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Improvement of Livestock Product Delivery Services Using Design Thinking

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ABSTRACT

PT. Charoen Pokphand Indonesia, the largest livestock company in Indonesia, was established in 1972 as PT Charoen Pokphand Indonesia Animal Feedmil Co. Limited. Today, the company is expanding with a focus on livestock activities such as broiler breeding, poultry slaughterhouses, and packing, processing of meat and poultry products, cultivation of broiler chickens, and a large trade in live animals and chicken meat. This study aims to identify the obstacles that occur in the process of shipping chickens, both experienced by farmers and by chicken expedition companies. In addition, this research also aims to improve livestock product delivery services by applying the Design Thinking approach. In the context of the livestock industry, the delivery of products such as live DOC chickens requires special handling, especially related to temperature and humidity, considering the vulnerability of DOC chickens to environmental changes. With a focus on partner logistics companies PT. Charoen Pokphand Indonesia, namely CV. Joint Work. The researcher included the Design Thinking method. The results of this research are expected to make a significant contribution to improving the quality of livestock product delivery services, improving operational efficiency, and providing a better experience for stakeholders.

Introduction

PT. Charoen Pokphand Indonesia is one of the largest livestock companies in Indonesia. The company was established in 1972 under the name PT Charoen Pokphand Indonesia Animal Feedmil Co. Limited. (Latifah, 2021).

In running its business, PT. Charoen Pokphand Indonesia has collaborated with several logistics companies to make deliveries, especially in the delivery of DOC (day one chick) live chickens to fostered farmers from PT. Charoen Pokphand Indonesia. These DOC live chickens will later be bred by fostered breeders into broilers. (Ahtiainen et al., 2022).

CV. Karya Bersama is one of the logistics companies that is a partner or partner of PT. Charoen Pokphand Indonesia who is in charge of making deliveries. Currently, CV.

Karya Bersama has 26 fleets that serve deliveries to all of Java, Bali, and parts of Kalimantan. A management system is needed to support the fleet's journey with an estimated 3-4 deliveries per week (Van Der Pijl et al., 2016).

In addition, DOC live chickens are a type of chicken that is still susceptible to death in transit because the age of the chicken is only one day before being sent. DOC chickens require special handling in delivery, especially in temperature and humidity (Domokos et al., 2018). The duration of delivery also greatly affects the health of the DOC chickens. The longer the duration of the trip, the greater the risk of death or weight loss that will be experienced by chickens. Therefore, the supporting management system needs to be able to track and monitor the location of the vehicle and the duration of the trip. (Kholis et al., 2018).

The quality of logistics delivery also affects customer satisfaction, the service provided to customers is the basic measure in logistics competition. Logistics delivery management must also be well-organized (Marliana et al., 2024). Previous research related to the design of a collaboration system for logistics service providers shows that the use of management applications in logistics companies helps the business processes that are run, thereby facilitating the monitoring process and ensuring constant service quality. (Armiati & Choldun, 2020).

Relevant previous research has an important role in providing a more comprehensive understanding of this research topic. Some relevant previous research supporting this thesis is listed in **Error! Not a valid bookmark self-reference.**.

Table 1
List of Relevant Previous Studies

Journal Name	Heading	Result	Domain
Journal of Informatics Engineering Musirawas (2022)	Mobile Web-Based Doc (Day Old Chicken) Chicken Cultivation Application.	The research produced a web-based application that can be used by chicken farmers to obtain information about DOC chicken cultivation and can be used to calculate the estimated cost of DOC chicken cultivation.	Farm
Journal of Physics: Conference Series (2018)	Information Systems Of Logistic Management: a Case Study	Information System Logistic Management (ISLM) is a valuable technology that companies use. To evaluate the efficiency of their company's operations as well as the performance of their staff.	Logistics, Management Logistics
Science And Engineering National	UI/UX Design Feature Integration with Logistics in Creativity	UI Design The Integration with Logistic feature in the Krealogi Application is designed to be enough to help	Logistic, Design Thinking

Seminar 6 (2021)	Applications Using the Design Thinking Method	users carry out more precise supervision of their orders.

Based on the presentation of the problem written in the background above, the problem can be formulated according to the design thinking phase as follows. (Riyanto & Anto, 2022).

1. What is the empathy process and problem definition in the delivery of livestock products?
2. How can the idea and development of a prototype application platform that can overcome problems in the process of delivering livestock products?
3. How is the user experience study on the prototype of the delivery application platform of the developed livestock product?
4. How is the evaluation of the livestock product delivery service based on the results of the user experience study on the prototype through the user?

The purpose of this research is to identify problems that arise in the delivery of chicken livestock in expedition companies, define features or services that can overcome these problems through online application platforms, develop related solutions, and design, build, and test platform prototypes with a Design Thinking approach to meet the needs of stakeholders, such as chicken farmers, delivery companies, and breeding companies, with the hope of improving user satisfaction, management, and supervision in the chicken delivery process, including monitoring the health of chickens during delivery.

Method

Background and Sample of Research

The research method involves a research sample consisting of several people who work as chicken farmers and chicken delivery business owners. With the following sample description:

Table 2
Table of Chicken Farm Owners

Chicken Farm Owner	
The target number of respondents	30 Respond
Method Survey	*Online* surveys
Survey Location	- Bogor - Pasuruan - Jombang - Bali

Research Stages

In the context of the research, researchers use the Design Thinking methodology to understand users and identify relevant strategies for user needs.

1. Literature Studies

At this stage, the author conducts research on the literature that is by the thesis to be worked on. The study of this literature is especially related to or related to livestock, livestock delivery services, and related issues about livestock delivery services. This literature can include papers, journals, related websites, previous theses, and other literature. The results of the literature study give the conclusion that there are several problem factors in the process of sending chickens.

2. Identify Problems (Empathize)

Problem identification is the process of defining a problem or challenge that needs to be solved. At this stage, the process carried out is to conduct interviews and surveys with questions that explore the problems experienced by expedition companies, breeders, and chicken hatchery companies.

Results and Discussion

Stakeholder Typology

In understanding the persona of stakeholders, the researcher collected preliminary data by conducting online surveys and interviews. Then a total of 36 farmers were gathered and spread into the following areas:

Table 3
Table of Number of Respondents

It	Number of Respondents	Farm Location
1	21 Respond	East Java
2	4 Respond	Central Java
3	7 Respond	West Java
4	4 Respond	Other

Next, the researcher also conducted interviews or in-depth interviews with several chicken delivery expedition entrepreneurs in several regions in East Java, with most of them having businesses for more than 5 years. Figure Figure ***1*** Shows a diagram of the length of the expedition business (Legowo & Aditama, 2020).

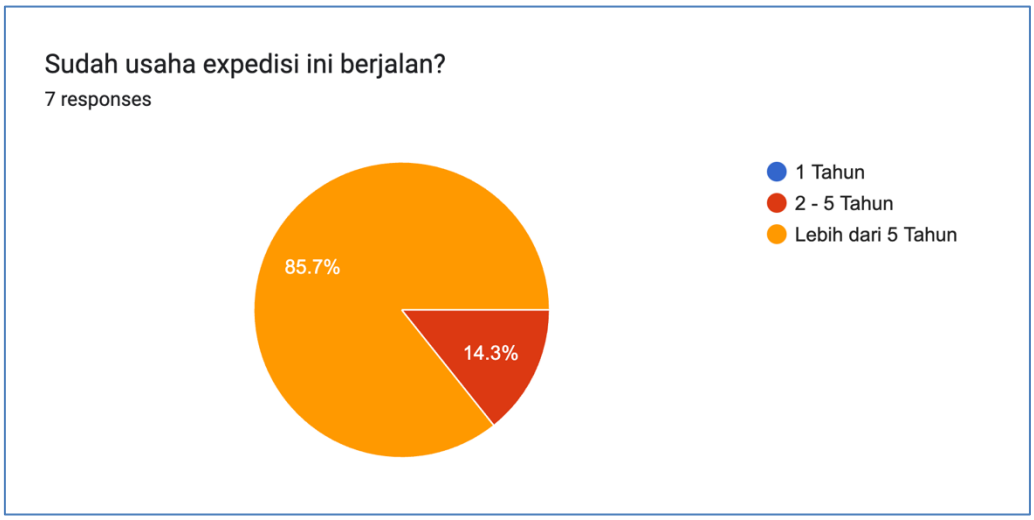

Figure 1 Diagram of the old expedition business

Stakeholder Personas

Based on the above data, the researcher can determine several personas used. Then the persona was redeveloped through an online survey and in-depth interview process.

Persona of an Experienced Expedition Entrepreneur

This persona is taken from the stakeholder typology with the following provisions:

a. Have a minimum business duration of 2 years
b. Have a fleet of at least 5 units
c. Have a minimum of 10 experienced drivers
d. Have a roadworthy vehicle condition and complete papers

As for the results of in-depth interviews with the persona, the results of the persona were obtained as follows:

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Results of Personas of Experienced Expedition Entrepreneurs

Experienced Expedition Entrepreneur	***Goal***
	1. Want the delivered DOC chickens can be monitored in real-time to maintain quality.
- Minimum 2 years of business	2. Because the fleet is more, it is necessary to have a fleet maintenance feature
- Have a minimum of 5 delivery fleets	3. Requires real-time fleet monitoring or *tracking*.
- Have a minimum of 10 drivers for delivery - Have a roadworthy vehicle condition and complete papers	
	Frustration
	- It is difficult to charge farmers, especially small farmers.

	- It is difficult to know the fleet maintenance schedule because there are many fleets. - Difficulty in ensuring available drivers - Difficulty knowing the applicable KIR schedule. - Difficulty creating monthly reports on income and expenses per month

From some of the personas above, the initial analysis of the researcher has several obstacles that arise experienced by stakeholders, namely:

a. There needs to be an integrated and *user-friendly* system that can make payments more easily
b. There needs to be a system that can monitor the journey of chicken seed delivery, this is because there are several risks that arise if the chicken is delivered late such as chicken seeds will be weak and even the death of chicken seeds.

Empathy Maps for Chicken Farmers

Figure 2 Shows the results of *empathy maps* from farmer personas based on the results of interviews.

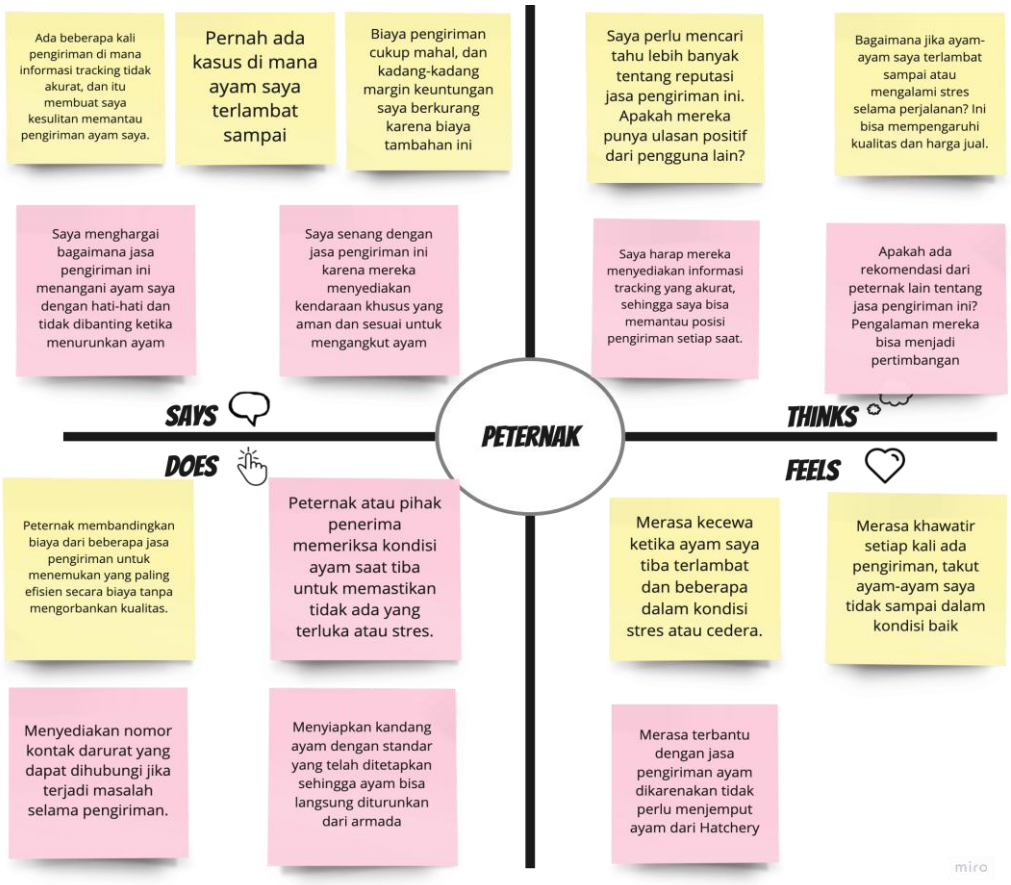

Figure 2
Empathy maps for farmers

This empathy map was compiled by conducting interviews with several chicken farmers, both small and large-scale farmers. In the interview, several complaints and responses related to the current performance of chicken delivery were obtained. With the caption on the image, pink is a positive response and yellow is a negative response or complaint. (Andry & Loisa, 2019). Some responses that can be taken from the activity:

a. Some farmers complain that chickens arrive late
b. Farmers complained that there were difficulties in monitoring chicken shipments.
c. Farmers also compare the reputation of word-of-mouth delivery services.
d. Farmers consider that shipping costs will affect the profits they get.

Registration Menu

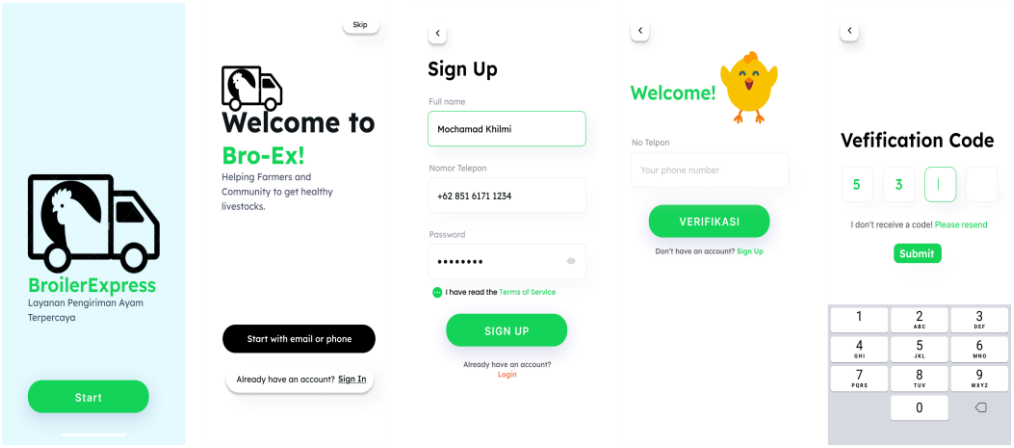

Figure 3 BRO-Ex application registration menu

Figure 3 **BRO-Ex application registration menu** Shows the registration menu there are several menu flows, namely:

a. Landing page

The welcome page contains a button that shows the new user or the user who already has an account.

b. The signup page used to register.
c. Phone number registration page to register a phone number.
d. Phone number verification page to verify your phone number.

Web Apps for Expedition Entrepreneurs

In the web application for expedition entrepreneurs, there are 4 main menus used, namely the Dashboard Menu.

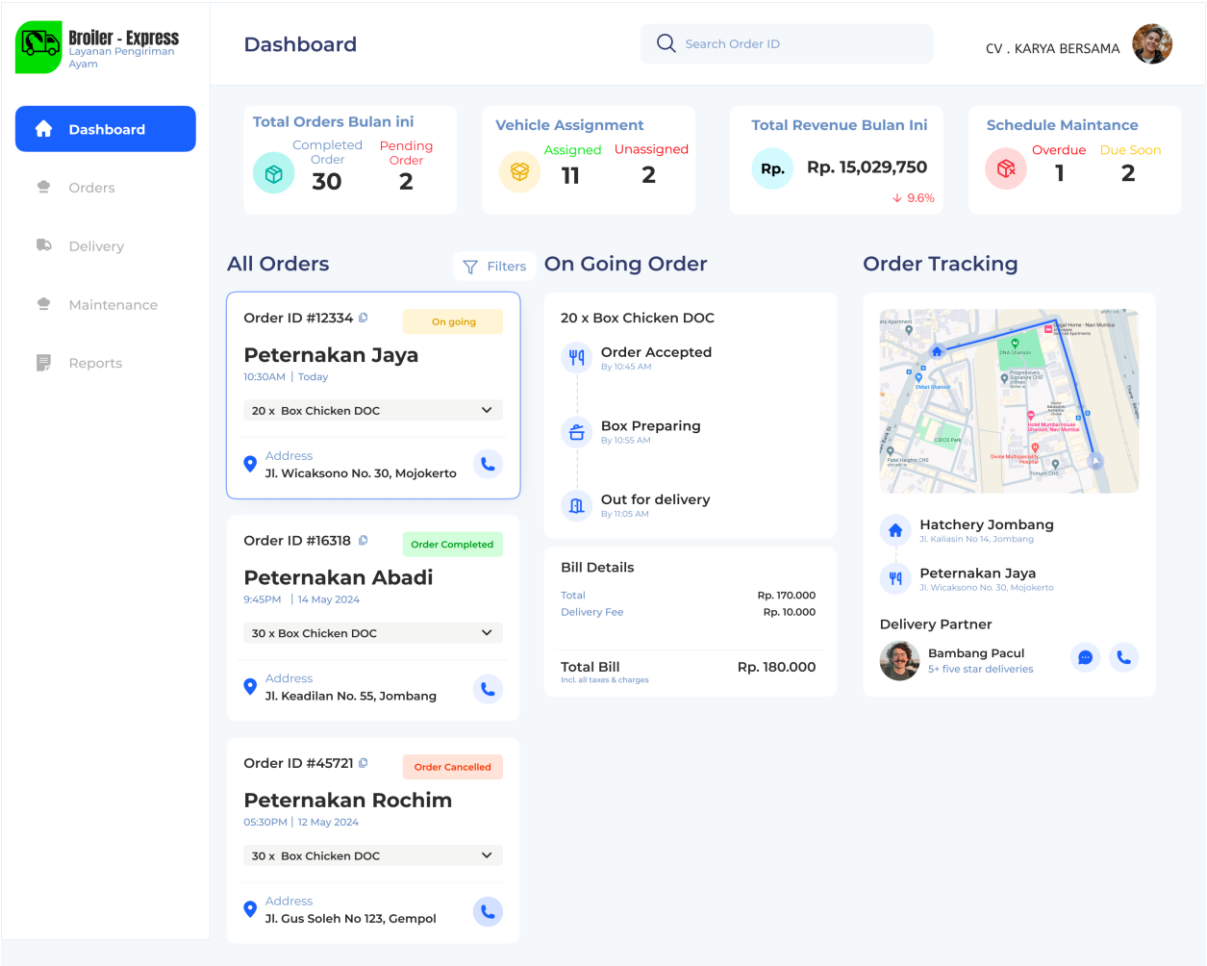

Figure Error! No text of specified style in document.
Main dashboard display

On the dashboard menu, the features displayed are a summary of order monitoring, a summary of vehicle tracking monitoring, and a summary of vehicle maintenance schedule monitoring.

Testing

After the prototype stage, the prototype that has been made is then tested. This test uses the Maze application, while the type of test carried out is usability testing. Usability testing is a testing method used to measure how easily and efficiently users can interact with a product or system. The goal is to identify usability issues and find ways to improve the user experience. In addition, another benefit of usability testing is that finding and fixing usability issues in the early stages of development can reduce the cost of more expensive repairs later on.

The usability testing scenario of the mobile application for farmers will be carried out as follows:

a. Enter the mobile application for farmers then register
b. After registration, the user will be directed to the login page, then the user will be asked to log in according to the user and password that has been entered
c. Next, users will be asked to process the order.

d. Then the next user will follow the order flow until payment is completed and completed.

In determining success in this usability test, several factors must be considered, including:

a. Exit rate is the percentage of users who leave the app compared to the total number of users who view the page. This is an important metric in web analytics that provides insights into user behavior and helps identify which pages are causing users to leave the site.
b. Missclicked Rate is a metric used to measure the percentage of accidental clicks or clicks a user makes on an element that is not the actual purpose of the click. In the Maze application, the missclicked rate test is replicated using a heatmap test.
c. Average Duration refers to the measurement of the average time spent by a user performing a task or using a feature on a website, app, or during a given experiment. This method is often used in usability testing and performance analysis to understand how effective and efficient a system or feature is in meeting user needs.

Survey Against Application Features for Chicken Delivery Entrepreneurs

Next, an online survey was also conducted for applications used for chicken delivery entrepreneurs. The results of the survey are as follows.

a. Features to provide and view *ratings* and feedback on chicken delivery services

At this stage, researchers conducted an online survey to find out if the feature to view ratings and feedback was helpful enough. Figure 5 shows the results of an online survey related to this feature.

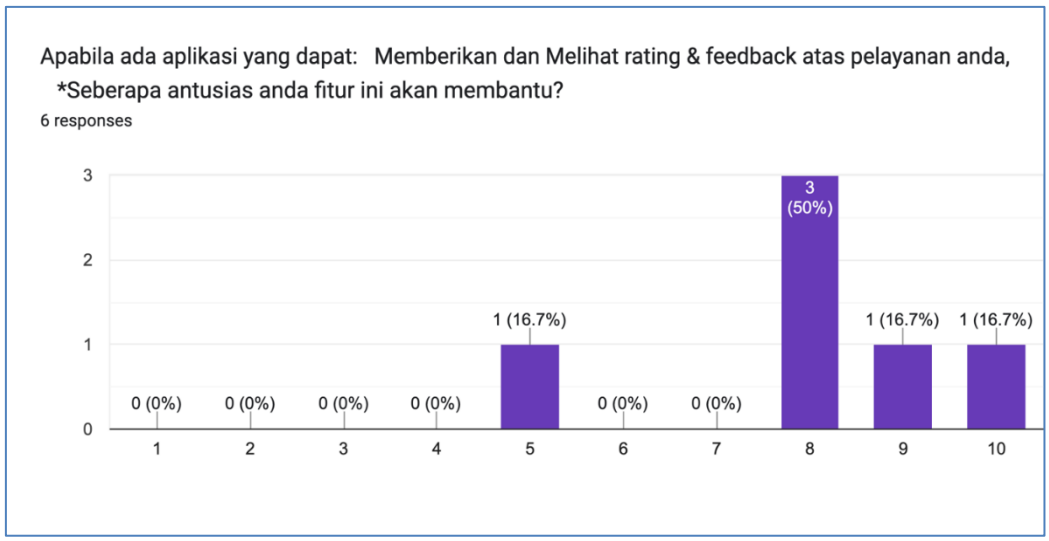

Figure 5
Results of online surveys on the rating and feedback feature of delivery services

It can be seen that from these results, 50% of chicken delivery service entrepreneurs give a score of 8 which means that some of the respondents think that the feature is quite helpful, while 16.7% choose the feature as very helpful to improve the quality of their services.

b. Order Information Feature

The next feature that is no less important is the feature to inform orders that have taken place. Figure 6 shows that 33.3% of respondents think that this feature helps chicken delivery entrepreneurs.

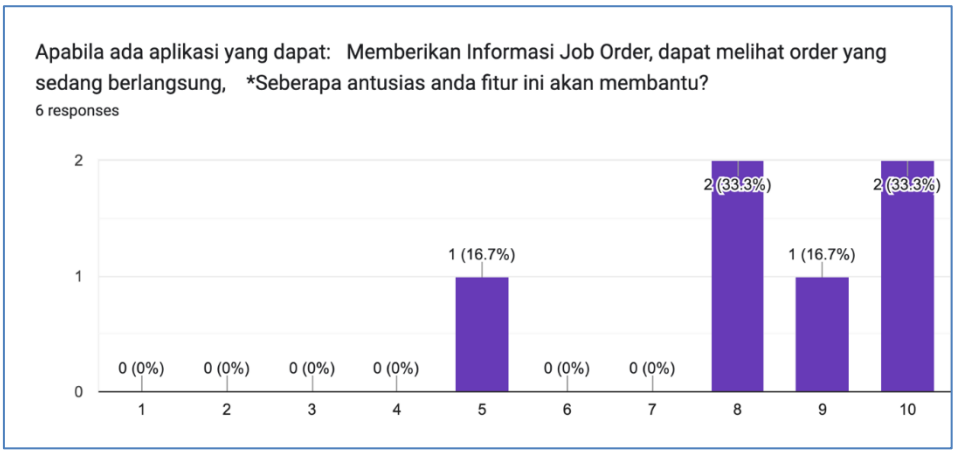

Figure 6
Results of the online survey for the order information feature that is currently taking place.

c. Vehicle position and condition information feature

This feature functions to find out the position and condition of the vehicle through GPS. Figure 7 shows that 50% of respondents agree that this feature helps chicken delivery entrepreneurs to run their businesses.

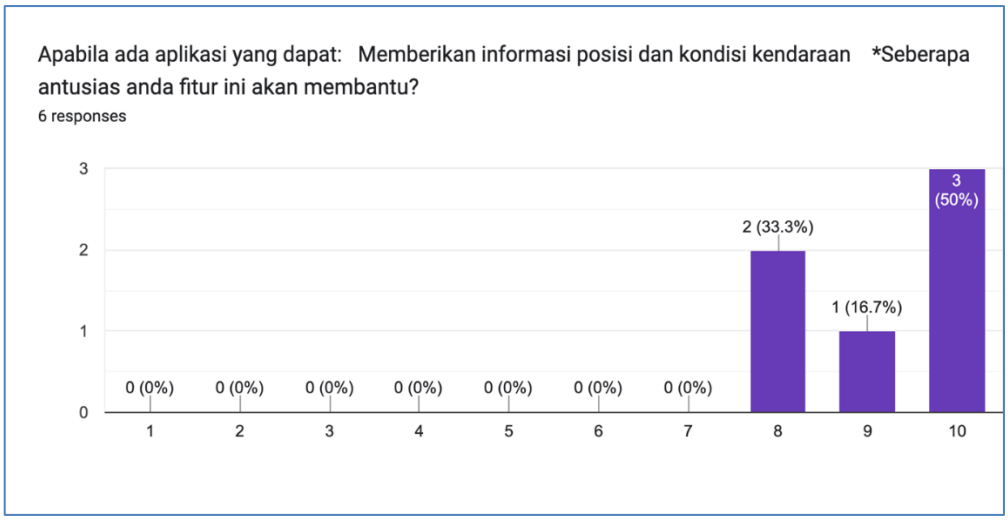

Figure 7
Results of online survey features to find out the position and condition of vehicles.

Conclusion

Based on the results of the study, it was concluded that this study successfully identified various problems in the delivery service of livestock products, such as uncertainty in delivery time, product damage during transportation, and customer dissatisfaction. The application of the Design Thinking method is used to analyze and design solutions to improve delivery services through the stages of empathy, problem definition, ideation, prototype, and testing. The researcher also divided stakeholders into four customer personas, namely Small Farm Persona, Large Farm Persona, Beginner Expedition Entrepreneur Persona, and Experienced Expedition Persona. Based on in-depth interviews with stakeholders, various obstacles were found in the livestock delivery business process, such as difficulties for farmers to monitor chicken shipments, delays in delivery, delays in payments by farmers, concerns of delivery service companies related to the loss of travel documents, and difficulties in monitoring travel schedules and fleet maintenance in companies with a fleet of more than five units.

To overcome these obstacles, several creative solutions were proposed, including the development of web and mobile applications with GPS trackers to monitor chicken shipments, digitization of documents such as bills and road letters, and an application equipped with monthly reports for billing recapitulation. Prototypes of these ideas were developed using the Figma app, and prototype testing through usability testing showed that some components needed to be improved, such as user click errors and the need for further iterations until the user error rate was lower than 30 percent. The conclusion shows that the Design Thinking method can be applied well in the chicken delivery business process, but further coordination with stakeholders is needed to understand the needs and problems, as well as continuous iteration of the prototype until it is ready for use.

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