DEVELOPMENT OF UI/UX FOR BIPA MOBILE APPLICATION BASED ON HUMAN-CENTERED DESIGN (HCD) METHOD

THESIS

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MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY
MALANG
2023

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Addressed to:
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I hereby declare that this Thesis I have written is truly my own work and is not a reproduction of data, writings, or thoughts of others that I acknowledge as my own, except by citing the sources of excerpts in the bibliography.

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Malang , 25 June 2023

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MOTTO PAGE

"The best results always rely on the best efforts."

DEDICATION PAGE

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيم

The author would like to dedicate this scientific work to Prophet Mohamed ﷺ and his noble and pure family , Imam Ali Bin Abi Talib , My beloved Father,My dear Sister, family, lecturers, friends, and all parties who have actively helped in completing this research .

PREFACE

Alsalamualikom Wr. Wb

Alhamdolilah Praise be to Allah ﷻ who taught by the pen, He ﷻ taught mankind what they never know. Praise be to Allah ﷻ , the All-Knowing, the All-Powerful, who bestowed the ability upon humans to disseminate the knowledge they acquired from their father, Adam. Praise be to Allah, who granted humans the capacity for analysis and understanding, facilitated their affairs, and provided sustenance without limit or restraint. Peace and blessings be upon the Messenger of Allah Rassoul Allah ﷺ and his pure and virtuous family, whom Allah illuminated our world with and brought us out of darkness into light of Iman . Praise be to Allah, who bestowed knowledge, health, guidance, and strength upon the writer to complete thesis with the title "Development Of UI/UX For Biba Application Based On Human-centered Design (HCD) Method" well .

Many parties have been involved in the writing of this thesis and have provided both moral and material support. Therefore, on this occasion, the author would like to express sincere gratitude to:

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The writer realizes that this thesis is far from perfect and there may be errors in it. Therefore, the writer expects constructive criticism and suggestions to develop this thesis so that it is more useful for himself and readers in general.

Malang, 25 June 2023

Writer

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ABSTRACT

Ali Al_Shihaby, Yassin Mohamed Zakaria Abdelfatah , 2023. **Development Of UI/UX For BIPA Mobile Application Based On Human-centered Design (HCD) Method** Undergraduate Thesis, Department of Informatics Engineering, Faculty of Science and Technology, Maulana Malik Ibrahim State Islamic University Malang. Supervisors: (I) Puspa Miladin Nuraida Safitri A Basid, M.Kom. (II) Fajar Rohman Hariri, M.Kom.

Language serves as the fundamental medium of communication among humans, highlighting its paramount importance. The diverse array of languages across the world stands as a testament to the existence of an Almighty Creator, Allah ﷻ, within the universe. BIPA (Bahasa Indonesia untuk Penutur Asing), a program initiated by the Indonesian government, aims to teach the Indonesian language to foreign speakers, fostering intercultural dialogue and facilitating communication between Indonesians and foreigners. BIPA offers courses at various proficiency levels, both online and in person, attracting students globally who are keen on delving into Indonesian language and culture. This research focuses on the development of the BIPA official website (https://bipa.kemdikbud.go.id), which serves as the primary online resource for learning Indonesian based on the BIPA curriculum. While the website boasts notable strengths, such as a comprehensive curriculum and accessibility options, it also presents several drawbacks that need to be addressed. These include slow loading speed, the presence of Indonesian aspects despite an English language option, ineffective organization of learning resources, inadequate interactivity, difficulties with registration forms, unclear instructions, and suboptimal website navigation. This research aims to develop the UI/UX of the BIPA website using the Human-Centered Design (HCD) method to make a mobile-based application of BIPA. In order to overcome the weaknesses of the official BIPA website. Through various stages of the HCD method, the research uncovers valuable insights. The usability test using System Usability Scale (SUS) method conducted on the redesigned BIPA Mobile-Application yields an exceptional usability score of 90.378%, signifying excellent results and successful outcomes. The redesigned Mobile Application effectively caters to user needs by streamlining the process of getting education material, geographic information, and BIPA activities, expediting the learning process, and improving access to BIPA news. This research highlights the significance of continuous development and improvement of language learning platforms, ensuring an immersive and enriching experience in Indonesian language and culture for learners worldwide.

Keywords: BIPA (Indonesian language for Foreign Speakers) , the Human-Centered Design (HCD) method , usability, mobile-based application , UI/UX development , System Usability Scale (SUS)

ABSTRAK

Ali Al_Shihaby, Yassin Mohamed Zakaria Abdelfatah , 2023. **I Pengembangan UI/UX Untuk Aplikasi BIPA Mobile Berbasis Metode Human Centered Design (HCD)**. Skripsi, Program Studi Teknik Informatika, Fakultas Sains dan Teknologi, Universitas Islam Negeri Maulana Malik Ibrahim Malang. Pembimbing: (I) Puspa Miladin Nuraida Safitri A Basid, M.Kom. (II) Fajar Rohman Hariri, M.Kom.

Kata Kunci: BIPA (Bahasa Indonesia untuk Penutur Asing) , *the Human-Centered Design (HCD)* method , aplikasi berbasis seluler *, Pengembangan UI/UX* , System Usability Scale (SUS).

Bahasa merupakan medium komunikasi yang mendasar di antara manusia, menyoroti pentingnya yang sangat besar. Ragam bahasa yang ada di seluruh dunia menjadi bukti akan keberadaan Sang Pencipta, Allah ﷻ, dalam alam semesta. BIPA (Bahasa Indonesia untuk Penutur Asing), program yang diinisiasi oleh pemerintah Indonesia, bertujuan untuk mengajarkan bahasa Indonesia kepada penutur asing, mendorong dialog antarbudaya, dan memfasilitasi komunikasi antara orang Indonesia dan orang asing. BIPA menawarkan kursus pada berbagai tingkatan kemampuan, baik secara daring maupun tatap muka, menarik minat siswa dari seluruh dunia yang ingin mempelajari bahasa dan budaya Indonesia.Penelitian ini berfokus pada pengembangan situs web resmi BIPA (https://bipa.kemdikbud.go.id), yang menjadi sumber daya utama daring untuk belajar bahasa Indonesia berdasarkan kurikulum BIPA. Meskipun situs web ini memiliki keunggulan yang mencolok, seperti kurikulum yang komprehensif dan opsi aksesibilitas, terdapat beberapa kelemahan yang perlu diperbaiki. Kelemahan tersebut meliputi kecepatan muat yang lambat, adanya unsur berbahasa Indonesia meskipun tersedia pilihan bahasa Inggris, organisasi sumber daya pembelajaran yang kurang efektif, interaktivitas yang tidak memadai, kesulitan dengan formulir pendaftaran, instruksi yang tidak jelas, dan navigasi situs web yang suboptimal. Penelitian ini bertujuan untuk mengembangkan UI/UX situs web BIPA menggunakan metode Human-Centered Design (HCD) untuk membuat aplikasi berbasis seluler dari BIPA. Hal ini dilakukan guna mengatasi kelemahan-kelemahan situs web resmi BIPA. Melalui berbagai tahapan metode HCD, penelitian ini mengungkapkan wawasan yang berharga. Uji usability menggunakan metode System Usability Scale (SUS) kegunaan yang dilakukan pada terhadap Aplikasi seluler yang telah diubah desainnya menghasilkan skor kegunaan yang luar biasa, yaitu 90,378%, menunjukkan hasil yang sangat baik dan berhasil. Aplikasi seluler yang telah diubah desainnya efektif dalam memenuhi kebutuhan pengguna dengan menyederhanakan proses akses materi pendidikan, informasi geografis, dan kegiatan BIPA, mempercepat proses pembelajaran, dan meningkatkan akses ke berita BIPA. Penelitian ini menyoroti pentingnya pengembangan dan perbaikan berkelanjutan pada platform pembelajaran bahasa, guna memastikan pengalaman yang mendalam dan kaya dalam bahasa dan budaya Indonesia bagi para pembelajar di seluruh dunia.

مستخلص البحث

علي الشهابي، ياسين محمد زكريا عبد الفتاح، 2023. **تطوير الواجهه الرسوميه لتطبيق BIPA للهاتف الجوال استنادًا إلى أسلوب التصميم الذي يركز على الإنسان (HCD)**. **رسالة بحثية، قسم الهندسة المعلوماتية**، كلية العلوم والتكنولوجيا، جامعة الإسلامية الحكومية مولانا مالك إبراهيم مالانغ. المشرفون (I) :بوسبا ميلادين نور عايده سافيتري عبد الباسط الماجيستير (II) فجر رحمن حريري الماجيستير

تعمل اللغة كوسيلة أساسية للتواصل بين البشر ، مما يبرز أهميتها القصوى. تعد مجموعة اللغات المتنوعة في جميع أنحاء العالم بمثابة ايه و دليل و علامه على وجود الخالق القدير ، الله ﷻ ، في الكون . يهدف برنامج بيبا (BIPA) (الإندونيسية للمتحدثين الأجانب) ، وهو برنامج أطلقته الحكومة الإندونيسية ، إلى تعليم اللغة الإندونيسية للمتحدثين الأجانب ، وتعزيز الحوار بين الثقافات وتسهيل التواصل بين الإندونيسيين والأجانب. يقدم بيبا (BIPA) دورات على مستويات إتقان مختلفة ، سواء عبر الإنترنت أو شخصيًا ، وتجذب الطلاب على مستوى العالم الذين يحرصون على الخوض في اللغة والثقافة الإندونيسية. يركز هذا البحث على تطوير الموقع الرسمي لبرنامج بيبا (**https**://**bipa**.**kemdikbud**.**go**.**id**) ، والذي يعمل كمورد أساسي عبر عبرالإنترنت لتعلم اللغة الإندونيسية استنادًا إلى المنهج التعليمي لبيبا. بينما يتمتع الموقع بنقاط قوة ملحوظة ، مثل وجود منهج شامل وخيارات وصول ، فإنه يعرض أيضًا العديد من العيوب التي يجب معالجتها. يتضمن ذلك سرعة التحميل البطيئة ، وعرض بعض الجوانب باللغة الإندونيسية على الرغم من خيار اللغة الإنجليزية ، والتنظيم غير الفعال لموارد التعلم ، والتفاعل غير الكافي ، والصعوبات في نماذج التسجيل ، والتعليمات غير الواضحة ، وتصفح الموقع دون المستوى الأمثل. يهدف هذا البحث إلى تطوير الواجهه الرسومية لموقع بيبا بإستخدام طريقة التصميم المرتكز على الإنسان لإنشاء تطبيق قائم على الهاتف المحمول لبيبا. من أجل التغلب على نقاط الضعف في موقع بيبا الرسمي. من خلال مراحل مختلفة من تطبيق طريقة التصميم المرتكز على الإنسان يكشف البحث عن رؤى قيمة. حقق اختبار قابلية الاستخدام الذي تم إجراؤه على تطبيق بيبا للهاتف الجوال المعاد تصميمه درجة استخدام عبر نتائج تقييمات باستخدام طريقة مقياس قابلية استخدام النظام بنتائج استثنائية بنسبة نجاح 90.378٪ ، مما يدل على نتائج ممتازة ونتائج ناجحة. يلبي تطبيق الهاتف المحمول المعاد تصميمه بشكل فعال احتياجات المستخدمين من خلال تبسيط عملية الحصول على المواد التعليمية والمعلومات الجغرافية وأنشطة بيبا, وتسريع عملية التعلم ، وتحسين الوصول إلى أخبار بيبا. يسلط هذا البحث الضوء على أهمية التطوير والتحسين المستمر لمنصات تعلم اللغة ، مما يضمن تجربة غامرة ومثيرة في اللغة والثقافة الإندونيسية للمتعلمين في جميع أنحاء العالم .

الكلمات الرئيسية : برنامج بيبا BIPA , طريقة التصميم المرتكز على الإنسان(HCD), قابلية الاستخدام , تطبيق الهاتف الجوال , تطوير الواجهه الرسومية , طريقة مقياس قابلية استخدام النظام (**SUS**)

CHAPTER I

INTRODUCTION

1.1 Background Of The Problem

Language is very important for humans, because language is the first means of communication between humans, and the diversity of languages is one of the miracles of Allah SWT to prove that there is a Almighty Creator in this universe, and Allah SWT mentions in the Quran in Surah Ar-Rum, verse 22.

﴿ وَمِنْ آيَاتِهِ خَلْقُ السَّمَاوَاتِ وَالْأَرْضِ وَاخْتِلَافُ أَلْسِنَتِكُمْ وَأَلْوَانِكُمْ ۚ إِنَّ فِي ذَٰلِكَ لَآيَاتٍ لِّلْعَالِمِينَ ﴾

which Means" And among His Signs is the creation of the heavens and the earth, and the difference of your languages and colours. Verily, in that are indeed signs for men of sound knowledge."

In that verse, Allah SWT explains that the differences in gender, skin color, and language among humans are among the miracles that indicate the presence of Allah SWT. Even though Allah SWT created humans in a state of diversity in language and culture, Allah SWT has explained one of the reasons and wisdoms behind it in Surah Al-Hujurat, verse 13, where Allah SWT says:

﴿ يَا أَيُّهَا النَّاسُ إِنَّا خَلَقْنَاكُم مِّن ذَكَرٍ وَأُنثَىٰ وَجَعَلْنَاكُمْ شُعُوبًا وَقَبَائِلَ لِتَعَارَفُوا ۚ إِنَّ أَكْرَمَكُمْ عِندَ اللَّهِ أَتْقَاكُمْ ۚ إِنَّ اللَّهَ عَلِيمٌ خَبِيرٌ ﴾

which means " O mankind! We have created you from a male and a female, and made you into nations and tribes, that you may know one another. Verily, the most honourable of you with Allah is that (believer) who has At-Taqwa [i.e. one

of the Muttaqun (pious - see V. 2:2). Verily, Allah is All-Knowing, All-Aware.” In that verse, Allah SWT explains that the wisdom behind creating humans in diverse conditions is for them to get to know one another, and this acquaintance cannot be achieved except by learning each other's languages and cultures among nations.

From the interpretation of those two verses, it can be understood that when humans learn each other's languages and cultures, they are implementing the wisdom of Allah SWT in creating humans with differences in languages, cultures, and so on. This highlights the importance of diversity and encourages individuals to embrace and learn from differences rather than fear or reject them. It also emphasises the idea that unity can be achieved through understanding and respect for one another's differences.

The advantages of learning a foreign language are numerous. It facilitates the removal of boundaries and fosters a higher degree of understanding between people. Recent brain research indicates that learning foreign languages improves pupils general intelligence. It improves pupils ability to concentrate, read and write, and even their mathematics abilities, among other advantages. Learning a second language also enhances students' comprehension of their own language.(Welch, D., Welch, L., & Piekkari, R. ,2005)

Learning a second language has cognitive advantages, but it can also help student to grow as a productive person. It can aid in your understanding of various cultures and lifestyles. Additionally, it can support student growth in both empathy and open-mindedness (Kim, 2020).

BIPA (Bahasa Indonesia untuk Penutur Asing) is a program for teaching the Indonesian language to foreign speakers. The program was started by the Indonesian government to encourage intercultural dialogue and make it easier for Indonesians and foreigners to communicate BIPA courses are available at various levels, from beginner to advanced, and can be taken both online and in-person. The program has been successful in attracting students from all over the world who are interested in learning about Indonesian language and culture. BIPA wants to give students an intensive learning opportunity that enables them to get completely absorbed in Indonesian language and culture (Suyitno, 2015).

The number of international students enrolling in Indonesian colleges and universities rises significantly each year. This is evident from the rising number of applicants to the scholarship program and patronising organisation. Not to mention, a number of international students come here as a result of collaboration between universities in Indonesia and overseas. Since one measure of university excellence is the number of foreign students enrolled on campus, many universities work to increase the number of international students there. This collaboration not only benefits the international students but also provides opportunities for local students to interact with people from different cultures and backgrounds, which can enhance their learning experience and prepare them for a globalised workforce. Additionally, having a diversified student population can also contribute to a more vibrant campus community (Kusmiatun, Suyitno, HS, & Basuki, 2017).

Studying Indonesian language is important for BIPA students because

learning Indonesian or learning foreign languages in general will help them to understand Indonesian culture more easily and clearly, it will help them if students want to travel to Indonesia and of course it is a basic need if students want to continue their studies on campus like UIN Maulana Malik Ibrahim Malang . Furthermore, learning a new language can also improve cognitive abilities and enhance job prospects in an increasingly globalised world. It can also foster cross-cultural communication and understanding, which is crucial for building a more inclusive society.

The international perception of Indonesian culture can be enhanced through the growth of the Indonesian language. This is because conversing in Indonesian and being able to understand it may aid in cultural adaptation and a thorough grasp of Indonesian society for outsiders. According to Bambang Sudibyo, the Minister of National Education, learning a language can help people understand the social, cultural, and political conditions of the society that speaks that language. Moreover, being able to speak Indonesian can also open up opportunities for foreigners to work or do business in Indonesia, as it is the official language of the country and widely used in various industries. Therefore, learning Indonesian can be a valuable asset for anyone interested in exploring and engaging with the Indonesian community (Suyitno, 2015).

In today's fast-paced world, it is important to continuously develop and adapt learning media. This will help improve learning and provide students with the most effective and efficient education possible as technology develops and new tools become available. However, developing new learning media requires a

significant amount of time and financial resources. This can be especially difficult for educational institutions with limited funding and resources. Despite this, investing in technology can lead to long-term cost savings and increased efficiency. Therefore, it is important for educational institutions to carefully consider the potential benefits and drawbacks before making a decision (Alqahtani, 2015).

Nowadays, technology and means of communication are developing rapidly and the development of education is very rapid, affecting the development of learning psychology as well as the existing education system. technological advances, the development of learning media is so fast, where each existing media has its own characteristics and capabilities. From this, then efforts to arrange it arise, namely grouping or classification according to the similarity of characteristics or characteristics (Tafonao, 2018).

All of this makes the development of Bipa learning methods and learning tools must be modified to facilitate the learning process for teachers and students, which is sure to make the learning process more efficient and more entertaining.

BIPA has an official website (https://bipa.kemdikbud.go.id), a great website, and this is the only source for learning Indonesian online according to the BIPA curriculum from the ministries of education, culture, research, and technology.

This website offers several benefits to its users. Firstly, the website is organized, which make user can access all features. Secondly, the website provides clear information on Bipa learning media, which is helpful for Bipa students and those who are not yet enrolled in the program. Thirdly, the website

can be used by both Bipa students and non-Bipa students, making it a valuable resource for anyone interested in learning about Bipa. Fourthly, the website is an official source of information from the Ministry of Education, providing information on courses, events, and competitions. Finally, the website includes English translations of the majority of components, making it easy for beginner-level students to learn and understand.

These advantages make the website a great resource for Indonesian language students who want to improve their knowledge of Indonesian vocabulary and grammar. Additionally, the website offers interactive exercises and quizzes to test students' understanding of the language. This feature allows students to practise Indonesian language.

This website has certain strengths, but it also has several drawbacks that need to be addressed. First, users may have a bad experience as a result of the website's hefty and slow loading speed. Second, although having an English language option, some Indonesian aspects are still present on the website, which causes confusion for non-Indonesian speakers. Thirdly, access to pertinent resources may be hampered by the learning media's ineffective level-based organization. Fourth, although having blogs and questions, the website lacks adequate interactivity, which lowers user interest. Fifth, there are difficulties with registration forms that result in mistakes and unclear instructions that need to be fixed in order to improve the site's usability and user experience. The website's layers are also not ordered well, which could make it difficult for users to navigate and get around on the page. In general, Although the website has numerous advantages, there are a

number of places where it may be optimized to improve the user experience.

Of course, the website is a wonderful effort and benefits many students of the Indonesian language, but in the end Every human endeavor is prone to errors and imperfections, and this holds true for any work created by humans, and from here it was necessary to develop this website periodically in order to avoid these errors.

Human-centered Design (HCD) is an approach utilized for the development of interactive systems with the aim of creating systems that are both useful and usable. By using human factors, ergonomics, and usability methodologies, HCD focuses on the user, their needs, and requirements. This strategy can increase efficacy and efficiency, as well as user satisfaction, accessibility, sustainability, and the well-being of people, while also potentially reducing any negative consequences that system usage may have on people's health, safety, and performance. The HCD technique aims to develop systems that prioritize the user's experience and general pleasure in addition to being efficient and useful. HCD ultimately results in the development of systems that are more user-friendly, accessible, and sustainable, ultimately benefiting both users and developers alike (Kirby, Tolle, & Brata, 2019).

Utilizing the Human Centered Design (HCD) methodology is crucial because it makes the human component of the design process a top priority. HCD may foster empathy and a deeper comprehension of end-user views by concentrating on their requirements, behaviors, and psychology. As a result, systems become more effective, efficient, and user-friendly. The framework offered by HCD places a focus on the user experience, resulting in designs that give usability,

accessibility, and sustainability top priority, eventually helping both users and developers. Through a survey with 68 respondents, HCD was applied in the Ivent mobile application to elicit empathy from users. The engineers were able to construct a more user-friendly and efficient system that better served the needs of its users by placing a higher priority on empathy and user feedback. Overall, the HCD approach has the potential to improve design effectiveness and efficiency as well as overall user happiness, which would ultimately result in more successful and long-lasting systems (Idris, Mahardhika, & Suranto, 2021).

For the purpose of designing products and services, the Human-Centered Design (HCD) methodology offers a number of important benefits. HCD encourages the creation of more accessible and inclusive products that can appeal to a larger audience by taking into account the requirements of everyone, including those who have disabilities or other difficulties. Furthermore, using a human-centric design approach improves the likelihood of effective adoption and usage, leading to increased success rates for the good or service. Additionally, HCD encourages experimentation and creativity within teams, promoting the investigation of original ideas to suit customer needs. Finally, HCD can lead to more successful and significant goods and services that actually meet user needs by developing empathy and gaining understanding of potential customers or beneficiaries living experiences, goals, and obstacles (Tobing & Tolle, 2021).

The Human Centered Design (HCD) approach is a three-stage process that includes Inspiration, Ideation, and Implementation. The Inspiration stage is the primary stage of the HCD method, which involves comprehending people's needs

by observing potential users. The Ideation stage is where ideas are generated based on the insights gathered from the Inspiration stage. The Implementation stage includes building prototypes and testing them with users to obtain feedback, enabling iterative design improvements until user needs are met (Idris et al., 2021).

The Human Centered Design (HCD) approach is a process consisting of three stages: Inspiration, Ideation, and Implementation.The Inspiration stage is the first stage of the HCD process, and it involves understanding people's needs by observing potential users. During this stage, designers seek to gain insight into users' behaviors, motivations, and pain points through activities such as interviews, surveys, and observations. By understanding users' needs, designers can identify opportunities for innovation and create solutions that meet those needs.

The Ideation stage is the stage where designers generate ideas based on the insights gained from the Inspiration stage. This stage encourages a divergent thinking process, where designers brainstorm and generate multiple solutions to the problem at hand. During this stage, designers should seek to come up with a wide range of ideas without judgment or criticism, fostering creativity and innovation.

The Implementation stage is the final stage in the HCD process, which involves building prototypes and testing them with users to obtain feedback. In this stage, designers create low-fidelity and high-fidelity prototypes to test and refine their ideas iteratively. By testing the prototypes with users, designers can

obtain valuable feedback that can help improve the design and ensure that it meets user needs. The testing and refinement process continues until the design solution is optimized and ready for implementation.

This study will develop the interfaces of the BIPA website using the Human-Centered Design (HCD) Method to develop UI/UX BIPA software in mobile form. The author has chosen the Human-Centered Design (HCD) Method because it has features that can solve problems that are on the BIPA official website, such as Innovation, differentiation, increased effectiveness, and User satisfaction. The Human-Centered Design (HCD) Method allows for quick iterations and testing of the interface design, which can lead to a more user-friendly and efficient mobile application. Additionally, by addressing the issues on the official website, BIPA software can provide a better user experience for its users.

1.2 Identification Of The Problem

1. How to develop UI/UX of BIPA software according to the official BIPA curriculum using the Human Centered Design (HCD) method?
2. What are the results of the usability of the new design with the Human Centered Design (HCD) method?

1.3 Research Purposes

Based on the Identification of the problem that has been described, the purpose of this research is to find out the results of the usability test in BIPA software development using the Human Centered Design (HCD) method and to find out whether the Human Centered Design (HCD) method has a positive or

negative effect on usability.

1.4 Benefits Of Research

1.4.1 Theoretical Benefits of Research

The results of this study can be used as an additional reference for further research materials related to usability testing using the Human Centered Design (HCD) method, and can be carried out on other systems using the same method.

1.4.2 Practical Benefits of Research

1.4.2.1 For Researcher

Researcher obtain input or references in evaluating and developing the system, especially in evaluating usability using the Human Centered Design (HCD) method.

1.4.2.2 For Academics

Practical benefits for academics include a means of increasing and developing knowledge, especially in the field of bipa software usability testing. In addition, the development that will be carried out will greatly impact the use of the official BIPA software in the future, which will make it easier for users to access the software. This, of course, will also improve the quality of the existing learning process.

1.4.2.3 For BIPA official website

The results of this study can later become useful input and considerations for related institutions and can contribute to improving the usability of educational software in BIPA official software.

1.5 Scope and limitations

In research there are limitations to the scope of the problem to avoid the occurrence of cases out of the main issues that have been formulated, the scope is as follows:

1. Research is limited to active BIPA students of the Indonesian Cultural Center in Cairo, Egypt, for 2022 period III and who are in the Indonesian language learning stages according to the BIPA curriculum.
2. This study only assesses indicators based on the usability provisions of the software using the Human Centered Design (HCD) method.

1.6 Writing system

This research is organised into five chapters with the following systematic writing:

CHAPTER 1 INTRODUCTION

This chapter contains the background of the problem, the formulation of the problem, the research objectives, the benefits of the research, and the systematics of preparing the research. In the background of the problem, it contains an overview of the BIPA official website with several existing problems,

with the aim of knowing the usability value and the reasons for using the Human Centered Design (HCD) method . In the formulation of the problem, it is explained in more detail regarding the existing problems. The objective of the problem contains the purpose of this research, namely to determine the usability value of the official BIPA website. The benefits of this research contain both theoretically and practically benifits . The systematics of writing contains the systematics of writing starting from Chapter I, Chapter II, Chapter III, Chapter IV, and also Chapter V.

CHAPTER 2 REVIEW OF RELATED LITERATURE

This chapter contains the theoretical basis and related previous studies. In this study, the literature review will contain the definition of the object of research, namely related to mobile based software, usability, and the Human Centered Design (HCD) method .

CHAPTER 3 RESEARCH METHODOLOGY

This chapter contains the research design and procedures. This chapter discusses the methods used to carry out this research such as research design, place and time of research, research flow, research subjects and objects, research instruments, data sources, data collection, and data analysis.

CHAPTER 4 FINDINGS AND DISCUSSIONS

This chapter contains an explanation of the results and discussion of the Human Centered Design (HCD) method in the official BIPA Software Development.

CHAPTER 5 CONCLUSIONS AND SUGGESTIONS

This chapter is the closing chapter which contains conclusions from the results of data analysis, as well as suggestions from researchers and related parties.

CHAPTER II
REVIEW OF RELATED LITERATURE

2.1 Literature Review

This chapter discusses previous related research and will be a reference for this research and the theoretical basis for the terms and methods that will be used in this research.

Table 2.1 Literature Review

No.	Author's name	Year of Publication	Research Title	Method	Constraint	Results
1	Arief Ramadhan Setiadi, Hari Setiaji (Setiadi & Setiaji, 202z0)	2020	Perancangan UI/UX menggunakan pendekatan HCD (Human-Centered design) pada website Thriftdoor	Human Centered Design (HCD)	Input : user opinions that can be obtained from the analysis of the questionnaire feed Output : The UI/UX website Thriftdoor, which was developed using the Human Centered Design (HCD) approach.	UI/UX of website Thriftdoor which meet users desires which are an ecommerce system that simplifies searching and transactions, along with a chat feature and game feature. Users also suggest a list view, a filter for favorites, and more detailed product categories for product display. Additionally, users suggest creating a visually appealing design.
2	Muhammad Arif Idris, Galang Prihadi Mahardhika, Beni Suranto. (Idris et al., 2021)	2021	Perancangan UI/UX Aplikasi Perangkat Bergerak Ivent Menggunakan Pendekatan HCD (Human Centered Design)	Human Centered Design (HCD), and Prototyping	Input : user opinions that can be obtained from the analysis of the questionnaire feed Output : The UI/UX Ivent mobile application, which was developed using the Human Centered Design (HCD) approach.	the successful development of the Ivent mobile application using the Human Centered Design (HCD) approach. The application was designed to meet user needs and provide a platform for event organizers and vendors to showcase their services. The paper also highlights the importance of using HCD in creating user-centered designs and obtaining empathy from users. The results of a questionnaire involving 68 respondents were used to improve the design of the application, which helped to obtain empathy from users.
3	Labina Kirby, Herman Tolle, Adam Hendra Brata. (Kirby et al., 2019)	2019	Perancangan User Experience Aplikasi Mobile Social Crowdsourcing Bencana Alam Menggunakan Pendekatan Human-	Human Centered Design (HCD) , Evaluasi Usability , and Cognitive Walkthroug h with users	Input : user opinions that can be obtained from the analysis of the questionnaire feed, and user characteristics Output : The UI/UX Crowdsourcing Social Mobile Application for Natural disasters, which was developed using the Human Centered Design (HCD)	The research conducted aimed to improve the usability and user experience of a designed solution through the application of the Human Centered Design (HCD) approach. The usability evaluation was conducted using the cognitive walkthrough method, which revealed a 76% improvement in usability and user experience between the first and second evaluations.

			centered Design (HCD)		approach.	
4	Winda Yulistiana. (Yulistiana, 2022)	2022	Implementasi User Centered Design (UCD) Pada Pengembangan Aplikasi rumahs Rumah Sakit	Human Centered Design (HCD) , System Usability Scale (SUS)	Input : user opinions that can be obtained from the value (sus) contained in the score of the questioner Output : Hospital management Information system which was developed using the Human Centered Design (HCD) approach.	The results of the usability testing using the System Usability Scale with 60 respondents showed an average score of 69.8, indicating that the system is in the "good" category according to the Adjective rating and Grade Scale of D. Therefore, the system is considered to be fairly user-friendly .
5	Lasma Divathama Tobing, Herman Tolle (Tobing & Tolle, 2021)	2021	Perancangan User Experience Aplikasi E-Koperasi Sekolah berbasis Android dengan menggunakan Metode Human Centered Design (HCD)	Human Centered Design (HCD) . and User Experience Questionnaire (UEQ)	Input : user opinions that can be obtained from the analysis of the questionnaire feed, user characteristics, and user needs Output : The UI/UX Android-based School E-Cooperative Application , which was developed using the Human Centered Design (HCD) approach	The paper describes the development and assessment of an E-Cooperative School application based on user needs. It resulted in 11 user requirements and a wireframe design consisting of 34 pages. The design was evaluated using the User Experience Questionnaire and Heuristic Evaluation methods, which showed positive ratings for some aspects but also identified issues with the lack of an undo function and feedback

6	Ikrima Nuha Arifin , Herman Tolle , Retno Indah Rokhmawati (Arifin, Tolle, & Rokhmawati, 2019)	2019	Evaluasi dan Perancangan User Interface untuk Meningkatkan User Experience menggunakan Metode Human-Centered Design dan Heuristic Evaluation pada Aplikasi Ezyschool	Human Centered Design (HCD) , and Heuristic Evaluation (HE)	Input : user opinions that can be obtained from the analysis of the questionnaire feed Output : The UI/UX Ezyschool application , which was developed using the Human Centered Design (HCD) approach	The paper describes the development and evaluation of the EzySchool mobile application for parents or guardians of students in Indonesia. The user requirements were obtained through heuristic evaluations of the initial design, and a three-stage solution design process was implemented to address identified issues. The final solution showed a reduction in heuristic issues, indicating improved user experience compared to the initial design.
7	Hendri Suryo Prakoso , Kristoko Dwi Hartomo (Prakoso & Hartomo, 2020)	2020	Perancangan Antarmuka Sistem Pelaporan Kerusakan Gedung Menggunakan Metode Human Centered Design (HCD) Berbasis Mobile dengan Teknologi	Human Centered Design (HCD) , and End User Computing Satisfaction (EUCS)	Input : user opinions that can be obtained from the analysis of the questionnaire feed Output : The UI/UX Building Damage Reporting System , which was developed using the Human Centered Design (HCD) approach	Building a system with an interactive and informative design that makes it easier for users to operate. The test results showed 90.6% validity and the design was able to meet the needs of lab staff as users of the system.

			Hybrid (Studi Kasus : Kampus Notohamidjojo FTI-UKSW)			
8	Shandya Fajar Widyono , Niken Hendrakusma , Muhammad Aminul Akbar (Widyono, Hendrakusma, & Akbar, 2019)	2019	Perancangan User Interface Aplikasi Travelingyuk Berbasis Mobile Menggunakan Metode Human Centered Design (HCD)	Human Centered Design (HCD) , System Usability Scale (SUS)	Input : user opinions that can be obtained from the analysis of the SUS questionnaire feed Output : The UI/UX Mobile-Based Travelingyuk Application , which was developed using the Human Centered Design (HCD) approach	The analysis of user needs involved identifying user contexts, such as stakeholders and end-users, and determining functional requirements through interviews with stakeholders and transforming the Travelingyuk website. The prototype was designed based on the interviews, transformation results, and design guidelines, and evaluated using the System Usability Scale (SUS) questionnaire with 30 respondents, resulting in an acceptable score of 77.25. Overall, the study shows that HCD is an effective approach for designing user interfaces that meet user needs and expectations.

Related research entitled “Perancangan UI/UX menggunakan pendekatan HCD (Human-Centered design) pada website Thriftdoor” discusses the process of creating the UI/UX of the Thriftdoor website using the HCD (Human-Centered Design) approach. The paper discusses the significance of human-centered design (HCD) in developing something that satisfies the demands of people based on their qualities, psychology, and perception. It also outlines the HCD and UCD (User-Centered Design) procedures, which include observation and interface display to users based on what users require from the system. The research indicates that adopting the HCD approach is appropriate for creating UI/UX e-commerce secondhand because it can give user needs and input, which can be used to optimize the final design outcome.

The HCD (Human-Centered Design) method can assist authors in developing UI/UX by focusing on human qualities, psychology, and perception in order to produce something that fits the demands of users. The writers used the HCD approach to build the UI/UX of the Thriftdoor website by observing users and displaying interfaces to them based on what they needed from the system. They were able to get insights into user wants and preferences by employing HCD, which enabled them develop a website that met those needs. Furthermore, putting oneself in the shoes of a system user can foster a strong empathy approach toward users. The authors stated that the HCD technique is appropriate for building UI/UX e-commerce products because it can meet the expectations of the users.

The conclusion of this study is that employing the Human-Centered Design (HCD) approach in developing the UI/UX of the Thriftdoor website is appropriate

for e-commerce secondhand because it can give user demands and input, which can then be used to optimize the final design outcome. To gather insights into user wants and preferences, the authors used different techniques such as observation and interface display to users linked to what consumers need from the system. They were able to build a strong empathy approach toward users by putting themselves in the position of a user who would use the system. The writers came to the conclusion that the HCD strategy is based on human qualities, psychology, and perception in order to create something that fits the demands of users.

Through the utilization of the Human-Centered Design (HCD) methodology during the development of the UI/UX for the Thriftdoor website, the researchers effectively emphasized the significance of user demands and input, thereby leading to an optimized final design outcome. The study encompassed diverse techniques, such as observation and interface display, to collect valuable insights into user preferences and desires, effectively bridging the gap between consumers and the system. The researchers adopted a proactive approach by immersing themselves in the user's perspective, fostering a deep sense of empathy towards their needs and expectations. This empathetic approach facilitated an in-depth exploration of human qualities, psychology, and perception, enabling the creation of a design that resonates with user demands and desires. Consequently, the study concludes that the adoption of the HCD strategy is a suitable and relevant approach for e-commerce secondhand platforms like Thriftdoor, as it places utmost importance on the human element in design and aligns it with user-centered requirements.

Furthermore, in the study entitled “Perancangan UI/UX Aplikasi Perangkat

Bergerak Ivent Menggunakan Pendekatan HCD (Human Centered Design)" by Idris et al., (2021) discusses the development of the Ivent mobile application using the Human Centered Design (HCD) approach. The paper explains how the HCD approach was used to understand user needs and create a mobile application that meets those needs. It also provides insights into how the HCD approach can be used to create user-centered designs and obtain empathy from users. The paper includes a discussion of the three stages of HCD: Inspiration, Ideation, and Implementation. Additionally, it presents feedback from users that was used to improve the design of the application.

The paper explores the application of the Human-Centered Design (HCD) approach in the development of the Ivent mobile application, encompassing three key stages. The first stage, Inspiration, involved understanding user needs and challenges through observations of their daily habits and routines, as well as collecting feedback to identify requirements for an event organizer application. The second stage, Ideation, focused on generating ideas by leveraging the insights gathered in the Inspiration stage. Brainstorming sessions were conducted to devise potential solutions that address the identified user needs. Finally, in the Implementation stage, the ideas generated in the previous stage were translated into a prototype of the Ivent mobile application. This prototype underwent testing with users, enabling the collection of feedback to refine the design and enhance functionality. These three stages of the HCD approach proved instrumental in guiding the development process of the Ivent application, ensuring that user needs and preferences were thoroughly considered.

The paper provides a detailed explanation of how the HCD approach was used to develop the Ivent mobile application, including the three stages of HCD: Inspiration, Ideation, and Implementation. The paper also highlights the importance of obtaining empathy from users and collecting feedback to improve the design of the application. Therefore, this paper can serve as a guide for designers and developers who want to use HCD to create user-centered designs that meet user needs and expectations.

This study presents the successful implementation of the Human-Centered Design (HCD) approach in developing the Ivent mobile application. The primary objective was to create a user-centric platform catering to the requirements of event organizers and vendors. The research emphasizes the importance of integrating HCD principles to foster empathetic designs that align with user preferences. The study employed a questionnaire-based survey involving 68 participants to gather feedback, enabling iterative improvements in the application's design. By incorporating user input and adhering to the principles of HCD, the Ivent mobile application achieved its intended goal of effectively meeting the target users' needs, thereby establishing a favorable outcome.

Labina Kirby , Herman Tolle , Adam Hendra Brata also use Human-Centered Design (HCD) method for the design of a mobile application for social crowdsourcing in disaster management . The authors explains how the HCD approach was used to design a high-fidelity prototype of the application, which was then evaluated for usability using cognitive walkthrough with users. The authors also presents the findings of the usability evaluation and provides recommendations

for improving the application. Overall, this paper aims to demonstrate how HCD can be used to design effective and user-friendly applications for disaster management.

This paper outlines the step-by-step process employed to design a mobile application utilizing the Human-Centered Design (HCD) approach. The initial phase involved comprehending the problem at hand and understanding the needs of the users. User personas were then created, followed by conducting interviews with the users to gather their insights. Expert interviews were also conducted to gain valuable perspectives. Subsequently, the information architecture and screenflow were developed to establish a solid foundation. Wireframes and prototypes were designed to visualize the proposed solutions. Finally, the design solution underwent evaluation using cognitive walkthrough techniques with actual users, ensuring that the application aligns with their cognitive processes and preferences. Through the systematic execution of these steps, the HCD approach was effectively applied to create a user-centered and optimized mobile application design.

In this study, the usability of the application was assessed utilizing the Cognitive Walkthrough (CW) technique with users. The CW method involves a systematic evaluation of the system by simulating user interactions and posing a series of questions from the user's standpoint. Four CW questions were employed to gauge the application's usability. The evaluation process was repeated twice, resulting in the identification and classification of 17 usability issues during each assessment, based on their severity. The findings revealed a noteworthy 76% enhancement in both usability and user experience between the initial and

subsequent evaluations. This scientific investigation effectively employed the CW method to evaluate and improve the application's usability through iterative refinements.

The findings of this paper indicate that the utilization of the Human-Centered Design (HCD) approach is instrumental in creating mobile applications that are both efficient and user-friendly for social crowdsourcing in the context of disaster management. The study's assessment of usability, employing the cognitive walkthrough technique with users, revealed a remarkable 76% improvement in usability and user experience between the initial and subsequent evaluations. Furthermore, the study offered recommendations for addressing the remaining four identified issues discovered during the second evaluation. Given the suitability and effectiveness of the HCD method demonstrated in this research, the resulting prototype holds potential for further development and implementation in practical applications.

Winda Yulistiana focuses on the implementation of the User-Centered Design (UCD) methodology for developing the information management system of Dr. Etty Asharto Hospital (SIMRS Dr. Etty Asharto), with the primary objective of addressing limitations in the previous SIMRS system, particularly related to data access and the five-year cutoff requirement. By leveraging Odoo ERP (Enterprise Resource Planning) and adopting the UCD approach, the researchers aimed to establish seamless alignment between users and the application, eliminating the need for data cutoff. The data collection process involved conducting a literature review, distributing questionnaires to gather user requirements for system

functionality, and evaluating the system. The study presents an integrated approach that combines UCD principles with Odoo ERP to overcome limitations in the previous system and ensure a user-centered design for the information management system of Dr. Etty Asharto Hospital.

The methods used by the author in this study include the implementation of the User-Centered Design (UCD) methodology in developing the hospital management information system (SIMRS) for Dr. Etty Asharto Hospital. The study utilized data collection techniques such as literature review, books, and the distribution of questionnaires to gather user requirements and assess system functionality. Usability testing was conducted using the System Usability Scale (SUS) method with a sample size of 60 respondents. The author has defined The standards of User-Centered Design (UCD) encompass the following aspects. Firstly, a clear and comprehensive understanding of the users needs, preferences, and behaviors is essential to effectively design a system that meets their requirements. Secondly, the design process should be guided by research and experimentation, drawing upon existing literature and studies to inform decision-making. Thirdly, prioritizing user experience throughout the design process is crucial, ensuring that the system is intuitive, user-friendly, and provides a positive overall experience. Lastly, active involvement of users in the design process is vital, integrating their input and feedback to align the design with their expectations and requirements. The fundamental element of UCD implementation lies in conducting user research, wherein thorough investigation and comprehension of the target user base aids developers and designers in gaining valuable insights into their needs and

perspectives. The provided diagram illustrates the sequential stages of the User-Centered Design methodology.

Winda Yulistiana explains the User-Centered Design (UCD) process, based on ISO 9241-210:2010, consists of five key stages. Firstly, Plan the Human-Centered Design involves engaging in discussions with stakeholders from the project's initiation to completion, with a focus on user needs. It is important for the involved parties to be aware of and understand UCD methods through literature studies, research, or seminars. Secondly, Specify the context of use entails identifying the individuals who will be using the designed item or system. Thirdly, Specify user and organizational requirements involves gathering data and information to collect user needs, organizing this information, and representing user requirements through various structures such as diagrams and graphs. This cycle can work in conjunction with design processes, utilizing storyboards and setting important objectives to make the item beneficial. Fourthly, Product design solutions entails creating design solutions that address the identified system requirements. Lastly, Evaluate design against user requirements involves the crucial step of evaluating the developed system to determine whether the user goals have been achieved. During this stage, the solutions generated from the previous stages are assessed in relation to user needs, determining which features should be included in the system. The UCD process, as explained, follows a systematic approach to ensure the design is aligned with user requirements and objectives.

The research conducted on the design, planning, development, and testing of the hospital management application indicates that the application of the User-

Centered Design (UCD) methodology has been successful. By involving users in surveys and system creation and evaluation, the system was developed in alignment with the initial research plan. Usability testing using the System Usability Scale (SUS) method with 60 respondents resulted in an average score of 69.8, indicating that the system falls within the “good” category with a “Good” rating and a Grade Scale score of D. The Acceptability Ranges assessment yielded a “Marginal” rating, suggesting sufficient usability for users. These findings demonstrate the effectiveness of implementing UCD in the design and development process, resulting in a system that meets user requirements and is well-received.

Furthermore, research conducted by Lasma Divathama Tobing, Herman Tolle which entitled “Perancangan User Experience Aplikasi E-Koperasi Sekolah berbasis Android dengan menggunakan Metode Human Centered Design (HCD)” . Authors discuss the design of a User Experience (UX) for an Android-based E-Koperasi Sekolah application using the Human Centered Design (HCD) method. The application is intended to assist school cooperatives in selling and buying goods required by individuals within the school environment. The paper highlights the limitations of the current system, such as the absence of an undo feature, inability to select page views, and difficulty in returning to previous menus/pages. The proposed solution involves designing a user-friendly interface that considers every possible action that users may take and understands their expectations at each step of the process. The HCD method is used to ensure that the application is tailored to meet users' needs and preferences. Overall, this paper provides valuable insights into how UX design can be used to improve the functionality and usability of mobile

applications for school cooperatives.

The User Experience (UX) of the E-Koperasi Sekolah application was developed by the writers of this study report using a methodical methodology. They started by thoroughly examining the activities taking place in the cooperative learning environment of the school. They developed the buying and selling process scenario and the products control process scenario based on this investigation. They then used the Human Centered Design (HCD) methodology, which places an emphasis on creating user interfaces that are in line with human activities. To ensure that the application meets users expectations, it was necessary to thoroughly understand their needs and preferences at each stage of the process. The following step entailed designing an intuitive user interface that accounts for all potential user actions across the application. Finally, the authors performed heuristic evaluation and usability testing to evaluate the UX design, aiming to identify any issues or areas that could be enhanced. These sequential steps were essential in guaranteeing that the E-Koperasi Sekolah application prioritizes user-friendliness and adequately addresses users needs and preferences.

According to the findings of this study, the E-Koperasi Sekolah application's user experience (UX) design, which used the human-centered design (HCD) methodology, obtained high marks, particularly in the categories of attractiveness, clarity, efficiency, and correctness. The User Experience Questionnaire (UEQ), which was used to assess the UX design, revealed that the application offers a positive perception in terms of user experience. The heuristic evaluation did, however, point up certain problems with the design that may be resolved to improve

usability even more. Overall, this essay shows how important UX design is when creating mobile programs for school cooperatives. Designers may build an interface that is user-friendly and meets users expectations by following a sequential procedure that takes into account users wants and preferences at each phase of the process. The results of this paper provide valuable insights into how UX design can be used to improve mobile application functionality and usability for school cooperatives.

Ikrima Nuha Arifin, Herman Tolle, and Retno Indah Rokhmawati use the Human-Centered Design (HCD) method in their research, which is entitled "Evaluasi dan Perancangan User Interface untuk Meningkatkan User Experience Menggunakan Metode Human-Centered Design dan Heuristic Evaluation pada Aplikasi Ezyschool". In this research authors discuss the evaluation and design of the user interface for the Ezyschool application, aimed at enhancing user experience through the utilization of Human-Centered Design and Heuristic Evaluation methods. The study employed heuristic evaluation procedures and 10 heuristic principles to identify usability issues in the Ezyschool application. Severity ratings and Google Material Design guidelines were utilized to design solutions based on evaluator suggestions. The study highlights that a Human-Centered Design approach was adopted, which prioritizes users and their needs in developing interactive systems.

Human-centered design and heuristic evaluation are the two techniques the authors of this research employ to assess and create the user interface for the Ezyschool program. While the Heuristic Evaluation method entails locating and

evaluating usability issues based on heuristic principles with the assistance of expert assessors, the Human-Centered Design approach focuses on users and their demands in the development of interactive systems. In order to analyze the application usage context, the authors also conducted initial data collecting through interviews with Ezyschool stakeholders.

In order to find usability issues, the authors of this study used three evaluators to undertake an initial heuristic evaluation of the Ezyschool application. This evaluation resulted in the identification of 17 difficulties in total, which served as a starting point for comprehending user demands and guiding the design of alternative solutions. The authors then used the severity ratings and Google Material Design standards to direct their approach when building solutions based on the advice given by the evaluators. We carefully contrasted and studied the results of the original heuristic evaluation and the suggested solution design. This study produced insightful findings that answered the research questions and provided guidance for other studies. The results showed that the bulk of the usability issues discovered during the initial heuristic evaluation were successfully resolved by the solution design. However, other problems remained unanswered and would need more study. Overall, the study showed that using the Heuristic Evaluation (HE) approach along with Human Centered Design (HCD) principles can be helpful in detecting usability issues and coming up with solutions that are in line with user requirements.

This study focuses on the concepts of human-centered design (HCD) and the heuristic evaluation (HE) methodology as it explores and compares the first heuristic assessment and solution design in the context of the Ezyschool application.

The bulk of the usability issues discovered during the initial heuristic evaluation, according to the authors, were successfully addressed by the solution design, but certain unresolved problems required more research. The study emphasizes the need of using the HE methodology and adopting HCD principles to recognize and resolve usability issues using user-centered design approaches. The authors also offer suggestions for future studies that will try to improve the usability of the Ezyschool program.

Hendri Suryo Prakoso, Kristoko Dwi Hartomo use the Human-Centered Design (HCD) method in their research, which is entitled “Perancangan Antarmuka Sistem Pelaporan Kerusakan Gedung Menggunakan Metode Human Centered Design (HCD) Berbasis Mobile Dengan Teknologi Hybrid” . In this research the Human Centered Design (HCD) and End User Computing Satisfaction (EUCS) methodologies are used by the authors to design and implement a user-friendly building damage reporting system. The paper details the difficulties encountered during system development and how hybrid technology was employed to improve it. The Satya Wacana Christian University Faculty of Information Technology campus is the subject of the case study in the article, although the system can be modified for use in various kinds of structures or businesses.

The steps in this research's sequential linear software development paradigm were as follows. Firstly, the study's specific problems and potential solutions were identified during the Identification of Problems phase. The design of a system in the form of a prototype, with an emphasis on developing a user-friendly interface for a damage reporting system, was the issue that was identified. In order to ascertain the

case study and system restrictions, interviews with the faculty's facilities and infrastructure supervisor were conducted throughout the literature review phase. It also decided whether to apply the Human Centered Design (HCD) approach, which puts user needs first and uses interface design to guarantee usability and comprehension. Thirdly, choosing the right technologies and methods for the system design was a part of the Method Analysis phase. The Human Centered Design methodology was chosen because it complements HCD's user-centered strategy and iterative evaluation cycle. The system's damage reporting prototype was created in the fourth stage, the Prototype phase, using the HCD method's cycles and guiding principles. The application release phase, the fifth step, involved showing the designed prototype and carrying out tests to gauge its effectiveness. The system design was finally described in the Report phase using the Unified Modeling Language (UML). Overall, these phases served as a roadmap for the research procedure and the creation of an efficient and user-centered design for the damage reporting system.

In the fourth stage of the design process, the authors particularly used the prototype model to create a prototype of the building damage reporting system. The Human Centered Design (HCD) methodology was used to create the prototype, which included its iterative cycle. Understanding user requirements, developing potential solutions, and conducting user testing to improve those solutions are all parts of the HCD methodology. The HCD methodology was used by the authors to create a clear and user-friendly system prototype. The prototype was subsequently put to the test by end users, who provided insightful input that was used to

incrementally improve it. The user needs were successfully met, and the reporting of building damage was made easier, through this iterative process that persisted until a final design was attained.

This paper presents the successful design and implementation of a building damage reporting system by leveraging the Human Centered Design (HCD) and End User Computing Satisfaction (EUCS) methods.Using a prototype created using the HCD methodology, the system was painstakingly constructed with user-friendliness and convenience of use as its top priorities. The creators used hybrid technology to make sure it worked with both Android and iOS systems. The EUCS method was used to test the system's interface, and the results showed a level of satisfaction above 90%. The design of the damage reporting system, which combines the HCD and EUCS approaches to produce a user-friendly interface for reporting faults, is effective as demonstrated by the high satisfaction rate. Although the case study at Satya Wacana Christian University's Faculty of Information Technology largely focuses on a campus environment, the system can be modified for usage in a variety of other building types or businesses.

Furthermore, research conducted by Shandya Fajar Widyono , Niken Hendrakusma ,and Muhammad Aminul Akbar which entitled “ Perancangan User Interface Aplikasi Travelingyuk Berbasis Mobile Menggunakan Metode Human Centered Design (HCD)”. This article describes the design of a user interface for the Travelingyuk mobile application, which is geared at offering users with easy access to tourism information. It covers the use of Human Centered Design (HCD) as a method for developing user interfaces, the demands of users and stakeholders,

and functional requirements for the application. The study also offers a summary of user interface feedback acquired through interviews.

The user interface of the Travelingyuk mobile application was designed using the Human Centered Design (HCD) methodology in this study. Understanding user needs, prototyping, and testing are just a few of the phases of the HCD approach. The purpose of this study was to identify the requirements and preferences of users through user interviews. They subsequently used this knowledge to develop user interface prototypes, tested them with users, and collected feedback. The writers used Google Material Design Guidelines into their design approach and took stakeholder needs into account. Finally, they used a System usefulness Scale (SUS) questionnaire to assess the user interface's usefulness. In conclusion, this study shows how HCD may be applied to develop a user-friendly mobile application that satisfies its users needs.

The usability of the user interface design of the Travelingyuk mobile application was evaluated by the authors of this study using the System Usability Scale (SUS) approach. Users that engaged with prototypes of the user interface design were given the 10-question SUS questionnaire. The results of the questionnaire were then examined in order to gauge how usable the interface design was. The findings showed that the design had a favorable SUS score of 77.25, indicating that consumers would find it acceptable and effective. This study serves as an example of how SUS may be applied as a trustworthy and effective tool for assessing the user interface design of mobile applications.

This research successfully applied the Human Centered Design (HCD)

methodology to create a user interface for the Travelingyuk mobile application. 13 functional demands, including elements like login, browsing dining options, locations, tales, searching for attractions, and more, were found after the user requirements were assessed. Incorporating design principles, website redesign, and interview findings, a user interface prototype was created. With 30 respondents, the System Usability Scale (SUS) questionnaire was used to assess the user interface design. The results showed that the user interface for the mobile application received an acceptable SUS score of 77.25. Overall, the study shows how HCD can be successfully used to create a user-friendly interface for the Travelingyuk mobile application, giving PT. Traveling Media Network an advantage in the travel market.

2.2 Theoretical basis

2.2.1 BIPA program

BIPA stands for "Bahasa Indonesia Ranah Sosial Budaya Bagi Penutur Asing," which translates to "Indonesian Language in the Social and Cultural Sphere for Foreign Speakers." It refers to teaching materials and programs designed to help foreign learners learn Indonesian language and culture (Ulumuddin Agus, 2014).

BIPA, or Bahasa Indonesia Penutur Asing, is a program aimed at teaching Indonesian language to non-native speakers. The existence of BIPA is crucial in the era of globalisation, where the ability to communicate in multiple languages is highly valued. In Indonesia, the use of Indonesian language in education has been regulated by law, and BIPA has become one of the ways to implement this regulation. Through BIPA, foreign students who study or work in Indonesia can

learn and master the Indonesian language, which will enable them to communicate effectively with locals and adapt better to their new environment.

Moreover, BIPA also plays a significant role in internationalising Indonesian universities. By offering BIPA programs, universities can attract more international students who are interested in learning about Indonesian culture and language. This will not only increase the diversity of students on campus but also promote cultural exchange between different countries. Additionally, BIPA programs can also help promote Indonesian language as an international language and contribute to its recognition as a valuable asset for global communication. Overall, BIPA is an essential program that supports both individual and national goals towards internationalisation and cultural exchange (Ningrum, Waluyo, & Winarni, 2017).

BIPA teachers and instructors of Indonesian as a Foreign Language (IFL) must prepare teaching-learning materials and activities that are relevant to the learners' needs. This is because IFL learners generally have different language and cultural backgrounds, learning styles, and goals compared to Indonesian learners. Therefore, it is important for BIPA (Indonesian for Foreign Learners) teachers to focus on the needs of their students and consider factors such as their language proficiency level, cultural background, and field of expertise. The teaching-learning process should be centred around the learners' needs (Suyitno, 2015).

The goal of BIPA (Bahasa Indonesia Penutur Asing) is to provide teaching materials and programs that help non-native speakers learn Indonesian language and culture. BIPA programs are important in the era of globalisation to promote cultural exchange and enable effective communication between foreign students and locals.

BIPA teachers must prepare relevant teaching materials and activities that cater to the learners needs and consider their language proficiency level, cultural background, and field of expertise. Overall, BIPA aims to support individual and national goals towards internationalisation and cultural exchange.

2.2.2 Human Centered Design (HCD)

Human-Centered Design (HCD) is a Method that is centered on human characteristics, psychology, and perception in creating something that meets the needs of users. HCD involves several processes such as observation and interface display to users related to what users need from the system. The goal of HCD is to gain insights into user needs and preferences, which can then be used to design a product or service that meets those needs. Additionally, placing oneself in the position of a user who would use the system can create a strong empathy approach towards users. Using HCD approach is suitable for designing UI/UX of e-commerce secondhand because it can provide user needs and feedback, which can optimize the final design result with that feedback (Setiadi & Setiaji, 2020).

Human-Centered Design (HCD) has a lot of advantages, and one of the advantages of using Human-Centered Design (HCD) as a method for developing Interface of a system is by putting users at the center of the design process, HCD guarantees that their requirements and preferences are taken into account at every stage. Second, it makes it easier to create a user-friendly, intuitive design that is simple to understand and utilize. Thirdly, HCD minimizes potential usability concerns by promoting user-centric design, reducing the chance of mistakes and

confusion. Additionally, by customizing the interface to fit their unique needs, it improves user acceptance and happiness. In addition, HCD increases productivity and efficiency by improving navigation and usability and speeding up work completion. Overall, HCD shows to be an excellent strategy for developing mobile applications that gain user acceptability, effectively address their needs, and improve their overall experience(Widyono et al., 2019).

Human Centered Design (HCD) places users at the forefront of the design process, prioritizing their needs and preferences. HCD ensures the development of a user-friendly and intuitive interface that is simply understood and utilized by combining user input and feedback. By precisely addressing users needs when developing the interface, this strategy reduces the chance of mistakes and confusion. HCD increases user happiness and application acceptability by customizing the interface to fit users individual demands. Users are more likely to view an application favorably and interact with it more successfully if they believe that it is tailored to their interests. This ultimately results in a better overall experience.

By improving the interface's usability and navigation, HCD also maximizes productivity and efficiency. Users may do jobs more quickly and effectively by creating an interface that is simple to use and intuitive. This decrease in complexity and cognitive burden raises productivity as a whole. HCD increases efficiency and frees users to concentrate on the tasks at hand rather than fumbling with the interface by reducing the amount of time needed to execute tasks. In the end, the user-centric design process used by HCD ensures that the user interface is created in a way that not only satisfies users needs but also improves their entire experience by enabling

quick and easy communication with the program (Arifin et al., 2019).

Human-centered design (HCD) delivers various benefits by putting users at the center of the design process. Improved user experiences are the result of making sure solutions are tailored to the needs and preferences of users. Designers can improve the usability, functionality, and aesthetics of the solutions, resulting in more satisfying and intuitive user experiences, by comprehending users motivations and pain points. HCD also increases adoption and engagement as users are involved throughout the process, ensuring that the final product or service resonates with their requirements and expectations. Overall, HCD makes it possible to design user-centered solutions that improve user satisfaction, usability, and the success of the solution as a whole.

Therefore, Human-centered design (HCD) is an effective technique for developing user infterfaces of systems that meet user needs while minimising development risks and costs.

2.2.3 Usability

In order to create successful interactive software applications, usability is a crucial component of all software quality models. Usability can be summed up as how simple it is for users to learn, comprehend, and use a piece of software. To ensure that software applications meet the needs and expectations of their intended users, usability must be taken into account during the design and development phases. The most popular standardized test for determining perceived usability is the System Usability Scale (SUS) (Lengkana, Tangkudung, & Asmawi, 2018).

Another usability evaluation method is the USE Questionnaire, which tests learnability, efficiency, memorability, errors, and satisfaction. The USE Questionnaire can be used to evaluate the usability of Flutter as well, by assessing its learnability, efficiency, memorability, errors, and satisfaction. This method can provide valuable insights into the user experience of Flutter and help developers improve its usability.The USE Questionnaire is another tool for assessing usability; it measures satisfaction, memorability, efficiency, and learnability. The learnability, effectiveness, memorability, errors, and satisfaction of Flutter can all be evaluated using the USE Questionnaire. This approach can give developers insightful information about the Flutter user experience and aid in enhancing its usability(Madan & Dubey, 2012).

One of the usability test methods is the System Usability Scale (SUS) and this is a questionnaire-based method that can be used to determine the extent to which a system is useful from the user's subjective view (Defriani, Resmi, & Jaelani, 2021).

The System Usability Scale (SUS) is a questionnaire that consists of 10 questions aimed at measuring the perceived usability of a system. Respondents, who are users that have already interacted with the system being tested, are asked to rate their level of agreement with each statement on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree". The 10 statements cover various aspects of the system's usability, including its ease of use, consistency, and the need for assistance in using it.

The SUS questionnaire has been used in various studies to evaluate the

usability of different systems, including software and websites. The scores obtained from the questionnaire can be used to identify areas for improvement in the system's design and to compare the usability of different systems. The use of a standardised questionnaire like SUS allows for a consistent and objective assessment of system usability, making it a valuable tool for designers and researchers alike (Defriani et al., 2021).

2.2.4 Mobile-based Software

The term "mobile-based software" refers to software programs created especially for use on portable wireless computing devices like smartphones and tablets. The user can access these programs via a mobile web browser, a mobile app store, or pre installed versions that come preloaded on the device. In order to provide a wide range of functions and services, mobile-based software must take into account the requirements, limitations, and capabilities of mobile devices (González-Valenzuela, Chen, & Leung, 2011).

The majority of the adult population now owns a smartphone, which has become a crucial component of everyday life. The majority of time spent on smartphones is spent using applications, with the most popular categories being social networking, information, and gaming. The applications that offer offline services or enhance behaviour are those that are growing the fastest. Applications have supplanted conventional communication methods and have grown to be essential. While using applications, people are frequently influenced by customised advertisements, the views, and actions of their family and friends. This highlights

the importance of targeted advertising in the app industry and the impact of social influence on consumer behaviour. As such, companies must prioritise creating personalised experiences and leveraging social connections to remain competitive in this space (Zhang, Calabrese, Ding, Liu, & Zhang, 2018).

An application, commonly known as an app, is a type of software created specifically for small wireless devices. There are three types of apps: web-based, native, and hybrid. Web-based apps are stored on the internet and accessed through a web browser, while native apps are built for a particular platform, using specific code libraries to access the hardware features of the mobile device. Hybrid apps combine both web-based and native app features, allowing them to run across multiple platforms and access hardware features. Apps can provide direct access to existing websites, function as independent software, and collect data from device hardware.

Mobile apps have a multitude of advantages, including convenient access to device features and the ability to function as a marketing tool for businesses. Mobile apps can increase brand visibility and offer numerous features, including design and photography tools, easy banking operations, and educational resources for students. Furthermore, mobile apps are faster than traditional websites and can deliver a more seamless user experience.

Moreover, mobile apps are a useful way for businesses to remain at the forefront of their customers minds. They offer a simple and accessible way for users to engage with their mobile devices, and can provide valuable data on user activity and purchasing patterns, which can assist businesses in improving their products

and services. Additionally, mobile apps can enhance customer loyalty by providing a fresh avenue for customers to connect with a brand and participate in its loyalty program(Zhang et al., 2018).

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research design

In a study, a design of the research to be carried out is needed. This is done for research that is more planned and systematic. In this study, the type of research used is quantitative research.Quantitative research refers to a systematic and structured approach to investigating social phenomena, which involves the collection, analysis, and interpretation of numerical or statistical data. It is based on the assumption that social phenomena can be measured and quantified, and aims to identify trends, patterns, and relationships within data to test theories and draw conclusions. Quantitative research is often deductive in nature, uses formal hypothesis testing and statistical analysis, and can be used alone or in combination with qualitative research methods (Roger, 2016). Quantitative research is a type of research that is systematic, planned and structured, with the following research flow in the form of a flowchart or figure 3.1 as shown below.

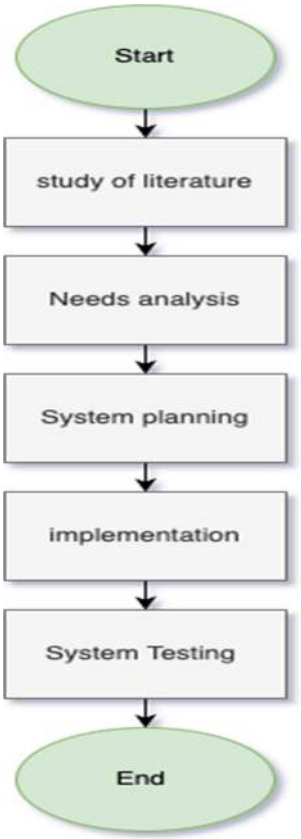

Figure 3.1 Research Flowchart

1. Study of literature

The literature study step in academic research involves a comprehensive review of existing literature related to a developing UI/UX of BIPA mobile Applications.It accomplishes a number of tasks, such as defining the research's scope, locating pertinent sources, reading and evaluating sources.

2. Needs analysis

This step involves gathering and analysing requirements from stakeholders to understand their expectations and constraints.In this phase, stakeholders are

identified, requirements are gathered, the current environment is analysed, requirements are prioritised, validated, and documented. This stage lays the groundwork for later phases, improving the likelihood of delivering successful software that satisfies specifications and adds value for stakeholders.

3. **System planning**

This step involves identifying project objectives, defining the scope, establishing requirements, developing a project plan, The goals, needs, and constraints of the project are clearly understood during this phase, which establishes the framework for the entire software development life cycle.System planning stage lays the foundation for effective software development.

4. **Implementation**

This step involves designing, module development, testing, debugging, version control, deployment, and user training. Successful implementation guarantees that design and plans are translated into a usable software system, laying the groundwork for further phases. To develop a high-quality software product, collaboration, adherence to design standards, and comprehensive testing and debugging are necessary.

5. **System testing**

This step involves planning, developing test cases, executing tests, tracking and resolving defects, and conducting user acceptance testing.System running, results recording, and defect reporting are all steps in the test execution process. User acceptance testing measures usability and business objectives whereas

performance testing analyses system capabilities under load and stress circumstances.

3.2. Human Centred Design (HCD)

Human Centred Design (HCD) is a development method that aims to make systems more interactive and useful for system users. It is a technique used during the process of building system interfaces that entails comprehending and identifying the context of usage, outlining user needs, coming up with creative solutions, and assessing designs. The use of HCD might lessen interface designs that are challenging for system users to comprehend (Prakoso & Hartomo, 2020).

The Human-Centred Design (HCD) methodology emphasises the value of improving the usability of interactive systems by utilising usability, human factors/ergonomics, and usability knowledge and methodologies. By using HCD, it is feasible to enhance a product's quality, raise the possibility that the project will be successfully completed, and lower the risk that the product won't satisfy stakeholder needs or be well-liked by users. HCD basically makes sure that a product is user-friendly, satisfies stakeholder needs, and is finished on schedule and on budget. This strategy has been proven to improve customer satisfaction and experience while lowering development costs and time to market.

Human-Centred Design (HCD) comprises two main approaches: ISO and IDEO. ISO focuses on improving the usability of interactive systems by applying human factors/ergonomics and usability knowledge. It prioritises user experience and incorporates techniques to enhance system usability. Conversely, IDEO is a problem-solving approach that centres around the target audience. By considering

the needs of users, IDEO aims to generate innovative solutions. Both ISO and IDEO are crucial for developing user-friendly products that meet stakeholder needs within project constraints. By integrating these approaches, a comprehensive HCD framework is established, emphasising user-centricity throughout the design and development process.

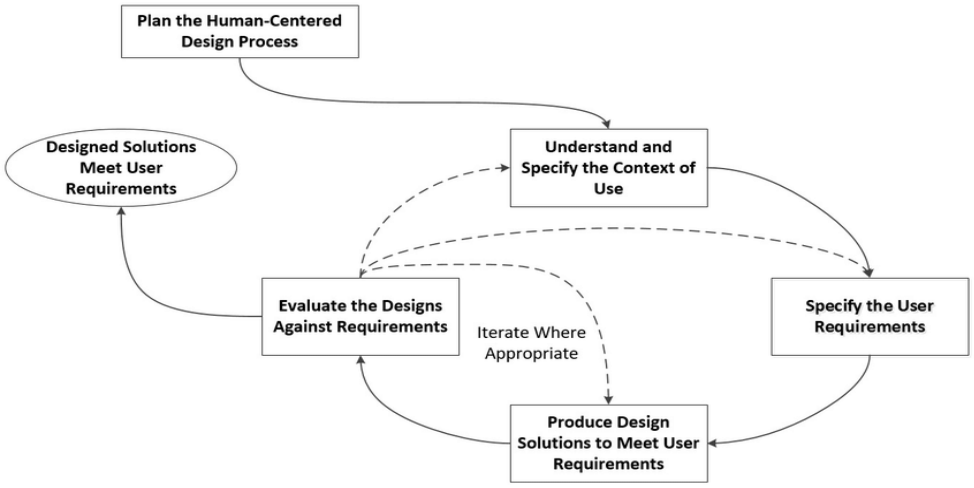

Figure 3.2 Human-Centered Design (HCD) Phases

3.2.1 Understand and Specify the Context of Use

Understand and specify the context of use is the first step in the Human-Centred Design (HCD) process, which is an approach to systems design and development that aims to make interactive systems more usable by focusing on the use of the system and applying knowledge and techniques from the fields of human factors/ergonomics and usability, is to comprehend and specify the context of use. Gathering data on the users, tasks, and settings where the interactive system will be used is what this activity entails. Users and other stakeholder groups, user characteristics or user groups, user goals and tasks, and environment(s) of the system are the four primary parts of the context-of-use

description. Designers can acquire a thorough knowledge of the intended use of the interactive system by incorporating these components in the context-of-use description and guarantee that it is designed to meet the needs of its intended users.

In the context of user-centred design, a comprehensive understanding of the context of use is essential. This understanding involves considering several components. Firstly, the users and other stakeholder groups need to be identified, encompassing those who will be utilising the interactive system and other stakeholders impacted by its use. Secondly, the characteristics of the users or user groups must be assessed, including physical, cognitive, and emotional abilities, as well as preferences and expectations. Thirdly, the goals and tasks of the users need to be identified, focusing on the objectives they aim to achieve and the specific actions they will undertake within the system. Lastly, the environment in which the system will be utilised must be considered, encompassing physical and social factors that may influence its usage. By incorporating these components into the context-of-use description, designers can gain a holistic understanding of how the interactive system will be employed and ensure its effective alignment with user needs.

3.2.2 Specify the User Requirement

Specifying user requirements refers to the process of precisely defining and describing the needs and expectations of users for a specific system or product.Creating quantifiable statements that describe the desired functionality, behaviour, and usage of the system from the viewpoint of the user is required. To make sure that interactive systems effectively meet user needs, this stage is

essential in the design and evaluation of those systems. Developers and designers may match their efforts with user expectations and provide solutions that are user-centric, practical, and pertinent by articulating user requirements in a clear and concise manner.

The result of the Specify the user requirement activity is a clear and measurable statement of the needs and expectations of the users for a particular system or product. These claims provide a framework for creating and assessing interactive systems that satisfy user needs. Throughout the project, the requirements should be constant, verifiable, and updateable as needed. Designers may guarantee they are developing systems that are useable, effective, and efficient for their intended users by defining user requirements.

Usability testing can be used to measure user demands and goals linked to usability difficulties. This entails figuring out and comprehending the precise needs and goals users have in terms of usability. Researchers and designers can acquire empirical data to evaluate the degree to which these objectives and aims are met by conducting usability testing. Usability testing enables the observation and evaluation of user interactions with a system, revealing information on the system's usability, usability, effectiveness, and efficiency. Usability testing data is used to guide iterative design modifications and guarantee that the final product meets usability objectives and user expectations.

In the creation of software, user needs should be specified in accordance with guidelines. These specifications must be described in quantifiable ways to enable for usability testing and other forms of impartial evaluation. To ensure that

they are in line with expectations and needs, they should be validated by the pertinent stakeholders. Maintaining a list of criteria that is logical and free of inconsistencies requires consistency. Throughout the project, user requirements should be able to be modified to reflect changes and user input. In order to support efficient system design and development, user requirements should generally be explicit, quantitative, verifiable, consistent, and adaptive.

3.2.3 Produce Design Solution

The "Produce Design Solution" step in the Human-Centered Design (HCD) methodology involves the creation of a prototype that embodies the developed solution based on user needs and requirements identified in prior stages.Designers build prototypes that are very similar to the finished product using a variety of tools and methods, including drawings, wireframes, mockups, and physical models. After that, consumers evaluate these prototypes to provide input on their usability, functionality, and general design. Prior to moving on to the following development phases, this iterative method enables designers to adjust their design in response to user feedback. the possibility of developing an effective, user-centred solution.

A persona is a descriptive profile of a person who stands in for a certain user group. It offers a thorough grasp of the traits, actions, requirements, and objectives of users. Personas are utilised by the whole team, including designers, developers, marketers, and executives, to assist us understand the diversity of consumers and acquire insights into the end-users. Personas help us to avoid making assumptions and prejudices about users since they serve as a reminder that

they might not share our viewpoints, tastes, or skills. Personas give the design process a human touch by ensuring that the team keeps the end users in mind and creates goods or services that are tailored to their particular needs. This leads to better user experiences and higher user satisfaction.

A scenario is a story that depicts how a user interacts with a system. It is crucial to the design process for a number of reasons. In the beginning, scenarios aid in transforming design ideas into a concrete design framework, enabling designers to picture how users will interact with the system. Second, because they offer a way to gauge a design's viability, usability, and efficacy, scenarios are essential for verifying the work that has been done. Additionally, scenarios provide the whole team—including designers, developers, marketers, and executives—a thorough grasp of the end-user, hence fostering a user-centric approach. By employing scenarios, the team may get rid of preconceived notions and biases about the user, acknowledging that different users may have various viewpoints, requirements, and preferences.

3.2.4 Evaluate The Designs Against Requirements

The last phase in the Human-Centred Design (HCD) process involves comparing designs to requirements. In this stage, the developed designs are evaluated to see how well they adhere to the established user criteria. Designers collect information through usability testing, user feedback sessions, and other assessment techniques to find any gaps or inadequacies in fulfilling the criteria. Designers obtain insights about areas for improvement by comparing the designs to industry standards and best practices. Iterative design modifications are

informed by requirements evaluation, which also guarantees that the final product is user-centred and meets specified user demands. Making decisions, prioritising design enhancements, and continuously improving the user experience are all made easier by this method. Overall, the assessment phase is crucial for confirming the success of the design, guaranteeing user pleasure, and promoting ongoing progress.

3.3 Place and Time of Research

This research took place at the Indonesian culture centre in Cairo. Puskin (Pusat kebudayaan Indonesia Kairo). The time of the research was carried out from April 2023 to June 2023, with details as in table 3.1.

Table 3.1 Research timeline

No	Activity	2023												
		April				May					June			
1	Study of literature													
2	Needs analysis													
3	System planning													
4	Implementation													
5	System testing													

3.4 Research Subjects and Objects

3.4.1 Population

According to Shukla (2020) Population refers to the set or group of all the units on which the findings of the research are to be applied. And the Meaning of Population is the entirety of a group of individuals or objects possessing a particular characteristic under study, and for whom the findings of research can

be extrapolated. The population represents the complete set of units that can be included in the study and upon which the research can be applied. It is the basis for drawing accurate conclusions from the research and serves as a critical parameter for ensuring the generalizability and validity of the study's findings.

The population in this study are active student in Indonesian culture centre in Cairo. Puskin (Pusat kebudayaan Indonesia Kairo). The number of students registered in Puskin periode III 2022 will have a total of 258 students.

3.4.2 Sample

Shukla (2020) provides several definitions of a sample. Firstly, a sample is described as a representative portion of a larger population under study. Secondly, it refers to any subset of the population that encompasses all the different types of elements found within that population. Finally, a sample can be seen as a small quantity of something that is taken from a larger entity, providing information and insights about the entity as a whole. These definitions highlight the importance of selecting a sample that accurately reflects the characteristics and diversity of the population being studied, allowing researchers to draw meaningful conclusions and generalisations. (Satishprakash Shukla, 2020)

Which can refer to a subset of a larger population, selected to provide an understanding of the population's characteristics. The selection of a representative sample that captures the diversity of the population is crucial to ensure the validity and accuracy of research findings. Therefore, the careful selection of a sample is a critical component of research design, as it can impact the generalizability and validity of the study's conclusions. A statistically significant sample can offer

dependable information about the population from which it was drawn.

The number of samples used in this study is determined by the Slovin formula:

$$n = \frac{N}{1+ Ne^2}$$

Information:

n : number of samples

N : total population

e : error rate (10%)

In this study the error rate or (e) is 10%, while N is 539. So the minimum samples taken by researchers are:

$$n = \frac{N}{1+ Ne^2}$$

$$n = \frac{258}{1+ 258(0.1)^2}$$

$$n = \frac{258}{1+ 258(0.01)}$$

$$n = \frac{258}{1+ 2.58}$$

$$n = \frac{258}{3.58}$$

n = 72.0670 rounded up to 72

Based on the Slovin formula, a sample of 72 students was obtained from a population of 258 students.

3.4.3 Sampling Technique

In this study, the sampling technique used was purposive sampling. Purposive sampling is a sampling technique in which the researcher intentionally selects informants based on their ability to elucidate a specific theme, concept, or phenomenon. It is a sampling design that is not intended to offer a representative sample but rather to hone in on particular phenomena and/or processes (Etiken, Musa, & Alkassim, 2016).

Purposive sampling is a sampling technique utilised by researchers to investigate a particular phenomenon or process. Unlike random sampling, which seeks to generate a representative sample of a population, purposive sampling involves selecting participants who can offer unique and insightful perspectives on the research topic. This method is especially advantageous when faced with budgetary constraints or when the population of interest is complex to define or access. By deliberately selecting participants based on their capacity to explicate a specific theme, concept, or phenomenon, researchers can increase their chances of obtaining detailed and comprehensive data, enabling a more profound understanding of the research problem. Nonetheless, it is crucial to acknowledge that the results of purposive sampling may not be applicable to the broader population and, therefore, the findings must be analysed in the context of the study's limitations.

The criteria needed are that Active students are at Indonesian culture centre in Cairo. Puskin periode III 2022 (Pusat kebudayaan Indonesia Kairo) and have accessed the BIPA official website.

3.5 Research Instruments

The research instrument in this study was a questionnaire based on the SUS method. The questionnaire has a 5-point Likert scale. Respondents were asked to provide an assessment of the 10 SUS statement items according to their subjective assessment. Respondents were asked to provide ratings "Strongly Disagree (SD)", " Disagree (D) ", " Hesitate (H)", "Agree (A)", and "Strongly Agree (SA)" on the 10 SUS statement items according to with subjective judgement.

Table 3.2 Statement Items for System Usability Scale (SUS) Method (Sembodo, Fitriana, & Prasetyo, 2021)

NO	Statement Items
1	I often use/visit BIPA Application
2	I think the BIPA Application is too complex (loads a lot of unnecessary stuff)
3	I think the BIPA Application is easy to navigate
4	I need technical assistance to use/browse the BIPA Application
5	I think that the functions/features provided in the BIPA Application are well designed and prepared
6	I think there are too many inconsistencies in the BIPA Application
7	I feel that most people will find it easy to use/explore the BIPA Application quickly
8	I consider the BIPA Application to be very complicated to explore
9	I feel very confident exploring BIPA Application
10	I need to learn many things before I can properly explore the BIPA Application

3.6 Data Sources

3.6.1 Primary Data Sources

Primary data is data obtained directly from the results of interviews, observations, and questionnaires distributed to a number of sample respondents. In this quantitative research, primary data can be obtained through interviews, observation, and working on task scenarios and questionnaires distributed by researchers to respondents.

3.6.2 Secondary Data Sources

Secondary data is information that has already been gathered and published by another party. This information is not gathered by the researcher directly; rather, it is gathered from publications like books, journal articles, government reports, and online databases. Secondary data can be used in a thesis to support or disprove a hypothesis or to give background knowledge on a particular subject. Primary data, or information gathered by the researcher directly through techniques like surveys, experiments, or observations, is frequently contrasted with secondary data (Pratiwi, Rachmawati, & Pharmawati, 2015).

3.7 Data Collection

3.7.1 Questionnaire

A questionnaire is a list of inquiries made to people in order to gather statistics about a particular subject. Questionnaires can be an essential tool for making claims about particular individuals, groups, or entire populations when they are carefully designed and implemented (Satya & Roopa, 2017).

Which means A questionnaire is a research instrument that is used to collect data by asking a sequence of questions to individuals or groups of people. It is an essential tool for gathering information about a particular subject, population, or phenomenon. When carefully planned and implemented, questionnaires can provide reliable and valid statistics from which to make claims and draw conclusions about the target community. A questionnaire's questions can be open-ended or closed-ended, and they can cover a broad range of topics. It is critical to ensure that the questions are clear, concise, and relevant to the study objectives. Proper administration and analysis of questionnaire answers can provide valuable insights into the research topic and support informed decision-making.

3.7.2 Observation

Observation is a research method that involves collecting data using one's senses, especially looking and listening in a systematic and meaningful way. It is one of the oldest and most fundamental research methods approaches and Observation can be either participant or non-participant, direct or indirect (Ciesielska & Jemielniak, 2017).

Observation is a well-established research method that entails systematically and meaningfully gathering data through one's senses, particularly looking and listening. It is an essential approach to collecting information on people, objects, and events that has been utilized for centuries. The observer may either participate in the activity being observed or observe it from a distance. In participant observation, the researcher actively takes part in the observed activity, while in non-participant observation, the researcher observes from a distance. The

observation can be either direct, where the researcher directly observes the subject, or indirect, where the researcher collects data from secondary sources, such as video recordings. Observation is useful for collecting both qualitative and quantitative data, and it is particularly advantageous for understanding behaviour, attitudes, and beliefs. It is, however, critical to ensure that ethical standards are followed, and that the participants provide informed consent before conducting the observation.

3.7.3 Interview

An interview is a data collection technique used by researchers to gather information from individuals. It can be structured, semi-structured, or unstructured depending on the level of flexibility and predetermined questions (Adhabi & Anozie, 2017).

An interview is a commonly employed data collection method in research wherein a series of questions are presented to gather information from individuals. The manner in which an interview is conducted can be categorised as structured, semi-structured, or unstructured, based on the degree of flexibility granted in terms of question presentation. Structured interviews have a predetermined set of questions, while semi-structured interviews allow some scope for the respondent to offer additional information. Unstructured interviews are the most flexible in terms of the topics that can be covered. Interviews can be conducted in a variety of ways, including in-person, over the phone, or online. Interviews are an effective means of obtaining detailed information about individuals' experiences, opinions, and beliefs. Proper planning is essential, as establishing a rapport with the

respondent is crucial in ensuring honest and accurate information. Additionally, confidentiality and ethical standards must be upheld throughout the interview process.

3.8 Data Analysis

Data analysis was conducted in this study after the collection of data, employing a descriptive data analysis approach. The analysis utilized the System Usability Scale (SUS) as a theoretical framework for assessing usability in the usability test study. The calculation of the SUS value involved several steps. Firstly, the Likert scale responses from the 10 statements were transformed into numerical values. Next, the scores obtained from respondents were calculated using the SUS formula.as follows:

Table 3. 3 Score system for System Usability Scale (SUS) Method

NO	Answer	Score
1	Strongly Disagree (SD)	1
2	Disagree (D)	2
3	Hesitate (H)	3
4	Agree (A)	4
5	Strongly Agree (SA)	5

After the SUS score is obtained, the next step is to find the average by adding up all the scores and dividing it by the number of respondents. Here's the formula for calculating the average:

$$\bar{x} = \frac{\sum x}{n}$$

Information:

$\bar{x}$ = Average score
Σx = Sum of SUS scores
n = Number of Respondents

The standard SUS score is 68 with a total score of 100 points, if the SUS score is above 68, it can be interpreted as satisfied (Sarwani Sarwani,2020) . when you have gotten the results from the SUS score, a system can be determined which category it belongs to based on table 3.4

Table 3.4 value category for System Usability Scale (SUS) Method

SUS Score	Grade	Adjective Rating
>80.3	A	Excellent
68 – 80.3	B	Good
68	C	Okay
51 – 68	D	Poor
<51	F	Awful

CHAPTER IV

RESULTS AND DISCUSSION

In this chapter, the implementation of the Human-Centered Design (HCD) method used to develop the UI/UX of the BIBA application will be explained.

4.1 System Implementation

The implementation stage is the most typical technique to incorporate a strategy into a framework that will be developed using a PC programming approach. The built system implementation is based on Figma.

4.1.1 Client Hardware Requirements

1. Network : GSM / HSPA / LTE
2. Operating system (OS) : Android Jelly Bean, v16, 4.1.x or newer, and iOS 8 or newer
3. RAM : 2GB

4.1.2 Software Requirements

4.1.2.1 Figma

Figma is a popular design tool for creating user interfaces for mobile applications, desktop applications, websites, and other applications. It may be used online while running on the Windows, Linux, or Mac operating systems. The benefit of collaborative work is provided by Figma, which enables numerous

people to collaborate on the same project from various places. Figma is a well-liked option among UI/UX designers for quickly producing prototypes for websites or applications because to its collaborative capacity, speed, and efficiency (Naufal, Faruq, Aufan, Islam, & Walisongo, 2022).

4.1.2.2 Web Browser

A web browser is a program or piece of software that is used to navigate the internet or search for information from web pages saved on a computer. Initially, web browsers could only display text and were text-oriented. Modern web browsers can play multimedia files like music and video files in addition to showing text and photos, though. Additionally, web browsers can send and receive emails, process HTML as input, and display web pages as useful output. Internet users may quickly access a variety of information on the internet by utilizing a web browser. Web browsers include, among others, Internet Explorer, Mozilla Firefox, Safari, and Opera (Aryani, Wahyudin, & Fazri, 2015).

4.1.2.3 Canva

Canva is a free online design tool that makes it easy to make logos , videos, wallpaper whenever and wherever you are. For instructors, it is simple to use and access. Canva offers appealing designs with a variety of templates, features, and categories that satisfy customers' needs for certain themes (Rahmawati & Atmojo, 2021).

4.2 Understand and specify the context of use

The Understand and Specify The Context Of Use stage involves the data

collection process, which was conducted following the User Research phase. User Research is an activity aimed at gathering data from potential users to support UI/UX design in the BIPA application. In this study, data was collected through online questionnaires and interviews with prospective users. These methods were employed to obtain valuable information for the design process.

4.2.1 Questionnaire

The first step will be a survey using an online questionnaire. The questionnaire was compiled on the Google Form platform, the questionnaire contains questions based on the data needed and as a reference for designing UI/UX BIPA applications. Online questionnaires were distributed to active BIPA students. From the distribution of questionnaires, the following data were obtained:

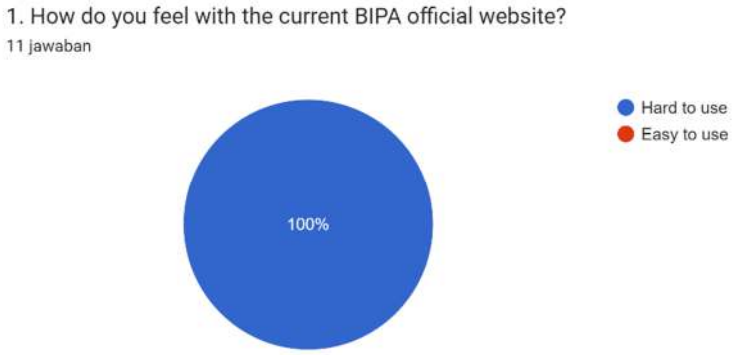

Figure 4.1 Questionnaire Results 1st question

The results of the questionnaire data above show that 100% of prospective users feel difficulties in the process of using BIPA oficial website . this because a majority of bipa students still use offline tools .

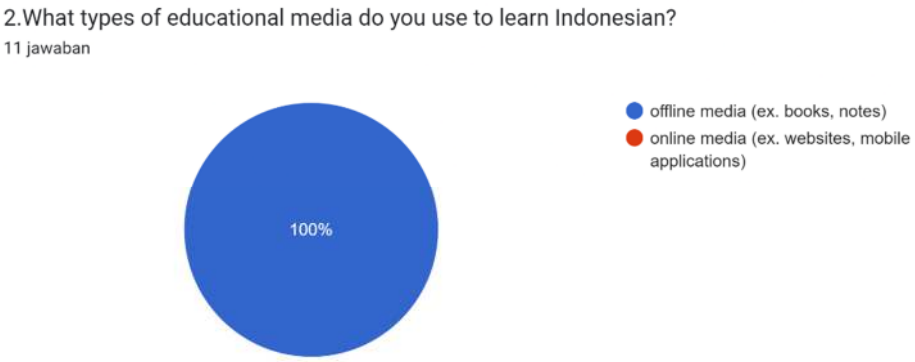

Figure 4.2 Questionnaire Results 2nd question

The results of the questionnaire data above show that 100% of prospective users do not use online education media in thier studies .

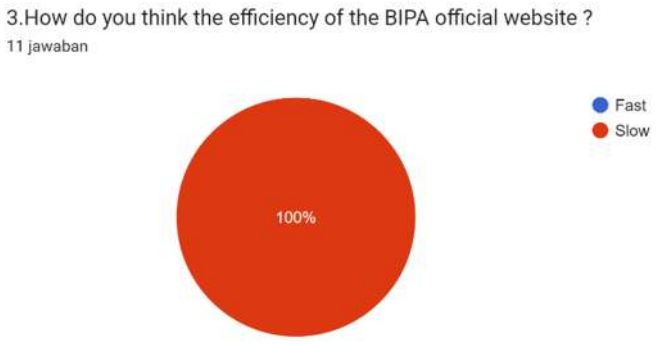

Figure 4.3 Questionnaire Results 3rd question

The results of the questionnaire data above show that 100% of prospective users feel that BIPA official website is slow when they browsing it.

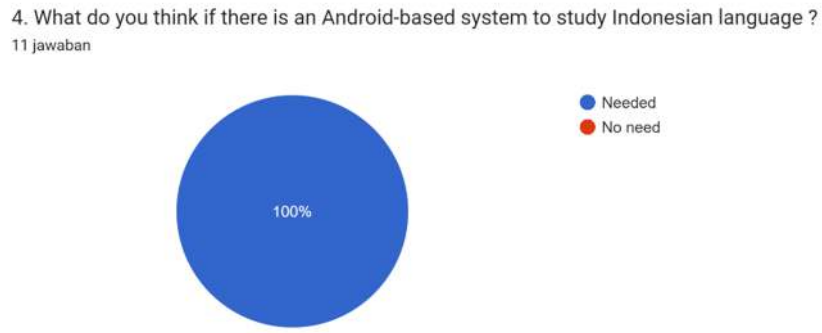

Figure 4.4 Questionnaire Results 4th question

The results of the questionnaire data above show that 100% of prospective users feel that they need an Android-based system to study Indonesian language.

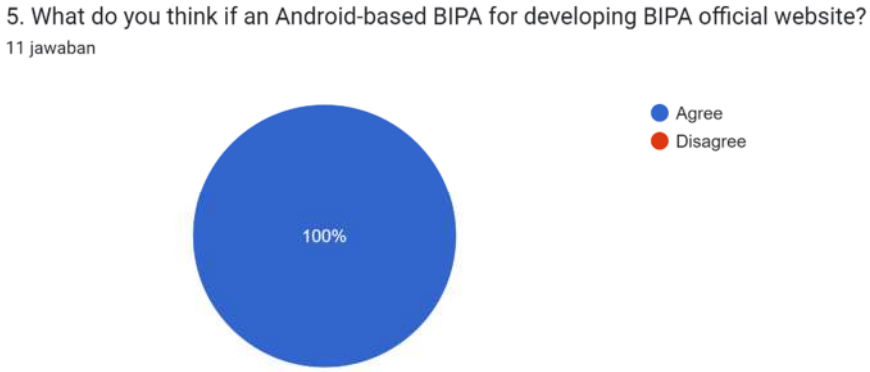

Figure 4.5 Questionnaire Results 5th question

The results of the questionnaire data above show that 100% of prospective users Agree that they will accept an Android-based system to study Indonesian language.

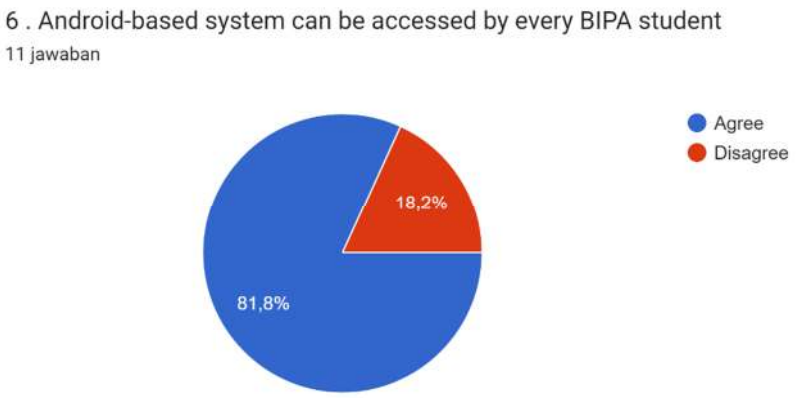

Figure 4.6 Questionnaire Results 6th question

The results of the questionnaire data above show that 81.8 % of prospective users Agree that an Android-based system to study Indonesian language can be accessed by all students this because some of respondands can not use Inernet in some places in Egypt.

The results of data collection through a questionnaire can be concluded that prospective users find it difficult when learning Indonesian at this time, because the learning process still uses offline media and the official website can be felt to be long and takes quite a long time to be accessed. Therefore we need a system to be used to facilitate the process of learning Indonesian such as an Android-based application.

4.2.2 Interview

The next step is to conduct interviews with prospective users. The purpose of conducting interviews is to obtain additional data and information that is not obtained from the results of the questionnaire. The results of the interviews will

be compiled and used as a reference in designing the UI/UX of the BIPA application in addition to the results of the online questionnaire. The interview process will be conducted with Puskin Cairo (Indonesian culture center in Cairo) students, so as to describe user segmentation and the problems experienced by users. The conclusion that can be drawn from the interview process is that the factors that are the problem of this research: the Indonesian language learning process is still carried out offline without using technology learning media, the BIPA official website is slow, causing many students not to use the BIPA official website. So it is less effective and the process takes a very long time. There are often errors on the official Bipa website, such as features submitted in Indonesian, even though the user changes the website language to English.

4.3 Specify The User Requirements

The Specifying stage The User Requirements or User Needs Specification stage, in which the process of defining user needs and the requisite functional specifications is carried out. At this stage, numerous approaches are used to identify user demands, including User Personas and User Scenarios.

4.3.1 User Persona

The User Persona was obtained from the results of interviews in the User Research process which was carried out on students of the Cairo Puskin, namely Yasmin Al_shihaby as an active Puskin student. The User Persona describes the identity and background of the user, as well as the problems, goals and expectations of potential users for the application. The following is the User

Persona of prospective users that has been compiled:

Figure 4.7 User Persona

4.3.2 User Scenario

In the User Scenario process, the background of how problems arise and the need for BIPA application design will be explained. User scenarios are created based on situations, actions, and attitudes that correspond to the settings that potential users face.

Figure 4.8 User Scenario

4.4 Produce Design Solution

The Producing design solutions stage is the activity of mapping the framework, designing or designing and developing solution design ideas based on the identification of needs that have been obtained in the previous process.

4.4.1 System design

The Producing design solutions stage or creating a solution design, which is the activity of mapping the framework, designing and developing solution design ideas based on the identification of needs that have been obtained in the previous process.

4.4.2 Use Case Diagram

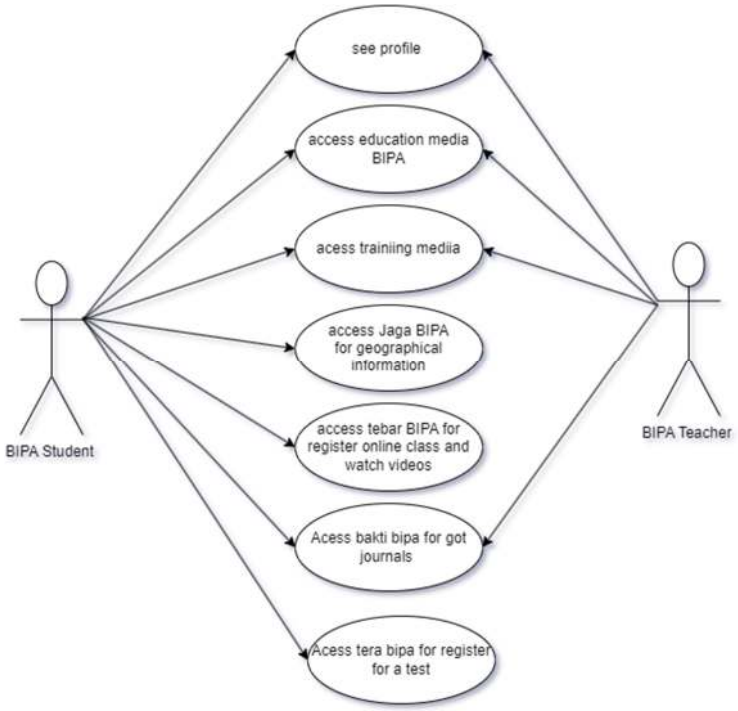

Figure 4.9 Use Case Diagram

Figure 4.9 shows that there are several actors in charge of operating the

BIPA application, namely BIPA students and BIPA teachers.BIPA students can access their profiles , education media , training media , BIPA geografical Information , register for BIPA classes , download jounals , and register for tests . while BIPA Teachers can see profiles , access Education Media , acess geografical Information ,and access bakti BIPA for download or share a journal.

4.4.3 Activity Diagram

Viewing user profiles, explaining the workflow of a process to view user profiles.

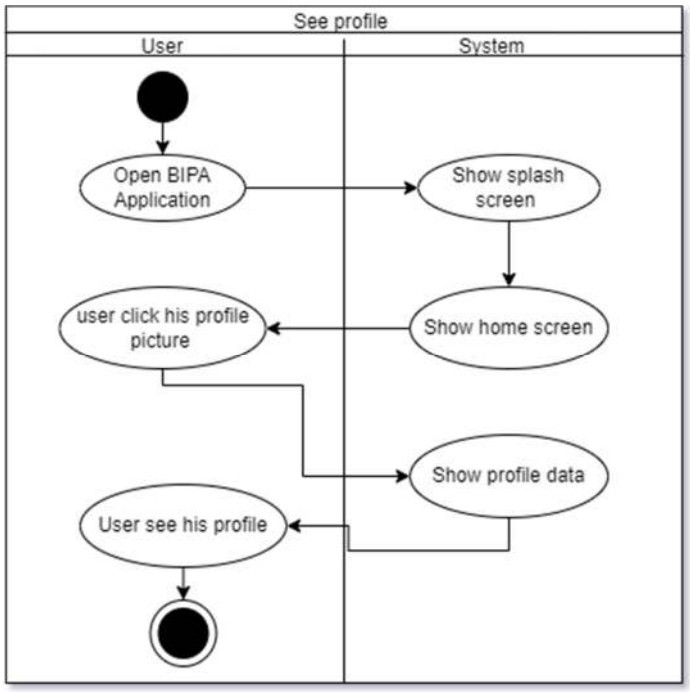

Figure 4.10 Activity Diagram View profile

Access to educational media, explaining the workflow of a process for accessing educational media.

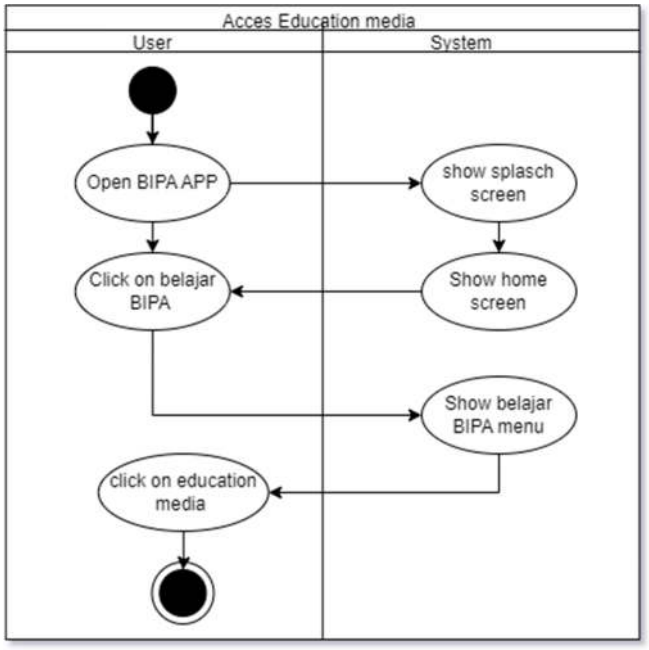

Figure 4.11 Activity Diagram Access Educational Media

Access to training media, explains the workflow of a process for accessing training media.

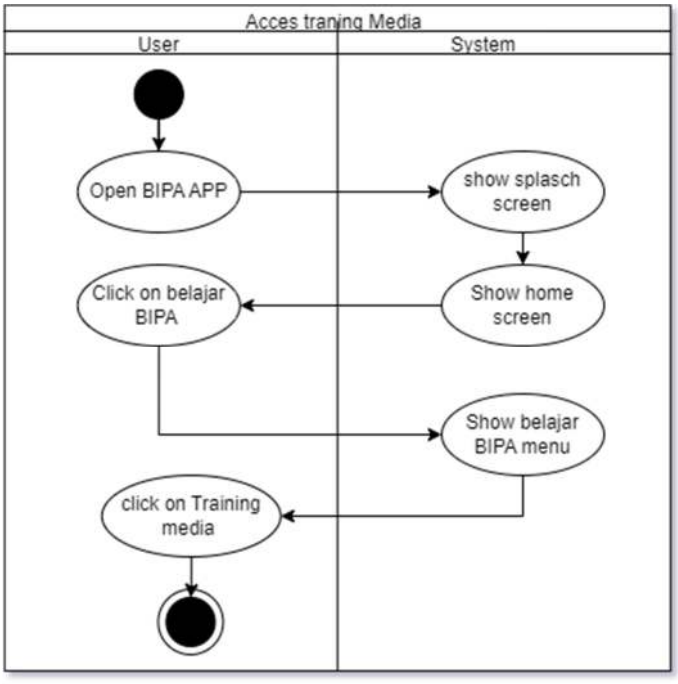

Figure 4.12 Activity Diagram Access Training Media

Geographic information access , describes the workflow of a process for accessing geographic information.

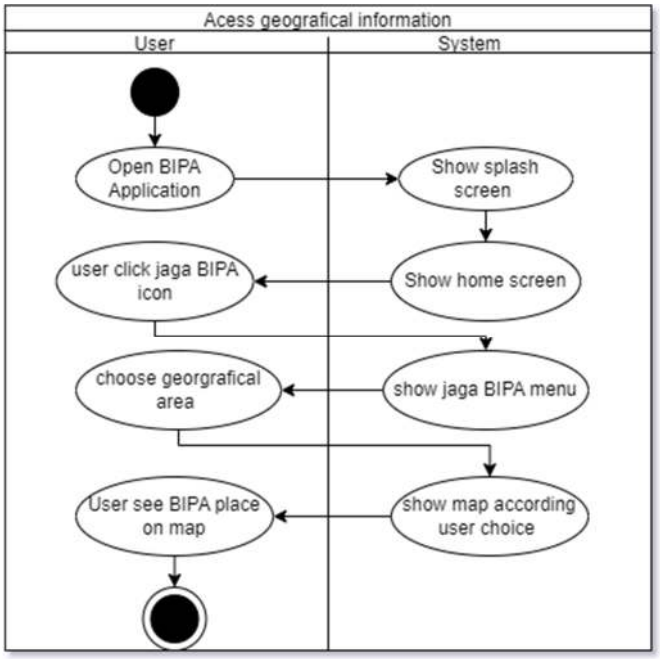

Figure 4.13 Activity Diagram Access geografical Information

Register online class , describes the workflow of a process to register online class.

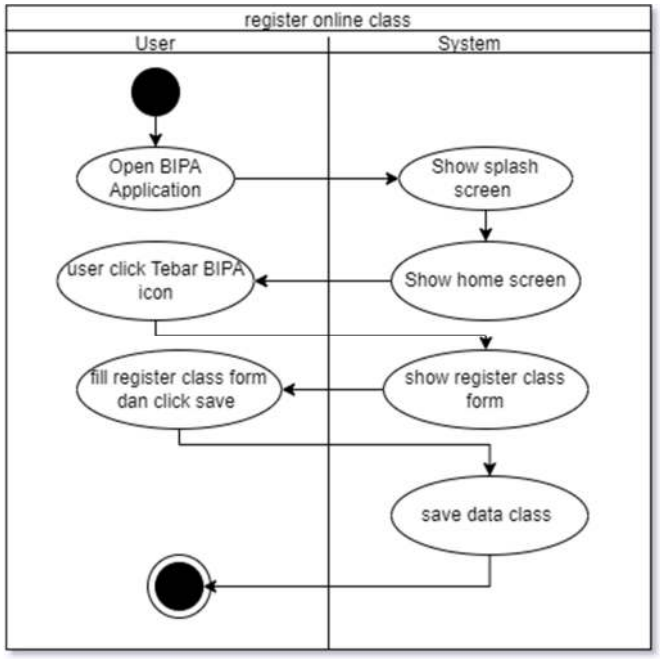

Figure 4.14 Activity Diagram Register online class

Access to journals and scientific papers, explaining the workflow of a process for accessing journals and scientific papers.

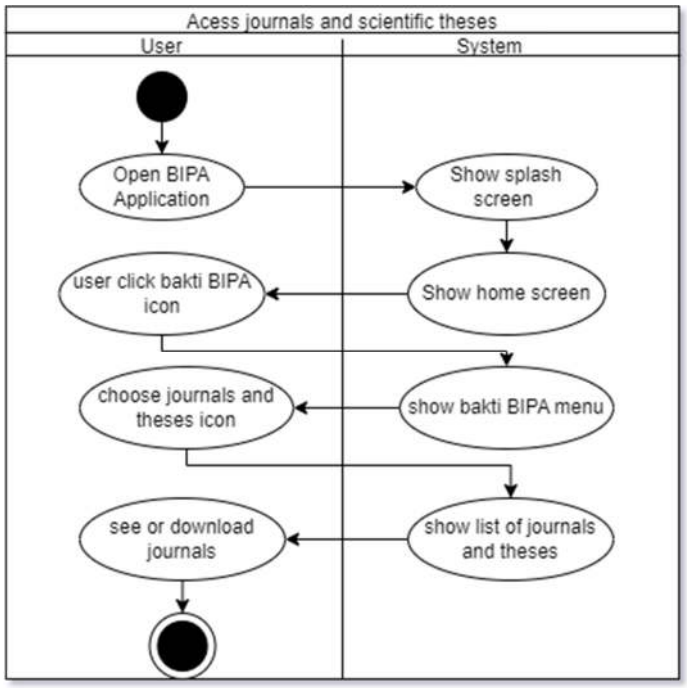

Figure 4.15 Activity Diagram Access to journals and scientific papers

Indonesian exam register , describes the workflow of a process for Indonesian language exam register.

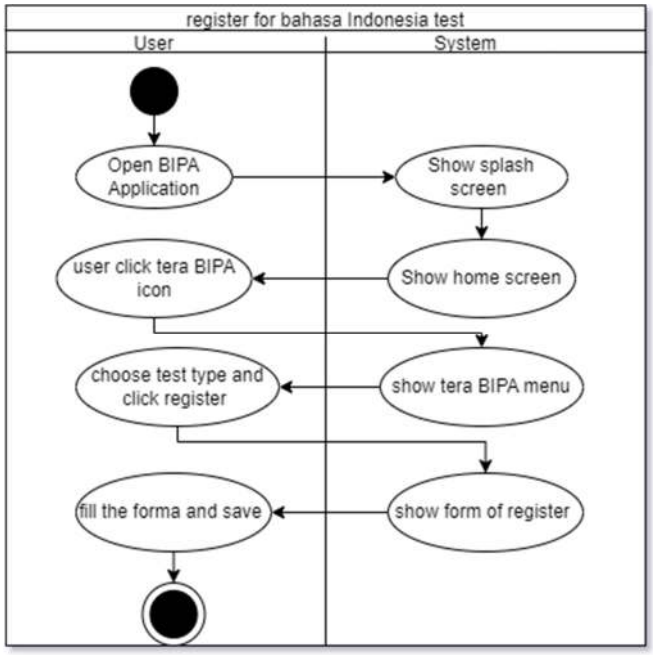

Figure 4.16 Activity Diagram Indonesian exam register

4.4.4 Sitemap

In this process, the Sitemap or BIPA application framework mapping is carried out. This process will produce an application framework in the form of an application page structure, features, and application content that can provide an overall picture of the application. The following is the BIPA application sitemap:

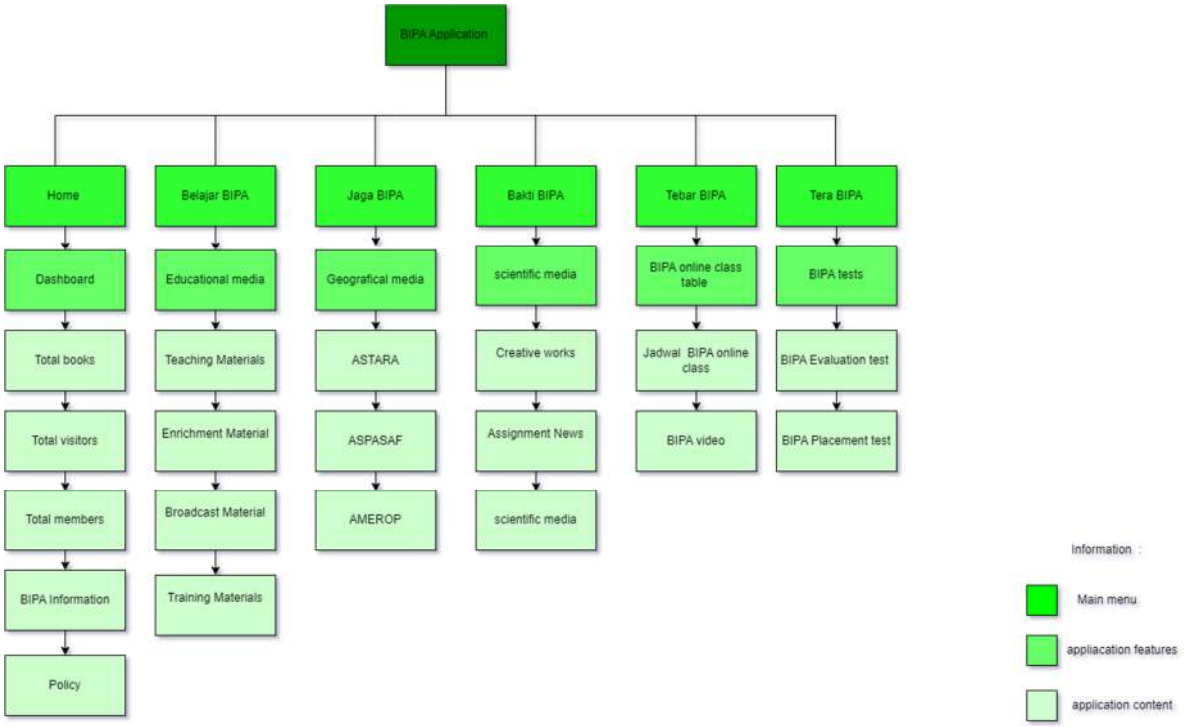

Figure 4.17 Sitemap

The sitemap above explains that the BIPA application has a main menu, features and content. The main menu in this application is Home, Learn BIPA, Spread BIPA, Take Care of BIPA, Serve BIPA, and Tera BIPA. The features on the Home menu are in the form of a dashboard that presents content regarding BIPA application information, total visitors, total books. The features on the BIPA Learning menu are BIPA learning tools with content that can be used to get

Indonesian language material and practice. Furthermore, the BIPA Guard menu with the feature displays the position of the BIPA world wide office. Then the bipa service feature which can provide explanations about scientific and creative media lesson materials then the bipa spread feature which can give users information about BIPA online class schedules, and the tera bipa feature which can provide users with information about BIPA exams.

4.4.5 User Flow

Additionally, the application's or user's flow will be organized. At this point, a number of processes are formed, which the user will employ to run the program. The splash screen is shown as soon as the program launches, and after that, you may access the main menu and see the application dashboard.

Then the user can select the BIPA Learning menu for the process of viewing Educational media which proposes an educational media menu and will allow the user to select one of the features to submit a list of available data. Then the user can select the BIPA Guard menu which allows the user to find the nearest Bipa office where the user will be able to choose the continent where he lives, then the application will submit a map and list the Bipa office location. Users can also select the BIPA Bakti menu which displays a list of scientific works and will display creative works that can be submitted to the user. Users can also select the Tebar BIPA menu which displays an online class schedule that the user can choose to enroll in one of the classes, then the application will store the name of a student in one of the classes. Users can also select the Tera BIPA menu which displays the types of exams that the user can take. The user flow is depicted in Figure 4.18.

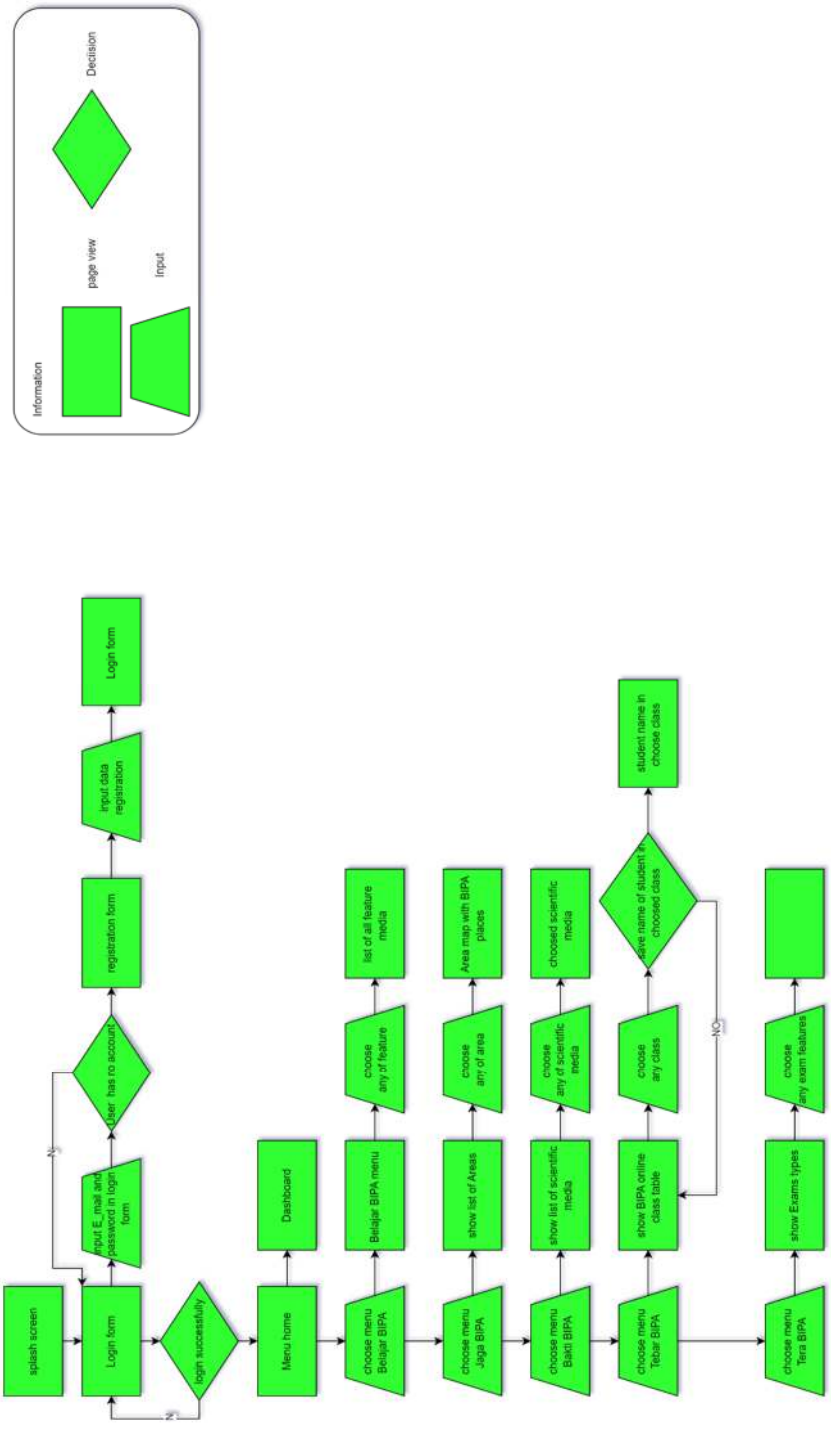

Figure 4.18 Userflow

4.4.6 Prototyping

In the previous process, namely the preparation of the sitemap and userflow, an application framework has been obtained. Then in this process the development of the application framework will be carried out into an application display design. The application display design is built by going through several stages:

A. Low-Fidelity Prototype

In this process a Low-Fidelity Prototype will be built or commonly referred to as a wireframe, which is an overview of the initial design of the application, in the form of a simple display design or sketch regarding the features available in the application and the layout or layout of the components that are on each application page view. The wireframe design was built with the help of Figma.

- **Wireframe of Splash Screen page**

Figure 4.19 Wireframe Splash Screen

The splash screen page wireframe design has a logo in the middle of the page.

- **Wireframe of Login page**

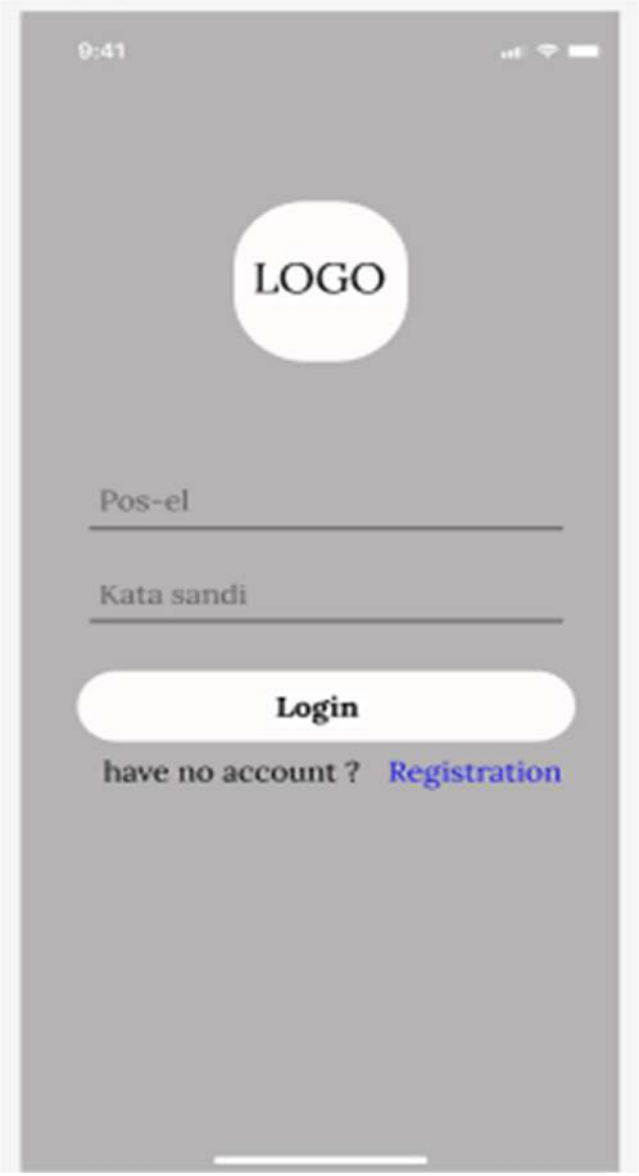

Figure 4.20 Wireframe login page

The Login page wireframe design has a logo in the middle of the page and have an input places for E-mail and password and button for login and ask for registration.

- **Wireframe of Registration page**

Figure 4.21 Wireframe of Registration page

The Registration page wireframe design has a logo in the middle of the page and have an input places for name , surname, date of birth ,E-mail and password and button for signup and ask for login if user have an account.

- **Wireframe of Home page**

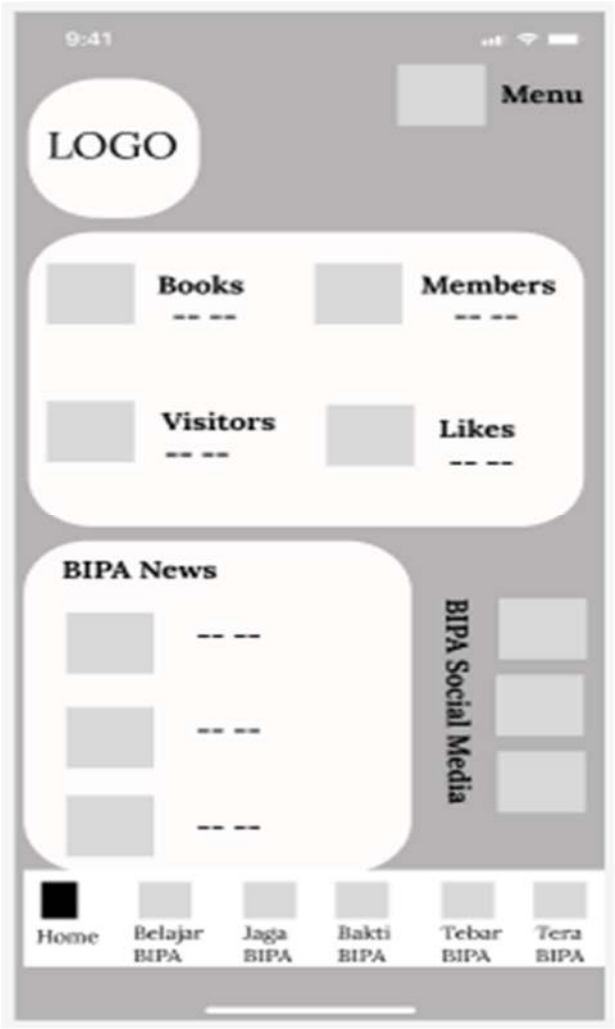

Figure 4.22 Wireframe of home page

The Home page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page also show data about visitors ,books and , BIPA news and bipa social media , in the button of this page there is a bar which present application features .

- **Wireframe of belajar BIPA page**

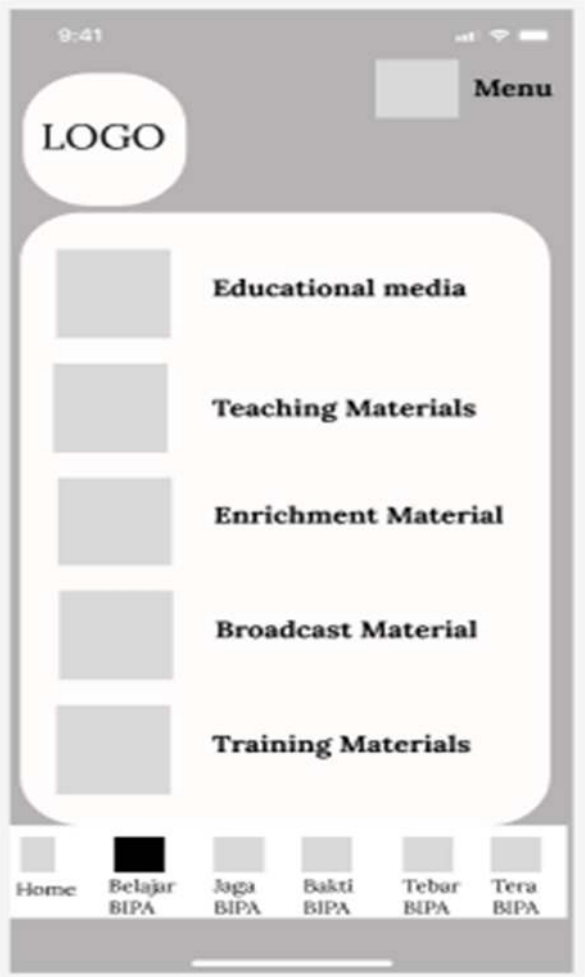

Figure 4.23 Wireframe of belajar BIPA page

The belajar BIPA page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page also show main features of belajar BIPA it shows icon and name of features.user can choose one to go check what need from this features .

- **Wireframe of Media belajar BIPA page**

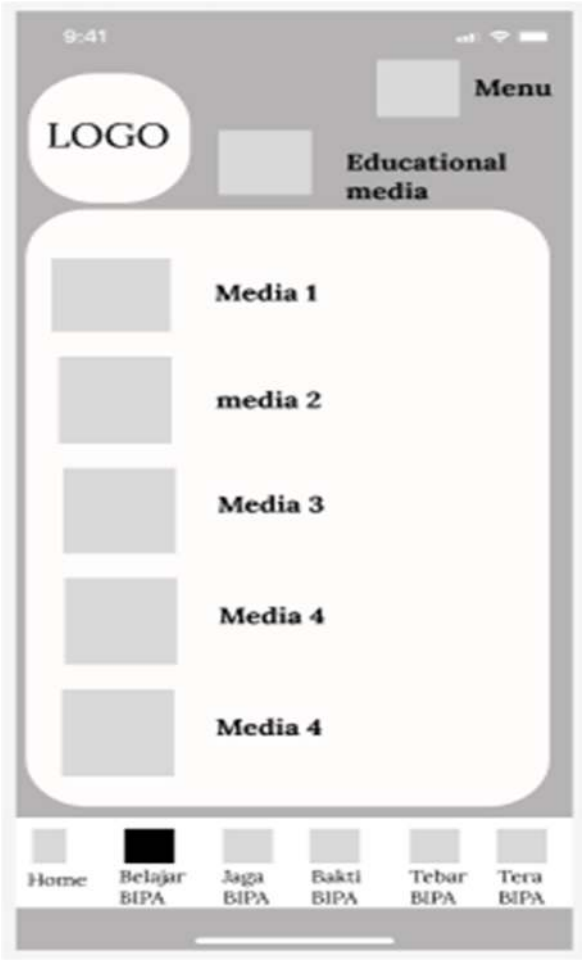

Figure 4.24 Wireframe of media belajar BIPA page

The media of belajar BIPA page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page also show one tipe of application data .whcih is educational media this wireframe shows how media will appear for user.

- **Wireframe of Jaga BIPA page**

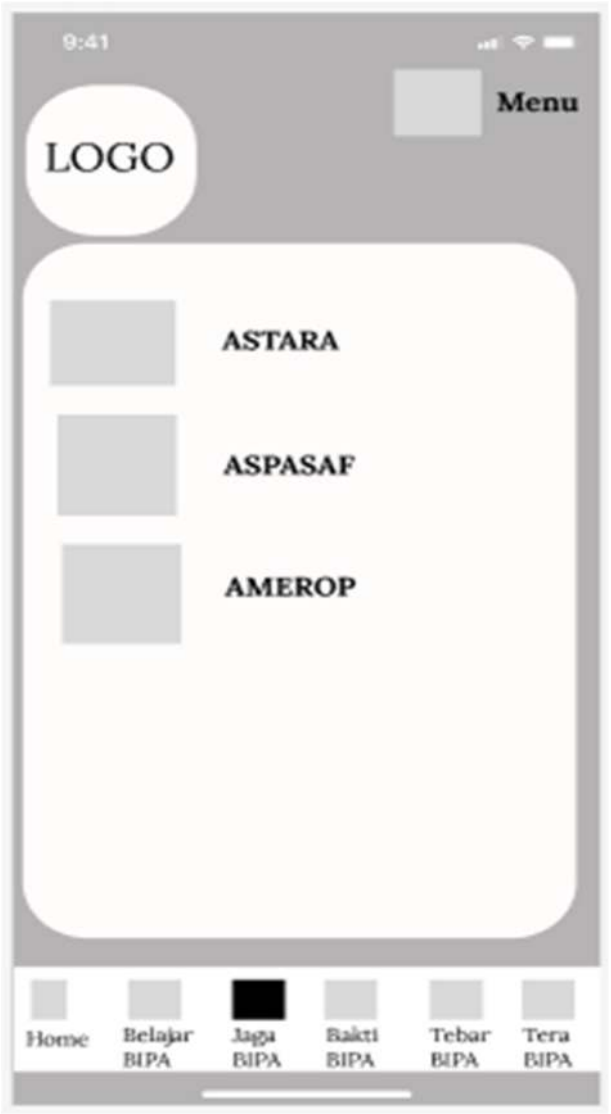

Figure 4.25 Wireframe of jaga BIPA page

The Jaga BIPA page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show three world areas which based on continent .

- **Wireframe of Jaga BIPA map page**

Figure 4.26 Wireframe of jaga BIPA page

The map Jaga BIPA page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show map of choosed area and give user the place of BIPA offices.

- **Wireframe of Bakti BIPA map page**

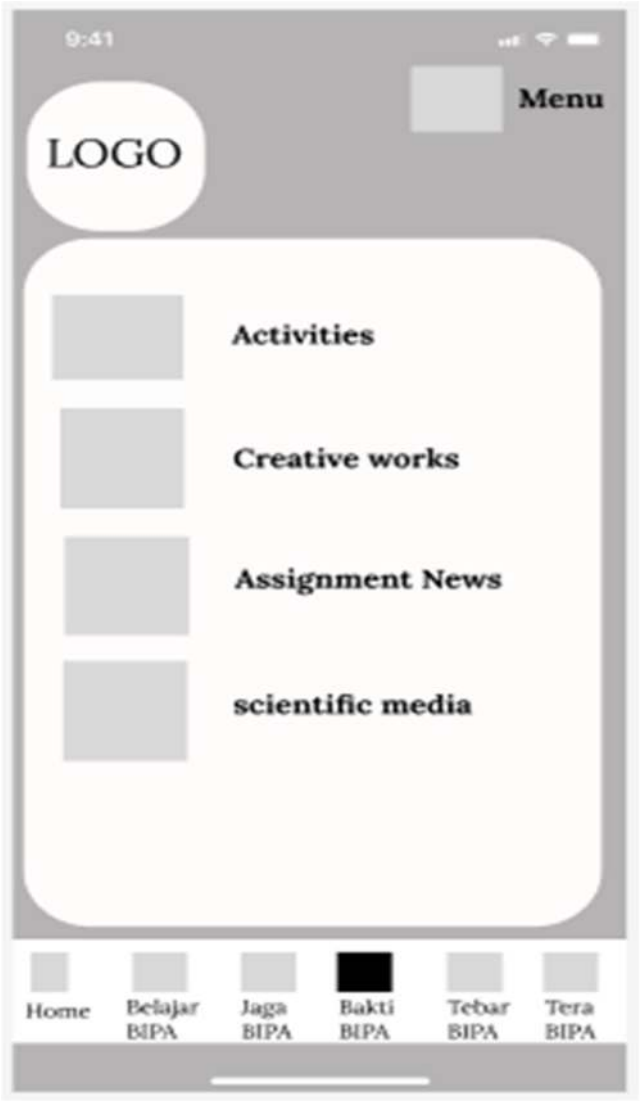

Figure 4.27 Wireframe of Bakti BIPA page

The Bakti BIPA page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show main features of bakti BIPA it shows icon and name of features.user can choose one to go check what need from this features .

- **Wireframe of activity Bakti BIPA map page**

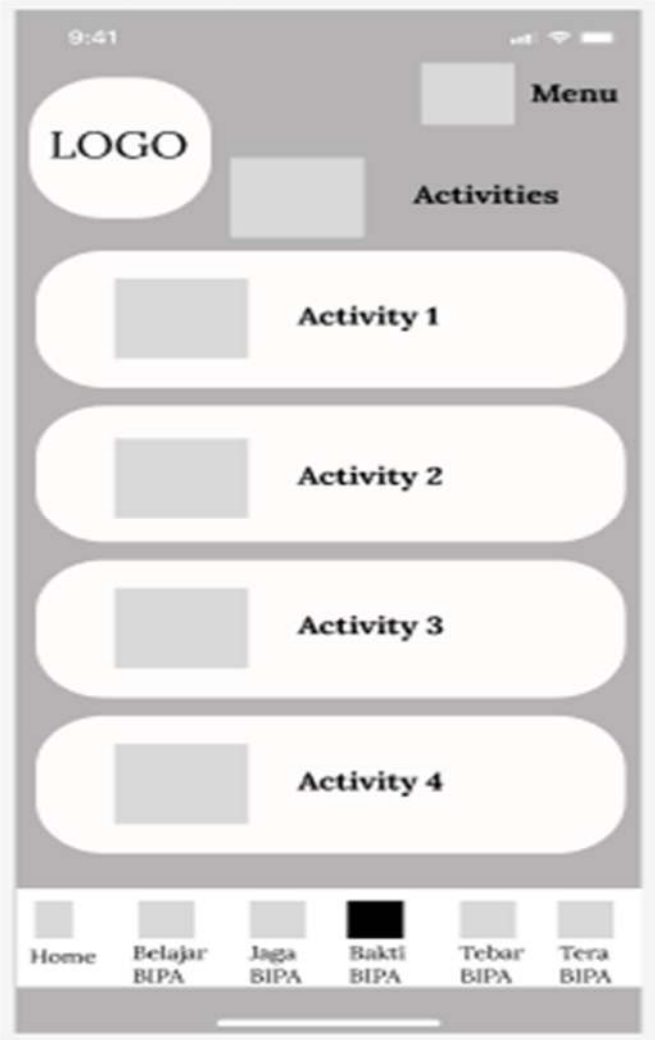

Figure 4.28 Wireframe of Bakti BIPA activities page

The Bakti BIPA activity page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show BIPA activities list for user .

- **Wireframe of Tebar BIPA map page**

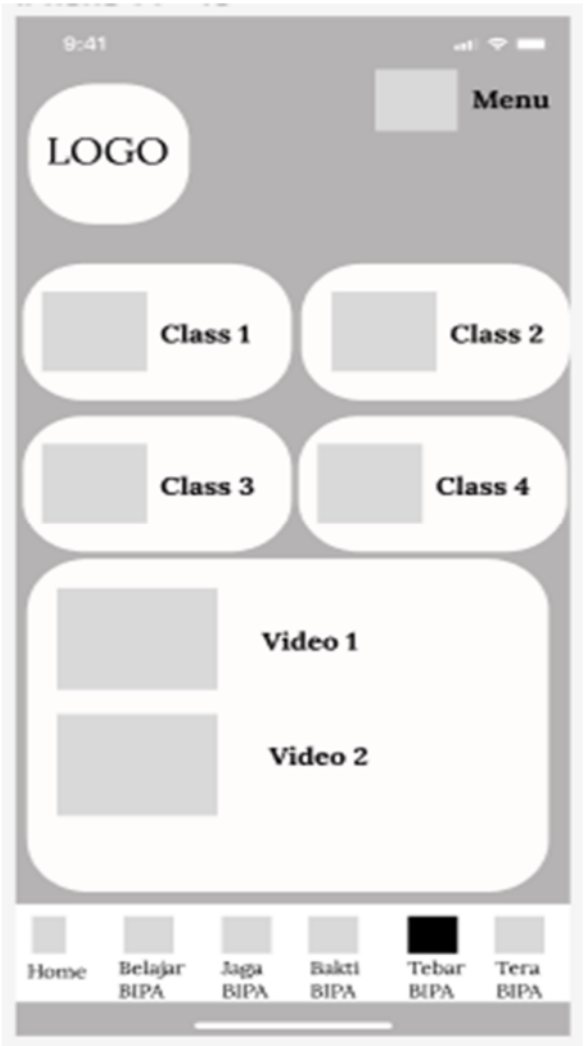

Figure 4.29 Wireframe of Tebar BIPA page

The Tebar BIPA activity page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show main features of tebar BIPA which are classes and videos .

- **Wireframe of Class Tebar BIPA map page**

Figure 4.30 Wireframe of class Tebar BIPA page

The Class Tebar BIPA activity page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show picture and main information about class and button for join class .

- **Wireframe of Tera BIPA map page**

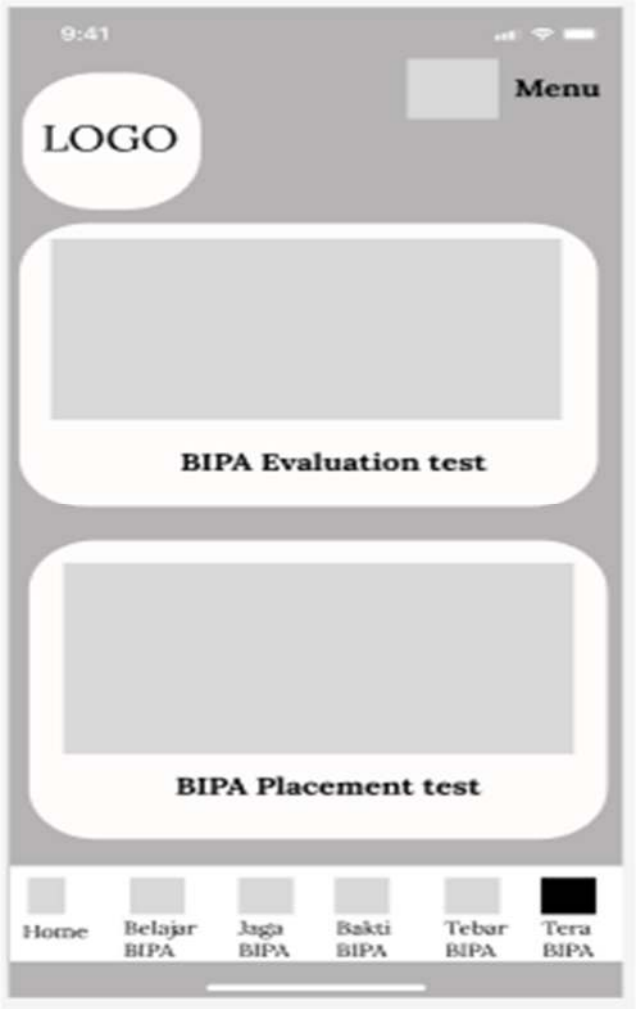

Figure 4.31 Wireframe of Tera BIPA page

The Class Tera BIPA activity page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show main benifit of Tera BIPA which show and provides information about BIPA exams .

- **Wireframe of Exam Tera BIPA map page**

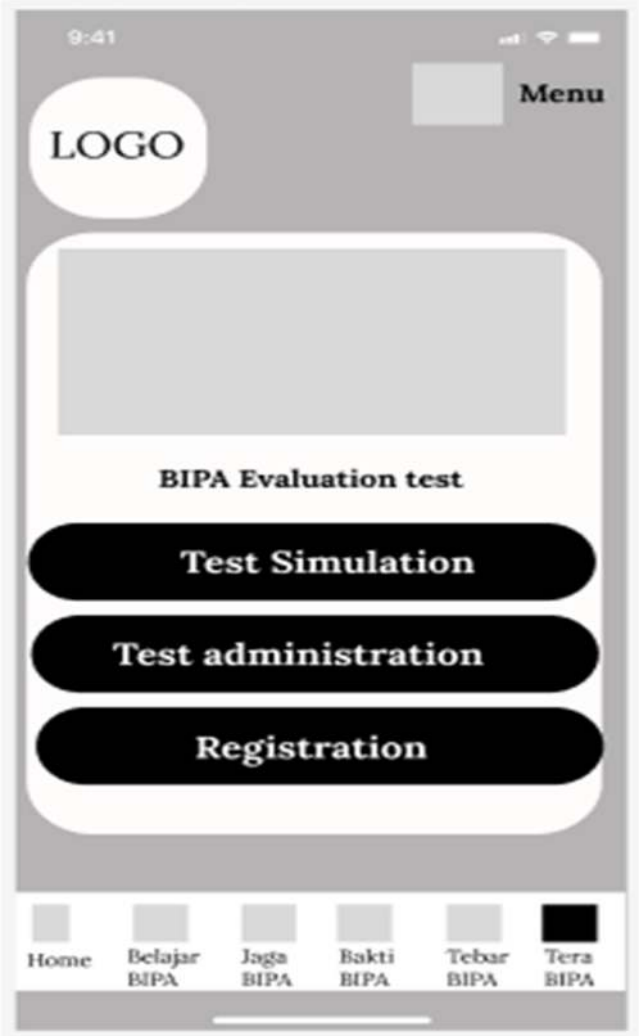

Figure 4.32 Wireframe of Exam Tera BIPA page

The Class Exam Tera BIPA activity page wireframe design has a logo in the top of the page and have menu which will show profile of user and this page show how exam will apear after user click on one type of exams in Tera BIPA and show user main choices such as test simulation, test administrations and registrations.

B. High-Fidelity Prototype

The Following the acquisition of an adequate application sketch design, it will be improved to a High-Fidelity Prototype, also known as an application mockup. During this procedure, a thorough application display design that is near to the end product will be created. The design is created by combining the system design with ready-made materials like as colors, fonts, icons, and pictures, as well as incorporating Interactive Prototypes, which allow the design to function like a final product. The colors utilized symbolize BIPA's identifying colors, with red and white being the primary hues.

Figure 4.33 Color pallette

The typeface used is Lora . Lora has a style without indentations or tails at the ends of the letters, making it easier to read.

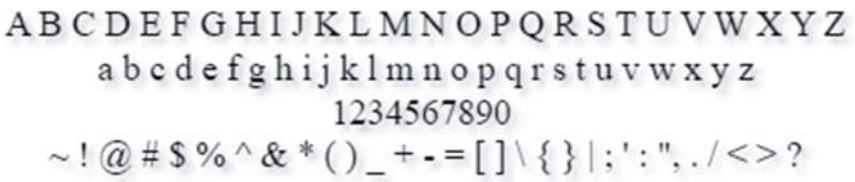

Figure 4.34 Typeface Lora

At this stage the application design was built with the help of Figma to develop the wireframe design into a mockup design. So that it can produce the following designs:

- Mockup Splash Screen page

Splash screen is the initial page that is displayed on the screen when the user opens the application.

Figure 4.35 Mockup Splash Screen page

- Mockup Login page

The Home page take Email and password from user and if he has no email , login page redirect user to registration page .

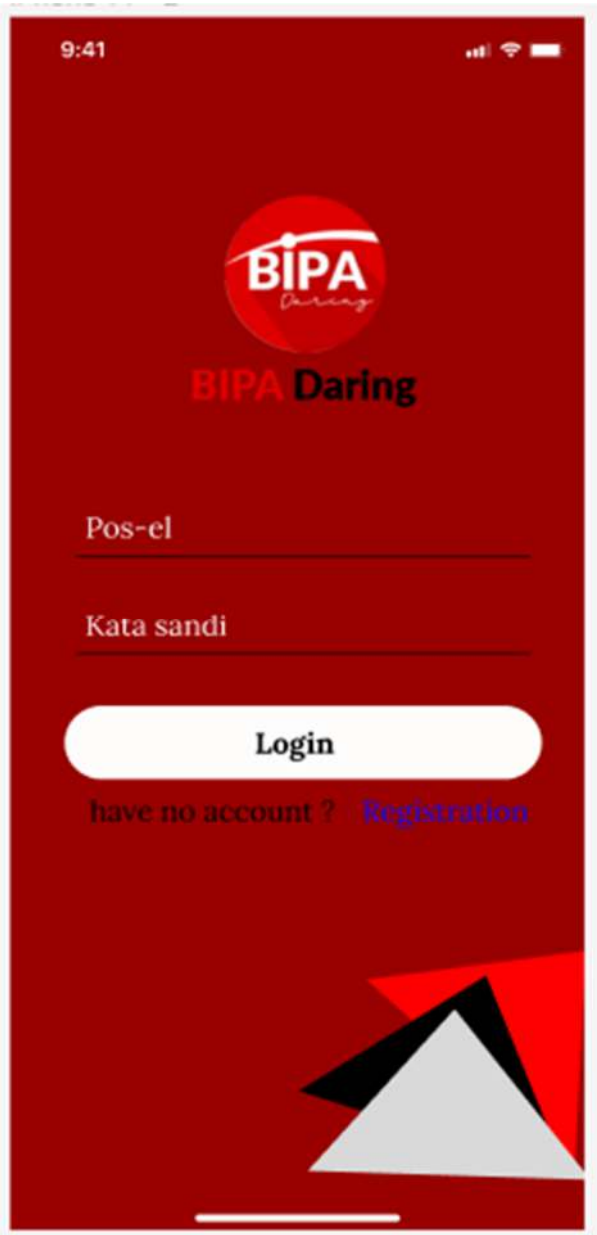

Figure 4.36 Mockup login page

- Mockup Registration page

Registration page is used to register a new user by accepting user data , user input name , surname, date of birth ,E-mail and password and button for signup and ask for login if user have an account.

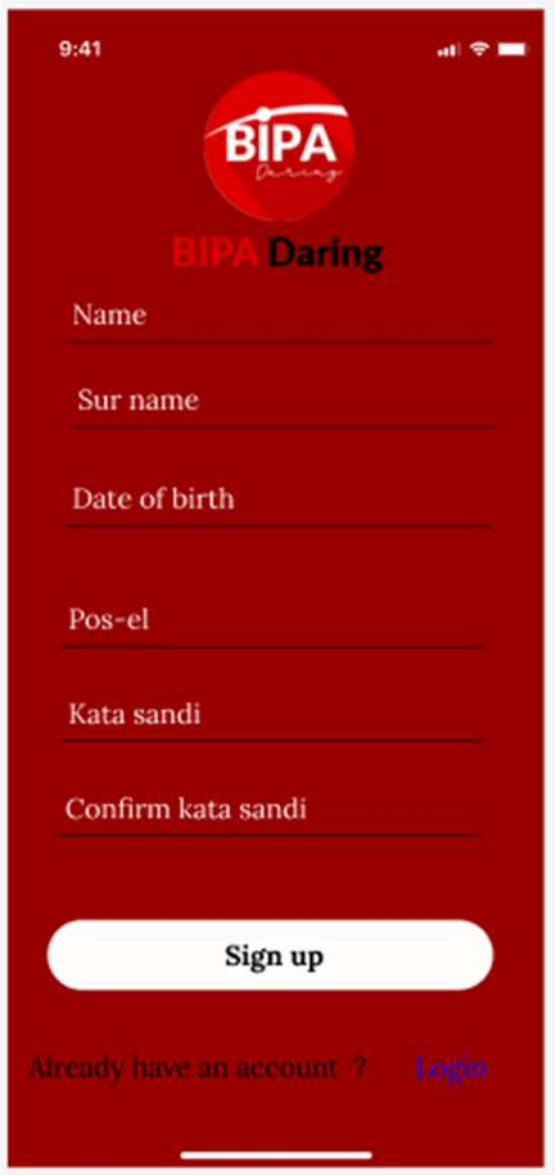

Figure 4.37 Mockup Registration page

- Mockup Home page

Home page show data about visitors ,books and , BIPA news and bipa social media , in the button of this page there is a bar which present application features .

Figure 4.38 Mockup Home page

- Mockup belajar bahasa Page

Belajar BIPA page show main features of belajar BIPA it shows icon and name of features.user can choose one to go check what need from this features.

Figure 4.39 Mockup Belajar BIPA page

- Mockup Belajar BIPA Media Page

Belajar BIPA Media Page show one tipe of application data .whcih is educational media this wireframe shows how media will appear for user.

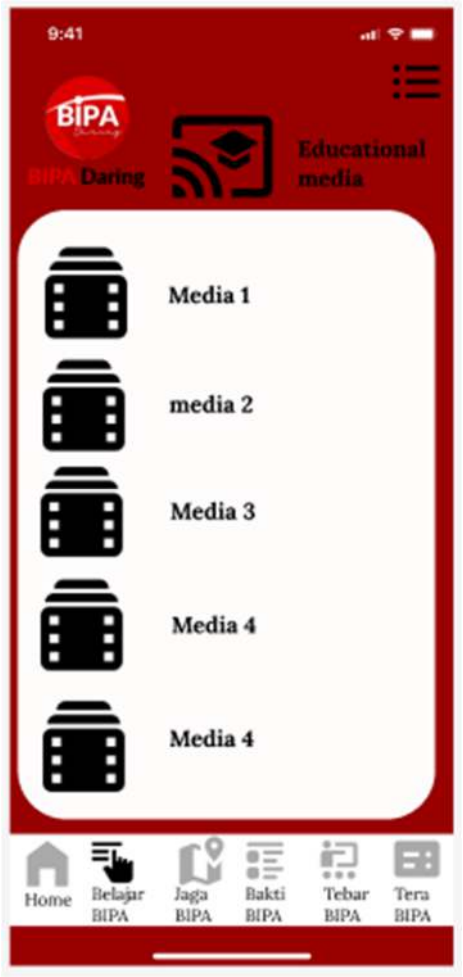

Figure 4.40 Mockup Belajar BIPA media page

- Mockup Jaga BIPA page

Jaga BIPA page show three world areas which based on continent .

Figure 4.41 Mockup jaga BIPA page

- Mockup Jaga BIPA Map page

Jaga bipa map page show map of choosed area and give user the place of BIPA offices.

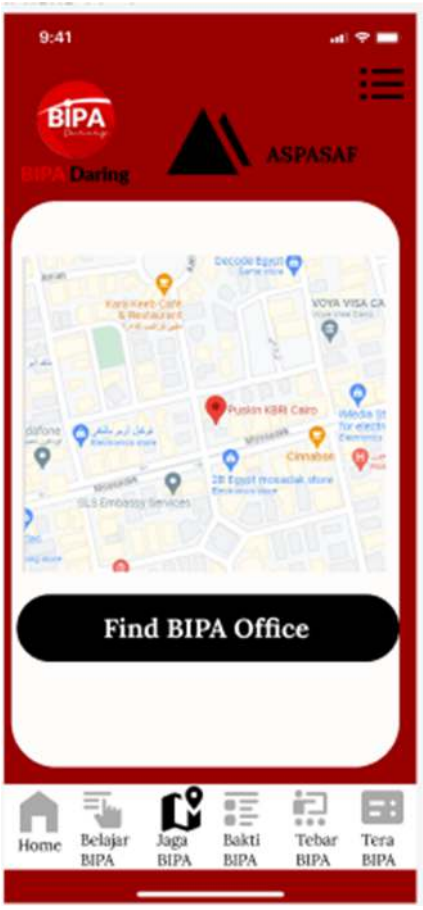

Figure 4.42 Mockup jaga BIPA map page

- Mockup Bakti BIPA

Bakti BIPA page will show main features of bakti BIPA it shows icon and name of features.user can choose one to go check what need from this feature .

Figure 4.43 Mockup Bakti BIPA page

- Mockup Bakti BIPA Activity Page

  Bakti BIPA activity page show BIPA activities list for user.

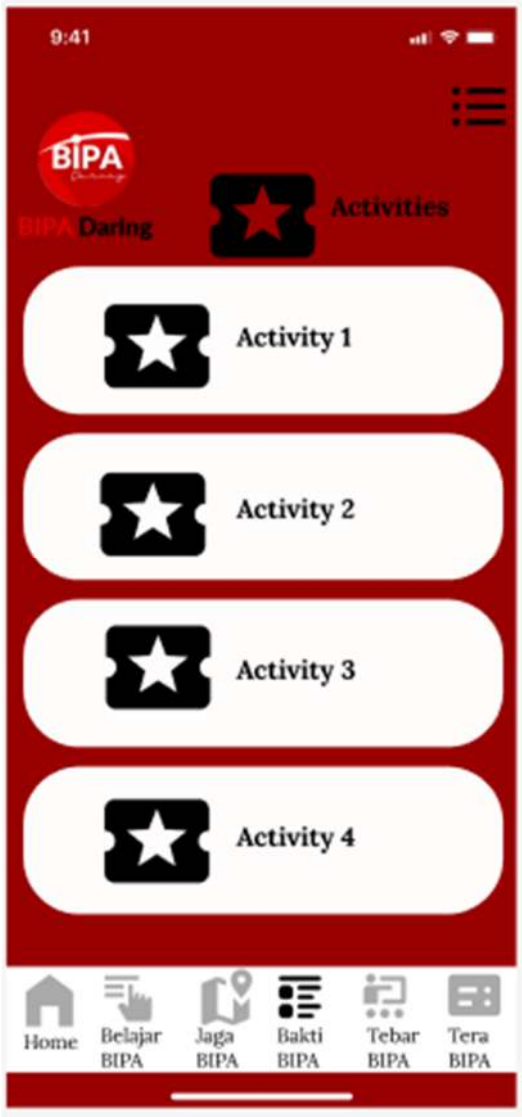

Figure 4.44 Mockup Bakti BIPA activity page

- Mockup tebar BIPA page

  Tebar BIPA page show main features of tebar BIPA which are classes and videos

Figure 4.45 Mockup Tebar BIPA page

- Mockup Tebar BIPA Class page

Tebar BIPA Class page show picture and main information about class and button for join class .

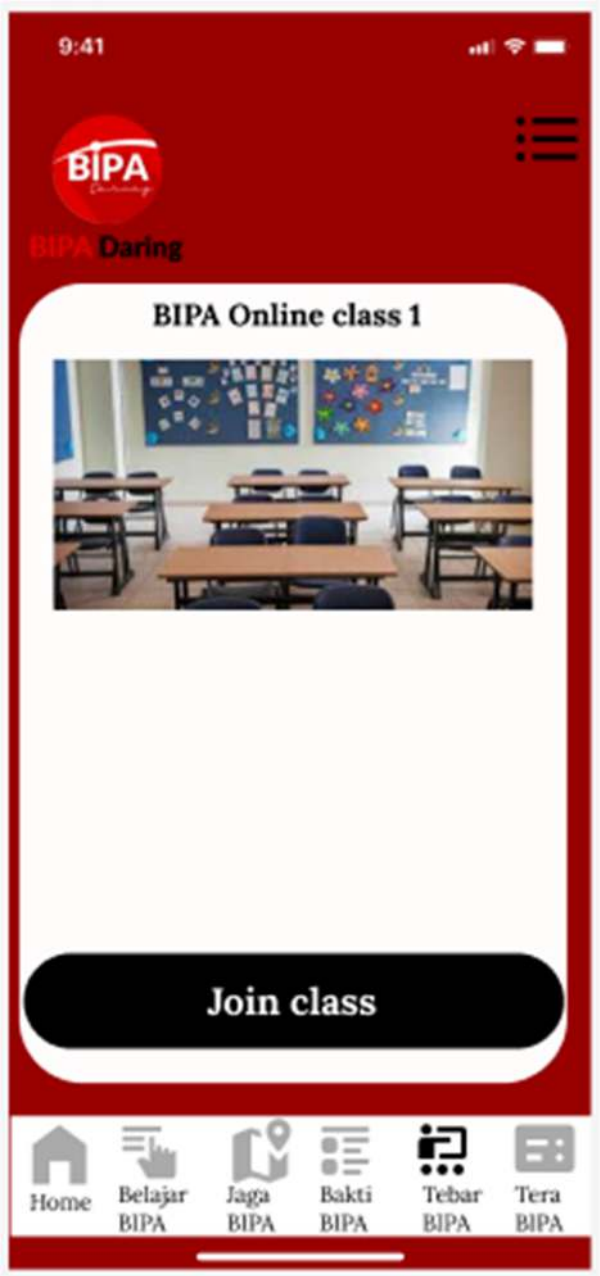

Figure 4.46 Mockup Tebar BIPA page

- Mockup Tera BIPA page

  Tera BIPA page show and provides information about BIPA exams .

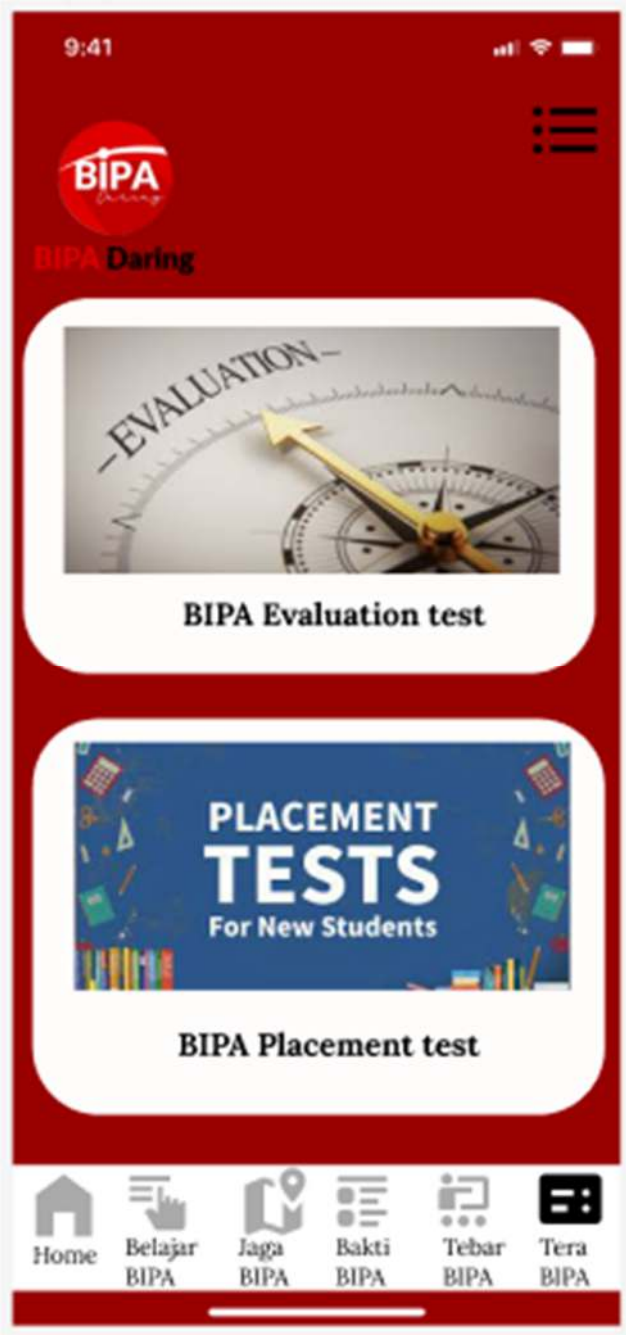

Figure 4.47 Mockup Tera BIPA page

- Mockup tera BIPA exam Page

tera BIPA exam page show how exam will apear after user click on one type of exams in Tera BIPA and show user main choices such as test simulation, test administrations and registrations .

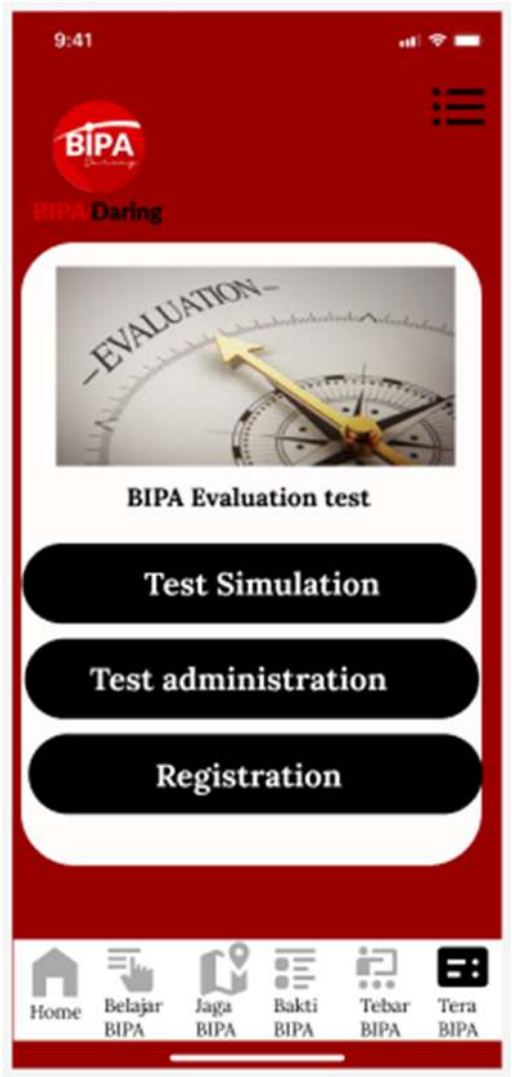

Figure 4.48 Mockup Tera BIPA page

4.5 Solution Design Evaluation Phase

Evaluating the design solution or evaluating the design solution stage, the last step in the human centered design (HCD) method is to carry out the testing process on the solution design to evaluate the system and assess user satisfaction that has been built in the previous stage. Testing based on the user's perspective is carried out by inviting respondents to try the prototype that has been made. The component tested in this study is how much satisfaction is experienced by users. There are steps that must be taken in the solution design evaluation stage, namely determining respondents .

4.5.1 Determining Respondents

The first step is to determine the respondents. Respondents are an important part of the usability testing process, where respondents are the people who will carry out the testing and provide information in the form of data used in the research. Respondents who were involved in testing in this study were active BIPA students at Pushkin Cairo (Indonesian cultural center, Cairo).

As explained in Chapter III, the sample size can be calculated using the Solvin formula, which determines that the number of respondents is equal to 72 active Puskin students.which means at least 72 active student should answer this questionnaire

4.5.2 Test Results

To analyze usability, an examination was carried out with the SUS questionnaire given to each respondent.

Table 4.1 Statement Items for System Usability Scale (SUS) Method (Novian Adi Prasetyo., 2021)

NO	Statement Items
1	I will often use/visit BIPA new Application
2	I think the BIPA new Application is too complex (loads a lot of unnecessary stuff)
3	I think the BIPA new Application is easy to navigate
4	I need technical assistance to use/browse the BIPA new Application
5	I think that the functions/features provided in the BIPA new Application are well designed and prepared
6	I think there are too many inconsistencies in the BIPA new Application
7	I feel that most people will find it easy to use/explore the BIPA new Application quickly
8	I consider the BIPA new Application to be very complicated to explore
9	I feel very confident exploring BIPA new Application
10	I need to learn many things before I can properly explore the BIPA new Application

Table 4.2 Results of System Usability Scale (SUS) Method .

Respondents	**Rating Score**										**Score**	**Score 2.5**
	Q 1	**Q 2**	**Q 3**	**Q 4**	**Q 5**	**Q 6**	**Q 7**	**Q 8**	**Q 9**	**Q 10**		
1	4	4	5	3	5	4	3	3	5	2	38	95
2	5	4	3	3	5	4	5	2	3	1	35	87.5
3	5	2	4	3	5	2	4	4	5	2	36	90
4	5	3	5	3	5	3	5	3	5	3	40	100
5	5	2	5	4	4	3	5	4	4	3	39	97.5
6	5	3	5	4	3	3	5	4	5	2	39	97.5
7	5	2	4	2	5	3	5	3	5	3	37	92.5
8	5	2	5	1	5	1	5	3	5	2	34	85
9	5	3	5	4	5	2	5	2	4	1	36	90
10	5	2	4	4	5	4	5	3	4	4	40	100

11	5	2	5	2	5	1	5	4	5	3	37	92.5
12	5	3	5	3	5	1	5	3	5	4	39	97.5
13	5	2	4	3	5	4	5	3	4	1	36	90
14	5	3	5	4	5	3	5	2	5	3	40	100
15	5	2	5	3	4	4	3	2	5	1	34	85
16	5	4	3	5	3	5	4	4	3	1	37	92.5
17	5	3	5	2	5	1	4	3	5	3	36	90
18	5	3	4	3	5	4	5	3	3	4	39	97.5
19	5	2	5	3	5	2	5	4	5	2	38	95
20	5	3	4	3	3	2	5	3	5	4	37	92.5
21	5	2	5	4	4	3	5	2	5	2	37	92.5
22	5	1	5	2	5	3	5	4	5	2	37	92.5
23	5	3	3	2	4	3	5	4	5	2	36	90
24	5	3	4	3	5	2	5	3	5	3	38	95
25	5	1	5	1	5	3	5	1	5	3	34	85
26	5	2	4	2	5	3	5	2	5	2	35	87.5
27	5	3	3	2	5	3	5	4	5	4	39	97.5
28	5	2	5	2	5	2	5	3	5	3	37	92.5
29	5	1	5	3	4	3	5	3	5	2	36	90
30	5	2	4	2	4	3	4	4	3	2	33	82.5
31	5	3	5	4	4	2	5	3	5	3	39	97.5
32	5	2	5	1	4	2	5	3	4	2	33	82.5
33	5	3	5	2	5	1	5	3	5	2	36	90
34	5	3	5	2	4	3	5	2	5	4	38	95
35	5	3	4	2	5	3	5	2	4	3	36	90
36	5	2	4	4	5	2	5	3	4	4	38	95
37	5	3	5	2	5	3	5	3	5	2	38	95
38	5	2	5	1	4	2	5	3	4	2	33	82.5
39	5	3	4	3	5	4	5	3	3	4	39	97.5
40	5	3	5	2	5	4	3	3	5	3	38	95
41	5	4	3	3	5	4	5	2	3	1	35	87.5
42	5	2	4	3	5	2	4	4	5	2	36	90
43	5	3	5	3	5	3	5	3	5	3	40	100
44	5	2	5	1	4	2	5	3	4	2	33	82.5
45	5	3	5	2	5	1	5	3	5	2	36	90
46	5	2	4	4	5	4	5	3	4	4	40	100
47	5	3	5	2	5	1	5	3	5	2	36	90
48	5	2	5	1	4	2	5	3	4	2	33	82.5
49	5	3	4	3	5	4	5	3	3	4	39	97.5
50	5	4	3	3	4	2	5	3	4	2	35	87.5
51	5	2	5	1	4	2	5	3	5	2	34	85
52	5	3	5	2	5	1	5	3	5	2	36	90
53	5	4	2	3	4	4	2	1	4	3	32	80
54	5	2	5	3	5	2	5	4	5	2	38	95
55	5	3	4	3	3	2	5	3	5	4	37	92.5
56	5	4	3	3	5	4	5	2	3	3	37	92.5
57	5	3	5	2	5	4	3	3	5	3	38	95
58	5	3	5	2	5	1	5	3	5	2	36	90
59	5	3	5	3	5	4	5	3	3	4	40	100
60	5	3	4	3	5	4	5	3	3	4	39	97.5
61	5	4	3	5	3	5	4	4	3	1	37	92.5
62	5	2	5	1	4	2	5	3	4	2	33	82.5

63	5	3	5	2	5	1	5	3	5	2	36	90
64	5	3	5	3	5	3	5	3	5	3	40	100
65	4	4	3	3	5	4	5	2	3	1	34	85
66	5	3	5	2	5	4	3	3	5	3	38	95
67	5	3	4	3	5	4	5	3	3	4	39	97.5
68	5	4	3	5	3	5	4	5	3	1	38	95
69	5	3	5	2	5	1	4	3	5	3	36	90
70	5	3	4	3	5	4	5	3	3	4	39	97.5
71	5	2	4	1	5	3	5	3	4	3	35	87.5
72	5	3	5	2	4	4	5	2	5	3	38	95
73	5	3	4	3	5	2	3	2	5	2	34	85
74	5	2	5	1	4	3	5	3	5	3	36	90
75	3	1	4	2	5	2	4	3	5	2	31	77.5
76	4	2	5	2	4	1	3	4	2	5	32	80
77	5	3	4	2	3	1	4	2	5	3	32	80
78	4	3	4	2	5	2	4	1	5	1	31	77.5
79	5	2	5	3	4	1	3	2	4	1	30	75
80	4	2	5	1	4	2	5	3	5	2	33	82.5
81	5	3	4	2	5	2	5	3	3	2	34	85
82	4	2	5	3	5	1	5	3	5	2	35	87.5
83	3	2	4	1	4	3	5	2	5	1	30	75
84	5	3	5	2	5	2	5	3	5	1	36	90
85	3	2	4	1	5	2	4	2	5	3	31	77.5
86	4	2	5	2	5	3	4	3	5	1	34	85
Total SUS Score												7772.5
Average SUS Score												**90.378 %**

Based on the SUS results that have been calculated in the table above, the test conducted by BIPA students obtained a score of 90.378 %, which means that almost all users who use the application are satisfied with what the application can do.

4.5.3 Analysis of Test Results

With the equation used to measure the usability value, it is found that the overall usability score of the BIPA application gets a usability score of 90.378 %. According to table 3.3, the usability score range of 80.3% - 100% shows very Excellent results and is declared successful.

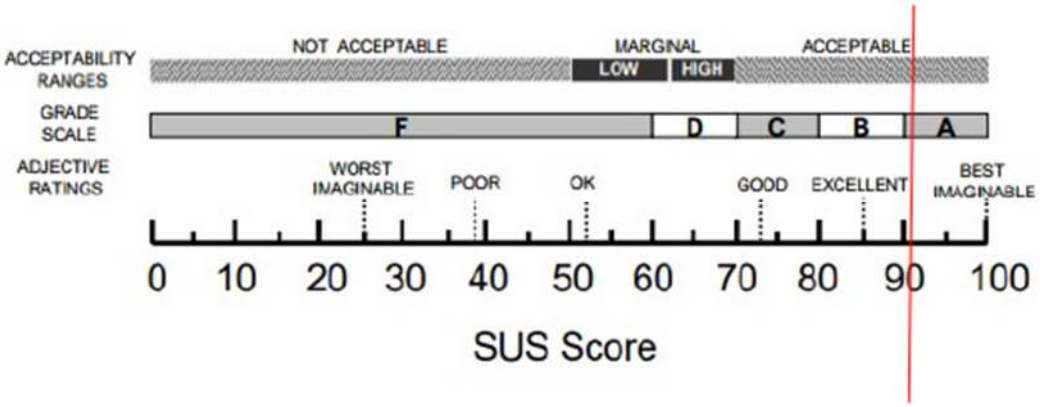

Figure 4.49 SUS Score Interpretation Results

4.6 Application Improvement Recommendations

Based on the feedback obtained from the testing and evaluation that has been carried out, at this stage recommendations for improvements to be made in the second iteration of the Human Centered Design (HCD) method are obtained. The second iteration is carried out at the Producing Design Solution stage, namely the re-creation of the prototype design based on the results of the feedback given in the first iteration. In the design of the second iteration of the prototype design, there were not many changes to be made, while the feedback obtained from the first iteration was regarding text, font size and color.

4.7 Discussion

Based on the stages of the Human Centered Design (HCD) method that

has been carried out, it produces a User Interface (UI) and User Experience (UX) design for the BIPA application. the implementation process has be carried out by applying the designs that have been made on Android-based or iOS mobile devices.

4.8 Integration in Islam

One of Human-Centred design (HCD) properties is Creativity and Innovation. Which mean that HCD fosters a creative mindset and encourages designers to think outside the box. It promotes ideation techniques that help generate a wide range of ideas and possibilities. In accordance with the word of Allah in Surah Fatir verse 27 and 28 :

﴿ أَلَمْ تَرَ أَنَّ اللَّهَ أَنزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ ثَمَرَاتٍ مُّخْتَلِفًا أَلْوَانُهَا ۚ وَمِنَ الْجِبَالِ جُدَدٌ بِيضٌ وَحُمْرٌ مُّخْتَلِفٌ أَلْوَانُهَا وَغَرَابِيبُ سُودٌ (27) وَمِنَ النَّاسِ وَالدَّوَابِّ وَالْأَنْعَامِ مُخْتَلِفٌ أَلْوَانُهُ كَذَٰلِكَ ۗ إِنَّمَا يَخْشَى اللَّهَ مِنْ عِبَادِهِ الْعُلَمَاءُ ۗ إِنَّ اللَّهَ عَزِيزٌ غَفُورٌ(28) ﴾

[سورة فاطر: 28:27]

“ Do you not see that Allah sends down rain from the sky with which We bring forth fruits of different colours? And in the mountains are streaks of varying shades of white, red, and raven black “ (Al-Quran , Fatir / 35 : 27)

According to the interpretation of Ibn kathir, the verse highlights the comprehensive and flawless creative ability of Allah. It emphasizes the process through which diverse forms of life are generated from water, which is essential for sustaining life on Earth. Water, originating from the heavens in the form of precipitation, plays a crucial role in the growth and development of various fruits. These fruits exhibit a remarkable array of colors, including yellow, red, green, white, and other shades, showcasing an immense diversity in their appearance, flavors, and fragrances.

وَمِنَ الْجِبَالِ جُدَدٌ بِيضٌ وَحُمْرٌ مُّخْتَلِفٌ أَلْوَانُهَا

From Ibn Kathir's interpretation, the verse suggests that Allah has created mountains with various colors, including white and red. This observation aligns with the presence of actual mountains in the world exhibiting such colors, often accompanied by streaks of different hues. According to Ibn Abbas and other scholars, the term "Al-Judad" refers to pathways or tracks within the mountains. Additionally, some mountains are characterized as being very black, with the term "Al-Gharabib" indicating high and black mountains. This understanding is supported by the linguistic usage among the Arabs, who describe intense blackness as "Gharabib."

وَمِنَ النَّاسِ وَالدَّوَابِّ وَالْأَنْعَامِ مُخْتَلِفٌ أَلْوَانُهُ كَذَٰلِكَ

(And likewise, men and moving creatures and cattle are of various colors.)
(Al-Quran , Fatir / 35 : 28)

the verse indicates that diversity exists among living beings, including humans and animals. This diversity encompasses various species that possess the ability to walk on their feet, such as humans and certain types of livestock. Within the human species itself, there are notable distinctions in physical characteristics. For instance, there are individuals belonging to different ethnic groups, such as Berbers, Ethiopians, non-Arabs, Slavs, Romans, Arabs, and Indians. These groups exhibit variations in skin pigmentation, with some individuals being very black, others being very white, and some falling in between. This highlights the range of genetic and environmental factors that contribute to the diversity of human populations across the world.

إِنَّمَا يَخْشَى اللَّهَ مِنْ عِبَادِهِ الْعُلَمَاءُ

(It is only those who have knowledge among His servants that fear Allah.)
(Al-Quran , Fatir / 35 : 28)

those who possess knowledge understand that Allah has the capability to accomplish all things.. Ibn `Abbas said , “The servant who possesses knowledge of Ar-Rahman (the Most Merciful) is the one who does not engage in the worship of anything or anyone besides Allah. They abide by the permissible and abstain from the forbidden. They dutifully follow Allah's commands and firmly believe in being held accountable for their actions, anticipating their eventual meeting with Allah.”. Sa`id bin Jubayr said , " Fear serves as a barrier that prevents one from disobeying Allah, may He be glorified." Al-Hasan Al-Basri said, " The person of knowledge is one who possesses a reverential fear of Ar-Rahman (the Most Merciful) regarding the unseen matters. They have a preference for what Allah desires them to like and they avoid what incurs His anger."

In this verse, Allah ﷻ communicates the concept of Creativity in the creation of the universe, emphasizing the importance for mankind to appreciate the beauty of Allah's creation. Allah ﷻ also enjoins upon humans to exhibit creativity in their own lives, aligning with one of Allah's purposes in creating the entire universe. This directive correlates with the Human-Centered Design (HCD) methodology, specifically the element of creativity, encouraging individuals to discover innovative approaches in solving users' problems.

The application of the HCD method in achieving its goal is to create a system that can implement improved accessibility and inclusivity. This means that HCD

focuses on creating designs that are accessible to a wide range of users, including individuals with disabilities or diverse backgrounds. It aims to remove barriers and provide equal opportunities for all users, taking into account factors such as visual impairments, motor limitations or language differences. Which embodies one of the goals of the HCD method, which is cooperation between humans to produce the final product in the best way to help users, and this cooperation is one of the purposes of Islamic law, according to the word of Allah ﷻ in Surat Luqman verses 13 to 19:

﴿ وَإِذْ قَالَ لُقْمَٰنُ لِٱبْنِهِۦ وَهُوَ يَعِظُهُۥ يَٰبُنَيَّ لَا تُشْرِكْ بِٱللَّهِ إِنَّ ٱلشِّرْكَ لَظُلْمٌ عَظِيمٌ(13) وَوَصَّيْنَا ٱلْإِنسَٰنَ بِوَٰلِدَيْهِ حَمَلَتْهُ أُمُّهُۥ وَهْنًا عَلَىٰ وَهْنٍ وَفِصَٰلُهُۥ فِي عَامَيْنِ أَنِ ٱشْكُرْ لِي وَلِوَٰلِدَيْكَ إِلَيَّ ٱلْمَصِيرُ (14) وَإِن جَٰهَدَاكَ عَلَىٰٓ أَن تُشْرِكَ بِي مَا لَيْسَ لَكَ بِهِۦ عِلْمٌ فَلَا تُطِعْهُمَا وَصَاحِبْهُمَا فِي ٱلدُّنْيَا مَعْرُوفًا وَٱتَّبِعْ سَبِيلَ مَنْ أَنَابَ إِلَيَّ ثُمَّ إِلَيَّ مَرْجِعُكُمْ فَأُنَبِّئُكُم بِمَا كُنتُمْ تَعْمَلُونَ (15) يَٰبُنَيَّ إِنَّهَآ إِن تَكُ مِثْقَالَ حَبَّةٍ مِّنْ خَرْدَلٍ فَتَكُن فِي صَخْرَةٍ أَوْ فِي ٱلسَّمَٰوَٰتِ أَوْ فِي ٱلْأَرْضِ يَأْتِ بِهَا ٱللَّهُ إِنَّ ٱللَّهَ لَطِيفٌ خَبِيرٌ(16) يَٰبُنَيَّ أَقِمِ ٱلصَّلَوٰةَ وَأْمُرْ بِٱلْمَعْرُوفِ وَٱنْهَ عَنِ ٱلْمُنكَرِ وَٱصْبِرْ عَلَىٰ مَآ أَصَابَكَ إِنَّ ذَٰلِكَ مِنْ عَزْمِ ٱلْأُمُورِ (17) وَلَا تُصَعِّرْ خَدَّكَ لِلنَّاسِ وَلَا تَمْشِ فِي ٱلْأَرْضِ مَرَحًا إِنَّ ٱللَّهَ لَا يُحِبُّ كُلَّ مُخْتَالٍ فَخُورٍ (18) وَٱقْصِدْ فِي مَشْيِكَ وَٱغْضُضْ مِن صَوْتِكَ إِنَّ أَنكَرَ ٱلْأَصْوَٰتِ لَصَوْتُ ٱلْحَمِيرِ (19) ﴾

[سورة لقمان: 13 : 19]

Ibn Kathir's interpretation of the passage explains that Allah tells us how Luqman counseled his son. According to a statement cited by As-Suhayli, his full name was Luqman bin 'Anqa' bin Sadun, and his son's name was Tharan. Allah praises him and claims to have bestowed knowledge upon him. The person to whom Luqman was closest and most devoted, his son, who was deserving of receiving the finest of his wisdom, was counseled. Luqman therefore gave him his first piece of advice, telling him to worship Allah Alone and not to associate anything with him.. Then he warned him:

إِنَّ ٱلشِّرۡكَ لَظُلۡمٌ عَظِيم

(Verily, joining others in worship with Allah is a great Zulm (wrong) indeed.) (Al-Quran , Luqman / 31 : 13)

meaning, it is the greatest wrong

وَوَصَّيۡنَا ٱلۡإِنسَٰنَ بِوَٰلِدَيۡهِ حَمَلَتۡهُ أُمُّهُۥ وَهۡنًا عَلَىٰ وَهۡن

(And We have enjoined on man (to be dutiful and good) (Al-Quran , Luqman / 31 : 14)

to his parents. His mother bore him in weakness and hardship upon weakness and hardship,) According to Mujahid, the phrase "hardship of bearing the child" implies the physical and emotional challenges experienced during the process of childbirth. Qatadah adds that it entails a state of continuous exhaustion or weariness. `Ata' Al-Khurasani further explains that it involves a sense of increasing weakness or vulnerability. These descriptions collectively highlight the arduous nature and physical strain associated with the experience of childbirth.

وَإِن جَٰهَدَاكَ عَلَىٰٓ أَن تُشۡرِكَ بِي مَا لَيۡسَ لَكَ بِهِۦ عِلۡم فَلَا تُطِعۡهُمَاۖ

(But if they strive with you to make you join in worship with Me others that of which you have no knowledge, then obey them not;) (Al-Quran , Luqman / 31 : 15)

The intended meaning of the statement is that if individuals exert significant efforts to persuade you to adopt their religious beliefs, it is advised not to comply with their request. However, this should not hinder you from treating them kindly and respectfully in worldly matters. The emphasis lies in maintaining a courteous and respectful attitude towards others, regardless of religious differences, while remaining steadfast in one's own beliefs.

يٰبُنَيَّ إِنَّهَآ إِن تَكُ مِثْقَالَ حَبَّةٍ مِّنْ خَرْدَلٍ

(O my son! If it be (anything) equal to the weight of a grain of mustard seed) (Al-Quran , Luqman / 31 : 16)

The intended meaning is that if a wrongful action or sin is equivalent to the size of a grain of mustard seed, it implies its minimal scale or magnitude. The comparison highlights the insignificance or smallness of the wrongdoing in question.

يَأْتِ بِهَا اللَّهُ

(Allah will bring it forth.) (Al-Quran , Luqman / 31 : 16)

The intended meaning is that on the Day of Resurrection, any action, regardless of its size, will be brought forward and evaluated. These actions will be weighed on the Scales of justice, and individuals will be rewarded or punished accordingly. If the actions are virtuous and good, they will receive rewards, but if they are immoral or evil, they will face punishment. This concept is similar to the verses in the Quran that highlight the accountability and consequences of one's deeds in the afterlife. This is like the Ayat:

وَنَضَعُ الْمَوَازِينَ الْقِسْطَ لِيَوْمِ الْقِيَمَةِ فَلاَ تُظْلَمُ نَفْسٌ شَيْئاً

(And We shall set up Balances of justice on the Day of Resurrection, then none will be dealt with unjustly in anything) (Al-Quran,Al-Anbiya/21:47).

This Quranic verse conveys the idea that on the Day of Resurrection, precise and impartial scales of justice will be established. This implies that every individual will be treated fairly, without any injustice or unfairness in any aspect.

From a scientific perspective, this verse metaphorically suggests the existence of a divine mechanism or system that ensures absolute justice in the afterlife.

يٰبُنَيَّ أَقِمِ الصَّلَوٰةَ

(O my son! Perform the Salah,) (Al-Quran , Luqman / 31 : 17)

meaning, offer the prayer properly at the appointed times.

وَأْمُرْ بِالْمَعْرُوفِ وَانْهَ عَنِ الْمُنْكَرِ

(enjoin the good, and forbid the evil,) (Al-Quran , Luqman / 31 : 17)

The intended meaning is to perform the prayer diligently and correctly according to the designated times and procedures. It emphasizes the importance of observing the prescribed prayer at its specific designated times. This implies a scientific approach of adhering to a structured and disciplined practice of prayer, following the established guidelines and maintaining consistency in its observance.

وَاصْبِرْ عَلَى مَآ أَصَابَكَ

(and bear with patience whatever befalls you.) (Al-Quran , Luqman / 31 : 17)

Luqman possessed the understanding that individuals who advocate for righteous deeds and discourage wrongdoing are likely to face adversity and irritation from others. Therefore, he advised his son to exhibit patience in such circumstances. This implies that in the pursuit of promoting goodness and discouraging evil, it is essential to remain resilient and composed in the face of challenges.

وَلاَ تُصَعِّرْ خَدَّكَ لِلنَّاسِ

(And turn not your face away from men with pride) (Al-Quran , Luqman / 31 : 18)

The intended meaning is to avoid displaying arrogance or a dismissive attitude towards others by avoiding turning away or looking down on them during conversations. Instead, it is advised to engage with people in a gentle and respectful manner, accompanied by a friendly facial expression when greeting them. From a scientific perspective, this advice aligns with principles of effective communication and social interaction. It emphasizes the importance of non-verbal cues, such as maintaining eye contact and displaying positive facial expressions, in fostering positive relationships and creating a conducive environment for meaningful dialogue.

وَلاَ تَمْشِ فِي الأَرْضِ مَرَحًا

(nor walk in insolence through the earth.) (Al-Quran , Luqman / 31 : 18)

The intended meaning is to refrain from exhibiting qualities of boastfulness, arrogance, pride, and stubbornness. It is advised not to engage in such behaviors, as they are disliked by Allah. In response to this admonition, one should heed the advice and avoid actions that would displease Allah.so he said :

إِنَّ اللَّهَ لاَ يُحِبُّ كُلَّ مُخْتَالٍ فَخُورٍ

(Verily, Allah likes not any arrogant boaster.) (Al-Quran , Luqman / 31 : 18)

The meaning conveyed is that individuals who engage in showboating and excessive self-admiration, considering themselves superior to others, are not favored by Allah. Allah does not hold love for such individuals.

وَاقْصِدْ فِي مَشْيِكَ

(And be moderate in your walking,) (Al-Quran , Luqman / 31 : 19)

The intended meaning is to adopt a balanced and moderate pace while walking, avoiding both sluggishness and excessive speed. Instead, it is recommended to maintain a moderate and measured stride, finding a middle ground between these two extremes. In other words, one should neither walk too slowly and lazily nor rush excessively, but rather maintain a moderate pace in their movement.

وَاغْضُضْ مِن صَوْتِكَ

(and lower your voice.) (Al-Quran , Luqman / 31 : 19)

The intended meaning is to engage in clear communication without resorting to unnecessary force or raising one's voice. It suggests the importance of expressing oneself effectively and transparently, while avoiding aggressive or loud behavior. In essence, it encourages a calm and assertive approach to communication, emphasizing the significance of conveying thoughts and ideas clearly without the need for excessive force or raised voices. Allah says:

إِنَّ أَنكَرَ الأَصْوَاتِ لَصَوْتُ الْحَمِيرِ

(Verily, the harshest of all voices is the braying of the asses.) (Al-Quran , Luqman / 31 : 19)

According to Mujahid and other scholars, the act of raising one's voice is likened to the unpleasant sound produced by a donkey. They described the voice of a donkey as the most displeasing. Moreover, this behavior is regarded as detestable to Allah. Comparing a loud voice to that of a donkey signifies its violation of propriety and indicates its highly objectionable nature.

These verses indicate that Allah ﷻ encourages people to engage in collaboration and extend assistance, advice, and guidance to others, drawing upon the example of Al-Hakim Luqman imparting wisdom to his son across various aspects of life. This concept aligns with one of the objectives of Human-Centered Design (HCD) methodology. In order to create an optimal product that effectively addresses the needs and concerns of users, it is essential to foster collaboration among the designer, programmer, and end user. This collaborative approach ensures that the product is tailored to meet user requirements and preferences, resulting in a more user-centered and impactful solution. The parallels between the divine guidance and the HCD approach emphasize the importance of collective efforts, shared knowledge, and user involvement in the design and development process.

CHAPTER V

CONCLUSIONS AND SUGGESTIONS

At this stage, conclusions and suggestions will be explained from the process of implementing user interface design and user experience in BIPA applications designed using the Human Centered Design method.

5.1 Conclusions

Based on the results obtained from each stage of the human centered design method that has been carried out in the application of user interface design and user experience in the BIPA application, several conclusions can be obtained, including:

1. The results of the usability test that has been carried out on the BIPA application that has been designed and getting a usability score of 90.378%, The result showed Excellent results and were declared successful.
2. The design of the BIPA application that has been designed can be concluded that it meets user needs, which will facilitate the process of recording meters and reports, the learning process will be faster, will reduce difficulties using the official BIPA website and make BIPA news more accessible.

5.2 Suggestions

After conducting research on the application of user interface design and user experience in BIPA applications using the human centered design (HCD)

method, further research is needed so that the application can be further developed to be more optimal, such as:

1. Doing application usability testing on other aspects such as efficiency, memorability and others, in order to get new inputs through several other aspects.
2. Applications in this research can be further developed by adding various tools with new technology or by adding new features, so that applications can run more efficiently and accurately.
3. This application which is designed for the Android mobile app can also be further developed into all devices, so that it can be operated for various devices according to user needs.

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