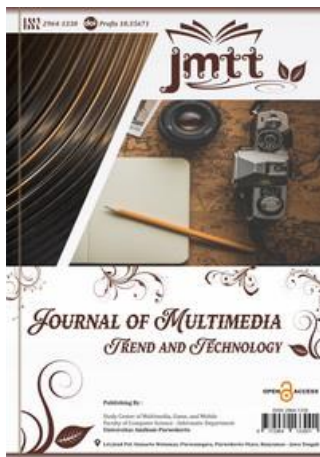


UI/UX Design Modeling on Chatting and Forum Applications Using Design Thinking

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ABSTRACT

Informatics is one of the study programs at the private university of Amikom University Purwokerto which prioritizes learning on the development of Information Technology, but the problems faced vary such as the absence of a campus facility for discussion and community, difficulty in conveying the problems they face, especially related to assignments and materials presented by lecturers. The purpose of this study is to design a visual concept of user interface design and prototype flow design for the Chatting and Forum Discussion Forum application using the Design Thinking method. The method used involves iterative steps to understand user needs, build prototypes, and test the resulting solutions. In addition, the usability testing method is used to test the prototype results of the interface that has been created, with a focus on user experience. The final result of this study is a user interface and prototyping that have passed the testing stage according to usability testing standards, task completion testing using the SEQ (Single Ease Question) method on each task has an average task completion above 6. And the results of the SUS (System Usability Scale) method have a value of 88.3 meeting the SUS acceptable scoring aspect with a grade scale B which shows that the project created is easy to use. Successfully designed a visual design concept through user interface and user experience design of online discussion forum platform media using the Design Thinking method through the stages of Empathize, Define, Ideate, Prototype, and Testing.

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INTRODUCTION

Digital products of technology and the internet allow us to create products that can be used in everyday life that have visual value with functionality and provide a comfortable and easy experience for users through the interface on the product[1][2]. User Interface (UI) and User Experience (UX) are one of the many technological developments that exist. UI focuses on the beautiful appearance of the product, such as graphic displays and layouts, to make the product more attractive and have a distinctive character[3][4]. UX focuses on how to create comfort for users when users use a product, they must feel happy[5]. There are three aspects in the digital world: Goods, Services, and Human. Goods and Services are products, while Humans are users or makers of the product. The product manufacturing process goes through several processes carried out by someone with a certain role, one of which is the UI/UX Designer who plays a role in the digital world[6][7]. Therefore, a cool appearance with user comfort is the result of a product through good UI and UX. Ease of UI and UX can help increase efficiency, productivity, satisfaction, and user loyalty to a digital product or service[8][9]. Therefore, UI and UX design should be a top priority in the development of a digital product or service, and must be continuously adapted to meet user needs and desires to the maximum[10].

Informatics is one of the study programs at the private university of Amikom University Purwokerto which prioritizes learning on the development of Information Technology. However, from the results of the review through the experience of opinions and questionnaires from 32 respondents that the author obtained at a facility in the Informatics study program, there is still no forum for community, sharing topics that they are interested in, especially for students, the problem that is often found is the difficulty of discussing with other students to alumni, especially with new students who are still confused about lectures and social problems in the Amikom University Purwokerto environment, and also sometimes there are students who just want to follow a program in the Informatics study program, as well as how to access information circulating about programs in the Informatics study program which is sometimes so fast.

So the problem arises based on the sources the author found first is that there is no longer an effective discussion place for the academic community to discuss problems that need to be discussed. Students also have difficulty in conveying the problems they face, especially related to assignments and materials presented by lecturers. Furthermore, there is another problem based on the literature that the author found, namely too much media that is spread so quickly on various platforms that allow all students to be confused about wanting to see information on social networks such as websites, blogs, and other social media applications[11][12]. Social networks also cause misunderstandings of information and incorrect information that is not directed at all students, especially Informatics study programs, especially since there is no forum to accommodate a joint discussion with a community to channel information, opinions, assistance and experience[13][14]. Therefore, the role of the community in a discussion forum is very much needed[15].

The design thinking method was chosen as a step to solve problems and find solutions because it is considered suitable for various situations and easy to implement because it is iterative[16]. Based on sources, the use of the design thinking method makes the interface design on the application being built easier for users to use[17]. Each stage in design thinking produces a solution or result that is clear and in accordance with needs[18]. Design thinking has a high level of complexity in an architecture as a problem-solving tool and is suitable for interactive things[19].

METHOD

The following is a concept of research stages which is a framework flow using Design Thinking.

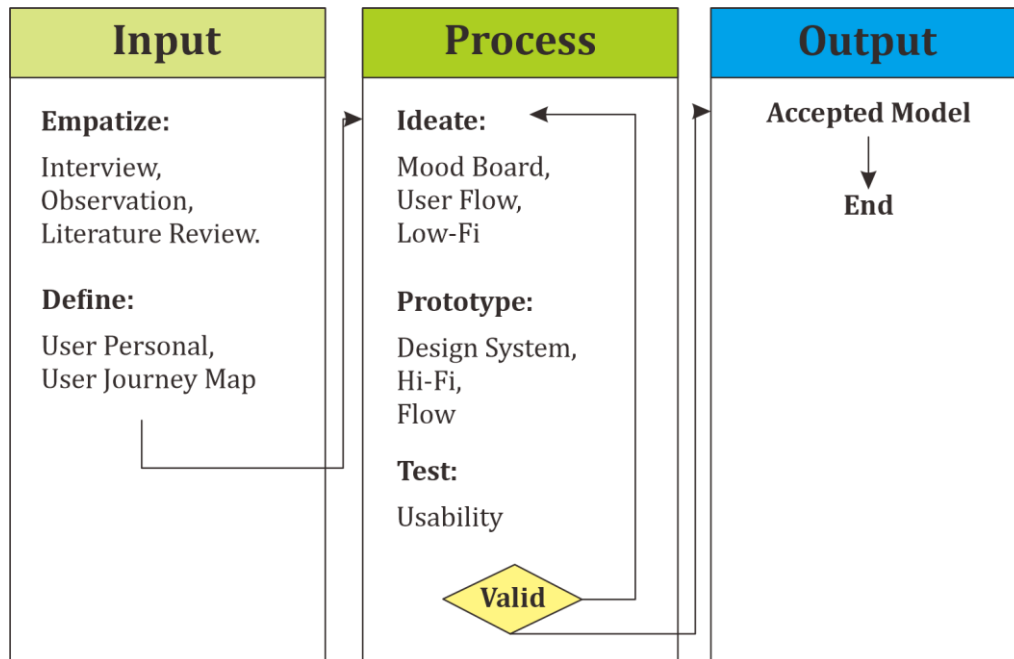


Figure 1. Research Stage

In Figure 1, a flow or stages in conducting research using the Design Thinking method starting from the Empathize phase to the implementation of Usability Testing, and iterations can occur in the use of this method.

1. Empathize

To conduct the research, an observation was first conducted by understanding the identification of the problems that would be raised against the design concept of the Charum Discussion Forum (Chatting and Forum) based on mobile, which is the main object in designing a UI/UX design concept. The problems taken were related to the case study program from the background of the problem, this was then used as the basis for designing the Charum Discussion Forum concept in order to help overcome the problems obtained. Furthermore, an interview and distribution of questionnaires were conducted to respondents to obtain opinions from Informatics study program students and aimed to ensure the truth of the assumptions made by the author and to find out the needs and problems faced by prospective users or respondents themselves. Thus, the author can better understand the target users and can design a more appropriate and effective solution.

2. Define

At this stage, the problem statement analysis is carried out and synthesized to find the core problem by sorting the data. Next, a user persona and user journey map are created. According to the NN/g Group Nielsen Norman website, "A persona is a fictional, yet realistic, description of a typical or target user of a product. A persona is an archetype, not a real living person, but a persona should be described as if they were a real person."

User personas are important in the design, creation, and even development of UI/UX because they aim to align perceptions and allow everyone involved in the project to empathize with the persona or potential user according to their behavioral patterns. In this case, user personas and user journey maps are used to ensure that the product created can meet user needs and provide an optimal user experience. A user journey map is a visual representation that illustrates the steps or stages of user interaction with a product or service, also known as a user journey map. The creation of user personas and user journey maps is done through interviews with respondents and selecting one character that is suitable to be used as a representation of the user. This aims to increase the writer's empathy and understanding of potential users and how users interact with the product to be created. The user journey map consists of several components such as user names, scenarios and expectations, journey phases, actions, mindsets, emotions, and opportunities that exist during the user's journey.

3. *Ideate*

Moodboard is one of the tools used by UI/UX designers to describe the concept and visual feel of a design project. Moodboard contains a collection of images, colors, patterns, and other visual elements used to express the feelings, atmosphere, and mood that you want to show in the design. Moodboard can help designers in several ways. First, moodboard can help designers develop and visualize their initial ideas more clearly and concretely. Second, moodboard can help designers determine the color palette, fonts, and other design elements that are suitable for their project. Third, moodboard can help designers communicate with clients or development teams to clarify the vision and goals of the design. In practice, UI/UX designers usually start by creating some basic concepts and ideas, and then choosing images, colors, and other visual elements that support the concept to be made into a moodboard. Moodboard can be created manually by printing and sticking images on a board, or by using digital tools such as graphic design applications. User flow in UI/UX design refers to the sequence of actions that users must take to complete a particular task in the design concept. User flow is used to help UI/UX designers understand and design intuitive interaction flows for users. In designing user flow, designers must understand the user's goals when using an application or website and identify the key tasks that must be completed[20]. Next, designers need to create an interaction flow diagram that illustrates the sequence of actions that must be taken by the user, from the initial action to the final action in completing the task. User flow diagrams help designers to visualize and identify areas that may need improvement or change in UI/UX design. In practice, user flow diagrams are usually used in conjunction with user personas, user journeys maps, and wireframes to help designers understand the comprehensive user experience and design solutions that are intuitive and easy to use for users. Low-Fi Design is usually a rough sketch or wireframe used to describe the layout, structure and function of a digital product without paying attention to visual aspects such as color and fonts. The purpose of Low-Fi Design is to ensure that the concept and structure of the digital product are truly understood and in accordance with user needs before entering a more detailed visual design stage. Low-Fi Design can be done using pencil and paper or using design software such as Figma, Adobe XD or Sketch. The advantage of using Low-Fi Design is that it can save time and costs in digital product development because improvements or revisions can be made at an early stage before entering a more detailed visual design stage.

4. *Prototype*

An approach to developing system and user interface designs through several stages. The first stage is to create a Design System, which is to plan the overall system by considering the features and needs of the user. Next, a High-Fi UI is created, which is the process of depicting the system design after carrying out the Low-Fi UI phase using digital

technology. After this stage, a UI prototype is created, which is the stage where the design that has been created is summarized in the form of a model that can be tested by users to see the user's response and feedback on the design created. The purpose of the prototype phase research concept in UI/UX is to ensure that the system and user interface created meet user needs and can be used properly by users. By combining these stages, it can help the design team to develop more effective and efficient systems and user interfaces.

5. *Testing*

When entering the final stage, the usability testing method is used using research usability testing consisting of scenarios and task lists or questions that will be tested to the tester. This procedure uses Maze.co, an online software that offers several advantages, such as heatmaps output to find out how users explore the design and reports from the application that can be in the form of excel files. The data produced includes qualitative and quantitative because the author uses a Likert scale with the SEQ (Single Ease Question) method to assess the usability value of each task tested by the tester. Finally, the SUS method is used to assess the overall usability value of the user experience.

RESULT & DISCUSSION

At this stage, which is the first stage in this research, several discovery steps were carried out to conduct observations, interviews and questionnaires, and search for sources based on literature studies to find or research user needs which are carried out by searching for information through research with potential end users. Because research in designing a good UI/UX concept is centered on the needs of user problems and assumptions from researchers must also be validated so that there is no bias in product development. In addition, from various opinions from several students that the author obtained through interviews and questionnaires, they had difficulty finding information about the program activities of the Faculty of Informatics Study Program, based on literature study sources the author found that there was a connection with this, the problem that arose was the lack of effective discussion space for the academic community to discuss topics that needed to be discussed. This was also experienced by students who had difficulty in conveying the problems they faced related to assignments and materials given by lecturers. However, based on the results of interview research and the distribution of questionnaires that have been given to potential end users or respondents, as well as the habits and interests of the majority of 32 respondents, they have used a discussion forum platform to seek opinions, share information, and find friends based on the results of the author's questionnaire research below.

Table 1. Questions and Results of Obtaining Questionnaire Answers

Question	Answer	Quantity
Have you ever used a community forum such as Quora, Stackoverflow, FOMO, Facebook, or Kaskus?	Ever, Yes and True	29
Have you ever searched for information or answers to a question in the community forum?		3
Have you ever found an interesting thread or topic in the community forum?	Ever, Yes and True	30
Do you find it difficult to discuss with other students and alumni in the Informatics study program at Amikom University Purwokerto?		2
Have you ever had difficulty in finding information about programs in the Informatics study program?	Yes	29
	Maybe	2
		1

Do you think an online discussion forum can be a solution for Informatics study program students at Amikom University Purwokerto in sharing information and exchanging ideas?		
Are you interested in joining an online discussion forum that discusses topics related to the Informatics study program at Amikom University Purwokerto?		
Do you believe that intuitive navigation, a clean appearance, clear action buttons, reply notifications, effective search facilities, and complete user profiles will create a good user experience in an online discussion forum?	Yes	17
	Maybe	8
		7
Do you feel that the login process is made easier by using an Amikom Student Portal account?		
Have you ever used a community forum such as Quora, Stackoverflow, FOMO, Facebook, or Kaskus?	Yes	20
	Maybe	4
		8
Have you ever searched for information or answers to a question in the community forum?		
Have you ever found an interesting thread or topic in the community forum?		
Do you find it difficult to discuss with other students and alumni in the Informatics study program at Amikom University Purwokerto?	Yes	28
	Maybe	4
		0
Have you ever had difficulty in finding information about programs in the Informatics study program?		
Do you think an online discussion forum can be a solution for Informatics study program students at Amikom University Purwokerto in sharing information and exchanging ideas?		
Are you interested in joining an online discussion forum that discusses topics related to the Informatics study program at Amikom University Purwokerto?	Yes	25
	Maybe	5
		2
Do you believe that intuitive navigation, a clean appearance, clear action buttons, reply notifications, effective search facilities, and complete user profiles will create a good user experience in an online discussion forum?		
Do you feel that the login process is made easier by using an Amikom Student Portal account?		
Do you agree that students should be able to open new discussion threads without restrictions?	Yes	20
	Maybe	10
		2
Have you ever used a community forum such as Quora, Stackoverflow, FOMO, Facebook, or Kaskus?		
Have you ever searched for information or answers to a question in the community forum?		
Have you ever found an interesting thread or topic in the community forum?	Yes	28
	Maybe	3
		1
Do you find it difficult to discuss with other students and alumni in the Informatics study program at Amikom University Purwokerto?		
Have you ever had difficulty in finding information about programs in the Informatics study program?		
	Yes	32

Do you think an online discussion forum can be a solution for Informatics study program students at Amikom University Purwokerto in sharing information and exchanging ideas?	Maybe	0
		0
Do you find notifications for every reply or campus news received on the discussion forum very helpful?	Yes	32
	Maybe	0
Do you find notifications for every reply or campus news received on the discussion forum very helpful?		0
Do you find the ability to search for related questions using the search menu very useful?	Yes	32
	Maybe	0
		0

From the results of the mixed questionnaire, namely a combination of open and closed questionnaires, but the author involved 32 respondents in table 4.1 and table 4.2 as the identity data above, it was found that some respondents (17 out of 32) had difficulty in getting to know or seeking information from relatives, campus friends, alumni, even their own campus. However, there are still a number of respondents (3 out of 32) who have never used the discussion forum platform. The questionnaire results show that 82.5% of respondents consider community forums as an alternative solution for finding important and solution-oriented information. However, new students at Amikom Purwokerto University often feel confused about accessing information about lectures and social life on campus. They also face difficulties in accessing information related to programs in the Informatics study program. Sometimes, the information spread about these programs is so fast and difficult to access through the information media they usually use such as Facebook, Instagram, TikTok, Quora, Twitter, and Stack Overflow. Although 87.5% of respondents think that a mobile-based application platform that focuses on discussion forums with a UI/UX concept would be better in meeting their needs for a concentrated information container, there are also 78.1% of respondents who are interested in joining and getting interesting information through the platform. From this, a conclusion was drawn that it is necessary to build platform facilities through an attractive interface design concept for a community as a container that is concentrated on the Informatics study program. Therefore, at the Empathize stage based on user experience to be able to reference a display by representing user behavior patterns through features that users usually use such as search columns, creating Threads based on topics or groups that users follow and opening a new discussion in the comments column on the topic being discussed in the Charum Discussion Forum at the Define stage.

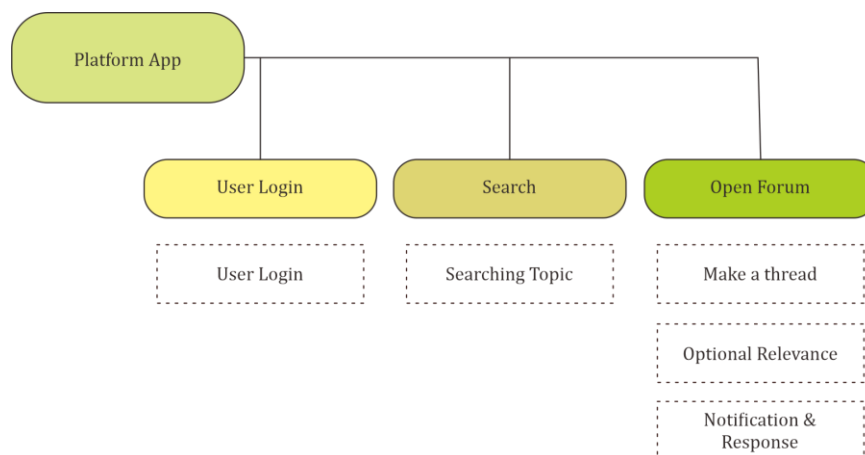


Figure 2, Journey Map in the forum community.

The User Journey Map shown in Figure 2 is a visual representation of how a persona walks to achieve a specific goal. In this User Journey Map, a scenario is presented that illustrates how the flow of a student discussion forum application concept works through user experience. Starting by logging in using an account from the Amikom Purwokerto University academic student portal. After logging in, users can search for discussions of interest. If there are no relevant discussions, users can also create new discussions through the requested group/space. Users will receive a notification when another student answers a question. Discussions can be marked as complete when users find the appropriate answer.

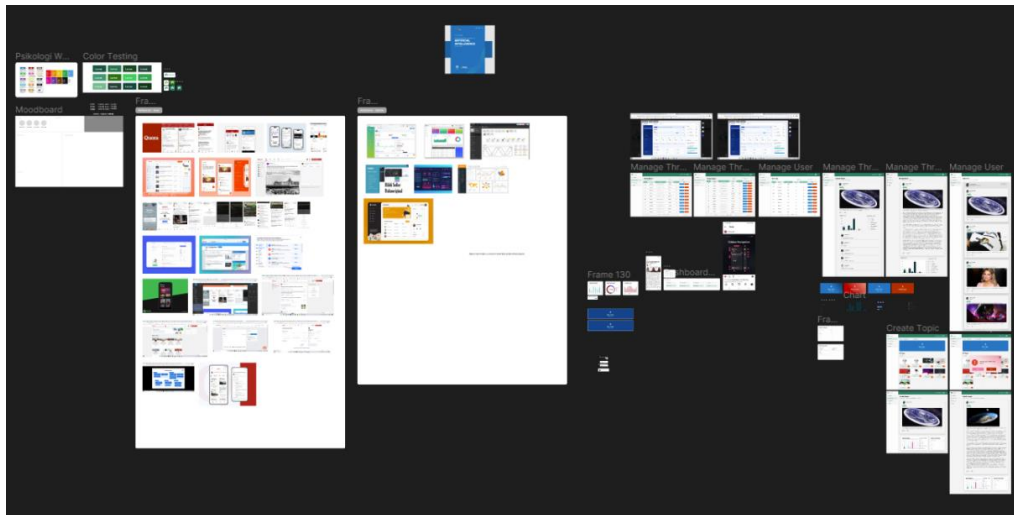


Figure 3, Visual presentation media used to collect and organize various elements

Moodboard is a visual presentation media used to collect and organize various elements, such as images, colors, text, shapes, and other materials in one attractive and organized display. Moodboard plays a very important role for designers in creating attractive works, also in accordance with the desired vision. Moodboard can help designers in developing and running the business projects they want. The moodboard in Figure 4.2 was created from various references to the author's literature studies that became sources of reference or as a source of inspiration for creating interface designs. The use of bright colors is a depiction of the creation of the interface and the elements used in creating the concept of the charum discussion forum. In the Discussion Forum topic, User Flow starts from Start and continues to Onboarding. After that, the user will enter the Logged In page which has a Yes or No status. If the user chooses No, they will be directed to the Login page and then to the Media Feed. Meanwhile, if the user chooses Yes, they will be directed directly to the Media Feed.

After that, the user can continue to two main menu options, namely the Thread Detail Page or Space Group. If the user selects the Thread Detail Page, then they can continue to User Write Thread or when viewing the Thread they can add comments to the Thread with Add Comment in Thread. Then the user can continue by clicking the Send Button Thread. If successful, the flow ends (End), if not, an Error Message 404 will appear. Meanwhile, if the user selects the main menu, namely Space Group, there is a Choose Topic option and then continues to Open Group. If the user chooses to continue again, the flow is the same as that on the previous Thread Detail Page.

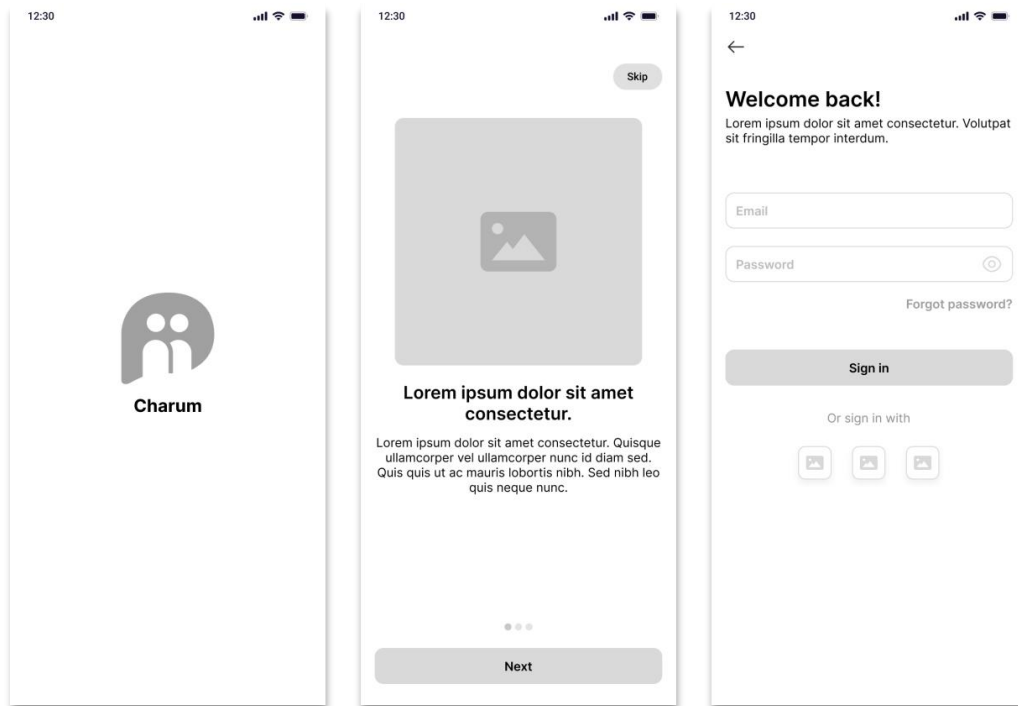


Figure 4, Platform display design.

In Figure 4, an initial page in the application to access the discussion forum platform, these pages are components for the formation of Hi-Fidelity later, where there is a Splash Screen page containing an Icon, then there is an Onboarding page containing a brief description of the application or an introduction to the application, then there is an Authentication page containing 1 different page, namely Login Authentication which has a Form component to fill in user identity data.

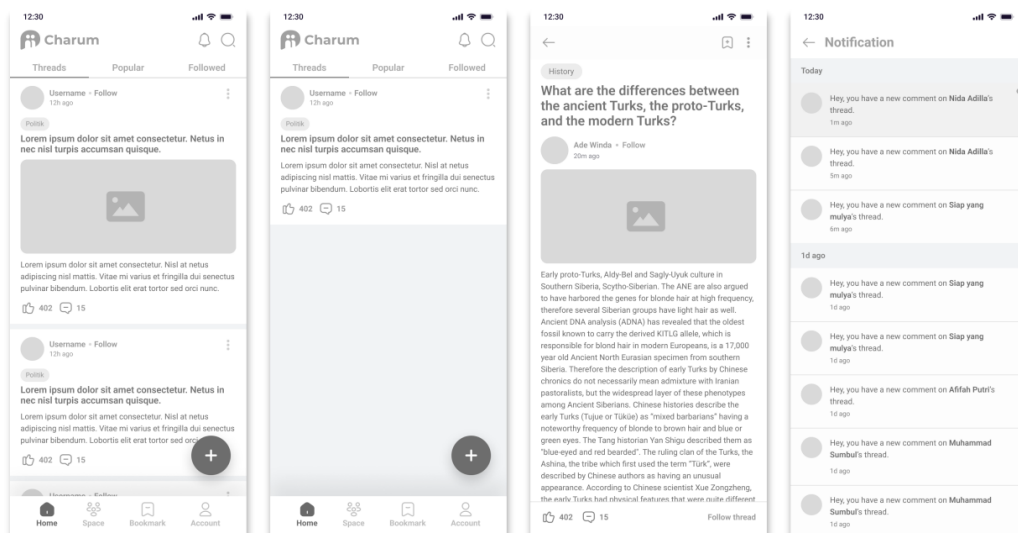


Figure 5, Application homepage design.

In Figure 5, a Homepage page in the application to access after the logged in flow on the discussion forum platform, these pages are components for the formation of the next Hi-Fidelity where there is a Home Screen page that has a Charum icon in the upper left corner accompanied by various icons in the upper right corner such as notification and search, thread list and main menu in the application at the bottom, then there is a Followed Threads page which has the same components as the Home Screen regarding the application but only displays a thread that the user follows, then there is a Thread Detail Page page which has a more descriptive component regarding the thread, continued to the Notification page there is a list component to see a list of notifications from various newspapers from other users or regarding the application.

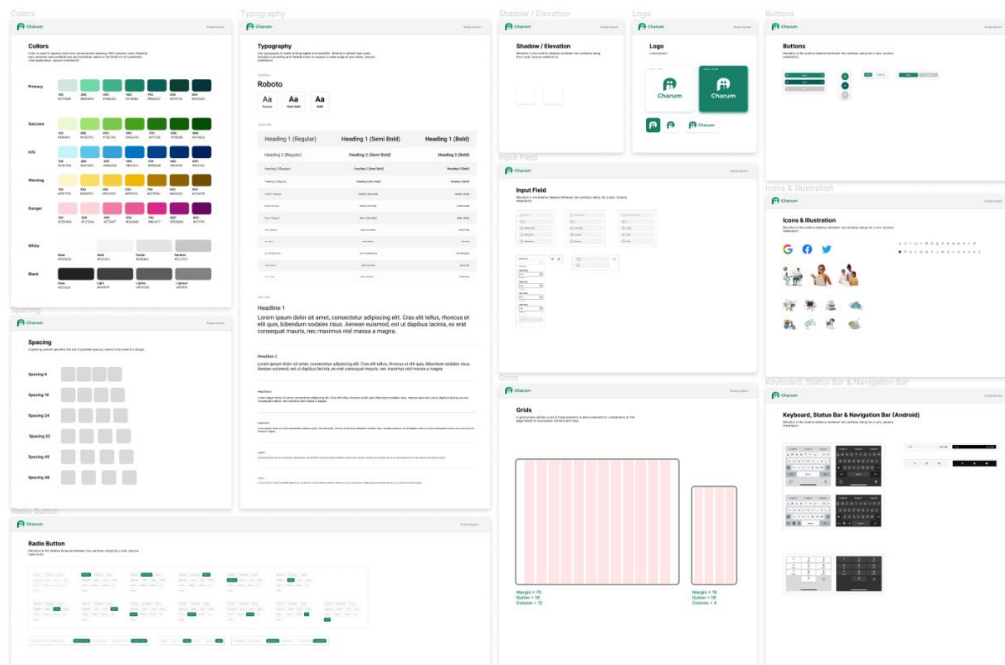


Figure 6, System design based on moodboard.

Design System is a set of guidelines used to build consistent and easy-to-use digital products. This design system consists of several elements such as color, typography, icons, and other UI components used to build digital products. This design system helps design and development teams to work more efficiently and consistently in building digital products. The design system also helps ensure that the digital products created are consistent in terms of appearance and behavior. By using a design system, the design and development team can ensure that every element in the digital product has a consistent appearance and behavior. In the picture 6 above, it is a design system that the author has prepared and made referring to the moodboard that has been made or the beginning of the author looking for a reference literature study to determine the selection of colors, brand identity, style guide, colorgraphy, determining space and grid to determining an iconography and the right components for making the design concept of the Charum discussion forum application, not just any to prepare components of this design system to be applied to the design concept of the Charum discussion forum application, it is necessary to adjust based on the needs of the concept, both determining space and grid, then whether these needs are in accordance with what is needed in making the concept of the Charum discussion forum application and making it easier to make more reusable on

each page in this application design. Furthermore, the author explains a main concept in the design system, both the logo, basic colors and also the icons & illustrations used to make the design concept of the discussion forum.

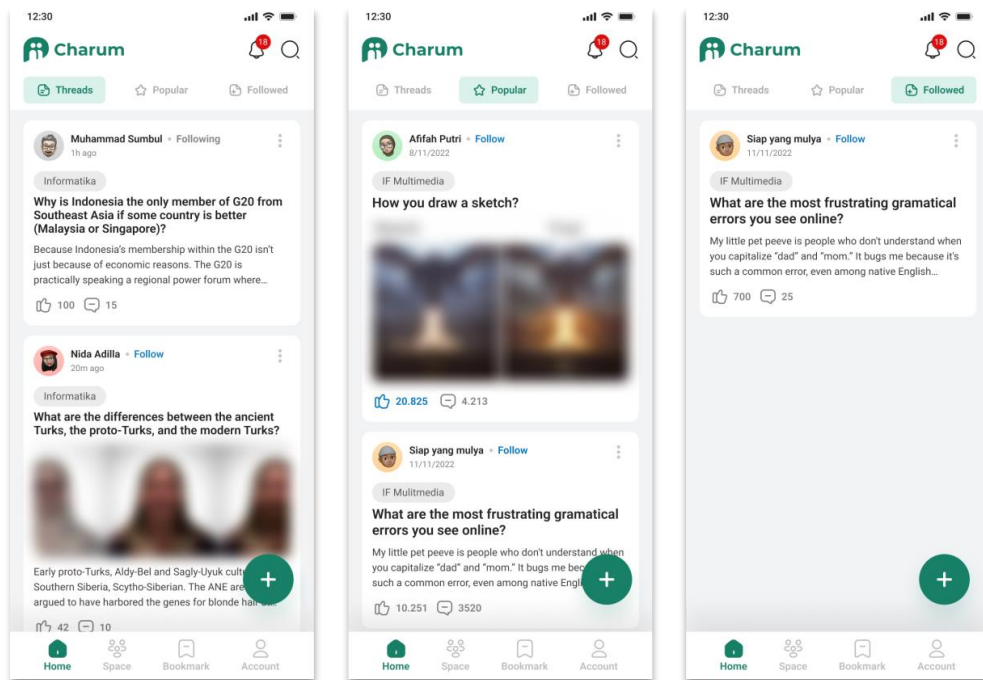


Figure 7, Detailed Page

Figure 7 shows a detail page of the thread that the user clicks from the registered thread list page, on the page it shows a detail about the photo that is not blurry then the description that the user expresses through the thread and there is a bookmark button to save a thread from another user. Not only that, there is a button to display comments from other users, so users can ask each other questions in the long comments by replying to each other. The testing plan or stimulus research is carried out for product testing in the form of a prototype of the interface design to avoid failure. Before conducting testing with testers or respondents who have participated in interviews in the previous phase, namely empathize, the author plans several tasks, scenarios, and supporting questions that will be used to test prospective users. To find out the results of calculating the question score using SUS, you can use the table that has become a provision for assessing the use of SUS with figure 8, the table can help the author find out what category the assessment given by the examiner falls into.

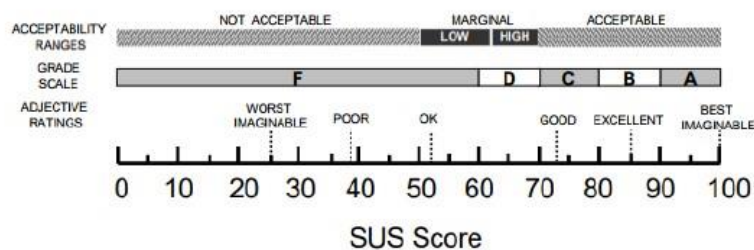


Figure 8, SUS Score

According to. to calculate the SUS value, there are several rules that must be applied.

1. For odd statement numbers, the number selected by the user is reduced by 1. (x-1)
2. For even statement numbers, subtract 5 from the number selected by the user. (5-x)
3. All values from the results of rules 1 and 2 will range from 0–4 (with 4 being the best.)
4. Add all of these values and multiply by 2.5. This multiplication will change the scale from 0–40 to 0–100.

Table 2, SUS Score Results

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Count	Result
19SA1013	4	4	4	4	4	4	4	4	4	4	40	100
19SA1036	3	3	3	3	4	4	3	4	3	2	32	80
19SA1015	4	4	4	4	4	4	4	3	3	3	37	92.5
19SA1243	4	4	4	4	4	4	4	4	4	4	40	100
19SA1146	3	3	3	3	3	4	4	4	3	2	32	80
0628128702	3	3	3	3	4	3	3	3	3	3	31	77.5
Result with 6 tester												88.3

Based on table 4.20, the total SUS assessment given by the examiners is 530/6 or 88.3, this value is the final result of the additional System Usability Scale from the Informatics study program staff in the final attachment to fulfill the final acceptable SUS scoring aspect with a scale grade of B or excellent.

CONCLUTIONS

The results of the study that accompany the discussion of the author compiled in the previous chapter, therefore a first conclusion was obtained, namely successfully designing a visual design concept through the design of the user interface and user experience of the online discussion forum media platform using the Design Thinking method through the stages of Empathize, Define, Ideate, Prototype, and Testing. Second, for the prototype and interface itself, it has gone through the usability testing results stage. From the results of testing to respondents using the SEQ (Single Ease Question) method, each respondent was given a task, from the tasks given, the average work obtained was above 6. And from the results of testing using the SUS (System Usability Scale) method, it has a score that is quite satisfactory for the author of 88.3 which meets the SUS acceptable scoring aspect with grade A, therefore it shows that the project the author created is easy to use.

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