Article

Design of a Web-Based Health Information System to Support a Teaching Factory in Health Information Management of PSDKU Ngawi

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Abstract: Health services are among the most needed services by the community. In Ngawi Regency, Indonesia, residents often struggle to access vital health service information. With the advancement of technology, such as web-based health service information systems, it becomes easier for the community to access information about health services. The design of a web-based health service information system aims to support the establishment of a pioneering teaching factory for the Health Information Management study program. This research employs the SDLC (System Development Life Cycle) software development method using the prototype model. The stages of the system design and development include quick plan, modelling, quick design, construction of prototype, deployment, delivery and feedback, and communication. The research results indicate that the web-based health service information system can facilitate the Ngawi community and its surroundings in accessing health service information, registering online, conducting self-health checks, consulting with health personnel via a WhatsApp link available on the web, serving as a health promotion media, and enabling users or health personnel to utilize patient data stored in the system database as a learning support tool. Based on the research findings, the system significantly enhances community access to health services and streamlines health management processes for users.

Keywords: Web; Health Service; Information System; Teaching Factory

1. Introduction

Health is one of the basic human needs besides clothing, food, and shelter, because when a person is ill, they cannot carry out daily activities properly [1]. To improve the health status of the community, many aspects need to be considered [2,3]. One important factor is the provision of healthcare services. The community in Ngawi Regency still faces difficulties in accessing information about the types of healthcare services and health-related information. Data shows that 20% of people with Diabetes Mellitus and 14% of individuals at risk of being infected with HIV/AIDS have not received standard services due to limited access to information. As a result, many people are often unaware of the healthcare services available at healthcare facilities [4].

The advancement of information technology has enabled the development of web-based information systems, making it easier for the public to access information about healthcare services, especially for those with limited time to visit healthcare facilities [5,6]. In addition, web-based information systems simplify the process for healthcare staff to record medical records and report health data, offering a more flexible user interface,

accessible via laptops or smartphones, with easily distributed information and easier scheduling of services [7].

The Government Regulation of the Republic of Indonesia No. 41 of 2015 states that competency-based vocational education must be equipped with a Teaching Factory (TeFa) [8–12]. Teaching factory is a production-based learning framework designed for students in vocational education for the future [13]. The Health Information Management (MIK) PSDKU in Ngawi Regency was newly established following the Decree of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia No. 161/D/OT/2023 on July 10, 2023. Therefore, to support the competency achievement of PSDKU MIK Ngawi, a pioneering TeFa will be established, which can later serve as a practical training field for students to manage health information [14].

The development of a web-based information system to support the establishment of the teaching factory at PSDKU MIK Ngawi is essential as a promotional tool. The web-based information system is designed with features such as online registration, live chat consultations, self-health checks, health promotion, and electronic patient data recording. Therefore, based on the aforementioned background, the design and development of a web-based information system becomes a key factor in supporting the establishment of the teaching factory at PSDKU MIK Ngawi, assisting users in patient data management and making it easier for the Ngawi community to access health service information and perform self-health checks based on previous test results.

2. Materials and Methods

This research uses the System Development Life Cycle (SDLC) software development method with a Prototype model. One of the advantages of the prototype model is its ability to manage time more effectively and adjust the required resources. The stages of system development include:

a. Quick Plan

Quickly planning according to user needs. The requirements for the Teaching Factory (TeFa) as a user include needing an information system that can be used as a promotional media for TeFa at PSDKU Health Information Management in Ngawi Regency. This information system should include online registration, health promotion media, and live health consultations, and it should also be able to store and process patient data.

b. Modeling Quick Design

Designing with a graphical approach concerning the appearance and layout of buttons integrated with the desired functions. This quick design stage results in an output in the form of UI/UX design. The graphics used are coded with CSS embedded in the Blogspot CMS. The existing CSS is modified according to the user requirements that were previously formulated. Therefore, an additional user requirements table is needed to illustrate how the website will be delivered to the user or tailored to their needs. As a result, this website is designed to be simple and easily accessible, in line with the principles and characteristics of the users.

c. Construction of Prototype

The output of this stage is the design for each page, access rights, admin pages, and counselor pages. Once the design is approved, the software can move on to the Development or coding phase. The coding phase is carried out using a content management system (CMS) platform. The Content Management System (CMS) used is Blogspot because it is easy to access and simple to add administrators. The CMS is then configured for domain forwarding. Blogspot CMS is also easy to modify coding and can perform various other functions. The required software includes a code editor such as Visual Code and a database storage system using MySQL.

d. Deployment Delivery & Feedback

This stage involves presenting the information system to the user (TeFa Manager) to provide feedback on the system that has been built. We expect real feedback from users, in this case, we are planning white box testing, where users are involved in the testing

process. This feedback will then be used for revisions. However, if the proposed results are approved, the process can move on to the next stage
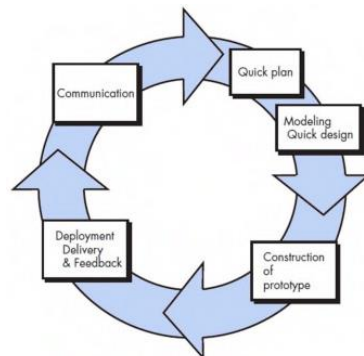
e.   Communication

Figure 1. Prototype Model Diagram

The image represents the planned activities that we will carry out in the development of this website.

3. Results and Discussion

3.1. The Proposed Use Case Diagram

Here is the proposed use case diagram for the design and development of the web-based information system for the TeFa PSDKU MIK Ngawi initiative:

1.   Use Case Diagram for Admin

In the web-based information system, the admin is the only user who can access and edit the contents of each menu on the website. Additionally, the admin can set access rights and add modules to the website.
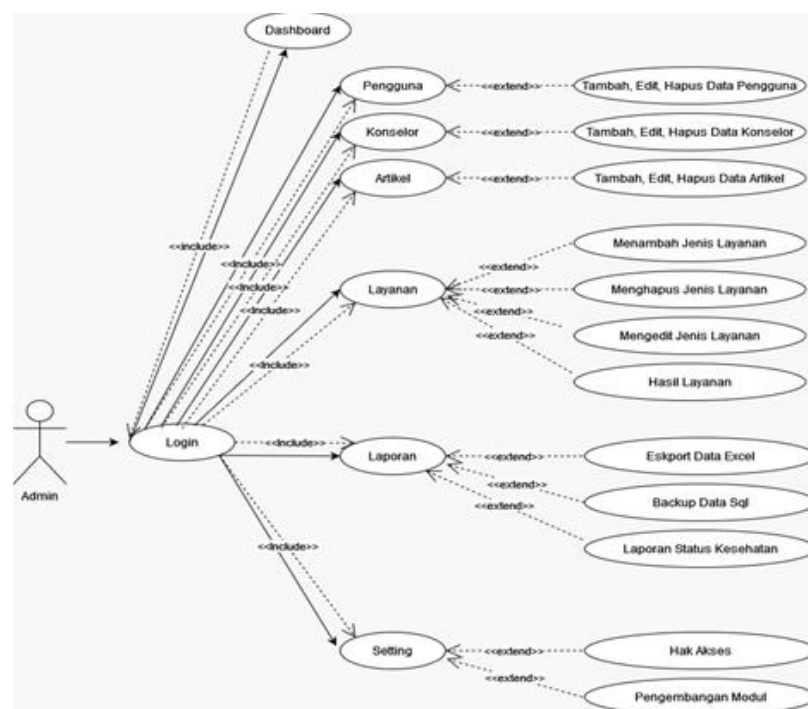

Figure 2. Use Case Diagram for Admin

2.   Use Case Diagram for Public

The public or general audience can access information related to the services provided at TeFa, read health articles, and perform basic health tests independently.
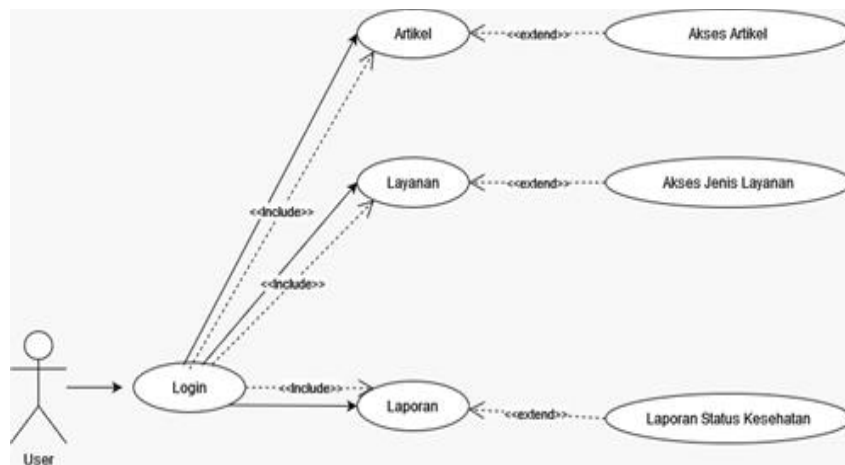
Figure 3. Use Case Diagram for Public

3. Use Case Diagram for Health Worker
   Healthcare workers who provide services to patients can input patient data into the patient database. Additionally, medical record personnel can input the patient's social data into the system, where the medical record personnel will be students from PSDKU MIK Ngawi themselves.
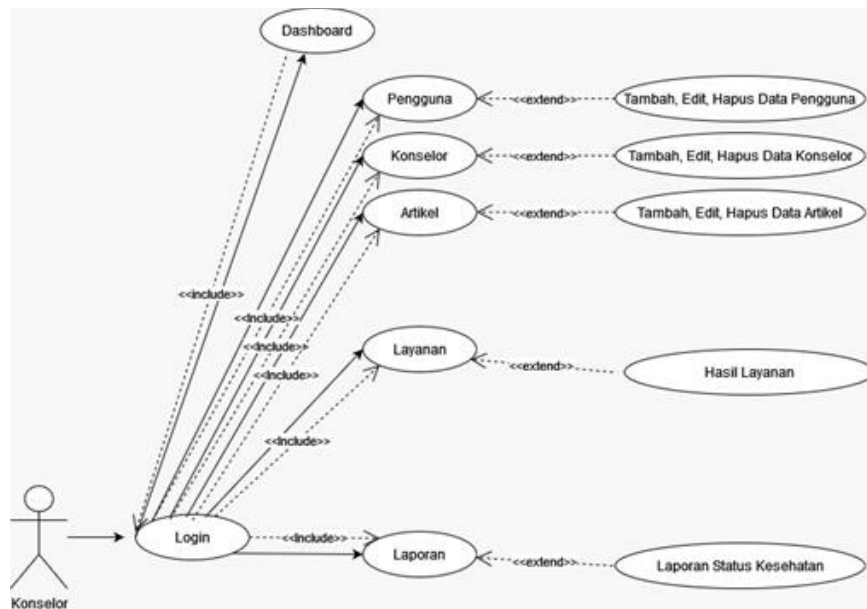

Figure 4. Use Case Diagram for Health Worker

3.2. Visualization of The Website Display
   On the homepage, there are several main menus, such as the home page to view the initial website display, the campus profile page, and the health education services page.
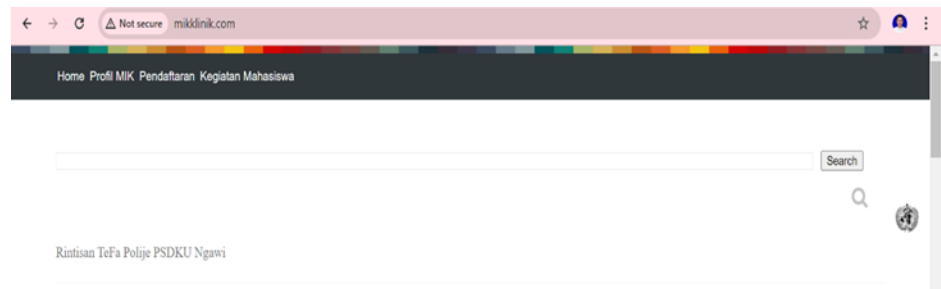
Figure 5. Homepage of the Website

On the front page of the website, there are several menu options that can direct users to the sections of the page they wish to visit.
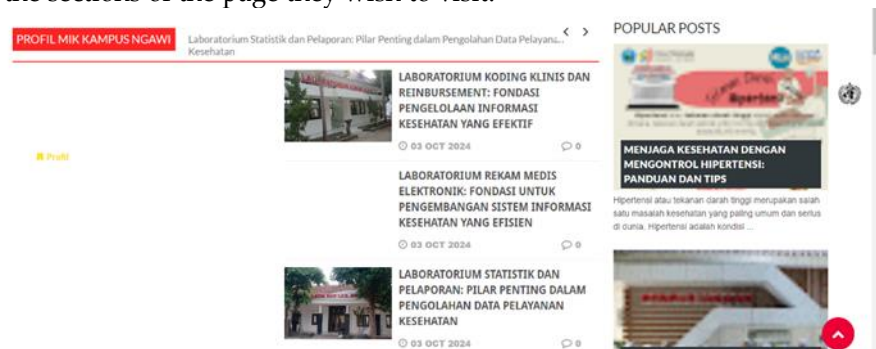

Figure 6. Campus Profil Page

On the campus profile page, users can see information related to the history of the establishment of PSDKU Health Information Management Ngawi, as well as the facilities provided to support both lecture and practical learning processes.

Figure 7. Teaching Factory Initiatives Page

On the Teaching Factory Initiatives page, visitors can read a description of the organizational structure of the Health Service Center, which is the teaching factory initiative of PSDKU Health Information Management Ngawi. Visitors can also learn about the types of health services available and how to access the health service center, which currently serves as a means for basic health examinations.
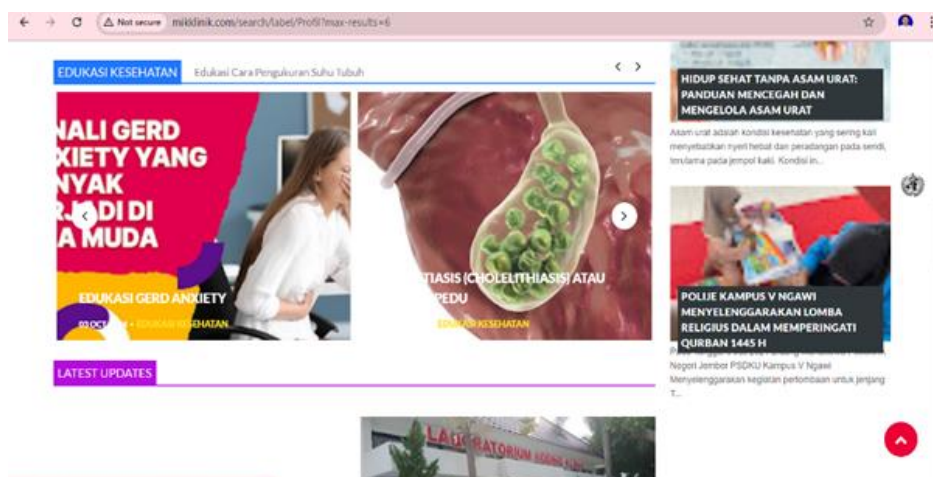
Figure 8. Health Education Page

On the health education page, visitors can read several health articles that serve as reading material and a foundation for adopting a healthy lifestyle.

Figure 9. Footer Section of the Website

At the bottom of the website, there is contact information that visitors can use to find out the location of the Health Service Center, which is the teaching factory initiative of PSDKU Health Information Management Ngawi.

3.3. Requirements Analysis

Through the system requirements analysis, it has been determined that the system is ready for implementation to support the health services provided by the teaching factory initiative. The system requirements analysis includes functional requirements, non-functional requirements, and user requirements.

To access healthcare services, patients are required to register, which can be done online by accessing the website, contacting the available person, or by visiting the healthcare service directly during specific events organized by the Ngawi Regency government. For administrative purposes, the identity obtained from registration is also recorded in the registration form. This aligns with Ismail Arifin's (2023) research, which states that patient registration is a crucial component of healthcare services. During the registration stage, patient identity and visit purposes are recorded. This registration process is very important as it serves as the reference for patient data in subsequent processes; if there are errors in the registration process, the patient data in other processes will also be incorrect [8,15–18].

Non-functional analysis is conducted to identify the specifications of both software and hardware that support system design, as well as the necessary hardware and software specifications for implementing an online registration system. By performing a non-functional requirements analysis before designing the system, the needed specifications for both software and hardware can be determined, ensuring that the devices are suitable for the system to be used [19].

In this healthcare system, there are two types of users: admins and patients. First, admins have access to manage data, including service data, and can add new data if needed. Second, patients can access their profile page, view health education information provided, and contact available personnel on the website to support online registration. User requirements analysis in system design ensures that the functions and features displayed meet user needs, so that no features are unused [20].

3.4. The Design og System Planning

In the use case diagram process, both the processes and roles of users in utilizing the system are described. The first actor is the admin, who can verify patient visit data through the website and manage patient data from health service visits as a database to support the learning process. The next actor is the patient, who can view the website profile page, access health education articles, and use the contact person page for online registration. Through the contact person available on the website, patients can also perform self-health checks, where the admin will direct them to the health officers of the teaching factory initiative for consultations. The design of the use case diagram process from the user's perspective involves describing typical interactions between users and the system through a narrative on how the system will be used [14].

4. Conclusions

The design of a web-based health information system aims to support the establishment of the teaching factory initiative at PSDKU Health Information Management. The system design explains the processes that depict the relationships and functions that users can utilize. This information system design is only up to the Construction of Prototype stage. Moving forward, it is hoped that the system design will continue to the next two stages: Deployment Delivery & Feedback and Communication. Additionally, the system design should also explain the processes conducted by each user, including admins, health workers, and patients.

5. Acknowledgements

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