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DATA IN SUMMARY | ENGINEERING, MATHEMATICS AND STATISTICS

Nailflow Application Interface Design Using Design Thinking Methods to Support Nail Ordering Efficiency

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ABSTRACT
The development of information technology requires the industry to transform into a digital system to improve efficiency and service. CV. Tjahaya Logam, as a nail manufacturing company, still uses a manual ordering system that has the potential to cause recording errors and late confirmation. To overcome these problems, the NailFlow application interface was designed using the Design Thinking method with five main stages: Empathize, Define, Ideate, Prototype, and Test. The purpose of this design is to produce a user interface (UI) and user experience (UX) design that is intuitive, efficient, and meets the needs of customers and company admins. The design results in a prototype application with key features such as digital ordering, real-time order tracking, and stock management. Testing using the Black Box Testing method shows that all interface elements function as expected. With this interface design, it is hoped that NailFlow can improve the efficiency of the ordering process, reduce errors, and provide a better service experience for CV. Tjahaya Logam customers.

Keywords: Design Thinking, Interface Design, UI/UX, Nailflow Application.

I. Introduction

The development of information technology is encouraging the industrial sector to undergo digital transformation to improve operational efficiency and customer service. One crucial aspect of digital system development is designing the user interface (UI) and user experience (UX), which can improve the comfort and ease of use of the application. CV. Tjahaya Logam, a nail manufacturing company, still uses a manual ordering system that often causes problems such as recording errors, late confirmations, and difficulty for customers to monitor order status. This impacts service effectiveness and customer satisfaction. To address these challenges, the authors designed the NailFlow application using a Design Thinking approach that focuses on understanding user needs. Through the stages of Empathize, Define, Ideate, Prototype, and Test, the NailFlow application design was developed to be more intuitive and efficient, with the aim of speeding up the ordering process and making it easier for customers and internal company staff to manage orders. The primary focus of the design was on the UI/UX aspects without involving functional system implementation. With a more user-friendly interface, the NailFlow app is expected to improve ordering efficiency, minimize errors, and provide transparency into order statuses for customers. This design will serve as a solid foundation for future development of a more comprehensive app, providing better solutions to support CV. Tjahaya Logam's operations.

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II. Literature Review and Hypothesis Development

2.1. Company Overview

CV. Tjahaya Logam is a company engaged in nail manufacturing and is located at Jln. AKBP Cek Agus No. 1344 A, Kenten, Palembang. This company was founded in 1982 by Mr. Bustannuddin (deceased) as the founder and first owner. As time went by, ownership of the company was continued by his son, namely Mr. Tanu Darma. However, along the way, the company experienced bankruptcy due to various obstacles it faced. In mid- 2024, the company was taken over and purchased by a new owner, Mr. David Gozali, the current Director of CV. Tjahaya Logam. Under the leadership of Mr. David Gozali, the company began to improve and carry out various innovations, one of which was starting to develop a digital system to support and simplify work (Company Profile of CV. Tjahaya Logam, 2025). According to the Great Dictionary of the Indonesian Language, a work unit refers to a work unit or group. In the professional world, a work unit can also be defined as an individual's role within a group, team, or squad. Work units are formed to achieve specific goals within an organization. The work units at CV. Tjahaya Logam includes the Director, Operations Manager, *Head of Department (HoD),* Head of Factory Workers, Operations Administrator, and Factory Workers.

2.2. Duties and Authorities

a. Director

Carrying out duties and authorities in planning, supervising, controlling, and making strategic decisions to ensure the overall survival and development of the company, including establishing general company policies and ensuring that all operational activities run in accordance with the vision, mission, and regulations applicable within CV. Tjahaya Logam.

b. Operations Manager

Carrying out duties and authorities in organizing, supervising, and ensuring the smooth running of all company operational activities starting from the production process, administration, to distribution so that they run according to the targets that have been set, as well as conducting periodic evaluations of the performance of each section to ensure the achievement of company goals in accordance with applicable provisions and regulations.

c. Head of Department

Carry out the duties and authority in leading, coordinating, and supervising each division under his/her responsibility and ensure that all company operational activities, both in the production (factory) and administrative sectors, run effectively, efficiently, and in accordance with established work procedures and operational standards. In addition, ensure that all company policies are implemented consistently in order to achieve company performance targets, increase work productivity, and achieve the company's vision and mission.

d. Factory Operations Admin

Carrying out duties and authorities in recording in detail and accurately every nail production process, inputting data into the system, and controlling the availability of nail stock in the factory regularly. In addition, responsible for sending stock and production results reports to sales admin as a basis for managing distribution and sales. All these activities are carried out while adhering to the applicable company systems and procedures to support smooth operations and accurate production information.

e. Sales Operations Admin

Carry out duties and authorities in managing every order process from customers, starting from receiving orders, checking stock availability, creating bills or invoices, to arranging delivery schedules for goods to customers directly, and being fully responsible for collecting payments from customers in accordance with company procedures and provisions for the smooth flow of cash and sales operations.

f. Head of Factory Workers

Carrying out duties and authorities in organizing, supervising, and coordinating all factory workers in carrying out the nail production process from start to finish, ensuring that each stage of production runs in

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accordance with standard operating procedures (SOP) and established production targets, and maintaining product quality to comply with company quality standards and be ready for marketing.

g. Factory Workers

Carrying out duties and responsibilities in carrying out the entire nail production process according to the direction and guidance of the factory head, starting from the initial production process to the final packaging stage, as well as maintaining product quality to comply with the standards set by the company, to support smooth operations and meet production targets set by company management.

h. Practical Work Unit

At CV. Tjahaya Logam is located at Jln. AKBP Cek Agus No. 1344 A, Kenten, Palembang, the author carried out practical work in the Factory Operations Admin section, which was tasked with processing nail production data and managing stock of goods using a digital system provided by the company. CV. Tjahaya Logam is a manufacturing company established in 1982 and engaged in the production of nails for distribution to various regions in Indonesia. With a computerized work system, the company optimizes production, data processing, and distribution of goods to increase efficiency, information accuracy, and minimize errors in data and stock management.

2.3. Procedures in the Practical Work Unit

The practical work procedures applicable at CV. Tjahaya Logam is as follows:

a. Receiving and Recording Customer Orders

Customers order nails via *WhatsApp*, specifying the type, quantity, and specifications. Orders are recorded and summarized in an Excel file.

b. Stock Check and Production Process

Admin checks stock in the warehouse. If stock is sufficient, the goods are prepared immediately. If the stock is insufficient, production will be carried out according to the order.

c. Making Delivery Notes, Invoices, and Shipping Goods

Once the goods are ready, the administration creates a Delivery Note and Invoice according to the customer's order. The goods are then sent to the customer, accompanied by documents for payment purposes.

2.4. Work activities carried out

Activities carried out during the internship period at CV. Tjahaya Logam, especially in the Operational Admin section, including the following:

a. Recording customer orders and confirming orders.
b. Create minutes regarding changes in production conversion.
c. Inputting production data and creating Delivery Orders according to customer orders.
d. Review and determine the title of the practical work based on problems in the Operational Admin unit

III. Research Method

3.1. General Theory

General theory refers to the basic theories that form the basis for understanding and applying the other theories discussed in this report. General theories provide a broad and fundamental basis that is relevant to the development context of the system or application being analyzed. In this report, general theory is used to provide a comprehensive framework underlying the understanding of information management, technology,

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and systems used at CV. Tjahaya Logam, specifically in the context of developing the NailFlow application to support nail ordering efficiency. Some general theories that underlie the discussion in this report are:

a. Design

According to (Prayogi Nugroho & Suwarno, 2024) sees design as a process that combines creativity in user interfaces with a formal framework of logic and database structure, which is implemented iteratively using prototype methods. In designing the NailFlow application interface, a strategic and structured approach was required to support efficient nail ordering at CV. Tjahaya Logam. Furthermore, an intuitive and engaging interface was also a key focus, ensuring users could easily access and utilize the available features.

b. User Interface (UI) and User Experience (UX) Design

User Interface (UI) is the visual and interactive elements that allow users to interact with a system or application. UI encompasses the design of visual elements such as buttons, icons, colors, typography, and layout. According to (Abdul Kholik et al., 2024) User Interface (UI) focuses on the visual and interactive aspects of an application, such as the appearance of buttons, icons, colors, and typography. The main goal is to ensure that these elements are easy for users to understand and use, thereby increasing the effectiveness and convenience of interacting with the system. User Experience (UX), on the other hand, encompasses the overall user experience when interacting with a system or application. UX encompasses not only visual aspects but also how the application functions, how easy it is to use, and how satisfying the overall user experience is. In the Indonesian context, research by (Wijaya et al., 2025) emphasizes the importance of inclusive and user-oriented UX design in the development of smart city websites, in order to improve the accessibility of public services for all levels of society. Effective implementation of UI and UX principles is crucial in developing an app like NailFlow. By prioritizing intuitive interface design and a satisfying user experience, this application can improve efficiency and convenience in the nail ordering process at CV. Tjahaya Logam.

c. Business Process Efficiency

Business process efficiency refers to efforts to improve an organization's performance and productivity by reducing wasteful resources, time, and costs, while still achieving desired goals. In the context of information technology, business process efficiency can be achieved through workflow automation, system integration, and increased collaboration between departments or business units. According to Priambodo (2025) Efficiency in business processes can be achieved through the implementation of appropriate information systems. Technology serves to accelerate operational tasks, reduce human error, and enable faster and more accurate decision-making. Implementation of information systems Management has proven to be able to automate workflows and improve the effectiveness of organizational performance as a whole.

3.2. Special Theory

Special theories refer to theories that are more specific and directly related to the context or social reality that occurs in a particular environment. In this case, a specific theory is used to explain the phenomena or processes that occur within the system or organization being analyzed, such as those found at CV. Tjahaya Logam in the context of managing the nail production and ordering system. These specific theories provide more detailed guidance regarding the procedures, interactions, and practical needs encountered in the field. Some of the specific theories used in writing this report include:

a. Flow chart

A flowchart is a diagram used to visually depict the sequence of steps in a process or system. Using standard symbols, a flowchart presents a structured and systematic workflow, making it easier to analyze,

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design, and evaluate ongoing processes. According to, flowcharts are used to "describe in detail the stages of problem-solving" and facilitate understanding of algorithms. In fact, with the help of Flowgorithm, flowcharts can be run directly as code, supporting collaboration and communication within development teams.

b. UML (Unified Modeling Language)

UML (Unified Modeling Language) is a standard language used to model, design, and describe software systems and their components. UML provides various types of diagrams to describe different aspects of a system, both in terms of structure (data) and behavior (process).

c. Design Thinking

Design Thinking is a user-centered problem-solving method with an iterative and creative approach. According to (Nuraini & Rachmawati, 2023) The Design Thinking methodology enables the development team to understand user needs in depth through a series of stages, namely: Empathize, Define, Ideate, Prototype, and Test. There are five main stages in Design Thinking used in designing the NailFlow application, namely:

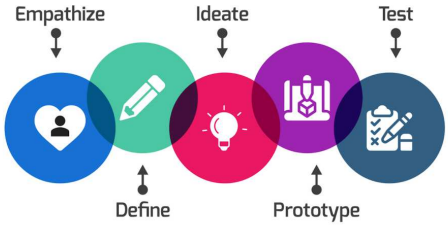

Figure 1. Stages of the Design Thinking Method

1) Empathize

The Empathize phase focuses on a deep understanding of NailFlow app users, namely, admins and customers at CV. Tjahaya Logam. In this phase, data collection was conducted through interviews and observations to identify the main challenges faced by users in the nail ordering process. By understanding user experiences and feelings, the development team can design solutions that meet their real needs.

2) Define (Problem Definition)

After the empathy phase, Define focuses on formulating the key problems that need to be addressed in the application design. In the context of NailFlow, the identified problems were inefficiencies in the manual nail ordering process, difficulties in monitoring inventory in real time, and delays in order processing. By clearly defining the problems, the development team can ensure that the application being designed will effectively address these issues.

3) Ideate (Ideation)

In the ideate stage, various creative ideas and solutions are developed to solve the defined problem. This stage prioritizes brainstorming without limits, so that various ideas, both conventional and innovative, can be generated. When designing the NailFlow app, ideas may include features such as online ordering integration, automated stock management linked to production data, and an intuitive interface to make it easier for admins to process data and check order status. These ideas will be filtered and selected based on their relevance and feasibility.

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4) Prototype

Once the best ideas are selected, the Prototype stage begins by creating a prototype of the application that illustrates the proposed interface and functionality. This prototype can be a mockup that visually depicts the application's interface design. The purpose of the prototype is to provide an initial idea of how the NailFlow application will work. will function and interact with users. This prototype will be tested and evaluated to ensure that the proposed design and features meet user needs and address previously identified problems.

5) Test

Test Phase is the process of testing the NailFlow application prototype by real users, namely the admin and customers of CV. Tjahaya Logam. The purpose of this stage is to evaluate the ease of use of the interface and the effectiveness of the features in supporting the ordering and order monitoring process. At this stage, the Black Box Testing method is used, where testing focuses on application functionality without paying attention to the internal structure or program code. This allows users to assess whether the application is performing according to their needs and expectations.

IV. Result and Discussion

4.1. Analysis of Practical Work Results

a. Analysis of the Running System

Analyzing the current system aims to understand the nail ordering process at CV. Tjahaya Logam and identify any problems that arise. Based on interviews and direct observations, it was discovered that the ordering process is still carried out manually via telephone or WhatsApp, with the admin recording orders manually in notebooks or spreadsheets. This system is prone to input errors, data duplication, and verification delays, especially when order volumes increase. Customers are also unable to monitor order status in real-time, resulting in frequent miscommunication regarding order details, item availability, and delivery schedules, which impacts efficiency. In the Empathize stage of the Design Thinking method, the author conducted interviews and direct observations with admins and customers to explore their needs, constraints, and expectations regarding the ordering system. Observations focused on the communication process and manual recording carried out by admins. The results of this stage became the basis for designing the NailFlow application as a digital solution that is expected to increase efficiency and transparency in the nail ordering process at CV. Tjahaya Logam .

b. Solution to the problem

As a solution to the problems in the nail ordering system at CV. Tjahaya Logam, the author, proposes a digital application-based ordering system design (NailFlow) that can be used directly by customers without having to contact the admin via telephone or WhatsApp. With this app, customers can independently place orders, view product lists, monitor order status in real time, and receive notifications regarding shipping progress. This is expected to simplify and expedite the ordering process and reduce the potential for recording errors.

c. System Design

The design of this system aims to help customers in ordering nails more easily, quickly, and in a structured manner, as well as making it easier for CV. Tjahaya Logam admin to manage order data and carry out the verification process until delivery efficiently. The design process is carried out using the Design Thinking approach, which consists of five stages: Empathize, Define, Ideate, Prototype, and Test. This method is used to ensure that the developed solution truly suits the needs of users in the field, both from the customer and admin sides. The author also used a system design tool in the form of UML (Unified Modeling Language), which includes Use Case Diagrams, Activity Diagrams, and Class Diagrams. These diagrams illustrate the

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digital nail ordering process, from order input to shipping management and data archiving. With this design, the NailFlow system is expected to improve efficiency, accuracy, and transparency in the ordering process at CV. Tjahaya Logam, while providing a better service experience for customers.

d. Flow chart

A flowchart is a diagram used to illustrate the steps in a process, complete with special symbols representing specific activities. Using a flowchart makes the workflow within a system easier to understand because each stage of the process is displayed visually and sequentially. The flowchart aims to provide a clear overview of the system, designed to simplify its implementation into the program. Furthermore, the flowchart also helps ensure that no important steps are missed in the ordering process.

e. Use Case Diagram

A Use Case Diagram is a component of system design used to illustrate the interaction between users (actors) and the system. The main actors in this system are the Customer and the Admin. In the context of the Android-based nail ordering application at CV. Tjahaya Logam, Use case diagrams are used to map the main functions a user can perform and how the system responds to those interactions. Here is a narrative use case version of the proposed nail ordering system:

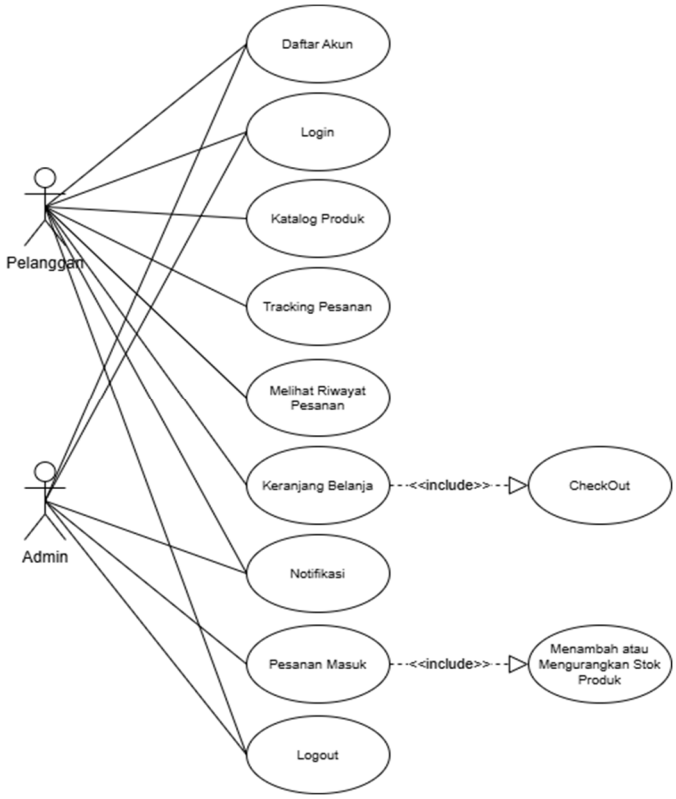

Figure 2. Proposed Use Case Diagram

f. Activity Diagram

An activity diagram is a diagram that depicts the flow of activities or business processes within a system being designed. This diagram displays the sequence of steps taken by the user and the system in executing a process. In the NailFlow application-based nail ordering system, activity diagrams are used to visualize the process from when a customer places an order to when the administrator verifies and arranges for delivery. The following are the main activities depicted in the activity diagram:

1) Account Registration

This feature allows new users to create an account by filling in data such as name, email, telephone number, and password, which is then stored in a database for login and transaction purposes.

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2) Login
This feature is used by customers and admins to access the system by entering email/username and password, then the system will verify and grant access according to the user's role.
3) View and Order Products
This feature allows customers to view a complete product list along with details such as name, brand, size, price, and stock, then select the product and add it to the cart.
4) Checkout and Payment
This feature is used by customers to review the orders they have selected, determine the shipping and payment method, and then proceed to the payment stage. This feature allows customers to complete payments according to instructions, such as via bank transfer or COD, and upload proof of payment if necessary.
5) View Order Tracking
This feature provides customers with information about the current status of their order, such as whether it is being processed, shipped, or has arrived.
6) View Order History
This feature allows customers to review all previous transactions, including product details, order status, and payment history.
7) Processing Incoming Orders (Admin)
This feature allows admins to prepare orders for shipping, as well as update order status so customers can monitor the progress of their orders.
8) Add or Reduce Stock (Admin)
This feature is used by the admin to update the number of stock items available in the system, either due to purchases, damaged goods, or additional stock from the warehouse.
9) Managing Notifications (Admin)
This feature gives admins the ability to send notifications to customers regarding order status, promotions, or important alerts, such as product stock running low.

g. Class Diagram

A class diagram is a UML diagram that depicts the structure of classes in a system, including attributes, methods, and relationships between classes. In the NailFlow application, this diagram shows the relationships between key entities such as Customer, Admin, Product, Order, and Payment, and illustrates the data and processes that support the system.

4.2. Design / Design Thinking

a. Empathize

The Empathize stage is a research process to understand user needs based on the challenges they face in CV. Tjahaya Logam's nail ordering system. This process is conducted through interviews with parties involved in the ordering process, including customers and operational administrators, to gain a deeper understanding of the challenges. Interviews were conducted with customers who frequently order nails and employees responsible for order management. Five respondents from various company departments were interviewed to gain insight into the challenges they experience with the current ordering system. The research found that users desire a faster, more transparent ordering process that reduces the risk of errors in order recording.

b. Define

The Define phase focuses on formulating the main problem based on previously collected data. Interviews with five respondents, consisting of customers and employees of CV. Tjahaya Logam, aged 20-40, who is accustomed to using digital devices, revealed several challenges in the existing ordering system. These include delays in order processing, a lack of transparency regarding order status, and frequent recording errors due to the manual system. Therefore, a digital solution is needed that can improve the accuracy of order recording, speed up order transactions, and provide real-time order status monitoring features.

c. Ideate

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After identifying the core problem from the Define stage, the next stage is to develop various solution ideas that can overcome the existing problem. The Ideate stage aims to generate innovative ideas that can improve the efficiency of nail ordering at CV. Tjahaya Logam. In this process, the author conducted analysis and brainstorming to design the main features that will be implemented in the NailFlow application. This process emphasizes creativity in finding the best solution by considering user needs and technical constraints that may be encountered in implementing the system.

d. Prototype

This stage implements the ideas from the previous stage to realize user needs in the form of web-based and mobile application models. In the prototype design stage, the primary focus is on creating mockups as visual representations of the application's appearance and flow. This mockup was used to design the user interface in detail and evaluate the design through end-user testing to ensure an optimal user experience before the development phase. The NailFlow app features are designed to support users in ordering nails and efficiently monitoring their order status.

1) Registration and Login

This feature allows users to create new accounts and access existing ones. During registration, users are asked to provide information such as name, email address, password, and phone number. Once registered, users can log in to access the system and access personalized features such as order history and delivery tracking.

Figure 3. NailFlow App Interface on Registration & Login Page

2) Bottom Navigation Bar (Home, Contact, Login, Account)

This main navigation button feature is designed to make it easy for users to navigate between the main pages of an application quickly and intuitively. This navigation is typically located at the bottom of the screen (bottom navigation bar) and consists of three main sections:

- Home: Displays a homepage containing a product catalog, the latest promotions, and important information about the company, making it easier for users to explore available products and offers.
- Incoming Contacts: Displays messages or notifications from the admin, such as order confirmations, order status updates, and other relevant information, ensuring users stay informed.
- Account: Provides access to the user's personal data, account settings, and provides a Logout button to safely exit after using the application.

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Figure 4. NailFlow Application Interface on the Bottom Navigation Bar Page

3) Product Ordering

This feature allows users to select and order products available within the app. Products are displayed in a complete list with details such as name, price, and variants (brand, size, weight). Users can specify the number of products they wish to purchase and add them to their shopping cart.

Figure 5. NailFlow App Interface on Product Order Page

4) Shopping Cart, Checkout, and Order Tracking

After selecting products, users can add them to their shopping cart, which serves as a temporary storage area before the checkout process. Within the cart, users can set the quantity of products and view the total price. Next, at the checkout stage, the user selects a payment method and confirms the purchase. Once an order is successfully placed, users can track the courier's or delivery's position in real-time via a map view, which displays the package's current location and estimated arrival time to the destination address.

Figure 6. NailFlow App Interface on Shopping Cart, Check Out, and Track Order Pages

5) Order History

This feature displays a list of all orders a user has ever placed. The information displayed includes the order date, product name, quantity, total payment, and the latest order status, such as "processing," "shipped," or "completed." This feature is useful for documenting transactions and makes it easier for users to track their historical purchasing activity. Additionally, the order history feature allows users to reorder the same product without having to re-enter product details, saving time and increasing the efficiency of the ordering process. This feature can also serve as a reference for users to periodically evaluate purchasing needs.

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Figure 7. NailFlow App Interface on Order History Page

6) Managing Notifications

This feature can only be accessed by admins and is used to manage various important notifications sent to customers. Admins can create, edit, and delete notifications regarding order status, product updates, or other important announcements. This feature helps keep communication between admins and customers informative and responsive.

Figure 8. NailFlow App Interface on Notification Page

7) Adding Nail Stock

This feature is also specifically intended for admins, which functions to update the number of product stocks available in the application. Through this feature, admins can select certain products from the available list, then add or reduce the stock quantity according to the actual conditions in the warehouse or the latest production results. Stock updates are done in real-time, so the product availability information displayed in the application is always accurate and up-to-date. This is important to avoid ordering products that are actually out of stock or unavailable. With this feature, the inventory management process becomes more efficient, transparent, and supports the smooth operation of the business as a whole.

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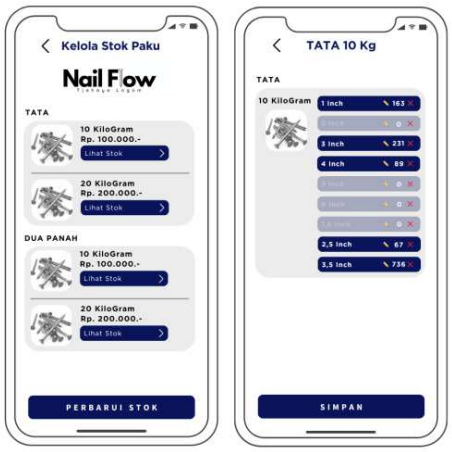

Figure 9. NailFlow App Interface on the Add Nail Stock Page

8) View Incoming Orders

This feature allows admins to view a list of recently placed customer orders in real time. The information displayed includes the customer's name, product ordered, order quantity, total payment, selected payment method, and order time. The data is presented in a detailed and structured manner for easy understanding and management by admins. This feature is crucial because it helps admins verify orders quickly and accurately. Furthermore, it supports scheduling, packaging, and shipping items based on the order sequence. This ensures a more organized and efficient order processing workflow, reducing the risk of shipping delays.

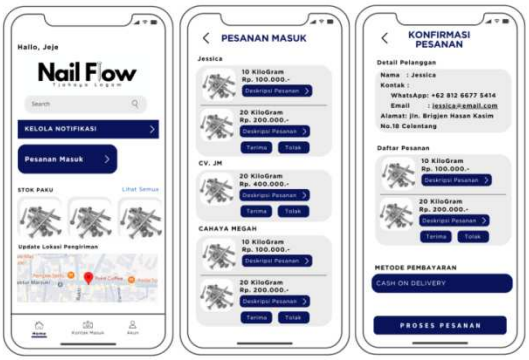

Figure 10. NailFlow App Interface on the View Incoming Orders Page

9) Test (Black Box Testing)

In this test, the author used the Black Box method to test the interface design of the NailFlow application based on the functionality that had been designed at the prototyping stage. Testing is performed to ensure that each interface element responds appropriately to user interactions, even though the system as a whole is not yet connected to the backend or database in real time. The main features tested at the interface design stage include Login, Account Registration, Viewing and Ordering Products, Checkout and Payment, Tracking Orders, Managing Notifications, Nail Stock, and Viewing Incoming Orders. Each feature is tested under two conditions, namely when the interface design flow follows the correct usage scenario (valid) and when the user performs an action that deviates from the proper flow (invalid), to ensure that the interface can display the appropriate display or notification. This test aims to evaluate whether the display design has described the appropriate system response to user interaction under various conditions.

V. Conclusion

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Based on the results of the practical work carried out at CV. Tjahaya Logam, it can be concluded that the manual nail ordering system currently used still has many shortcomings, such as the risk of recording errors, delays in order verification, and miscommunication between customers and the admin. This has an impact on low efficiency and a lack of transparency in the ordering and delivery process. Through the Design Thinking method approach, a comprehensive user needs analysis was carried out, which was then used as the basis for designing a digital solution in the form of the NailFlow application. The NailFlow application is designed to provide various conveniences, such as customer self-ordering, informative product displays, real-time order status tracking, and a well-documented transaction history. The design process also includes UML diagrams and black box testing to ensure the interface functions as expected. With this application, it is hoped that the nail ordering process at CV. Tjahaya Logam will be more efficient, accurate, and provide a better customer experience.

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