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Design of "Chicken Move Tracking" Integrated System as an Innovation to Support a Sustainable Economy in Pitiek Racing Sidomulyo Distribution

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ABSTRACT

Pitiek Balap Sidomulyo is a business engaged in the distribution of chickens. The scope of this business market is in the form of restaurants, markets, hotels, and chicken slaughterhouses in Yogyakarta and Jakarta. Based on the observed data, problems were found, namely in the shipping and distribution management sections that were not optimal. The purpose of this study is to analyze and design an information system to support a sustainable economy in the distribution of chicken from distributors to consumers. The methods used are observation, interviews and literature studies which are then made into an information system design using the Business Process Model and Notation (BPMN), and the Unified Modeling Language (UML). The design of this information system is expected to be able to increase the effectiveness of the Supply Chain Management of chicken distribution in the Pitiek Balap Sidomulyo business

INTRODUCTION

The development of information technology has provided a paradigm for logistics, inventory regulations and transportation to become a process of increasing the added value of goods and services (Sari & Santoso, 2019). In addition, the use of information technology in the economic field is an innovation that is being developed by business actors. The use of this technology provides an opportunity to expand market reach and become an important medium for communicating with customers (Mavilinda, 2021). Conceptually, running an economic system requires cooperation between economic actors. The existence of various parties involved and related to the flow of products from upstream to downstream will form a system known as a supply chain management or supply chain system (Risyaldi, Muhammad, & Dirgahayu, 2021). The function of the supply chain system is to provide the right products and services, at the right place, at the right time, and in the desired conditions while still making an optimal contribution to the company (Parwati, Andrianto, & Industry, 2009). This is one of the strategic steps in realizing a sustainable economy.

The Covid-19 pandemic has had a very broad impact on the fields of life in the community including, in the fields of health, education and the economy. One of the biggest impacts is economic instability (Raharja & Natari, 2021). The impact on this field is due to the Enforcement of Community Activity Restrictions (PPKM) so that several companies, shops and other businesses reduce or even stop production (Sundari, 2019). One of the affected economic sectors is the Micro, Small and Medium Enterprises (MSMEs) sector. In general, the majority of MSMEs have experienced a decrease in income and even losses as a result of the Covid-19 pandemic (Hadi & Zakiah, 2021). One of the MSMEs affected by the Covid-19 pandemic is Pitiek Balap Sidomulyo in Sleman Regency, Yogyakarta. The existence of the Covid-19 pandemic caused the UMKM Pitiek Balap Sidomulyo to experience a crisis due to reduced customer demand and restrictions on market mobility. The pandemic has also resulted in a reduction in human resources working on the production and promotion of Pitiek Balap Sidomulyo.

Pitiek Balap Sidomulyo is a business engaged in the distribution of chickens in the Ngaglik area, Sleman, Yogyakarta. This business was founded in 2002. The Pitiek Balap business gets chicken supplies from breeders in Yogyakarta. This business has a market scope of restaurants, markets, hotels, and chicken slaughterhouses in Yogyakarta and Jakarta. During the Covid-19 pandemic, Pitiek Balap Sidomulyo's business experienced a decrease in demand due to the many limitations in implementing the chicken distribution process. This is due to the Enforcement of Community Activity Restrictions (PPKM) which has reduced the demand for chicken in several areas that have implemented PPKM. Apart from the implementation of PPKM which is an obstacle, there are also other obstacles such as the large number of chicken senders who do not match the order address, this is due to the large amount of order data that has not been adjusted to the chicken distribution process. From the description of the problem, therefore a solution is needed to answer all the existing problems.

Sustainable economic growth means economic growth that can increase availability and quality by taking into account the amount available for future generations (Sunarsi, Kustini, Lutfi, Fauzi, & Noryani, 2019). In implementing a sustainable economy, it still faces various obstacles. Therefore we need an innovation that can be applied in everyday life. Rapid economic growth cannot be separated from the influence of the role of information technology (Nasir, 2017). The number of business actors who utilize information technology for the development of their business. This opens up great opportunities for economic sustainability in the future. Where integrating the economy with information systems can be the latest innovation in implementing a sustainable economy which of course must be based on sustainable principles (Sunarsi et al., 2019).

Chicken Move Tracking is an innovation by utilizing the development of information systems in its application. This system was built to assist chicken delivery officers in receiving information from customers. Where this system will work by tracking a particular product from several stakeholders involved with the network in real-time anytime and anywhere via a smartphone (Citra et al., 2022). With the existence of a Chicken Move Tracking design system for chicken distribution, it

can make it easier for consumers to access the tracking system with inexpensive and readily available devices such as cell phones. This is intended so that consumers know that the chicken product is by order (Nulhakim, Azizah, & Ajija, 2018). This system also contains information in the form of chicken delivery points, the number of chickens sent, the purpose of sending the chickens, payment and receipts or proof of payment that will be stored in the system (Susanto, 2017). The ease of using the information system in the form of tracking is expected to be able to contribute to the problems experienced by the Pitiek Balap business and can provide the maximum form of service to consumers.

METHODS

The system development methodology used in this study is the waterfall method. The waterfall model is a classic model that is systematic, and sequential in building software. Among them, phases are starting from the Requirement, Design, Implementation, and Verification phases, and the last is the Maintenance phase (Yetti Yuniati, Melvi Ulvan, 2016).

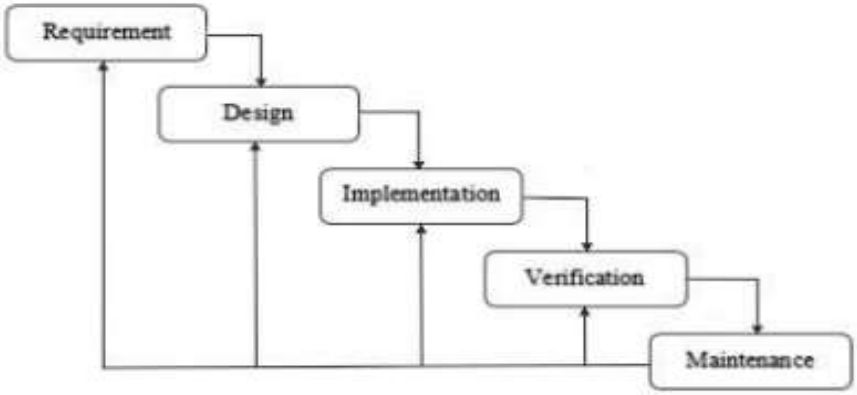

Figure 1. Waterfall Method

First is the Requirements or needs analysis stage, at this stage the author studies the problems of running business processes and is defined in detail to determine goals as system specifications. The second stage is the design stage. The system requirements that have been obtained are allocated to this stage to form a system design plan using UML (Unified Modeling Language). In this stage, determine the system flow to the detailed algorithm stage. The third stage is the implementation stage. At this stage, the design is realized as a series of programs to form applications. After the application has been implemented, it enters the fourth stage, namely verification. At this stage, the program units are combined and tested as a complete system to ensure whether the system that has been created can run according to its function, after that it can be given to the user. The last is the maintenance or system maintenance stage, this stage focuses on maintaining the system which will be used in real-time. In this study, the waterfall stage only used 2 stages, namely the Requirement and Design stages. The type of research data used is qualitative data or document review. This qualitative data is used with the following considerations:

1. Interview Method

The researcher conducted a question-and-answer session with the owner of the Pitiek Balap Sidomulyo business, Mr. Heri. From the results of the interviews we can conclude that the business is still not working optimally, this is because the management process for recording inventory still uses manual methods by recording only on book cards so many sales reports and orders are often lost.

2. Observation Method

This method is used to follow up on the results of interviews with business owners where the results of these observations will be analyzed in the form of participatory observations and group observations.

3. PIECES Method

This method is a follow-up method of the observation method in which this method will analyze the results of observations into 6 PIECES

categories to see what problems exist in the Pitiek Balap Sidomulyo business.

Table 1. PIECES Method

Component	Analysis Results
Performance	• The average delivery distribution for Super Kampung Chicken is 300 heads/day with an estimated delivery of 1 day for each request in the Yogyakarta area and 2 days for delivery outside the area (Jakarta). • The preparation process for delivery is carried out on the same day. • Every time a request comes in, the owner will immediately process every request. Usually, the owner will check the availability of chickens in the warehouse/temporary cage. If the order is lacking, it will contact the chicken breeder.
Information	• Data on orders, sales, payments, and invoices are stored manually so that the data is not structured properly. • Information on chicken availability is still done manually so that when an order comes in it often does not match the available chicken. • Bookkeeping is done once a week.
Economy	• For the calculation of profits made after one week of delivery. • If there are delivery problems, such as dead chickens on the road, sales are made at half price. • Delivery of chicken that does not match the destination address. • Payments from customers to owners are made in due time within one week. • Payments from owners to breeders are made according to the number and type of chickens that have been sent. • Daily delivery transportation costs Rp 100,000 including gas money and pickup rental. • There is no neat record regarding the number of orders, purchases, sales and other data.
control	• Each shipment of chickens outside the region (Jakarta) may not exceed 1,000 chickens. • Car delivery capacity of 1000 heads. • Sending done every day. • The number of shipments is adjusted to the number of requests. • It is not possible to estimate the number of orders because the sales history information is not well organized.
Efficiency	• Delivery delays are caused by wrong shipments. • Delivery outside the area (Jakarta) has an estimated time of around 15 hours. • The number and capacity of transportation are limited so that which affects the number of shipments. • *Lead time for delivery from supplier 1 to production is 2 days.*

	• Limited number of workers so chicken shipments cannot be sent at the same time.
Services	• The service has been carried out properly, every time there is input from the customer, it is immediately processed on the same day. • Recording of sales transactions is still done manually, invoices or receipts are often lost or torn while in transit. • There are no penalties for overdue payments.

RESULTS AND DISCUSSION

1. Business Process Modeling Notation (BPMN) proposed by BPMN has been adjusted based on the information system design proposal that the researcher made. This BPMN shows the process from the beginning the consumer places an order which is then automatically collected by the system which will later become a database for business owners. This will be a solution to administrative management problems that were lacking before. The following is a picture of the BPMN that the researchers propose.

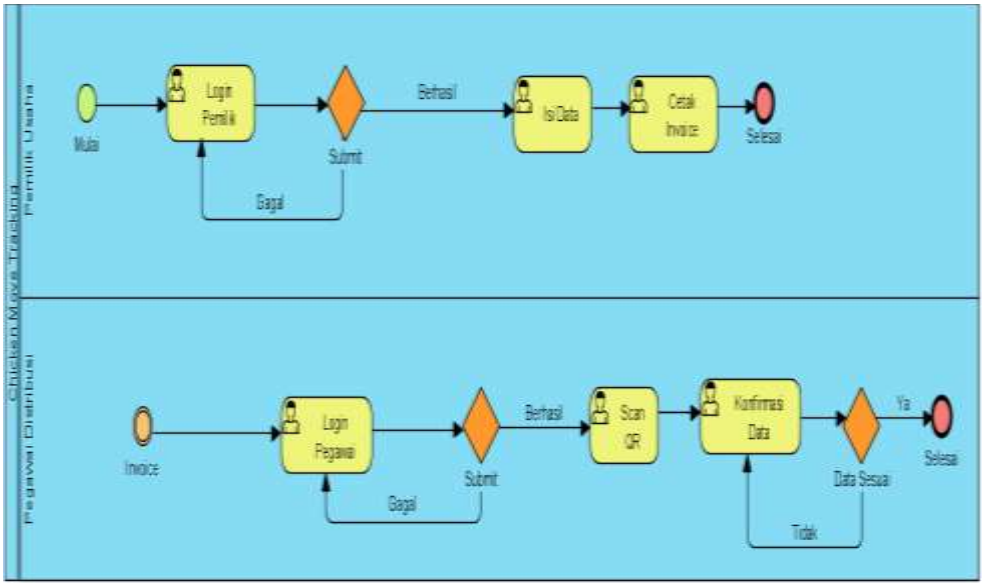

Figure 2. BPMN to-be

The process flow in BPMN is that the business owner logs in with a special password for the business owner if it fails, logs back in. If successful, go directly to the next menu, namely filling in the data. Then, the business owner enters incoming order data starting from the time of delivery, the transportation used the delivery address, and the number and type of orders. The business owner prints the invoice, the order data is saved, done. Next, the distribution employee continues the invoice for the shipping process. First, the distribution employee logs in with a special password for the distribution employee. If it fails, log in again. If successful, immediately scan the QR (containing the invoice order data received by the business owner and connected/monitoring with the business owner's account). Make preparations for shipping, shipping transportation and routes to be traversed. Then, confirm the data and make the delivery (monitoring by the business owner). If it matches the checklist if it doesn't match cross. Proof of delivery/payment is entered and the process is complete.

2. Furthermore, after determining the BPMN on the designed system, the researcher modeled the system using UML (Unified Modeling Language), which is an object-oriented system or software modeling language. The UML used in the design of the

Chicken Move Tracking system are Use Cases and Activity Diagrams.

a. Use Case Diagram

In the Use Case Diagram, it is necessary to involve every user in the system where there are 3 actors that the researcher proposes, namely Business Owners, Drivers and Consumers. The use case diagram that the researcher proposes can be seen in the following figure.

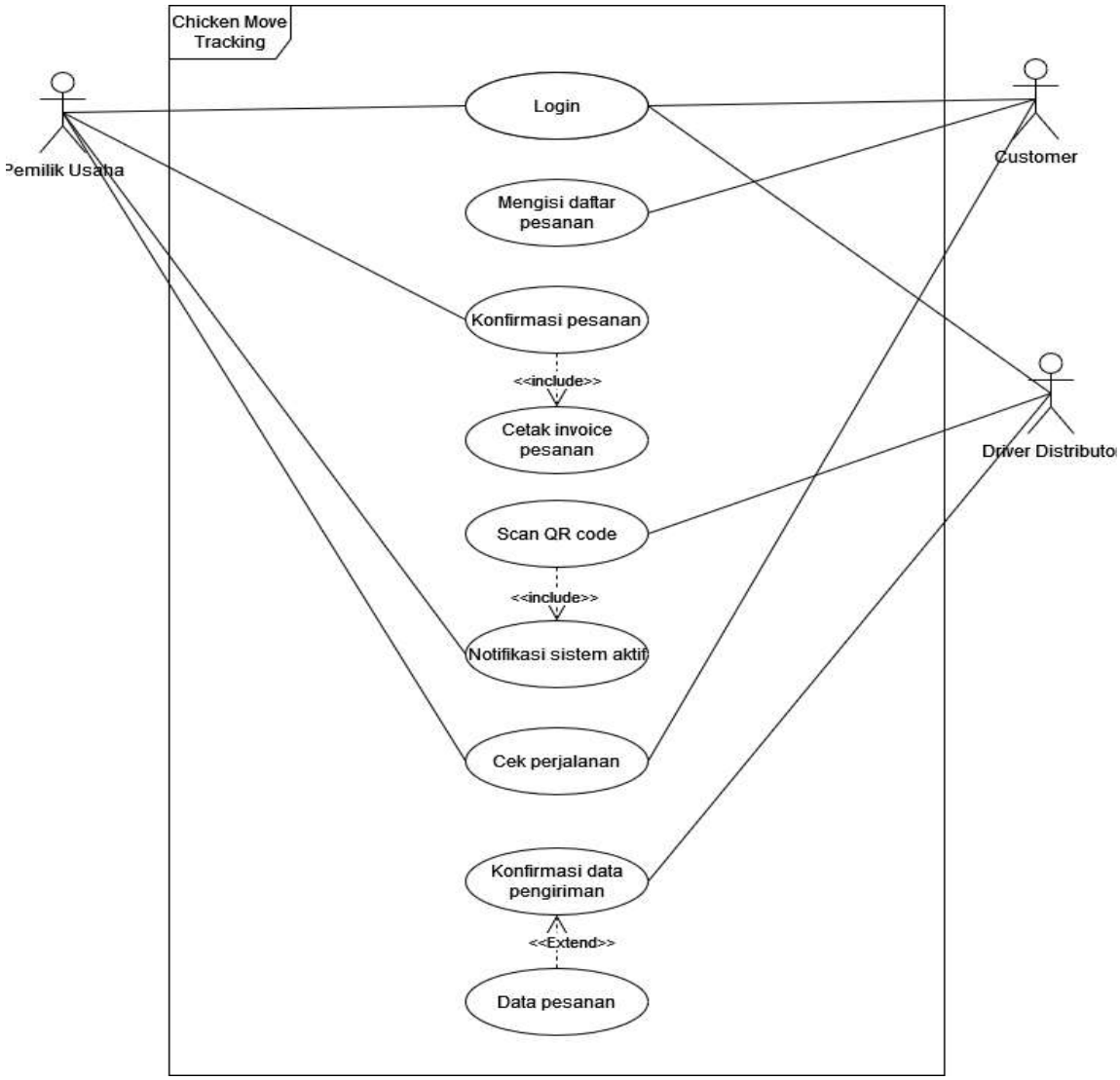

Figure 3. Use Case Diagram of Chicken Tracking

In this system process, three stakeholders can log in, namely customers, business owners and distributor drivers. Login is the first step for all stakeholders to be able to use this system. The business process in this system begins with the customer placing an order and then the order notification goes to the business owner's account. The order confirmation is carried out by the business owner to accept or not incoming orders by checking inventory directly. If the business owner receives the order, he will immediately print an invoice in the form of a QR code to be given to the distributor driver. Scan the QR code by the distributor driver and immediately an active tracking system notification will enter the account of the business owner and customer. Therefore, business owners and customers can check travelers when distributor drivers make deliveries. If it doesn't suit the business owner or customer, you can contact the distributor driver. If appropriate, the distributor driver makes the delivery and arrives at the destination address and immediately reconfirms with the customer whether

the order is appropriate or not and documents the order when it has been sent.

b. Activity Diagram

Activity Diagram is used to describe the activities that occur in a system. Activity diagrams can be used to describe the flow of events (Workflow) contained in a use case, to the detailed specifications of the use case. The following is a description of the proposed activity diagram.

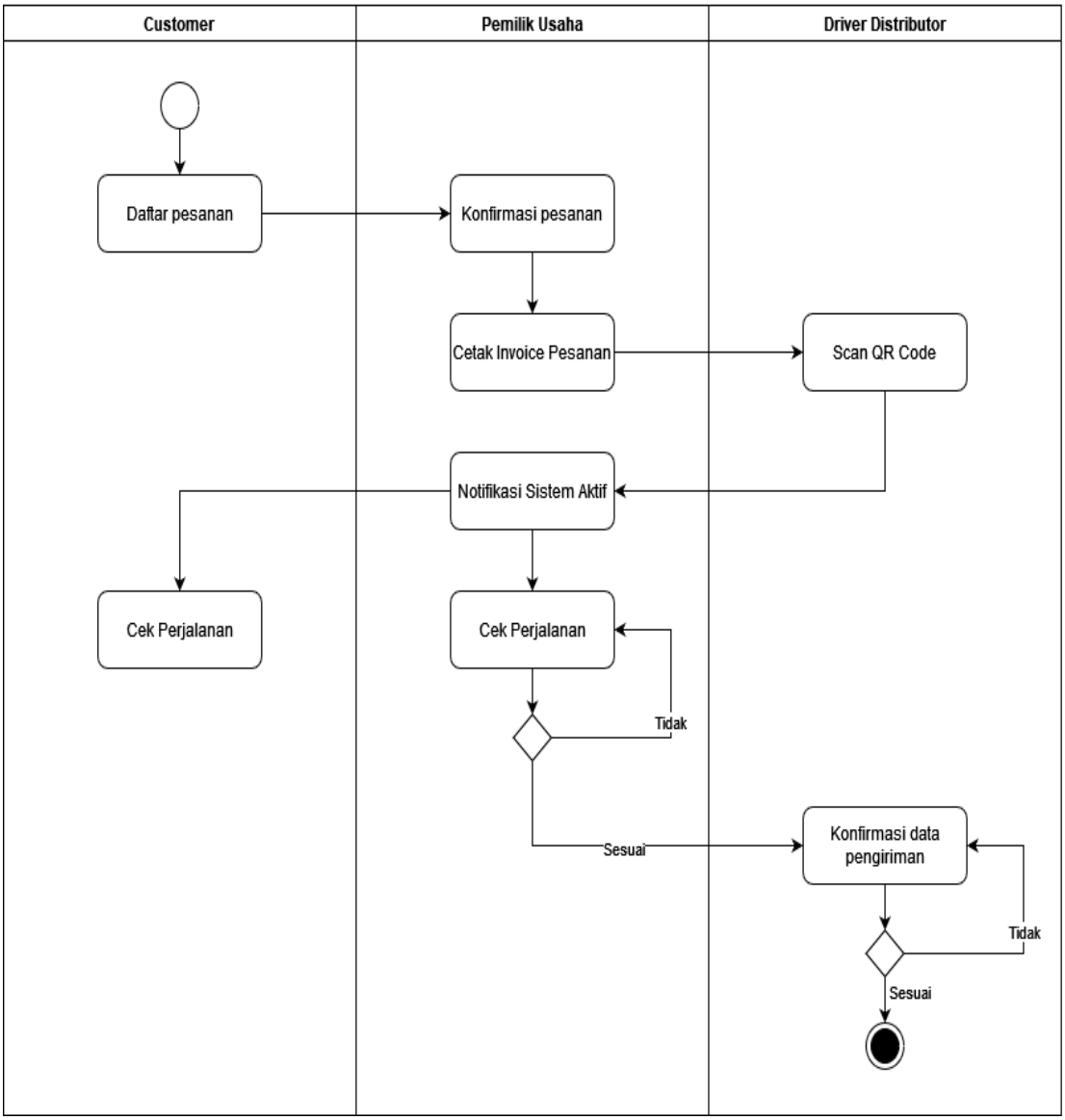

Figure 4. Activity Diagram Chicken Move

In the proposed activity diagram that the researcher made, it shows that there is a relationship between one user and another. Starting from the customer registering an order then it is confirmed by the business owner. The business owner will print an invoice to be given to the distributor driver in the form of a QR code. The distributor driver scans the QR code and the automatic tracking system is active, business owners and customers get the notification. Distributor drivers make deliveries that can be monitored by business owners and customers. If the trip is not suitable, the business owner or customer can directly contact the distributor driver. If appropriate, the distributor driver makes the delivery and after arriving at the destination address will re-confirm the order to the customer to make sure the order is appropriate or not. And documenting the order after it has been shipped.

1. **Implementation of User Interface**

a. The Main Page of the System

On this page, several options are adjusted to the number of users on the system

Figure 5. Main Menu Interface

b. Login Menu

On this page not everyone can access it, only users who already have an account. Where this aims to maintain data security on the distribution of chickens.

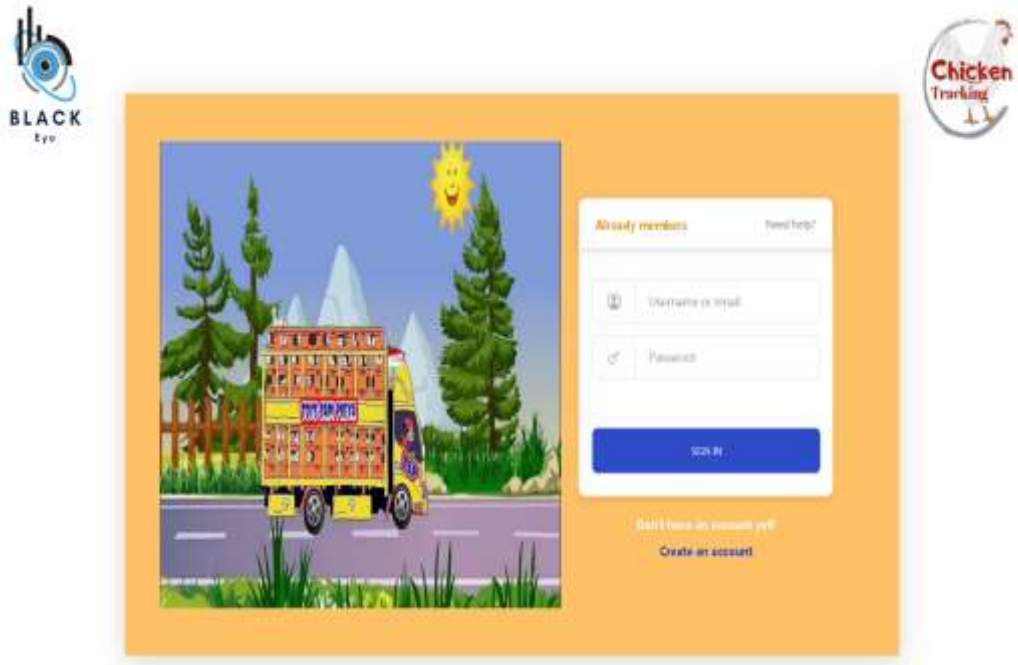

Figure 6. Login Menu

c. Sales Report

This page contains reports and sales targets every month. In addition, this page contains information on how many employees or drivers and farmers work together in this business.

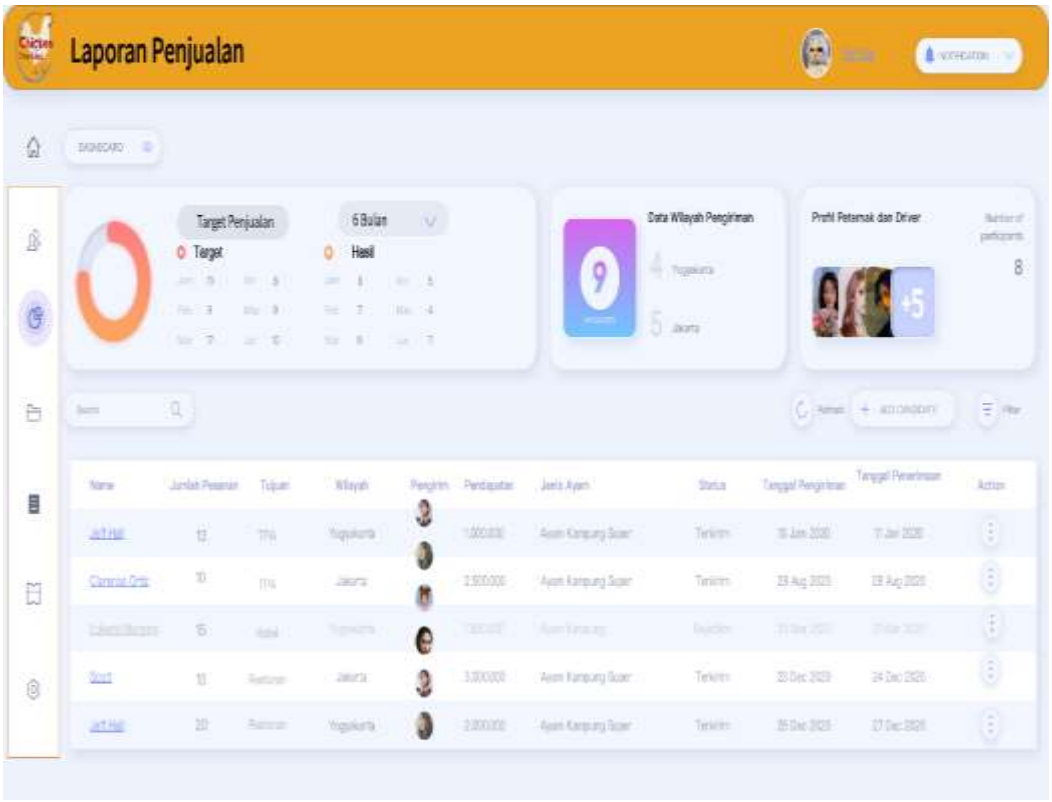

Figure 7. Sales Report

d. Order Data

Every order that comes in from consumers will be automatically stored in the system, making it easier for business owners to distribute orders.

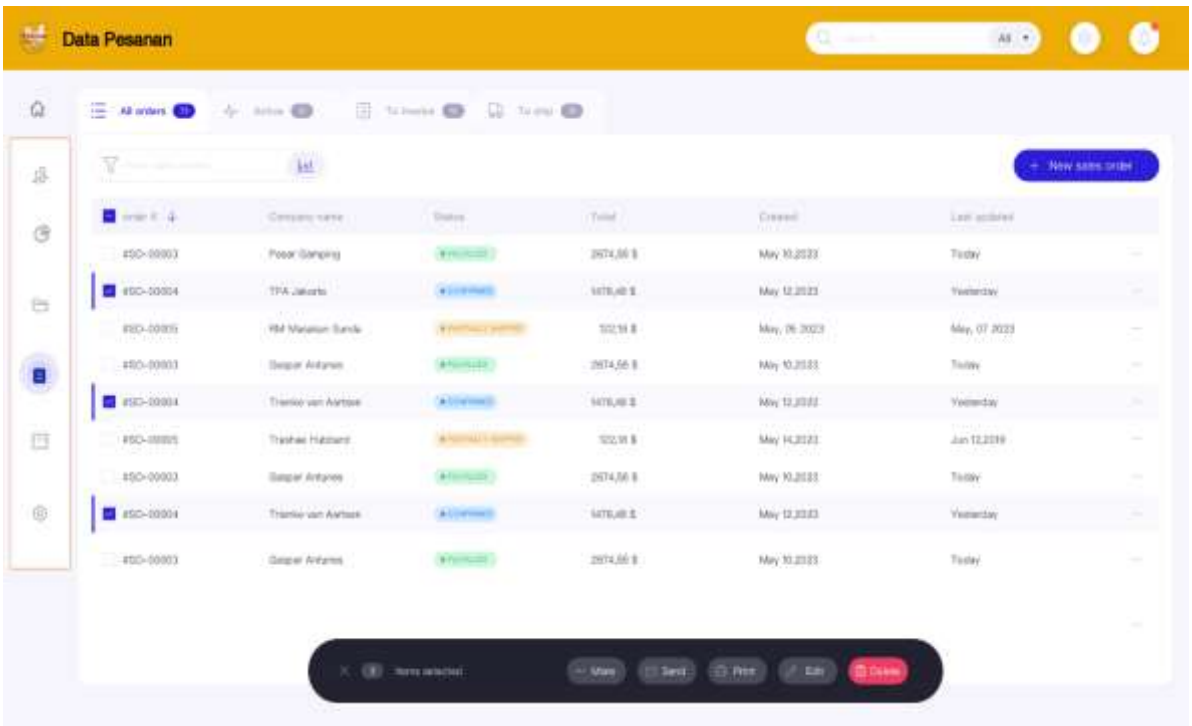

Figure 8. Order Data

e. Tracking System

Being one of the innovations in the system, this page can provide information on the location of the drivers who are delivering chickens. This aims to maintain consumer confidence and ensure orders are delivered according to their destination.

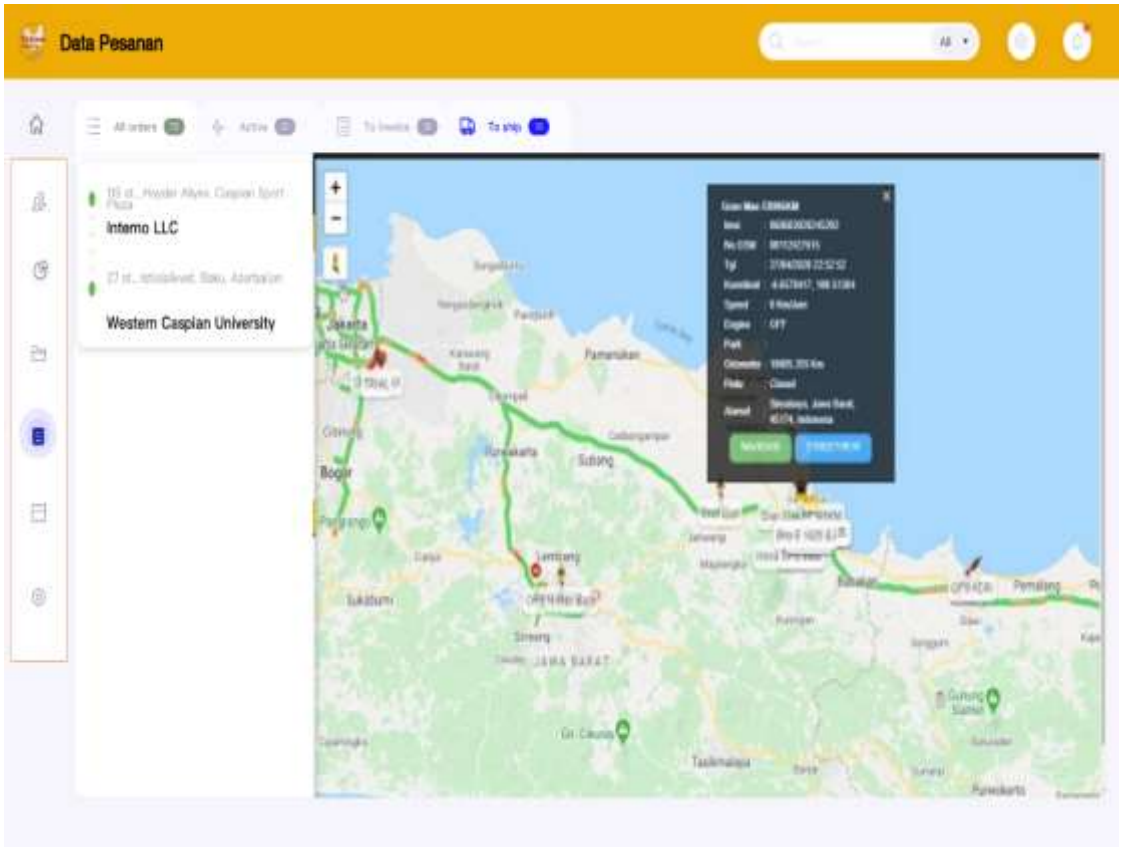

Figure 9. Tracking Menu

CONCLUSION

As for the conclusions from the results and discussion that have been described, the researcher describes as follows:

The system design was successfully made using UML (Unified Modeling Language).

a. This system can be used by business owners, consumers, and chicken distribution drivers.
b. Providing alternative solutions for these businesses in obtaining, processing, and producing information on matters related to permits for effective and efficient decision-making or action.
c. This system was built to support programs from a sustainable economy where in its application the principles of a sustainable economy will be used.
d. The Chicken Move Tracking system integrates information systems and data processing management so that it can become a renewable innovation in the Sidomulyo Racing Pitiek business.

The limitations of implementing the user interface only focus on the owner user.

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