

Health Information Media for Outpatient Services at Puskesmas OPI Palembang Based on a Website

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Abstract: In every aspect of life, the advancement of information technology has had a profound impact and is frequently used in the delivery of healthcare services to patients. Websites currently have a significant impact on providing healthcare services and information to patients, serving as a medium of information. Puskesmas OPI Palembang is a health service institution for the community that includes several departments (polyclinics), namely the Maternal and Child Health Room, the Elderly Room, Special Room 1 for Respiratory Diseases, Special Room 2, General Examination Room, Dental and Oral Room, Laboratory Room, Pediatric Room, and Immunization Room. At Puskesmas OPI Palembang, only a blog is used as a medium for health service information, alongside distributing brochures, e-flyers, or promotions to the surrounding community through free health education. For outpatient health services, patient registration information is still managed using paper or books as a means of recording outpatient registrations. Efforts to improve services include using websites as one of the most effective media to facilitate patients in obtaining information about community health centers, doctor schedules, polyclinics, and outpatient health services such as patient registration. The information includes knowing the location of the community health center, contact details of the community health center, the schedule of names, the hours and days of doctors' practice. In the patient registration section, patients can register online by completing personal identity details, complaints, intended polyclinic, intended doctor, etc., in the format provided on the website page.. The website was developed utilizing the Planning, Design, Coding, and Testing phases of the Extreme Programming approach.

Keywords: Website, Information Media, Outpatient Services, Extreme Programming, Patient registration

1. INTRODUCTION

The advancement of information technology has a significant impact on all aspects, especially in the field of healthcare. Information technology is often used in the delivery of healthcare services to patients, improving services and increasing patient satisfaction. Services are the means by which the government, private groups working with the government, or private groups themselves provide something to meet the needs and interests of the community [1]. Healthcare services refer to the assurance that the community receives optimal availability, safety, quality, benefits, affordability, and access to medicines and healthcare services[2]. This enhances patient service comfort, particularly in terms of websites. A website is a series of distinct information pages within a single domain that can be accessed by anyone via the internet[3]. A website is a page that contains information accessible when a computer is connected to the internet. With a website, people around the world can access and manage information from various sources available online[4].

Puskesmas OPI Palembang is a healthcare institution for the community that has several rooms (Poli), including the KIA Room, Elderly Room, Special Room 1 ISPA, General Examination Room, Dental and Oral Room, Laboratory Room, and Pediatric Room. The advancement of information plays an important role as a supporting tool for media to disseminate information about Puskesmas OPI Palembang. Media, in general, refers to communication channels. Media are tools that convey educational messages from the message sender to the message receiver [5].

Currently, there are many media created and produced by humans to convey information, ranging from offline to online media. The use of online media is very popular due to its ease of access and low cost for obtaining information[6]. The system in place at Puskesmas OPI Palembang still uses blogs as an information medium and distributes brochures, e-flyers, or promotions to the surrounding community by conducting free counseling. For outpatient health services, patient registration information still uses paper or books as registration signs for outpatient care. Therefore, patients are less effective in obtaining accurate information regarding Puskesmas information, doctor schedules, and available Poliklinik, which can impede healthcare services during outpatient registration. Outpatient services are one category of healthcare services. In short, outpatient care involves providing medical services to patients outside of an inpatient setting[1]. Information that has been modified or changed to better serve an audience is referred to as information[7]. Data that represents types of information is a source of general knowledge; data represents reality by describing events of real objects. Based on this information, the author will develop a website as a medium for health information on outpatient services at Puskesmas OPI Palembang to facilitate patients in obtaining information about Puskesmas, doctor schedules, Poliklinik, and outpatient health services such as patient registration. The information obtained by patients regarding doctor schedules includes knowing the names, hours, and days of the doctors' practices. In the patient registration section, patients can register online by completing personal identification, complaints, target Poliklinik, target doctor, etc., in the format provided on the website page. With the presence of this website as an information medium, it can be more effective in terms of time and performance for patient registration services and information dissemination. The information displayed allows patients to easily access details about the health center, as the previous system at the health center did not have a media for online information dissemination, such as doctor and polyclinic schedules.

The software development methodology known as Extreme Programming (XP) aims to simplify, enhance adaptability, and increase the flexibility of its stages [8]. This research uses the Extreme Programming method because it includes several processes, the first being planning, which serves to identify problems, analyze requirements, and formulate a development schedule. The second process is design, during which the researcher creates database tables, user interfaces, and UML models for the proposed system design that meets the needs of the research object. UML (Unified Modeling Language) is a graphic-based language used to visualize, define, develop, and document object-oriented software systems [9]. The third process is coding, which involves implementing modeling in the user interface design. The final stage is testing, where the system is tested to identify issues that arise when the website does not function properly and to determine whether the designed system meets user needs.

2. *Research Methods*

This research uses a descriptive approach to explain or describe the condition of the research object in accordance with the identified issues to achieve greater accuracy. To strengthen the research, the author undertakes the following research stages to collect the necessary information and data:

1) *Interviews*

Interviews involve collecting data by directly asking individuals involved in the study.

2) *Observations*

Information is collected directly through observation by researching or monitoring an object. Observation can be conducted either directly or indirectly. Through observation, data and information are gathered to understand what is occurring within the system at Puskesmas OPI Palembang.

3) *Literature Study*

To obtain theoretical or conceptual data, throughout the research, the author collects information by studying or reviewing references from journal articles and books.

4) *Extreme Programming*

The goal of the software development methodology known as Extreme Programming is to simplify, enhance adaptability, and increase the flexibility of its stages. Extreme Programming (XP) is an approach to software development that emphasizes delivering high-quality products in a fast and efficient manner[10]

1. *Planning*

The planning phase is used for analyzing the system's functionality and non-functional system analysis.

2. *Design*

Creating UML models that meet the research object's needs, designing database tables, and developing user interfaces.

3. Coding

The system must be coded during this phase for the programming that will be developed.

4. Testing

At this stage, the classification system is tested until predicted results are obtained using blackbox testing. Blackbox testing is a software testing approach that focuses on assessing the functionality of an application without considering the details of its internal structure or operation. This method can be applied at various levels of software testing, including unit, integration, system, and acceptance testing.[11]

2.1. Problem identification

Based on the results of interviews, observations, and literature reviews, the research identified a problem: the absence of a website-based information medium at Puskesmas OPI Palembang, which hinders patients from easily finding or obtaining information about the services at Puskesmas OPI Palembang and registering for outpatient services online. This issue constitutes the problem in this research. By leveraging advancements in information technology, the researcher aims to develop a website-based information medium to enhance the efficiency and effectiveness of patient services at Puskesmas OPI Palembang.

2.2. Need analysis

The following needs analysis aims to identify user requirements for the system to be developed, specifically the information media for outpatient services at Puskesmas OPI Palembang.

- 1) Patients can search for information about healthcare services and the profile of Puskesmas OPI Palembang.
- 2) Patients can view the practice or Poliklinik schedules for doctors at Puskesmas OPI Palembang.
- 3) Patients can register for outpatient services at Puskesmas OPI Palembang online through the website.
- 4) Admins can manage, edit, and add information displayed on the website.
- 5) Admins can add doctor practice schedules.

2.3. Design

In the design phase, the website utilizes use case diagrams, activity diagrams, and class diagrams as part of UML (Unified Modeling Language) techniques in the construction design and wireframes. UML is one of the standard languages frequently used in the industry to define requirements, conduct analysis and design, and describe architecture in object-oriented programming[12]. This design will assist in the subsequent stages of developing the system to ensure it is more structured and directed

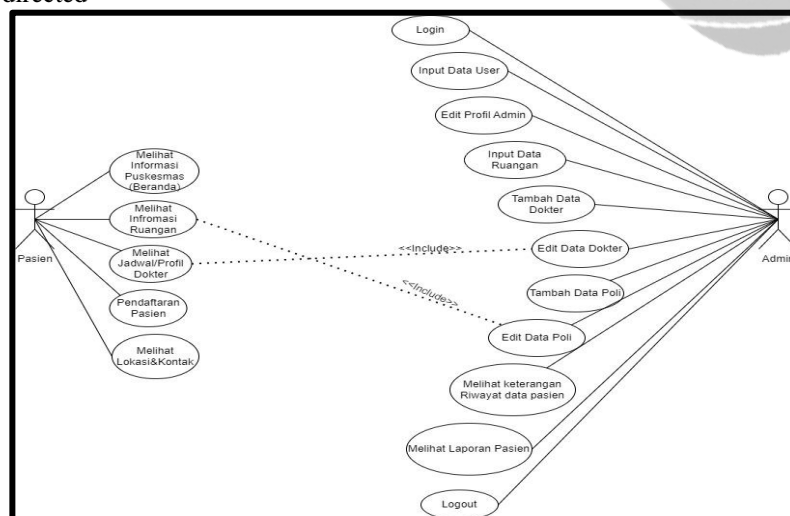


Figure.1.Use Case Diagram

Figure 1 shows a use case diagram that illustrates the website system's activities, consisting of two actors: patients and admins. Patients can view information displayed on the website, such as Puskesmas information, Poliklinik details,

doctor schedules, and can register as patients. Meanwhile, the admin can manage the data on the website, including inputting, editing, and viewing data related to Puskesmas OPI Palembang available on the site.

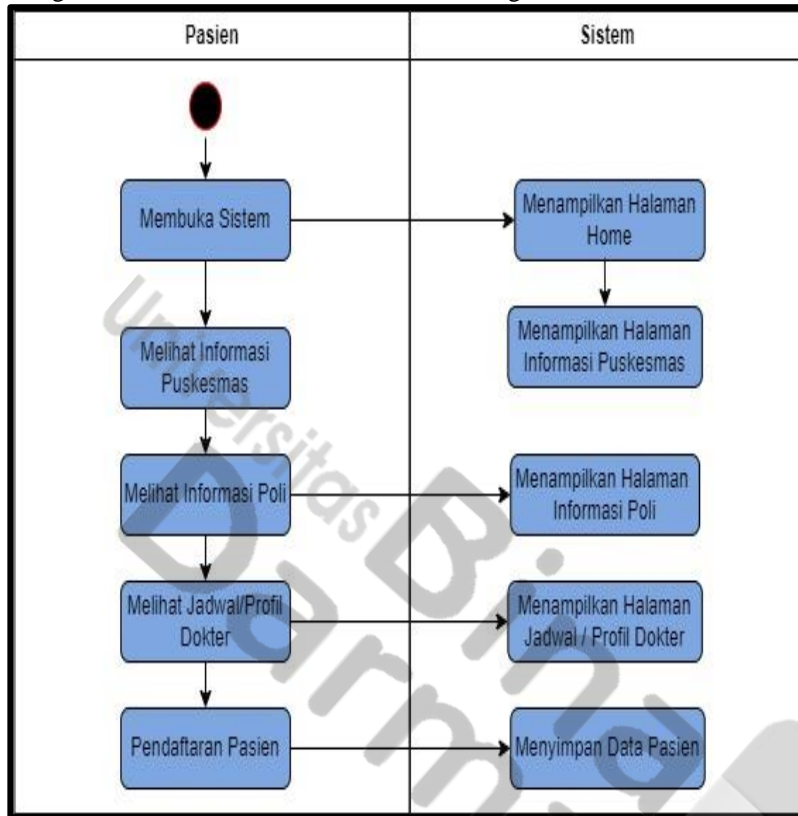


Figure.2.Activity Diagram Pasien

Figure 2 contains an activity diagram for patients, showing the procedures carried out by patients. The activity diagram is designed to provide an overview of the proposed system solution.

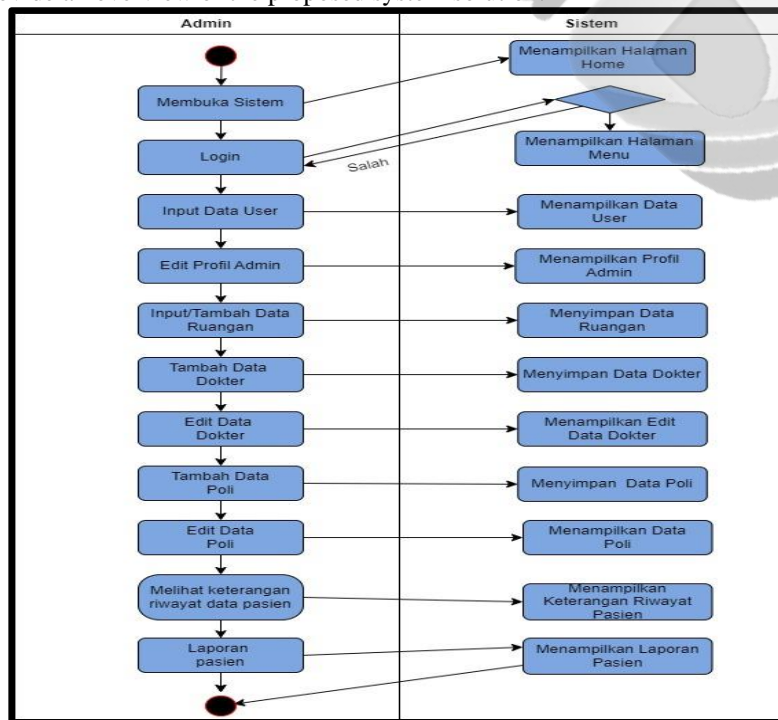


Figure.3.Activity Diagram Admin

Figure 3 shows the activity diagram for admins, depicting the activities of admins in using the website system to manage information related to Puskesmas, patients, Poliklinik, and doctors.

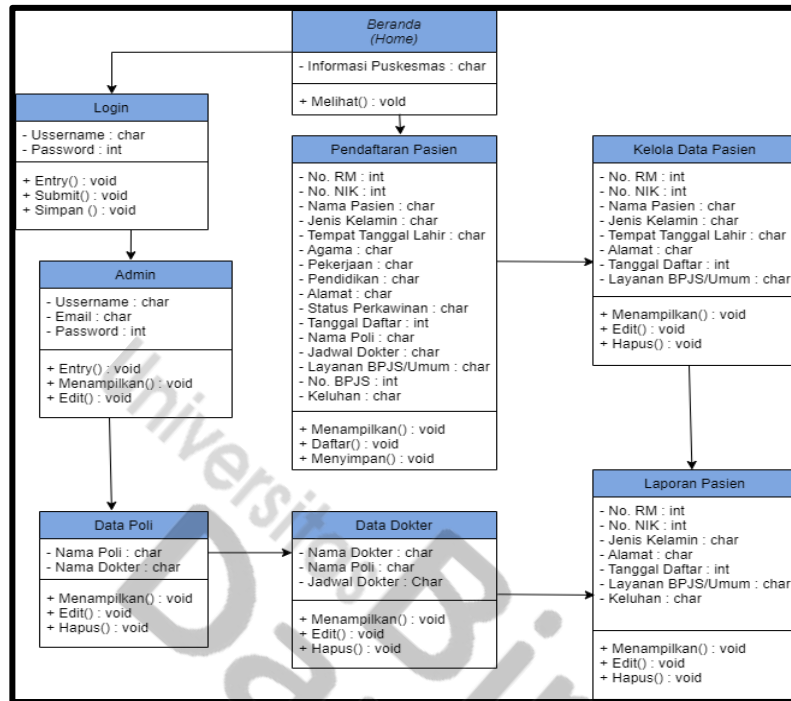


Figure.4.Class Diagram

Figure 4 shows the class diagram that illustrates or describes the relationships between each structured object, detailing the content and functions of the data that will be displayed on the website.

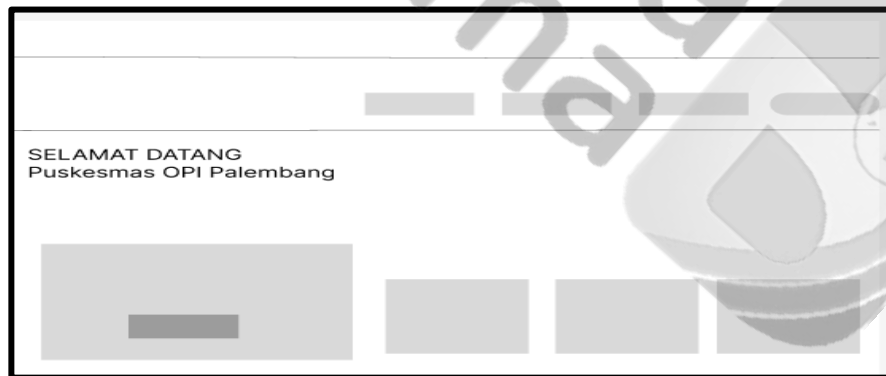


Figure.5.Wireframe Home Page

The home page of the website is the initial view displayed when users first access the site. This page includes various information about Puskesmas OPI Palembang, such as details about the values of OPI and direct access to the social media of Puskesmas OPI Palembang.

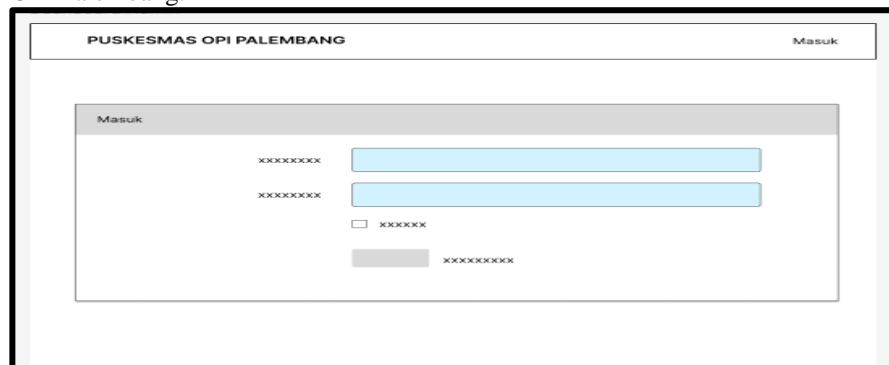


Figure.6.Admin Page

The first page that admins see upon accessing the site is the admin login page. Next, admins can enter their email address and password to log in.

3. Result and Discussion

3.1. Result

Here is an example of coding processes created using the Laravel framework. Laravel is an open-source PHP framework developed by Taylor Otwell. This framework is designed for web application development using the Model-View-Controller (MVC) pattern and is available for free [13].

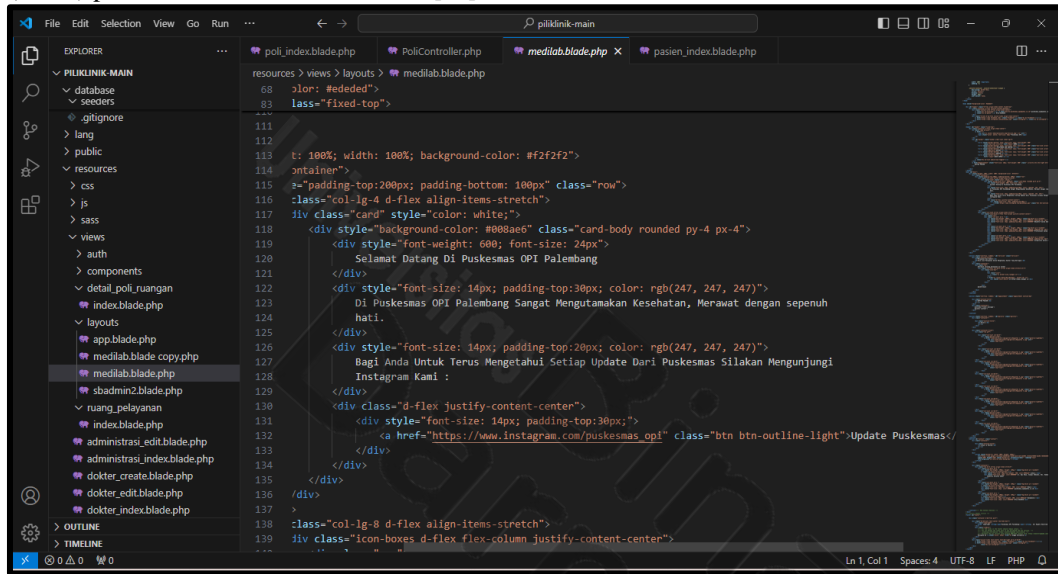


Figure.6.Main Page Coding Display

Figure 6 shows the source code layout for the main page, with its display as seen in Figure 3.5, which is visible to users upon first accessing the website. The source code includes information about Puskesmas displayed on the main page, such as social media links like Instagram and the layout of text, elements, and images.

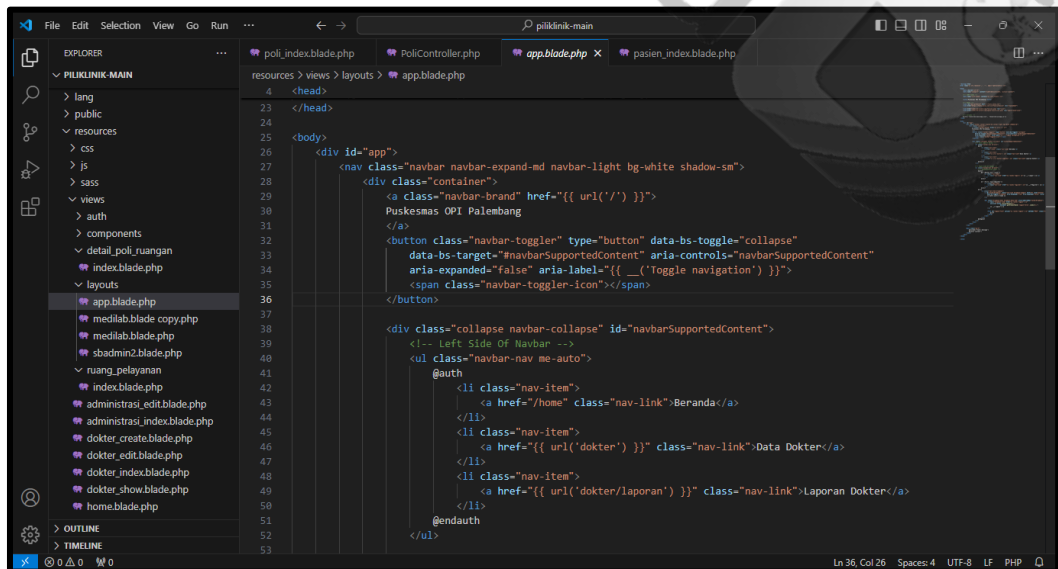
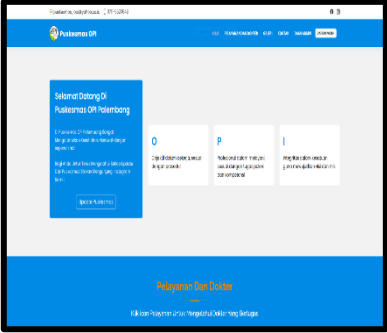
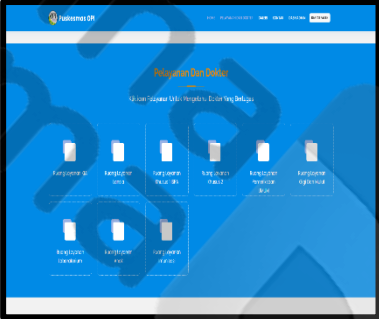
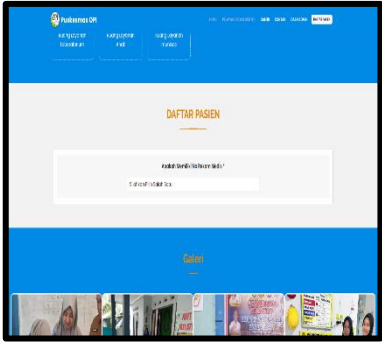
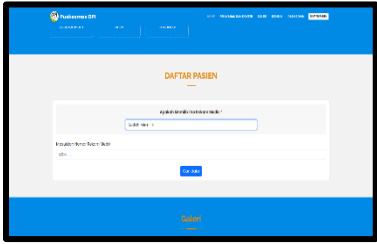
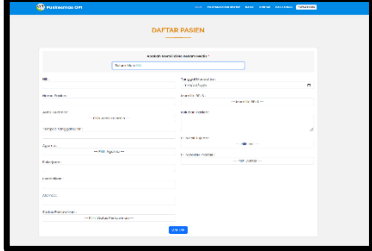
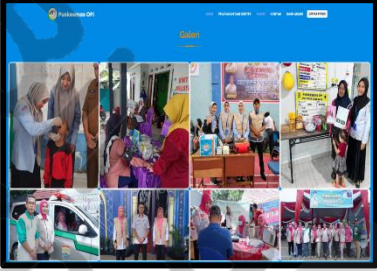
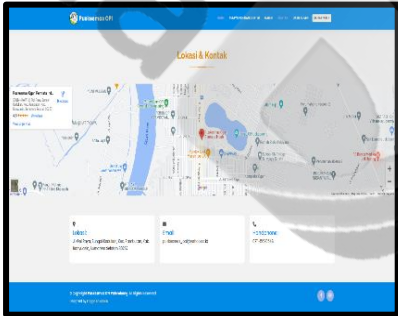

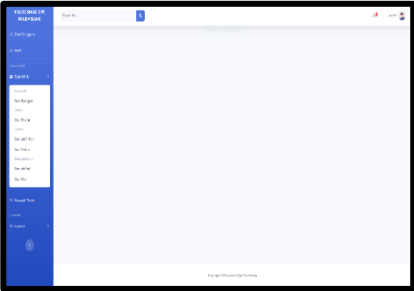


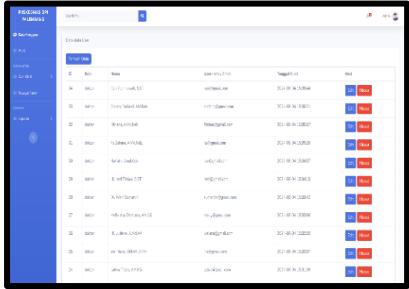
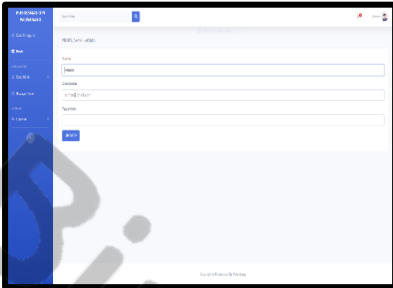
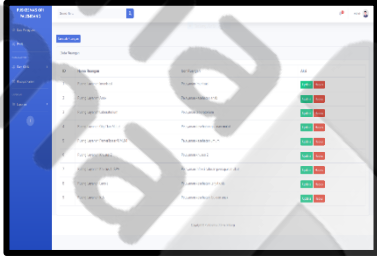
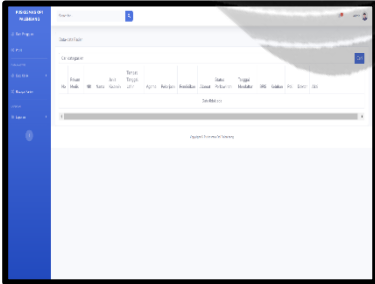
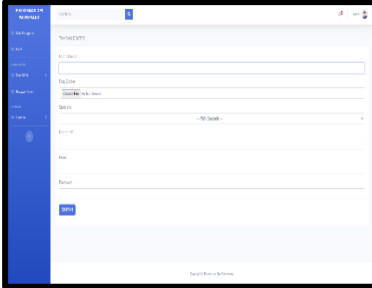
Figure.7. Patient Page Coding Display

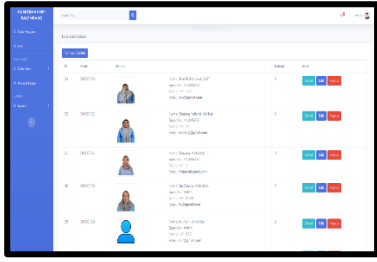
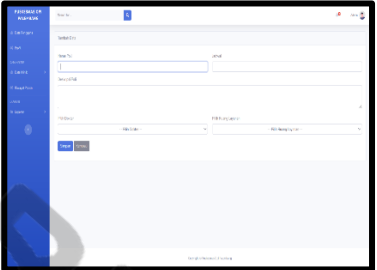
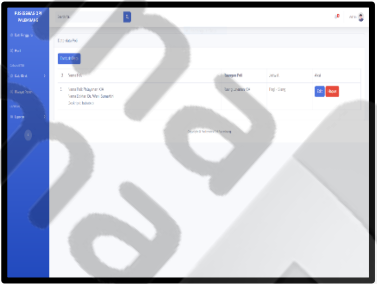
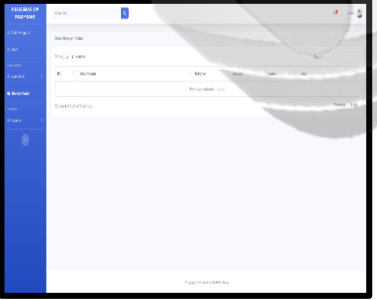
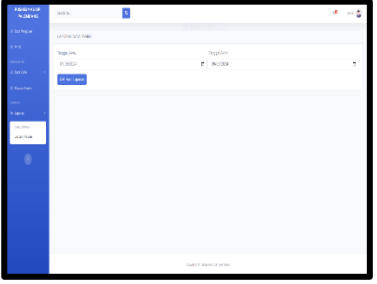
Figure 7 shows an example of the source code for the admin page, which functions to display various layouts on the admin page.

Table 1.Black Box Testing

No	Function	Testing methods	Expected results	Picture	Test results
1	Home Page	When patients access the website for the first time, it will display the home page, which shows information about Puskesmas OPI Palembang.	The home page successfully opens and displays information about Puskesmas OPI Palembang.		Successful
2	Services & Doctors	Patients can view the rooms (polyclinics) and, upon clicking, will see the names of the doctors, nurses, and midwives on duty.	Displays information about the rooms (polyclinics) and the names of the doctors, nurses, and midwives.		Successful
3	Patient registration	Patients register online by filling out the mandatory fields on the form.	The registration process is successfully completed after the patient fills out the patient information.		Successful

				 	
4	Gallery	Patients can view images of activities conducted by Puskesmas OPI Palembang.	The page displays images of activities conducted by Puskesmas OPI Palembang.		Successful
5	Location & Contact	Patients explore the location of Puskesmas OPI and view the contact information provided on the website page.	The location & contact page successfully displays the location and contact information.		Successful
6	Admin Login	The admin enters the email address and password to log in.	The admin can log in and access the subsequent pages.		Successful
7	Admin dashboard	Displays the initial page, which is the admin dashboard, featuring several functions and menus.	The admin dashboard page can display menus and features.		Successful

8	User data	Add and display user data to access the admin page.	Successfully adds user data and displays user data.		Successful
9	Admin profile	The admin can update the admin profile, such as changing the password.	Successfully updated the admin profile.		Successful
10	Room data	The admin adds room data to be displayed on the rooms and doctors page.	Successfully added and displayed room data.		Successful
11	Patient Data	Displays patient data after patient registration.	Successfully displayed patient data.		Successful
12	Add doctor	The admin can add doctor data and then save it.	Successfully saved the added doctor data.		Successful

13	Doctor Data	Displays the doctor data that has been added.	Displays doctor data.		Successful
14	Add Polyclinic	The admin adds polyclinic data to be displayed on the patient registration form.	Successfully saved the added polyclinic data.		Successful
15	Polyclinic Data	Displays polyclinic data that can be edited and deleted.	Successfully displayed polyclinic data, which can be edited and deleted.		Successful
16	Patient history	The administrator performs actions on patient data that has undergone procedures by filling in the diagnosis.	Successfully saved the action and displayed the patient history.		Successful
17	Report	Displays the final patient report and can be searched by the desired date.	Can successfully display and search the final report by the desired date.		Successful

3.2. Discussion

For the research process, a website has been developed as a health information medium for outpatient services at Puskesmas OPI Palembang. This website features several pages with different functions, facilitating patients in finding information about healthcare services at Puskesmas OPI Palembang. The development process in this research followed several stages of the Extreme Programming method, including planning, design, coding, and testing. Using Extreme Programming made the development process more structured. The final result of the research was obtained from black box testing, where each system on the website pages was tested, and the average results indicated success.

4. Related Work

The first research conducted by (Muharam & Persada, n.d.) titled "Implementation of Website Use as an Information and Marketing Medium for Agricultural and Livestock Products in Sumberejo Village" aims to expand the market reach and information of Sumberejo Village to facilitate it, without being constrained by space or time, or to provide information about Sumberejo Village to a broader audience. Utilizing the website as a channel for marketing and information about livestock and agricultural products from Sumberejo Village is the proposed solution.

The second research conducted by (Andriyan et al., n.d.) titled "Website Design as an Information Medium and Image Enhancement at SMK Dewi Sartika Tangerang" aims to assist SMK Dewi Sartika Tangerang in improving the effectiveness and efficiency of promotion and information distribution. By managing information resources through a web-based platform, this will help achieve the goals of student registration and enhance the school's reputation in the community.

The last research conducted by (Nurlailah & Nova Wardani, 2023) titled "Designing as an Information and Promotion Medium for Souvenirs from Pagaram City" aims to create a website as a medium for promotion and information, helping to promote products more effectively in terms of cost, time, and effort. This will successfully achieve the goals of business development.

5. Conclusion and Recommendations

Based on the results and discussion presented, the conclusions of this study regarding the Website-Based Health Information Media for Outpatient Services at Puskesmas OPI Palembang are as follows: this study has developed and produced a website-based health information media for outpatient services at Puskesmas OPI Palembang, and the website-based health information media for outpatient services at Puskesmas OPI Palembang assists patients in accessing service information and enables online patient registration at Puskesmas OPI Palembang. With the creation of this website, it is more effective compared to the previous system, where patient registration was done only using paper or books and required visiting the location for registration. However, with this website, patients can register online from home and view doctor schedules through the website without having to ask or check the location directly.

With the presence of this outpatient health information media for Puskesmas, the researcher provides recommendations or suggestions for future research: it is hoped that this system can be used as a resource for further studies, to facilitate user access, the system could be developed into an application, and features that are not yet available should be implemented to enhance user satisfaction in accessing the system. The researcher also hopes that future developers will add a doctor user feature so that doctors can access and view the information and data, and include an email notification feature for patients who have completed registration.

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