



Implementation of human centered design (hcd) Models in designing web-based information systems

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ABSTRACT

The digital revolution has been able to change aspects of life. As of October 2020, the total number of cellphone users is 5.2 billion or 67% of the total world population (datareportal). The hospital is one of the public service institutions in the health sector that must implement good corporate governance and good clinical governance. Bengkalis Hospital is the only hospital located in Bengkalis Regency. Currently the registration of outpatients and inpatients is done manually, the patient or the patient's family must come in person to queue to pick up the registration number. Based on these problems, the authors will design a web-based hospital outpatient registration information system by applying the Human Centered Design (HCD) method. The Hcd method is a method with a problem approach that exists when the system is running with users and stake holders. this makes patients have to come earlier so they can get service faster and have to queue for hours just to take a registration number. The results of this study obtained the design of an information system that can be utilized by patients and staff/staff at Bengkalis Hospital in order to improve excellent service.

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1. INTRODUCTION

The hospital is one of the individual community health service centers, both from inpatient, outpatient, to emergency services. Human resources who excel in carrying out their work can certainly support the achievement of the goals to be achieved by the hospital effectively and efficiently (Sinaga, 2022). Hospitals are required to be able to provide services swiftly and quickly both in terms of medical treatment and providing real time data and information to the whole community (Cahyadi & Wardani, n.d.). based on the Law of the Republic of Indonesia number 44 of 2009 one of the objectives of the

hospital is to facilitate public access to health services. Hospital data management is an important component in realizing a quality hospital service (Topan et al., 2015).

Bengkalis Hospital is the only government hospital located in Bengkalis district. all people from various remote villages around the Bengkalis district seek treatment at the Bengkalis Hospital. From Bengkalis Hospital data, the total number of patients currently recorded is Inpatients 8.060, Outpatient is 42.263, Emergency Room patient is 11.517 in total 139,626 people.

In addition to the abundant number of patients, the current condition, especially outpatients, is that there is no online registration information system available. For patients who are outpatient, taking a queue number must come directly to the Bengkalis Hospital. this makes patients have to come earlier in order to get faster service and have to queue for hours just to take a registration number. When the Covid-19 pandemic hit, it was recorded that Indonesia was one of the many countries that had been exposed to COVID-19, it was recorded that Indonesia was in the 14th place with a total of 4,205,705 cases (Rahmayani & Hidayati, 2022). From the data during the Covid-19 pandemic, the people of Bengkalis Regency were also exposed to the Covid-19 virus a lot. This made the Bengkalis Hospital an additional tent because there was no room available to collect registration numbers.). With such a large number of users, it can be utilized as an innovation to improve services, especially in the health sector (Astuti, 2021). Bengkalis Hospital needs to implement a health information system to support excellent service. A health information system is a science that collects information about health services and all information about research by fulfilling all of its development, design, and management model of the health information system (Alievia, n.d.). The use of information technology can be used in data management as well as in producing effective, efficient, fast and accurate information (Nopriandi, 2018).

In previous research obtained through the application of HCD and CRM can produce a complete information system with company orientation (Rokhmawati et al., 2019). Technological advances in the era of rapid disruption technology have made many changes in human life (Erza et al., 2022). The result of further research using the HCD method is an increase in the design solution, if on the first usability evaluation found 17 (seventeen) problems and in the second usability evaluation there were only 4 (four) problems, that thing indicating that there is an increase by 76% in terms of usability and user experience (Kirby et al., n.d.).

Technological developments continue develop to a more sophisticated This development is based on innovation and human creativity (Fitria & Nunsina, 2022). Information System is a data processing system into a quality information and used as a decision making tool (Fajri, 2022). This information system will later be able to help patients take registration numbers online, to see the schedule of the poly doctor they are going to, see the number of patients in a particular poly and predict patients to be examined by a doctor. In designing this registration information system, the author uses the Human Centered Design (HCD) approach. This Human Centered Design (HCD) approach can explore the problems faced by users and stakeholders so that an information system design that suits patient needs can be produced (Hapsari et al., 2022). The HCD method is used to design the user interface because the HCD model can understand the needs of system users (Cahyaningsih et al., n.d.). This registration information system is expected to provide more effective and efficient services.

2. RESEARCH METHOD

In this study the authors used the Human-centered Design (HCD) approach model. Human-centered design is an approach or method in system design and development that aims to create useful interactive systems with a focus on system use and the application of human factors or ergonomic aspects so as to increase efficiency,

effectiveness, user satisfaction, and user comfort (Aniesiyah et al. ., n.d.). HCD has 4 cycles, the first is understanding and determining the context of use, specifying user requirements, designing solutions and conducting design evaluations (Prakoso & Hartomo, 2020). The following is an overview of the Human-centered Design approach model :

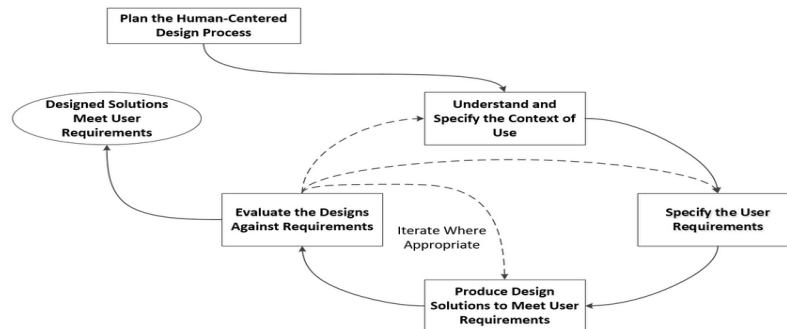


Figure 1. Human Centered Design (HCD) Model

The stages in using Human Centered Design are (Muliani et al., n.d.):

- a. Understand and specify the context of use This stage contains the user context which consists of interviewing patients and staff/nurses at Bengkalis Hospital, identifying stakeholders and patients, identifying the characteristics and features of what will be built;
- b. Specify the user requirements This stage is an activity to identify and define the needs of system users, analyze the processes / procedures of Bengkalis Hospital policies and model use cases;
- c. Produce design solutions to meet user requirements. This stage decides on a design solution that will be designed based on the wishes of information system users, both patients, staff/nurses, Bengkalis Hospital management and stakeholders;
- d. Evaluate the design against requirements This stage is a design evaluation activity that has been designed and then evaluated according to the needs of information system users so as to obtain effective feedback for the sustainability of the information system to be designed.

3. RESULTS AND DISCUSSIONS

This research was conducted to build a web-based hospital patient registration information system using the Intel® Core™ i3-2370 computer hardware specifications, 2.0 GB RAM. The operating system uses Windows 7 32-bit. . The design design in this study are as follows :

3.1 Design

The design of the information system is the output design which is the display design of the information system (Zuliani & Nunsina, 2022). As for the design in the study described in the following :

- a. Use case diagrams

Use case diagram is a user description of the registration information system.

There are 2 users, namely patients and officers/staff/nurses. The task description of the system is as follows :

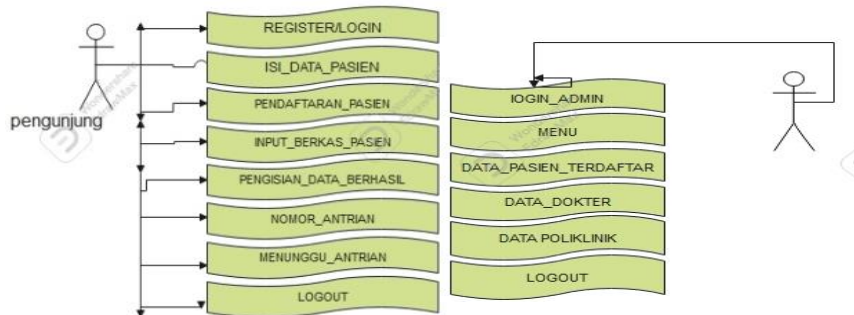


Figure 2. Usecase Diagram

b. Activity Diagrams

Activity diagrams are used as a visualization of the sequence of activities in a process (Chandra Husada et al., 2020). The Activity Diagram is an information system flow that will run from the time the patient logs in until the patient gets a registration number according to the intended patient polyclinic. The following is an overview of the activity diagram on the information system that will be designed :

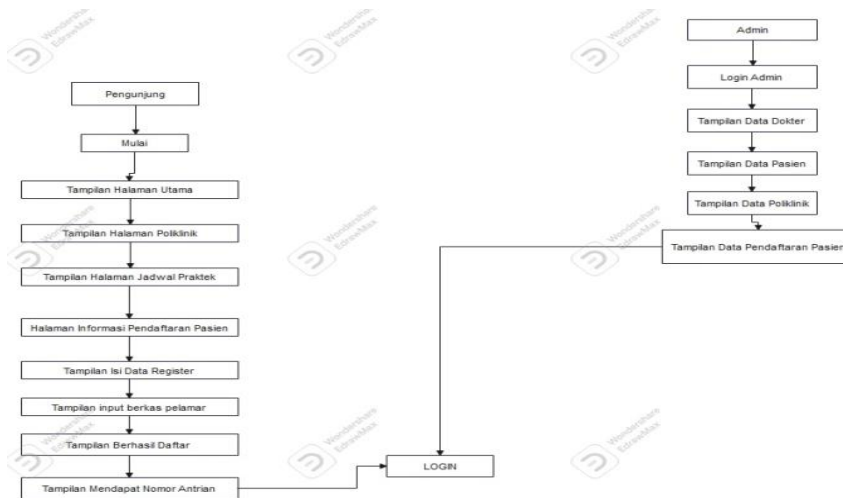


Figure 3. Activity Diagram

3.2 Design Layout

Before designing a system we must understand the needs of users (Putri & Hartanto, 2022).

a. Display User Login

The user login display that the user will do when the user will use the website for patient registration.

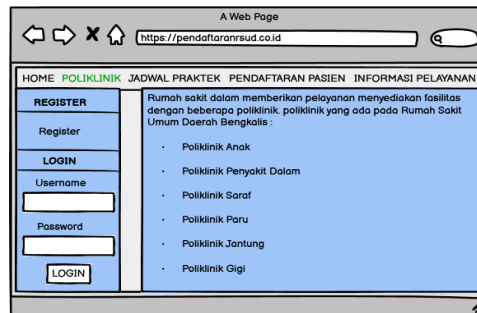


Figure 4. User Login

b. Display Practice Schedule

This view serves to see the schedule for the doctor's practice that will be visited

KEAHLIAN	NAMA DOKTER	HARI	PUKUL
Penyakit Dalam	Dr.Ary Dewanto,SpPD	Senin-Rabu	09.30-15.00
Poli Saraf	Dr.Nila Wati,Sp.S Dr.Yuri Zarito,Sp.S	Senin-Rabu Kamis,Sabtu	09.00-14.30 09.00-14.00
Poli Paru	Dr.Suryanto Suglon Sp.P	Senin-Jumat	08.30-15.30
Poli Gigi	Dr.Annisa Dwi Insan,Sp.B	Senin-Rabu	09.00-15.00
Poli Anak	Dr.Madya Ulfah,Sp.A	Setiap Hari	09.00-14.30

Figure 5. Display Practice Schedule

c. Display of Patient Registration

The following is a display to find out how or the procedure for patient registration.

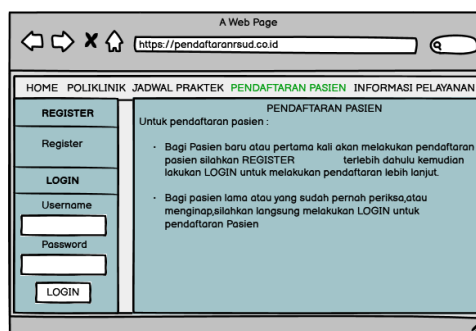


Figure 6. Display of Patient Registration

d. Display of Emergency Room Information Services

The following is a service that contains information and call centers at Bengkalis Hospital

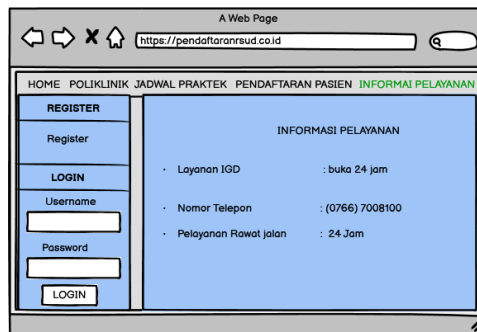


Figure 7. Display of Emergency Room Information Services

e. Registration Display

The following is the registration display that is carried out by the patient to fill in the biodata so that he can seek treatment at the Bengkalis Hospital

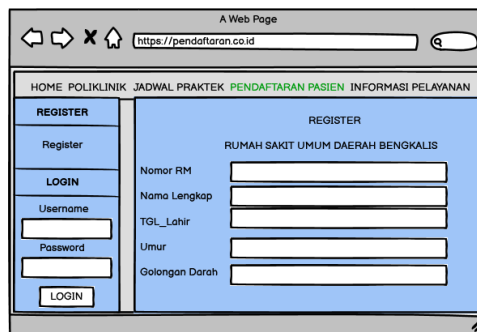


Figure 8. Registration Display

f. Registration Display

The following is a registration display that must be filled in to find out which doctor you want to go to when seeking treatment at Bengkalis Hospital.

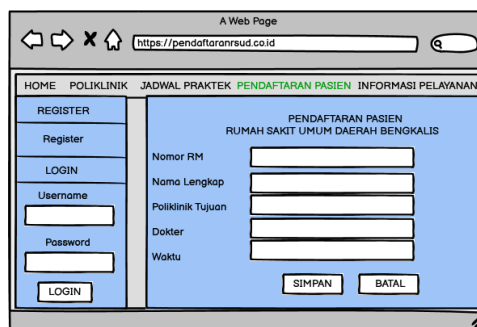


Figure 9. Registration Display

g. Patient File Input Display

The following display serves to input patient data that will be treated at Bengkalis Hospital

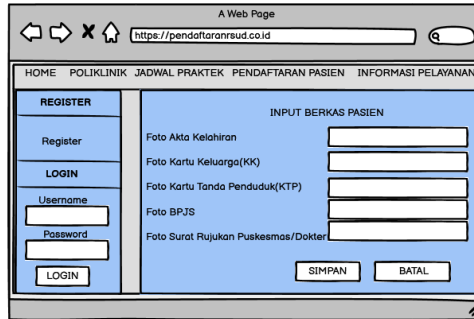


Figure 10. Patient File Input Display

h. Queue Number Display

The following display is the queue number of patients who will be treated at Bengkalis Hospital and if called, it can be shown to officers in administration

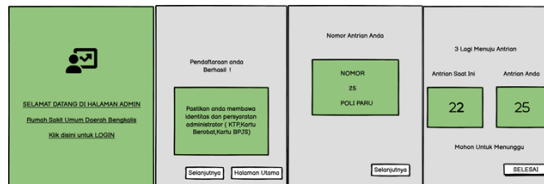


Figure 11. Queue Number Display

i. Administrator View

The following view can function to view patient data. Doctor data to be addressed, polyclinic data, and patient registration data.

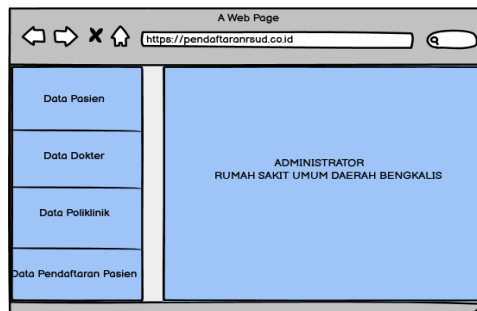


Figure 12. Administrator View

j. Patient Data Display

The following is a display of patient data that will be treated.

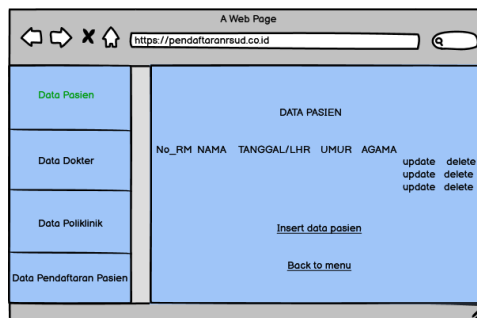


Figure 13. Patient Data Display

k. Doctor Data View

The following shows the doctor's data and the working time of the doctor to be addressed.

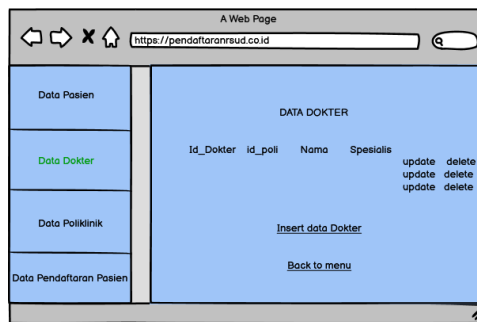


Figure 14. Doctor Data View

l. Display of Polyclinic Data

The following shows the patient's polyclinic data display that will be visited for treatment.

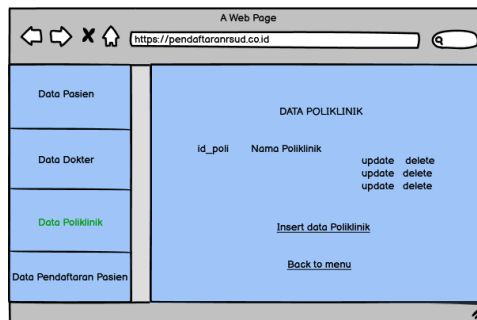


Figure 15. Display of Polyclinic Data

4. CONCLUSION

From the results of the design of the Bengkalis Hospital registration information system using Human Centered Design (HCD) it can build an information system that has an interactive and informative design with users, both patients and officers/staff/nurses at Bengkalis Hospital and for the operation of the information system can be easily implemented by user. From the results of design testing, it is obtained that 90.2% indicates that the design of this information system can fulfill and can improve services to the community. The results of the design of the registration information system designed by the author can provide solutions to the problems that exist in the current hospital. In future research, it is hoped that this registration information system can be built and can be implemented in Bengkalis Hospital so that the benefits of this patient registration information system design can be used by Bengkalis Hospital patients.

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