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Redesign of The Gobis Surabaya Mobile Application User Interface Based on User Experience Evaluation To Enhance User Understanding and Features Using The User-Centered Design Method

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ABSTRACT
The Gobis Surabaya application, developed by the Surabaya City Government, provides public transportation information. The Transportation Agency aims to facilitate transportation access through this application. The development process includes data collection, analysis, design, implementation, testing, and maintenance. This research describes the redesign efforts of the GOBIS Surabaya mobile application interface using UCD to enhance user experience. From an analysis of 30 respondents using the System Usability Scale (SUS), it was found that the previous application had low usability. However, after a meticulous redesign process, the SUS score significantly improved, with the majority of respondents rating it above 85, indicating a substantial increase in usability. The redesign process involved careful consideration of user needs. Usability testing conducted by Maze also confirmed excellent UI and UX quality. With usability scores ranging from 97 to 100, no incomplete tasks, click accuracy from 0% to 4.5%, and task completion times ranging from 1.5 to 24.4 seconds, the testing showed high efficiency levels. Overall, the testing results affirmed that the UI and UX design provided a satisfying user experience, indicating user satisfaction with the application. It is expected that this research will facilitate users in utilizing the GOBIS Surabaya application.

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Introduction

In this era, technology is developing more and more rapidly, humans are very dependent on technology. This makes technology a basic need for everyone. From the elderly to young people, experts to ordinary people also use technology in various aspects of their lives. As an example of technological development, mobile phones have become friends as well as personal facilities for most people coupled with an internet connection,

allowing people to access various services available on the internet, of course, easily and can be done anytime and anywhere (Warastuti et al., 2021). One of the advances in technology is mobile applications where the application of work or activities in real life that is applied to the online system makes it easier to do activities (Al Rasyid et al., 2022).

As one of the developments of advancement in technology, which is impossible to separate from human life in the life of every daily activity, it functions for the smooth running of human interests and the movement of humans from one place to another, namely transportation (Putra et al., 2024). An increase in the population will demand an increase in transportation facilities such as road networks and the availability of transportation fleets. But unfortunately currently there are still many different types of public transportation that are not suitable for operation but are still forced to serve the community. Therefore, the need for renewal between transportation and with the times. Transportation tools accompanied by mobile applications are very helpful to the general public because they have facilitated public transportation easily (Ramadhana & Fanida, 2020). This application can provide public transportation that is very suitable for urban applications because the population is dense and allows to reduce congestion if all people prioritize public transportation. This public transportation location ordering or tracking application is very helpful because it can be used anytime and anywhere online. The Gobis Surabaya application provides information about public transportation specialized in Surabaya by the Surabaya City Government (Barki & Pramono, 2025). The Surabaya City Transportation Agency (Dishub) is trying to find various ways that have a vision for the future in order to provide convenience and smoothness to the community, especially in the city of Surabaya in the implementation of public transportation access, namely Gobis Surabaya. In an application, it must be inseparable from development, where an application has its own uses and has its own shortcomings. The software development process has several stages that are carried out including requirements collection, analysis, design, implementation, testing and maintenance (Subhiyakto et al., 2021).

The Gobis Surabaya application can choose the means of public transportation that you want to use, namely city buses for major road areas and mikrolets for areas where the road is slightly entering the residential area. There are also free services in its feature that are specifically for veterans, the elderly, children under 5 years old, and also residents with disabilities. There is also a tracking area feature where there are stops from the public transportation. The next feature is bottle exchange, where users of this application are faced with a feature that can bring up a bottle exchange place that can be used for public transportation (Magenda, 2020).

User-centered design is part of a system design method called System Development Life Cycle (SDLC) which takes the wishes and needs of users as a reference. The UCD method focuses on the end-user with an approach to approach the display design needed by the user so that it can increase the chances of acceptance of the system or application by the user (Bragi, 2023). User centered design (UCD) is a method in designing a design that focuses on user needs (Hannah & Kholiza, 2024). In relation to the Information System, so that the application design developed through UCD will be optimized and focus on user needs so that it is hoped that applications that will follow the needs of users and users do not need to change their behavior to use the application. Then it will produce ideas that are then continued to be used as a User Interface (UI) and User Experience (UX) display which can be a solution to carry out a redesign (Gunawan et al., 2019). Redesign of the Gobis Surabaya application design to produce an application design that suits the user's wishes and makes it easier to use (Kurniawan & Romzi, 2022).

Research Methods

This research was carried out by designing Ul/UX applications using the User-centered design approach, and for data processing using the System Usability Scale method. There are several stages that have been explained in the previous chapter.

In the testing stage, the researcher uses the SUS (System Usability Scale) method to measure the product. SUS uses a Likert scale of one to five with the description of the System Usability Scale using a Likert scale of one to five, namely 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree).

This study also uses a quantitative method where quantitative data is obtained from the stages of usability results and the distribution of questionnaires to respondents. At the usability stage, calculations will be carried out on 3 aspects, namely learnability, efficiency, and error. The following is an analysis method for each aspect measured in usability testing:

1. Learnability aspect

The data needed to conduct analysis on the learnability aspect is the success of participants in completing the task. The data analysis used in this aspect is to calculate the success rate which functions to analyze the tasks successfully done by the participants

2. Efficiency Aspects

The data needed to conduct analysis on the efficiency aspect is the time spent by participants in completing the task. The data analysis used in this aspect is by calculating time-based efficiency which functions to analyze the time needed by participants in completing the task

3. Error Aspect

The data required to analyze the error aspect is the number of mistakes made by the participant while processing a particular task. The data analysis used in this aspect is to calculate the error rate used to analyze the number of errors made by the participants.

System Usability Scale on Old Gobis Applications

In this discussion, an assessment will be carried out on the System Usability Scale (SUS) applied to the GOBIS application before being redesigned. This assessment is based on the user experience of the GOBIS Surabaya application by customers who use the service.

Based on data obtained from previous use of the application, the average GOBIS Surabaya customer tends not to continue using the application after downloading it. This can be due to the user experience that users find the previous app design inadequate and do not meet the expected usability standards. From this assessment, the researcher concluded that the previous design of the GOBIS Surabaya application was inadequate and needed to be significantly improved. The following is a statement of the questionnaire that will be submitted to the respondents which can be seen in table 1.

Table 1 SUS Statement

It	Statement
1	I'm thinking of using this system again
2	I find this system complicated to use
3	I find this system easy to use
4	I need help from other people or technicians in using this system
5	I feel that the features of this system are working properly

6	I feel like there are a lot of inconsistencies (incompatible with this system)
7	I feel like others will understand how to use this system quickly
8	I find this system confusing
9	I feel that there are no obstacles in using this system
10	I need to get used to it first before using this system

From this statement, a questionnaire has been carried out with a target of 30 passengers from Surabaya gobis. The following is a recap of the questionnaire given to the respondents and this data has been calculated in accordance with the applicable provisions which can be seen in table 2.

Table 2 Results of the gobis application before redesign

Respondents	Value	Respondents	Value
1	12,5	16	12,5
2	12,5	17	17,5
3	15	18	22,5
4	15	19	17,5
5	12,5	20	17,5
6	12,5	21	15
7	10	22	12,5
8	12,5	23	12,5
9	12,5	24	12,5
10	10	25	12,5
11	17,5	26	22,5
12	17,5	27	25
13	7,5	28	12,5
14	12,5	29	15
15	12,5	30	17,5

In the context of the System Usability Scale (SUS) assessment, if the score obtained from the calculation is above 50, then the application is considered feasible to use. Conversely, if the score is below 50, then the app is considered less feasible to use (Kesuma, 2020).

Affinity Diagram

Affinity Diagram, also known as the Kawakita Jiro (KJ) method or affinity diagram, is an approach used to organize complex ideas or information into more structured and better understandable groups. This method was developed by Professor Jiro Kawakita, a prominent Japanese anthropologist, in the 1960s. Using anthropological principles and grouping techniques based on similarities or relationships, affinity diagrams help in identifying patterns, key themes, or relationships that may not be directly apparent in raw data or scattered information (Agam et al., 2024).

In this study, an Affinity Diagram will be made based on suggestions or input from users who use old designs or designs that have not been redesigned by researchers so that this diagram will facilitate this research for design development so that development can be right on target and meet the needs of users, this diagram can be seen in figure 1.

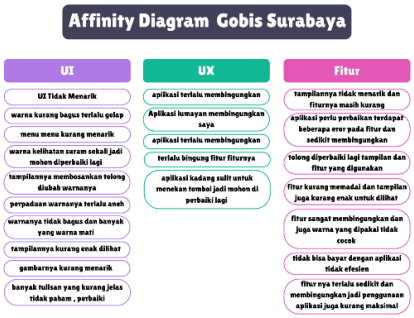


Figure 1 Affinity Diagram.

Results and Discussions

Application Redesign

In this section, we will explain in detail some of the differences between a pre-redesigned app and a post-redesigned app. This explanation will cover important aspects that affect user experience (UX) and user interface (UI). These differences are not just aesthetic or visual improvements, but also include improvements in functionality that have been implemented based on user feedback and needs

In particular, this explanation will show how the improvements have better met the needs of users, as well as how the UI and UX changes have been designed to provide a more intuitive and enjoyable experience. In addition, in this redesign, there are also several new features and menus designed to make it easier for users to navigate and use the application. These additional features were created with the goal of improving usage efficiency, providing faster access to important functions, and ensuring that each user can easily find what they are looking for in the app.

As such, the redesign focuses not only on the visual aspect, but also on improving overall performance and user satisfaction, making the app more responsive and easier to use. The following is a list of menus or features that have been created and improved in the redesigned application which can be seen in table 3.

Table 3 Design Comparison Table

Feature	Old Design	New Design
Landing Page	✓	✓
Register	✓	✓
Login	X	✓
Dashboard	✓	✓
Forgot Password	X	✓
Settings	✓	✓
Notification	X	✓
History	✓	✓
Change Password	✓	✓
Change Profile	✓	✓
Logout	✓	✓
Surabaya Bus	✓	✓
Wira Wiri	✓	✓
Bus Friends	X	✓
Trans East Java	✓	✓

Integration Map	X	✓
Bottle Post	✓	✓
Top Up Bottle Points	X	✓
Top Up e-Wallet	X	✓
Top Up e-Peken	X	✓
Explore	✓	✓
Service and Support	X	✓
Payment	X	✓

As one example of a redesigned display is the dashboard view, the dashboard page view has undergone changes by paying attention to good UI principles and simple UX. This change aims to maximize the user experience so that there is no confusion in navigation and users can quickly understand what they need without having to search for the appropriate menu. The new design also pays attention to the use of the app's signature color blend, which not only reflects the app's visual identity but also considers appropriate contrast and the selection of easy-to-read fonts. This makes the display less dark, which can improve the readability of the information and ensure that the interface does not interfere with the user's eyes This view can be seen in Figure 2.

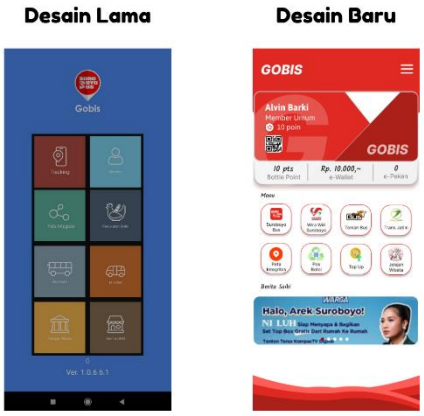


Figure 2 Dashboard page

The redesign was carried out on the entire application display, including the settings display, it can be seen that there are significant changes in the settings display. The old design was criticized for being visually unpleasant, so the new design has been made better. This new design uses a combination of the app's signature colors, which not only depicts the app's visual identity but also pays attention to the pleasing aesthetics for the user's eyes.

In addition, the icons are carefully selected and placed to add aesthetic value to the appearance of the setting. The selection and placement of simplified features is also part of the effort to maximize the user experience (UX) on the display. Thus, the new design in figure 2 not only improves the visual aspect, but also ensures that the app's settings become more intuitive and convenient for users to use. This display can be seen in figure 3.

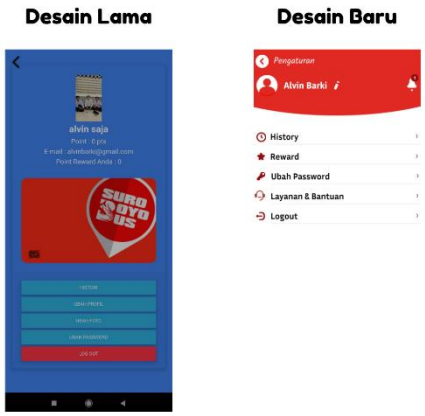


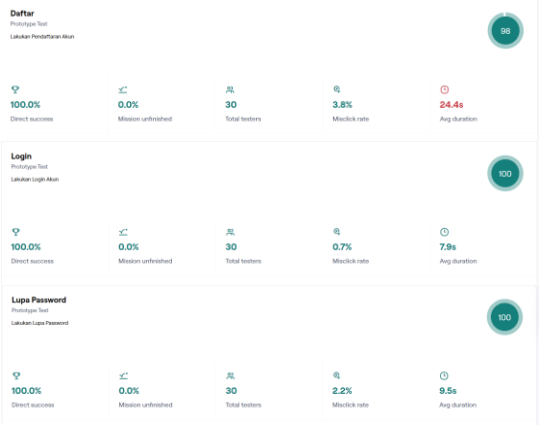
Figure 3 Settings page

The redesign of this application is based on user complaints and criticisms or suggestions made by questionnaire respondents that have been summarized in the Affinity Diagram in figure 1 above and after the redesign is also retested using the help of maze software and a questionnaire is conducted again with the same person as the previous respondent.

Maze

In this section, we will review in detail the use of the Maze website in the context of usability. Through a series of trials involving the use of Maze, various aspects will be explored ranging from missclicks, the ability to complete tasks directly, to the overall usability score. This approach aims to gain in-depth insights into how effectively and efficiently users can interact with the design. Missclick, as one of the rated parameters, is an indicator of an event when a user accidentally clicks on an area that is not intended, which can disrupt the user experience. Then, a direct evaluation of the user's ability to complete tasks efficiently and without obstacles will be an important focus in this study.

In addition, the usability score will be an overall measure of how well this design is perceived by users in terms of ease of use, clarity, and satisfaction in navigation and interaction. By combining all of these aspects, a thorough assessment will be obtained, providing valuable insight into whether the features provided by this design may be deemed feasible or require further improvement. The following are the results of the maze test conducted by the same target respondents.



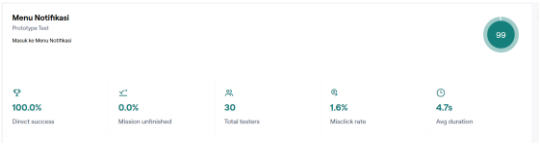


Figure 4 Maze Results

In Figure 4 above, it can be seen that the results of the Maze test involve 4 of the 21 available menus or features, namely register, login, forgot password, and notifications. A more in-depth analysis of the efficiency of Maze results for menus or other features has been conducted, and to facilitate access, researchers have uploaded those results to Google Drive. You can access the full details of the Maze test results for the rest of the menus or features via the following link https://drive.google.com/drive /folders/15cfgtJug5VIiBnSSXnKtm8daTOEoDGI3?usp=sharing.

System Usability Scale Gobis Application After Redesign

In this discussion, an assessment will be carried out on the System Usability Scale (SUS) applied to the GOBIS application that has been redesigned. This assessment is based on the user experience of the GOBIS Surabaya application by customers who use the service.

This questionnaire statement adheres to the statement shown in table one and from the statement data was obtained from 30 respondents and the data has been processed according to the provisions that can be seen in table 4.

Table 4 Gobis Application Questionnaire Results After Redesign

Respondents	Value	Respondents	Value
1	90	16	92,5
2	92,5	17	87,5
3	90	18	92,5
4	85	19	90
5	90	20	92,5
6	95	21	90
7	90	22	90
8	95	23	90
9	95	24	90
10	90	25	90
11	92,5	26	87,5
12	90	27	92,5
13	95	28	95
14	95	29	92,5
15	92,5	30	90

In the context of the System Usability Scale (SUS) assessment, if the score obtained from the calculation is above 50, then the application is considered feasible to use. Conversely, if the score is below 50, then the app is considered less feasible to use (Nugroho & Pramono, 2022).

It can be seen that in table 4 almost all of the results of each respondent are above 50 so that from the above statement the application that has been redesigned can be categorized as good.

Conclusion

A study of 30 respondents showed that apps that had not undergone a redesign had a SUS score below 50, indicating low usability due to various shortcomings such as navigation and clarity of information. However, after the redesign, the SUS score of the GOBIS application increased significantly with the majority of ratings above 85, indicating a high usability improvement. This success is achieved through attention to user experience and interface, as well as the application of ergonomic and aesthetic design principles. The feasibility test involving 30 respondents for each menu demonstrated excellent UI and UX quality with a usability score between 97 and 100, as well as well-designed navigation, allowing for task completion without significant difficulty. Despite the low missclick rate (0%-4.5%), the fast duration of task completion (1.5-24.4 seconds) indicates high efficiency. Overall, the app's UI design and UX provide a satisfying experience for users.

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