planning

The planning stage in this research is the stage of combining user requests and information, and the technical planning is done by identifying the software and hardware that are needed.

3. Modeling
 - a. Content analysis (content), interaction analysis (interaction), functional analysis (function), configuration analysis (configuration),
 - b. Modeling design
The design stages in the system include interface design, aesthetic design, content design, and navigation design.
4. Construction
 - a. The implementation was carried out by applying the web page in the form of HTML as a whole based on the results of the content design in non-technical and technical member activities, while the implementation of the content and logic functions was made in the form of PHP.
 - b. Testing is carried out to identify the possibility of errors such as errors in scripts or forms, navigation, or display, or other parts.
5. Deployment
The final stage of the entire work process is Deployment, which is to release the application of the service information system at the Medan Sunggal Public Health Center [7].

3. RESULT AND ANALYSIS

3.1. Landing Page

The Landing Page is the home page of the public health center Medan Sunggal website, which displays all information about the public health center Medan Sunggal, including email, phone number, address, services available [8]. and the names of specialist doctors at the public health center Medan Sunggal.

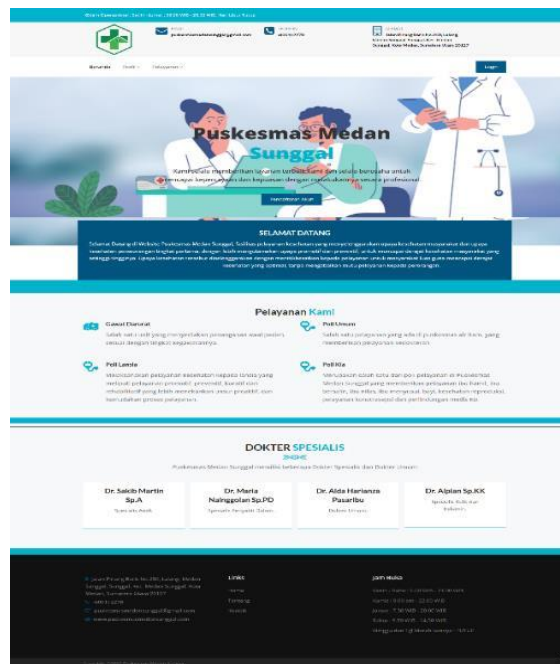


Figure 2. Page Landing Page Overall

3.2. Admin Page

The admin section is divided into several pages: dashboard, examination data (general clinic, geriatric clinic, and maternal and child health clinic), reports (medical record reports and referral reports), user data, pharmacy (item data and usage instructions), and patient data. The dashboard page contains the income earned by the Medan Sunggal Public Health Center for the annual, monthly, and daily periods. There are also many patients who have been registered in the system, and this page also displays the latest examinations [9].

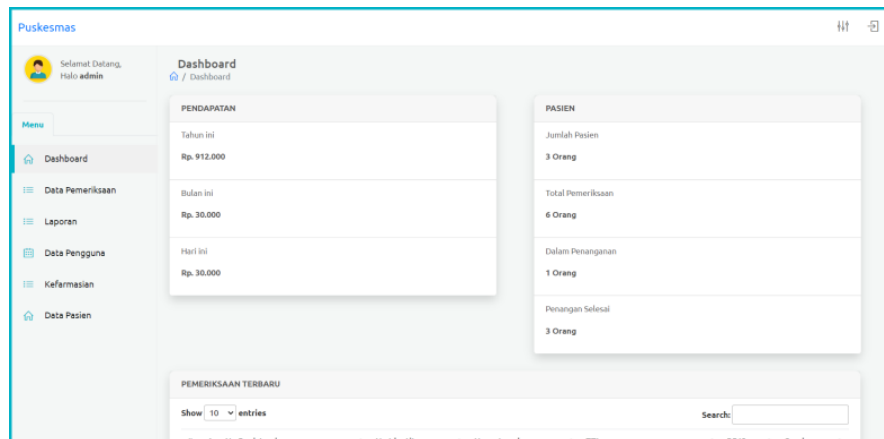


Figure 3. Page Dashboard on Admin

The examination data page contains the examinations performed by each clinic. The admin can input examination data on a clinic or change existing examination data.

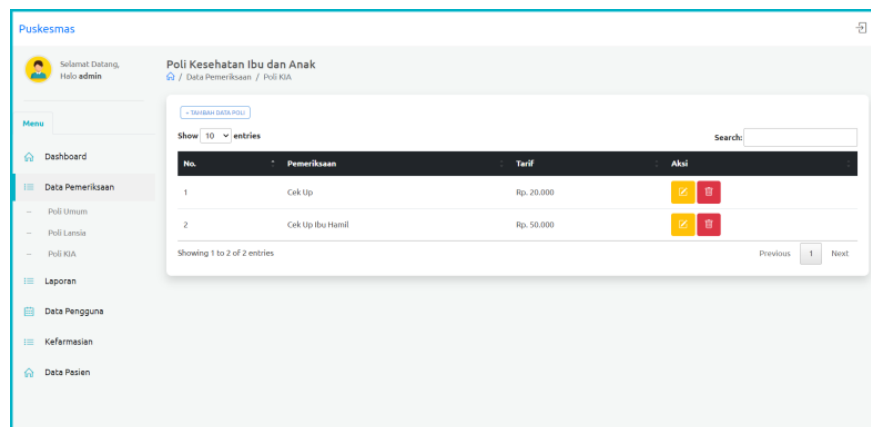


Figure 4. Page Data Inspection (Poly KIA) on Admin

The report page contains medical record reports that have been performed by patients during their stay. Medical record reports can be printed in PDF format. In addition to medical record reports, there are also referral reports that are used as referral letters from the Medan Sunggal Public Health Center.

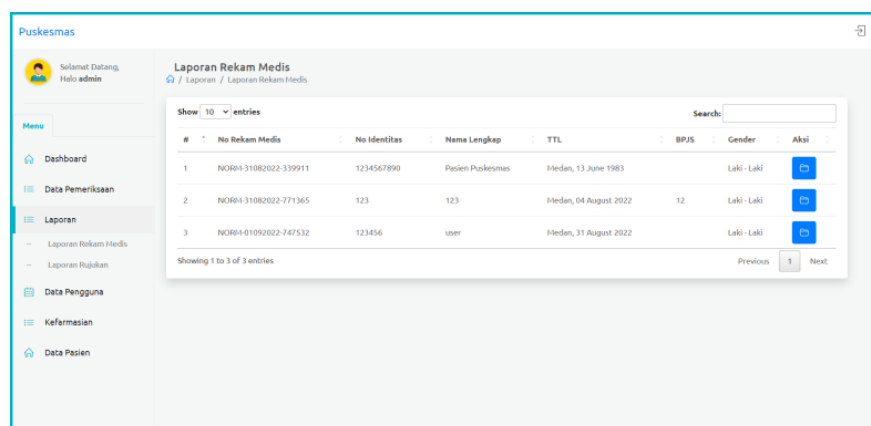


Figure 5. Page Medical Record Report in Admin

The User Data page contains data on doctors, nurses, receptionists, and staff at the Medan Sunggal Public Health Center. On this page, the admin can input new user data or edit existing user data [10].

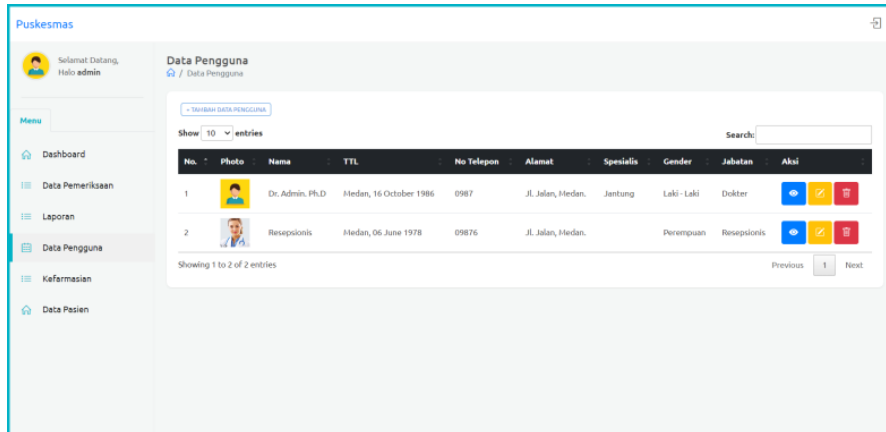


Figure 6. Page Data User on Admin

The Pharmacy page contains data on the items available at the public health center as well as data on the usage instructions that are used to instruct patients on how to use the drugs that will be given to them in the future.

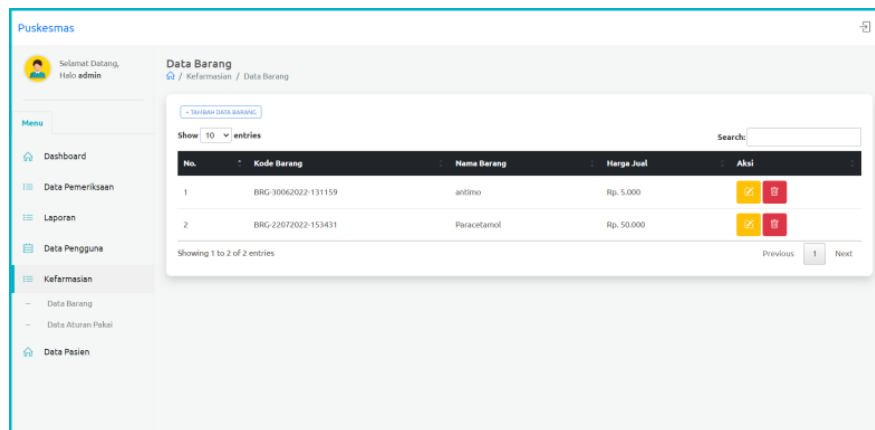


Figure 7. Page Inventory on Admin

The Patient Data page contains data on users who have registered on the system. On this page, the admin can input new patient data or edit existing patient data.

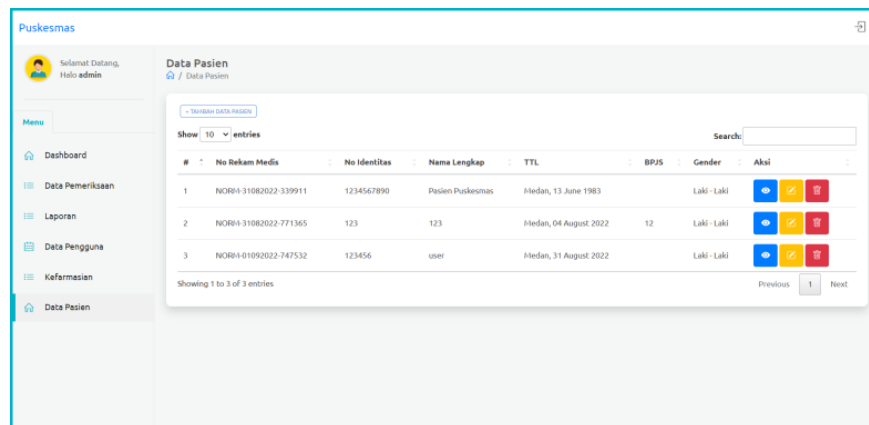


Figure 8. Page Patient data on Admin

3.3. Doctor's Web Page Display

The doctor's page is divided into several pages, such as dashboard, patients (in progress, and completed), and examination history. The dashboard page displays the total number of patients in each clinic and also displays the data of patients who will be treated by the doctor.

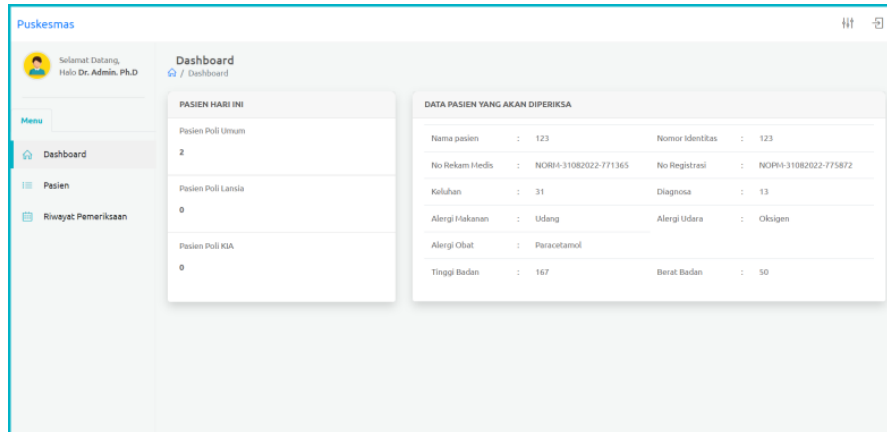


Figure 9. Page Dashboard on Doctor

The patient page contains all patients who will be treated by the doctor. Here, the doctor can input the examinations that have been carried out, such as treatment, actions, and medication that will be given to the patient. The doctor can also determine the patient's status, whether they will be treated as an outpatient or referred. This page also displays the data of the examinations that the doctor has performed on patients who have completed their examinations [11].

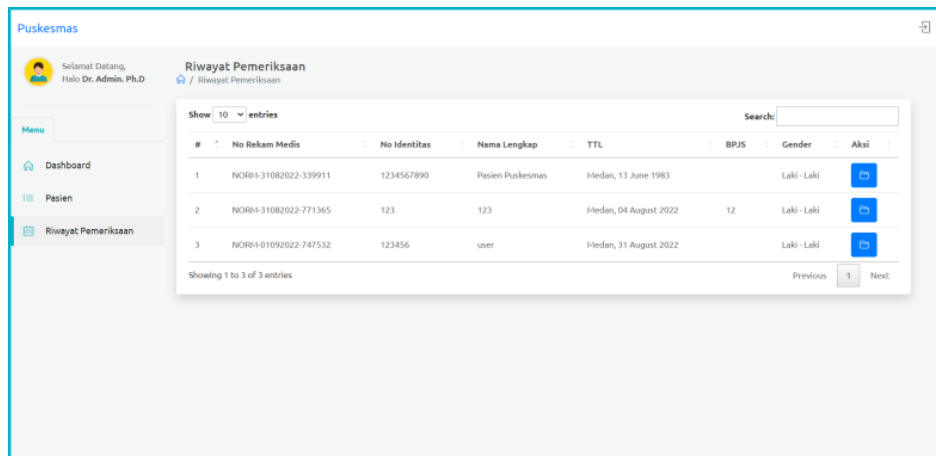


Figure 10. Page in the Treatment of Doctor

The Examination History page contains the examination history of each patient. On this page, the doctor can only view the patient's examination history or print the history into a medical record report in PDF format. Some page descriptions in Doctor Care can be seen as follows:

1. Filing
Filing is a feature used to collect patient administrative details before receiving health services.
2. Medical prescription
This feature provides a description of the types of medicines that the patient will receive. The grouping of various types of medicine will be entered according to the patient's specific complaint or type of disease.

3. Cost
The costs feature will outline the amount of health service charges received by the patient. This is in accordance with the type of health service and the variety of drugs received by the patient according to the type of disease or complaint.
4. Administrative support features
This feature aims to provide additional administrative services that patients need. This feature includes the availability of sick certificates, health certificates, and patient referral letters if patients need to receive more complete health services at other hospitals.

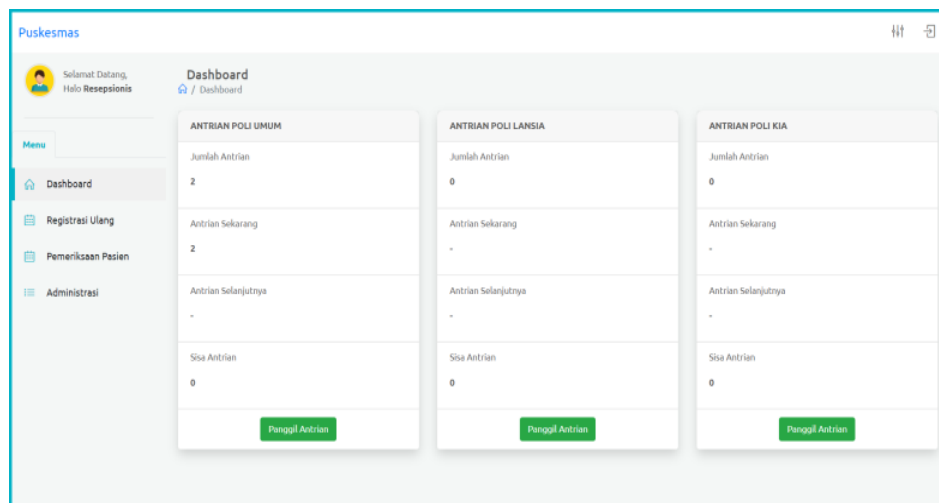


#	No Rekam Medis	No Identitas	Nama Lengkap	TTL	BPJS	Gender	Aksi
1	NOR4-31082022-339911	1234567890	Pasien Puskesmas	Medan, 13 June 1983		Laki-Laki	[D]
2	NOR4-31082022-771365	123		Medan, 04 August 2022	12	Laki-Laki	[D]
3	NOR4-01092022-747532	123456	user	Medan, 31 August 2022		Laki-Laki	[D]

Figure 12. Page Doctor Examination History

3.4. Receptionist Page

The receptionist page is divided into several pages, such as dashboard, re-registration, patient examination, administration, and message. The dashboard page contains the queues in the general clinic, geriatric clinic, and maternal and child health clinic. On this page, the receptionist can call the patient's queue number.



ANTRIAN POLI UMUM	ANTRIAN POLI LANSIA	ANTRIAN POLI KIA
Jumlah Antrian 2	Jumlah Antrian 0	Jumlah Antrian 0
Antrian Sekarang 2	Antrian Sekarang -	Antrian Sekarang -
Antrian Selanjutnya -	Antrian Selanjutnya -	Antrian Selanjutnya -
Sisa Antrian 0	Sisa Antrian 0	Sisa Antrian 0
[Panggil Antrian]	[Panggil Antrian]	[Panggil Antrian]

Figure 13. Page Dashboard in Receptionist

The re-registration page contains all patients who will re-register after registering online on their account. On this page, the receptionist will input data such as age, height, weight, temperature, systole, and diastole.

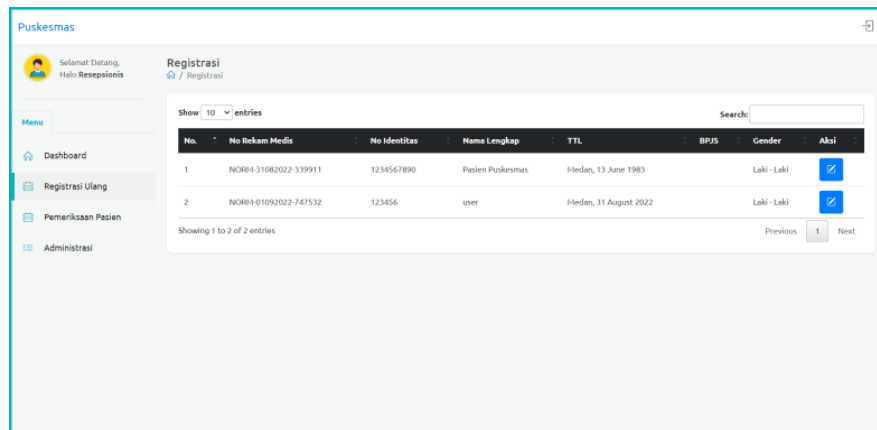


Figure 14. Page Registration Repeat on Reception

The patient examination page contains data on patients who have re-registered and are waiting for their turn in line or are being examined by a doctor. On this page, the receptionist can see the data that was input on the patient when they re-registered.

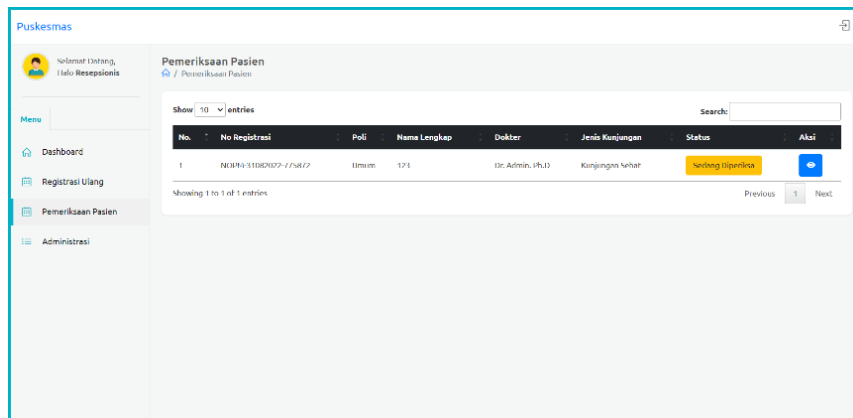


Figure 15. Page Ceck Patient at Reception

The administration page contains the costs that must be paid by patients who have completed their examination with the doctor. After making a payment, the receptionist can print the cost details in PDF format and all systems will automatically send an email containing the correspondence needed by the patient to the patient's email address registered in the system

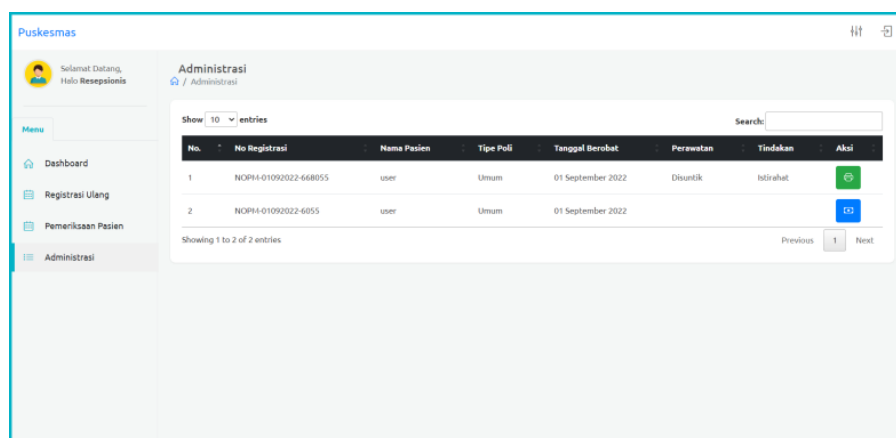


Figure 16. Page Administration at the Reception

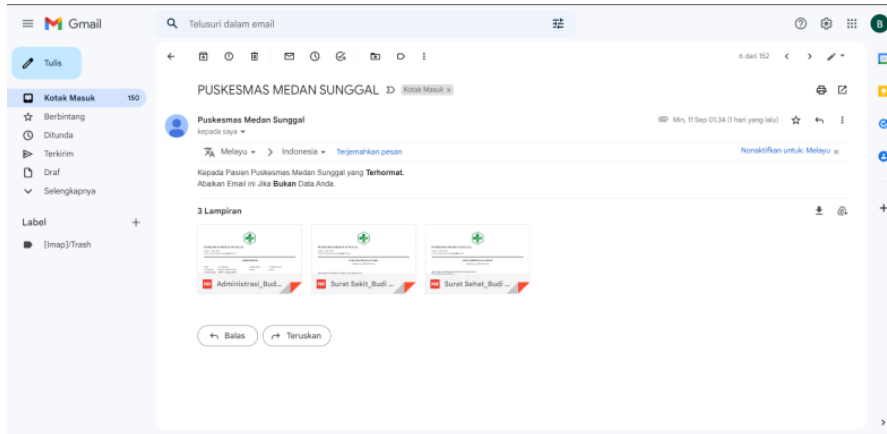


Figure 17. A Letter Sent by The System to the Patient’s E-mail

The message page is a page that contains messages from patients. On this page, the receptionist can communicate with patients like in any other messaging application.

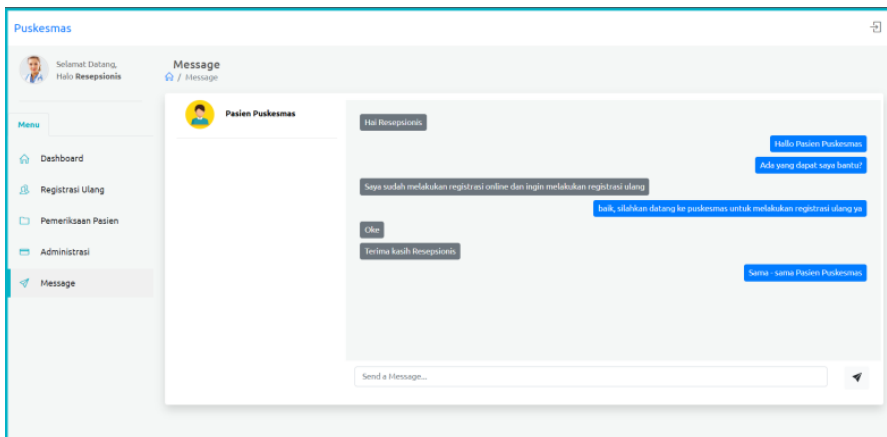


Figure 18. Page Message on Reception

3.5. Patient Page

The patient page is divided into several pages: dashboard, medical record report, online registration, and message. The dashboard page displays many patients queuing at the general polyclinic, the elderly polyclinic, and the KIA polyclinic, as well as the current queue number at each polyclinic. In addition, this page also displays the user's queue number and the polyclinic where they re-registered.

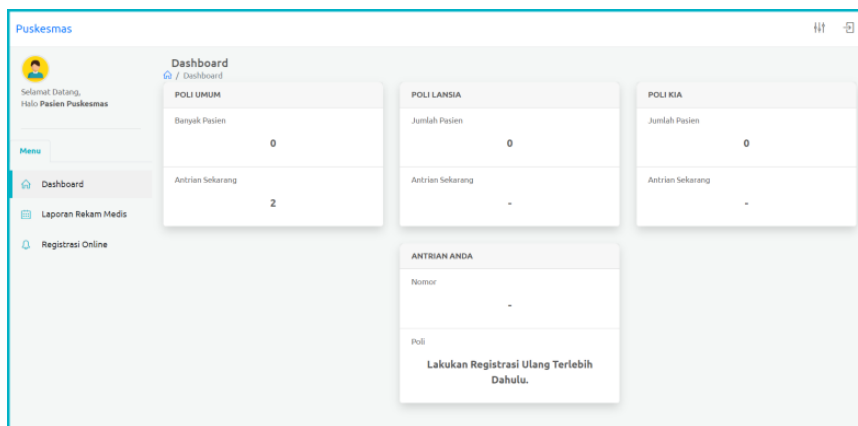


Figure 19. Page Dashboard on Patient

The Medical Record Report page contains all the user's examination data. On this page, users can view the details of their examination report and also print the report as a PDF.

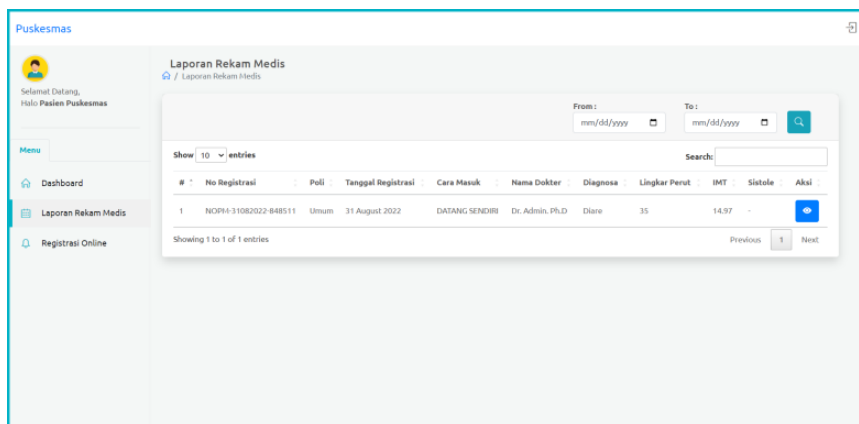


Figure 20. Patient Medical Record Report Page

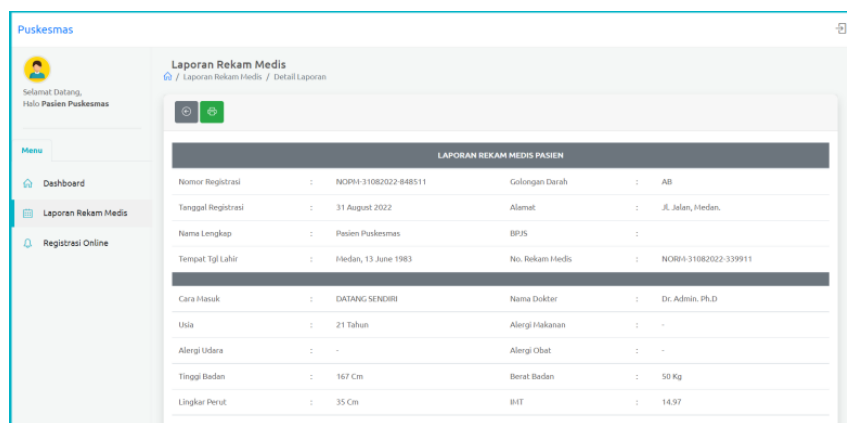


Figure 21. Patient Medical Report Detail Page

The Online Registration page displays all information about Medan Sunggal Public Health Center, from email, phone number, address, to the services available, as well as the names of specialist doctors at Medan Sunggal Public Health Center. On this page, users can click the "Online Registration" button and select the clinic they will visit at Medan Sunggal Public Health Center [12].

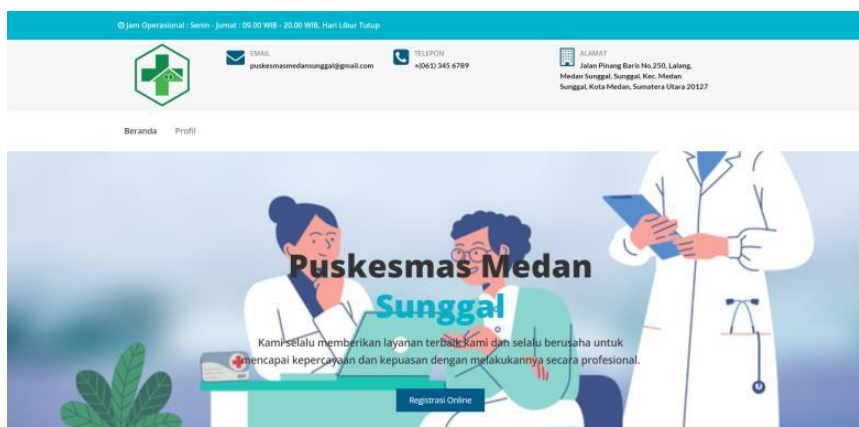


Figure 22. Online Patient Registration Page

Figure 23. Form Online Registration of Patient

The message page contains communication between patients and receptionists. On this page, patients can only communicate with receptionists who are registered in the system.

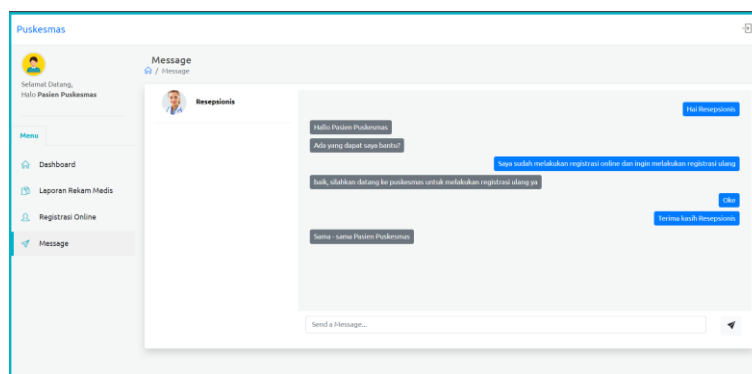


Figure 24. Patient Message Page

4. CONCLUSION

Based on the research that has been done, the results show that this research has created a website for the Medan Sunggal Public Health Center Information System using the Web Engineering method. It is expected that the results of this research can provide positive results and reduce inefficiency in work. The results of this research can be summarized as follows:

1. The results of this research have made it easier for staff at the Medan Sunggal Public Health Center to work.
2. Able to register online
The data entry process, which used to be very time-consuming, is now much easier and faster.

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