The UI/UX Design with Design Thinking Method for The University Complaint Website

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ABSTRACT

One system that can be used to manage and resolve complaints within the university is the complaint system. The Complaint System that has been provided at UPN "Veteran" East Java seems not to be optimal because the service response is slow. The design of the UI/UX complaint website "Wadulan Ing UPNVJT" was carried out using the design thinking method in this study, which focuses on potential users so that they can produce websites that meet user criteria. The purpose of designing this website is to produce complaints system designs and features that suit user needs by rearranging problems and adopting ideas through a direct approach to users. The results of the study are a complaint system prototype in the form of a display for users and admins based on exploring needs and searching for the core problems experienced by users. The approach taken is to use a questionnaire with a total of 18 samples at the empathize stage and involve 5 respondents at the testing stage. The conclusion obtained from the test results using usability testing is that the website that has been designed meets the user criteria with a percentage result of 94% which can be categorized as very good.

1. Introduction

Indonesia is a country with the most internet users which is experiencing growth every year. According to the general chairman of APJII, Muhammad Arif during the Indonesia Digital Outlook 2022, at The Westin, Jakarta on Thursday, 09/06/2022 stated that currently approximately 77% of Indonesian people have access to internet technology. The increase in the number of internet users has skyrocketed compared to before the pandemic, internet users only reached 175 million, while the APJII data update, in 2022 internet users in Indonesia will touch 210 million. Which means that there is an increase of around 35 million internet users in Indonesia [1].

An important element of internet availability is the website. The website can be used as a means of digitally promoting the company in increasing its revenue. The Indonesian Internet Domain Name Manager (PANDI) stated that until February 2021 domain.id users reached 500,000 users. This data is also in line with Exabytes Indonesia's data. Exabytes Indonesia reported that there were 1057 websites registered throughout 2020. This data has increased by 61.6% compared to the previous year's report[2].

UPN "Veteran" East Java is one of the universities whose complaint service uses internet technology. Apart from academic information, internet technology is utilized in the form of a complaint website (SIADU). UPN "Veteran" East Java is a superior university in East Java which was established on July 5, 1959 known as the Belanegara campus which officially turned into a State University in 2014 [3]. Currently UPN "Veteran" East Java has thousands of students so that the

complaint website within the scope of UPN "Veteran" East Java is deemed important to improve services.

Service is one of the most important factors in creating a smooth teaching and learning process. One of the supporting factors is managing and overcoming complaints complained by students regarding the discrepancy between the needs of the services provided by an educational institution [4].

Complaint reports at UPN "Veteran" East Java are carried out by filling out a complaint form and will be replied to in the complainant's email. This has annoyed the academic community a lot because of the slow response, replies to complaints that cannot be received immediately by the complainant, and the reporter, of course, does not monitor e-mails continuously. In addition, not many students know that at UPN "Veteran" East Java a complaint website is provided. Departing from these problems, a system was created called "Wadulan Ing UPNVJT" which can overcome existing problems by adding several superior features such as live chat so that reporters can monitor their complaints only through the website. The purpose of designing the system design is to produce a complaint system design and features that suit user needs by rearranging problems and adopting ideas through a direct approach to users. The target of the "Wadulan Ing UPNVJT" website is all the academic community at UPN "Veteran" East Java with the limitation that only users who have personal data as part of the academic community at UPN "Veteran" East Java can make complaints. The platform used is a website-based complaint system.

In improving the complaint system services needed by users, it is necessary to design an interface or User Interface (UI) and user experience or User Experience (UX)[5]. User Experience (UX) is a series of aspects related to user experience when using the system which includes how the system works, what users feel, whether the system is easy to understand, and whether the system is useful for users[6]. On the other hand, one part of the program that deals directly with the user is called the User Interface (UI)[7]. UX design aims to create a good user experience by increasing efficiency when using the system. User experience (User Experience) can provide comfort when users use the system and wish to use it again [8].

In this study the method to be used is the design thinking method. This method prioritizes designs that are more user centered and easy to use, and functionality gets better [9].

From the background that has been presented, it can be concluded that the design thinking method is very suitable for use in designing UI/UX designs because it can provide opportunities for prospective users to meet appropriate needs to provide user satisfaction when using the website [5].

2. Method

2.1. Design Thinking

The design thinking method was used in this study. The following are the stages of design thinking [10]:

- Empathize: find and understand what the problem is going on.
- Define: collect problem information obtained.
- Ideate: start to design ideas, to answer problems.
- Prototype: expressing the ideas obtained in the initial realization.
- Test: redefining and adapting to the initial problems encountered.

The following are the steps taken in the research.

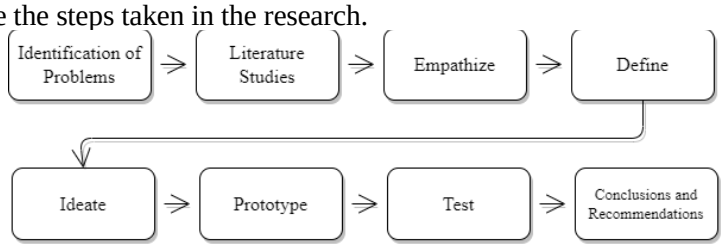

Fig. 1. Research Flow

Problem identification is the stage where the researcher explores the problem of potential website users. The identification was carried out through a direct approach by conducting surveys using questionnaires and interviews with the parties involved.

Literature study is one of the things that must be applied when conducting research. Literature study can be done by looking for previous sources that have the same themes and methods as the

topics raised in the research. In this study, the literature study used is related to UI/UX design, complaint systems, prototyping, usability testing, and design thinking methods.

Empathize, namely the identification stage carried out to prospective users regarding the system to be created. This stage is carried out by distributing questionnaires to respondents using several question criteria related to the problems and needs needed by the user. At this stage it is also explained about the description of the system as a description of the target users of the system created.

Furthermore define, at this stage the information from the empathize stage is processed to find various problems experienced by users and then concluded in the form of the core of the problem. Which is the main problem is mapped in the form of an empathy map.

Then ideate which is the stage of turning the problem into a solution that can be implemented by the system through discussion in deciding the best solution so that all parties are involved in conveying ideas and solutions tailored to user needs.

After that the prototype aims to implement the idea in the form of a design to describe the system as a whole. This prototype will later be tested for feasibility and changes will be made if there are features that are not in accordance with the requirements. Prototype stages are divided into 2, namely low-fidelity prototypes and high-fidelity prototypes.

Next is the test phase to test the feasibility of the prototype before the system is released to users. The tests carried out include several aspects of meeting user needs and determining whether the system created is in accordance with the original purpose of making the system.

The last stage is the conclusion and suggestions. At this stage conclusions are drawn and also suggestions that can be given from the results of the research that has been carried out. Preparation of conclusions aims to explain the outline of the research results. Provision of suggestions aims to convey research deficiencies or messages for improvement in further research.

2.2. Equations

There is previous research entitled "UI/UX Design Model for Student Complaint Handling Applications Using Design Thinking Method (Case Study: STMIK Rosma Karawang). The purpose of this research is to analyze the functional needs of STMIK, the application for student complaints from Rosma Karawang, using the design thinking method. With the result that the UI/UX design of the STMIK Rosma Karawang student complaint application was designed using the Mockuplus Classic tool [11].

As for other previous studies with the title "Application of the Design Thinking Method in the UI/UX Design Model for Applications for Handling Reports of Loss and Findings of Scattered Goods". The goal is to build a UI/UX design model through innovation in the form of a mobile application specifically designed to deal with lost and found items that are scattered in public places. The results of this study are to make recommendations in the form of a UI/UX model called "Kembaliin" which is a solution related to information needs when handling lost and found items [12].

Another study entitled "Implementation of the Design Thinking Approach Method in Making Happy Class Applications at the UPI Cibiru Campus". The goal is to provide a solution to the problem, namely the problem of students and lecturers, by creating an application called "Happy Class" as a class scheduler and reservation at UPI Cibiru so that there are no more communication problems between classes. The results of this study are proposing the design of the Happy Class application using the design thinking method to be implemented [13].

The next previous research was entitled "Application of the Design Thinking Method in the Design of Applications for Handling Reports of Theft of Valuables at the Sukmajaya Police Station". The purpose of this research is to design an application to handle reports of theft of valuables in the Sukmajaya Police area. The result is proposing to design an application for handling reports of theft of valuables at the Sukmajaya Police Station using the design thinking method to be implemented [14].

Another previous study entitled "Let's Go to Action Application Design with the Design Thinking Method" has the aim of creating an application that serves complaints digitally. The results of this study are that the Ayo BerAksi application is expected to be implemented in the community, but in fact it still has several obstacles that can be used as input and improvements [15].

The similarities between this study and the five previous studies are the selection of case studies and the approach used. The case study in previous research is about the complaint system. Meanwhile, the approach method used is the design thinking method. The difference in this study is that the complaint system is designed specifically for UPN "Veteran" East Java students and academics, and is also website-based so that it can be used anywhere and anytime.

User Interface

The User Interface (UI) is the display that will be encountered by the user when using the application. Thus, there is interaction between the user and the system such as entering data, giving orders, and so on until the user can use the system properly[16]. UI success can be used as a measure of system success.

User Experience

According to ISO 9241-210, UX is an analysis of user perceptions when using the system [17]. UX can be a measure of the success of a system, whether the system can be used properly or not.

Design Thinking

Design thinking is the process of trying to understand users, provide assumptions, and come up with solutions to problems. This method has simple and clear steps and ways of working [18].

3. Results and Discussion

3.1. Empathize

In this study, 17 respondents were involved who were interviewed as students of UPN "Veteran" East Java, using the media google form.

A List of Questions

The following questions are used to conduct interviews with respondents.

Table 1. A List of Questions

Code Question	Questions
P001	Full Name
P002	Student ID Number
P003	Majoring
P004	Did you know that at UPN "Veteran" East Java there is a complaint system?
P005	If you experience problems related to facilities and other problems at UPN "Veteran" East Java, where do you make complaints?
P006	Have you ever made a complaint at UPN "Veteran" East Java?
P007	If so, what are your complaints when you make a complaint using the website?
P008	Has your complaint received a good response so far?
P009	What important information should be on the complaint website?
P010	In your opinion, what features should be on a complaint website?
P011	In your opinion, what kind of complaint system do you expect?

The following is the answer received from the respondent.

Answer to Question Code P004

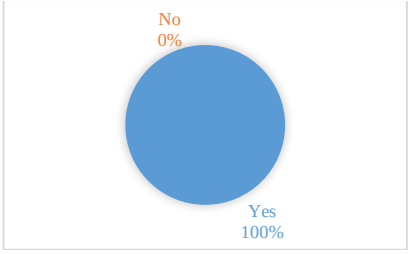

Fig. 2. Answer to Question Code P004

Based on the respondents' answers, it can be seen that all respondents know that at UPN "Veteran" East Java there is a complaint system.

Answer to Question Code P005

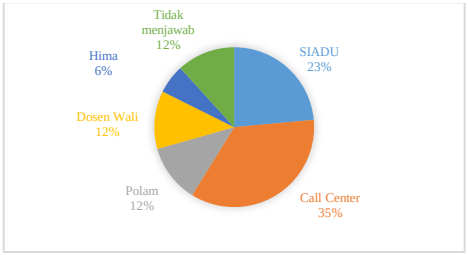

Fig. 3. Answer to Question Code P005

Based on the answers from the respondents, it can be seen that if the respondents experienced problems related to UPN "Veteran" East Java, only 23% percent of the 17 respondents made complaints through the complaint website at UPN "Veteran" East Java, namely SIADU.

Answer to Question Code P006

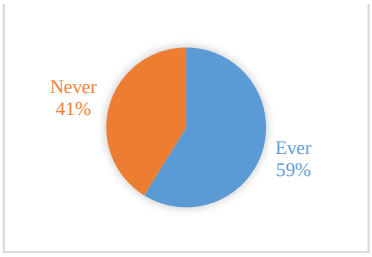

Fig. 4. Answer to Question Code P005

As many as 59% of the 17 respondents had made complaints at UPN "Veteran" East Java.

Answer to Question Code P007

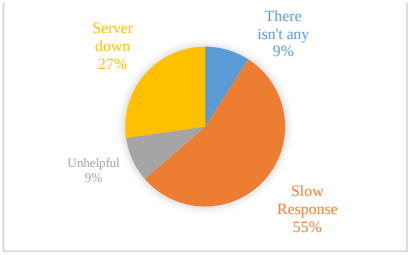

Fig. 5. Answer to Question Code P007

As many as 55% of the 17 respondents complained about the slow response to complaints, 27% of the server was down, and 9% said that the answers were not very helpful. Meanwhile, 9% of the 17 respondents said that they did not have any complaints when using the complaint website.

Answer to Question Code P008

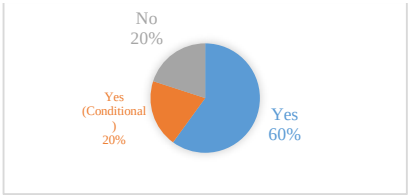

Fig. 6. Answer to Question Code P008

As many as 60% of 17 users said that they get a good response from the complaint website.

Answer to Question Code P009

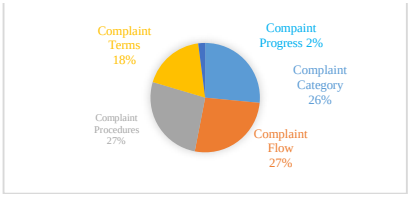

Fig. 7. Answer to Question Code P009

Based on the answers from the respondents, the information most desired to be displayed is regarding the flow of complaints and procedures for complaints.

Answer to Question Code P010

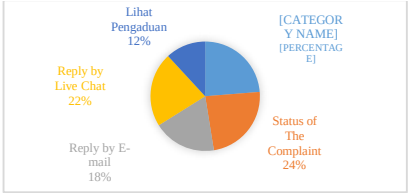

Fig. 8. Answer to Question Code P010

Based on the respondents' answers, the most desired feature on the complaint website is the existence of a complaint form and the status of the complaint (24%), as well as the live chat feature (22%).

Answer to Question Code P011

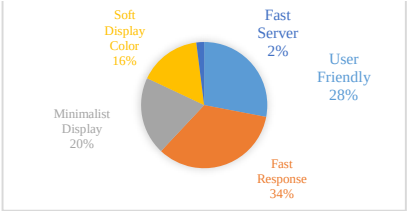

Fig. 9. Answer to Question Code P011

It can be seen that users expect a complaint system that has a fast response.

3.2. Define

After getting the results from the interview process and getting data from the questionnaire conducted at the empathize stage, it can be continued at the problem and needs analysis stage. To solve the problems experienced by users, they must understand the steps that need to be taken in running a system, so an experience map is needed so that the user's goals in using the system are achieved. The experience map is mapped in several descriptions in the form of steps, comments, questions, and ideas, each of which is symbolized by a color as shown in Figure 10.

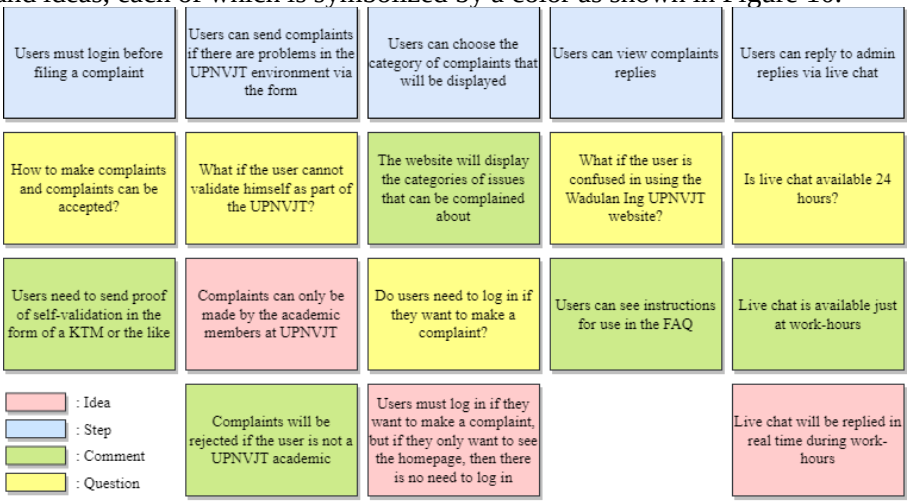

Fig. 10. Experience Map Wadulan Ing UPNVJT

After mapping the steps, an empathy map is needed to be able to determine the main problem that is the focus of the research. Using an empathy map can make it easier for researchers to make a decision [19]. The following is an empathy map table in this study.

Table 2. Empathy Map

No	Empathy Map Aspects	Keterangan
1	Says	Facilities on campus were damaged
		Information and how to complain
		Incomplete facilities
		Hard to complain to anyone
		It took a long time to respond to complaints
		Admin response
		Complaint flow
2	Thinks	Will the complaint be processed?
		Has the complaint been conveyed?
		What is my complaint by category?
		How do you file a complaint?
		Will my complaint be responded to?
3	Feels	The complaint process is long
		Don’t know what the status of the application is
		No reply to complaints
		Don’t know where the replies sent
		Disappointed that the response was slow
		Difficulty communicating 2 way
		Doubt whether the complaint will be answered
4	Does	Search on the FAQs
		Ask a friend if anyone has ever filed a complaint
		Live chat feature

	Complaint information
	Must be logged in to view replies

3.3. Ideate

In the ideating process, a search for solutions to the problems experienced by users is carried out. The ideate phase is an important stage to adapt user needs to the system to be built. Problem solutions are based on research through data collected and translated into a system form. To make it easier for users to run the system, a brief user flow is designed which explains how the system works as a whole as shown in Figure 11.

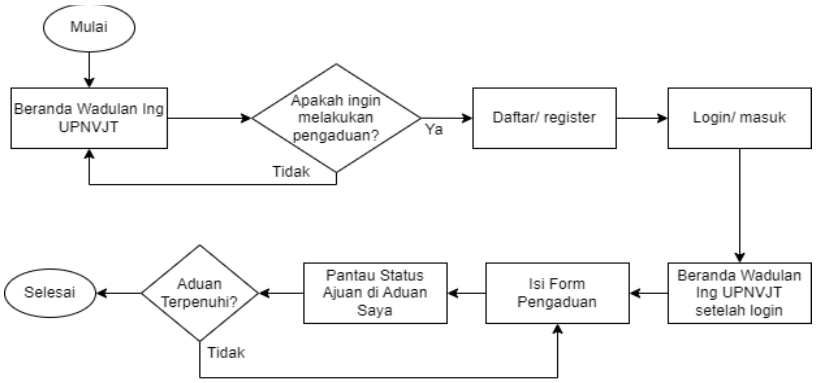

Fig. 11. User Flow Wadulan Ing UPNVJT

After the user flow is created, it is followed by the process of making a rough website design (wireframe) which is part of the low-fidelity design to make it easier for developers when design changes occur and to make it easier to create high-fidelity mockups that are already similar to the finished website at a later stage. The wireframe design is still in the form of a simple appearance without a touch of color. The following is a wireframe from the "Wadulan Ing UPNVJT" website, which is shown in Figure 12.

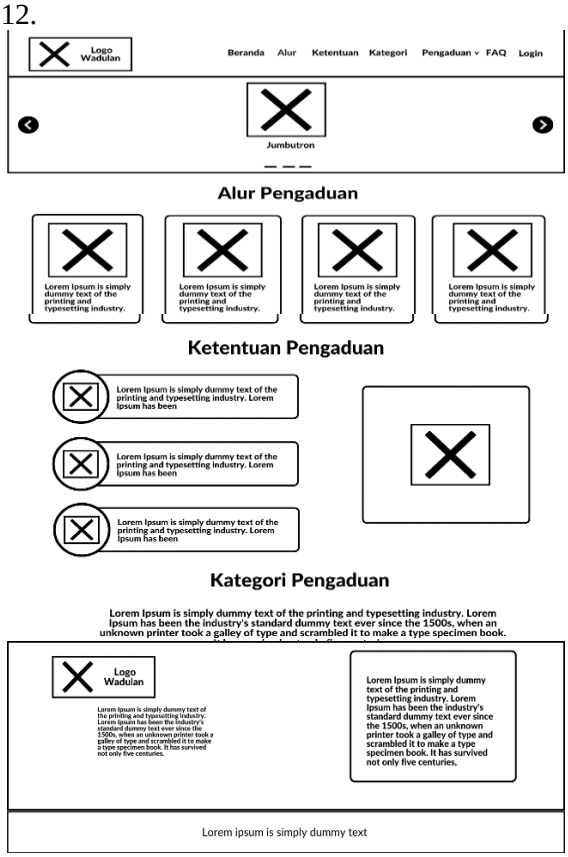

Fig. 12. User Home Wireframe

The website uses the Indonesian language in its appearance, due to make it easier for users, considering that the users of this website are academic members of UPN "Veteran" East Java located in Surabaya, Indonesia.

The website wireframe is still in the form of a system sketch that can be easily changed if there are changes. It is important to make a wireframe before moving on to the high-fidelity prototype stage because with a design, the making of a prototype will be more focused and in accordance with what is desired.

3.4. Prototype

The prototype stage is the final stage of UI/UX design. The prototype can be used as communication material for users regarding the form of the system being built. After the low-fidelity design stage in the ideate section, the prototype stage is the result of user flow validation and the wireframe that has been created. This stage can be called the high-fidelity stage which contains the creation of a prototype design by integrating colors, fonts, logos, images, and clearer shapes so that the visual appearance can be reviewed to understand problems, ideas, and user experience when interacting with the system.

The following is a high-fidelity prototype display for users using figma.

1) Home Page

Fig. 13. Home User Prototype

The home page contains jumbotrons, flows, conditions, and categories that users can scroll down to.

2) Complaint Form Page

It must be ensured that the user is part of the academic community at UPN "Veteran" East Java by proving it in the self-validation section in the form of a file on the form.

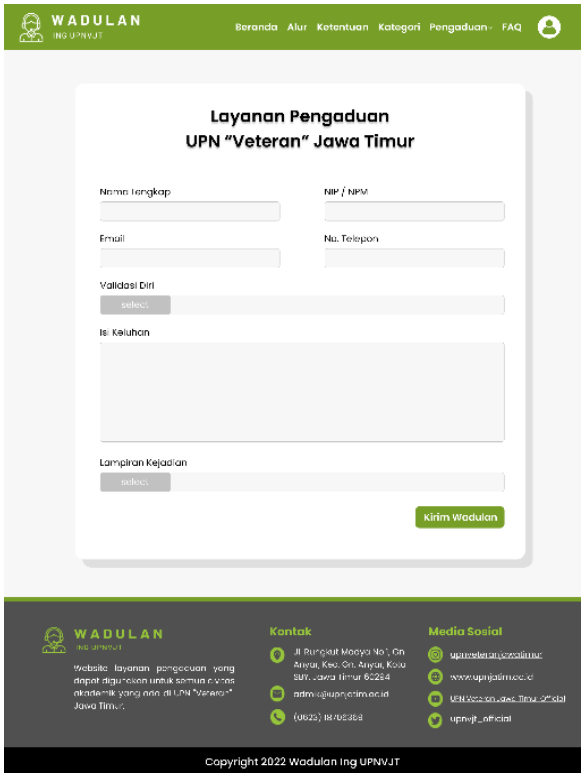

Fig. 14. Complaint Form Prototype

3) Login, Register and Forget Password Page

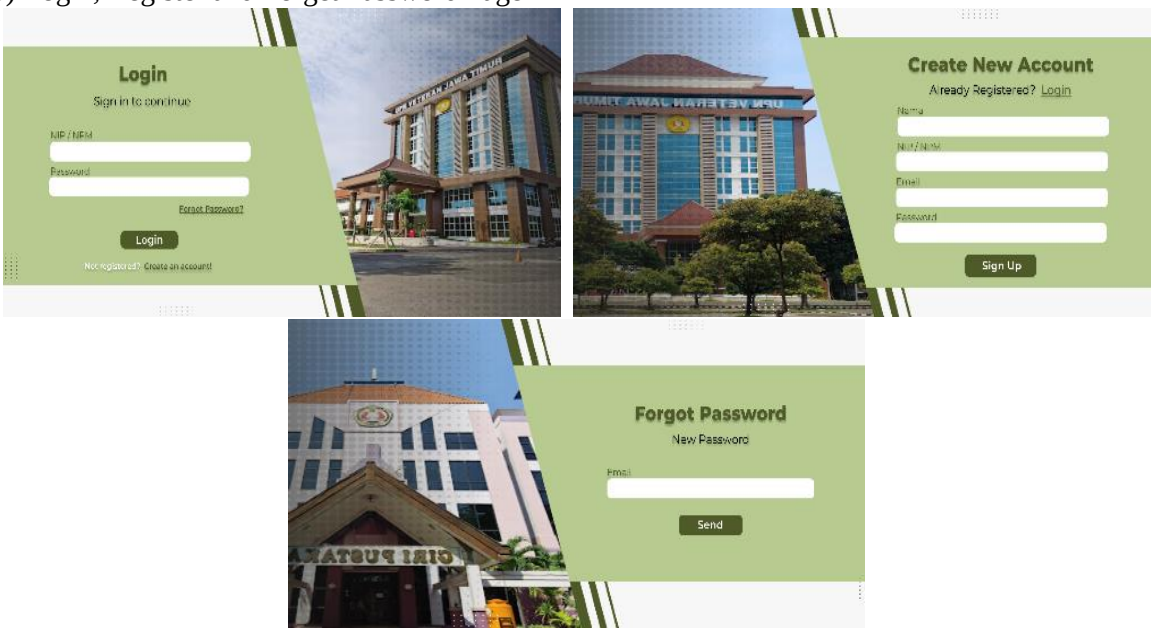

Fig. 15. Login, Register, and Forget Pasword Prototype

In addition to the display for the user, a high-fidelity prototype design is also provided for the admin display, which is as follows.

1) Admin Login Page

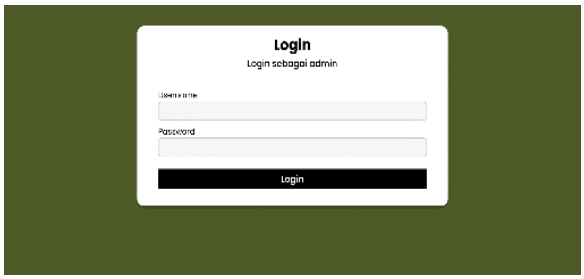

Fig. 16. Admin Login Prototype

2) Admin Dashboard Page

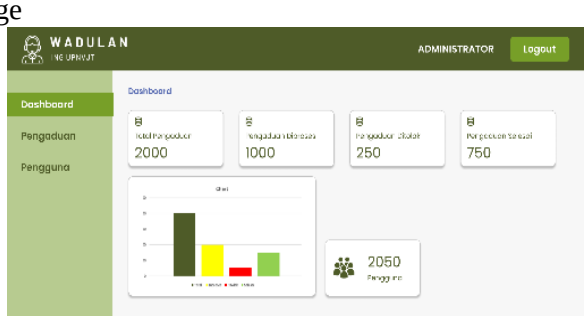

Fig. 17. Admin Dashboard Prototype

3) Complaint List Page

Fig. 18. Complaint List Prototype

4) Complain Details Page

Fig. 19. Complain Details Prototype

5) Live Chat Page

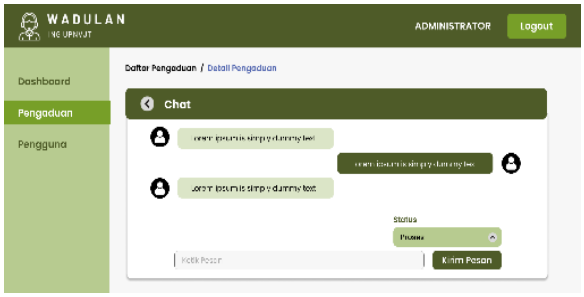

Fig. 20. Live Chat Prototype

3.5. Testing Using Usabillity Testing

1) Number of Respondents

Based on previous research, that usability testing can be done by taking 5 respondents because 5 people are considered to have given the best results in usability testing (Nielsen, 2000). These 5 respondents are users who have met the criteria as part of the academic community at UPN "Veteran" East Java.

2) Testing with Task Scenarios

This stage is to make assignments for respondents, so that respondents can run the website according to a predetermined path. The tasks given to respondents were 7 tasks. The following is a task list table.

Table 3. User Tasks List

Task Code	Task	Task Description
T1	Access the website homepage	The user sees the complaint provisions contained on the website homepage
T2	View the terms, categories, and flow of complaints	User can see the terms, categories and flow of complaints on the home page after logging in and before logging in by clicking on the navbar
T3	View FAQs	User can see a guide to using the website in the FAQ
T4	Registration/login	The user registers and then logs in so he can submit a complaint
T5	Fill out the complaint form	The user fills out the complaint form accompanied by self-validation so that the complaint is accepted
T6	View complaint status	User can see the status of complaints in the details of complaints that have been sent in the My Complaints section
T7	View the reply to the complaint	User can see the replies to their complaints via the live chat feature which is in my complaints section
T8	Reply to complaints	The user can reply to the admin's answer in the live chat section if the complaint submitted is still unclear
T9	Edit account	User can edit their accounts on the edit profile page
T10	Account logout	The user can log out of the account by clicking the logout button which is at the top right corner

In addition to testing tasks on user views, tasks are also given to test the flow of the admin view with the list of tasks in table 4.

Table 4. Admin Tasks List

Task Code	Task	Task Description
T1	Login	Admin can login first in order to access the system
T2	View dashboard page	Admin can see the core of the system through the dashboard display that has been provided
T3	View a list of complaints, details of complaints, change complaint status, and reply to chat users	The admin can see the amount of complaint data that has entered on the complaint list page, each of which has a complaint detail button to view complaint details and reply to chats sent by the users
T4	View user data	Admin can access a list of users who have logged in on the “Wadulan Ing UPNVJT” website
T5	Logout	Admin can logout if his business is finished

3) Testing with a Questionnaire

The testing stage uses a usability testing technique based on Nielsen along with the technique used, namely relative percentage analysis to interpret data in the form of percentages generated by research on respondents. The testing aspects used in usability testing include: learnability, efficiency, memorability, errors, and satisfaction.

The test begins with determining the weighting scale table as shown in table 5.

Table 5. Weighting Scale

Scale	Information	Score	Percentage
SA	Strongly Agree	5	80-100%
A	Agree	4	60-79%
N	Neuteral	3	40-59%
D	Disagree	2	20-39%
SD	Strongly Disagree	1	0-19%

Based on the percentage weighting, calculations are carried out using the percentage formula proposed by Anas Sudjino, namely as follows.

$$\boldsymbol{P = \frac{f}{N} x 100\%}$$

P = Percentage
f = Frequency
N = Number of Frequencies

The test was carried out by applying several aspects with a total of 15 questions. The following are the results of the usability testing that has been carried out on the appearance of the "Wadulan Ing UPNVJT" website, namely in table 6.

Table 6. Usability Testing Calculation Results

No	Aspect/ Statement	Testing Value					Percentage
		SA (5)	A (4)	N (3)	D (2)	SD (1)	
	Learnability Aspect						
1.	This website is easy to understand	4	1	0	0	0	96%
2.	The text used is easy to read and understand	5	0	0	0	0	100%
3.	Symbols, icons and images are easy to understand	5	0	0	0	0	100%
4.	Existing menu options are easy to understand	4	1	0	0	0	96%
	Efficiency Aspect						
5.	I can quickly find the information and goals that I need	3	2	0	0	0	92%
6.	It doesn't take long to view each page	5	0	0	0	0	100%
7.	Menu options, displays complete information in one click	3	2	0	0	0	92%
	Memorability Aspect						
8.	I can master the use of this website	5	0	0	0	0	100%
9.	I remember the flow of this website	4	1	0	0	0	96%
10.	I know which key to press to execute the command I want to run	3	2	0	0	0	92%
	Errors Aspect						
11.	There is a clear message when the user presses the wrong button (for example, the complaint form contains a mandatory login message for users who have not logged in)	3	2	0	0	0	92%
12.	There are no wrong buttons or features	1	3	1	0	0	80%
	Satisfaction Aspect						

13.	Do you like the look and features of this website?	2	3	0	0	0	88%
14.	Do you want to use this website?	3	2	0	0	0	92%
15.	Can the appearance and features of this website help you, according to its function?	4	1	0	0	0	96%
	Total Percentage (%)						**94%**

Based on the results of the Likert scale calculation above, it is known that of the 5 respondents, the total percentage produced is **94%** which can be categorized as **Very Good**.

4. Conclusion

The application of the design thinking method to the UI/UX design of the "Wadulan Ing UPNVJT" website is considered very suitable because the method focuses on potential users, so that the designed website can improve user experience. The results of this study are in the form of a prototype that fits the user's needs. This is evidenced by the usability testing conducted at the final stage of design thinking in the form of a percentage of the results of the calculation of the Likert scale taken from several respondents with a percentage result of 94% which indicates the Very Good category.

The author's suggestion for further research with the same theme is that researchers can expand the range of respondents when conducting testing at the final stage of design thinking. This is because so that researchers can find out in more detail related to system requirements that match the user's criteria. So that the system built will increase the usefulness of the user.

References

[1] C. I. Intan Rakhmayanti Dewi, "Data Terbaru! Berapa Pengguna Internet Indonesia 2022?," [Latest Data! How many Indonesian Internet Users are in 2022?] *CNBC Indonesia*, 2022. https://www.cnbcindonesia.com/tech/20220609153306-37-345740/data-terbaru-berapa-pengguna-internet-indonesia-2022 (accessed Dec. 16, 2022).

[2] F. Kurniawan, "Pengguna Website di Indonesia Naik 61,6% Sepanjang 2020," [Website Users in Indonesia Increase 61.6% Throughout 2020,] *SindoNews.com*, 2021. https://tekno.sindonews.com/read/389902/207/pengguna-website-di-indonesia-naik-616-sepanjang-2020-1617800664#:~:text=Hingga Februari 2021 pengguna domain,Foto%2FIst.&text=JAKARTA - Menurut Hootsuite%2C per Januari,mencapai angka 202%2C6 juta. (accessed Dec. 10, 2022).

[3] Q. Campus, "Universitas Pembangunan Nasional Veteran Jawa Timur," [East Java Veterans National Development University,] *campus quipper*, 2022. https://campus.quipper.com/directory/universitas-pembangunan-nasional-veteran-jawa-timur (accessed Dec. 16, 2022).

[4] B. L. Prandawa and A. Muliawati, "Rancang Bangun Sistem Informasi Pengelolaan Pengaduan Sarana dan Prasarana Berbasis Web (Studi Kasus : Universitas Pembangunan Nasional Veteran Jakarta)," [Design of a Web-Based Facility and Infrastructure Complaint Management Information System (Case Study: Jakarta Veterans National Development University),] *Semin. Nas. Mhs. Ilmu Komput. dan Apl.*, no. November, pp. 123–135, 2020.

[5] F. R. Isadora, B. T. Hanggara, and Y. T. Mursityo, "Perancangan User Experience Pada Aplikasi Mobile HomeCare Rumah Sakit Semen Gresik Menggunakan Metode Design Thinking," [Designing User Experience in the Mobile HomeCare Application at Semen Gresik Hospital Using the Design Thinking Method,] *J. Teknol. Inf. dan Ilmu Komput.*, vol. 8, no. 5, p. 1057, 2021, doi: 10.25126/jtiik.2021844550.

[6] D. Nuswantoro, E. Adyati Rahmasari, and D. Hening Yanuarsari, "KAJIAN USABILITY DALAM KONSEP DASAR USER EXPERIENCE PADA GAME 'ABC KIDS-TRACING AND PHONICS' SEBAGAI MEDIA EDUKASI UNIVERSAL UNTUK ANAK," [USABILITY STUDY IN THE BASIC CONCEPTS OF USER EXPERIENCE IN THE GAME 'ABC KIDS-TRACING AND PHONICS' AS A UNIVERSAL EDUCATIONAL MEDIA FOR CHILDREN,] pp. 49–71, 2017.

[7] A. Blair-Early and M. Zender, "User interface design principles for interaction design," *Des. Issues*, vol. 24, no. 3, pp. 85–107, 2008, doi: 10.1162/desi.2008.24.3.85.

[8] Jesse James Garrett, *The Elements of User Experience: User-Centered Design for the Web*, 2nd Editio. New Riders, Berkeley, 2011.

[9] D. A. Rusanty, H. Tolle, and L. Fanani, "Perancangan User Experience Aplikasi Mobile Lelenesia (Marketplace Penjualan Lele) Menggunakan Metode Design Thinking," [Designing the Lelenesia Mobile Application User Experience (Lele Sales Marketplace) Using the Design Thinking Method,] *J. Pengemb. Teknol. Inf. dan Ilmu Komput.*, vol. 3, no. 11, pp. 10484–10493, 2019.

[10] P. P. Rohmat Indra Borman, Yogi Purnomo Putra, Yusra Fernando, Dwi Ely Kurniawan and I. Ahmad, "Designing an Android-based Space Travel Application Trough Virtual Reality for Teaching Media," *Int. Conf. Appl. Eng.*, pp. 1–5, 2008, [Online]. Available: 10.1109/INCAE.2018.8579394

[11] L. Setiyani and E. Tjandra, "UI / UX Design Model for Student Complaint Handling Application Using Design Thinking Method (Case Study: STMIK Rosma Karawang)," *Int. J. Sci. Technol. Manag.*, vol. 3, no. 3, pp. 690–702, 2022, doi: 10.46729/ijstm.v3i3.505.

[12] A. A. Razi, I. R. Mutiaz, and P. Setiawan, "Penerapan Metode Design Thinking Pada Model Perancangan Ui/Ux Aplikasi Penanganan Laporan Kehilangan Dan Temuan Barang Tercecer," [Application of the Design Thinking Method to the Ui/Ux Design Model for Applications for Handling Reports of Loss and Findings of Scattered Goods,] *Desain Komun. Vis. Manaj. Desain dan Periklanan*, vol. 3, no. 02, p. 219, 2018, doi: 10.25124/demandia.v3i02.1549.

[13] I. P. Sari, A. H. Kartina, A. M. Pratiwi, F. Oktariana, M. F. Nasrulloh, and S. A. Zain, "Implementasi Metode Pendekatan Design Thinking dalam Pembuatan Aplikasi Happy Class Di Kampus UPI Cibiru," [Implementation of the Design Thinking Approach Method in Making Happy Class Applications at the UPI Cibiru Campus,] *Edsence J. Pendidik. Multimed.*, vol. 2, no. 1, pp. 45–55, 2020, doi: 10.17509/edsence.v2i1.25131.

[14] A. Maniek, A. Triayudi, and A. Rubhasy, "Penerapan Metode Design Thinking Dalam Rancang Aplikasi Penanganan Laporan Pencurian Barang Berharga Di Polsek Sukmajaya," [Application of the Design Thinking Method in Designing an Application for Handling Valuables Theft Reports at the Sukmajaya Police,] *JIPI (Jurnal Ilm. Penelit. dan Pembelajaran Inform.*, vol. 6, no. 2, pp. 267–276, 2021, doi: 10.29100/jipi.v6i2.2026.

[15] R. A. Almayda and A. Luthfi, "Perancangan Aplikasi Ayo Beraksi Dengan Metode Design Thinking" [Let's Design Applications In Action With the Design Thinking Method].

[16] S.-H. Park, "A Study on UX/UI Design Methodology as a Branding Strategy Using Digital Media: Focusing on UX/UI Education Cases," *J. Digit. Contents Soc.*, vol. 23, no. 9, pp. 1661–1671, 2022, doi: 10.9728/dcs.2022.23.9.1661.

[17] I. 9241-210, "Ergonomics of human-system interaction — Part 210: Human-centred design for interactive systems," *Online Browsing Platform (OBP)*, 2010. https://www.iso.org/obp/ui/#iso:std:iso:9241:-210:ed-1:v1:en (accessed Dec. 29, 2022).

[18] A. D. Putra and A. D. Putra, "Rancang Bangun Aplikasi E-Commerce Untuk Usaha Penjualan Helm," [Design and Build E-Commerce Applications for Helmet Sales Businesses,] *J. Inform. dan Rekayasa Perangkat Lunak*, vol. 1, no. 1, pp. 17–24, 2020, doi: 10.33365/jatika.v1i1.145.

[19] S. Gibbons, "Empathy Mapping: The First Step in Design Thinking," *Nielsen Norman Group*, 2018. https://www.nngroup.com/articles/empathy-mapping/ (accessed Dec. 29, 2022).