

Implementation of UI/UX Design for Goods Delivery System With One Way To Go Model - SiCepat Hackathon Challenge

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Abstract

The SiCepat Hackathon Challenge is a collaborative start-up activity in building an application ecosystem that aims to support system updates to become more efficient and support the growth of digital businesses in accordance with market needs in the field of logistics technology to accelerate the delivery process of goods based on consumer needs. The main problem in the traditional delivery system is the lack of ability to determine the optimal delivery and pick-up location. Many couriers have to travel long distances simply because the system is unable to find the closest pickup point from the courier's position. As a result, delivery times are inefficient, and operational costs increase. In addition, an unclear commission system often causes dissatisfaction among couriers because it does not represent the effort and time they put in. Problem solving using Design Thinking method approach to study user needs. In the Design Thinking process, there are several stages such as Empathize, Define, Ideate, Prototype, and Test. There is also a Design System process to help determine the component requirements in the design interface that can be used for reusable purposes with the Atomic's Design approach. In the validation or testing stage of the feature development results, the result of this development plan is to provide features for selecting a warehouse for picking goods, destination locations, a commission system, deposits, withdrawals, and shipping history. The results of the Usability Testing with Usability Metrics using SEQ (Single Ease Question) obtained a score of 6 (out of 7 points), this is interpreted as Passing for each testing criterion carried out by the user.

Keywords : Design Thinking, Design System, UI/UX Design, Usability Metrics, Single Ease Question

1. INTRODUCTION

The rapid development of information technology has transformed many aspects of human life, particularly in the logistics and delivery sectors. As more people shop online on various e-commerce platforms, the need for fast, accurate, and efficient delivery systems is growing. However, delivery service companies also face challenges in managing effective distribution systems, such as determining delivery routes, assigning courier tasks, and providing fair commissions based on their work. Therefore, a delivery system is needed that not only speeds up the delivery process but also provides balanced and transparent incentives for couriers.

The SiCepat Hackathon Challenge is a collaborative start-up activity to build an application ecosystem aimed at supporting system upgrades to make them more efficient and supporting the growth of digital businesses in line with market needs in the logistics technology sector, accelerating the delivery process based on consumer needs, especially in the digital era. SiCepat, as a logistics service provider, offers several services such as inventory management, order management, and recording delivery transactions from sellers to buyers. Currently, SiCepat faces several limitations, such as relying solely on express courier services in partnership with e-commerce platforms like Tokopedia, Shopee, BukaLapak, and similar platforms, as well as logistics delivery services at select branches. In line with the company's vision to holistically penetrate the logistics market, SiCepat is collaborating in the Hackathon Challenge program to challenge innovation in an integrated, fast, and solution-oriented delivery system that meets consumers' daily needs, eliminating the long wait times associated with standard delivery packages based on the number of days.

In practice, the main problem with traditional delivery systems is the lack of ability to determine optimal pickup and drop-off locations. Many couriers are forced to travel long distances simply because the system cannot find the closest pickup point to their location. As a result, delivery times are inefficient and operational costs are increasing. Furthermore, an unclear commission system often leads to dissatisfaction among couriers because it does not reflect the effort and time they expend. This highlights the need for a system design that can integrate real-time location data, calculate distances, and allocate delivery tasks with fairness and efficiency in mind. A commission-based delivery system offers a solution to improve courier performance and well-being. This system allows commission sharing based on distance traveled, delivery time, and the number of packages successfully delivered. With this system, couriers will be more motivated to work efficiently because their performance is measured objectively and automatically. Furthermore, customers will be more satisfied because delivery times can be faster, especially if the courier appointed is the closest to the pickup location. Another requirement for the Hackathon Challenge program is courier data management, including rankings and commissions for SiCepat couriers, to provide delivery history and commissions for couriers. Another case for supply & demand for goods stock is Predicting the demand for goods is an important aspect of inventory management and operational planning because inaccurate predictions can lead to overstock or shortages of goods [1].

To create an effective and user-friendly system, a user-centered design approach is required. One method often used in interface development is Design Thinking. This method focuses on a deep understanding of user needs, behaviors, and obstacles before developing a solution. The main stages in this method are *empathize, define, ideate, prototype, and test*.

Based on the above description, an application development process is needed that can understand user needs based on the stated objective, utilizing Design Thinking to increase customer satisfaction based on the application's success rate and improve delivery efficiency. The method used to develop this information system is Design Thinking, using the Design Process approach, which is believed to solve problems accurately, quickly, and humanely. Design Thinking also applies a Design System concept to the UI/UX design process.

Application service providers use various methods to build applications that are as easy to use as possible, with beautiful displays, precision, and easy navigation between menus. This is inseparable from the application of the Design Thinking concept in the Design Process, where application use is based on user needs with a Human Centered Design (HCD) pattern. HCD is an approach to designing a product that focuses on user activities. HCD is a procedure and method for designing a system that focuses on users, both activities and processes within it. HCD is carried out by first understanding the user and knowing what the user needs. In this study, the user interface design uses the HCD method. HCD is considered appropriate because it involves users to be involved in product development based on user understanding and the product is refined through user-centered evaluation [2].

Due to the numerous problems found in the NANDA application, the author used the Heuristic Evaluation method. This method was used because it is quick, easy to implement, and can identify numerous and relevant problems. This study involved three evaluators with experience in the field of usability. Based on the results of the three evaluators, 20 problems were identified. Based on the research conducted, many improvements are needed to the system, both in terms of appearance and features, to make it easier and more comfortable for users [3].

Another research related to evaluation using the Heuristic Evaluation method is "Usability Analysis of the Mobile E-Government Application for People's Online Aspiration and Complaint Services (LAPOR!) Using Heuristic Evaluation" by Tiur Prasetyaningtias (2017). This application aims to provide a social media-based aspiration and complaint facility. This study aims to analyze the many problems found in the LAPOR! application using the Heuristic Evaluation method. This type of heuristic evaluation is suitable for this study because it is in accordance with the aspects of learnability, efficiency, memorability, error and safety, and satisfaction, where in the LAPOR! application problems were found in efficiency and satisfaction [4].

In the design process within Design Thinking, several stages are used to identify and validate user needs: Empathize, Define, Ideate, Prototype, and Test [5].

The process carried out using the Design Thinking method will produce a product that is not only marketable or creates a superior product using the most advanced technology. This method also combines user needs with appropriate technological capabilities and is capable of solving a problem, while still being able to create something that can be successful in a business [6]. According to [7], Design Thinking has several important elements, namely:

People-Centered: In this stage, it is important to ensure that every action is centered on the needs and interests of the user. Highly Creative: This method also allows for a high degree of flexibility and creativity, so the planning process is not rigid or fixed. Hands-On: The design process also requires real-world experiments, not just ideas or concepts in the form of drawings and theories outlined in a plan. Iterative: The design process is a process with repeated steps to improvise and produce a good product or application that meets customer expectations.

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User-Centered Design consists of four iterative steps, as [8]: Specify the context of use: Identify the people who will use the system. This will explain why and under what conditions they will use the system. Specify User and Organizational Requirements: Identify user and organizational needs. Reduce Design Solutions: Develop a design as a solution to the system being analyzed. Evaluate Design: Evaluate the design developed in the previous stage.

A design system is a set of design standards or design guidelines for designing a product. It is intended to manage interface design by collecting interface components on a large scale. These components and patterns can be reused repeatedly. A design system is a collection of design components gathered as a consistent guideline. The goal is to reduce redundancy and create a common language for designers [9].

Atomic Design is a design approach developed and popularized by Brad Frost. This method breaks down website application elements into their smallest, modular components. These elements are divided into several levels or hierarchies: atoms, molecules, organisms, templates, and pages. The purpose of breaking down all elements is to reduce repetitive code, setup, and consistency between website components. Atomic design is a methodology for creating design systems. There are five distinct levels within atomic design [9] Atoms (Level 1), Molecules (Level 2), Organism (Level 3), Templates (Level 4), and Pages (Level 5). Simulation Atomic Design with figure below:



Figure 1. Atomic Design

The interview method is a question-and-answer method used between the interviewer and the interviewee, who acts as the source of information for the research [10].

A wireframe is a framework for arranging various elements on a website or application page before the actual design process begins [11]. A prototype is a simplified model of a product before further detailing. The resulting design will be adjusted based on the researcher's analysis. During this stage, the researcher and product designer will engage in extensive discussion to create a design that addresses the existing problem [11].

Questionnaires are a widely used technique for obtaining information from subjects. They are relatively economical, contain the same questions for all subjects, and ensure subject confidentiality. Questionnaires can use questions or statements, but in many cases, subjects respond to a specifically written response [12]

This questionnaire testing used a Likert scale to determine customer satisfaction with the application trial. The Likert scale measures a person's agreement or disagreement with a series of statements related to beliefs or behaviors regarding a particular object. The Likert scale format combines agreement and disagreement. This scale was developed by Rensis Likert and is therefore known as the Likert Scale [12]. In other way, testing must be included for making Accuracy meaning Measures the overall accuracy of a prediction [13].

The System Usability Scale Standard Version		Strongly Disagree					Strongly Agree				
		1	2	3	4	5	6	7	8	9	10
1	I think that I would like to use this system frequently.										
2	I found the system unnecessarily complex.										
3	I thought the system was easy to use.										
4	I think that I would need the support of a technical person to be able to use this system.										
5	I found the various functions in this system were well integrated.										
6	I thought there was too much inconsistency in this system.										
7	I would imagine that most people would learn to use this system very quickly.										
8	I found the system very awkward to use.										
9	I felt very confident using the system.										
10	I needed to learn a lot of things before I could get going with this system.										

Figure 2. Likert Scale & Count Score Index

This scale generally uses a five-point assessment as shown in above figure Likert Scale Calculation Formula and Index Score Calculation, namely [12] as (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, & (5) Strongly Agree.

The Single Ease Question is a scale of 1-7 that measures ease of use. The number 5.5 in the image below represents a success parameter that can be used as a target reference. Single Ease Question (SEQ) testing is a system usability testing method that uses a post-scenario or task questionnaire to measure the perceived ease of use of a system after completing all scenarios or tasks. It uses a 7-point Likert scale, where 1 represents very difficult and 7 represents very easy [14].

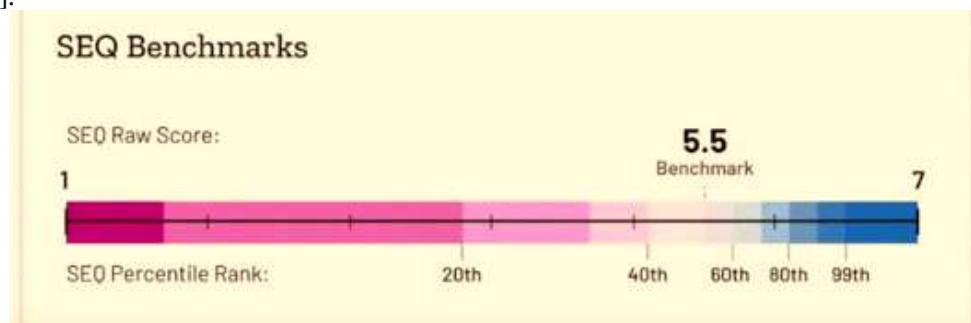


Figure 3. Single Ease Question

2. RESEARCH METHODOLOGY

The decision was made to use Design Thinking as the design process approach because it can solve problems accurately, quickly, and in a humane manner. The design process using this method consists of several stages: Empathize, Define, Ideate, Prototyping, and Testing.

2.1 Emphatize

In this phase, research was conducted to understand user issues, needs, and feelings. Research was conducted on several similar applications that feature delivery systems, commission systems, courier location tracking, and commission recording. Another step was to position ourselves as courier users to gain insight into their experiences managing deliveries and recording commissions.

2.2 Define

At this stage, user pain points are identified and then grouped into an affinity diagram. These key issues are then used to generate ideas for solving the problem.

a. Pain Points

User pain points are collected by understanding information based on user experience and summarizing it into various possible user pain points. FigmaJam is used to collaboratively gather ideas about potential user challenges, including delivery features, pickup location selection, destination selection, location, and commissions.



Figure 4. Pain Points Diagram

b. Affinity Diagram

After all pain points are collected, pain points related to the same problem are grouped. Each topic group is given an appropriate name to reflect the overall problem identified.



Figure 5. Affinity Diagram

c. How-Might-We

In the How-Might-We diagram, objectives are summarized to represent how to solve the problem in each topic. In the How-Might-We diagram, conclusions can be applied based on the problem mapping, which ostensibly represents user needs.



Figure 6. How-Might We

2.3 Ideate

At this stage, solution ideas for the target audience will be generated. Solution ideas are classified into a priority diagram based on the primary user needs and the effort required to create them.

a. Solution Ideas

Provides various solutions that are implemented and sorted based on the primary objective.

b. Priority Diagram

This Priority Diagram is used to determine which things will take priority in developing features that are predicted to directly help user meet needs.

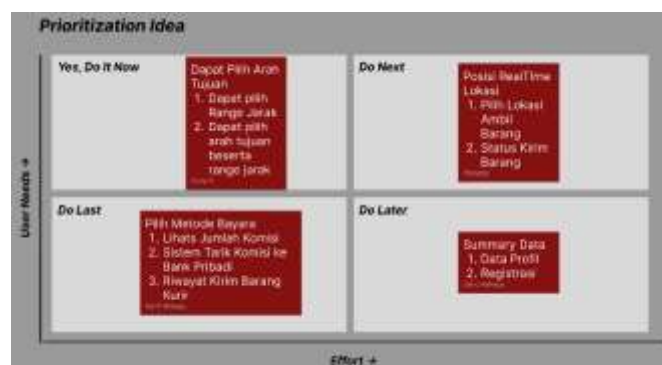


Figure 7. Prioritization Idea

c. Crazy 8's

Used by creating a general sketch for 8 minutes on a sheet of paper folded into 8 sections, with each fold having a sketching duration of 1 minute.



Figure 8. Crazy 8's Process

2.4 Prototyping

In this phase, User Flow, Wireframing (Low Fidelity Design), System Design, and UI Design (High Fidelity Design) are created.

a. Wireframing (Low Fidelity Design)

A sketch of an application. The sketch represents the main design that will be implemented in a more complete form as an illustration for creating the application.

b. Design System

A component in the application that can be reused repeatedly.

c. UI Design (High Fidelity Design)

The complete form of the application design, which already includes colors, icons, typography, and a larger component unit.

2.5 Testing

The testing and validation stages will use the Usability Testing method to measure the level of user satisfaction.

3. RESULTS AND DISCUSSION

The process of implementing the design results into the form of High Fidelity Design (Detail Design), starting from the Wireframe form then implemented with the Design System into the form of User Interface Design then tested with Usability Testing until the score assessment process using the Single Ease Question.

3.1 Implementation Wireframe

Wireframe creation for splash screen, login and registration pages before converting them into high-fidelity designs.



Figure 9. Wireframe Splash Screen, Login, & Registration

Wireframe creation for Main Dashboard & Deposit Account Courier before converting into High Fidelity Design.



Figure 10. Wireframe Main Dashboard & Deposit Account

Wireframe creation to select locations, packages, and shipping statuses before turning them into highly detailed designs.

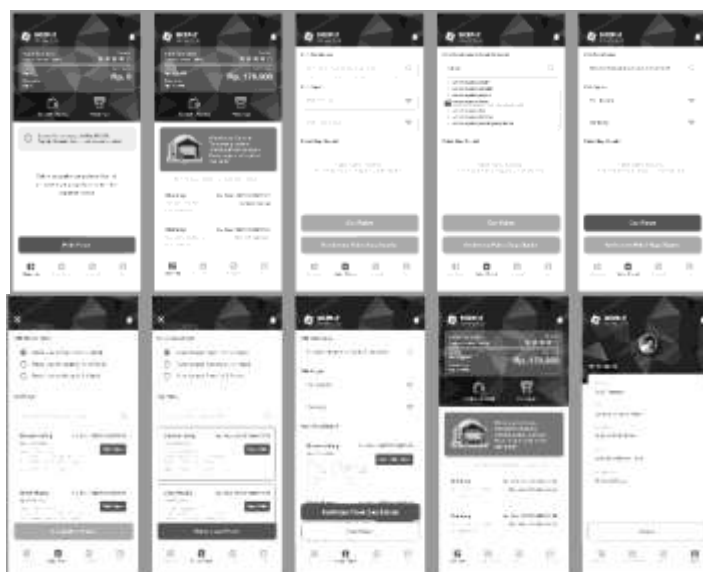


Figure 11. Wireframe Choose Location, Package, & Status Delivery

Wireframing the history before forming it into a high-fidelity design.



Figure 12. Wireframe History

Wireframing the Withdrawal Balance view based on the User Flow before converting it into a High Fidelity Design.



Figure 13. Wireframe Withdrawal Balance

3.2 Implementation Design System

Typography Design Systems are based on the application of Atomic Design before being formed into High Level Design.



Figure 14. Design System Typography

Color Design System for Brand Colors, Primary Colors, Neutral Colors, and Secondary Colors based on the application of Atomic Design before being formed into High Fidelity Design.



Figure 15. Design System Color

The Primary Button and Secondary Button Design System is based on Atomic Design before being formed into High Fidelity Design.



Figure 16. Design System Button

The Navigation Bar Menu & Icon Design System was based on Atomic Design before being shaped into High Fidelity Design.

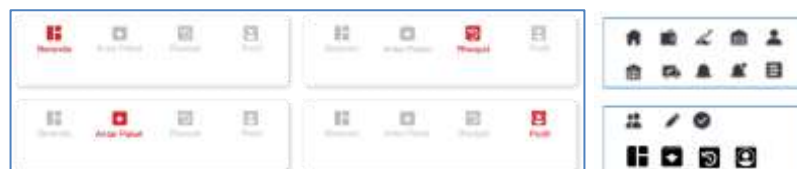


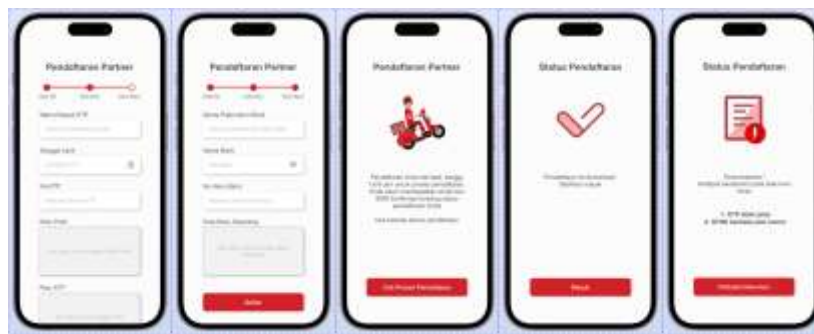
Figure 17. Design System Navigation Bar Menu & Icon

3.3 Implementation High Fidelity Design

High Fidelity Design based on the application of User Experience Design and Flow Design for Splash Screen, Login, & Registration



(a)



(b)

Figure 18. (a)dan(b)UI Design - Splash Screen, Login, & Registration

High Fidelity Design based on the implementation of User Experience Design and Flow Design for Main Dashboard & Deposit Account Courier

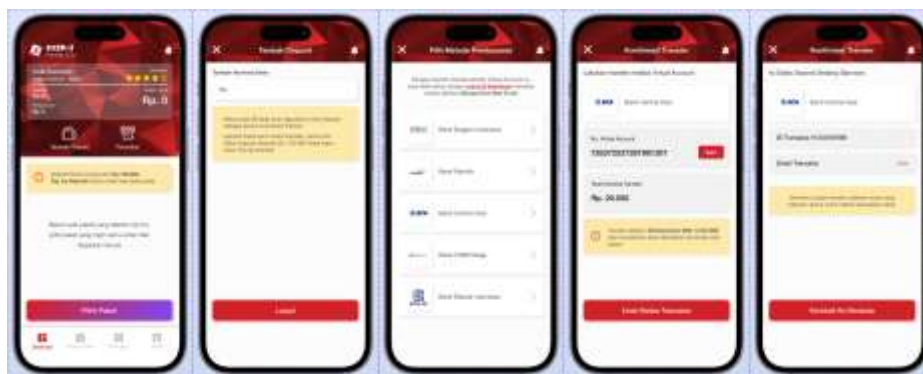


Figure 19. UI Design - Main Dashboard & Deposit Account Kurir

High Fidelity Design based on the implementation of User Experience Design and Flow Design for Selecting Location, Package, & Shipping Status

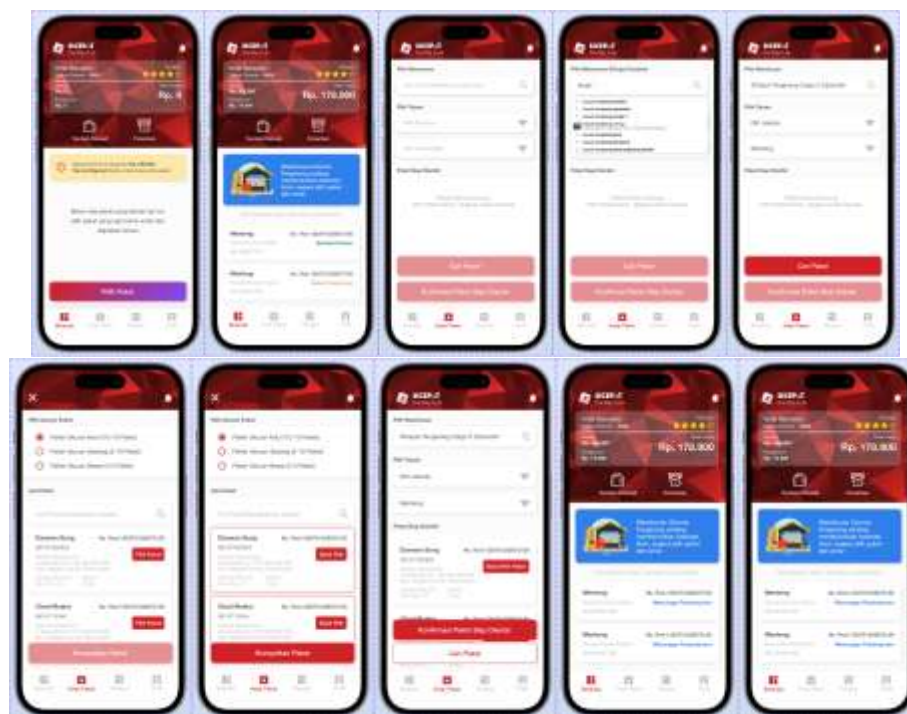


Figure 20. UI Design - Choose Location, Package, & Status Delivery

High Fidelity Design based on the implementation of User Experience Design and Flow Design for History

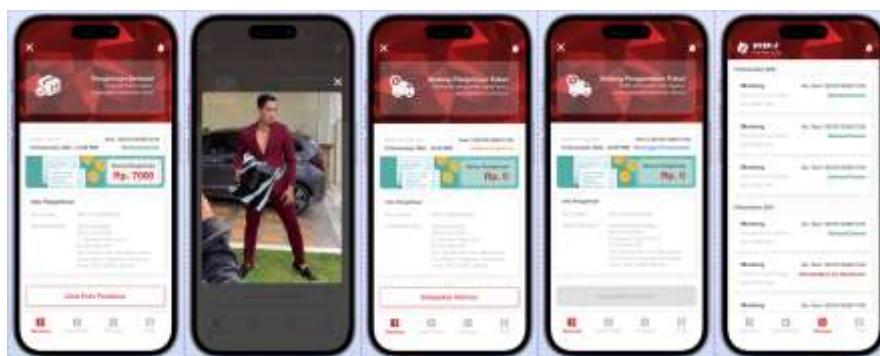


Figure 21. UI Design - History

High Fidelity Design based on the application of User Experience Design and Flow design for Withdrawal Balance

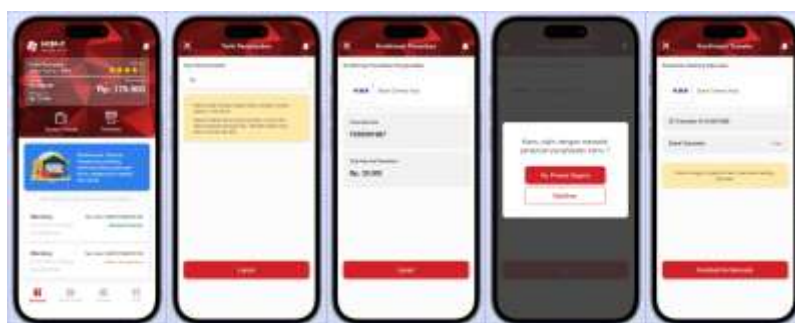


Figure 22. UI Design - Withdrawal Balance

High Fidelity Design based on the implementation of User Experience Design and Flow design for the Goods Delivery Status Dashboard - Admin

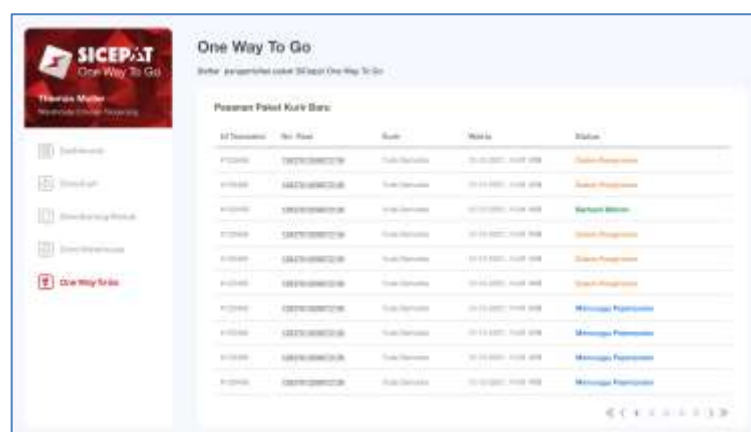


Figure 23. UI Design - Dashboard Status – Admin

High Fidelity Design based on the implementation of User Experience Design and Flow design for the Delivery Status Dashboard - Courier Details

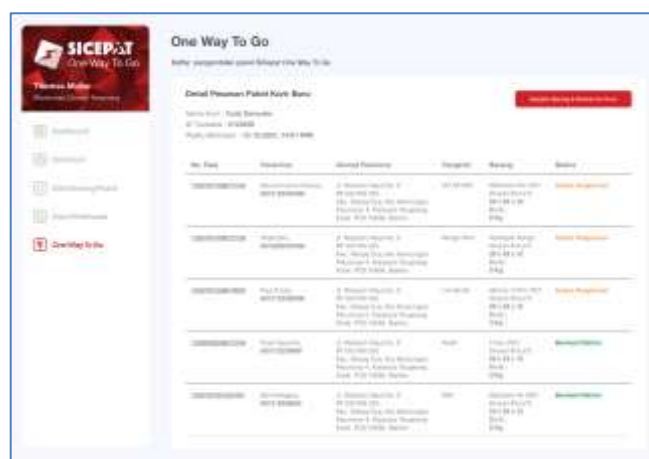


Figure 24. UI Design - Dashboard Status - Detail Kurir

3.4 Stimulus Preparation User Research For Usability Testing

3.4.1 Research Objective

The objective values of the Usability Testing-based User Interview research are categorized as follows:

- Identifying user needs for the registration process and delivery of goods based on pickup and destination locations.
- Determining the success rate of the Account Deposit, Withdrawal Balance/Earnings, Commission Sharing, History Viewing, Item Status, and User Data systems.

3.4.2 User Criteria

To ensure objective assessments, user criteria for usability testing must be defined as follows:

- Aged 18-50 years
- General workers, couriers, and online motorcycle taxi drivers
- Residing throughout Indonesia
- Possess Indonesian language skills and good, clear articulation
- Able to operate an Android device

3.4.3 Question List

A list of questions was created to help make the Q&A session process easier with examples of basic questions as follows (Define In Bahasa):

- Silahkan perkenalkan diri Anda? (Nama, Pekerjaan, Usia)
- Selama Anda menggunakan aplikasi One Way To Go, apa yang menjadi perhatian anda sehingga anda merasa kesulitan?
- Fitur apa yang anda harapkan?
- Manfaat apa yang anda harapkan?

3.4.5 Research Scenario

The scenario was created to facilitate the Q&A session, with the following basic questions:

- Greeting
- Introducing yourself and explaining the purpose of the Q&A session
- Asking questions from the Question List
- Asking the user to open the application prototype and run it
- Observing user activity
- Asking about obstacles and whether the information obtained meets their needs or providing feedback
- Providing feedback on a score range of 1-7 based on the level of difficulty and understanding of the information, along with an explanation of the reason for the score given
- Closing

3.5 Usability Testing Process

System testing is conducted to identify errors or deficiencies in the software being developed. The purpose of testing is to determine whether the software meets the criteria for its design. Testing results are based on user interviews, with detailed results below (Usability Testing Results):

Table 1. User Interview - Usability Testing Result (Define in Bahasa)

No	Question	Answer
1	Invite respondents to introduce themselves	Done!
2	Jika sebagai Kurir untuk pengiriman barang, apakah selama ini anda sudah memiliki catatan terhadap penghasilan per pengiriman barang? jika ya, bagaimana cara anda melakukan catatan tersebut, jika menggunakan aplikasi, aplikasi apa?	Belum ada, namun saat ini menggunakan GoJek, tetapi tidak tertera jelas komisi yang didapat berdasarkan matrix apa, saat ini seperti Gojek dan Grab dengan mekanisme 80:20
2.a	Jika menggunakan aplikasi tertentu, apa yang menurut anda kurang memadai dari aplikasi tersebut dan seharusnya bagaimana aplikasi tersebut harus berjalan sesuai kebutuhan anda?	belum menggunakan aplikasi pencatatan komisi khusus
3	Bagaimana cara anda menentukan lokasi pengiriman barang?	saat ini hanya menunggu order yang diberikan dari pemilik aplikasi
4	Bagaimana cara anda menentukan lokasi pengambilan yang akan dikirim?	saat ini hanya menunggu order yang diberikan dari pemilik aplikasi
5	Bagaimana cara anda mengetahui status penghasilan anda berdasarkan riwayat kirim barang?	saat ini hanya diberi komisi per pengiriman dengan komponen 80:20, namun dirasa kurang transparan
6	Apakah ada sistem lain yang mengharuskan anda harus melakukan Deposit dengan jumlah tertentu untuk menjadi mitra kurir? Jika ya, mengapa?	belum ada, namun jika dirasa, aplikasi seperti gojek harus deposit gopay agar dapat prioritas order
7	Bagaimana cara anda mengetahui tentang ketersediaan barang yang akan dikirim secara ready stock list dan realtime ketika dibutuhkan?	saat ini hanya menunggu order yang diberikan dari pemilik aplikasi
8	Apa yang anda sukai dan tidak sukai dari aplikasi <i>One Way To Go</i> tersebut secara sekilas penggunaan?	Sangat suka bagian menu Rekapitulasi dan pilih lokasi yang satu arah, lihat riwayat komisi, riwayat pengiriman barang
Single Ease Question		
[TASK 1] Pilih Area Lokasi Tujuan Untuk Pengiriman Barang & Lokasi Warehouse		6
1	Meminta pengguna untuk melakukan Lokasi Tujuan, Pilih Lokasi Warehouse, Pilih barang yang akan diantar melalui sistem <i>One Way To Go</i>	
1.a	Pilih Lokasi Tujuan [OK]	
1.b	Pilih Lokasi Warehouse [OK]	
2	Pilih barang yang akan diantar [OK]	Result PASSED
2.a	Lihat status pengiriman barang dan komisi [OK]	Integrasi pemilihan langsung dari admin seperti tanpa kita yang mencari barang yang akan dikirim
Single Ease Question		
[TASK 2] Tambah Saldo (Deposit Account) Dan Tarik Penghasilan (Withdrawal)		6
1	Meminta pengguna untuk melakukan Tambah Saldo (Deposit) sebelum kirim barang, Lihat Penghasilan (Komisi) per pengiriman barang, dan Tarik Penghasilan (Withdrawal)	
1.a	Tambah Saldo (Deposit) [OK]	
1.b	Tarik Penghasilan (Withdrawal) [OK]	Result PASSED

1.c	Milhat Riwayat Transaksi [OK]	Cukup memahami, namun terdapat masukan
2		Tambahkan menu khusus untuk instant delivery untuk langsung bertemu dengan pengirim barang dan sistem rating
[TASK 3] Dashboard Admin & System Tracking		Single Ease Question
1	Admin melakukan pemilahan barang yang termasuk kategori <i>One Way To Go</i> , Catatan pengiriman barang dan kordinat alamat serta werwhouse	6
1.a	Lihat Lokasi Kurir ketika proses pengantaran barang berdasarkan Time Tracking [OK]	
1.b	Tambah data Werehouse & Validasi pendaftaran Kurir [OK]	Result PASSED

Getting the results of Usability Testing, all tasks got PASS results, with scores above the minimum passing score of 6. In addition, respondents provided some additional input and information that can be used to iterate User Interface Design.

4. CONCLUSION

Based on the results of the UI/UX design implementation for the One Way To Go goods delivery system using the Design Thinking approach, which consists of the Empathize, Define, Ideate, Prototype, and Test stages, the resulting interface and feature flow were able to accommodate the identified needs of couriers and support the delivery process, including location selection, warehouse selection, deposit and withdrawal, commission information, delivery history, and admin tracking. The usability testing results show that all tested tasks achieved a Passed status, with a Single Ease Question (SEQ) score of 6 out of 7, indicating that the proposed design provides a good level of ease of use and accessibility for users. Nevertheless, further development is recommended, particularly through the integration of real-time location visualization, adaptation of features to different user segments, and optimization of interface interactions based on user age and device characteristics, so that the system can provide a more effective, flexible, and user-centered delivery experience.

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