REDESIGNING USER INTERFACE OF TEMAN BUS APPLICATION USING GOAL-DIRECTED DESIGN

I Putu Yogi Putra Prastiawan*[1], Veronikha Effendy[2], Anisa Herdiani[3]
1. Telkom University, Bandung, Indonesia
2. Telkom University, Bandung, Indonesia
3. Telkom University, Bandung, Indonesia

ABSTRACT

Teman Bus is a Buy the Service (BTS) service launched by the Kementerian Perhubungan (Kemenhub) in 2020. Teman Bus has a mobile application to support its services to make it easier for Teman Bus passengers. From the results of observations and interviews with users of Teman Bus service, there are obstacles experienced by application users because the user interface in the application confuses users. This is also reinforced by the results of usability testing using the System Usability Scale (SUS) evaluation method which gets a SUS score of 35, this value means the application is still bad for users and requires improvement. Users have the main goal when using the application, which is to see the schedule, bus stops, and routes. By using the Goal-Directed Design (GDD) method in this study, it will be adjusted to the user's goals so that they can be achieved. Then testing using SUS can measure the effectiveness, efficiency, and satisfaction of users. From the results of testing and analysis, it can be concluded that using the GDD method in this study can help produce a user interface model that is following the goals and needs of the user. In the results of testing the prototype using SUS, the initial value increased from 35 to 80, from this value the prototype design can be categorized into a good range with grade B, namely the prototype design can be accepted by the user.

I. INTRODUCTION

HUMANS are very dependent on technology in this modern era, which makes technology a basic need for everyone. technology is used in various aspects of human life, from various ages and various expertise using technology [1]. Technology is considered important for life because it can provide convenience for people's daily needs such as computers, cellphones, vehicles, and others [2]. The user interface is a means of interaction between humans and the system. The purpose of creating a user interface is to facilitate the operation of the system in providing information content [3]. The user interface becomes very important considering the more effective and efficient a design is, the more comfortable users will be in the application [4]

Kementrian Perhubungan (Kemenhub) has developed mass transportation through the Teman Bus program [5]. This implementation is named Teman Bus which presents the cashless concept to provide economical, easy, reliable, and comfortable transportation for the public. The service from Teman Bus is also supported by a mobile application to make it easier for passengers to get information such as routes, bus stops, and bus departure schedules. With the presence of the Teman Bus mobile application, it is hoped that it can help users who use the Teman Bus service. However, on the Play Store and App Store, the Teman Bus application gets a low review score. From the results of initial testing of the application, users have some difficulties with the application where users are confused about the route information presented, confused with menu placement, ambiguous with menu naming, and do not know the gestures in the application to access certain features.

This can be detrimental to the Teman Bus service, where the purpose of the application is to help users but instead makes it difficult for users with the user interface that is presented. This impact will make users feel disappointed or annoyed which results in users being able to no longer using the Teman Bus application. To achieve an appropriate user interface design, the focus of this research is on developing user interfaces by adjusting user goals. The approach used is the Goal-Directed Design (GDD) method, GDD has a process that focuses on users and has a specific process [6].

Revina Laksmi Permata Hati conducted previous research entitled "Evaluasi Dan Perbaikan Rancangan Antarmuka Pengguna Aplikasi MboisApp Menggunakan Metode Goal-Directed Design". This study aims to fix usability problems in the application when users use it to access tourism information. The result of this application

is a redesign of the application in the form of a prototype. The weakness of previous research is that the segmentation of sample users is only based on geography [7], so the target market desired by stakeholders is not necessarily accurate. In order to avoid the same weakness occurring in this study, we first collected information from Teman Bus management about their target market using interviews. According to them, the company's main target markets are students and workers. For this reason, we determine the criteria for participants who will be involved in this research are students and workers.

Initial evaluation was carried out using the System Usability Scale (SUS) method which has a calculated value so that it can be measured [8]. The author conducted usability testing on 7 users of the Teman Bus application using SUS, from the results of the final test score, it obtained a value of 35 which means the application is still bad for users and requires repair.

Based on the results obtained in the initial test, the Teman Bus application has not been able to meet the needs and desires of users who use the Teman Bus service, especially in terms of the user interface provided. Because there is an information display that confuses users in the form of icons, colors, menu naming, menu placement, and gestures to access certain features. So there needs to be a solution to this problem by evaluating the Teman Bus application to suit the user's purpose of using the application, namely helping when using Teman Bus service and following the stakeholder goals of building an application, namely developing community mobilization and community resources through Teman Bus application and system. This study aims to evaluate the Teman Bus application which resulted in the design of a new User Interface application model using the GDD method and testing using SUS. The success indicator in this study is when the usability test results from the model design that have been made get an average value of 68 of the total number of values. This value was taken because in testing using the SUS method, a value above 68 is considered a good product and can be accepted by users.
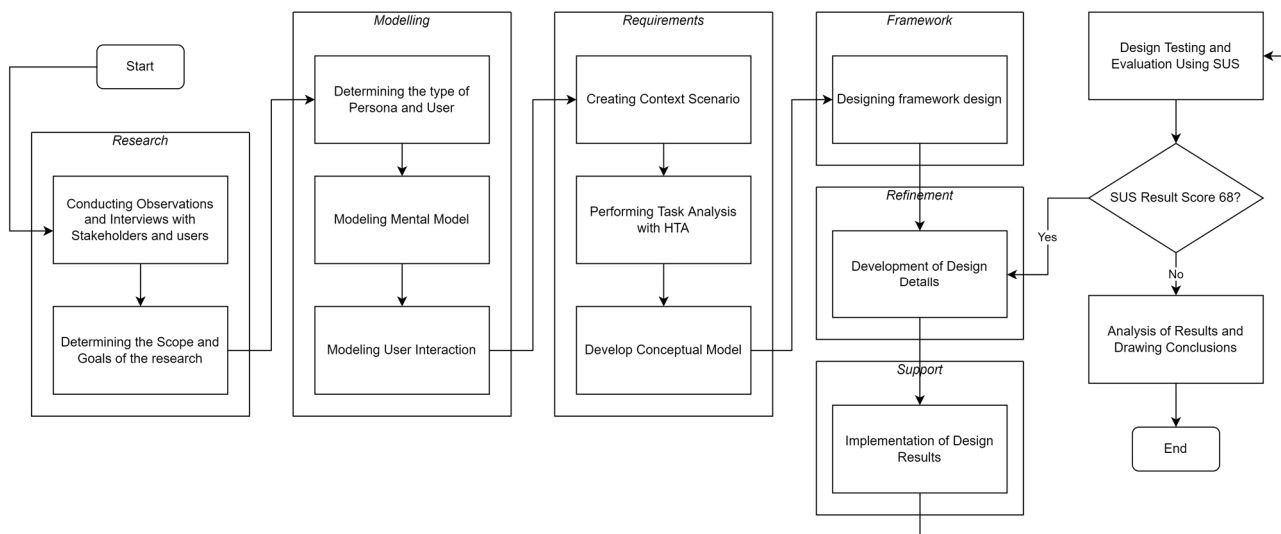
II. RESEARCH METHODS

Figure 1. Goal-Directed Design Method Flow

Figure 1 shows the flow of the GDD Method, the GDD method is a combination of ethnographic techniques, stakeholders, interviews, market research, detailed user models, scenario-based design, and core principles and interaction patterns. This method can provide solutions to meet the needs and objectives of the users by considering the business/organizational and technical needs. There are 6 process phases in this method, namely research, modeling, requirements definition, framework definition, refinement, and support [9]. At the end of the support phase, usability testing is carried out using SUS.

In the first phase, observations were made at where Teman Bus service operates, after that interviews were conducted with PT. Trans Metro Dewata as a stakeholder then to Teman Bus service passengers as users. The data obtained is in the form of information about the background, user needs, and goals of users and stakeholders. Initial usability testing was carried out on the application users to get more information about the problems experienced by users in using the Teman Bus application. Usability testing is done by giving users 10 tasks to complete. Then from the data that has been obtained, the scope and goals are identified for service owners and users. The data is then analyzed to get the user persona of the user, user needs, mental model, Hierarchical Task Analysis (HTA),

190

context scenario, and conceptual model. The next process is to create a framework, this stage is the process of defining the requirements needed to be wireframes and other needs such as coloring and typography to create a mock-up display [10]. After the mockup design is complete, user interface modeling is carried out to redesign the Teman Bus application into a prototype using Figma. The results of the prototype that were made were then tested for usability testing using the SUS method. The last stage is the results and discussion of the research carried out to know the results and the advantages and disadvantages of the research that has been done.

A. Research

Observations were made at the bus stops and bus stops in the research area in the City of Tabanan and Denpasar. Then conducted interviews with stakeholders from Teman Bus to understand the background of stakeholders, focused market segmentation, the purpose of the service, and the use of applications on Teman Bus service. Furthermore, interviews with Teman Bus service users were conducted based on market segmentation prioritized by Teman Bus service, namely students and workers to obtain user background, user basic ability to use technology, user needs, and user goals. In the tests carried out, the samples taken were 5 users of Teman Bus service and prospective users of Teman Bus service. Interviews were conducted in a semi-structured manner to get a more open problem. Then proceed with initial usability testing on the Teman Bus application by giving 10 tasks to users to complete. The following is the proposed test task which is described in Table I.

TABLE I
TESTING TASK TO USERS

No	Code	Task
1	UT_01	Before ordering a Bus, please login first to the Teman Bus application
2	UT_02	Please check whether you have a balance in the Teman Bus application and check the available balance.
3	UT_03	Please check if your area is already in Denpasar.
4	UT_04	Find the route from "Terminal Pesiapan" to "Halte Surapati"
5	UT_05	Check if the route shown is appropriate and understandable.
6	UT_06	Look for available buses at the first stop and book a ticket for 1 passenger
7	UT_07	Please check your e-ticket (QR Code) in the history menu, is it available?
8	UT_08	Please change the features in the menu bar below you by changing the help feature to a news feature then save it
9	UT_09	Please read 1 news available on the news menu
10	UT_10	Please login to the Teman Bus application

From the tests carried out, it was found that there were errors made by the user when given a task, these errors included minor errors such as wrong clicks and fatal errors where the user could not complete the given task. From the data that has been obtained then an analysis of the results is carried out, namely the goal of Teman Bus service users, which is to make it easier to obtain information on available bus routes and easy to order buses, and the goal of Teman Bus service owner is to provide public transportation that is easy to use by integrating via digital app.

B. Modeling

Based on the information obtained from the research results, it will produce personas from various patterns of behavior and attitudes of each user in using the Teman Bus service. There are 6 pieces of information that are used to present user profiles using the Teman Bus application, the information includes demographic, device & platform, technology expertise, activity, motivation & goals, and action to achieve goals [11]. Table II explains the details of the user persona.

TABLE II
USER PERSONA TEMAN BUS

Demographic	- Age: 21-29 years old	- Profession: Student, Employee
	- Gender: Male & Female	- Lives in Bali
Device & Platform	Smartphone Android	
Technology Expertise	- Users interact with the application using Indonesian and English	
	- Users already understand operating smartphones with the Android operating system	
	- Users use smartphones more than 4 hours a day	
	- The time it takes the user to adapt to a new application is between 2-10 minutes	
Activity	Activities carried out while using a smartphone:	
	- work support	- Order food or drink
	- Work team meeting	- Take online transportation
	- Online class meeting	- Streaming video
	- Phone and chat	- Music streaming
	- Play social media	- Playing games
	- Online Shopping	
	Activities carried out when using Teman Bus service:	
	- Go to work at the office	- Go for a walk in a tourist spot

Redesigning user interface of teman bus application using goal-directed design

	- - Go study on campus	
Motivation & Goals	Motivation for using Teman Bus service: - Want to support government programs - Likes to use public transportation Goals to be achieved: - Easily obtain available bus route information - Get bus booking information easily	
Action To Achieve Goals	Activities carried out to be able to use Teman Bus service: - Learn to adapt to the application - Remembering frequent bus routes - Using the help of third-party applications - Come directly to the terminal and ask the Teman Bus officer	

C. Requirement

The results obtained from the modeling phase will be carried out by compiling user requirements for the Te-man Bus application taken from the user persona and the results of usability testing with users. Then the goals persona is obtained by identifying the user persona and the results of usability testing. The resulting goals will be used as requirements that contain user needs, described in Table III.

TABLE III
USER NEEDS

No	Stakeholder Goals	User Goals	Needs	Requirements
1	Providing easy-to-use public transportation by integrating through digital applications	Get easy-to-understand bus route information	Easy to find the desired destination	There is a search for the place the user wants to go
			Get travel recommendations that must be taken to reach the destination	Provides a recommended route to a previously searched destination
			Easy to see operating bus schedules	There is information that displays the bus schedule that is currently operating in each corridor
			Can save locations frequently searched by users and add them to favorites	There are suggestions in the search about places that users often search for, and users can add them to their favorites
			Easy to distinguish colors on each corridor path	Change the color of each corridor with the contrasting color of each corridor path
			See the stop icon easily and clearly	Size change on the more enlarged stop icon
			Can find out an overview of the location around the existing bus stop	Adding images to each existing bus stop
			Easily distinguish icons on each existing bus stop	Added information on each bus stop icon
			Can operate toggle or bar line easily	Adjustment of toggles or bar lines when minimized or swiped down and when maximized or swiped up
2		Get bus booking information	Can see bus booking history	There is a trip history menu that provides information from bus reservations that have just been ordered and have been ordered
			Unambiguous with the naming "History"	Changed the naming "History" to view bus booking history
			The efficiency of information on "Transaction History" and "Travel History"	Merging information on "Transaction History" and Travel History" into one piece of information
			Unambiguous with the naming "Schedule"	Changed the name "Schedule" to see the bus schedule that is currently operating
3		Easy in-app customization	Change the language according to the user's wishes	Provides additional English in the application
			Changing the location of the Bus Buddy service	Provides a choice of locations available with Teman Bus service
			Easy to delete and add menus	Adjustment of settings for removing and adding menus
			Knowing the menu bar that can be swiped up	Added a sign on the menu bar to indicate the menu bar can be swiped up

Redesigning user interface of teman bus application using goal-directed design

4	Familiar with page placement issuing account	Can issue accounts according to user habits	Change of placement to remove user account
5	Easy to order bus	There is a balance for paying bus tickets	Provide special balance for payment from bus booking
		Provides a method of replenishing the balance	Provides a choice of various balance replenishment methods with the filling procedure
6	Provide informative and helpful information for users	Can read information related to Teman Bus service	Provide news about the latest information from the Teman Bus service
		Can ask for help when needed	A help menu is provided for users if needed to use the Teman Bus service
7	Have an account on the Teman Bus app	Can register a user account to connect with the Teman Bus application	Users can register an account with Teman Bus service to be able to access all application services
		Easy to customize user's data	Users can change their previously registered user data
		Can issue an account that is already connected	Users can log out of accounts that have been previously linked to the application

Mental models are made to describe how users think about problems or systems taken from personal data and observations that have been made previously. Mental models are used to visualize how things work in the real world in this case, the user's representation of how the Teman Bus application works. [12], illustrated in the form of an activity diagram in Figure 2.
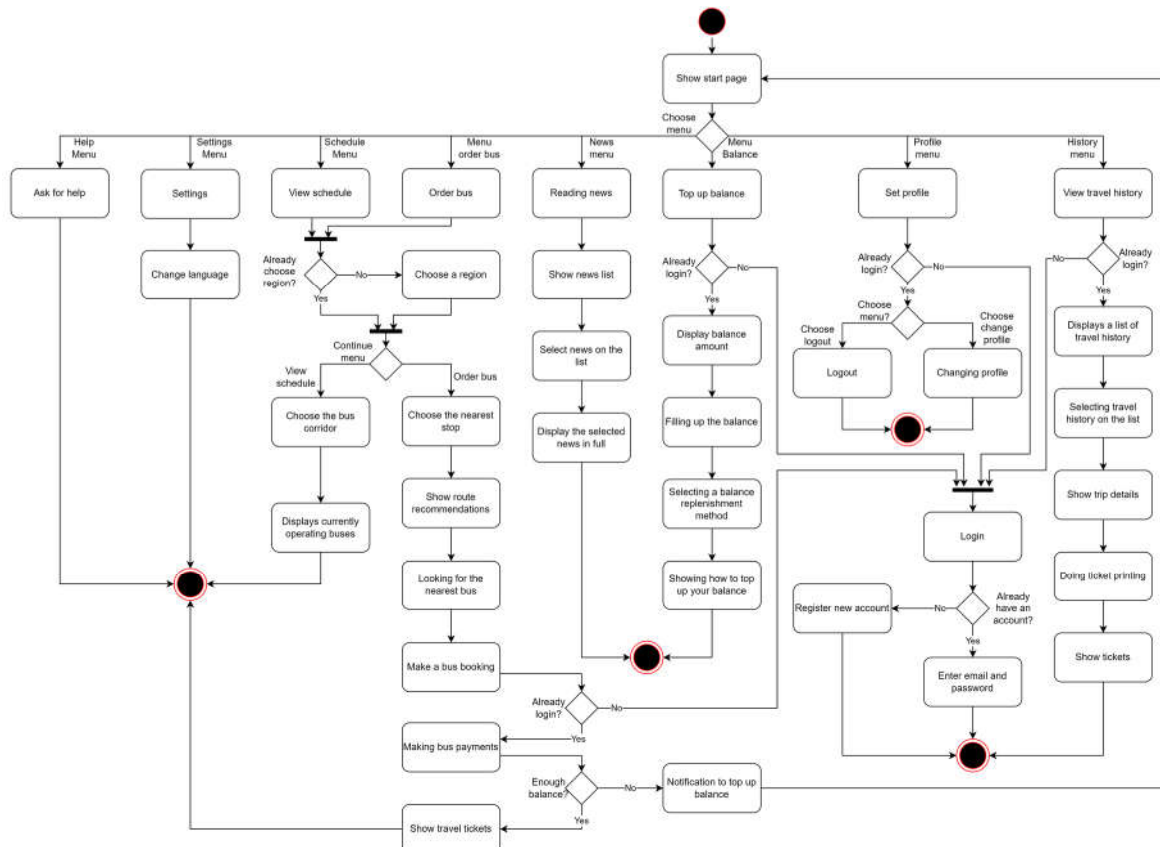
Figure 2. Goal-Directed Design Method Flow

After that, a task analysis is carried out using Hierarchical Task Analysis (HTA) in the form of a diagram that aims to identify user tasks because each task is broken down into subtasks making it easier to know the designed interface. [13]. The following are the results of the HTA which can be seen in Figure 3.
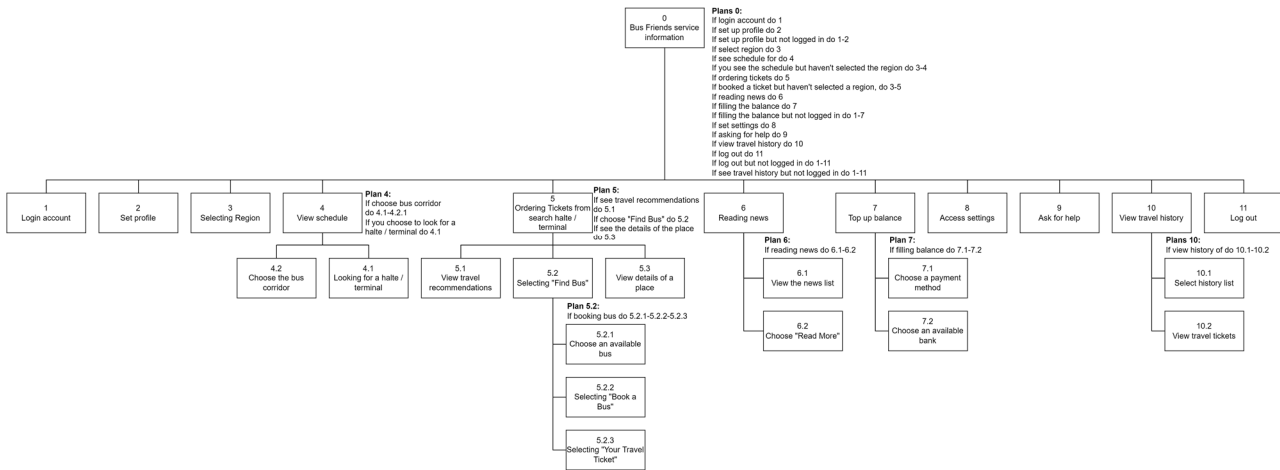
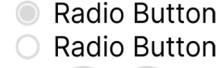*Redesigning user interface of teman bus application using goal-directed design*
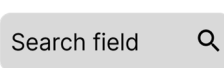
Figure 3. Hierarchical Task Analysis

Then context scenario is prepared which serves to provide an overview of user interactions on each page of the modeled application, the purpose of this stage is to carry out this stage as a basic framework and guide in designing the user interface. Context scenarios focus on goals, needs, and persona behavior [14]. There are several components in creating a context scenario, namely tasks, subtasks, task goals, and system descriptions. Next is the preparation of a conceptual model that produces a detailed description of all tasks. The picture is generated from the preparation of the context scenario and HTA that has been made previously. The conceptual model consists of several components, namely tasks, subtasks, expected responses, page layout, visual elements, and descriptions.

D. Framework

In this phase, to describe the display layout and structure of the Teman Bus application page, an interaction framework is made. The step taken is to determine the form factor of the product, which in this study is the user interface design in the form of a smartphone application. Then for application posture using transient posture where functions and features are displayed simply on one screen to offer an experience that is still easy, and the controls are clear. Next, determine the input method using a touchscreen because the design is made in the form of a smartphone application, making it easier for users to operate the application. The last is to determine the visual elements that will be used in making the wireframe as described in Table IV.

TABLE IV
VISUAL ELEMENTS

No	Visual Element	Function Description	No	Visual Element	Function Description
1		The button functions for the user to choose with one touch which is usually in the form of text, an icon, or both	6	Text field	The text field is used to give the user to enter and change the text
2		The image serves to display the content or media provided	7	Search field	The search field serves to provide users with entering keywords to search for and provide results that are relevant to what they are looking for
3		The icon serves to simplify images which are usually symbols	8	Radio Button / Radio Button	Radio buttons function to give the user to choose a given option
4	**Title**	The title serves to be the title of the page in the form of text	9		Goggles function to give the user the option to change settings that contain two or more states
5	Text	The text serves to convey information in the form of text	10	Text / Text / Text	Sheets serve to provide additional content at the bottom of the screen

After determining the description of the display structure to be created, a wireframe design will be generated to describe the page layout, content placement, and design elements created [15]. The following is one of the wireframes that have been created in Table V.

Redesigning user interface of teman bus application using goal-directed design

TABLE V
WIREFRAME SELECTING REGION

Region Selecting Page

Description
On the page selecting the region will display the cities available by Teman Bus service. This page can be accessed by users by selecting the "Region" button on the main menu. The main function of this page is to select or replace the city choices that have been previously selected by the user. To select a city, users can press the image of the desired city, users can also search for other cities by scrolling up or scrolling down.

User Interface Components
1. Back button
2. Title page name
3. Text city name
4. City variant image

Function
1. Back button serves to return to the previous page whereas on the page selecting the city will return to the main page
2. The title of the page name shows the title of the page in the application
3. Text the name of the city to describe the name of each city
4. City variant images show pictures of each city

E. Refinement

From the results of the prototype that has been made, design improvements will be made which will be redesigned by determining the appropriate color and setting the font on the prototype. Because the application is designed on a smartphone, the interactions that can be used are gestures such as tapping to interact with the menu and scrolling vertically to move the page menu. The prototype also provides convenience for navigation with the use of icons that are familiar and easy to understand by users. In determining the color used in making the mockup, it is based on the colors that are the identity of Teman Bus and Kemenhub, that is orange, white, black, and blue. The color selection is taken from the colors that already exist in the previous application as shown in Table VI.

TABLE VI
COLORS IN A MOCKUP

Colors			
	#F69D1B		#000000
	#FFFFFF		#317FA3

After determining the color to be used, then the icon is selected to make it easier for users to identify the features or functions of the application. The following in Table VII is an explanation of the icons used.

TABLE VII
ICONS USED

Icon	Icon Name	Information	Icon	Icon Name	Information
	Arrow Back	Used to return to the previous page		Location	Used to view service map
	Account	Used to view user accounts		Home	Used to return to the homepage
	QR Code	Used to view QR code of bus ticket		History	Used to view available bus schedules
	Plus	Used to top up the balance		Setting	Used to access the settings menu
	List	Used to view travel history		Help Center	Used to ask for help from customer service services
	Search	Used to find the bus stop/terminal you want to go to		News	Used to view news list

| ▼ | Drop Down | Used to select a city |

Then proceed with determining the typeface and typography in making a mockup for the Teman Bus application. The typeface in this design is used based on the previous application that has not been redesigned. The typeface used previously was Roboto. The following in Figure 4 and Figure 5 are examples of the Roboto typeface used in the mockup.
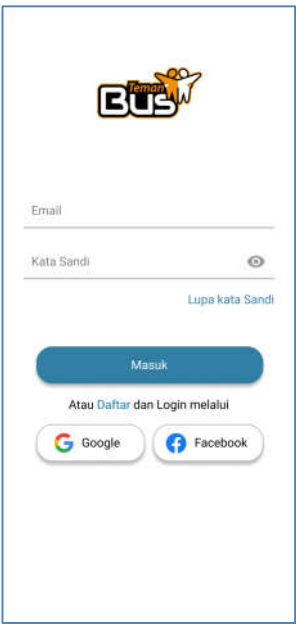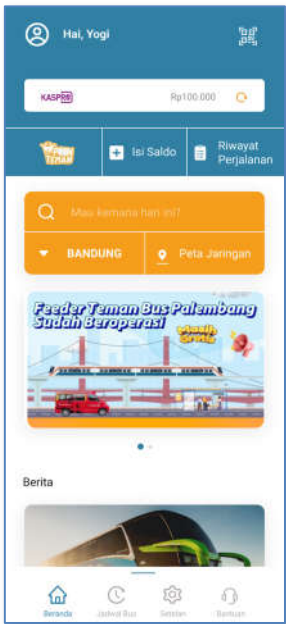

Figure 4. Roboto Regular

Figure 5. Roboto Bold

Then a mockup will be generated from the wireframe that has been created along with the predetermined colors, icons, typefaces, and typography. The resulting mockup is implemented in the form of a Teman Bus application prototype. In Table VIII are some of the pages generated in making the mockup.

TABLE VIII
GENERATED MOCKUPS

Login Page	Main Page	Bus Ticket Booking Page

F. Support

The last phase in GDD is the implementation of the prototype of the mockup design that has been created. The tools that will be used in modeling the user interface for the redesign of the Teman Bus application are using Figma. The prototype results will be tested for usability testing using the SUS method.

III. RESULT AND DISCUSSION

A. Testing

In the tests carried out, the number of samples to be tested is determined. The respondents who were taken were respondents in the previous research stage, namely 5 users of the Teman Bus service. The selection of respondents was carried out to get feedback from previous tests which became the user's pain point on the existing Teman Bus application. This test is done online using google meet. In testing, users are asked to fill out a Google Form containing 10 SUS questions represented by a Likert scale from 1 to 5, and 1 question regarding the responses of the respondents. The use of SUS is also to be used as a comparison of the results of the previous SUS, where previously the SUS value obtained was 35, which means that the application is bad for users and requires improvement. Following is each of the SUS questions given to users in Table IX.

TABLE IX
SUS QUESTIONS [16]

No	Item in Indonesian
1	Saya berpikir akan menggunakan sistem ini lagi.
2	Saya merasa sistem ini rumit untuk digunakan.
3	Saya merasa sistem ini mudah untuk digunakan.
4	Saya membutuhkan bantuan dari orang lain atau teknisi dalam menggunakan sistem ini.
5	Saya merasa fitur-fitur sistem ini berjalan dengan semestinya.
6	Saya merasa ada banyak hal yang tidak konsisten (tidak serasi) pada sistem ini.

Redesigning user interface of teman bus application using goal-directed design

7	Saya merasa orang lain akan memahami cara menggunakan sistem ini dengan cepat.
8	Saya merasa sistem ini membingungkan.
9	Saya merasa tidak ada hambatan dalam menggunakan sistem ini.
10	Saya perlu membiasakan diri terlebih dahulu sebelum menggunakan sistem ini.

In the test scenario on the Teman Bus application prototype, the researcher first contacted the respondents who had previously been interviewed and carried out usability testing. The researcher conveys the aims and objectives related to the usability testing of the prototype to the respondents to provide understanding to the respondents from the testing. Next, the researcher asked about the respondent's time available for testing the prototype. Then at the previously agreed time, the researcher provided testing tools to the respondents via a prototype link for respondents to try. Next, the researcher asked permission to record the test and when the test had started, the researcher explained in advance the testing scheme in the form of what steps the respondent would take during the test. After the respondent understood the explanation given, the researcher then asked the respondent to access the maze link that had been shared. There are 10 tasks given to respondents, the same as the tasks in the previous test. This is done to get feedback on whether the prototype that has been made is following user needs. After the respondent completed all the tasks given, the researcher asked the respondent to fill out the SUS questionnaire. This questionnaire was used as a comparison of the results of the SUS questionnaire which had previously been tested on the existing Teman Bus application

B.Test Analysis

In tests conducted on 5 respondents, the results obtained from the maze and the results from the SUS questionnaire were then analyzed for calculations. The purpose of using the maze is to make it easier for researchers in the testing process because researchers can regulate the flow of interactions that will be carried out and also the maze can be integrated directly with the prototype made in Figma. Then the purpose of using SUS is to measure the usability level of the prototype that has been made and whether the value obtained has met the indicators of research success, namely the average value of 68 of the total number of values. The use of SUS is also to get a comparison of the results of the value of a pre-existing application with a prototype that has been designed and whether there is an increase in value. Then the average value of SUS is calculated by adding all the final user values and then dividing by the number of users so that the average value of SUS will be obtained.

TABLE X
SUS RESULT FROM A PROTOTYPE

| Respondent | Score Result Count | | | | | | | | | | Amount | Value (Sum x 2.5) |
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
1	2	4	4	1	4	4	4	4	4	3	34	85
2	4	3	3	3	4	4	3	4	4	3	35	88
3	3	3	3	3	2	3	3	3	4	4	31	78
4	2	3	4	4	3	3	3	3	4	4	33	83
5	3	2	4	2	2	2	4	2	4	2	27	63
Average/ Qn	3	3	4	3	3	3	3	3	4	3	Final Score	80

From the results of the SUS test table in Table X, the resulting prototype gets a final value is 80. This value can be interpreted into three assessment categories: grade scale, acceptability ranges, and adjective ratings. The following is the result of the interpretation obtained:

1. Interpretation of Grade Scale, where the score obtained is at grade B.
2. Interpretation of Acceptability Range, where the score obtained is in the Acceptable range or the prototype can be accepted by the respondent.
3. Interpretation of Adjective Ratings, where the score obtained is in the Good rating or the prototype is good.

From the results of SUS, an analysis of the average score of each question can also be carried out to find out whether each question from SUS has a good score or not. Analysis was also carried out from the scores generated by each respondent to determine whether the prototype produced was acceptable to the user. Here are the points earned:

1. The average score obtained from each SUS question is 3 and 4 which is a good value because if the value is changed to a scale of 10 by multiplying the score obtained by 2.5 because 4 is the highest value in SUS, so if 4 x 2.5 then it will produce a maximum score of 10. In the results of the average score obtained, if the score is changed to a scale of 10 then it becomes 3 x 2.5 = 7.5 and 4 x 2.5 = 10 which is a good score.
2. The score obtained for each respondent gets a score that meets the minimum score that must be met, namely 68. Where in the test using the SUS method, the score can be said that the prototype that has been made is good and can be accepted by the user.
3. There is a significant difference in scores between respondent 5 with other respondents because the score obtained in respondent 5 is 68, while respondents 1 to 4 gets a score between 78 to 88. The score is obtained from several questions that get low scores, questions that get scores lower than respondent 5, namely

questions 2, 4, 5, 6, 8, and 10 where the value obtained is 2. This value is obtained because respondent 5 is a new user of the Teman Bus service so respondents are not too familiar with the menus and features available in the application. to support transportation services such as Teman Bus.

The results obtained in this study with other studies using the GDD method are because this method focuses on the goals to be achieved and the GDD method has an existing flow, the products produced by the GDD method can usually achieve the goals of users and stakeholders. However, the difference in results using the GDD method can be seen from the usability value obtained, because various usability methods can be used to determine product results when using the GDD method. In this study, the resulting product in the form of a redesign of the Teman Bus application can be categorized as successful because in usability testing using the SUS method, usability results are obtained with a value of 80 which means the product can be categorized as successful.

IV. CONCLUSION

Based on the results of the implementation of the prototype that has been designed and has been tested, then an analysis of the user interface is carried out on the Teman Bus application. From the results of the analysis carried out, it can be concluded that producing an interface model that is following the goals and needs of users in using Teman Bus transportation services, can be achieved by using Goal-Directed Design (GDD), which can make it easier to obtain information on available bus routes and easy to make a bus booking. Then in testing the prototype using the System Usability Testing (SUS) method, an average value of 80 was obtained. The value obtained was an increase from the previous SUS test, from the average SUS value of 35 to 80. From this value, a comparison of the acceptability categories was obtained from " Not Acceptable" becomes "Acceptable", grade scale from "F" to "B", and adjective ratings from "Poor" to "Good". From this value, the prototype design can be categorized into a good range with grade B where the prototype design can be accepted by the user.

REFERENCES

[1] M. A. Muhyidin, M. A. Sulhan, and A. Sevtiana, "Perancangan UI/UX Aplikasi my CIC Layanan informasi Akademik Mahasiswa Menggunakan aplikasi figma," Jurnal Digit, vol. 10, no. 2, p. 208, 2020.

[2] A. M. Ramadini, A. Junaidi, and F. M. Wibowo, "Perancangan Aplikasi kamus online Informatika-indonesia beserta fungsinya berbasis web menggunakan metode sequential search," Journal of Dinda : Data Science, Information Technology, and Data Analytics, vol. 1, no. 1, pp. 1–16, 2021.

[3] M. R. Arfianto, "Analisis Desain User Interface pada Aplikasi Pencari Parkir Mobil," Jurnal Desain Universitas Pembangunan Jaya, vol. 1, no. 1, pp. 29–33, Apr. 2022.

[4] S. Auliaddina, A. A. Puteri, and I. F. Anshori, "PERBANDINGAN analisa usability DESAIN user interface pada website Shopee Dan Bukalapak Menggunakan metode heuristic evaluation," Technologia: Jurnal Ilmiah, vol. 12, no. 3, p. 188, 2021.

[5] H. Hendrialdi, N. W. Sueni, A. Soimun, and A. P. Rupaka, "Angkutan Massal Sebagai Alternatif Mengatasi permasalahan kemacetan lalu lintas metropolitan sarbagita," Jurnal Teknologi Transportasi dan Logistik, vol. 2, no. 2, pp. 79–86, 2021.

[6] M. B. Syahroni and H. B. Santoso, "Designing social question-and-answering interaction using goal-directed design method," International Journal on Advanced Science, Engineering and Information Technology, vol. 8, no. 4, p. 1246, 2018.

[7] R. L. P. Hati, R. I. Rokhmawati, and L. Fanani, "Evaluasi Dan Perbaikan Rancangan Antarmuka Pengguna Aplikasi MboisApp Menggunakan Metode Goal-Directed Design," Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer, vol. 5, no. 6, pp. 2718–2726, Jun. 2021.

[8] S. Suyanto and U. Ependi, "Pengujian usability Dengan Teknik system usability scale PADA test engine try out Sertifikasi," MATRIK : Jurnal Manajemen, Teknik Informatika dan Rekayasa Komputer, vol. 19, no. 1, pp. 62–69, 2019.

[9] O. D. Yohanes, A. Ambarwati, and C. Darujati, "Pengembangan Antarmuka Dan Pengalaman Pengguna Aplikasi ujian online menggunakan metode goal-directed design," JOINTECS (Journal of Information Technology and Computer Science), vol. 6, no. 1, p. 55, 2021.

[10] A. Muliawati, T. Rahayu, I. H. Indriana, and K. Kraugusteeliana, "Desain Tampilan aplikasi sistem Pelayanan Masyarakat Desa Dengan metode goal-directed design," Jurnal Ilmiah Matrik, vol. 23, no. 2, pp. 229–238, 2021.

[11] S. A. Pribadi, R. I. Rokhmawati, and K. C. Brata, "Perancangan User Experience Situs Web Tanoto Scholars Association Brawijaya Malang menggunakan Metode Goal-Directed Design (GDD)," Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer , vol. 3, no. 8, pp. 7583–7593, Aug. 2019.

[12] F. W. Kardbri, D. D. J. Suwawi, and A. Herdiani, "Perancangan User Interface Fitur SAN Class untuk Guru pada Aplikasi SANEDU Menggunakan Metode Goal-Directed Design," e-Proceeding of Engineering, vol. 8, no. 1, pp. 836–851, Feb. 2021.

[13] M. N. A. Siddik, F. M. Al-Anshary, and A. Syahrina, "PERANCANGAN USER INTERFACE MITRA SEBAGAI PENERIMA PESANAN PADA APLIKASI EATAJA MITRA DENGAN METODE GOAL DIRECTED DESIGN," e-Proceeding of Engineering, vol. 8, no. 5, pp. 9705–9718, Oct. 2021.

[14] N. W. Elazri, S. H. Wijoyo, and B. S. Prakoso, "Analisis Kebutuhan dan Perancangan Antarmuka Pengguna Situs Web Pet N Pop menggunakan Metode Goal-Directed Design dan Post-Study System Usability Questionnaire (Studi Kasus : PT Mahitala Bramanta Digital)," Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer, vol. 6, no. 3, pp. 1082–1094, Mar. 2022.

[15] T. Andhiza, I. Fitri, and A. Rubhasy, "Perancangan user experience Pada aplikasi Pencarian Car Wash Menggunakan metode UCD (user centered design)," SMATIKA JURNAL, vol. 12, no. 01, pp. 135–145, 2022.

[16] Z. Sharfina and H. B. Santoso, "An Indonesian adaptation of the system usability scale (SUS)," 2016 International Conference on Advanced Computer Science and Information Systems (ICACSIS), 2016.