

DEVELOPMENT OF AN E-CLINIC SYSTEM BASED ON A WEBSITE AT TAMARA CLINIC, BATAM CITY

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Abstract

A clinical information system is a collection of diverse information technology applications that offer a centralized repository of patient care-related information across distributed locations. This repository contains the patient's clinical history along with the physician's decisions regarding the patient's condition, treatment choices, and overall health. The clinical information system is defined as a computer-based system dedicated to collecting, storing, and disseminating all essential clinical information required for patient care. Clinical information systems are frequently acknowledged for their potential to enhance the quality of healthcare services. The primary function of a clinical information system is to present tailored information to patients in a clear, organized, and timely manner. One of the clinical information systems employed for data management in clinics is the E-Clinic. This study aims to design and develop a web-based patient registration system for utilization at the Tamara Clinic. This qualitative research employs experimental research methods, involving the creation of a solution during the research process.

Keywords: Clinic Registration System, Healthcare Services Quality, Information System, Patient Registration

1. INTRODUCTION

According to the Ministry of Health Regulation No. 9 of 2014, a clinic is a healthcare facility that offers individual medical services, providing basic and/or specialized medical care. The regulations set by the Ministry of Health of the Republic of Indonesia in No. 9, 2014 require clinics to deliver safe, high-quality, patient-centric care while adhering to professional standards, service standards, and operational procedures. Additionally, clinics are expected to provide emergency care to patients based on their capabilities, without the need for upfront payments, prioritizing patient interests (PERMENKES RI No 9/MENKES/2014).

In accordance with (Brook, 2017), health represents a fundamental resource possessed by all individuals, encompassing not only physical well-being but also mental health, enabling individuals to be tolerant and accepting of diversity. Broadly, healthcare services can be divided into two categories: personal healthcare services or medical services, and environmental healthcare services or public health services. The primary focus of medical services is on individuals and families, whereas public health services target groups and communities.

Given the advancing technology landscape, the government has developed electronic health systems, as stated in the Regulation of the Minister of Health of the Republic of Indonesia No. 46 of 2017, setting out the strategy for a national e-health approach. The strategy aims to strengthen the governance and leadership of national e-health, promote coordinated system mechanisms, increase investment, and identify appropriate strategies for

accelerating healthcare implementation under resource limitations. It also emphasizes the importance of technology applications that enhance healthcare processes and infrastructure. This includes standardizing healthcare informatics and electronic data exchange to address the complexities of healthcare systems within the framework of interoperability. Furthermore, it underscores the need for regulations, policies, and national e-health commitments to ensure the integrated use, development, and implementation of information and communication technology in the healthcare sector.

A clinical information system comprises subsystems consisting of hardware, software, brain ware (human element), data, and procedures. It is a computer-based system that replaces paper-based records, organizing, designing, storing, collecting, manipulating, reviewing, and transmitting medical information, while facilitating critical information exchange for clinicians. These systems have evolved considerably in 21st-century healthcare. A clinical information system gathers various information technology applications, providing a centralized repository of patient-related data across distributed locations. This repository contains patient clinical histories and doctor decisions regarding their condition, treatment options, and health. It is recognized for its potential to enhance healthcare quality. One example of a clinical information system used for data management in clinics is E-Clinic.

E-Clinic is a web-based patient management application designed to streamline the operational aspects of clinics, such as patient registration, examination, and operational reporting. Utilizing Cloud Computing, E-Clinic eliminates the need for installation on specific devices. The Tamara Clinic, located in Batam Kota, already has a system for outpatient patient registration. However, the need for further system development is acknowledged to simplify the process of registering general outpatient patients.

Given this presented background, the author is both intrigued and motivated to delve into a research study centered on the "Development of a Web-Based E-Clinic System in Tamara Clinic, Batam Kota." The primary objective of this research endeavor is to address the existing gaps and enhance the efficiency and effectiveness of patient registration and data management processes within the clinic. By leveraging the power of modern technology, such as web-based platforms and Cloud Computing, the proposed E-Clinic system aims to revolutionize the way the Tamara Clinic operates.

2. THEORETICAL BASIS

2.1. Information System

An information system is a system within an organization that caters to the needs of processing daily transactions, supporting operations, having managerial attributes, and strategic activities of an organization, and providing specific external parties with the required reports. An information system is a system within an organization that is a combination of people, facilities, technology, media, procedures, and controls (Listiani, 2018). In essence, it can be stated that an information system is a system within an organization that addresses the needs of processing daily transactions, supporting operations, having managerial attributes, and strategic activities of an organization, and providing specific external parties with the required reports.

2.2. Clinic Information System

A Clinic Information System is an arrangement that deals with data collection, data management, information presentation, analysis, and summarization of information, as well as the storage of information needed for clinic activities (Hakam, 2015).

2.3. Electronic Medical Records

Electronic medical records refer to the storage of all data and information related to a healthcare system in electronic format concerning information processing and knowledge for managing a healthcare company system (Rosa, 2018). Electronic medical records have tasks that can be grouped as follows:

- a. Patient management
- b. File distribution
- c. Completeness
- d. Disease documentation
- e. Medical statistics
- f. Maintaining the quality of medical records.

3. RESEARCH METHOD

In this study, a qualitative research approach is employed, utilizing the experimental research method. The experimental method is employed to investigate the influence of specific behaviors on others within controlled conditions (Mulyadi et al., 2019). Essentially, experimentation serves as an evolution of true experimental research, where the manipulation of external variables is conducted systematically. Similar to genuine experiments, the purpose of experimental research is also to explore causality or identify a phenomenon. However, in this experimental design, control and treatment groups are intentionally selected, departing from random assignment (Sugiyono, 2019).

This approach has been chosen to meticulously examine the impact of the proposed web-based patient registration system within the context of Tamara Clinic. By implementing an experimental methodology, this research aims to provide insights into the efficacy and implications of the system's implementation, shedding light on its potential benefits and challenges. The structured experimental setup allows for a focused exploration of the system's effectiveness, user experience, and overall utility in the clinic's operations.

4. RESULT AND DISCUSSION

The patient registration system at Tamara Clinic is carried out directly, namely being called by the officer to be registered. When opening the registration menu, the officer clicks the 3rd menu from the left, namely the patient registration menu which can be seen in the image below.

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Figure 1. Main Page Menu of Patient Registration System

After the menu is clicked the display that will appear is the outpatient new patient registration menu, new patients are registered by officers according to the existing menu and must be complete so that patient data is easy to find which can be seen in the picture below.

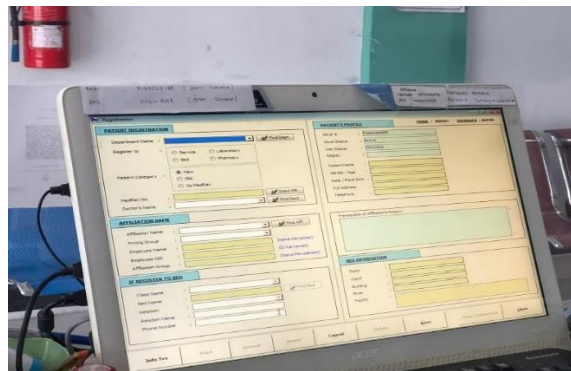


Figure 2. New Patient Registration Menu

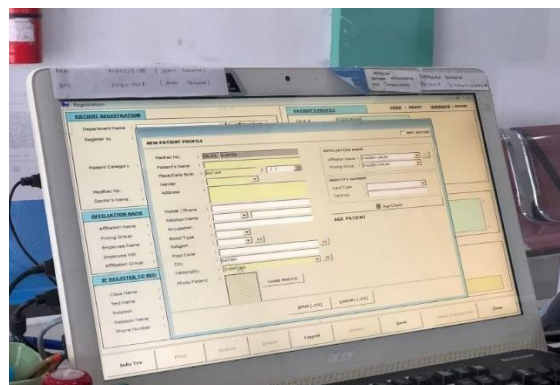


Figure 3. New Patient Registration Form

The picture below is a menu display to search for old patients who are visiting again, by only searching by name and date of birth, as well as the medical record number listed on the patient's treatment card, after which the medical record file is searched on the medical record shelf and the file is distributed to the intended doctor, namely the dental clinic or general clinic.



The diagram illustrates a login form structure. It consists of a white header box labeled "FORM LOGIN". Below this header is a large blue rectangular area. Inside the blue area, there are three white rectangular boxes stacked vertically. The top box is labeled "Username", the middle box is labeled "Password", and the bottom box is a button labeled "LOGIN".

In Figure 5 is a display of the login page used by officers before registering patients who come to visit for treatment, in the display contains the clinic name and logo and text input for the officer's username and password. Each officer has their own login.



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The figure displays three screenshots of a web application interface for patient registration. The top-left screenshot shows the 'PILIH PASIEN' (Select Patient) screen with buttons for '+ PASIEN BARU' (New Patient) and '+ PASIEN LAMA' (Old Patient). The top-right screenshot shows the 'TAMBAH PASIEN' (Add Patient) screen with a search bar and a table of existing patients. The bottom screenshot shows the 'TAMBAH PASIEN BARU' (Add New Patient) form with fields for patient details.

Figure 7. Menu Display of New Patient Registration Form

In Figure 7 above, the patient form will appear after we press the new patient menu after which the new patient is registered completely according to the menu above.

The figure displays a screenshot of the 'CHECK PASIEN' (Check Patient) screen. It features a search bar labeled 'KOLOM PENCARIAN PASIEN' (Patient Search Column) and a 'LOG OUT' button.

Figure 8: Old Patient Registration View

In Figure 8, the old patient registration form is very simple because the patient has been recorded in the system so that the admin only searches for patient data using the full name, date of birth, medical record number, and NIK.

The figure displays a screenshot of the 'TAMBAH OBAT' (Add Medicine) screen. It includes a search bar, a '+ TAMBAH OBAT' button, and a table with columns for 'NAMA OBAT', 'KATEGORI', 'SATUAN OBAT', 'SUPPLIER', 'HARGA', 'STOK', 'EXPIRED', 'KETERANGAN', and 'ACTION'.

Figure 9 Display of Medicine Data Menu

While figure 9 is a display of the drug menu containing drug data available at the clinic and if the drug has run out it can be deleted and if the drug stock is available it can be re-entered so that when reporting at the end of the month the clinic has recorded drug expenditure and income for that month.

4.2. Implementation of Application Program

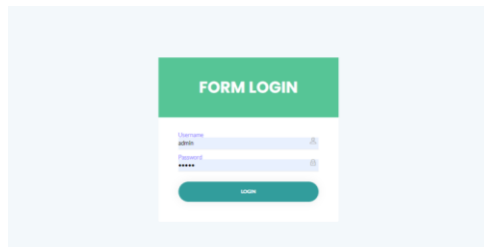


Figure 10. Login Menu Display

Figure 10 above is a view of the login menu in the clinic application that has been made displaying the username and password input menu entered by the officer when he wants to start patient registration at the clinic.

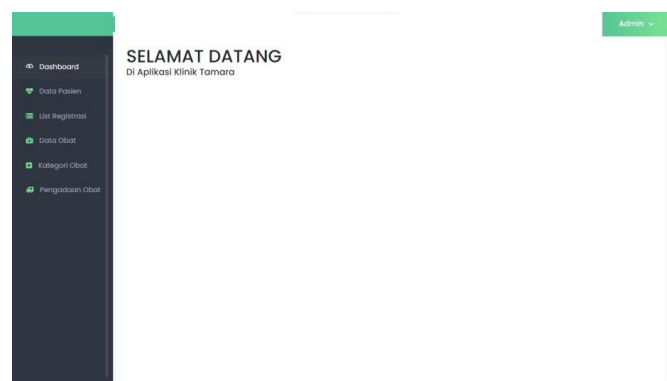


Figure 11. Main menu Page

Figure 11 is the main menu page of the clinic application that has been created displaying several menu options on the left side of the screen.

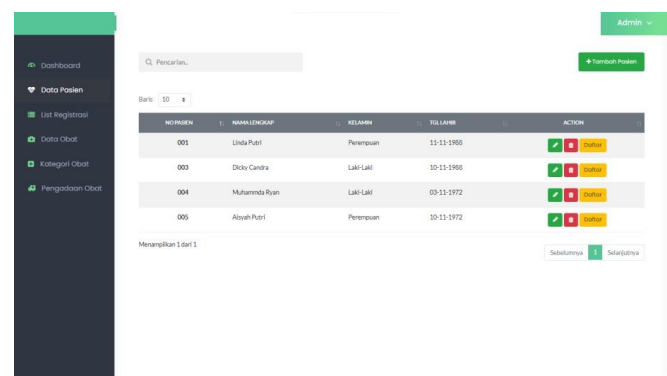


Figure 12. Patient Data Menu Page

Figure 12 above is a display of the patient data menu containing patient data stored in the clinic system, as well as a menu for registering new patients.

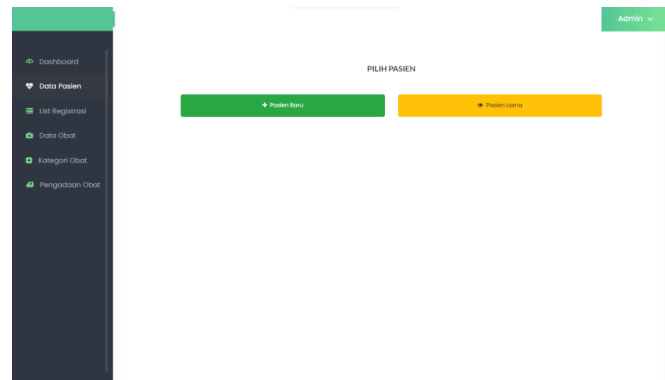


Figure 13. Display of Patient Selection Menu

There is figure 13 that show a display of the patient selection menu containing 2 types of patients, which are new patients and old patients, press new patients if the patient has never visited the clinic and press the old patient menu to search for patient data that has registered with the clinic before.

Figure 14. New Patient Form

In Figure 14, there is a display of a new patient form containing a menu that needs to be completed by the staff when registering new patients visiting the clinic. This form includes comprehensive data and should be filled out in accordance with the patient's identification card.

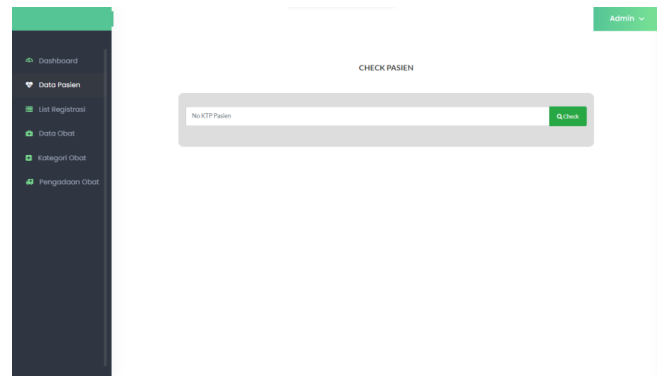


Figure 15. Old Patient Search Menu Display

Figure 15 is a display of the old patient search menu containing an input bar filled with Patient NIK so that the old patient data searched will appear.

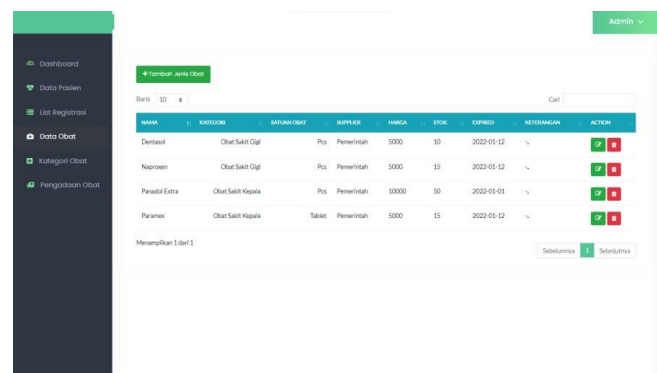


Figure 16. Display of Medicine Data

In Figure 16 above shows the drug data display containing information on what drugs are available and how much drug stock is at the clinic, so that it can inform patients if the drug stock is not available.

5. CONCLUSION

This conducted research concludes that the development of a web-based E-Clinic system has the potential to simplify the patient registration process by healthcare providers. The implementation of this system can enable staff to be more efficient in managing patient information and registration procedures, reducing administrative burdens, and avoiding manual recording errors. Not only that, the implementation of the web-based registration system has the potential to significantly enhance the quality of services provided by Tamara Clinic. Patients no longer need to face long queues on-site, which can negatively impact waiting times for medical services. With easy access through the web platform, patients can promptly register for consultations or treatments, reducing queue times and overall elevating patient satisfaction levels.

Therefore, it is essential for Tamara Clinic to ensure that the development of the web-based E-Clinic system is executed meticulously, taking into account user needs and preferences. In its implementation, providing training to staff is crucial to ensure they have a solid understanding of using this platform and are capable of guiding patients who might not be accustomed to technology. Periodic evaluation and monitoring of the system's

performance should be carried out to identify potential improvements and maintain the quality of services at an optimal level. By taking these steps, Tamara Clinic can maximize the utilization of technology to enhance operational efficiency and provide a better experience for patients.in

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