UI/UX Design for School Website Using Design Thinking Method at SMP Negeri 2 Palembang

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Abstrack

The development of information technology encourages educational institutions to provide digital services that can meet the needs of communication, transparency, and information accessibility. School websites function not only as a medium for conveying academic information, but also as a means of interaction between teachers, students, parents, and the general public. This study aims to design the UI/UX design of the SMP Negeri 2 Palembang website using the Design Thinking method which consists of five stages, namely Empathize, Define, Ideate, Prototype, and Test. This approach was chosen because it is oriented towards user needs and is able to produce innovative, applicable solutions. Data was obtained through interviews, questionnaires, and observations to explore user experiences and problems that arise in using the school website. The analysis results showed problems in aspects of navigation, information accessibility, visual appeal, and website responsiveness to various devices. Based on these findings, a website prototype was designed with the main elements of teacher, student, and admin dashboards, student monitoring features, a learning material repository, an activity gallery, and a more structured announcement system. The trial using the System Usability Scale (SUS) obtained an average score of 89.5 which is included in the "Excellent" category with a grade of "A." These findings indicate that the developed UI/UX design can improve user convenience, effectiveness, and satisfaction, while simultaneously strengthening the school's image in the digital age.

Keywords: *UI/UX, Design Thinking, usability, school website, System Usability Scale.*

1. Introduction

Advances in information technology have had a major impact on the world of education, especially regarding the delivery of information that is wise, transparent, and easily accessible to the general public. Institutional websites serve not only as platforms for disseminating academic information and detailing school- related activities, but also serve as official channels for communication between educational institutions, students, parents, and the wider community [1]. As competition in the digital industry increases, technology companies are racing to provide optimal user experiences to retain and attract more users [2]. In this regard, careful user interface (UI) and user experience (UX) design are fundamental aspects in ensuring that school websites are optimally utilized and improving the quality of educational information services.

UI/UX plays a crucial role in determining the success of a digital product. User Interface (UI) emphasizes the visual appearance, graphical elements, and navigation structure that facilitate user interaction with a digital product. In contrast, User Experience (UX) primarily concerns the holistic experience users experience when engaging with a product. Research shows that most users tend to abandon apps or websites that present usability challenges within seconds of interaction. According to data from Google, 53% of mobile users abandon websites that take more than three seconds to load [3]. This finding implies that a suboptimal user experience can negatively impact conversion and user retention metrics. Furthermore, the evolution of digital technology has raised user expectations regarding UI/UX design. Users increasingly demand faster, more intuitive, and visually captivating experiences. Consequently, digital companies are forced to continuously innovate in UI/UX design to meet rising market expectations [4].

In addition to functioning as an information medium, school websites also play a role in shaping the institution's image and increasing competition in the digital age. Schools that have websites with professional UI/UX designs will be more respected by the public, especially by prospective students and

parents in choosing educational institutions [5]. This confirms that websites with Design Thinking-based designs not only improve the user experience, but also become an effective communication strategy in strengthening the school's identity [6]. In the context of SMP Negeri 2 Palembang, the implementation of UI/UX that relies on DesignThinking is a crucial step in order to support information transparency, expand communication reach, and strengthen schools' positions in facing the challenges of digital transformation in education.

1.1 Problem Formulation

Based on the above review, this study will answer several questions:

a) How can the application of the principles of User Interface (UI) and User Experience (UX) improve the quality of educational information services on school websites?
b) What are the obstacles and challenges faced by users in accessing the school website? especially in the context of SMP Negeri 2 Palembang?

1.2 Research Objectives

The objectives of this research are:

a) Analyze the role of UI and UX in improving the usability and quality of information services on school websites.
b) Designing the website of SMP Negeri 2 Palembang using the Design Thinking approach to deliver a better user experience.

2. Research Methods

The method used in this research is the Design Thinking approach, an iterative design approach that focuses on understanding users and redefining problems to find alternative strategies and solutions that may have been missed in the early stages of the process. This method is very effective for dealing with complex or ambiguous problems, because it focuses on the user experience. Design Thinking consists of five main stages, namely user experience, problem identification, solution design, prototyping, and testing [7]. This method consists of five steps that must be carried out, which begin with the Empathize stage, followed by Define, Ideate, Prototype, and Testing [8]. Design Thinking can be seen in Figure 1.

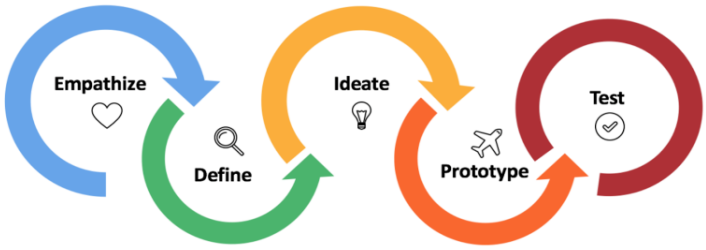


Figure 1. Research Method

The Design Thinking process is divided into five stages, namely Empathize, Define, Ideate, Prototype, and Test, which are applied specifically in the context of this research as follows:

a) Empathize
At this stage, direct observation and interviews were conducted with related parties at SMP Negeri 2 Palembang, such as students and teachers, while in-depth interviews were used to identify key problems, such as inefficiency and difficulties in accessing information.

b) Define
Based on the data obtained in the Empathize stage, an analysis was conducted to formulate specific problems that needed to be addressed. In the context of this research, the main problems identified were:
1) Manual process that is time consuming and prone to errors.
2) Difficulty in finding important information such as announcements.
3) The absence of a website has an impact on the school's image. This stage confirms the problem. formulated clearly to be used as a reference in developing solutions.

c) Ideate
At this stage, brainstorming is carried out to generate various solution ideas. Some of the ideas that The development process includes designing an intuitive web-based interface, developing creative ideas for page layout, navigation structure, color selection, typography, and interactive elements.

These ideas are then discussed with the development team and the school to select the solution that best meets user needs.

d) Prototype
This phase involved creating an initial prototype of the school website, including user interface (UI/UX) design. The prototype included key elements such as a homepage with the school's visual identity, main navigation, and an information banner as the initial communication hub with users. The prototype design was adjusted based on feedback from the school to ensure relevance and usability.

e) Test
The developed prototype is tested directly with users, including students, parents, and teachers. This testing aims to identify design flaws, such as less intuitive navigation or confusing UI elements. User feedback is used to refine the prototype before further development. This testing can include task scenarios executed directly by users. The five stages are iterative and flexible, meaning they do not need to be executed sequentially. Designers can return to previous stages whenever necessary to gather additional information or refine the solution [9].

3. Results and Discussion

The UI/UX design that was compiled to create the website design for SMP Negeri 2 Palembang was made using the Design Thinking framework, this design contains Empathize, Define, Ideate, Prototype, and Test. The following are the results and discussion of the Design Thinking method:

a) Empathize

This stage aims to identify existing problems and find the desired solutions agreed upon by the respondents and the designer together to achieve a common goal. This way, the author obtains the necessary interview results to identify user needs and the shortcomings of the website to be designed [10]. The following are some of the questions asked to respondents in Table 1.

Table 1.Questions asked to respondents

No	Question
1	Do you think this website is very helpful?
2	What do you think about this website design?
3	Do the features on this website meet your needs?
4	Does this website design have an easy to understand appearance?
5	Is there anything that should be added to the design or anything that should not be implemented in this design?

After the interview process is complete, the answers obtained will be summarized and analyzed as material for the next stage. The following are the results of several questions posed to respondents. in Table 2.

Table 2.Results of questions asked to respondents

No	Problems
1	Teachers need a platform that can monitor their students.
2	Respondents had difficulty finding the latest information updates.
3	Respondents had difficulty seeing events that had been held.
4	Respondents want an attractive website appearance and interactive responses.
5	Respondents had difficulty in saving and viewing the learning materials that had been created.

b) Define

The define stage is a process used to get to the core of the previous problems experienced by users [11]. In this define stage, Pain Points and How Might We (HMW) are compiled. Pain points are specific problems that cause discomfort or obstacles for users. Paint points compiled with data obtained from interviews are presented in Table 3.

Table 3.Pain Points

No	Pain Points
1	Teachers do not have quick access to monitor student progress (grades, activities), so the monitoring process is still manual and time-consuming.
2	The latest information is unstructured and difficult to find because there is no notification

	feature or clear placement of information on the website.
3	Event documentation is not well organized; users have difficulty finding archived photos/videos of previous events.
4	The website's visual appearance is monotonous, less aesthetic, and has minimal interactive elements, thus reducing users' interest in returning.
5	There is no integrated storage feature, making it difficult for teachers and students to systematically access learning materials.

Once pain points are identified, the next step is to formulate how might we questions. How might we questions are a method that aims to transform problems into questions, thereby changing the researcher's mindset when seeking solutions. The results of compiling how might we questions are presented in Table 4.

Table 4.How migth we

No	How migth we
1	How can we design a student monitoring feature that is easy for teachers to use? monitor student academic progress and attendance?
2	How can we present the latest information updates in a clearer and more structured way? so that it is easily accessible to users?
3	How can we display documentation of events that have been carried out in the format interesting and easy to find?
4	How can we design a website with a modern and interactive visual appearance? thereby improving user experience?
5	How can we provide storage and access features for learning materials that easy to use and well organized?

c) Ideate

The ideate stage is the creative part of idea development, where various ideas that have the potential to become solutions to a problem are generated. This process aims to create a variety of ideas that can help solve existing challenges effectively [12]. Based on the results of the empathize and define stages, the ideas that emerge will then be translated into user flows and wireframes. The user flow can be seen in Figure 2, while wireframe in Figure 3.

1) User flow

A user flow is a series of steps a user follows when interacting with an application or website. This user flow serves as a guide for designing the interface and user experience of the product. The more optimal the user flow design from start to finish, the smoother the product's operation and the greater the potential for creating a satisfying user experience.

Figure 2. User Flow

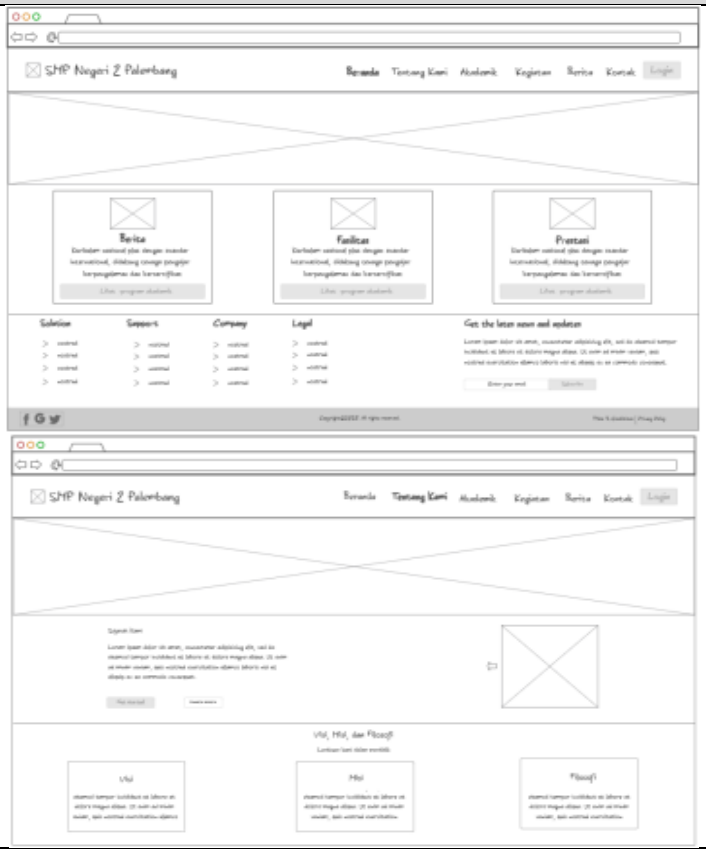
Figure 2 presents a visualization of the user flow of the features and pages on the SMP Negeri 2 Palembang website. The explanation is as follows:

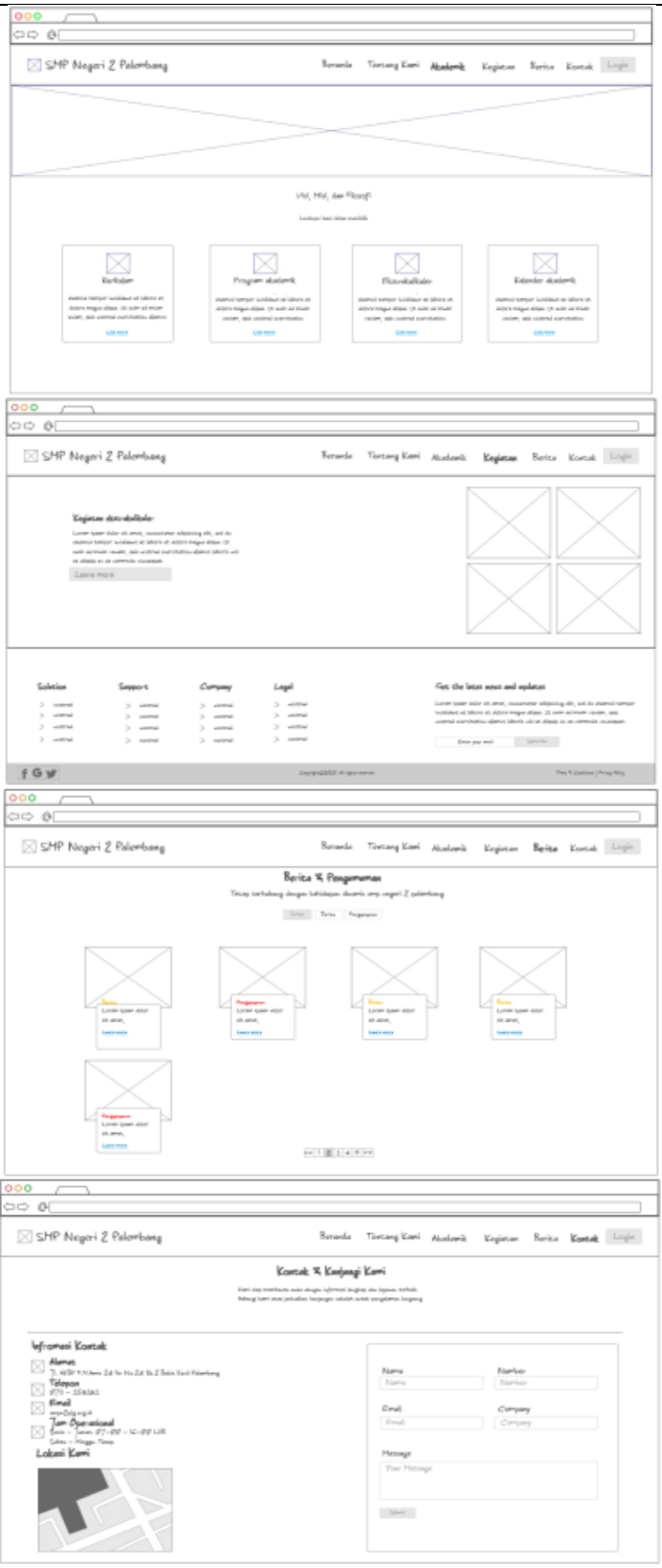
a) Users access the SMP Negeri 2 Palembang website, which contains a homepage, about us page, academic page, activities page, news page, and contact page.
b) Users can then log in using their email and password if they already have an account. If not, they must register first. After successfully logging in, they will be directed to their respective dashboard pages, including teacher, student, and admin.
c) After successfully logging in, the user is directed to the home page where there is a page The main page provides a summary of important information, and if not, the user must register first.
d) If the user has done all of that, the user can return to the home page, about us page, and extracurricular page.

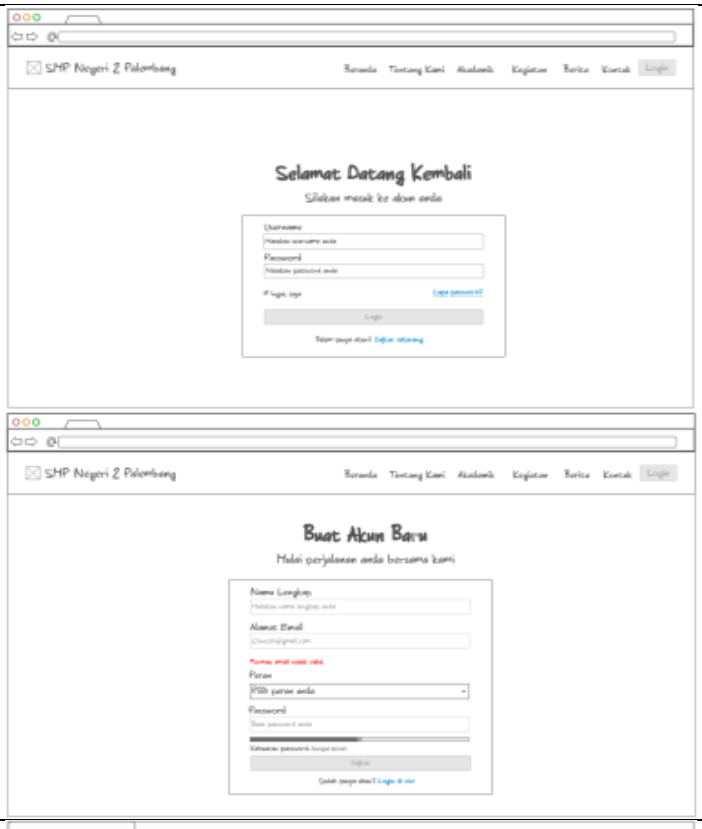
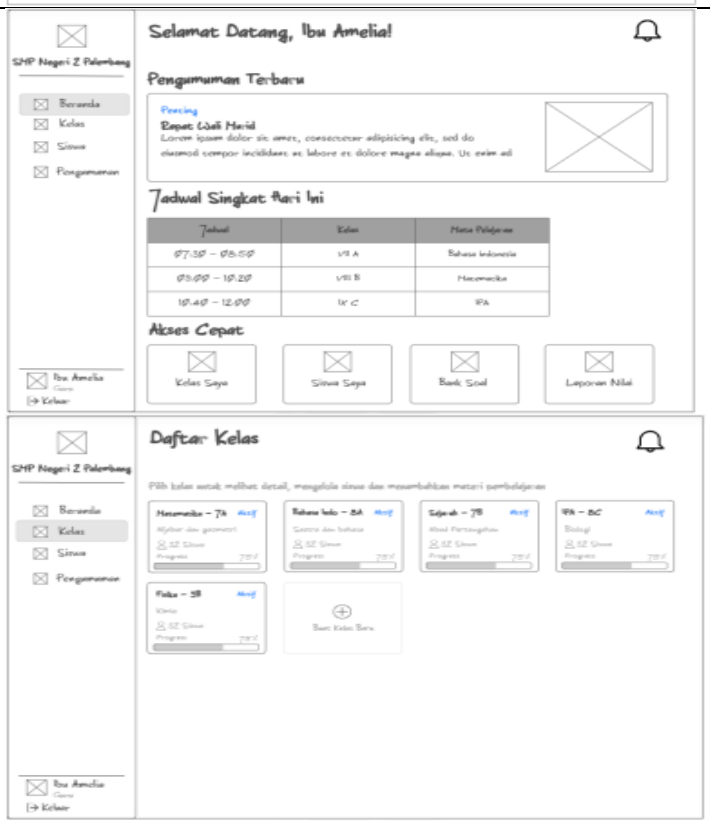
2) Wireframe

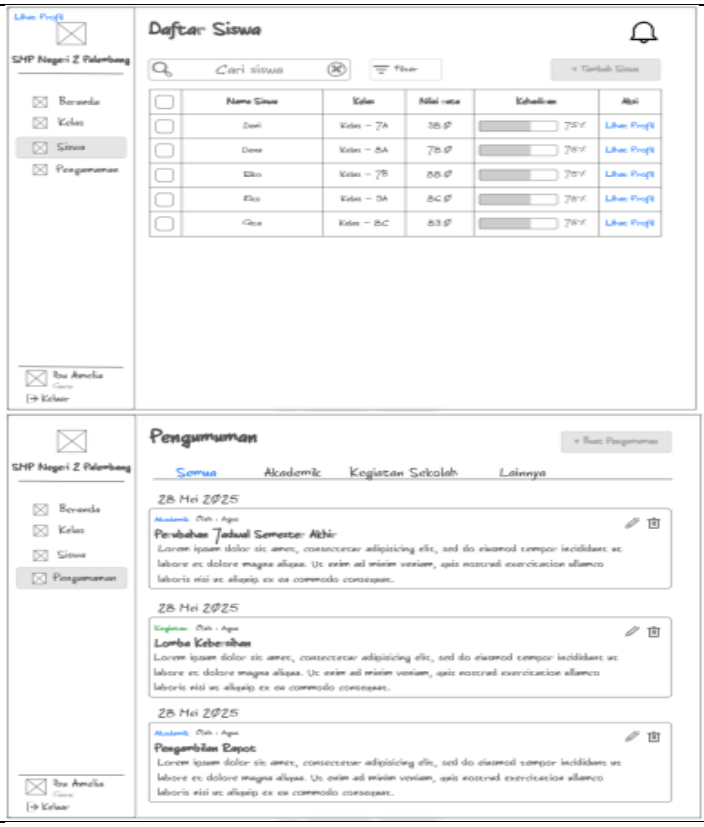
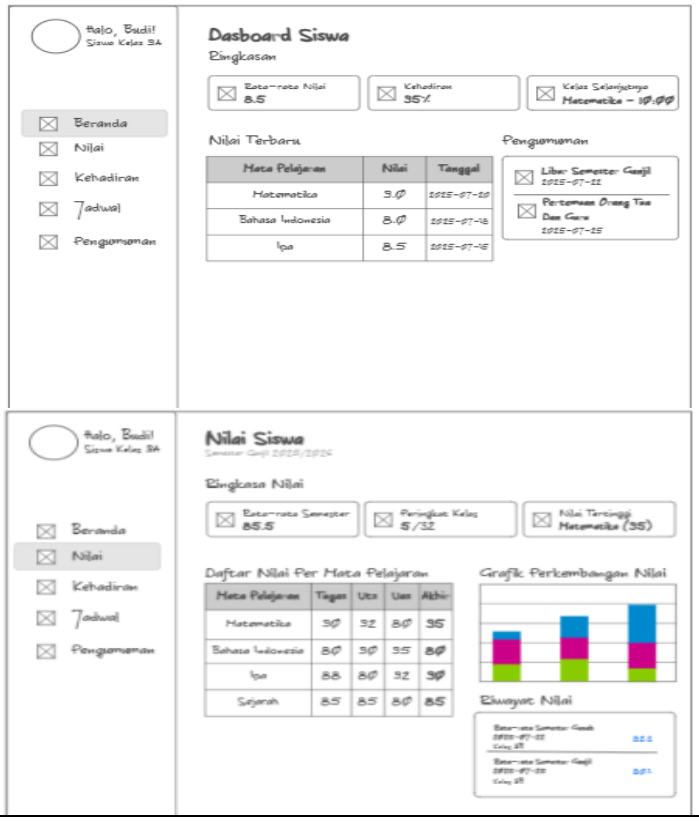
After completing the previous steps, the next step is to create a wireframe, or design sketch, that visualizes the UI, encompassing the layout structure and underlying design concepts. The wireframe can be seen in the following table.

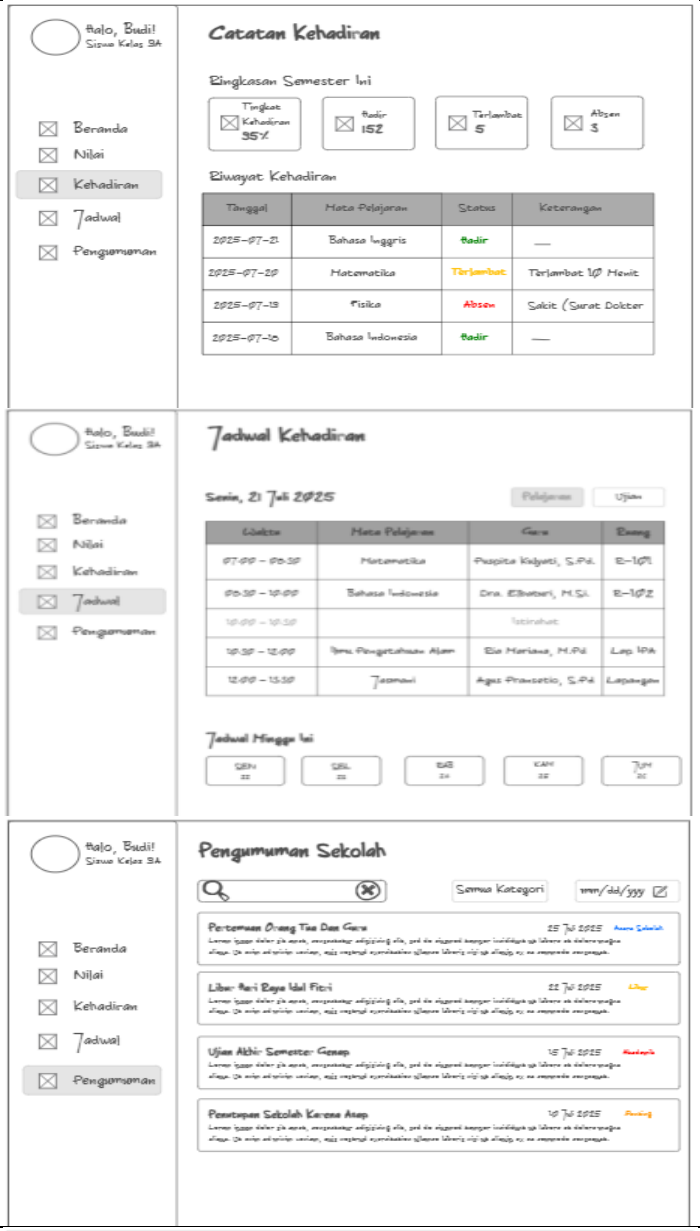
Table 5.Wireframe

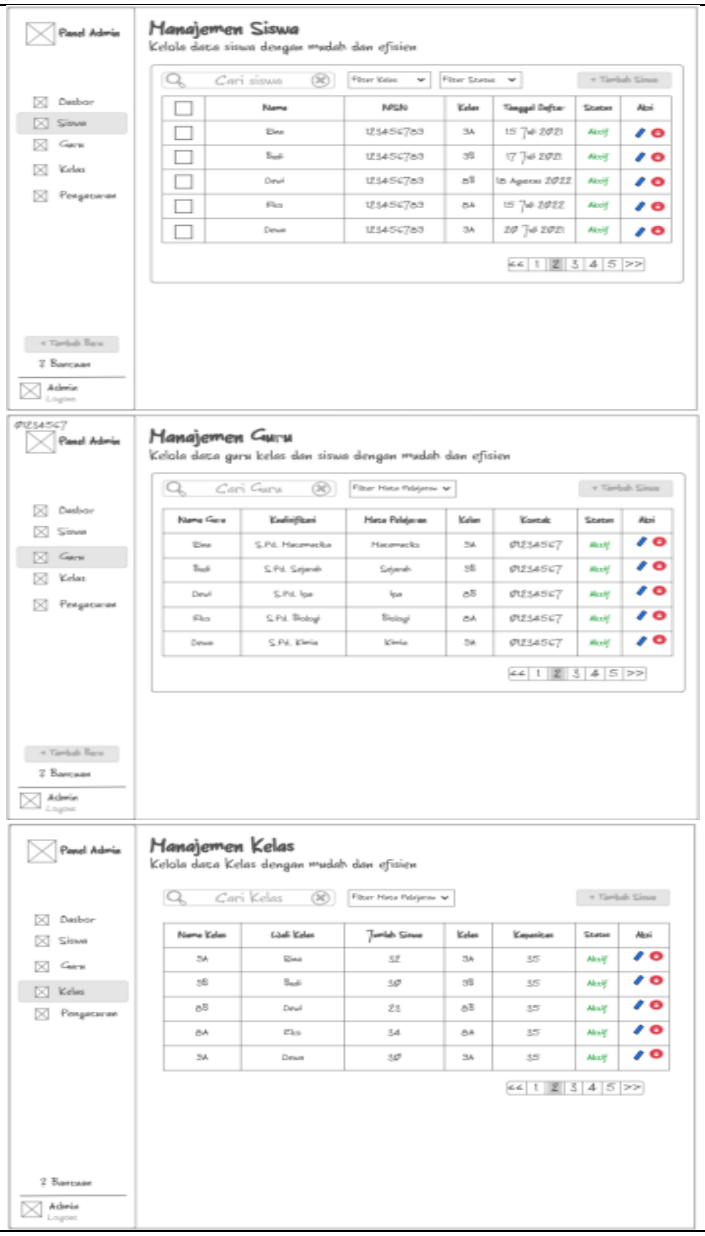
Name Page	Picture	Information
Page main website		In the design Website wireframe of the main website page of SMP Negeri 2 Palembang It contains features such as homepage, us, about academics, activities, news and contact. also a user-friendly design that reflects the school's identity.


SMP Negeri 2 Palembang
Beranda
Tentang Kami
Akademik
Kegiatan
Berita
Kontak
Login
Visi, Misi, dan Filosofi
Berita & Pengumuman
Kontak & Kunjungi Kami
Informasi Kontak
Lokasi Kami

Page login and list		Login page with user username and password, as well as options to reset password or register as a new user.
Page teacher		Teacher page showing homepage and subjects taught, and latest announcements. Each teacher can see more details advanced such as student list, class list, or grade input.

		
Page student		The student page displays a navigation panel containing the main menu, such as Home, Grades, Attendance, Schedule, and Announcements, which allows students to access information in a structured and systematic manner.

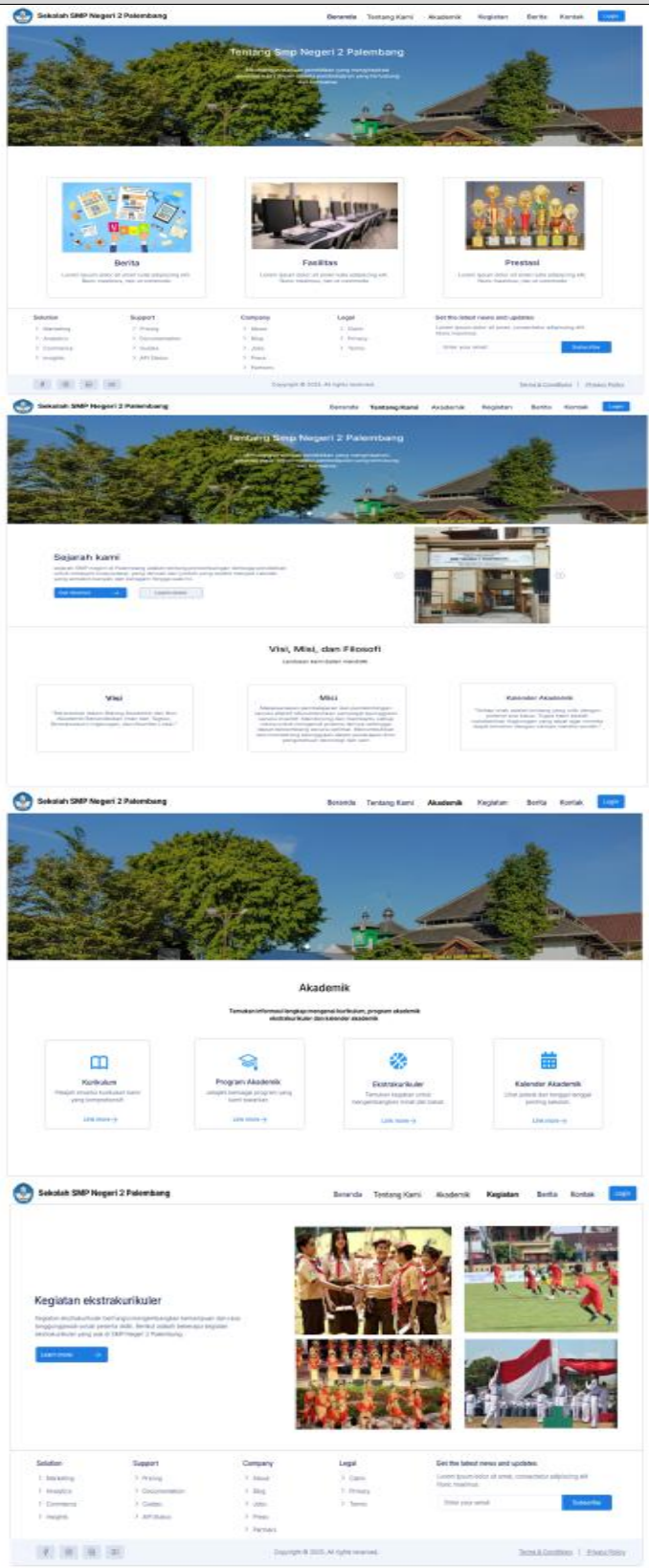
		
Page admin		Comprehensive admin page with the ability to view, add, edit and delete student and teacher data.

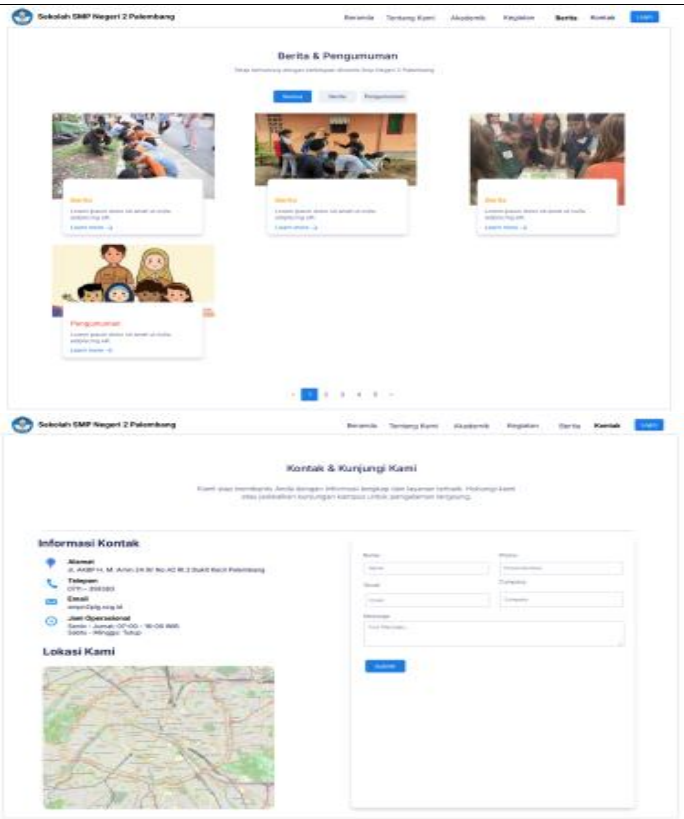
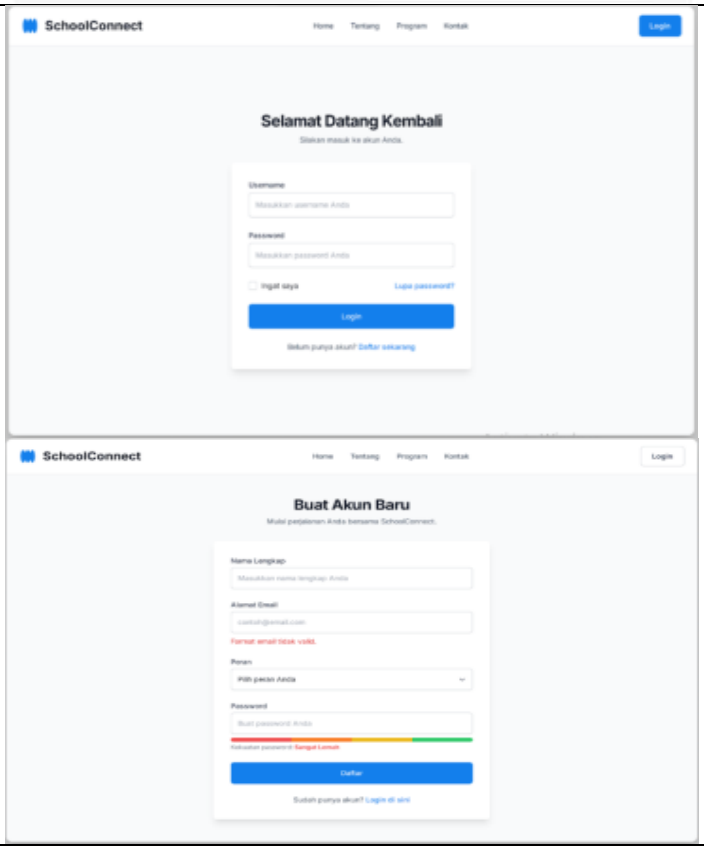
		

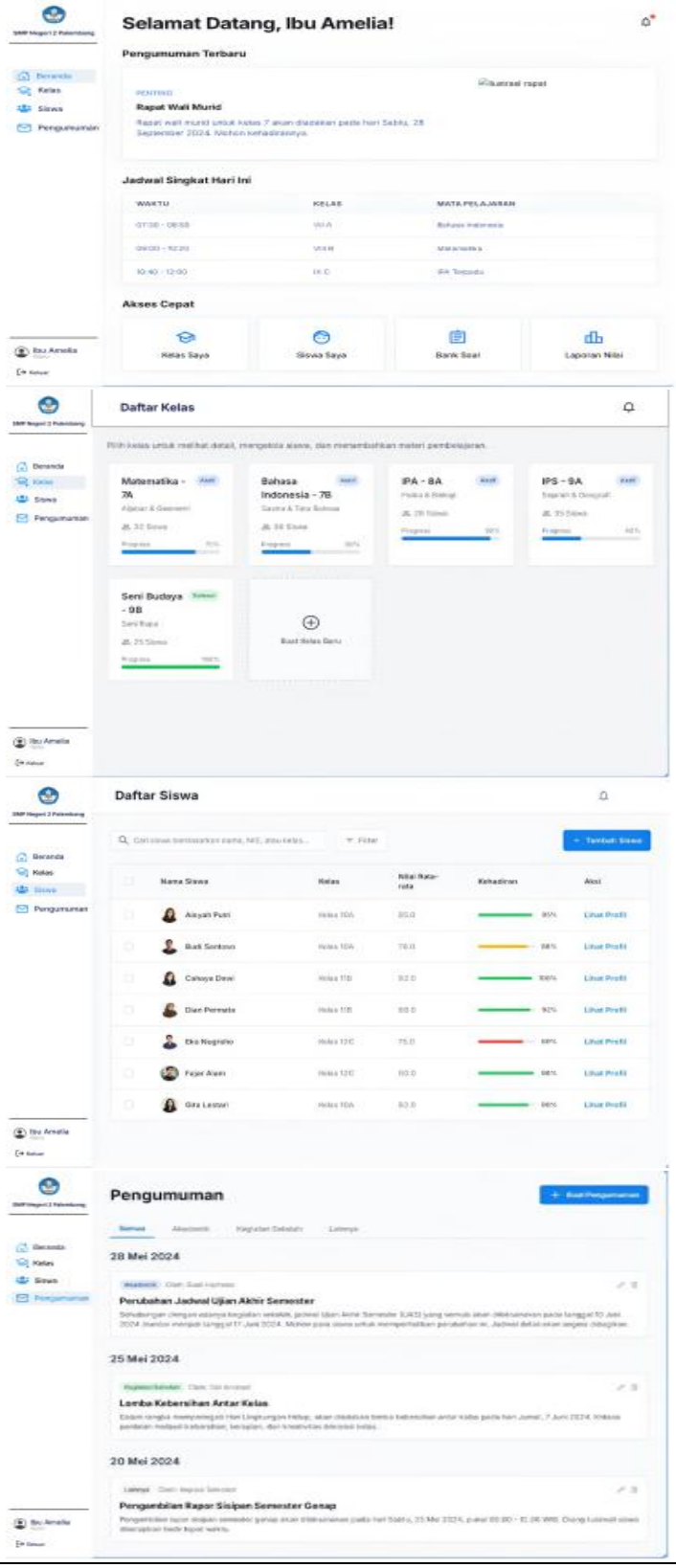
d) Prototype

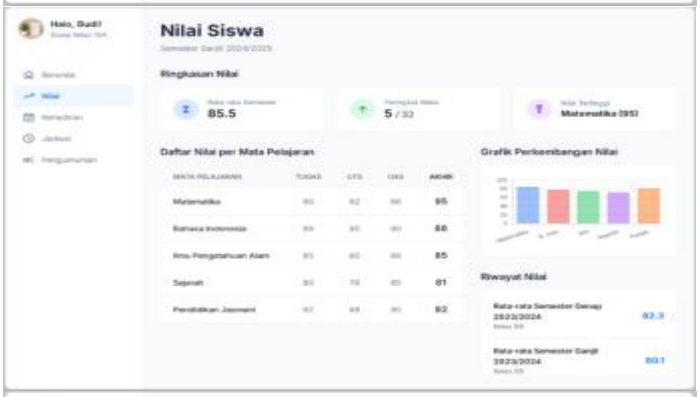
After completing the previous three stages, the next step is to build a prototype to make it easier for users to review the wireframe design. The prototype can be seen in Table 6.

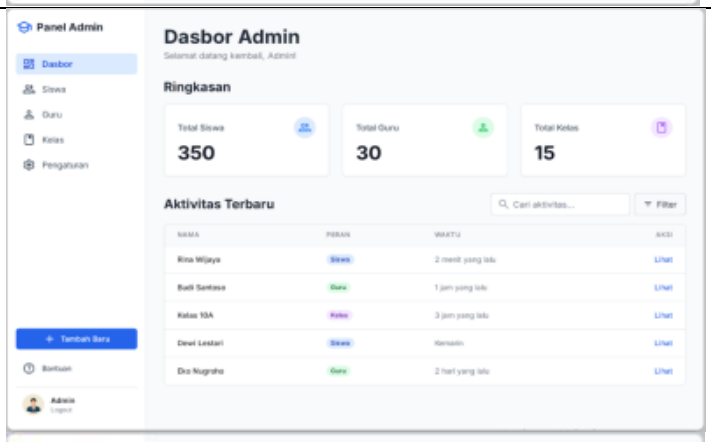
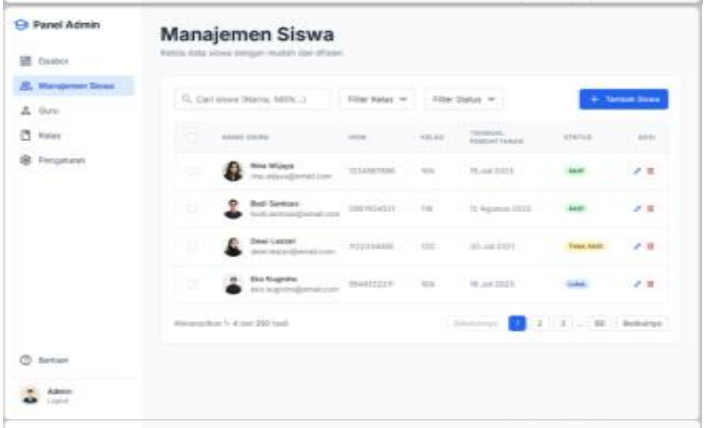
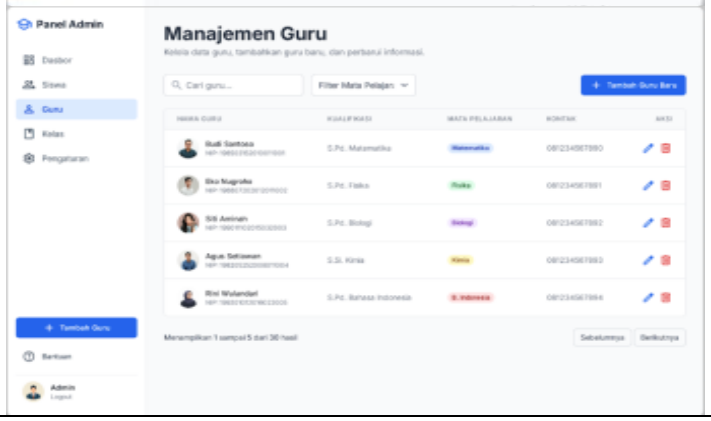
Table 6.Prototype Design Results

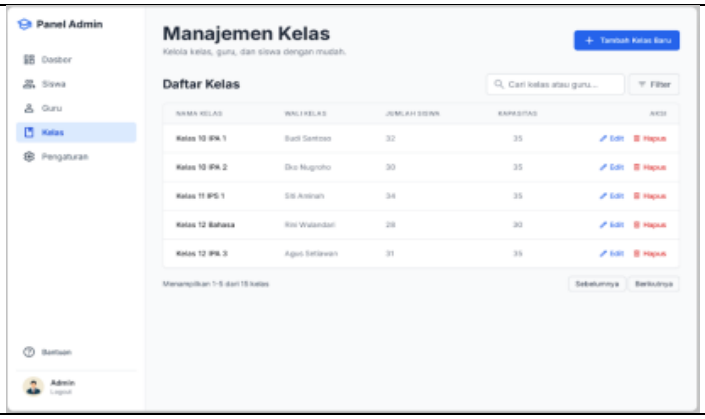
Name Page	Picture	Information
Page main website		The homepage is the main page of the SMP Negeri 2 Palembang website, containing a brief explanation of the school's Which profile. The navigation panel above also includes the main menu, which includes the homepage, about us page, academics page, activities page, news page, and contact page. Dashboard design This demonstrates a simple, organized, and informative interface design approach, thereby increasing the efficiency of information access capable for students

		
Halaman Login dan Daftar		The login page displays the main elements, a username or email input form, and a password used to verify the user's identity. Some systems also add role options, such as student, teacher, or admin, to customize access rights as needed.

Page teacher		The teacher page serves as a central control and management center for learning activities, accessible to educators. Typically, this page displays features such as the homepage, classes, students, teaching schedules, and material publications.

Page student	   	On this page, students receive a comprehensive overview of their academic progress, attendance, class schedules, and important school announcements. Typically, the main display is a summary dashboard, containing average grades, attendance percentage, and the next class schedule.

		
Page admin	  	The admin page on the website has features, namely class management, teacher management, student management and data updates or data management.



e) Test

The next stage was to test the prototype created in the previous stage by conducting Usability Testing. The testing was conducted with five respondents, consisting of parents, students, and teachers. This number was chosen because testing with five respondents is generally sufficient to identify most usability issues, almost equivalent to the results obtained using more participants [13]. Respondents were asked to answer a series of statements about the usability aspects of the application. These statements were structured based on the System Usability Scale (SUS) framework, with the following questions.

Table 7. List of System Usability Scale (SUS)

Code	Statements
P01	I will often use the school website to get the latest information.
P02	I feel this website is not very informative
P03	I find this website very informative
P04	I feel like I need someone else's help to use this website
P05	I find this website easy to use because the navigation menu is very clear
P06	I don't really understand the features available on the website
P07	I feel there are no obstacles in using this school website
P08	I feel that the available features do not yet mobilize the need for information
P09	I feel that the available features are appropriate to the information needs of the school

Table 8.System Usability Scale (SUS) Calculation Results

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Score SUS
R01	4	4	3	4	3	3	3	4	4	4	36
R02	4	3	4	3	4	3	4	3	4	4	36
R03	4	3	4	3	4	3	4	3	3	5	36
R04	4	4	3	4	4	3	3	4	2	3	34
R05	5	3	2	3	3	4	4	4	5	4	37
Total Score SUS											179
SUS Score Conversion (Total Score / Number of Respondents) x 2,5											89,5

From the results of the SUS score assessment, the average score obtained was 89.5, which is classified as "Excellent" and labeled grade "A". Then the value will be converted into a Grade scale and Adjective Rating as seen in Table 9 below [14].

Table 9.SUS Value Conversion

Hasil Nilai SUS	Grade Scale	Adjective Rating
>80.3	A	Excellent

68-80.3	B	Good
68	C	Okay
51-68	D	Poor
<51	F	Awful

4. Conclusion

Based on the description explained in the discussion section, it can be concluded that the application of the Design Thinking approach in designing the UI/UX of the school website is able to provide effective solutions to the problems faced by users, including teachers, students, parents, and the general public. Through the stages of Empathize, Define, Ideate, Prototype, and Test, the research successfully identified the main needs of users, formulated specific problems, and produced a prototype design that is relevant to actual needs. The results of the trial using the System Usability Scale (SUS) method showed an average score of 89.5, which is included in the "Excellent" category with a grade of "A". This proves that the developed website design not only meets the functional aspects, but also provides an optimal, intuitive, and representative user experience of the school's identity. Thus, this research contributes to the development of the school's digital communication strategy in the era of educational transformation, while strengthening the institutional image of SMP Negeri 2 Palembang.

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