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Application of Human-Centered Design Principles in WebMed Application UI/UX Development

Fried Sinlae[1], Dimas Alfauzi Hidayatullah[2], Hafiyan Rizqi Sanjaya[3], Lusiana Situmorang[4]
[1]Universitas Bhayangkara Jakarta Raya, Jawa Barat, Indonesia, fried.sinlae@dsn.ubharajaya.ac.id
[2]Universitas Bhayangkara Jakarta Raya, Jawa Barat, Indonesia, 202210715209@mhs.ubharajaya.ac.id
[3]Universitas Bhayangkara Jakarta Raya, Jawa Barat, Indonesia, 202210715057@mhs.ubharajaya.ac.id
[4]Universitas Bhayangkara Jakarta Raya, Jawa Barat, Indonesia, 202210715070@mhs.ubharajaya.ac.id

Corresponding Author: fried.sinlae@dsn.ubharajaya.ac.id[1]

Abstract: This research explores the application of Human-Centered Design (HCD) principles in developing the user interface (UI) and user experience (UX) for the WebMed telemedicine application. The HCD method employed consists of three main stages: inspiration, ideation, and implementation. In the inspiration phase, data collection was conducted through observation and questionnaires to understand user needs. The ideation phase involved brainstorming and prototyping using Figma. The prototype included features such as a home page, list of doctors, list of medications, payment, and invoice. During the implementation phase, the prototype was tested by potential users. Test results showed general satisfaction with the UI/UX design, but also identified some areas requiring improvement, such as the home page appearance and menu icon design. This study demonstrates the effectiveness of the HCD approach in developing digital health applications that meet user needs, while emphasizing the importance of continuous iteration and testing in the UI/UX development process.

Keyword: Human-Centered Design, UI/UX, telemedicine, WebMed.

INTRODUCTION

Digital health is a concept that developed due to advances in information technology in the health sector. Digital health can be defined as innovations that use information and communication technologies to meet healthcare needs and deliver effective health interventions (World Health Organization, 2019). E-health, mobile health (m-health), telemedicine, health information technology, and the development of computational science for big data, genomics, and artificial intelligence are all examples of digital health. Telemedicine is one of the digital health applications that can be used in healthcare facilities. Telemedicine is a type of health service provided remotely through the utilization of communication and information technology to provide diagnostic consultation, patient care

management, and guidance. It can save time, cost, and service effectiveness as patients can receive care independently (Albarrak et al., 2021).

The user experience in a computer system consists of the user interface (UI), which includes aspects of display that are attractive and provide the right tools to achieve goals. It includes communication between the system and the user through commands, content, and data input. Formal analysis, automated procedures, empirical experiments with users, and heuristic assessments by involving users are four ways that can be used to evaluate how effective and efficient a setup interface is. (Yudarmawan et al., 2020a).

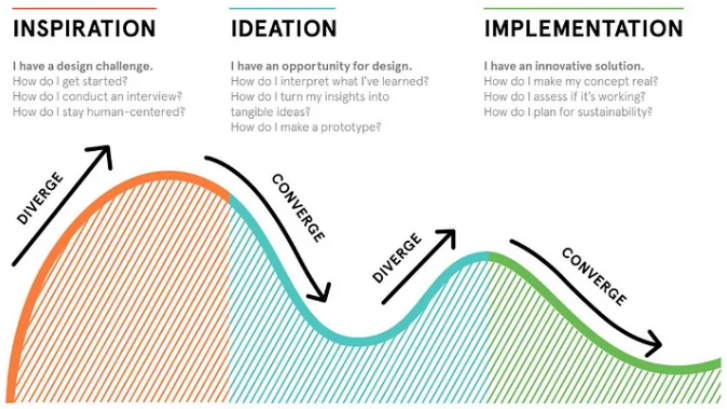
User experience (UX) is the experience experienced by users when using a system, which includes responses, perceptions, behaviors, emotions, and thoughts. The acceptance and success of user information is greatly influenced by UX. To measure it, user experience testing (UEQ) is an effective method to collect feedback. Usability, interaction design, visual design, information architecture, content strategy, and user research are six important parts of user experience (UX) design. Understanding these parts will help you improve UX design (Yudarmawan et al., 2020b).

This journal discusses the role of hipsters as user interface and user experience designers for WebMed web-based applications. It is hoped that the design that has been created by the hustler, who functions as a business idea generator, can be implemented.

METHOD

For this research, we used the Human-Centered Design (HCD) method. Human Centered Design is an approach to extending systems that puts the user's needs at the center and makes the system more interactive. The essence of this method is to fulfill the interests and needs of users. The HCD method pays attention to the main functions that users need.

Human Centered Design has several stages including inspiration, ideation, and implementation, as shown in Figure 1.



Source: Introduction to Human-Centered Design

Figure 1. Stages of Human-Centered Design

Inspiration

In the Human Centered Design (HCD) method, the “Inspiration” stage is the initial phase where the project team listens, observes, and empathizes with the user experience to understand the problem and its context. To reach this stage, in-depth field research is often required to collect data about the user, the problem, and the environment in which the product or service will be used. At this stage, we conduct interviews, direct observation, filling out questionnaires and others.

To determine potential users who will use WebMed. the criteria for potential users are shown in Table I.

Table 1. WebMed Prospective User Criteria

No.	Criteria
1	17 years old and above
2	Have limited access to physical facilities
3	Busy schedule
4	Ever used a telemedicine app

The next process looks at the problems that will be faced by potential users directly by making observations, collecting data with entities that meet the criteria, and looking for ideas through the internet and previous applications. Data collection is done directly to several respondents through filling out a questionnaire made through Google Form which consists of 9 questions. Table 2 contains a list of questions asked to respondents.

Table 2. Question Table

No.	Question
1	How often do you use health services (doctor, clinic, hospital)?
2	How comfortable are you using technology (smartphone, apps, internet)?
3	Have you used telemedicine services before?
4	If so, what services did you use and what was your experience?
5	What features are most important to you in a telemedicine app?
6	How important is it for you to be able to access your medical history online?
7	How important is it for you to be able to talk to your doctor at any time?
8	Would you feel more comfortable if you could choose the doctor you want to consult?
9	What features do you think can increase your trust and comfort in using telemedicine apps?

Ideation

After discovering the problem of the activity, this ideation stage ends with building a solution. At this stage, we have to be creative to fulfill the user's needs. They also have to play the role of users to understand the needs of potential users.

1. Idea Generation

At this stage, designers will create concepts to develop basic features that suit user needs. These concepts will be summarized into key points, making it easier to integrate the features that users need into the UI/UX design.

2. Prototype

Prototype is an important step to determine how users will interact with the results that have been created. At this stage, prototypes are created to get their feedback. We use the Figma tool to create prototypes at this stage.

Implementation

In this stage, the solution designed in the previous stage is implemented, and the application developer will receive criticism and feedback. This implementation stage also includes testing activities, where potential users test the WebMed UI/UX design that has been created. Developers test the app directly with respondents who have filled out questionnaires in the previous stage. This step is very important to understand the user experience and identify flaws that can be improved.

RESULT AND DISCUSSION

Inspiration

At this stage, data is collected to identify issues that can be considered for the application. There are several applications that are similar to the business concept of booking workers or builders, where previous developers have created applications with user-friendly UI/UX.

Table 3. Comparison Table of Previous Applications

Application	Pros	Disadvantages
Halodoc	Tampilan antarmuka cukup konsisten di seluruh fitur aplikasi.	Konten informasi kesehatan terbatas dibandingkan Alodokter.
	Menawarkan fitur konsultasi daring (chat, voice, video) dengan dokter, pembelian obat, tes kesehatan, dan lain-lain.	Antarmuka pengguna cukup sederhana dan kurang atraktif secara visual.
	Proses konsultasi dan pembelian obat cukup efisien melalui aplikasi.	Proses pendaftaran dan verifikasi identitas pengguna sedikit rumit.
Alodokter	Desain antarmuka yang konsisten dan menarik secara visual.	Fitur konsultasi daring terbatas dibandingkan Halodoc.
	Menyediakan konten informasi kesehatan yang lengkap dan berkualitas.	Tidak menyediakan fitur pembelian obat atau layanan lainnya.
	Pencarian informasi dan konsultasi daring sangat efisien.	Antarmuka pengguna untuk konsultasi daring terkesan kurang intuitif.

Based on table 2 in the previous chapter, which are the questions that will be given to respondents, at this stage data will be collected from the results of filling out the questionnaire. The main results of the problems faced by potential users after filling out the questionnaire about their needs are shown in table 4.

Table 4. Table List of Core Issues

No.	Problem
1.	Calon pengguna akan mengalami kebingungan jika desain antarmuka tidak konsisten.
2.	Calon pengguna akan merasa fitur yang tersedia tidak memadai atau sulit diakses.
3.	Calon pengguna akan merasa frustrasi jika proses pendaftaran, verifikasi, konsultasi, dan transaksi terlalu rumit dan panjang.
4.	Calon pengguna akan merasa tidak nyaman atau bingung jika desain antarmuka kurang menarik atau terlalu rumit.
5.	Calon pengguna akan kesulitan menemukan fitur yang mereka butuhkan jika navigasi tidak intuitif.

Ideation

1. Idea Generation

This section presents brief data, data analysis, and interpretation of results. Research results are presented through brainstormed images to clarify verbal explanations, as illustrations are often more comprehensive and informative than narrative descriptions. This section aims to answer the research problems or hypotheses that have been formulated previously.

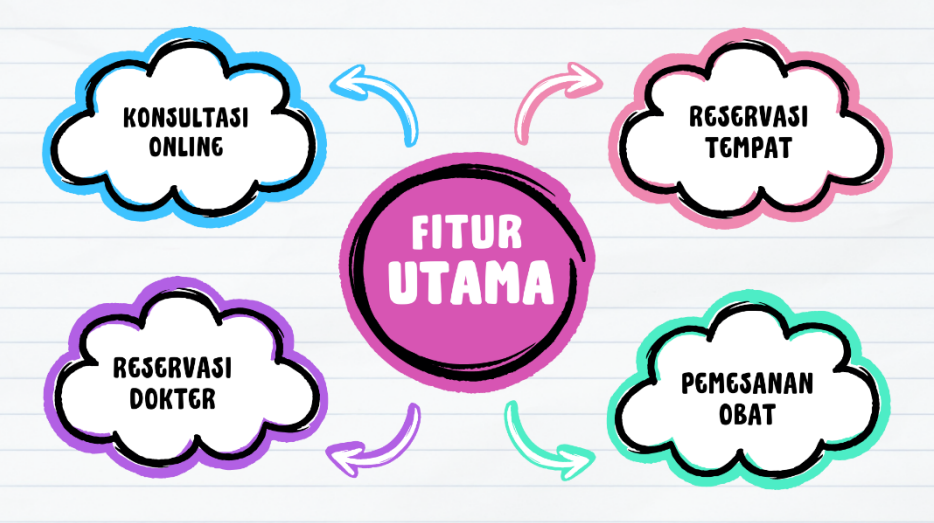


Figure 2. Brainstorming Result

2. Prototype

After brainstorming, designers use Figma to create UI/UX prototypes. This prototype helps to get suggestions and feedback from potential users. Here are the results of creating the UI/UX prototype of the WebMed application using Figma:

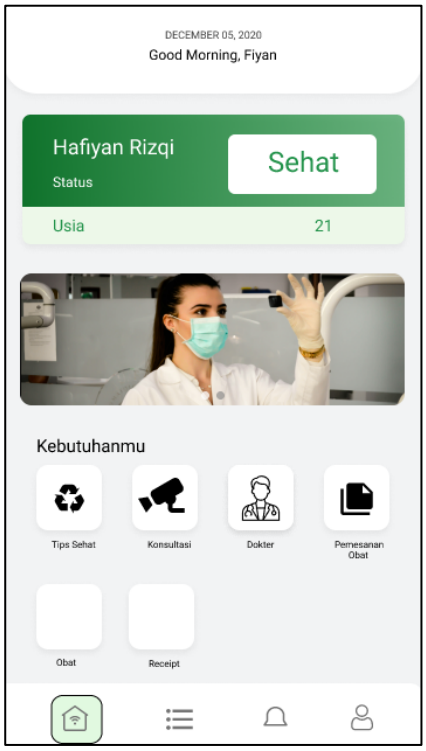


Figure 3. Home Page

- **User Profile:** Displays the user's name (Hafiyan Rizqi), health status (Healthy), and age (21).
- **Date and Greeting:** Displays the date and greeting (Good Morning, Fiyan).
- **Health Information Images:** Displays images related to health information.
- **Your Needs:** The main menu with several icons for various functions:

1. **Health Tips:** Access to health tips.
2. **Consultation:** Access to consultations with doctors.
3. **Doctors:** List of available doctors.
4. **Medicine Ordering:** For ordering medicine.
5. **Medicine:** Details about the medicine that has been ordered.
6. **Receipt:** Access to the payment receipt.

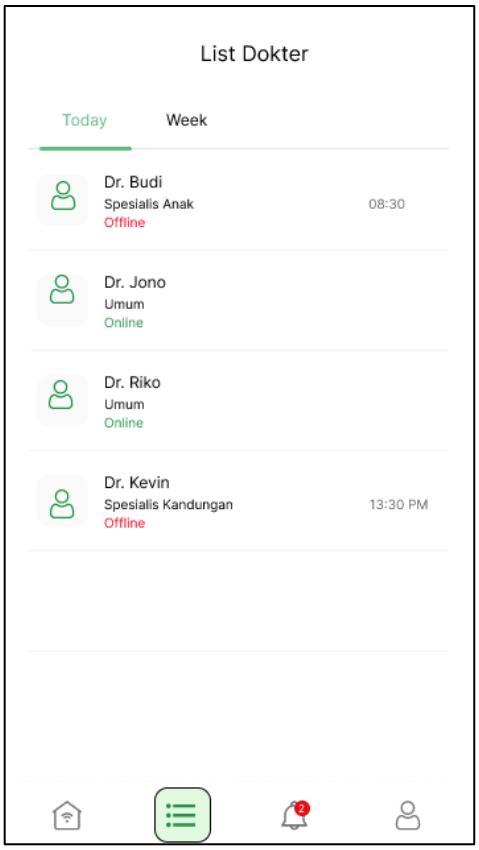


Figure 4. Doctor List page

- **Tab Today/Week**: Displays a list of doctors available today or within this week.
- **Daftar Dokter**: Each doctor is displayed with their name, specialty, online/offline status, and availability time. For example:
    1. Dr. Budi - Spesialis Anak (Offline, 08:30)
    2. Dr. Jono - Umum (Online)
    3. Dr. Riko - Umum (Online)
    4. Dr. Kevin - Spesialis Kandungan (Offline, 13:30)

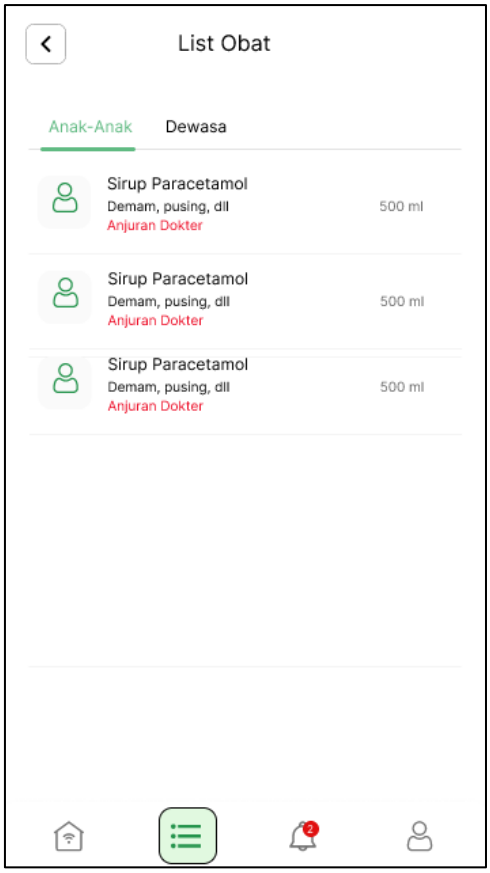


Figure 5. Medicine List Page

- **Children/Adult Tab:** Displays a list of medicines for children and adults.
- **Medicine size:** Each medicine is displayed in a different size.
- **Medicine name:** To display the name of the medicine.
- **Purpose of the medicine:** To display the efficacy and function of the drug.

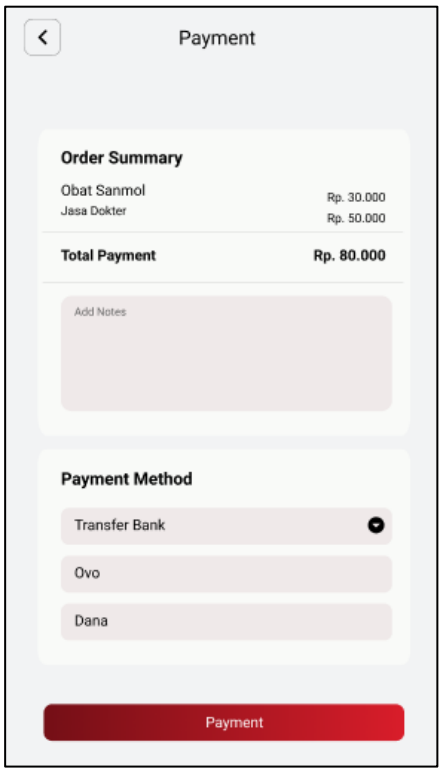


Figure 6. Payment Page

- **Order Summary**: An order summary that includes cost details such as "Sanmol Medicine" (Rp. 30,000) and "Doctor Services" (Rp. 50,000), as well as the total payment (Rp. 80,000).
- **Add Notes**: Columns to add additional notes if needed.
- **Payment Method**: Choice of payment methods, including Bank Transfer, Ovo, and Dana.
- **Tombol Payment**: Function to continue the payment process after the payment method is selected.

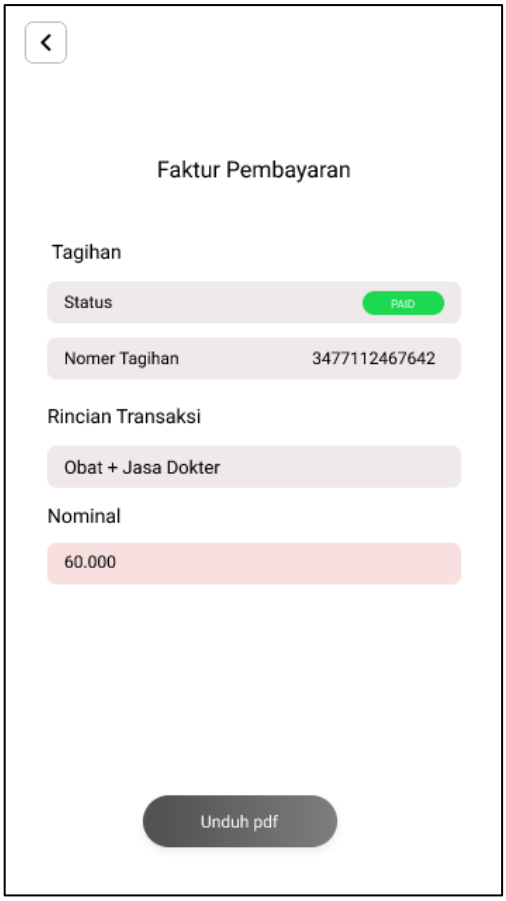


Figure 7. Invoice/Payment Receipt page

- **Status**: Indicates the status of the payment. Here, the status is "PAID" which means the payment has been made.
- **Bill Number**: Display the bill number for payment reference (3477112467642).
- **Transaction Details**: Contains a description of the transaction, namely "Medicine + Doctor Services".
- **Nominal**: Indicates the amount of fees to be paid, which is 60,000.
- **Download pdf button:** Function to download the payment invoice in PDF format**.**

Implementation

To evaluate and improve quality, testing activities are needed to get feedback from potential users. Testing the UI/UX design of the WebMed application was conducted by involving potential users who were previously respondents in the previous stage of the interview. The test results showed that potential users were quite satisfied with the UI/UX design of the application, which functioned according to their expectations. However, some issues were found by potential users or testers during testing.

Table 5. Problems encountered

No.	Problems	Location
1	Tampilan pada halaman utama kurang menarik	Halaman Utama
2	Bentuk kwitansi yang tidak dijelaskan lagi perinciannya	Halaman Kwitansi/Faktur

3	Desain ikon bottom bar menu yang kurang menarik	Semua Halaman

CONCLUSION

In this research, Human-Centered Design (HCD) principles are applied in creating the UI/UX of WebMed telemedicine application. It uses the stages of inspiration, ideation, and implementation. The research team discovered user needs and created prototypes using Figma through observation, questionnaires, and brainstorming. Various features, such as the main page, doctor list, medicine list, payment, and invoice, are part of the protocol. Testing of the prototype showed general user satisfaction, but also indicated that the design of the main page and menu icons needed improvement. This study shows that the HCD approach is effective in creating digital health apps that meet user requirements. On the other hand, it emphasizes how important continuous iteration and user testing are during the UI/UX development process.

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