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## **E-Commerce Website for CV. Jon Indo using Web Engineering Method**

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### **ABSTRACT**

CV Jon Indo operates in the field of factory materials as a supplier, contractor, and trader of various factory materials. To compete globally, an essential tool is needed to reach the target market, especially in boosting product sales. Currently, CV Jon Indo lacks an ordering system that can reach a broad audience, still relying on manual sales through WhatsApp and manually recording sales data. This has led to issues such as errors in scheduling deliveries and inputting product orders, resulting in a decline in sales. This research aims to design an application to increase sales volume and expand marketing for CV Jon Indo. The developed system includes promotional features and the addition of calls to action (CTA) on the website. In the delivery system, tracking and request features have been implemented to meet customer preferences. This web-based application is designed using the Research and Development (R&D) method and the Web Engineering Method for E-Commerce application design. Programming languages used for E-Commerce implementation include HTML, PHP, and MySQL for database management. System validation and testing are conducted using the Blackbox testing method, and the results indicate that all features operate well and align with the design. This application aims to facilitate the sales, purchasing, and dissemination of the latest product information processes, thereby supporting increased sales at CV Jon Indo.

**Keywords:** Application, E-Commerce, RnD, Sales, Web Engineering

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### **INTRODUCTION**

Information technology currently provides convenience in everyday life through various technology-based services that are used in various activities. With the existence of information technology in everyday life, it facilitates all human activities from various aspects. Web-based information system is a means in a computerized system that is equipped with various features and is designed in such a way as to suit the needs of certain data needed which aims to simplify, speed up and accuracy of the processed data (Pamungkas & Saifullah, 2019). Website is an example of technology that provides various facilities to help complete work quickly and easily. One example is electronic sales or what is called e-commerce. With e-commerce applications built in a shop or other institutions, customers or consumers can be in direct contact even though they do not come to the shop (Hasan et al., 2022).

CV. Jon Indo Medan is a company in the field of factory materials, serving as a supplier, contractor, and stockist, trading various factory materials such as spare parts, boilers, screw presses, sports gear, and other factory materials. Based on an interview with the owner of CV. Jon Indo, it was revealed that the company still conducts sales through WhatsApp and manually manages sales data. This practice has led to problems, including errors in scheduling deliveries and inputting product orders, ultimately resulting in a decline in sales. This issue highlights the urgency of conducting research. The manual data management has caused delays in product marketing, subsequently affecting sales and marketing at CV. Jon Indo. Therefore, this research aims to address these issues by designing and implementing a system that can enhance efficiency, manage sales effectively, assist in product marketing, and support the sales process from ordering to delivery. Thus, this study is expected to provide a concrete solution to improve the performance of sales and marketing at CV. Jon Indo.

Research on e-Commerce applications has been carried out with various case studies, Alexander Wawowuntu conducted research developing a Web-based Dropship e-Commerce Application Design. This application serves to support the movement of stock items in sales (Waworuntu, 2020). In addition, Dheara Kharisma, Saniati, and Neneng used Unified. The results of the research on e-Commerce Applications for Website-based Motorcycle Spare Parts Ordering using the Codeigniter Framework (Kharisma et al., 2022). Not only that, research on this system has also been carried out by Indra Griha Tofik Isa entitled planning electronic commerce applications for the sale of wood products at PT Sekar Gayanti Utama which is web-based, this research aims to make it easier between sellers and buyers without having to meet which is very time consuming (Isa, 2021).

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From the description above, it becomes the basis for developing a system that will be made in researchers, namely that the system created has a promotional feature so that buyers can get promos or discounts from sellers, on the ordering system researchers add CTA (call to action) on the website, then on the goods delivery system researchers create a tracking feature, namely the buyer knows the existence of the position of the GPS Tracker object, in the delivery of goods the CV. Jon Indo company makes deliveries by private couriers. And researchers add features to request goods according to what the customer wants. This research uses the Research and Development (RnD) methodology to test the effectiveness of CV. Jon Indo products and applies the Web Engineering method to design E-Commerce applications.

### LITERATURE REVIEW

Application have become a familiar term in everyday life in today's digital era. Various applications are used for various purposes, ranging from work, shopping, to transportation. Applications are software programs that operate on certain systems, helping various human activities (Aditama et al., 2023). Meanwhile, the notion of sales is a process in which individuals or organizations try to convince customers to purchase the products offered (Purwanto et al., 2022).

The distribution, sale, and purchase of products using telecommunications networks such as the internet, television, or other computer networks is the essence of E-commerce or Electronic Commerce. According to Pradana, M (2015), e-commerce is the process of buying and selling products electronically. The development of e-commerce in recent years has accelerated and is gradually replacing the role of traditional stores (Ausat et al., 2022). E-commerce applications include software that makes it easier for users to conduct online shopping transactions at various times and locations. Through online store applications, buying and selling activities can be carried out easily using both desktop and mobile devices. The online transaction process becomes more structured and runs systematically. Users can explore various products or choices of goods with just one click without leaving home (Wijaya et al., 2021).

Quoted from Roger S. Pressman, 2010 (Resky & Atika, 2020) explains that Web engineering is a process used in the creation of high-quality web applications. Web engineering is superior to conventional web development, especially in the aspect of needs. This approach combines web publishing concepts with software engineering, emphasizing graphic design, information, hypertext, systems, and programming. The processes in the web engineering method stand out, providing significant advantages.

Looking through previous research, which has created a website-based distribution and sales application, one of them conducted by Rahmanto in 2021 titled 'Design and Build of Cooperative Management Information System Using Web Engineering Method (Case Study: Primkop Kartika Gatam)' (Rahmanto et al., 2021). The issues identified in the management process of savings and loan data involve overall manual recording processes, such as loan applications and member data recapitulation, savings and loan data recapitulation. This manual approach hinders easy data integration between departments, and repetitive processes in reporting savings and loan data often lead to delays in submitting reports to the leadership. Another issue lies in the calculation of savings data, which still relies on calculators, resulting in errors in total savings and loan calculations. To address these problems, innovation in information technology operated via the internet is necessary. Thus, a cooperative management system was created, featuring online loan applications, viewing the history of savings and loans, and providing convenience through features like automated total recap calculation and amount of savings and loans based on the printing date and month of the report. System testing, utilizing the web engineering method, successfully created a high-quality application, effectively streamlining the savings and loan process and systematic cooperative management. In Isa's research in 2021, the issue revolves around the absence of an online platform for sales and purchases, impeding subsequent processes such as logging and delivering wood (Isa, 2021). Isa designed an application with an online-based offering and purchasing system to overcome this issue, providing efficiency by using internet media. Consequently, the application significantly facilitated PT. Sekar Gayanti Utama in internet-based sales and purchases, improving the effectiveness of transaction processes in terms of time efficiency. Referring to various studies, including Rahmanto and Isa, this research aims to design and innovate a leading system. The proposed solution involves creating an E-Commerce application for CV. Jon Indo, incorporating promotional features for buyers to avail discounts, adding a call to action (CTA) in the ordering system on the website, implementing a tracking feature for buyers to monitor the GPS Tracker's position during product delivery. CV. Jon Indo delivers goods using a private courier, and the researcher adds a feature for customers to request specific items. This research employs the Web Engineering method to develop a high-quality E-Commerce application based on a website.

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**METHOD**

The research method used in this study refers to the Research and Development (R&D) research method, used to produce and test the effectiveness of certain products through needs analysis. Research is conducted to ensure products can function well in the community (Zakariah et al., 2020). The selection of the R&D research method by Borg and Gall (1983) to design the E-Commerce Website for CV. Jon Indo, using the Web Engineering Method, is based on confidence in an established and proven approach in system development. The R&D approach provides a systematic framework for exploring innovative solutions, while the implementation of the Web Engineering Method ensures an efficient and responsive design, particularly in the context of web-based applications.

**Research Method**

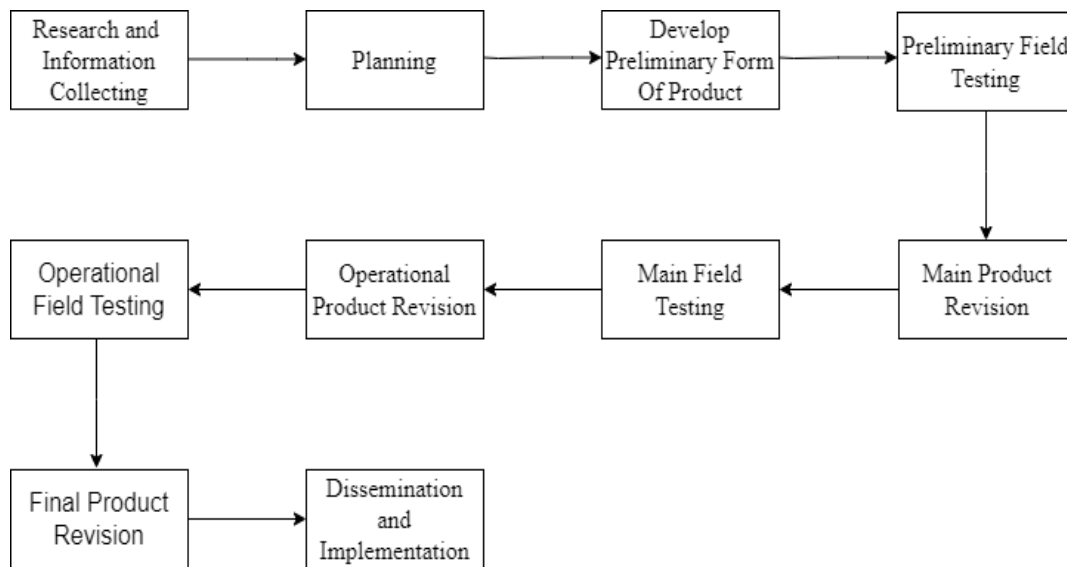


Fig 1. R&D Method Workflow by Borg and Gall (1983) (Sugiyono, 2013)

**Research and Information Collecting**

This initial phase involves reviewing relevant literature, identifying needs, and preparing the research framework. It begins by addressing the issue at CV. Jon Indo, where manual sales processes for factory production equipment lead to inefficiencies. The aim is to propose a system to enhance sales activities. Two data sources are utilized: primary data obtained through observations and interviews directly with the owner in September 2022, and secondary data obtained through e-commerce sales reviews. These data sources inform the development of a system to support sales and boost purchases.

**Planning**

During this phase, researchers initiate the planning of the product design. Key considerations include defining product characteristics, objectives, benefits, and identifying potential users.

**Development Preliminary Form of Product**

Researchers design the system using the PHP programming language, Codeigniter framework, and adapt applications to UML design, employing web engineering principles.

**Preliminary Field Testing**

Researchers conduct initial tests on the product display design (UI Design) to identify weaknesses.

**Main Product Revision**

Revisions are made based on data obtained from initial system testing, focusing on the main field testing stage to assess the effectiveness and suitability of the product.

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**Operational Product Revision**

Results from broader trials refine the product, preparing it as an operational model design ready for validation.

**Operational Field Testing**

Researchers conduct field testing with CV. Jon Indo to ensure the application aligns with the company's requirements.

**Final Product Revision**

Final improvements are made to the developed system to produce the final version of the product.

**Dissemination and Implementation**

At this stage, researchers promote the product intended for CV. Jon Indo, aligning with the Borg and Gall model for R&D.

**System Development Method**

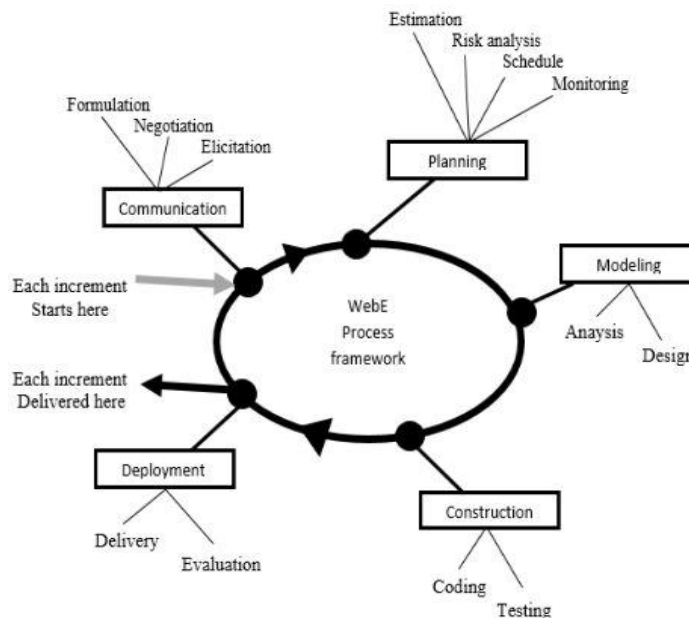


Fig 2. Web Engineering Method (Setiawansyah et al., 2021)

**Customer Communication**

Effective interaction with users is an efficient tool in the process of designing or interpreting user needs (requirements). The researcher conducts the formulation of the problem in the CV. Jon Indo; Researchers make agreements to develop systems according to CV needs. Jon Indo; And researchers also make observations on the system to be developed.

**Planning**

The incorporation of user needs involves interviews and technical planning. This planning includes identifying the necessary software and hardware. At this stage the researcher estimates how long the system will take to be built and analyzes the risks that will be faced by the development of a system for CV. Jon Indo. Then the researcher also determines the scheduling of the system to be implemented and monitors the system to be developed.

**Modeling**

The system is designed using UML, employing tools like Flowmaps, Usecase Diagram, Activity Diagram, and Class Diagram.

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**Construction**

Built on Windows 10, XAMPP 3.3.0, PHP 8.0.8, Visual Studio Code, and Codeigniter Framework. Implementation includes HTML and PHP coding, utilizing MySQL for the database. Testing employs blackbox methods for error detection in scripts, views, and navigation.

**Deployment**

Handover process and response to the system built for CV. Jon Indo involves services according to the system that has been developed and the assessment of the suitability of the system with the needs set.

**RESULT**

**Communication**

To understand the system's performance, customer communication analysis is crucial. This analysis aims to comprehend user needs, including input, output, and system features. After identifying these needs, interviews with the owner are conducted to understand the workflow. In analyzing the requirements of the new system, we need to examine the existing system. In customer and owner interactions, buyers can place orders via WhatsApp or visit the CV. Jon Indo Medan office. Subsequently, the owner checks the items, sets prices, the admin generates the total payment, and issues an invoice. After payment, the admin processes and ships the items. The recipient awaits the delivery to complete the transaction. The current system is conventional, and to enhance sales efficiency for CV. Jon Indo, the development of an e-Commerce website is planned. The following is the proposed flowmap for the system development.

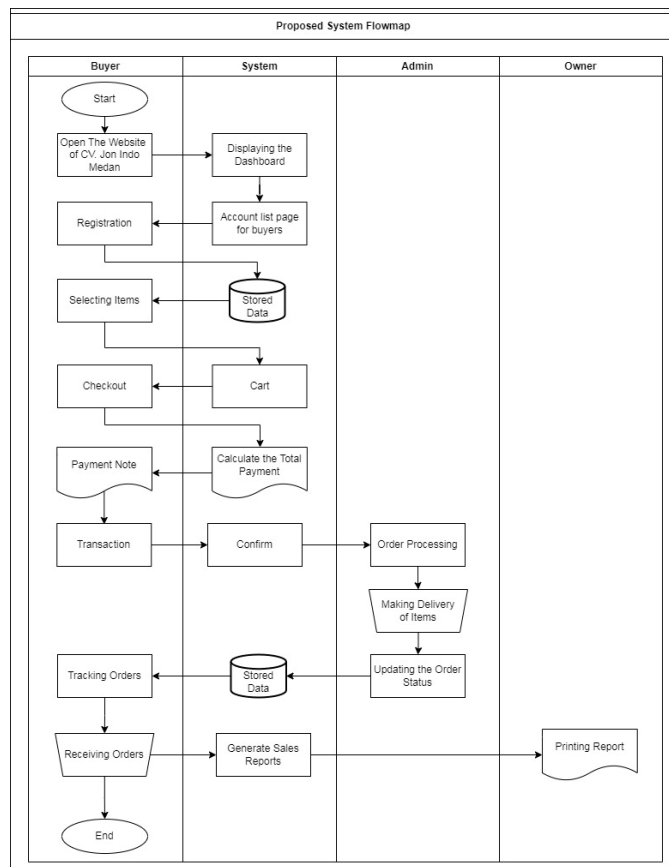


Fig 3. Flowmaps System Proposal

**Planning**

In this phase, it is necessary to plan all the requirements for the system development to proceed smoothly, including the timeframe for completion. The project is set to commence in June 2023 and scheduled to conclude in

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July 2023. Continuous monitoring will be implemented to oversee project progress and ensure the smooth execution of the plan, including input, work schedules, targeted outcomes, and other actions.

### Modeling

Modeling addresses the requirements and solutions in application development, aiming to fulfill the implications of analysis results and data collection. In the modeling phase, the design utilizes three types of diagrams, namely use case diagrams, activity diagrams, and class diagrams (Chairudin et al., 2020).

### Use Case Diagram

Use case diagrams on UML illustrate the interaction between systems and users, define user needs, and help establish organizational structures and software schemas (Abdulmonim et al., 2019). Here is a use case diagram of CV e-commerce application. Jon Indo Medan.

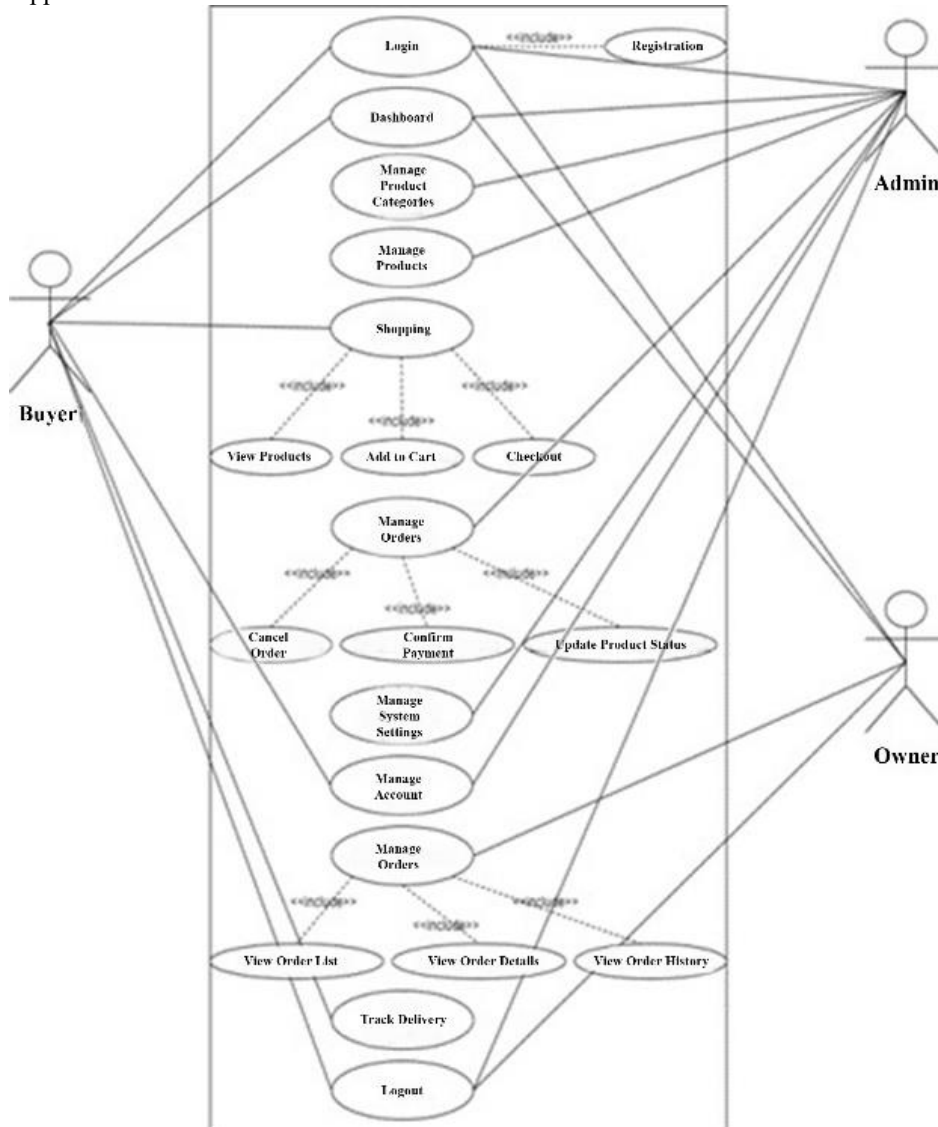


Fig 4. Usecase Diagram

### Activity Diagram

Activity diagram is a design that explains the business work flow and describes the process flow that occurs in a system. The following are two of several CV activity diagrams. Jon Indo Medan's most important ones are Activity

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diagram of Purchases by Buyers and Activity diagram of purchase reports by Owner.

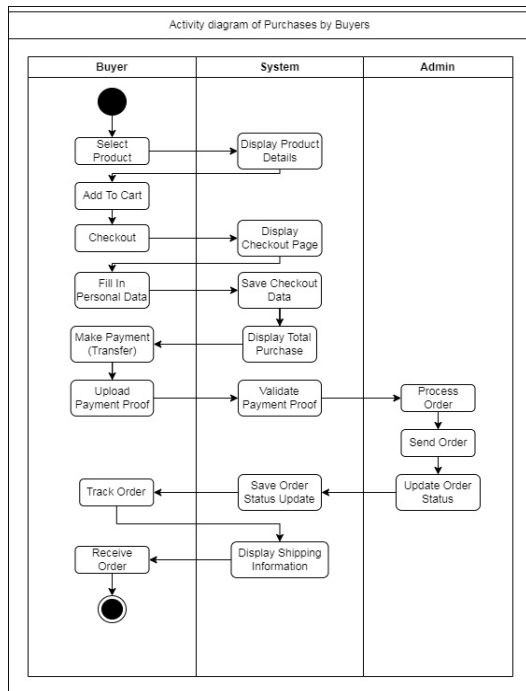


Fig 5. Activity diagram of Purchases by Buyers

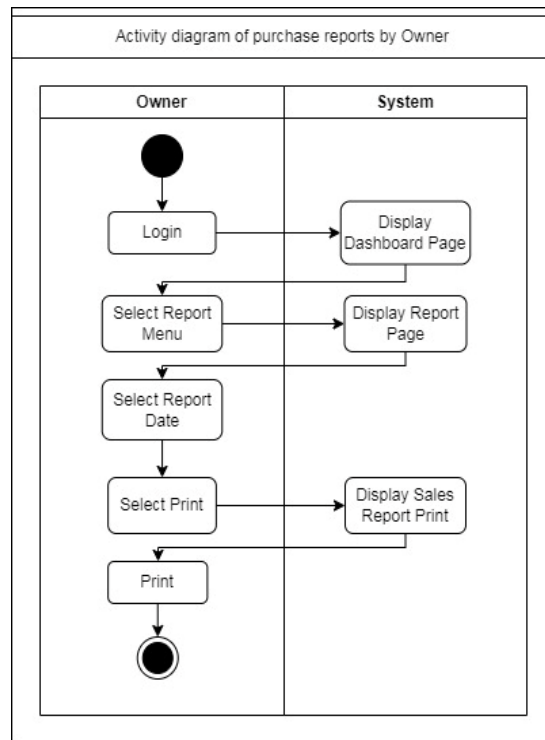


Fig 6. Activity diagram of purchase reports by Owner

**Class Diagram**

A class diagram is a design that displays classes in a system and contains information about related behavior (Putra & Octantia, 2021). Here is the class diagram of the e-commerce application CV. Jon Indo Medan.

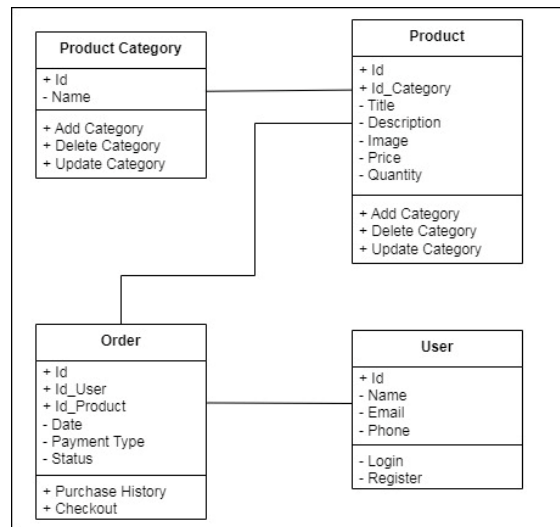


Fig 7. Class diagram

**System Implementation**

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After designing the appearance of the previous system, the researcher carried out the implementation stage of designing into a website on CV. Jon Indo Medan.

#### Dashboard Display

This Dashboard page provides various information and implements promotional features. It displays the prices and promotions for available items at CV. Jon Indo. Customers can input items into the cart provided, facilitating purchases when the items meet their needs.

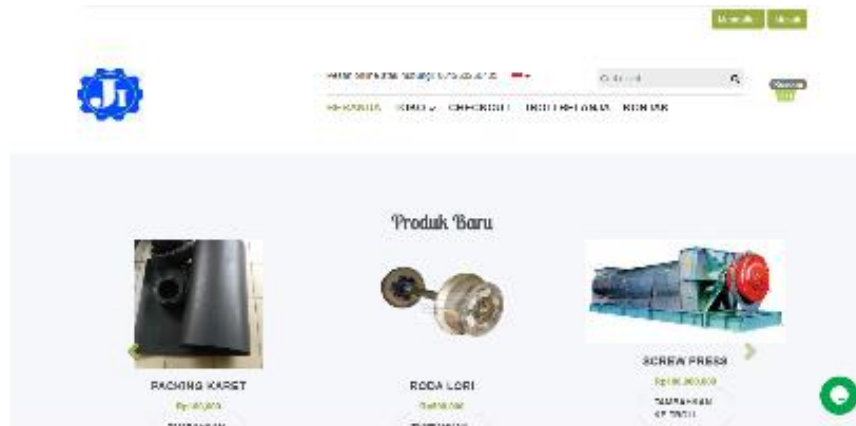


Fig 8. Dashboard Display

#### Product Specifications Display

On this page, customers can view specifications or detailed information about the product. The page features a Call to Action (CTA), which refers to an instruction or invitation designed to encourage people to take a specific action. The CTA feature on this page includes a button prompting visitors to "Buy Now." The goal of the CTA is to generate a positive response and encourage user conversion or participation in making a purchase on the website.

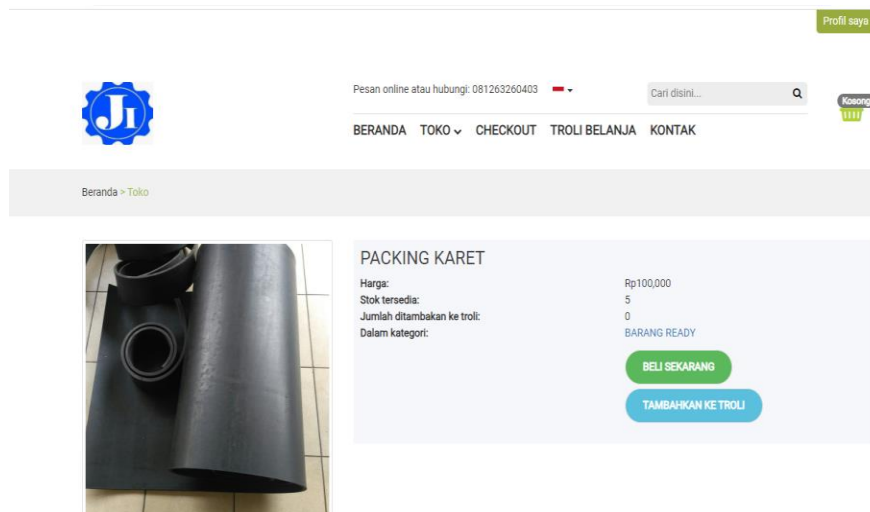


Fig 9. Product Specifications Display

#### Check Out Display

After the customer successfully presses the "Buy Now" button, they will be directed to the Ordering page, prompting them to fill in the recipient's identity, complete address, enter a discount code (if applicable), and proceed with the payment.

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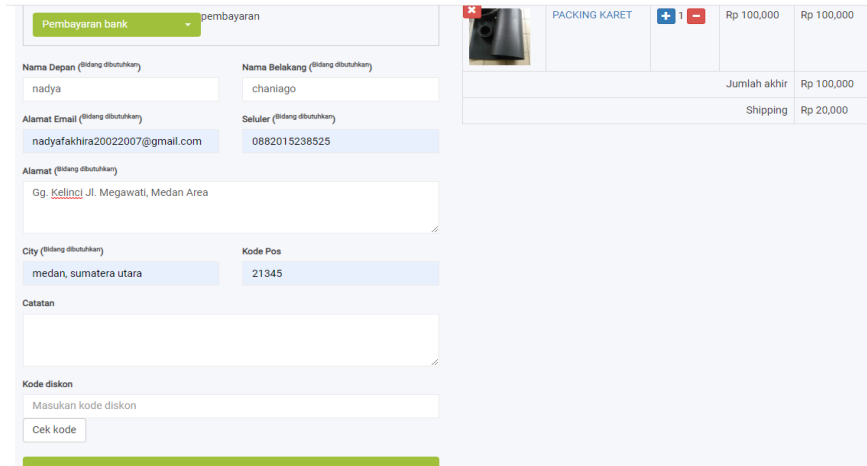


Fig 10. Check Out Display

### Tracking Display

On this page, information is presented regarding the status of the goods dispatched by the company. In the delivery system, the researcher has implemented a tracking feature where buyers can track the location of the GPS Tracker-equipped item during the delivery process by CV. Jon Indo's private courier. This tracking feature allows customers to monitor the whereabouts of the expected goods.



Fig 11. Tracking Display

### Order Display

On the Ordering page, the Admin receives order confirmation from customers who have made purchases and payments. The Admin will process the items and change the order status to "Packaging in Progress" before sending them to the destination address. This allows customers to monitor the order status updates made by the Admin on this page.

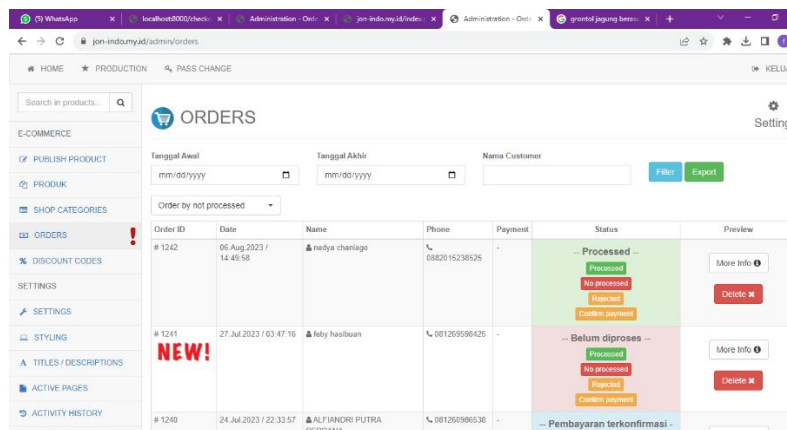


Fig 12. Order Display

### Construction

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The coding process involves creating web pages using HTML, following the design crafted by non-technical members. This process includes utilizing PHP version 8.0.8 and a MySQL database on XAMPP version 3.3.0. It is employed to manage the database within the website.

### System Testing

The system was tested using the blackbox method which emphasized functional requirements. This method limits the input to training the functional requirements of the program (Istianto & 'Uyun, 2021). System testing was conducted using Asus Core i3 Laptop. Here are table 1 and table 2 of tests conducted by users.

Table 1. Blackbox Testing on Buyers

No	Test Section	Expected Result	Conclusion
1	Open Website	Displaying the Dashboard	Success
2	Account Registration View	Display the Buyer Account Registration Page	Success
3	Item Specification Display	Display the Item Specifications Page	Success
4	Checkout View	View the checkout page	Success
5	Display Upload Proof of Payment	View the Payment Upload Page	Success
6	Track Transaction view	View the Track Transactions page	Success

Table 2. Blackbox Testing on Admin and Owner

No	Test Section	Expected Result	Conclusion
1	Open the Login Page	Display the Login Page	Success
2	Dashboard Page View	Displaying the Dashboard Page	Success
3	Order Specification Page Display	Display the Order Specifications Page	Success
4	Order Process Page Display	Displaying the Order Process Page	Success
5	Transaction Status Update Page Display	Display the Transaction Status Update Page	Success
6	Publish Product Page Display	Displaying the Publish Product Page	Success
7	Admin Product Update View	View the Admin Product Updates page	Success
8	Updated Dashboard Display	Displaying the Update Dashboard Page	Success
9	Shop Categories view	Displaying the Shop Categories Page	Success
10	Print View of Booking Report	Displaying the Print Page of the Booker Report	Success
11	Booker Report Results Display	View Booking Report Results	Success

Based on the system test table above that the system was successfully run according to expectations and design and no errors were found so that this system is qualified to run and be used by users.

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### Deployment

Deployment is a periodic improvement stage for the website users, involving evaluation and feedback collection. This process takes place after the application has been implemented and used by CV. Jon Indo Medan.

### DISCUSSIONS

The application that has been built will be used by three users, namely buyers, admins, and owners. Buyers can order goods online and monitor the delivery of the buyer's goods so that they can safely arrive at their destination. The admin can manage item data and also monitor and process sales of goods so that sales reports can be monitored by the store owner. This system has its own innovations, including the addition of various features such as features developed in this system in the form of promotional features so that buyers can get promos or discounts from sellers, in the ordering system researchers add CTA (call to action) on the website, then in the goods delivery system researchers create a tracking feature, namely the buyer knows the existence of the position of the GPS Track object in the process of delivering goods to the CV. Jon Indo company when making deliveries by private couriers. In addition, there is also a feature to request goods according to what the customer wants. So that this system is achieved in facilitating sales, purchases and disseminating the latest product information and the application can increase sales at CV Jon Indo. The system built utilizes the web engineering system development method, focusing on creating high-quality web applications with a smart and disciplined framework so as to create a capable system according to user needs.

### CONCLUSION

CV. Jon Indo is facing challenges in sales through WhatsApp and manual sales data management, leading to errors in scheduling deliveries and product orders. To address this issue, an e-commerce application has been developed based on web engineering methods. Blackbox testing results indicate that the application operates as designed without errors. The application is designed to simplify purchases for customers and enhance the efficiency of sales report management and the dissemination of the latest product information. Its objectives include improving efficiency, effectively managing sales, supporting product marketing, and streamlining the sales process from ordering to delivery at CV Jon Indo.

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