

Redesigning User Interface Using Prototype Method on The Scholarship Acceptance System

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Article Information	ABSTRACT
Article History Received : March 15, 2025 Revised : June 30, 2025 Published : July 18, 2025	This study aims to redesign the user interface (UI) of the KIP-K scholarship recipient prediction system at the Garut Institute of Technology by adding academic and non-academic monitoring features. The main issue raised is the lack of a system that can comprehensively monitor the progress of scholarship recipients. The research method used is qualitative descriptive, utilizing secondary data and six stages of system development, from literature review to testing. The design process was conducted using low-fidelity and high-fidelity prototyping approaches to produce a more functional and user-friendly interface design. System testing was conducted using usability testing through the Maze.co platform and heuristic evaluation based on Nielsen's 10 principles. The test results showed that most users were satisfied with the developed system, although some heuristic principles were not yet met. These results serve as the basis for further improvements to enhance the effectiveness and efficiency of managing and monitoring KIP-K scholarships.
Keywords: <i>Redisgn; Prototyping; Usability Testing; User Interface; Maze.co</i>	

INTRODUCTION

Design is the process of breaking down, organizing, and drawing or arranging several components into a comprehensive functional whole (Arifandi et al., 2024). According to (Adiguna et al., 2018), design is the act of determining something to be done using various methodologies. This includes a description of architectural details and components, as well as the limitations that will be encountered during the construction process.

The KIP-K (Kartu Indonesia Pintar Kuliah) scholarship is an initiative of the Indonesian government aimed at increasing access to higher education for students from low-income families (Pramudita et al., 2024). This program is expected to reduce educational disparities and provide better opportunities for the younger generation to achieve their aspirations. Garut Institute of Technology, as one of the higher education institutions that admits new students through the KIP-K scholarship, has seen an increase in the number of applicants each year (Kurniadi et al., 2024). However, there is currently no adequate system in place to monitor the academic and non-academic progress of KIP-K scholarship recipients at the Garut Institute of (Kurniadi et al., 2024). This makes it difficult to evaluate the effectiveness of the program and its impact on students.

Based on the above issues, this study will develop a user interface (UI) design with monitoring features added to the scholarship recipient prediction system. This feature will enable the university to actively monitor students' academic performance, participation in extracurricular

activities, and socio-economic conditions. Monitoring scholarship recipients is important to ensure that they make good use of the opportunities provided (Wardhana & Hasanah, 2017)

In a previous study (Kurniadi et al., 2024) discussing the development of a web-based scholarship recipient prediction system application in 2024, the researchers suggested expanding the system's features to monitor KIP-K students admitted to the Garut Institute of Technology. Based on this, the researchers were interested in redesigning the User Interface using low-fidelity and high-fidelity prototyping methods. Low-fidelity prototyping is an initial design of an application depicted with a simple interface (Gavinda et al., 2025). This depiction serves as a reference for the general workflow of the application, which will later form the basis for application development. High-fidelity prototyping, on the other hand, is a prototype that closely resembles its final form (Maulana, R.A; Renaldi, 2023). High-fidelity prototyping is a more detailed version of low-fidelity prototyping, with the addition of elements such as colors, images, icons, text fonts, and other necessary elements (Arifandi et al., 2024). User Interface (UI) design using low-fidelity and high-fidelity prototyping provides a better and more user-friendly design (Maulana, R.A; Renaldi, 2023).

Usability is essentially the ease with which a system (software) can be learned, the ease of use, and the encouragement of users to use the device. Usability is defined as the ease with which a product can be used by users to achieve goals effectively, efficiently, and satisfactorily in a specific context of use (Shidiqi et al., 2022). Usability testing is a measure of characteristics that refers to how users can learn and use a system or product to achieve goals and satisfaction in its use (Deni & Ferida, 2023). This testing is conducted directly to observe user interaction with the product. For the usability testing process on this application, it was conducted online using Maze.co. Maze.co was used for usability testing because it can help gather user insights, identify problems, and validate designs. Additionally, usability testing was conducted with the help of Maze.co to evaluate the user experience when interacting with the redesigned system. The purpose of this testing is to identify barriers to measure effectiveness, efficiency, and user satisfaction so that the development system can be optimized to support the scholarship maintenance process.

RESEARCH METHODS

This study uses a descriptive qualitative research method. Qualitative research is a form of expression in the form of spoken words, which are then observed by the researcher, as well as the objects being observed until completion so that conclusions can be drawn that are implied in the documents or files (Ahmadar et al., 2021). The data in this study uses secondary data as the basis for this research. Secondary data consists of written materials, information, or documents in physical form. Secondary data was chosen because the method used did not involve independent data collection (Putra, sadrakh zefanya; Faradillah, 2023).

There are five main activities conducted in this study, including: Literature Review, Problem Identification and Formulation, Requirements Modeling, System Architecture, and Implementation of the Design (Maulana, R.A; Renaldi, 2023). The research methods are shown in Figure 1:

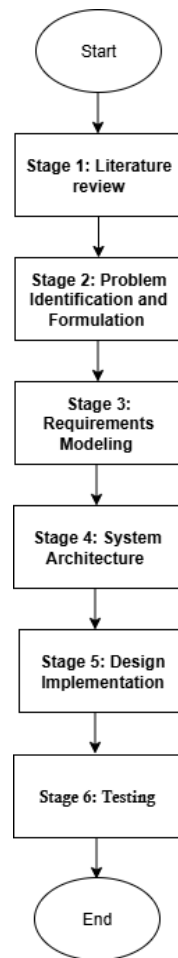


Figure 1. The Prototyping Model

Stage 1: Literature review

At this stage, theories are collected from various related scientific articles and connections with the selected research topic are sought. The literature review is conducted by reading and understanding reference books, theses, journals, and other media related to user interface design and data processing (Firmansyah et al., 2024). In their research, (Kurniadi et al., 2024) successfully developed a web-based scholarship recipient prediction system application. This research resulted in a web-based prediction system application that can help classify eligibility and select candidates for KIP-K scholarships at the Garut Institute of Technology with a system accuracy rate of 91.86% in predicting participant eligibility. The results of this study are proposals for the design of a website tracking process and time reminder that can automate activities that were previously done manually. The tracking process feature can be used by scholarship recipients to see how far the process has progressed, while the time reminder feature serves to send automatic messages regarding deadlines to the relevant parties (Ghina et al., 2023). Further research conducted by (Rahmawati et al., 2021) focused on monitoring student performance. The system was developed using the waterfall method due to its systematic nature.

Stage 2: Problem Identification and Formulation

After conducting a theoretical review and exploring the scope of the research, the next stage is to identify and formulate the problem to find solutions to existing issues and determine the data required for the research.

Stage 3: Requirements Modeling

In this stage, Requirements Modeling is conducted. Requirement modeling is a process that bridges the gap between the general system overview and specific requirements through a

prototype model approach. At this stage, the method to be used for application development is determined.

Stage 4: System Architecture

After data is obtained from the study, the next step is to design the system by implementing it into UML (Unified Modeling Language) formats, such as Use Case Diagrams and Activity Diagrams.

Stage 5: Design Implementation

The final stage is Design. After data is obtained from the study results, the next step is to design the system by implementing the system interface design into a prototype design (Low and High Fidelity Prototyping).

Stage 6: Testing

The testing phase is the final step in this research. At this stage, the scholarship application prototype was tested by eight users. The author gave users the task of trying out the main features of the application, taking into account the limitations of the Maze platform. Next, testing was carried out using the Heuristic Evaluation (HE) method. Heuristic Evaluation is a usability evaluation method used to assess how well an application can be utilized by users to achieve specific goals, such as effectiveness, efficiency, and user satisfaction during interaction with the application. (Ginting et al., 2021).

Through this evaluation method, the primary objective is to understand the benefits, efficiency, and effectiveness of the interface based on the 10 principles established by Jacob Nielsen and Rolf Molich. The HE principles are: Visibility of System Status, Match between system and the real world, User control and freedom, Consistency and standards, Error prevention, Recognition rather than recall, Flexibility and efficiency of use, Aesthetic and minimalist design, Help users recognize, diagnose, and recover from errors, and Help and documentation (Febriana et al., 2024). The definition of testing tasks using Maze can be seen in Table 1.

Tabel 1. Task

Task Number	Task
1	Logging in as an Admin
2	Logging in as a Student
3	Registering Participants
4	Viewing the Schedule
5	Creating a Schedule (By Admin)
6	Fund Disbursement Input
7	Student Report

RESULTS AND DISCUSSION

Existing System Analysis

The existing Scholarship Acceptance System at the Garut Institute of Technology is as follows:

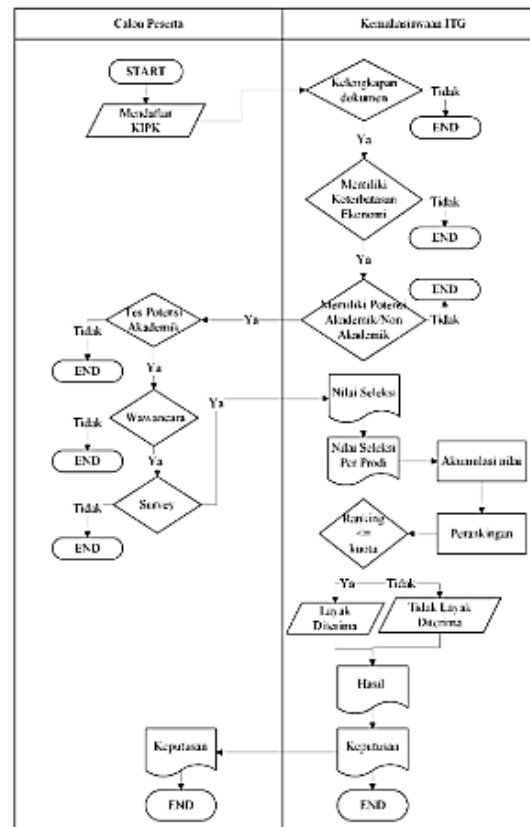


Figure 2. Current Business Process (Kurniadi et al., 2024)

A. Prototyping

This scholarship acceptance system was designed to facilitate monitoring of scholarship acceptance. It uses Unified Modeling Language (UML), including Use Case Diagrams and Activity Diagrams, as well as Low and High Fidelity Prototyping.

1. Use Case Diagram

Use Case Diagrams show the behavior or conduct of an information system (Ekalia et al., 2023). Usecase diagrams are very important to use to visualize, specify, and document the behavior of an element (Sengupta & Bhattacharya, 2006). This diagram describes the main functions or services provided by the system, referred to as use cases, as well as how actors interact with these functions.

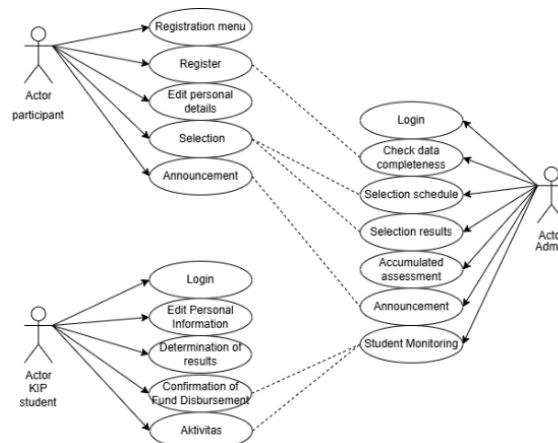


Figure 3. Use Case Diagram

Three main actor interactions are depicted in this use case diagram namely participants, KIP students, and admin, with the scholarship acceptance system. The participant actor interacts with the system to register, edit data, take part in the selection, and view the announcement of the selection results. KIP student actors, who are scholarship recipients, can login to the system, edit their biodata, approve the determination of results, confirm the disbursement of funds, and carry out activities related to the scholarship program. Meanwhile, the admin actor is tasked with checking the completeness of participant data, scheduling the selection, accumulating assessments, announcing results, and monitoring students who have received scholarships. This diagram shows the functional relationship between these actors and various features in the system to ensure the flow of scholarship acceptance and management runs effectively.

2. Activity Diagram

The diagram serves to illustrate the program flow activities that occur between the user and the system in operation. Each system procedure will be described using an activity diagram. (Nugraha & Rosmeida, 2021). This diagram shows how processes or activities are carried out sequentially, including branching and decision making.

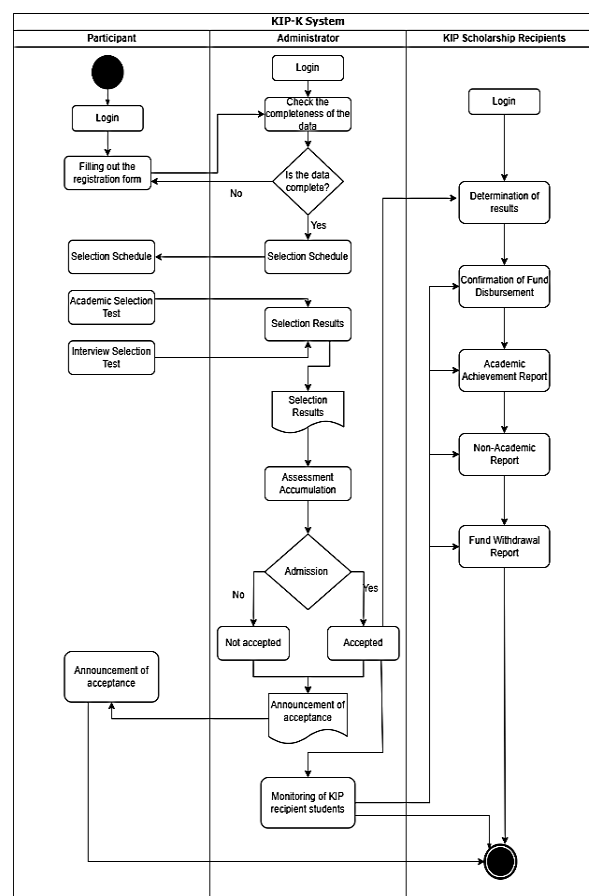


Figure 4. Activity Diagram

The diagram starts with a participant logging into the system to fill out the registration form. The data submitted by the participant is then checked by the admin to ensure the completeness of the documents. If the data is incomplete, the participant is asked to complete it, and if the data is complete, the admin schedules the selection process. Selection is carried out in two stages, namely academic selection and interview. The selection results are then assessed and accumulated by the admin. Based on the accumulated assessment, the admin determines whether the participant is accepted or not. Accepted participants will be announced through the system, while participants who are not accepted are given a rejection notification. Furthermore, KIP recipient students can login to the system to confirm fund disbursement and submit academic and non-academic

achievement reports. The report is used for the monitoring process by the admin, who records the withdrawal report for the scholarship recipient students. This diagram ends after the monitoring process is complete, signifying that the scholarship management cycle has been carried out.

B. Design Implementation

1. Low Fidelity Prototyping

Low fidelity prototyping is an early form of prototype that does not yet fully represent the final product. This stage is used by UI/UX designers as a first step to visualize or design the interface of the application to be developed. The results of the interface design using this method are shown in Figure 5.

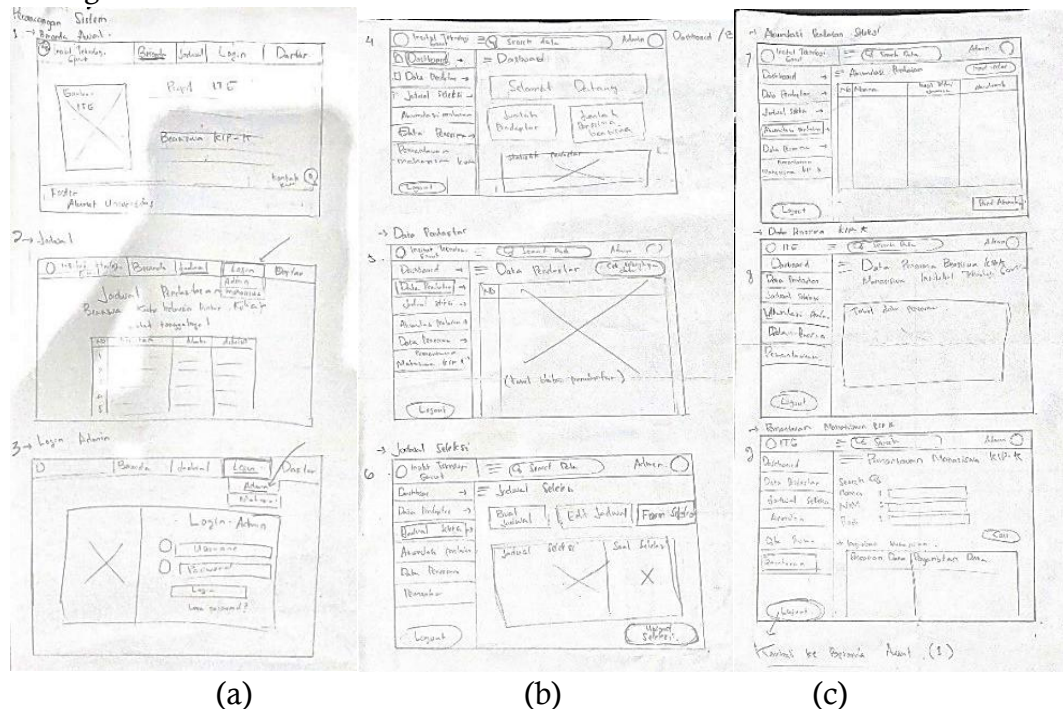


Figure 5. The low fidelity design results are shown in a, b, and c

2. High Fidelity Prototyping

High fidelity refers to highly detailed representations or prototypes that are close to the final product in product design, especially in the context of software and application development. High fidelity prototypes usually include complete visual elements, more complex interactivity, and often reflect a more realistic user experience. High fidelity design includes complete visual elements, such as colors, typography, images, and icons. It provides a clear picture of what the final product looks like. These prototypes are designed to reflect the actual user experience, including navigation flow and system response to user interaction. With a higher level of detail, high fidelity prototypes enable more in-depth and realistic user testing, so that the feedback obtained is more relevant for the development of the final product. High fidelity design can be seen in figures 7,8



Figure 7. KIP-K student report



Figure 8. KIP-K student monitoring display

Testing

At the final stage of this research is Testing. This test uses the Usability testing method, the use of Usability testing is to ensure or evaluate that a design or product developed is suitable for use both easily, effectively, efficiently and satisfactorily by end users (Putra et al., 2024). In this test using the maze tool involving 7 participants, 3 of whom were experts.

The usability evaluation results show the level of user satisfaction with various tasks, such as “Admin Schedule Input.” The data is presented in the form of an opinion scale with five categories, including the percentage and number of respondents in each category. For example, on the task “Input Admin Schedule” figure 10. 83% of respondents were very satisfied, while 17% were satisfied. Features such as filters, data export, and access to individual responses help with more in-depth analysis, making it easier for developers to identify areas that need improvement to enhance user experience.

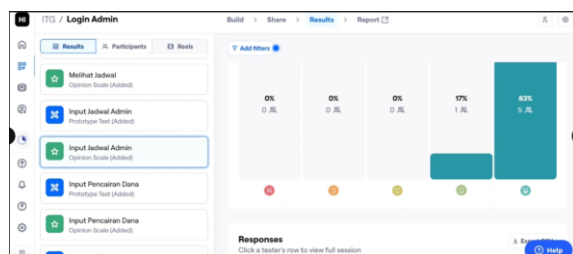


Figure 10. Testing process of “admin schedule input”

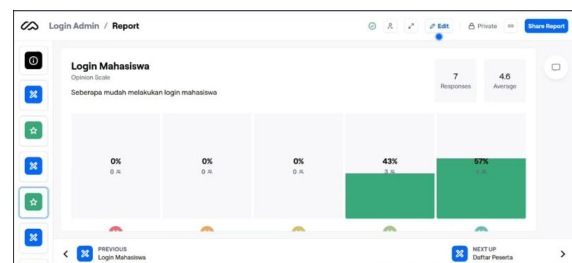


Figure 11. Testing process using the Maze.co

Further testing using heuristic testing revealed 5 heuristic principles that were not met after evaluation, namely: Match between system and real world , Error prevention , Recognition rather than recall , Flexibility and efficiency of use , Help and documenta-tion. Based on the results of testing by experts, the following feedback was obtained: 1. The display is still rough, no better than the KIP Institut Garut website. 2. It is very comprehensive, but the instructions could be expanded. After testing, it runs well and is easy to operate. 3. It would be better if it were converted into a website for internal scholarship selection, as KIPK is only for reporting purposes, with many options that are irrelevant to user needs. 4. There is a need for an “evidence” upload option for uploading bank statements, rather than photocopies (physical evidence).

CONCLUSION

This study aims to redesign the user interface (UI) of the KIP-K scholarship recipient prediction system at the Garut Institute of Technology by adding academic and non-academic monitoring

features. This is motivated by the lack of a system that can comprehensively monitor the progress of scholarship recipients. The design process was carried out using low-fidelity and high-fidelity prototyping approaches to produce a more functional and user-friendly interface design. The research method used was qualitative descriptive, utilizing secondary data and six stages of system development: literature review, problem identification, requirement modeling, system architecture design, design implementation, and testing. Testing was conducted using usability testing methods through the Maze.co platform and heuristic evaluation based on Nielsen's 10 principles. The evaluation results showed that the majority of users were satisfied with the developed system, although some heuristic principles were not fully met. These findings serve as the basis for further improvements to make the system more optimal in supporting the efficient and effective management and monitoring of KIP-K scholarships.

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