Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

JURNAL TEKNIK INFORMATIKA

Homepage : http://journal.uinjkt.ac.id/index.php/ti

Interaction Design of ITB Library Application Using User-Centered Design

Elisabeth Levana Thedjakusuma[1], Fetty Fitriyanti Lubis[2]

[1,2]Information System and Technology Department, School of Electrical Engineering and Informatics
[1,2]Institut Teknologi Bandung
[1.2]Bandung, West Java, Indonesia
E-mail: [1]18218032@std.stei.itb.ac.id, [2]fettyfitriyanti@staff.stei.itb.ac.id

Article:
Accepted: July 16, 2022
Revised: June 12, 2022
Issued: November 15, 2022

***Correspondence Address:**
18218032@std.stei.itb.ac.id

ABSTRACT

The Technical Implementation Unit is a part of a university or institute that supports the three pillars of higher education, one of which is the library. Library has a large collection of resources that can be accessed through a library catalog. ITB Library is a mobile application that allows users to search catalogs, but it currently lacks optimal appearance and user experience. The aim of this final project is to improve the ITB Library by implementing a user-centered design approach, which focuses on understanding and addressing user needs. The end goal is to create a high-fidelity prototype that meets the usability goals of effective to use, have good utility, easy to learn, and the user experience goal of being helpful. To evaluate the design, usability testing was conducted on the prototype. Testing was evaluated using several metrics, including task completion rate (100%), System Usability Scale (SUS) (93/100), Single Ease Question (SEQ) (6.7/7), and Intrinsic Motivation Inventory (IMI) (6.7/7 for the value/usefulness subscale) during the third iteration. Based on the results of the testing, the interaction design of the ITB Library meets the usability and user experience goals that were set out to be achieved.

Keywords: *Online Public Access Catalog, ITB Library, library, user experience goals, usability goals, user-centered design*

I. INTRODUCTION

According to Government Regulation (PP) No. 5 of 1980 on the Principles of Organization of State Universities/Institutes, libraries are an integral part of the Technical Implementation Unit, which serves as a support system for higher education institutions in achieving their goals and objectives. With the advancement of technology, many libraries have adopted remote access to information resources through digital platforms such as online public access catalogs (OPACs) [1]. The rapid transformation and advancement in mobile technology have changed the way libraries interact and access information resources [2]. Mobile forms of online public access catalogs (MOPACs) enable remote users to gain access to resources on mobile devices

ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

without the time and physical space restrictions [3].

ITB Library is a mobile app that allows users to search the ITB library catalog for books, scientific papers, magazines, journals, and other materials. However, the current design of ITB Library does not meet best practices in terms of layout, visual hierarchy, user flow, and user comfort, as determined by interaction design principles. While ITB also has web-based library search catalogs (Webpac and Digilib), this project focuses on the interaction design of ITB Library mobile app because more activities are conducted on mobile platforms, particularly during the COVID-19 pandemic.

The development of the ITB Library's interaction design focuses on improving the features of the catalog, circulation, and the addition of ITB library digital service guidance features, such as instructions for accessing digital collections (e-journals and e-books). These improvements were chosen based on their priority level, as the catalog feature is the focus of the ITB Library application as a library search catalog in ITB. These features were also prioritized based on the importance of information search in helping users meet their information needs and navigate the library effectively [4]. The development of circulation services and digital service guides will provide access to both physical and digital library collections in order to fulfill the information needs of users. These features also support the library's vision, "Providing services, collecting libraries and access to information for the ITB Academic Community to support the implementation of the three pillars of higher education, and to achieve knowledge-based Indonesian society". The present study aims to improve the user experience of the ITB Library application by employing a user-centered design approach. This involves considering the needs and perspectives of users in the design process. The results of the analysis will be implemented in the form of a prototype, which will be evaluated for usability and user experience goals. It is hoped that the resulting interaction design will offer an improved user experience compared to the previous ITB Library application.

1.1 Literature Review

1.1.1 Online public access catalog (OPAC)

Online Public Access Catalog (OPAC) is a library catalog system that replicates and expands the function of the card catalog in providing a search tool for books, journals and other collections from a library [5]. This OPAC provides bibliographic information and the location of the collection which is usually designed to make it easier for users so they don't need to ask questions in using it (user friendly). The advantages of using an online public access catalog (OPAC) include no physical restrictions, unlimited availability, multiple access, access to a variety of diverse content in a structured way, and easy access to information about both physical and digital collections through a single interface [6].

1.1.2 ITB library

As a unit supporting academic activities at ITB, the ITB Central Library has the role and responsibility of providing and improving the quality of various types of information and library resources, particularly those related to the academic activities of the ITB community. The ITB Central Library offers services such as borrowing books, audio-visual recordings, ordering copies of books from other libraries in Indonesia and abroad, and internet access. While the ITB Central Library is open to the general public, its services are only available to ITB academicians, including lecturers, students, and education staff (tendik). The ITB Central Library has developed the ITB Library mobile application, which allows users to easily and quickly search for collections including books, scientific works, magazines, journals, and more. Some views of the ITB Library version 3.0 application, including the library digital catalog feature, book details, and user profile (borrowing history), can be seen in Figure 1.

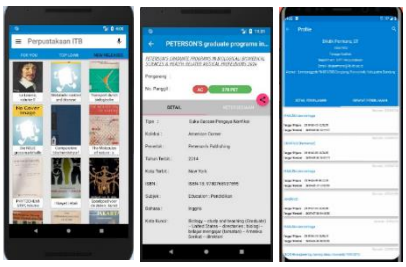

Figure 1. ITB library version 3.0

Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

On the main page of the ITB Library application, there is a search bar that allows users to search for library collections using specific keywords. The catalog section is divided into three tabs, For You, Top Loan, and New Releases. In the For You tab, there is a grouping of categories of collections, including the ITB central library collection, general collection, American corner, special collection-thesis, special collection-final assignment, TPB, and other categories arranged in a scrollable list.

When a book is selected, users can view detailed information about it, including the title, author, call number, type, collection category, publisher, year of publication, city of publication, ISBN, subject, language, keywords, reference, acquisition, and description.

In the profile section of the ITB Library application, users can view borrowing details tab as well as historical borrowing tab. The borrowing details tab includes information about the books currently being borrowed, while the historical borrowing tab includes information about previously borrowed books.

1.1.3 Interaction design

Interaction design can be defined as a term that describes the interaction between the user and the product being used. The type of interaction that occurs can vary such as interaction through gesture, sound and movement.

There are five principles that can be used as a reference in doing interaction design, visibility (ease of knowing the next step to do), feedback (there must be something that indicates that an activity succeeds or fails), constraints (limits on activities that can be done), consistency (similar or consistent interfaces), and affordance (providing clarity on the use of these components or providing instructions for their use) [7].

1.1.4 User interface

User interface is the way users interact with the product so that users and applications can communicate with each other. The user interface allows the system to receive and provide information to users through processes in the system based on user interests. In user interface design, there is also a visual hierarchy which is the principle of layout of design elements to display the more important ones first and will affect the way users see information. Some factors that affect the visual hierarchy are size, color, contrast, alignment, repetition, proximity, and whitespace (use of space around the content) [8].

1.1.5 Usability testing

The main purpose of usability testing is to verify the proposed interaction design principles and observe whether the interaction design principles can improve the usability of the application [9]. On average, more than 85% of usability problems can be found through 5 respondents [8]. There are several measurements taken in usability testing.

1. Task completion rate

Task completion rate is a metric that can be used to measure the effectiveness of interaction design [10]. Based on research conducted by Sauro (2011) on 1200 tasks, the average task completion rate obtained was 78%. Therefore, the minimum task completion rate value to indicate that a system or product is effectively used is 78%.

2. System usability scale (SUS)

System Usability of Scale (SUS) is a measurement of usability testing aspects with 10 general questions about usability aspects [11]. This question uses a Likert scale as a response scale with a range of 1-5 (strongly disagree - strongly agree). Based on the comparison of SUS values on many different systems conducted by Sauro (2011), it was found that the average SUS value of 500 studies was 68. Therefore, the SUS value of 68 is the minimum benchmark that indicates that the usability of a system or product is good. To find out the grade ranking on SUS, here is an illustration in Figure 2.

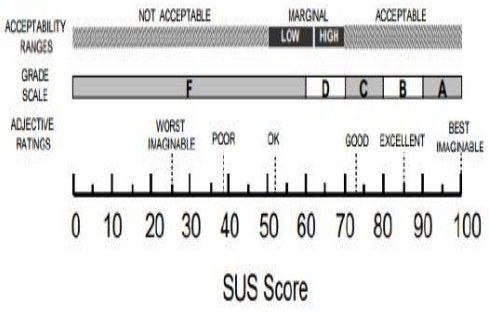

Figure 2. Grade ranking SUS score

Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

3. Single ease question (SEQ)

Single Ease Question (SEQ) is a questionnaire used to see the level of difficulty of users in completing a task [12]. SEQ has a form of questionnaire similar to SUS but uses a scale of 1-7 (very difficult - very easy). It was found that the minimum SEQ score to indicate that a system or product fulfills a good learnability aspect is 5.7.

4. Intrinsic motivation inventory (IMI)

Intrinsic Motivation Inventory (IMI) is a multidimensional measurement metric used to measure users' subjective experiences related to a task. There are six primary subscales that can be used as needed, namely interest/enjoyment to measure intrinsic motivation, perceived competence and perceived choice as positive predictors of intrinsic motivation, pressure/tension as a negative predictor of intrinsic motivation, effort, value/usefulness for research related to a person's internalization of an activity that is considered useful and valuable, and relatedness for research related to interpersonal interactions. Each subscale has a group of questions on a scale of 1 - 7 (strongly disagree - strongly agree).

II. METHODOLOGY

User-centered design is a multidisciplinary approach that involves end users in the design process of a product. Initially, the process will focus on deepening the understanding of users and their needs. Subsequently, the design and evaluation process will be iterative based on observations aimed at users [13]. User-centered design is also referred to as user-driven development because it focuses on user needs from the early stages to evaluation. In ISO 9241-210:2010, there is a diagram that illustrates the process of activities in conducting user-centered design depicted in Figure 3.

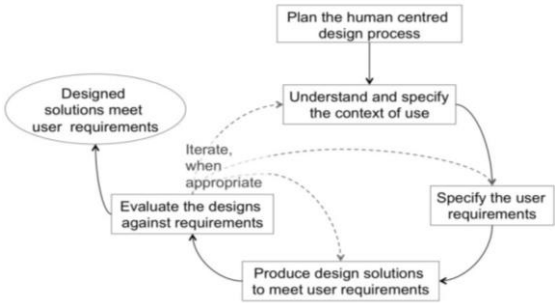

Figure 3. User-centered design process

2.1 Plan the human centered design process

The activities carried out are defining the scope of the application including the scope of users, the scope of functionality, and the scope of development.

2.2 Understand and specify the context of use

During this stage, user analysis was conducted through research using questionnaires to gather data on user behavior and problems. Based on this data, an analysis of user needs, goals, and activities was carried out. Persona analysis was also performed, which involved creating representations of the target users of the application and user scenarios to reflect events and experiences that may be encountered when using the application.

2.3 Specify the user requirements

This stage produces a list of application features designed based on the analysis of user goals and activities. Furthermore, it also analyzes the usability goals and user experience to be achieved in the designed application. A user flow analysis was also conducted to describe the flow that users take in completing activities on the application.

2.4 Produce design solutions to meet user requirements

The design process involved creating both low-fidelity and high-fidelity prototypes. The first step was to create a low-fidelity prototype that illustrates design ideas that meet the needs of users. This prototype was then developed into a high-fidelity prototype, which was used for user testing. The high-fidelity prototype provided a more detailed and accurate representation of the final design, allowing users to test and provide feedback on its usability and user experience.

2.5 Evaluate the design

The activity carried out is to conduct usability testing on the high-fidelity prototype solution design that was developed at the solution design stage. This testing aimed to measure the usability and user experience of the design, and user feedback was used to improve the design. The testing process was iterative, with multiple testing rounds conducted until the user's needs were met.

Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

III. RESULTS AND DISCUSSION

3.1 User analysis

3.1.1 User research

The focus of the user study will be students at the ITB Central Library because, based on interviews with librarians, they have the highest frequency of using services such as borrowing books. Additionally, although the ITB libraries are open to the general public, the selection of students as the focus of the study is also due to the fact that only ITB academicians, who have ITB Network Account (INA) accounts, can access the library's digital services. The user analysis was conducted through an online survey with a target of at least 96 active ITB students. The target number of respondents was calculated using surveysystem.com/sscalc.htm, based on a sample confidence level of 95% and a confidence interval of 10%, with a total population of 17,000 students over the past four years. A total of 108 respondents participated in the questionnaire.

3.1.2 User behavior and problems

Based on the results of observation and validation through questionnaire analysis, user behavior can be seen in Table 1 and user problems in
Table 2.

Table 1. User behavior

ID	User behavior
P-1	Likes the simple, straightforward look of the app
P-2	Want a catalog that makes browsing and searching the library collection easy
P-3	Checking the availability of a collection, either in the library or in digital form, through accessible links
P-4	Want access to digital library services that are integrated on a platform, such as searching, reserving, borrowing, and renewing loans for the library collection
P-5	View the history of loans made and receive notification if the loan status changes or the return time is approaching the deadline
P-6	Getting information about guidance/instructions to access the desired e-resources
P-7	Prefer access to digital library services through a mobile app because it is considered more practical, as there is no need to go back and forth logging in as with using the website

Table 2. User problems

Code	Category	User problems
M-1	Interaction design of the application interface	Inconvenience using the app because the display is not attractive
M-2		The application feedback after the user has done something still uses a loading spinner (when borrowing a message) and toast notification (when successfully borrowing a message) which allows users to miss knowing whether the goal of performing an action has been achieved.
M-3	Book search	The catalog feature in searching and displaying search results still makes it difficult for users to search for the library collection
M-4	Book information	The availability of books only displays information related to physical books in the central library
M-5	Circulation service	Users cannot borrow books independently on the ITB library application although the availability of physical collections is in the central library
M-6		Users must switch platforms on ITB webpac to borrow books independently
M-7		Users cannot see the status of books borrowed online /reserved, can only see a list of books that are being borrowed and returned ones in the history
M-8		Users often forget the deadline for book return
M-9	ITB library service guide	In its use, users are often confused about how to access the e-resource services

Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

Code	Category	User problems
		provided by ITB libraries.

3.1.3 User requirements

User requirements are things that users want to get through application design. User requirements are derived from user problems and behaviors, which can be seen in Table 3.

Table 3. User requirements

Code	Requirement	Link
K-1	Access a simple application interface	M-1 P-1
K-2	Search for the required book quickly	M-3 P-2
K-3	Search for books by category quickly	M-3 P-2
K-4	View necessary full information about a book	M-4 P-3
K-5	Online borrowing access to physical books needed	M-5 M-6 P-4
K-6	View the list of borrowed books	M-7 M-8 P-5
K-7	ITB library e-resources service access guide	M-9 P-6

3.1.4 Feature analysis

Based on the results of the user needs analysis which is derived into goals and user activities, a list of application features is obtained which can be seen in Table 4.

Table 4. Feature analysis

Code	Feature group	Feature design	Link
F-1	Catalog (search by keyword)	Search by specific keyword	K-2 K-1
F-2		Filter search results according to certain criteria	
F-3		Sort search results	
F-4	Catalog (by category)	Collection category grouping	K-3 K-1
F-5	Book information	Book information display	K-4 K-1
F-6		A book information page that provides a link to the digital format of the book. The difference in interaction design between collection categories will lie in the type of link provided. For example, in the book category of ITB thesis & dissertation special collection, a link to Digilib will be provided. For books categorized as magazine/journal collections, links to e-journals/e-books will be provided.	
F-7		Book information page that provides book availability information	
F-8	Borrowing online	Book borrowing booking feature	K-5 K-1
F-9		History feature that displays booking status of book borrowing	
F-10		Notification if the book borrowed orders are in stock	
F-11		Book borrowing feature if books are available	
F-12	History	History feature that displays information such as borrowing status, return date of each book. borrowed	K-6 K-2
F-13		Loan extension feature for borrowing	

Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

Code	Feature group	Feature design	Link
		books that are close to the due date returns	
F-14		Late return penalty payment info feature for books that have passed the return date	
F-15		Notification feature if the book borrowing period is almost over	
F-16	Guide	Guidance on how to access library e-resources service	K-7 K-1

3.1.5 Usability and user experience goals

Based on the results of user and needs analysis, it is important for applications developed using a user-centered design approach to consider usability aspects that can be used to measure the usability value of the application. The usability goals to be achieved from this application.

1. Effective to use, the application must be able to help users effectively use it and in completing activities to access ITB library services.
2. Have good utility, features on the application help fulfill user needs to access ITB library services.
3. Easy to learn, that is, the application must be easy to learn how to use because users do not want to spend time learning the application. This can be done by putting consistent components in all parts of the application so that it helps users to learn the application.

The user experience goals to be achieved.

1. Helpful, users should always feel assisted in using this application to access ITB library services.

3.1.6 User flow analysis

User flow analysis is a method used to evaluate the sequence of actions taken by users as they complete tasks within an application. This analysis helps to describe how the application's features work together and in sequence. The user flow diagram of the ITB Library version 3.0 application can be seen in Figure 4.

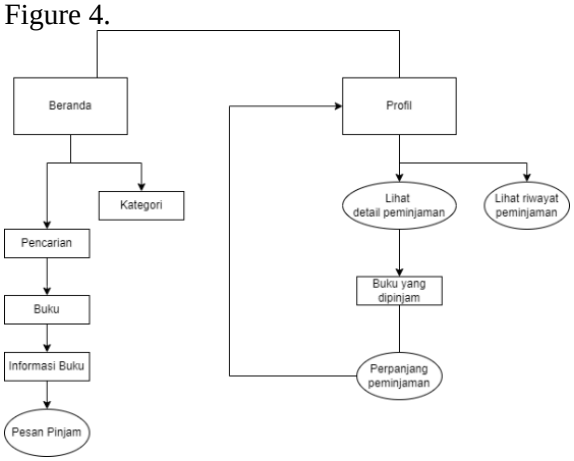

Figure 4. User flow of ITB library version 3.0

In this final project, user flow improvements were made to the ITB Library application to enhance the user experience. These improvements included the ability to search for collections by category groupings, filter and sort search results according to certain criteria, borrow books online if they are available, receive notifications related to borrowing books, view history features that display information such as online borrowing status and borrowing reservations, access information about payment of late return fines for books that have passed their return date, and access guidelines on how to use the library's e-resources services. The user flow diagram for the redesigned ITB Library application is shown in Figure 5.

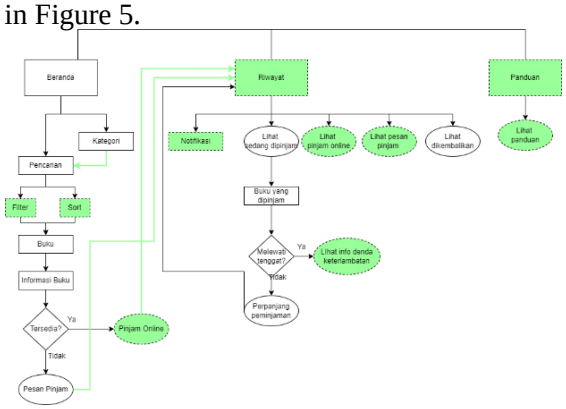

Figure 5. User flow of ITB library new design

3.2 Implementation

The activity carried out is to design a solution design in the form of a low-fidelity prototype that illustrates design ideas that meet the needs of users and high-fidelity that can later be used for testing to users.

Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

3.2.1 Low-fidelity prototype

The low-fidelity prototype, which can be accessed at bit.ly/lofi-itblibrary-elisabeth, provides a simple overview of the ITB Library application with a new design that does not yet support the overall interaction of the actual application and still focuses on the content and button placement framework. The tool used to create the low-fidelity prototype is Figma. Some of the results of the implementation of the low-fidelity prototype for the improvement of the ITB Library application's features, such as the digital catalog, book details, and user profile (borrowing history), can be seen in Figure 6.

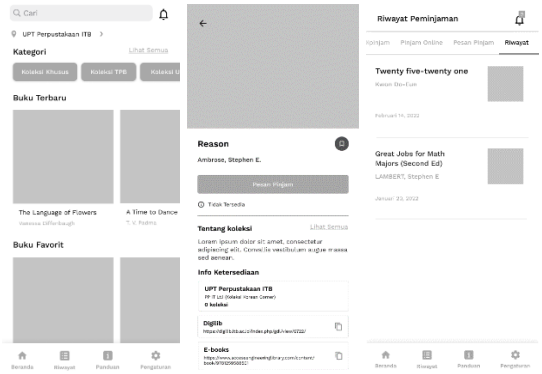

Figure 6. Low-fidelity prototype of ITB library

3.2.2 High-fidelity prototype

The high-fidelity prototype was created after designing the low-fidelity prototype. The high-fidelity prototype, which can be accessed at bit.ly/hifi-itblibrary-elisabeth, provides an overview of the new ITB Library application interaction design and can provide a real experience for later use in direct testing with users. Some of the results of the implementation of the high-fidelity prototype for the improvement of the ITB Library application's features, such as the digital catalog, book details, and user profile (borrowing history), can be seen in Figure 7.

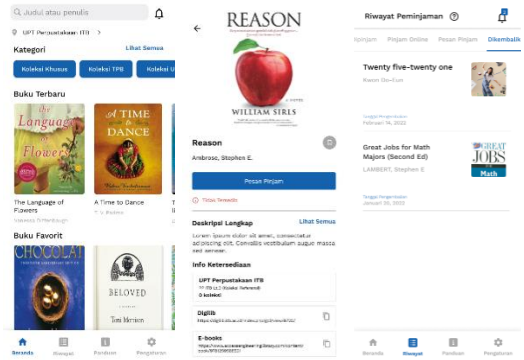

Figure 7. High-fidelity prototype of ITB library

3.3 Evaluation

The design evaluation process is the last stage of the design process with a user-centered design approach. At this stage, high-fidelity prototypes are tested through usability testing.

3.3.1 Test scenario

Testing takes place online with the help of Google Meet and the Useberry platform. Useberry is a testing service provider platform that is particularly helpful if the application being developed is a mobile application, as testing must take place on a mobile device to provide a true picture of the interaction design as designed in the mobile version. There is a setting so that participants can only open the testing link on a mobile device. Furthermore, participants do not need to share the screen on the mobile device being tested, as Useberry allows for task completion to be set for each task. If the participant successfully completes a task, a dialog box will appear saying, "Congratulations! You completed the task successfully!" Participants were only asked to use their microphones during the test so that the tester could observe any difficulties they experienced in completing a task. The high-fidelity prototype testing uses the usability testing method. The limitation of this test is that the data in the high-fidelity prototype is dummy data. The purpose of this test is to measure the achievement of usability goals (effective to use and easy to learn) and user experience goals (helpful) of the prototype. Usability measurement was carried out using the System Usability Scale to determine the level of usability of the prototype for users.

The flow of testing the high-fidelity prototype begins with an introduction and briefing, followed by exploration, task work, filling out a post-test questionnaire, and ending with closing. There are six tasks to be completed, including searching for books based on keywords, searching for books based on collection categories, viewing book information, borrowing books, viewing borrowing history, and viewing access guides for e-resource services.

3.3.2 Testing results

The following is an analysis of the results of testing the high-fidelity prototype against aspects of usability goals and user experience goals.

Jurnal Teknik Informatika Vol. 15 No. 2, 2022 (119-128)
ISSN: p-ISSN 1979-9160 (Print)| e-ISSN 2549-7901 (Online)
DOI: https://doi.org/10.15408/jti.v15i2.27956

1. Have good utility

The calculation results of the System Usability Scale (SUS) questionnaire show that the average SUS score of each test is 74.5 in the first iteration, 89 in the second iteration, and 93 in the third iteration (Figure 8). These results indicate that the final design of the application has entered the Excellent category in Figure 8. Therefore, it can be concluded that this high fidelity prototype has fulfilled the usability aspect.

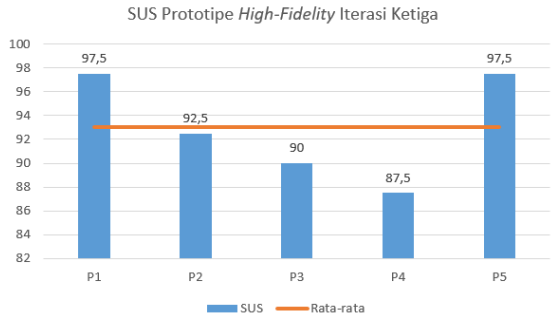

Figure 8. SUS high-fidelity prototype third iteration

2. Effective to use

The effectiveness value was measured by the completion rate, which reflects the success of participants in completing test tasks. Based on the results of testing on 5 participants with 6 test tasks, the completion rate was 80% in the first iteration, 100% in the second iteration, and 100% in the third iteration. Using a grade ranking system for the effectiveness value (completion rate), the effectiveness of the participants in the final design of the application falls into the highest range (90%-100%), indicating good performance. Therefore, it can be concluded that the high-fidelity prototype of the ITB Library application is effective to use.

3. Easy to learn

The calculation results of the Single Ease Questionnaire (SEQ), the test results show that the average SEQ score of each task is 6.3 in the first iteration, 6.6 in the second iteration and 6.7 in the third iteration (Figure 9). These results show that the final design of the application has entered the Very Easy category in the SEQ assessment. Therefore, it can be concluded that this high-fidelity prototype is easy to learn and easy to use by users.

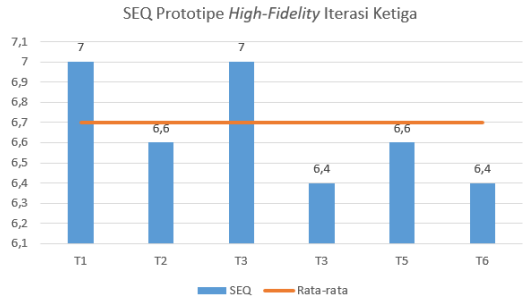

Figure 9. SEQ high-fidelity prototype third iteration

4. Helpful

Using the Intrinsic Motivation Inventory (IMI) value/usefulness sub-scale, testing on 5 participants and 6 test tasks, a score of 6.4 was obtained in the first iteration, 6.6 in the second iteration and 6.7 in the third iteration (Figure 10). Therefore, it can be concluded that this high fidelity prototype can help users in accessing library services.

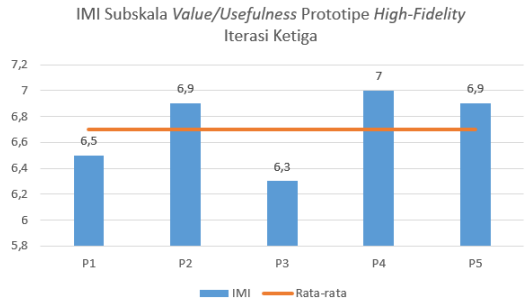

Figure 10. IMI subscale value/usefulness high-fidelity prototype third iteration

IV. CONCLUSION

ITB Library application improvements were made in terms of appearance by applying visual hierarchy and interaction design principles. The catalog feature was improved to make it easier for users to search for library collections and to see complete information about a book. The circulation feature was improved so that users can make independent loans of needed books through the application and see information about the borrowing process. In addition to its existing features and functionality, there is digital service guide feature to help users access e-book resources. This feature allows users to access digital versions of books through book links, as part of the e-resources service offered by the ITB library.

After three design iterations, the ITB Library application has met the usability goals

of being effective to use, having good utility, and being easy to learn, as well as the user experience goal of being helpful. This was determined through usability testing on the high-fidelity prototype, using several metrics to evaluate the design. The task completion rate scored 100%, the System Usability Scale (SUS) scored 93 out of 100, the Single Ease Question (SEQ) scored 6.7 out of 7, and the Intrinsic Motivation Inventory (IMI) scored 6.7 out of 7 for the value/usefulness subscale during the third iteration of testing. These results demonstrate that the ITB Library application has successfully achieved the usability and user experience goals set out for it.

BIBLIOGRAPHY

[1] E. Acheampong and F. G. Agyemang, "Enhancing academic library services provision in the distance learning environment with mobile technologies," *Journal of Academic Librarianship*, vol. 47, no. 1, Jan. 2021, doi: 10.1016/j.acalib.2020.102279.

[2] Y. Mehdipour and H. Zerehkafi, "Mobile Learning for Education: Benefits and Challenges," 2013. [Online]. Available: www.ijceronline.com

[3] E. Vassilakaki, "Mobile information services in libraries: A review of current trends in delivering information," *Interlending and Document Supply*, vol. 42, no. 4, pp. 176–186, Nov. 2014, doi: 10.1108/ILDS-08-2014-0037.

[4] O. A. Surachman, "PENELUSURAN INFORMASI: sebuah pengenalan," 2007. [Online]. Available: http://arifs.staff.ugm.ac.id

[5] "OPACs and discovery systems (IEKO)." https://www.isko.org/cyclo/opac (accessed May 08, 2021).

[6] J. Sun and B.-Z. Yuan, "Development and Characteristic of Digital Library as a Library Branch," *IERI Procedia*, vol. 2, pp. 12–17, Jan. 2012, doi: 10.1016/J.IERI.2012.06.044.

[7] Jenny Preece, Yvonne Rogers, and Helen Sharp, "Interaction Design - Beyond Human-Computer Interaction, 5th ed. - Preece, Rogers, Sharp," 2019.

[8] "Understanding Visual Hierarchy in Web Design." https://webdesign.tutsplus.com/articles/understanding-visual-hierarchy-in-web-design--webdesign-84 (accessed Oct. 07, 2021).

[9] A. Marcus and W. Wang, "Design, User Experience, and Usability Practice and Case Studies," 2019. [Online]. Available: http://www.springer.com/series/7409

[10] "Usability Metrics - A Guide To Quantify The Usability Of Any System - Usability Geek." https://usabilitygeek.com/usability-metrics-a-guide-to-quantify-system-usability/ (accessed Oct. 30, 2021).

[11] J. Brooke, "SUS: A quick and dirty usability scale," 1996. [Online]. Available: https://www.researchgate.net/publication/228593520

[12] "10 Things To Know About The Single Ease Question (SEQ) – MeasuringU." https://measuringu.com/seq10/ (accessed Oct. 30, 2021).

[13] J. Nielsen, "Usability Engineering" 1994. https://dl.acm.org/doi/book/10.5555/2821575 (accessed Oct. 10, 2021).