

DESIGNING INFORMATION SYSTEM BASED ON WEBSITE FOR KLINIK PRATAMA AT POLITEKNIK PENERBANGAN SURABAYA

Reza Putra Sandi Yudha, Lady Silk Moonlight*, Teguh Imam Suharto

Politeknik Penerbangan Surabaya, Jalan Jemur Andayani I No 73, Kota Surabaya, 60236

**Corresponding Author. Email: lady@poltekbangsby.ac.id*

ABSTRACT

A clinic is a small public healthcare facility established to provide care to outpatients. Klinik Pratama is a clinic that operates in the field of community health services. Located in Jemur Andayani, Siwalankerto Subdistrict, Klinik Pratama has been conducting its business processes effectively. However, there is a minor deficiency, which is the lack of a website that encompasses information about the clinic, including its profile, services, clinic promotions, and facilities. With this website, it is hoped to instill confidence in patients and encourage them to use the services provided by Klinik Pratama. Patients can learn about the clinic's profile, services offered, the latest news about the clinic, and the available facilities at Klinik Pratama. This endeavor is closely related to the increasing use of technology in supporting daily human activities. The research method for this website design involves the waterfall method and testing using the black box method. The waterfall method comprises five stages: Requirement, Design, Implementation, Testing, and Conclusion. By utilizing the waterfall method and black box testing technique, researchers can easily make improvements if there are errors or bugs in the coding. The results of identifying the requirements are still in abstract form, so they need to be refined and designed into a list of functional requirements that can then be visualized into a use case diagram. Based on the design of functional requirements, the author outlines scenarios for each function, resulting in a flow that can be implemented into program code.

Keywords: *information system, Klinik Pratama, laravel, black-box*

INTRODUCTION

One of the benefits of technological development is that it makes it easier for people to obtain fast and accurate information [1] [2] [3]. By utilizing the internet through the website. Website or better known by the public, namely the website is an information page that is accessed via the internet so that it can be accessed anywhere and anytime as long as it is connected to the internet network, with the website can be obtained the ease of information desired by internet users [4] [5] [6]. A clinic is a small public health facility established to provide care to outpatient patients [7].

Klinik Pratama is a clinic engaged in public health services. Klinik Pratama is located at Jl. Jemur Andayani, Siwalankerto, Kec. Wonocolo, Surabaya, 60236. Klinik Pratama has run its business process well, but there is a slight drawback, namely that it does not have a website media that includes clinic information from clinic profiles, services, clinic promotions, and Klinik

Pratama's facilities. This problem causes new patients to hesitate to use the services of Klinik Pratama because the clinic has not used official or formal media in disseminating information about Klinik Pratama. The ideal condition is that with the development of information technology today, Klinik Pratama should already have an information system website that contains clinic profiles, clinic services, the latest news about clinics, and facilities available at Klinik Pratama.

With this website media, it is expected to make patients sure not to hesitate to use the services of the Klinik Pratama, so research is needed to find innovations in overcoming problems in the current clinical information system [8] [9]. The author utilizes the role of technology that can be applied to clinical information systems to improve clinical work efficiency [10]. This is inseparable from the widespread use of technology in supporting daily human activities [11] [12].

Information technology is a technology that plays a role in helping humans process data and process

information. The development of technology has a positive impact in terms of disseminating informative media to humans. At first, information technology was only intended for certain agencies, but until now its application has been carried out in almost every line of life.

Based on the above background, the author can formulate problems in this study, as follows :

1. How to design a website-based information system for Klinik Pratama of Politeknik Penerbangan Surabaya?
2. How is the validation from medical experts and information technology experts on the Website-based information system for Klinik Pratama?

Based on the above background, the author does the following problem limitations:

1. Implementing a website-based information system for Klinik Pratama of Politeknik Penerbangan Surabaya.
2. Know the advantages and disadvantages of the website-based information system for Klinik Pratama of Politeknik Penerbangan Surabaya .

METHODS

Research Methods

The research method is an algorithm of a researcher in the implementation of research as a whole. This study used the Waterfall methodology. The waterfall method provides systematic and sequential system development.

The waterfall method is a software development process that is carried out sequentially, the process in the waterfall continues to flow down by going through the phases of planning, modeling, implementation (construction), and testing. In designing a website-based attendance information system, waterfall has the characteristic of being able to return to the previous process if an error occurs in the creation stage :

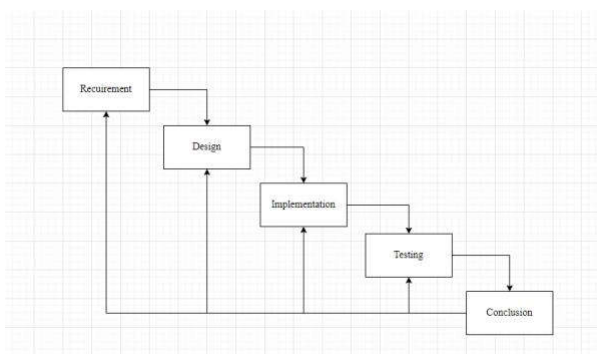


Figure 1 Stages of Research

Figure 1 is the research stage, following the description from Figure 1 :

1. Requirement
The initial stage is system needs analysis, at this stage the activities carried out are analyzing and collecting the data needed to develop this system.

In this process, look for various references to literature studies that can be in the form of books, journals, or literature that are valid and related to the research topic [13].

2. Design
The second stage is to discuss system planning, how the system runs by considering the data specification data of the tools used to design applications. This design is made so that the website implementation process becomes structured and meets research needs [14].
3. Implementation
The third stage is to make and implement tools according to the system design that has been made according to planned procedures so that the tools can function properly at the time of testing [15].
4. Testing
The fourth stage is the process of testing tools that are successfully made according to the plan and goals. If the tool is successful then proceed to the next stage, but if not the tool must be analyzed and then redesigned [16].
5. Conclusion
The last stage is a conclusion that can be drawn from data analysis in accordance with the initial purpose [17].

Requirement

At this stage, requirements analysis is used to define software functionality and constraints. Functional requirements describe the features, functions, and uses of the product/system/software from the perspective of the product and its users. This stage not only defines product functions, user characteristics, and constraints, but also serves as the basis for software design documents.

Design

The second step is system design where the author will design the appearance of the website interface and also its functionality. In order to facilitate the design of this website, a use case diagram and activity diagram were made as a guide.

Testing

Tool testing is a stage that must be taken to ensure the application product runs as designed and does not experience operating problems. What is meant by the tool in this test is a website that has been created. The proper testing method to test the entire functionality of the website is the Blackbox method [18]. The blackbox testing method is one of the tests carried out by carrying out each website function as designed. This method is done to ensure that the entire functional website runs without any problems. The stages carried out in the blackbox method are as follows :

1. Check specifications and system requirements.
2. Enter valid inputs and whether the processes are appropriate. It also tests for invalid input.
3. See if the output is as expected or not.

4. Create a test case with selected inputs.
5. Test cases run.
6. Compare the output produced.
7. Take notes and correct.

Media Expert and Material Expert Validation Methods

Before validating the data, the author conducted a survey to collect data. This technique does this by providing an assessment questionnaire directly in collecting data [19]. A questionnaire is an instrument that contains questions that must be answered by respondents according to what they know and experience. The use of questionnaires in this study aims to find out the assessment, criticism, and advice on products from experts.

In this instrument, there are two surveys conducted, namely each to media experts and material experts and four components that must be assessed. The components are in the form of software, visual design, tool functions, and tool practicality, the number of items submitted is 16 items.

Table 1 Assessment Aspects for Media Expert Validity Testing

No.	Assessment aspect	Score				
		1	2	3	4	5
A. Software						
1.	Maintable (can be maintained and managed easily)					
2.	Usable (easy to use in operation)					
3.	Compatible (application media can be installed and run in various browsers)Compatible (application media can be installed and run in various browsers)					
4.	Reusable (scripts can be reused and developed)					
5.	Setting the website is easy for the admin to do.					
B. Visual Design						
6.	Neatness of the display layout on the website					
7.	The appearance of the website interface is already attractive					
8.	The use of language in the website is easy to understand					
9.	The use of text size in the website can be read.					
C. Function						
10.	The effectiveness of the website in providing schedule information.					
11.	The effectiveness of the website in providing service information.					
12.	The effectiveness of the website in long-term use.					
13.	Make it easier to obtain health information.					
D. Practicality						
14.	Website efficiency					
15.	The use of the website is easy to understand					
16.	The use of the website is easy to operate					
Criticism and Suggestions:						
Total score:						

Table 2 Assessment Aspects for Material Expert Validity Testing

No.	Assessment aspect	Skor				
		1	2	3	4	5
A. Aspects of Needs						
1.	The content of the website is in accordance with the needs of patients.					
2.	The clarity of the website in conveying information is good					
3.	The scope of clarity of the information provided is in accordance with the needs					
4.	The depth of information content on the website is good					
5.	The amount of information presented on the website is in accordance with the purpose.					
B. Visual Design						
6.	Neatness of the display layout on the website					
7.	The appearance of the website interface is already attractive					
8.	The use of language in the website is easy to understand					
9.	The use of text size in the website can be read.					
C. Function						
10.	The effectiveness of the website in providing schedule information.					
11.	The effectiveness of the website in providing service information.					
12.	The effectiveness of the website in long-term use.					
13.	Make it easier for patients to obtain health information					
D. Practicality						
14.	Website efficiency for patients					
15.	The website is very practical for patients					
16.	The website is quite simple for patients					
Criticism and Suggestions:						
Total score:						

Validity Filling Instructions

Give an assessment by giving a mark () in the value column according to the results of the assessment of air quality monitoring devices. Here's the product rating scale.

Table 3 Rating Scale

No.	Kategori	Skor
1.	Excellent	5
2.	Good	4
3.	Good Enough	3
4.	Not good	2
5.	Bad	1

Table 3 shows the rating scale category given in the form of a product validation questionnaire with a score range of 5 strongly agree, 4 agree, 3 disagree, 2 disagree, 1 strongly disagree. The score obtained from the questionnaire will be converted to be converted into a percentage specified by the following formula :

$$Indeks = \frac{\text{score obtained}}{\text{maximum number of scores}} \times 100\%$$

After the results of the questionnaire are distributed to determine the validity of the product and the results are known using the formula above, the percentage results are adjusted using the following criteria table :

Table 4 Product Validity Index

No.	Indeks	Skor
1.	Excellent	80% - 100%
2.	Good	60% - 79,99%
3.	Good Enough	40% - 59,99%
4.	Not good	20% - 39,99%
5.	Bad	0% - 19,99 %

RESULT AND DISCUSSION

From the results of website design, the authors found several research results which will be explained, among others, such as website appearance and system testing as follows :

Research Result

a. Home Page

The home page is the first display encountered by users when accessing the clinic website. This page is simply designed for homepage view. In figure 2 below is the display of the website's home page.

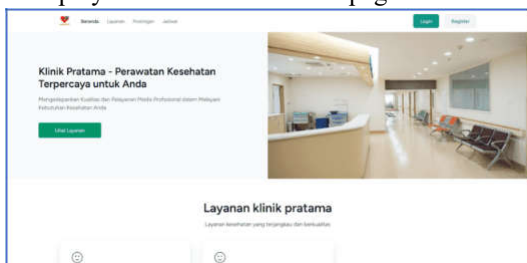


Figure 2 Home Page

b. Login View

The login page is a page used to receive user input in the form of data to log in. This page can be accessed by pressing the login button on the home page. In figure 3 below is what the login page looks like.

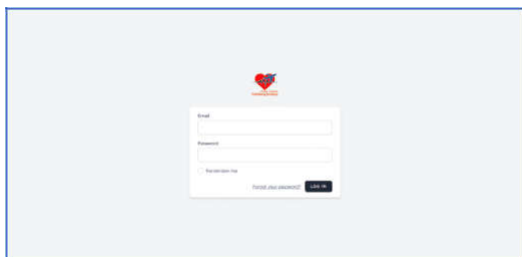


Figure 3 Login View

c. Service Management Page View

The service management page is used to manage the list of services stored in the database. On this page, users can perform various actions, such as adding, editing or deleting existing services. The service management page provides an intuitive and user-friendly interface, allowing admins to easily set service parameters. Figure 4 below is a display of the service management page.

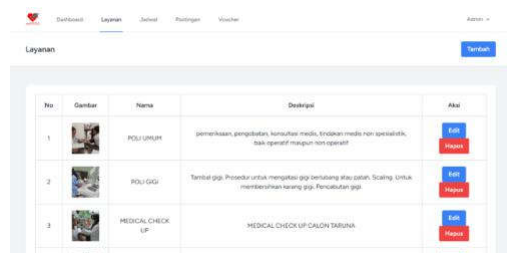


Figure 4 Service Management Page View

d. Schedule Management Page View

The In-clinic Schedule management page is a page specifically designed to manage the practice schedule for each service within the clinic. This page provides a structured and organized view to view practice schedules within a specific time span. Admins can set available doctor schedules, practice times, and types of services provided. In figure 5 below is what the schedule management page looks like.

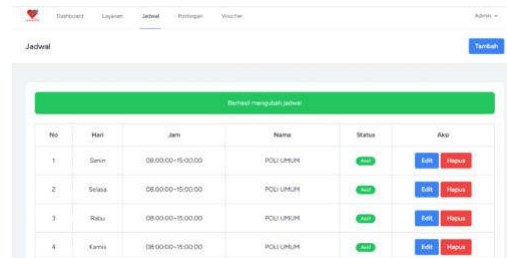


Figure 5 Schedule Management Page View

e. Post Management Page View

The post management page is a page that allows admins to manage and manage posts within the clinic's website. On this page admins can add, edit or delete a list of published posts. In figure 6 below is what the post management page looks like.

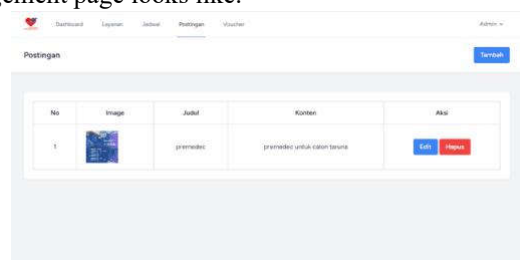


Figure 6 Post Management Page View

f. Service Page View

The service page is a page accessed by patients to see a list of services owned by the clinic. In this page will be loaded the entire list of services in the form of cards so that it looks more attractive and neat. In figure 7 below is what the service page looks like.

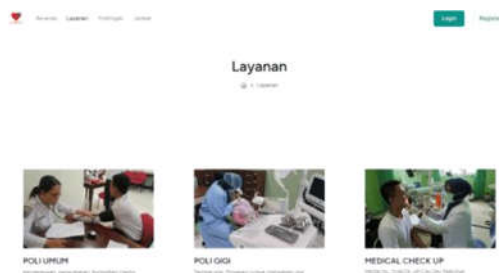


Figure 7 Service Page View

g. Post Page View

The posting page is a page that contains publications carried out by the clinic. This makes it easier for clinics to inform the public about important things and strengthens their online presence as a trusted source of information. In figure 8 below is what the clinic post page looks like.

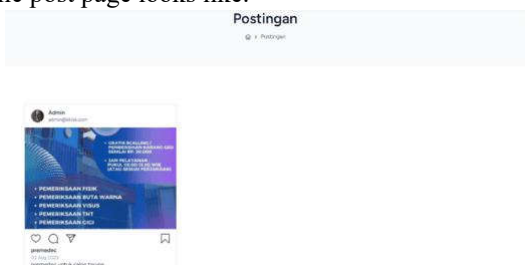


Figure 8 Post Page View

h. Schedule Page View

The schedule page is a page that contains the schedule of clinical practices per service mapped each week. The information displayed includes the days, hours, and types of services available. In figure 10 below is what the schedule page looks like.

Pinggu	Senin	Selasa	Rabu	Kamis	Jum
08:00:00 - POLI UMLUM	08:00:00 - POLI UMLUM	08:00:00 - POLI UMLUM	08:00:00 - POLI UMLUM	08:00:00 - POLI UMLUM	08:00:00 - POLI UMLUM
08:00:00 - POLI GIGI	08:00:00 - POLI GIGI	08:00:00 - POLI GIGI	08:00:00 - POLI GIGI	08:00:00 - POLI GIGI	08:00:00 - POLI GIGI
08:00:00 - PELAYANAN FARMASI	08:00:00 - PELAYANAN FARMASI	08:00:00 - PELAYANAN FARMASI	08:00:00 - PELAYANAN FARMASI	08:00:00 - PELAYANAN FARMASI	08:00:00 - PELAYANAN FARMASI

Figure 9 Schedule Page View

Media Validation Testing and Material Experts

The product validation questionnaire in this study aims to determine the assessment, criticism, and advice on products from experts. Product validation is carried out by Media Experts and Medical Experts of Politeknik Penerbangan Surabaya. The assessment aspects tested include aspects of software, visual design, tool functionality, and tool practicality [20] [21].

Table 5 Information Technology Expert Validation Results

No.	Assessment aspect	Total Score	Maximum Score	Validation Value	Category	Information
1.	Software	24	80	96%	Very agree	Can be used with additional revisions
2.	Visual Design	19				
3.	Tool Function	19				
4.	Practicality of the Tool	15				
TOTAL		77				

$$\text{Validation Value} = \frac{\text{score obtained}}{\text{maximum number of score}} \times 100\%$$

$$\text{Validation Value} = \frac{77}{80} \times 100\% \quad \text{Validation Value} = 0,96 \times 100\%$$

$$\text{Validation Value} = 96\%$$

Table 5 shows the results of product validation that has been tested by Mrs. Rahma Dini Maghfirotul Laily, S.Kom. as a Media Expert at Politeknik Penerbangan Surabaya. The average product validation result is 96% with the criteria strongly agreeable because it is at intervals of 80% - 100%, so that the website-based primary clinic information system can be used with additional revisions.

Table 6 Medical Expert Validation Results

No.	Assessment aspect	Total Score	Maximum Score	Validation Value	Category	Information
1.	Software	22	80	88%	Very Agree	Can be used with additional revisions
2.	Visual Design	16				
3.	Tool functions	18				
4.	Practicality of the tool	14				

$$\text{Validation Value} = \frac{\text{score obtained}}{\text{maximum number of scores}} \times 100\%$$

$$\text{Validation Value} = \frac{70}{80} \times 100\% \quad \text{Validation Value} = 0,88 \times 100\%$$

$$\text{Validation Value} = 88\%$$

Table 6 shows the results of product validation that has been tested by Mr. dr. Samodero Gumilar, M.Kes. as a Medical Expert at Politeknik Penerbangan Surabaya. The average product validation result is 88% with the criteria strongly agreeable because it is at intervals of 80% - 100%, so that the website-based primary clinic information system can be used with additional revisions.

CONCLUSION

Based on the author's research on the design of the website-based information system at Klinik Pratama of Politeknik Penerbangan Surabaya, it can be concluded as follows :

1. The design of the website-based information system at Klinik Pratama of Politeknik Penerbangan Surabaya was carried out with the first stage in the form of finding system needs. The results of requirements discovery are still abstract, so they need to be filtered and designed into a list of functional needs which can then be visualized into a use case

diagram. Based on the design of functional requirements, the author describes the scenario of each function so that a flow can be implemented into program code is obtained.

2. The information system validation process is carried out through 2 stages of testing. The first process is black-box testing, which is a testing process carried out to ensure that all functional systems run as expected. Black-box testing showed 100% functional results went well as expected. The second is the validation of medical experts and information technology experts. In this validation, the average product validation result is 96% with the criteria of being very agreeable because it is at intervals of 80% - 100%, so that the website-based at Klinik Pratama information system is very good.

REFERENCES

- [1] Y. Zhang dan J. Liu, "Deconstructing proxy health information-seeking behavior: A systematic review," *Library & Information Science Research*, 2023.
- [2] J. Dai, Z. Wang dan W. Huang, "Interval-valued fuzzy discernibility pair approach for attribute reduction in incomplete interval-valued information systems," *Information Sciences*, 2023.
- [3] J. Zhang, D. Wolfram dan F. Ma, "The impact of big data on research methods in information science," *Data and Information Management*, 2023.
- [4] H. Şimşek dan İ. Güvendirin, "Soft computing based e-commerce website service quality index measurement," *Electronic Commerce Research and Applications*, 2023.
- [5] O. Alghamdi, S. Clinch, R. Skeva dan C. Jay, "How are websites used during development and what are the implications for the coding process?," *Journal of Systems and Software*, 2023.
- [6] M. Wright, K. C. Thomas, D. Carpenter, C. Lee, I. Coyne, N. Garcia, A. Adjei dan B. Sleath, "Co-designing a website with and for youth, so they can better manage their health, PEC Innovation," 2023.
- [7] A. Saini, M. Agarwal, V. K. Singh, A. Agarwal, S. Tandon dan S. Jauhari, "Completeness and legibility of obstetric referral documents from peripheral public health facilities to a tertiary care facility in North India- a cross-sectional study," *Clinical Epidemiology and Global Health*, 2023.
- [8] V. Socrates, A. Gilson, K. Lopez, L. Chi, R. A. Taylor dan D. Chartash, "Predicting relations between SOAP note sections: The value of incorporating a clinical information model," *Journal of Biomedical Informatics*, 2023.
- [9] F. A. Nascimento, J. Jing, S. Beniczky, M. Olandoski, S. R. Benbadis, A. J. Cole dan M. B. Westover, "EEG reading with or without clinical information – a real-world practice study," *Neurophysiologie Clinique*, pp. 394-397, 2022.
- [10] W. M. Yee, A. A. Mamun, Z. Xueyun, W. M. H. W. Hussain dan Q. Yang, "Modelling the significance of psychological, social, and situational factors on work efficiency and the preference for working from home in Southeast Asia," 2023.
- [11] J. Hong, F. Liang dan H. Yang, "Research progress, trends and prospects of big data technology for new energy power and energy storage system," *Energy Reviews*, 2023.
- [12] J. Wang dan J.-J. Lee, "Predicting and analyzing technology convergence for exploring technological opportunities in the smart health industry," *Computers & Industrial Engineering*, 2023.
- [13] F. u. Hassan, T. Nguyen, T. Le dan C. Le, "Automated prioritization of construction project requirements using machine learning and fuzzy Failure Mode and Effects Analysis (FMEA)," *Automation in Construction*, 2023.
- [14] S. Lähteenoja, T. Marttila, İ. Gaziulusoy dan S. Hyysalo, "Transition co-design dynamics

in high level policy processes,” *Design Studies*, 2023.

- [15] A. Brockman, A. Krupp, C. Bach, J. Mu, E. E. Vasilevskis, A. Tan, L. C. Mion dan M. C. Balas, “Clinicians’ perceptions on implementation strategies used to facilitate ABCDEF bundle adoption: A multicenter survey,” pp. 108-115, 2023.
- [16] Q. Yang, X. Ma, F. Hu, J. Zhang, T. Sun, B. Chen, Y. Xu dan Y. Liu, “Expert Consensus on Polymyxin Antimicrobial Susceptibility Testing and Clinical Interpretation,” *Chinese Medical Sciences Journal*, pp. 1-16, 2021.
- [17] J. Liu dan L. Xiao, “A multi-dimensional analysis of conclusions in research articles: Variation across disciplines,” *English for Specific Purposes*, pp. 46-61, 2022.
- [18] X. He dan Y. Huang, “Web Content Management Systems as a Support Service in Academic Library Websites: An Investigation of the World-class Universities in 2012–2022,” *The Journal of Academic Librarianship*, 2023.
- [19] B. Misiuk dan C. J. Brown, “Improved environmental mapping and validation using bagging models with spatially clustered data,” *Ecological Informatics*, 2023.
- [20] K. P. R. Indonesia, “Organisasi dan Tata Kerja Politeknik Penerbangan Surabaya, Indonesia,” 2017.
- [21] L. S. Moonlight, L. Rochmawati, Fatmawati, F. A. Furyanto dan T. Arifianto, “Rancang Bangun Website Prodi D3 Komunikasi Penerbangan Menggunakan Metode Prototype,” *Journal of Information Technology*, 2023.