

THE UI/UX DESIGN FOR THE UII STUDENT BUSINESS MARKETPLACE APPLICATION USING UNMODERATED USABILITY TESTING

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ABSTRACT

The economic success of higher education institutions is greatly supported by student entrepreneurship. Although there is great potential for student-led businesses at the Islamic University of Indonesia (UII), current digital platforms, such as the UII Student Mall, only function as product catalogs and do not sufficiently facilitate transactions, company administration, or user-centered interactions. To ensure usability and reliability through unmoderated usability testing, this study discusses how to improve the user interface (UI) and user experience (UX) of online marketplace programs that aim to support various types of student companies. The purpose of this study is to develop a mobile-based online marketplace UI/UX solution based on actual user needs and evaluate its usability through unmoderated testing techniques. This study uses questionnaires, interviews, and observations as user research methods. An interactive prototype is then used for unmoderated usability assessment. The results show that fragmented platforms such as Instagram and WhatsApp are heavily relied upon by student entrepreneurs, resulting in complicated and inefficient transaction processes. To reduce cognitive load and improve usability, the proposed UI/UX design emphasizes information visibility, integrated user flows, and transaction transparency. Iterative design improvements and usability problem identification in natural usage situations were successfully supported by unmoderated testing. According to the study findings, campus-based marketplace applications for student entrepreneurship can significantly improve usability and reliability by combining unmoderated usability testing with data-driven UI/UX design processes.

Keywords: Marketplace, Entrepreneur, UI/UX, Bussiness

1. INTRODUCTION

Entrepreneurship has long been regarded as a key indicator of a nation's progress, particularly when the number of entrepreneurs reaches at least two percent of the total population. An adequate proportion of entrepreneurs not only reflects a healthy national economy but also drives economic growth through job creation, innovation, and enhanced national competitiveness [1]. Consequently, countries with high levels of business activity generally exhibit more stable and progressive economic conditions.

In Indonesia, the unemployment rate is relatively high compared to other ASEAN countries. According to Lailatul, the rate of new business establishment in Indonesia has reached 3.1 percent, surpassing Singapore (7%), Malaysia (5%), Thailand (4.5%), and Vietnam (3.3%). This low ratio poses a structural barrier to Indonesia's development into an advanced nation, as entrepreneurial capacity directly contributes to increasing public productivity [2].

Recent data released by Statistics Indonesia (Badan Pusat Statistik / BPS) in February 2024 shows that 56.56 million people were engaged in entrepreneurial activities, equivalent to 37.86% of the total national workforce of 149.38 million people. However, the Minister of Cooperative, Small and Medium Enterprises (Menteri Koperasi dan Usaha Kecil Menengah (UMKM)) noted that the number of pure entrepreneurs in October 2024 was only 3.35%, or approximately 4.99 million

people. This percentage remains below that of other countries, such as Malaysia (4.74%), Singapore (8.76%), and the United States (12%).

Higher education institutions utilize job training courses, incubation programs, and support facilities to establish entrepreneurial ecosystems. At Universitas Islam Indonesia (UII), there is significant evidence of student entrepreneurial activity, with hundreds of student-run businesses registered on the campus's internal platform. However, the existing platform (UII Student Mall) functions primarily as a catalog and does not yet support transaction mechanisms, store management, or adequate operational support tools for student entrepreneurs. This issue highlights the gap between students' entrepreneurial potential and the adequate digital infrastructure required to realize it.

Although UII students show high entrepreneurial potential, significant challenges arise from the gap between the demand for skilled labor and the available technology. Academically, this issue can be understood as a mismatch between user characteristics (student entrepreneurs) and the digital systems available to support their business activities. The UII Student Mall platform, currently used only as a catalog, does not adhere to user-centered design principles and thus fails to meet students' operational needs in digital business. The absence of transaction features, payment processing, navigation optimization, and payment integration indicates that the platform's design was

not based on research into user behavior and experience, as outlined in modern UI/UX standards.

From an academic point of view, this problem stems from the lack of empirical research on user experience (UX) in the context of student-focused marketplaces. Most previous studies have focused on general or commercial marketplaces, resulting in a lack of specific data regarding the preferences, barriers, and interaction patterns of UII students as business owners or buyers. This lack of empirical data leads to application designs that are not evidence-based, thereby reducing effectiveness in developing a student business ecosystem. Consequently, more comprehensive research on user needs through systematic UI/UX design is required.

Furthermore, from a theoretical standpoint, this issue is closely related to usability and user experience (UX), which are critical components of a digital application's success. Applications that fail to address usability aspects such as ease of navigation, task effectiveness, and user satisfaction are likely to be abandoned by users, particularly in the highly competitive marketplace environment. Therefore, the lack of systematic testing, such as unmoderated usability testing, results in application designs that do not follow the evaluation processes necessary to ensure user relevance and quality.

Recently, another academic issue has emerged due to the increasing digital competence of students. In the digital era, students are expected not only to possess business management skills but also the digital literacy required to conduct business transactions on e-commerce or marketplace platforms. If the campus internal platform fails to provide an ideal user experience, the potential for improving digital literacy among students will not develop significantly. Therefore, research on UI/UX in student marketplaces is important not only for developing student businesses, but also for enhancing digital literacy and preparing students to enter the digital labor market.

To address this issue, application development should focus on a user experience (UI/UX) that aligns with student user characteristics: fast, intuitive, and free from cognitive bias. Usability principles (e.g., Nielsen's heuristics) and user-centered design are critical technical areas, as they help reduce cognitive load, enhance user satisfaction, and improve overall task efficiency. Implementing these principles enables digital solutions that are not only aesthetic but also functional and can be widely adopted by the campus community.

In this case, conducting UI/UX research on application users is an essential approach to gaining a deeper understanding of their problems, needs, and activities. Designers can determine the most

appropriate design approach—one that addresses these issues and facilitates users in conducting online buying and selling transactions. The expected outcome of this research is a UI/UX marketplace application that is not only easy to use but also provides a satisfactory user experience.

It is expected that the organization will achieve a high level of functionality, enabling it to compete with larger digital market platforms. Furthermore, the developed design can serve as a standard for application development, resulting in clear and consistent outcomes in technical implementation.

For researchers, UI/UX research is beneficial in expanding their understanding of information technology within the context of digital business and user behavior. Furthermore, for Universitas Islam Indonesia, the development of a digital e-commerce application demonstrates the institution's commitment to encouraging innovation and entrepreneurship in the academic environment. This initiative aims not only to position UII as a technologically adaptive university but also to make a significant contribution to developing a new generation of workers who will succeed in the digital era.

This research focuses on how to improve the user interface (UI) and user experience (UX) design of a marketplace application intended to assist various types of student businesses at Universitas Islam Indonesia, as well as how to ensure ease of use and reliability through unmoderated testing. The need for a digital platform that not only facilitates student learning but also provides an intuitive, efficient interface tailored to students as primary users forms the foundation of this idea.

The scope of this research consists of two groups of potential users: UII students who operate businesses as sellers, and students or members of the university community as buyers. By focusing on these two groups, researchers can better understand user needs, challenges, and preferences, thereby producing innovations that are relevant and contextual to the UII student ecosystem.

The objective of this research is to create a UI/UX design for a mobile marketplace application that can serve as an initial solution to increase sales for UII students. By employing unmoderated testing methods, this research aims to identify user experiences in a natural setting, without requiring extensive researcher intervention, thereby generating more authentic data and perceptions. The final outcome is expected to be not only a design but also an understanding of the most important aspects to users.

This research yields various strategic advantages. For researchers, this study is essential for enhancing the efficiency of research implementation and applying UI/UX knowledge

and skills to solve real-world problems. Researchers gain a better understanding of user-centered design processes and evaluation through unmoderated testing methods.

2. LITERATURE REVIEW.

This research indicates that UI/UX design in marketplace applications and digital services is significantly influenced by user needs comprehension and systematic design processes. Sugandi explains that marketplaces, as interactive digital platforms, require user-centered design (UCD) to ensure that interfaces align with their usage environment. This study found that the primary reasons users utilize marketplace applications are ease of access, competitive pricing, and convenience. The validation process using the System Usability Scale (SUS) proved that intuitive design makes it easy for users to perform tasks manually [3].

Achyani and Andini also developed a user data collection method that includes observation, questionnaires, and interviews to identify users and their needs. This study found that understanding the problems faced by users can only be achieved through comprehensive exploratory methods. This principle is crucial for the development of UI/UX for the UII student marketplace, as design success is significantly influenced by user needs [4].

The relationship between unmoderated testing and Sulistiono's study, which conducted interviews with a group of users without a moderator to understand their natural interactions with the prototype, is evident. This study found that software-based prototype designs, such as those created in Figma, are highly effective in facilitating self-directed learning, especially when clear instructions and structured scenarios are provided. This concept may be important in determining the feasibility of developing the UII marketplace application [5].

Furthermore, Rahman and Indah found that employing the Double Diamond method in UI/UX design can increase user satisfaction compared to the original version of the application. Figma remains the primary tool in the design process. This demonstrates that comparing old and new designs is an essential strategy for improving product quality and can be applied when benchmarking the UII marketplace against competing applications [6].

Furthermore, Zakaria and Almanfaluthi focused more specifically on the application of design thinking in marketplace application development. Through careful observation, planning, and execution, they successfully developed a user-friendly and visually appealing environment. This study concluded that effective UI/UX design must consider the characteristics of

the services provided, such as the work context of students in design, culinary, or fashion fields [7].

Finally, Anggraini and Frendiana state that good UI/UX design should be simple, easy to understand, and concise. They consider Figma a collaborative and efficient tool for creating interactive content. This concept is particularly important for the implementation of unmoderated testing, as an intuitive design enables users to navigate and evaluate the application without relying on a researcher [8].

Based on the literature review above, UI/UX application design for marketplaces should be based on user needs, employ methods such as user-centered design or design thinking, and be verified using usability tools like SUS and SEQ. The use of Figma as a prototyping tool and unmoderated testing as an evaluation method has proven effective in creating intuitive, accessible, and contextual designs. These principles provide a solid foundation for the development of UI/UX for the business marketplace application at Universitas Islam Indonesia.

3. METHODOLOGY

The primary method employed in designing the UI/UX of the student business marketplace application at Universitas Islam Indonesia is *unmoderated testing*. This approach is a user experience evaluation method conducted without direct researcher supervision, allowing participants to interact naturally with the provided prototype. Through specialized software, this process enables researchers to capture user activity, both in terms of behavioral and qualitative responses, while simultaneously collecting quantitative data related to usage effectiveness.

Such software typically records the interaction process in video form, tracks participant steps, and compiles various usability metrics such as task completion rate, time on task, and perceived ease of use. Thus, *unmoderated testing* provides a more authentic depiction of how users interact with the interface design.

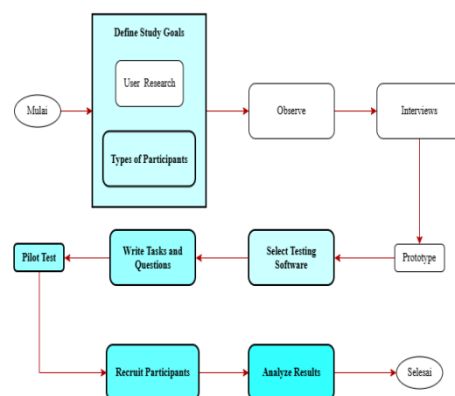


Figure 1. Research Process Flowchart

The research process using this method begins with the *'define study goals stage'*. In this initial stage, researchers should formulate clear research objectives to ensure that the study's direction remains focused and aligned with user needs. Formulating these objectives also assists in determining appropriate participant criteria, thereby enabling the research to yield targeted results.

The next stage is *'select testing software'*, which involves choosing software capable of facilitating testing effectively. This software not only guides participants throughout the testing process and records interaction data, but also ensures the integrity of the test results. Selecting the appropriate tool is critical in determining the quality of the data obtained.

Next, researchers create *'tasks and questions'*, which comprise a series of instructions and follow-up questions that participants should complete. These tasks are specifically designed according to the prototype's usage context, enabling researchers to gain in-depth insights into user behavior patterns, obstacles, and needs. Proper task formulation at this stage significantly impacts the quality of the data generated.

Afterward, a *'pilot test'* is conducted, which is an initial trial prior to the main study. This trial aims to identify potential obstacles, procedural errors, or inconsistencies in the prototype design. Through this phase, researchers can ensure that the instructions, test flow, and prototype functions operate properly. Preliminary data from the pilot test also serve as a basis for refinement before full-scale testing.

The next stage is *'recruit participants'*, in which researchers ensure that the participants involved truly represent the target users. The recruitment process can be carried out through screening based on specific criteria or by directly approaching potential participants. Selecting appropriate participants significantly influences the relevance of the research results.

The final stage is *'analyze results'*. Since unmoderated testing can generate large and diverse amounts of data, researchers require a structured analysis strategy to process the data into insights useful for design development. The analysis includes processing quantitative data, such as task success metrics, and qualitative data, such as user comments or expressions. The analysis results are then transformed into recommendations that can be directly implemented in the UI/UX design iteration process.

4. RESULTS AND DISCUSSION

This section presents the findings of the user needs analysis and observational data regarding student business activities at Universitas Islam Indonesia. The discussion focuses on the use of digital media, limitations of the marketplace

system, and obstacles in the transaction process. These findings are then linked to the implications for the UI/UX marketplace application, such as simplifying user flows, improving information visibility, and assessing ease of use through unmoderated testing.

Table 1. Number of Entrepreneurs

No	Commodity	Number of Entrepreneurs	Whatsapp	Instagram
1	Service	15	15	14
2	Creative Industry	16	16	15
3	Clothes	41	41	39
4	Food & Beverage	26	26	23
5	Others	26	26	22
Total		124	124	113

Table 1 shows a total of 124 student entrepreneurs identified, including those found through direct interviews with students and those registered in the application. WhatsApp is used by all entrepreneurs (124 entrepreneurs, or 100%) for direct communication with buyers. In addition, the majority of entrepreneurs use Instagram as a promotional tool, indicating that Instagram serves as the primary initial platform for students' digital marketing.

Table 2. Customer Data

No	Customer Name	Age	Occupation	Purchased Products	Application Used to Purchase
1	Grandis Noviyana	21	Student	Women's Clothing	TikTok Shop
2	Fathya Shafa Diani	23	Student	Food & Beverage	Shopee Food
3	bagawan akhsanul khoiry	20	Student	Shoe Cleaning Services	-

Based on Table 2, three persons with similar backgrounds — three UII students aged 20, 21, and 23 years — acted as buyer respondents in this study. This age range indicates that young adults constitute the majority of potential users for the UII marketplace program. Respondents purchased various items, including food and beverage, women's clothing, and shoe cleaning services. Moreover, although services were acquired without using specific applications, each buyer used different supporting applications during the purchasing process, such as Shopee Food and TikTok Shop. Based on these findings, the UII marketplace application should offer flexible product and service categories and features that can accommodate diverse buyer preferences and needs.

Table 3. Type of Participant

Persona 1 – Usaha barang			Persona 2 – Pembeli barang		
	Mahasiswi UII yang sambil berwirausaha produk pakaian			Mahasiswi UII dan sering belanja online pakaian	
	Afra Nabilah	Mahasiswi UII		Grandis Noviyana	Mahasiswi UII
	18 Tahun	D4 Bisnis Digital		21 Tahun	S1 Hubungan Internasional
	Perempuan	2023		Perempuan	2021
Kebiasaan :	Masalah :	Keinginan :	Kebiasaan :	Masalah :	Keinginan :
Gemar menggunakan aplikasi mobile Instagram dan Whatsapp untuk chat dan bisnis	Belum stabil berbisnis, tidak tahu banyak mengenai cara berbisnis online	Usaha semakin berkembang dan dapat maksimal menggunakan hp untuk berwirausaha	Suka menggunakan aplikasi mobile TikTok shop untuk belanja pakaian	Saat belanja online barang yang sampai tidak sesuai dengan iklannya	Tempat belanja yang terpercaya, murah, dan aman

Table 3 shows the two main participant types in this study — student buyers and student entrepreneurs — each represented as a persona. The entrepreneur persona describes students who manage product-based businesses and use digital platforms such as Instagram and WhatsApp for business purposes. Meanwhile, the buyer persona represents students who actively purchase goods online and utilize marketplace applications to facilitate their purchasing process. Although these two groups have different routines, problems, and needs, both require a user-friendly, reliable marketplace platform capable of facilitating transactions effectively.

4.1. Observe

Everyone who enters the market — whether buyers, sellers, or visitors — immediately sees the goods offered and the various types of shops and businesses on display. Crispy fried chicken and tofu vendors are examples of food businesses where only the company name, product category, and the business itself are displayed. Customers must approach the cart and ask the seller for the menu and prices offered. Coconut milling services are an example of a service business that only displays the shop name, appearance, and type of service. Customers also have to go to the shop and ask the seller for a list of service fees. While in the market, buyers and sellers each have their own goals or activities. In addition to managing their shops, some sellers purchase items such as food and beverages from nearby places. On the other hand, consumers search for goods they need. Each seller has a shop or stall where they offer their goods.

4.2. Experience map

This study was conducted using direct observation, and data were collected from traditional market interactions. To understand interaction patterns, information-seeking behavior, and transaction procedures in a real-world environment, buyers, sellers, and visitors were observed.

The results show that customers are exposed to visual factors such as shop names, broad business categories, and the physical form of products upon entering the market. However, essential data such as product catalogs, service information, and prices are not easily accessible. Buyers have to speak directly with sellers to obtain this information. Both product-based businesses, such as food vendors, and service-based businesses, such as coconut milling services, are subject to this requirement.

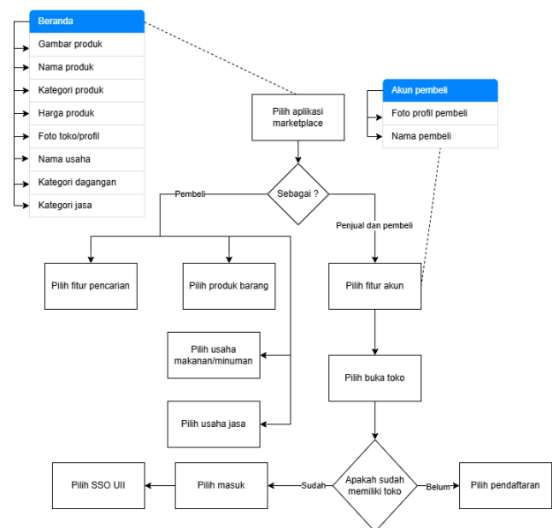


Figure 2. User Flow and Information Architecture

The observation data were then translated into user flows and information architecture to structure the interaction flow of the marketplace application based on the experience map results. The user flow begins at the homepage, which addresses the need for information visibility during the initial search phase by displaying essential details about businesses and products. Subsequently, based on actual behaviors identified during observation, users can assume the role of a buyer, seller, or both. The seller flow includes user identification, shop ownership verification, and shop registration or maintenance processes, while the buyer flow focuses on product search and selection based on categories.

4.3. Interview

Table 4. Interview Results Summary.

Commodity/ persona	No	Questions	Answers
Goods (P1)	1	What products do you sell?	I sell clothing products, specifically hijabs/veils
	2	Do you have a shop for your business?	No, I sell online through the Instagram application
	3	What is the first thing you need to prepare when starting to sell on Instagram?	First, install the application, then create or log in to an account, followed by uploading a seller profile to make it appealing to buyers, and also include the business/store name.
	4	Through Instagram, how do you sell your products?	First, I post all the products I want to sell and create Instagram stories. Then, I reply to incoming chats from potential buyers who want to purchase or ask questions, and I also ask questions to encourage their interest in buying the clothing products I sell. Once the buyer agrees to purchase, I send them an order form to fill out. After they complete it, I check the form, send my bank account number, verify the payment proof, and finally ship the product or have the buyer pick it up at my boarding house.

Based on the interview results with the seller respondent from the goods category (P1), it was found that the sales process is still conducted manually through social media, particularly Instagram. The seller does not have a dedicated online shop within an integrated platform and relies on product postings, interactions via private messages, and separate transaction recording. The sales process involves several stages, from account creation and product uploads to communication with potential buyers, payment confirmation, and delivery. These findings indicate that the existing sales flow still requires many manual steps and depends on direct communication, thus potentially causing inefficiency in transaction management.

4.4. User journey Map

The user journey map represents the main flow of seller activities in the digital sales process, starting from account management to product uploading and management, as well as order processing and delivery, as depicted in the user journey map. The mapping results show that sellers still perform many tasks manually, particularly in product administration, communication with buyers, and transaction confirmation. This need highlights the importance of UI/UX design that offers an integrated order and payment confirmation system, an organized sales flow, and effective product management features. The design of marketplace features aimed at improving system reliability and user convenience is based on this user journey map.

4.5. Prototype

After defining the information architecture and user flow, the prototyping stage was conducted. To visualize and replicate user interactions within the marketplace application, the prototype was created using Figma (<https://figma.com/>) as the design tool. Prior to usability testing, this prototype aims to illustrate the general system usage flow. To

ensure that the prototype accurately reflects the actual user needs and usage conditions, the interface design at this stage is based on insights from user observations and interviews.

4.6. Wireframe

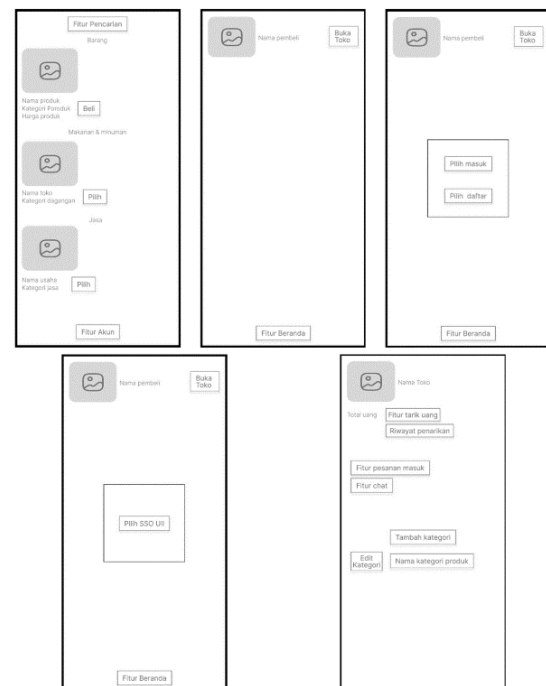


Figure 3. The results of the User Flow and Information Architecture design based on observations and interviews

Wireframes provide the basic structure of the user interface and serve as low-fidelity prototypes. Focusing on layout structure, navigation flow, and the placement of interface elements, these wireframes were developed based on the existing user flow and information architecture. To validate functionality, information hierarchy, and inter-page relationships before proceeding to high-fidelity

interface design, visual aspects such as color and typography were intentionally kept to a minimum in the wireframes.

4.7. Design System

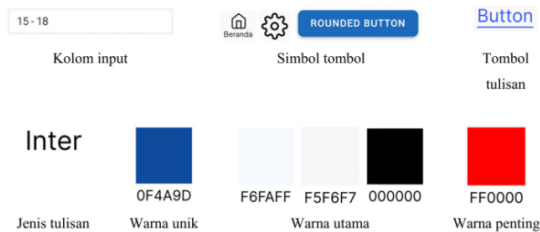


Figure 4. Design System

To ensure usability and visual consistency, the design system defines the key interface components used in the marketplace application. This system includes text-based and icon-based buttons, standard input fields, and a uniform typography system using the Inter font for enhanced readability. The color scheme consists of dominant blue shades for primary actions, neutral colors for text and backgrounds, and red accent colors to signify crucial or significant information. This design approach serves as a framework for developing an accessible, consistent, and user-friendly application interface.

4.8. High Fidelity

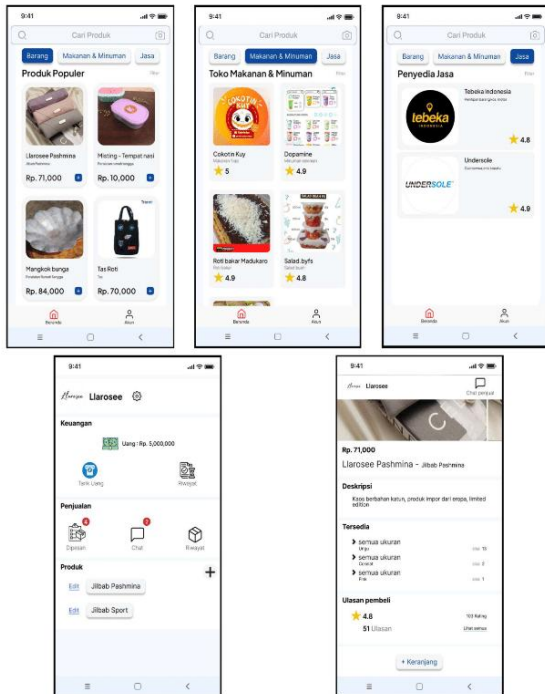


Figure 5. High Fidelity

To create a uniform and user-friendly interface that meets user needs, wireframes, the design system, and user interface concepts were used to design the user interface. Each interface component is designed to facilitate user efficiency, convenience, and ease of use of the application.

4.9. Select Testing Software

Prototype and application designs can be tested using various techniques, based on research findings and analysis of UX testing software. Several well-known software applications, such as Playbook UX, TryMata, Userfeel, Userlytics, UserTesting, and UserZoom, have limitations in terms of research as they do not provide free versions and require the use of specific institutional email accounts. Other programs, such as Userbrain, Lookback, Maze, and Loop11, do offer free trials, but they have significant feature limitations and short trial periods.

Free solutions with relatively comprehensive features can be found in other programs such as Quant-UX and UXtweak. Although it does not support participant text responses, Quant-UX excels at running prototypes and offers in-depth analysis. UXtweak does not provide screen or audio recording, but it supports a large number of blocks and open-ended questions. UXArmy is considered the best program for this study's requirements among all tested solutions. With a UI institutional email address, UXArmy can be used free of charge. The program offers various prototype testing methods, open-ended questions, image input, and supports up to 100 participants with in-depth analysis results. Therefore, UXArmy was selected as the UX testing tool for the UI student business marketplace application.

The analysis results indicate that most UX testing software have limited access or features in their free versions. UXArmy was selected because it provides the most comprehensive features, is free of charge, supports UI email, and can accommodate an adequate number of participants for the research requirements.

4.10. Analyze Results

Based on the Single Ease Question (SEQ) test results, scenarios considered easy are marked by a standard average SEQ score of ≥ 5 . The application obtained an average SEQ score of 5.822, which is higher than the common ease threshold, according to the test results in the table below. This indicates that the features tested in the marketplace application are considered user-friendly and can be completed easily without requiring significant effort.

Tabel 5. Analyze Result

Tugas	Persona						Total Nilai
	P1	P2	P3	P4	P5	P6	
1	5	5	6	6	5	6	920
2	6	6	5	6	6	7	
3	5	6	6	7	6	6	
4	5	6	5	6	6	6	
5	6	6	5	6	6	6	
6	6	6	6	5	6	6	
7	6	6	5	7	5	6	
8	6	6	6	6	5	6	
9	6	6	6	5	6	6	
10	5	6	6	5	5	5	
11	6	6	6	6	6	6	
12	6	7	5	5	6	6	
13	6	6	5	6	5	7	
14	6	6	6	6	6	6	
15	6	6	6	6	6	6	
16	6	6	6	5	5	6	
17	6	6	6	6	6	6	
18	7	6	6	6	7	6	
19	6	6	6	-	7	6	
20	6	6	6	-	6	6	
21	5	6	5	-	6	-	
22	5	-	6	-	6	-	
23	6	-	6	-	4	-	
24	6	-	6	-	6	-	
25	6	-	6	-	6	-	
26	6	-	6	-	6	-	
27	6	-	5	-	6	-	
28	5	-	6	-	6	-	
29	6	-	6	-	6	-	
30	5	-	6	-	6	-	
31	6	-	6	-	6	-	
32	6	-	5	-	5	-	
33	5	-	4	-	-	-	
34	-	-	6	-	-	-	
Total Tugas	158						5,822

Based on user perception, the usability of an application is evaluated using the System Usability Scale (SUS). The scores from the ten SUS statements for each persona are displayed in the table. The final score for each persona and the overall average score were then determined by applying the SUS scoring rules to these raw scores.

According to the SUS evaluation criteria, scores between 62 and 100 are considered highly acceptable, scores between 49 and 61 are considered acceptable, and scores between 0 and 50 are considered unacceptable. Based on the test results in the table, the application obtained an average SUS score of 79.16. This score indicates that the marketplace application has a high level of overall usability.

5. CONCLUSION AND RECOMMENDATIONS

Based on the findings of the UI/UX study conducted on the student business marketplace application at Universitas Islam Indonesia, the applied user-centered research approach successfully supported the design process. Data collection techniques, along with the implementation of experience maps and user journey maps, were critical in determining user requirements and translating them into appropriate design solutions. These techniques enabled an understanding of user behavior, pain points, and

expectations within the business marketplace context.

Furthermore, the use of unmoderated usability testing demonstrated significant benefits, particularly due to its online and asynchronous implementation. The Single Ease Question (SEQ) and System Usability Scale (SUS) ratings in the evaluation exceeded the predetermined usability targets. These results support the usability and effectiveness of the proposed application design, indicating that the application is easy to use and aligns with user needs.

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