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Applying Design Thinking to the Internet Cafe Booking Application Prototype

Muhammad Wira Ramadhana[1], Irvan[2], Nurjamiyah[3]
[1,3]Department of Information System, University of Harapan Sumatera Utara, Indonesia
[2]Department of Mathematics Education, University of Muhammadiyah Sumatera Utara, Indonesia

ABSTRACT

Stream Cyber Café is one of the icafe in Medan, categorized as mid-high end due to its excellent services, facilities, and PC specifications for playing various online games. As a result, this icafe, founded by the STREAM UNIVERSE company, has a significant number of customers. The high number of customers often leads to a crowded and full environment, causing some customers to feel disappointed when they visit but cannot play because there are no available PCs. Therefore, this research aims to address the issues faced by internet cafe customers by designing a Prototype Internet Cafe Booking Application using the Design Thinking method. This prototype application will make it easier for internet cafe customers to check PC availability and book PCs using their smartphones. It will also provide valuable insights to the STREAM UNIVERSE company regarding an application that can enhance the quality of service at their icafe.

Keyword : Prototype, UI/UX, Internet Cafe, Design Thinking, Booking Application.

Corresponding Author:
Irvan,
Universitas Muhammadiyah Sumatera Utara
Jl. Kapten Mukhtar Basri No 9, Medan, Indonesia.
Email : irvan@umsu.ac.id

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1. INTRODUCTION

The development of technology in the digital era, as it is happening now, is progressing rapidly and very swiftly. This technological development encompasses all platforms, especially mobile technology, where human daily needs are facilitated by this technology. This can be utilized by humans for various aspects, one of which is as a form of entertainment. A title of article should be the fewest possible words that accurately describe the content of the paper. Indexing and abstracting services depend on the accuracy of the title, extracting from it keywords useful in cross-referencing and computer searching. An improperly titled paper may never reach the audience for which it was intended, so be specific.

One of the entertainment media popular among young people today is the internet café, commonly abbreviated as "warnet." One company operating in this field is the System for Regularized Electronic Activities of Millennials (STREAM UNIVERSE). While their business activities are ongoing, there have been several complaints or issues experienced by their internet café customers. One of them is that the computers often become fully occupied during specific hours when customers want to use or play on them. This leaves customers feeling disappointed as they made an effort to come to the internet café only to find the computers in use or fully occupied. Many of them decide not to play and eventually leave because they are unwilling to wait. This problem is exacerbated by the fact that very few internet cafés offer booking services, including the System for Regularized Electronic Activities of Millennials (STREAM UNIVERSE).

Based on this issue, it can be concluded that mobile technology can be utilized for designing a Prototype User Interface for an internet café booking application. With this booking feature, internet café customers can find out whether the computers in the café are in high demand or even fully occupied. They can then reserve computers according to their preferred class and desired time online, right from their smartphones. This will undoubtedly enhance the quality of service offered by their internet café, and customers are more likely to remain loyal subscribers because they will be more satisfied with the available services. Consequently, this is also expected to boost the company's profitability.

A prototype is a draft version or product that aims to closely resemble the user or user representation, both from the website and its user interface, before coding begins. In designing this User

Interface Prototype, a good method is needed to produce a quality application design that is user-friendly. Therefore, the author will use a method called Design Thinking. William Visser, with the Oxman approach, defines Design Thinking in his book as a process that employs strategy and creativity used by interface designers in the design process. In simple terms, Design Thinking is an approach or method for problem-solving that is cognitive, creative, and practical in responding to human needs as users. This method includes several stages: Empathize, Define, Ideate, Prototype, and Test.

User Interface and User Experience (UI/UX) play a crucial role in the development of an application because the design of an application should be neat and organized, allowing users to easily use the features provided by the application. Therefore, the Design Thinking method is applied in the context of UI/UX. This research will discuss the design of the User Interface Prototype for a cybercafe booking application at STREAM UNIVERSE company, using the methods, criteria, and processes defined within the framework of Design Thinking. By applying this method, the designed User Interface Prototype is expected to serve as a basis for implementation into a complete application that can be used by the cybercafe's customers to book computers and improve the quality of service provided by STREAM UNIVERSE company.

2. RESEARCH METHOD

The development method applied by the researcher is the Design Thinking method. Design Thinking is an approach used to find solutions to existing problems. Design Thinking is a discipline that utilizes designer sensibilities and methods to match societal needs with what is technologically feasible and what is viable from a business strategy standpoint, thus creating customer value and market opportunities. There are five stages applied in the Design Thinking method, which are:

A. EMPATHIZE

In the initial stage of the Design Thinking process, the researcher personally observes an internet cafe located at Platina VII Street 18A&B, Medan Deli, North Sumatra, Indonesia. The researcher also engages with one of the individuals in charge of operating the internet cafe, inquiring about relevant questions to confirm the problems faced by the users/gamers at that particular internet cafe.

From the observations made at the internet cafe, the researcher has gathered the following information:

1. The internet cafe operates 24 hours a day, seven days a week.
2. The available PCs are divided into two classes: Regular, consisting of 29 PCs, and VIP, with a total of 23 PCs.
3. The internet cafe can be categorized as mid-high end, with the following PC specifications:
4. Regular Class: Intel® Core™ i3-10105 processor, NVIDIA GeForce GTX 1060 GPU, 16GB RAM.
5. VIP Class: Intel® Core™ i3-10105 processor, NVIDIA GeForce GTX 2060 GPU, 16GB RAM.
6. The internet cafe often reaches full capacity during the nighttime and on specific days like Saturdays, Sundays, and holidays.
7. There are more than 300 registered user accounts.
8. The average age of the cafe's customers/gamers ranges from 15 to 30 years old.

B. DEFINE

During this phase, the researcher has developed a user flow, which is a visual representation of the steps or actions that users take when engaging with the system or product. User flow helps depict the sequence of actions users follow in their interactions with the designed product or service. Below is the designed user flows.

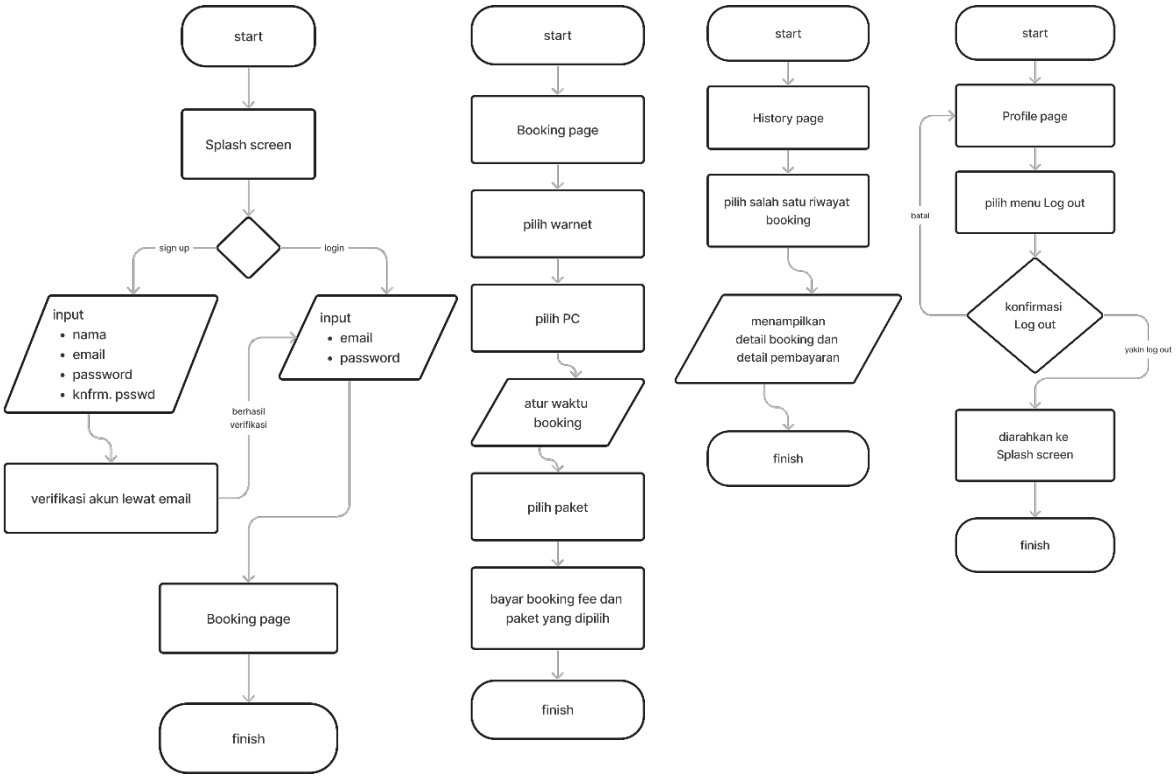


Fig 2. User flows of each main features

The first user flow shows the user's journey using the app, starting from the splash screen, then the decision symbol leads to the option to log in or sign up. After that, the user is directed to the main menu, which is the booking page.

The second user flow above illustrates the user's journey using the main feature located on the booking page. After selecting the internet cafe and PC, the user is directed to set the booking time, as indicated by the input flowchart symbol by entering numerical data representing the number of hours.

The third above user flow illustrates the user's interaction with the history feature located on the history page. It starts with the user selecting one of the history entries, and the flowchart output symbol indicates that the system will display the results of booking details and payment details previously made by the user.

The last user flow above demonstrates the user's journey using the log-out feature located in the profile page menu. After selecting the log-out option from among several listed choices, the flowchart decision symbol indicates that the system will prompt the user for confirmation regarding the log-out activity. If the user selects "Yes," the system will log out the user's account and return to the splash screen.

C. IDEATE

In the third stage of the Design Thinking method, researchers create Information Architecture (IA) for the prototype they are designing. Information Architecture serves to design the structure and organization of information within a system or product. This includes organizing hierarchy, navigation systems, and content layout. The function of IA also encompasses efficient information retrieval, consistency in information presentation, and creating a satisfying user experience. Information Architecture also considers the scalability and future development of the system or product. Overall, IA helps users easily navigate, search for, and interact with information within a system or product.

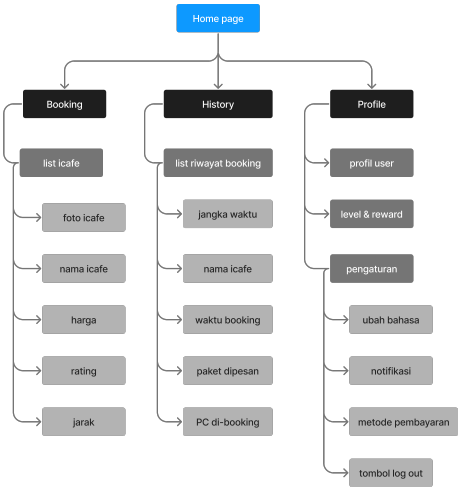


Fig 3. The Information Architecture in the design of the prototype to be created.

Once the Information Architecture is established, researchers can create sketches of the application, also known as low-fidelity design. Creating low-fidelity designs serves three main functions in the design process. First, it allows for rapid idea exploration and early feedback gathering. Second, it facilitates collaboration and communication among the team and stakeholders. Third, it aids in concept validation with more cost and time efficiency.

D. PROTOTYPE

In the fourth stage, the design process progresses to high-fidelity design. It begins with creating a Design System in accordance with the style guide used by the company. The function of a Design System is to establish consistency in design, enhance development efficiency, and facilitate collaboration between the design and development teams. A Design System also helps improve the quality of the user experience by providing clear and easily accessible design guidelines. After designing the necessary components of the Design System, the researchers then proceed to design the high-fidelity design for each screen of the Prototype application. Following the creation of high-fidelity designs, the next stage is prototyping.

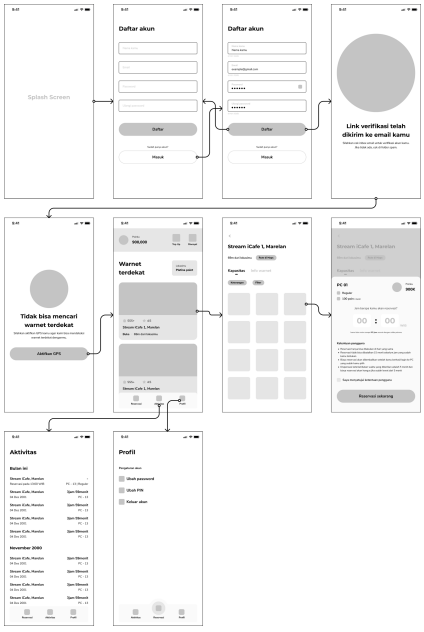


Fig 4. The prototyping stage.

3. RESULTS AND DISCUSSION

Based on the applied Design Thinking method, this research has produced a prototype for an internet cafe booking application called SCC Mobile or Stream Cyber Café Mobile. The name corresponds to the internet cafe owned by STREAM UNIVERSE company, and the prototype application is mobile-based.

A. SCREENS / DISPLAY

In the fourth stage, the design process progresses to high-fidelity design. It begins with creating a Design System in accordance with the style guide used by the company. The function of a Design System is to establish consistency in design, enhance development efficiency, and facilitate collaboration between the design and development teams. A Design System also helps improve the quality of the user experience by providing clear and easily accessible design guidelines.

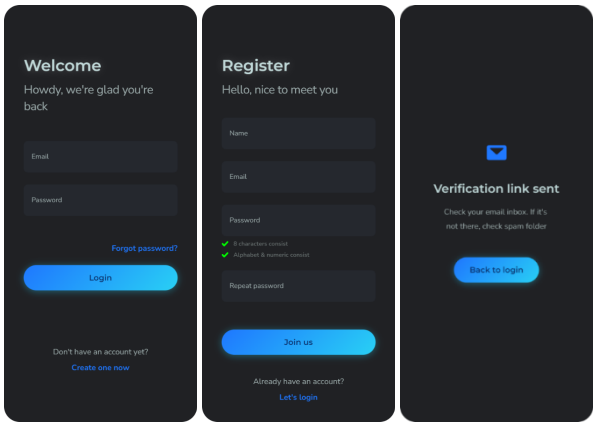


Fig 5. Display of Login Screen

The login screen will be displayed after passing the splash screen, allowing users to log in to their accounts by entering their email and password in the provided text fields. After users input their email and password, they will press the Login button located below the text field component. However, in this prototype, the "forgot password" feature is not yet available.

Users can also register for an account by clicking on the text button at the bottom labeled "Create one now," then entering their name, email, password, and confirming the password, followed by clicking the "Join us" button. The next step is to verify the registered account via email. After that, users will be redirected back to the Login Screen to enter the account they have just registered.

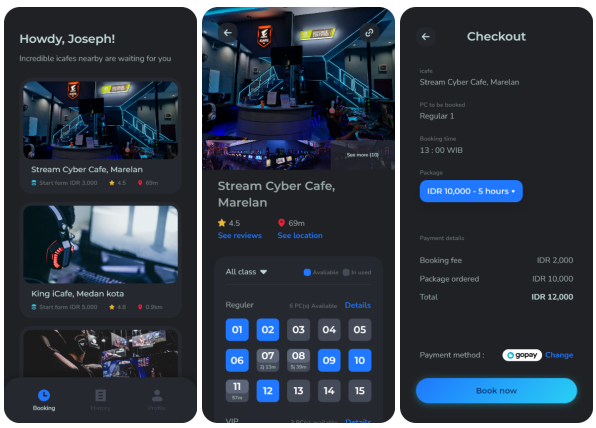


Fig 6. Display of Booking system

Users will choose one of the internet cafes displayed, and then the application prototype will show the name, photo, rating, and location of the internet cafe. Users can select a PC to book based on the available class and price. After selecting one of the available PCs, users will set the booking time for

the PC and choose the PC package to book, for example, Rp. 3,000 for 1 hour, Rp. 5,000 for 2 hours, Rp. 10,000 for 5 hours.

The total payment includes the booking fee and the price of the selected package, and then users can make the payment directly using the payment method they prefer. However, in this prototype, the feature to change the payment method cannot be applied, and it uses Gopay as a representative representation.

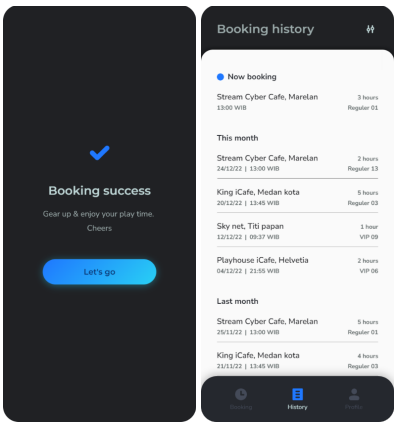
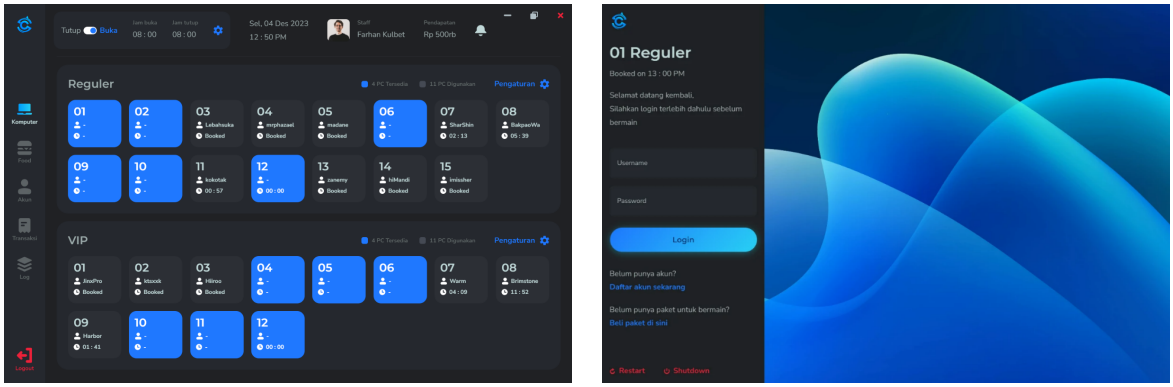


Fig 7. Display of transaction menu

After making the payment, the application system will process the booking for a few seconds. After that, the application prototype will display a screen confirming that the booking has been successfully completed and redirect the user to the History menu. In that menu, the name of the internet cafe, the booked PC, the selected package, and the time/hour at which they should log in/check-in to the PC will be displayed.



(a) (b)

Fig 8. The interconnection between prototypes.
(a) Main menu display of SCC Operator, (b) Display screen on the booked PC

You can see the connection between the SCC Mobile prototype and the SCC Operator prototype, as well as the PC client that is being booked. After the user makes a booking and payment, a booking notification will appear on the SCC Operator and the PC that was booked, and the status of the PC, which was previously "available" or "free," will change to "booked" or "reserved."

B. TEST

In the final stage of the Design Thinking method, testing will be conducted on the prototype that has been created to determine how satisfied and how well users understand the features available in the application. Prototype testing employs two methods, namely SEQ (Single Ease Question) and SUS (System Usability Scale). In this testing phase, the researcher uses 5 respondents who are representative of potential application users.

Table 1. SEQ (Single Ease Question)

Scenario Task	Question	Respondent Name	SEQ	Avg
The user signs up and logs in.	How easy is it to sign up and log in to the application?	Habib A.F.	6	6,4
		Chrsitofer M.	7	
		Khairil Ashar	7	
		Lian A.M.	6	
		Aldiansyah	6	
The user makes a PC booking.	How easy is it to book a PC at an internet cafe?	Habib A.F.	7	6,2
		Chrsitofer	7	
		Khairil	6	
		Lian	5	
		Aldiansyah	6	
The user checks internet cafe reviews.	How easy is it to find reviews of an internet cafe?	Habib	7	6,4
		Chrsitofer	7	
		Khairil	5	
		Lian	6	
		Aldiansyah	7	
The user views the internet cafe's location.	How easy is it to view the location of an internet cafe?	Habib	6	6,2
		Chrsitofer	7	
		Khairil	5	
		Lian	6	
		Aldiansyah	7	
The user checks the details of the booking history.	How easy is it to view the details of booking history in the application?	Habib Al	7	7
		Chrsitofer	7	
		Khairil	7	
		Lian	7	
		Aldiansyah	7	
The user logs out.	How easy is it to log out of the application?	Habib	7	7
		Chrsitofer	7	
		Khairil	7	
		Lian	7	
		Aldiansyah	7	

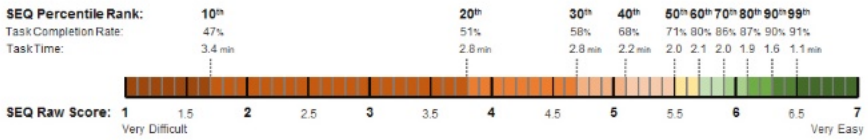


Fig 9. SEQ Likert Scale

Based on the SEQ testing that has been conducted, the results obtained with an average score of 6.2 - 7 indicate that the design of the internet cafe booking application prototype can be considered very good. In addition, respondents also provided some feedback during the testing interviews, which can be used for the further development of this application prototype to make it even better.

Table 2. SUS (System Usability Scale)

Question	Respondent Name	SUS	Avg
I think I will often use this feature.i	Habib A.F.	4	4
	Chrsitofer M.	5	
	Khairil Ashar	4	
	Lian A.M.	3	
	Aldiansyah	4	
I feel that this feature is too complicated, whereas it could be made simpler.	Habib A.F	2	1,4
	Chrsitofer M.	1	
	Khairil Ashar	2	
	Lian A.M.	1	
	Aldiansyah	1	
I find this feature easy to use.	Habib A.F.	5	4,6
	Chrsitofer M.	5	
	Khairil Ashar	4	
	Lian A.M.	4	
	Aldiansyah	5	
I think I need help from a technical person to be able to use this feature.	Habib A.F.	2	1,6
	Chrsitofer M.	1	
	Khairil Ashar	2	
	Lian A.M.	1	
	Aldiansyah	2	
I found that there are various features that are well integrated into the system.	Habib Al Fajri	4	4
	Chrsitofer M.	4	
	Khairil Ashar	5	
	Lian A.M.	4	
	Aldiansyah	3	
I feel that there are many inconsistencies in this feature.	Habib A.F.	1	1.4
	Chrsitofer M.	1	
	Khairil Ashar	1	
	Lian A.M.	2	
	Aldiansyah	2	
I believe the majority of users will be able to quickly learn this feature.	Habib A.F.	4	4,4
	Chrsitofer M.	4	
	Khairil Ashar	5	
	Lian A.M.	4	
	Aldiansyah	5	
I found that this feature is highly impractical when used.	Habib A.F.	2	1,4
	Chrsitofer M.	1	
	Khairil Ashar	1	
	Lian A.M.	2	
	Aldiansyah	1	
I am very confident that I can use this feature.	Habib A.F.	4	4,6
	Chrsitofer	5	
	Khairil Ashar	5	
	Lian A.M.	5	
	Aldiansyah	4	
I need to learn a lot of things before I can use this feature.	Habib Al Fajri	2	1,6
	Chrsitofer M.	2	
	Khairil Ashar	1	
	Lian A.M.	2	
	Aldiansyah	1	

After obtaining the results, the next step is to calculate them according to the applicable standards.

Q1.	4 - 1	= 3
Q2.	5 – 1,4	= 3,6
Q3.	4,6 - 1	= 3,6
Q4.	5 – 1,6	= 3,4
Q5.	4 - 1	= 3
Q6.	5 – 1,4	= 3,6
Q7.	4,4 - 1	= 3,4
Q8.	5 – 1,4	= 3,6
Q9.	4,6 - 1	= 3,6
Q10.	5 – 1,6	= 3,4
		———— +
	Total	34.2 × 2.5
	SUS Score	**85.5**

If the average score of the System Usability Scale (SUS) from various studies is 68, then scores above 68 will be considered above average, while scores below 68 will be considered below average. If the obtained score is below 68, it indicates usability issues, and improvements are needed.

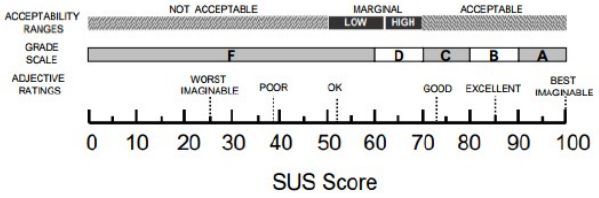


Fig 10. SUS Score

Based on the calculation or computation performed, the SUS score for the internet cafe booking application prototype is 85.5. This score falls into the "Excellent" category.

4. CONCLUSION

After completing the entire series of methods and discussing all the research procedures outlined earlier, the researcher can draw several conclusions as follows:

1. The research conducted by applying the Design Thinking method has resulted in a prototype of an internet cafe booking application called SCC Mobile, which successfully provides convenience to users in addressing various issues at internet cafes.
2. During the testing phase using the Single Ease Question (SEQ) method, the lowest score obtained was 6.2, and the highest score was 7, from the 5 participating respondents. This indicates that the user experience flow in the generated prototype can be understood and learned easily by users.
3. Referring to the usability testing with System Usability Scale (SUS) calculations outlined previously, an SUS score of 85.5 was obtained. From this calculation, it can be interpreted that the prototype design falls into the "Acceptable" and "Excellent" categories.

Based on the discussions and conclusions provided, there are some recommendations the researcher can offer:

1. This research is not yet perfect, and there are still some shortcomings in it. Therefore, there are areas that can be used as references for further development to create a better design. For example, the development of various menus, options, and features displayed but not yet fully implemented as intended.
2. Further research can be conducted by reapplying the Design Thinking method to address and supplement areas that the researcher may have missed in this prototype design.
3. If the prototype design for the internet cafe booking application has reached a mature and refined stage, the researcher suggests developing the prototype into a real application that can be used as intended.

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