Innovation Models and Business Concepts as Context for Radical Innovation in Freshwater Fish Trading Applications.

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Abstract

Indonesia is a maritime country with abundant fisheries resources potential. However, fish farmers often face challenges in terms of profit margins and marketing of their catches. An alternative is needed for fish sales activities that are anti-price wars and customer-oriented. This is due to the lack of market information, so farmers think it is more efficient to sell their harvest to middlemen or collectors because they don't need to find customers in the market and incur transportation costs for fish delivery. However, because of this, the price of fish sold will become more expensive with each transfer to a third party, and the profit margin for fish farmers remains small. Based on these problems, the author aims to provide a solution for fish farmers by designing an application for fish trading transactions. This research utilizes a Design Thinking approach simplified into the stages of the RSM (Recognize, Scrutinize, Materialize) Design Approach in application development. This model is aligned with addressing issues such as low profit margins and the challenges of independent sales. It also emphasizes the need for collaboration in sales management, such as the existence of digital fish cooperatives.

CCS Concepts

• **Human-centered computing**; • **Collaborative and social computing**; • **Collaborative and social computing design and evaluation methods**;

Keywords

eFishery Fresh, Radical innovation, RSM model

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1 Introduction

Indonesia is a maritime country with a sea area of 5.8 million *km2* with a number of islands ± 17,504 and a coastline of 95,000 km, the second longest in the world which has various types of fish in its sea waters. Based on studies, the potential for national fish resources reaches 65 million tonnes/year with details of capture fisheries amounting to 7.4 million tonnes/year and cultivation of 57.6 million tonnes/year [1].

Fish is a food ingredient that has high protein compared to other animal proteins with abundant cultivation results and fish is one of the many animal proteins that has the largest protein consumption in Indonesia at 13.59% of 25.79% of total protein consumption. animals in Indonesia [2].

Fish cultivation aims to obtain higher or greater yields and better results than if the fish were allowed to live completely naturally. Several techniques in fish cultivation have been developed to increase the efficiency and productivity of available fishery land. Fish cultivation techniques known in Indonesia include cultivating fish in fast water ponds, still water ponds and cages [3].

The development of aquaculture can be done by developing areas for superior commodities. A superior area is an area designated as a regional economic driver (prime mover) which has the criteria of being an area that grows quickly, has a superior sector and is connected to the surrounding area (hinterland). Determining an area to be a superior area is because it is hoped that it can increase the growth of an area. There are three factors that influence economic growth, namely capital accumulation, population growth and technological progress, the relationship between the economy of superior regions and the concept of specialization. There is specialization of commodities according to the leading sectors and/or sub-sectors of each region. This can be more effective and efficient if there is a division of labor, which divides the entire production process into special specialized units [4].

Homo homini lupus. Thomas Hobbes's description of human greed in fighting for resources for their own interests is clearly visible in liberal economic life which upholds freedom of business. A liberal paradigm like this leads to the concept of a free market, where only the strong will win business competition. Conditions like this will certainly result in a widening of the rich-poor gap in the fabric of society. However, humans can also be described as homo homini socius, where humans are friends or partners to others. This depiction of human greed in distributing natural wealth is reflected in the form of agricultural commercialization which results in social inequality while giving rise to patron-client relationships between farmers and middlemen. As Scott describes, this middleman-farmer relationship begins with differences between the rich and the poor who exchange goods and services. Farmers

who do not have to be forced to owe money to middlemen to meet their agricultural production needs will be bound to middlemen to sell their products, as well as the selling price of their production. This is what, according to Scott (in Putra, 1988: 3), is one of the characteristics of patron-client relationships [5].

Therefore, the author wants to create an application that is able to integrate with various users who make transactions well as an alternative to selling fish fairly. Emphasizing the need for collaboration in sales management, such as the existence of digital fish cooperatives.

2 Literature review

Radical innovation is a new function or technique that has not been previously identified, which indicates a paradigm shift or gives birth to new concepts that are in the opposite direction, such as the invention of the wheel, transistor, microprocessor, etc. System innovation is like radical innovation. However, this is achieved by using a combination of the latest technologies to produce new technologies that have never existed before in the market or network. To understand the innovation strategies that economists should adopt, it is important to understand users' main perceptions of innovation, such as professional work, lifestyle, organizational culture, and Corporate environment. Innovations in products, processes and organizations have different levels of newness, because newness is essential to innovation. Thus, the level of novelty of an innovation is another classification with two categories, incremental and radical [6].

Radical innovation is an innovation with a high degree of novelty, which breaks with what existed before and is the result of an unclear path or idea. Therefore, radical innovation involves great challenges and opportunities [7]. In contrast, incremental innovation is innovation with a low level of novelty, as well as smaller risks and costs than radical innovation [8] [9] even though the potential positive impact is much smaller on company performance. Therefore, incremental innovation does not necessarily break with the organization's previous product, process or method, as it is a significant improvement over the organization's previous product, process or method [8] as it has a lower degree of novelty. However, successive additional innovations can produce something that is a radical innovation.

Additionally, strategic options are limited to business concepts [10–12] such as identification of market opportunities, company products and services offered [10, 12] and innovation opportunities. In particular, processed innovation, choices identified in the conception, discovery, and exploitation phases limit the results that can be achieved [13–15]. Business relevant innovation concepts enable the identification of new options in the conception, discovery, and exploitation of innovations. Li et al. [16] highlights that changes in interpretation and conceptualization lead to efforts to achieve the changes necessary to achieve innovation within the company, as well as the creation of new innovations. combination of knowledge. Also, Hamel [17] details a theoretical business concept of innovation as self-innovation, taking into account its possible relationship with other innovations and its high impact on the company. However, business concept innovation is also based on a deep understanding of customer needs, enabling complete business transformation [17] leading to changes in the business, and in the innovation process. Indeed, the business concept limits the customer needs that can be identified and exploited. Especially if innovation is the commercialization of an invention [13, 15], and as a result, gradual and radical innovations emerge from what has been identified. customer needs (at least in the case of successful innovation), then the business concept limits incremental and radical processes. innovation. This means that new ideas are conceived, put into practice and exploited based on the concept of customer needs; even the opportunities that can be identified and exploited depend on the business concept. Therefore, business concept innovation provides new options in the business innovation process, as well as a new understanding of customer needs.

3 METHOD

In the context of this research, the conceptual model adopted is Design Thinking which is simplified in the form of the RSM Design Approach phases used by the author as a tool in achieving research objectives. As can be seen in Figure 1, which divides the activity phase into three, namely (Recognize), which focuses on the process of identifying the characteristics needed in application development, then (Scrutinize), examining the relationship, is carried out to examine or examine carefully and thoroughly the information collected and finally realized (Materialize) related to realizing solutions based on these problems As can be seen in Table 2. Meanwhile, Design Thinking is used because at the beginning when the design process is being carried out and also during the implementation the idea continues to be iterated (the planning, development, testing and evaluation process is repeated many times) in accordance with incremental innovation which is innovation with a low level of novelty, as well as risks and costs which is smaller than radical innovation [8, 9], even though its potential positive impact is much smaller on company performance. Therefore, incremental innovation does not necessarily break with the organization's previous product, process or method, as it is a significant improvement over the organization's previous product, process or method [8] as it has a lower degree of novelty. However, successive additional innovations can produce something that is a radical innovation. Simplified Design Thinking in the form of RSM Design Approach phases as in the Table 1

4 RESULTS AND DISCUSSION

This research utilizes a Design Thinking approach simplified into the stages of the RSM (Recognize, Scrutinize, Materialize) Design Approach in application development As can be seen in Figure 2. The author chose Human-Centric when starting the journey of implementing radical innovation in an organization. Empathise explains how to get an overall understanding of the problem being faced by empathizing with the people who are the target market. Empathy is at the core of the process that makes this method Human-Centric. Other information encountered in developing the product or solution offered is part of the empathy stage. In accordance with the RSM Design Approach phase, in the Recognize phase, namely discover.

In this Empathise stage, the author made an interview with a representative of fish farmers in Sawah Village, Riau, Kampar,

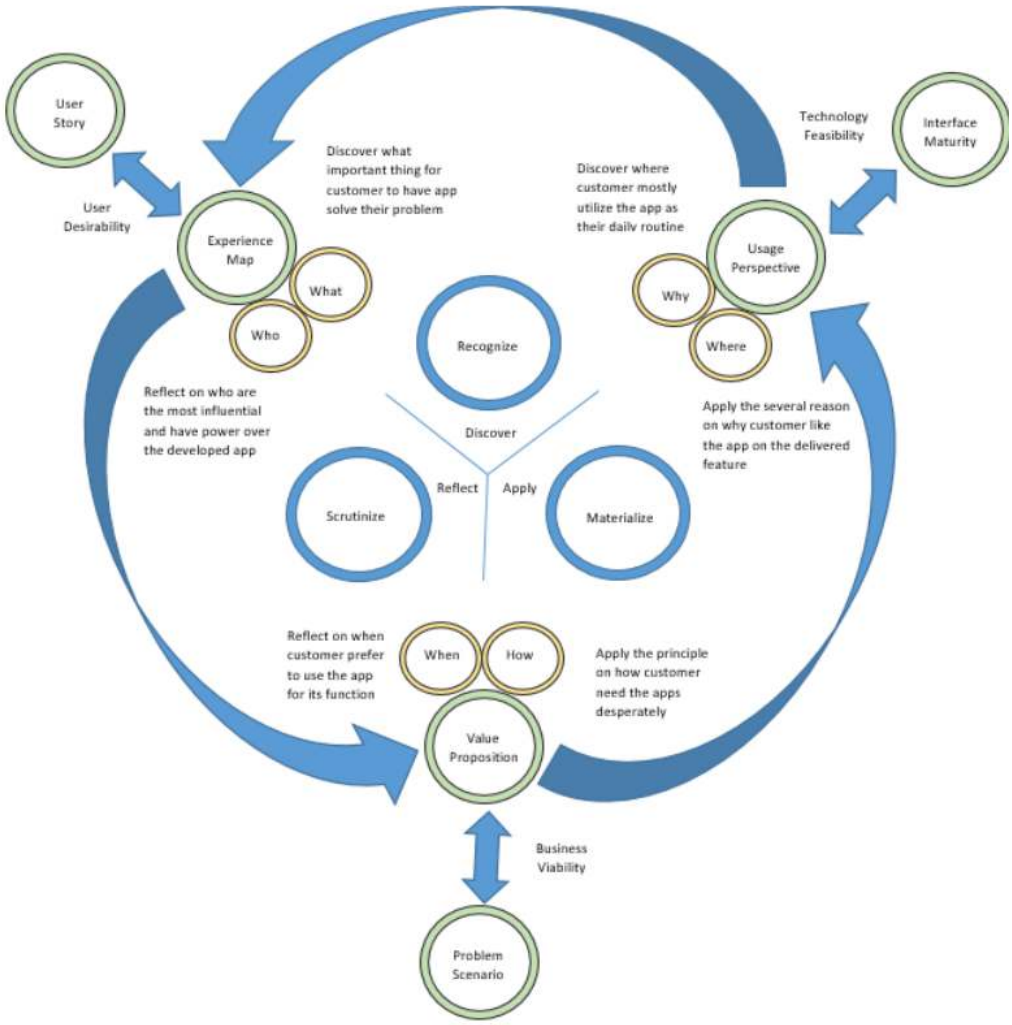

Figure 1: RSM Design Approach [18].

Indonesia, namely Mr. Kharuddin, SPi, MSi. Because according to the author, apart from customers, the most important thing is fish farmers. According to the author, the problem that occurs in Indonesia is that apart from the length of the fish sales chain from cultivators to consumers so that the price of fish becomes more expensive, cultivators definitely have other problems that need to be provided with solutions other than just bringing cultivators together with customers for fish transactions. From this interview the author asked questions based on the 4 quadrants empathy map & 5 stages customer journey map to get answers that suit the needs of fish farmers.

Empathy Map is a tool that authors use to collaborate to gain a deep understanding of users/customers and their behavior, attitudes and needs. Empathy Map expands users' knowledge to create a shared understanding of their needs and aid decision making. Empathy Maps can be used throughout the UX process to build common ground among team members and understand and prioritize user needs. In user-centered design, empathy maps are best used early in the design process.

A customer journey map is a journey map that describes how customers can use the products or services offered. This journey starts from the first time a customer thinks of using the product or service because of a certain urge, until the customer uses the product or service regularly. This is important to do so that business people can understand how customers and the products or services offered interact and how to structure the best overall interaction process.

After the Empathise stage is the Define stage, that is, from all the information obtained, analysis and synthesis of the information will be carried out to define the main problem which is answered by taking the user's point of view in delivering it, not the point of view of the solution maker or business actor. In accordance with the Scrutinize phase (check carefully), namely reflect.

Table 1: RSM Design Approach Phases

No.	Fase	RSM
1	Materialize - Recognize	Recognize (recognize), namely discover (find): 1. find out what is important to customers so that the app can solve their problems. 2. find out where most customers use the app as their daily routine. 3. discover the customer experience when using the application.
2	Recognize - Scrutinize	Scrutinize (check carefully) that is reflect (reflect): 1. reflects who has the most influence and power over the application being developed. 2. reflects when customers prefer to use the application for its function. 3. reflects the promised value for customer problem scenarios that can be resolved using the application being built.
3	Scrutinize - Materialize	Materialize (make it happen), namely apply (apply): 1. Apply the principle of how customers really need the application. 2. Apply several reasons why customers like the application to the features delivered. 3. Apply a usage perspective to interface maturity.

Table 2: Design Thinking simplified in the form of the RSM Design Approach phases

No.	Fase RSM	Fase Design Thinking
1	Materialize - Recognize	Test - Empathise & Define
2	Recognize - Scrutinize	Empathise - Define - Ideate
3	Scrutinize - Materialize	Ideate - Prototype - Test

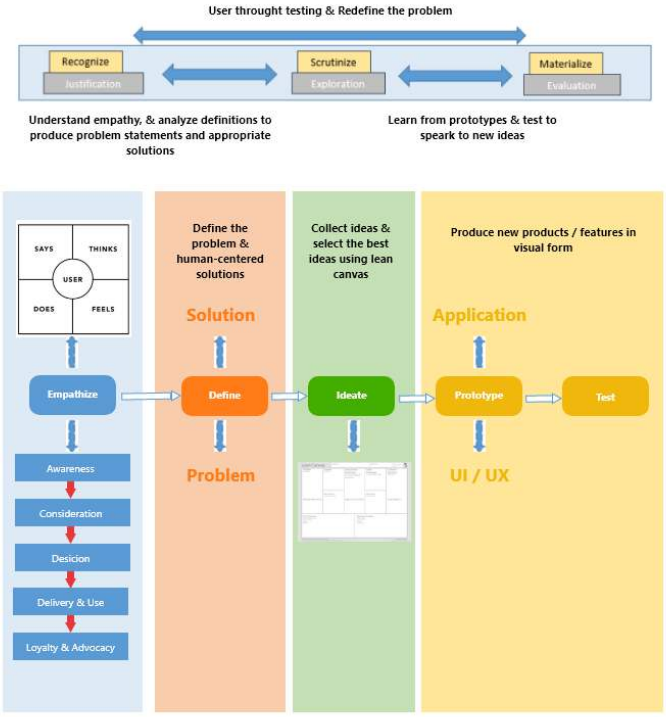

Figure 2: Simplified Design Thinking in RSM Design Steps

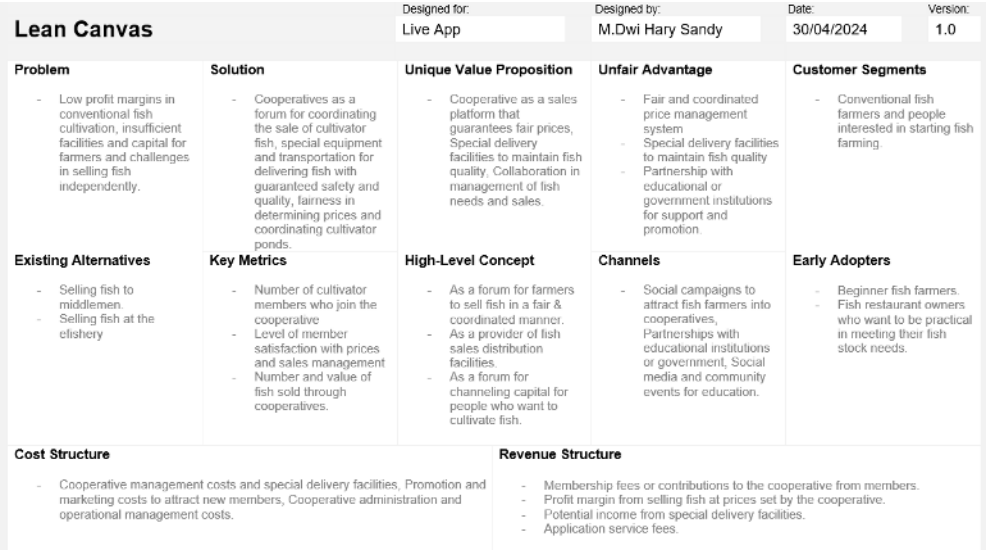

Figure 3: Lean Canvas

This Define stage will help team members and designers to get suitable ideas for building features, functions and other elements so that users can solve their own problems without having difficulty using the product.

After carrying out the Define stage, then enter the Ideate stage. At this Ideate stage, designers have collected ideas and started selecting the best ideas from the ideas obtained at the Define stage. So as to produce an accurate problem statement. Here the author uses the Lean Canvas to validate ideas and business concepts that will be created. As can be seen in Figure 3.

This Lean Canvas example includes information obtained from interviews about needs, solutions offered by cooperatives for fish farmers, as well as key aspects such as income, costs and advantages.

After getting several product or feature ideas resulting from ideation in a cheap or small-scale form, selection needs to be done. This is done so that the solutions offered can be visualized and shared with other colleagues for discussion. The selected solution can then be tried and evaluated together so that the author gets suggestions for realizing a better solution according to the user's point of view at the Prototype stage in accordance with the Materialize phase, namely apply. The author will make a comparison with a similar application, namely Efishery Fresh from a startup from Indonesia, namely Efishery, based on a Lean Canvas created.

Efishery Fresh is a fish sales platform from startup Efishery that utilizes harvest prediction data in each cultivation pond and connects directly to final buyers through digital transactions. Where Efishery Fresh sells fish from fish farmers who use equipment from Efishery Feeder. Efishery started its business from applications and IoT that help farmers to feed more efficiently, which is now called Efishery Feeder. With this application and IoT, Efishery can get various kinds of data from the farmers. This technology has been implemented and used in thousands of ponds and by hundreds of fish farming groups in 22 provinces throughout Indonesia. This data is used to build harvest estimates and sell them directly to end buyers. In this way, the quality of the fish used by Efishery Fresh is guaranteed because at Efishery Fresh fish growth is monitored through data obtained from the Efishery Feeder tool.

By utilizing simplified design thinking in the form of RSM design phases. As seen in Figure 4, the Efishery Fresh application displays a list and details of fish cultivator stalls. For a list and details of cultivator stalls, just use the Fish Cultivator application, because if you apply Efishery Fresh, it will cause uneven sales for each fish cultivation member. It could be that only some of the members' fish are sold. According to the Solution, Key Metrics and Unfair Advantage in the Lean Canvas, Efishery should be a forum for coordinating farmers' fish sales. Level of member satisfaction with price and sales management and a fair and coordinated price management system. So the list feature and details of the fish farmers' fish stalls have been replaced with a list of types of fish and details of fish orders that customers want to buy in Figure 5.

Then in each detail of the stall as shown in Figure 4, there is the amount of fish stock available. If the stock of fish at each fish farmer's stall is different, it will cause customers to be able to buy more than one order of fish. Because it could be that the amount of fish ordered by customers is not enough, so customers order fish from other farmers to meet their needs. In accordance with the Unique Value Proposition, collaboration in management of fish needs and sales. Not only a platform to bring together buyers and fish cultivators, but as a forum for fish cultivators as in Figure 5.

Fish cultivators who use Efishery Feeder can make an agreement with Efishery so that the fish cultivator's production is purchased by Efishery and then distributed properly so that it reaches the hands of fish consumers. From here, Efishery can be said to be in accordance with the example of Lean Canvas as a Solution: namely Efishery as a tool and transportation for delivering fish with guaranteed safety and quality, fairness in determining prices. What differentiates it Solution: Efishery cannot yet act as a forum for coordinating

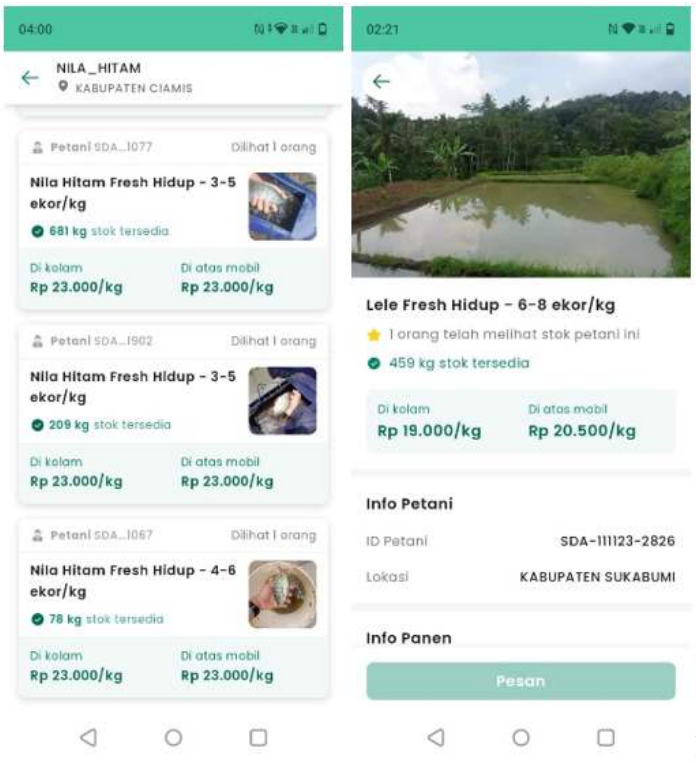

Figure 4: Fish Stall List and Details Features.

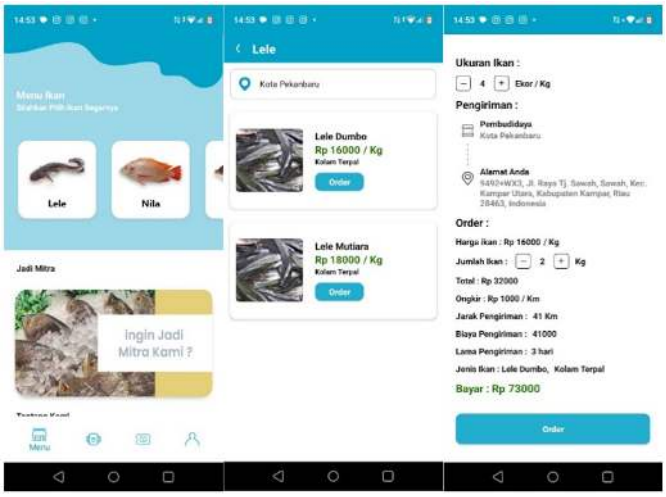

Figure 5: Live Application.

fish sales for its cultivator members and does not yet have special equipment and transportation fleet for shipping fish with the safety and quality of the fish maintained.

Fish sales that utilize harvest prediction data in each cultivation pond and connect directly to final buyers through digital transactions should be able to meet customers' fish stock needs, but in reality this is not the case. It can be seen in Figure 6.

This feeder sales system is unique because feeders are rented monthly. So farmers only need to pay the feeder rental fee per month, so this sales system is more pocket friendly for fish farmers. Then Efishery also sells fish food at low prices because Efishery has collaborated with several fish food brands. For fish cultivators who cannot afford the cost of renting feeders and fish food, Efishery has an Efishery Fund business which functions to help provide fish cultivators with capital for the cost of renting feeders and fish food, then the fish cultivators will pay the money in installments every month. to pay off their debts. From here, Efishery can be said to be in accordance with the Revenue Streams in the example of the lean canvas created, namely membership fees or contributions to Efishery from members, profit margins from selling fish at prices set by Efishery, potential income from special delivery facilities.

For the profit margin from selling fish at prices set by the Efishery and the potential income from special delivery facilities, it can be seen in Figure 6 that there is a difference between the price at the pool and the price for the car. From the price difference margin, Efishery can take advantage of the profits. By agreeing on the price determined by Efishery with the cultivator members, it can lead to an increase in profits on the cultivator's side. So in terms of the problem in the Lean Canvas example, it has been resolved,

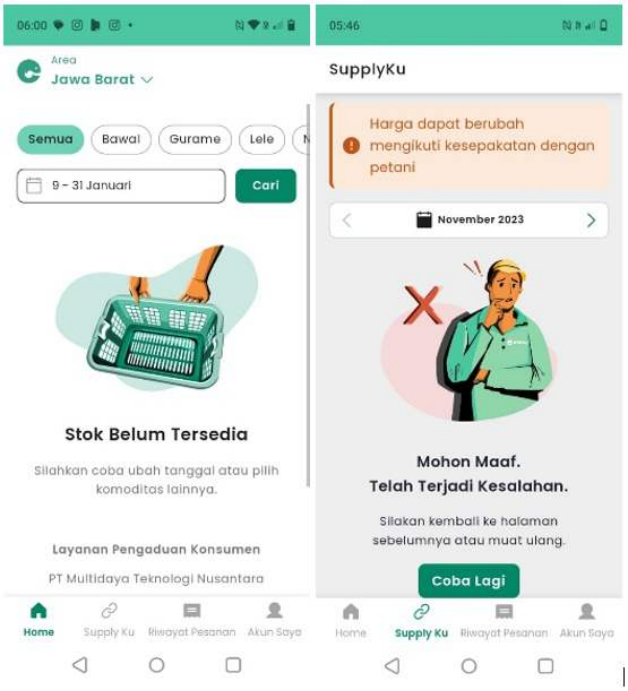

Figure 6: Fish Stock Notification.

namely the low profit margin in conventional fish cultivation and challenges in selling fish independently.

With Efishery having an Efishery Fund business, in terms of Channels: A social campaign to attract fish farmers to Efishery is appropriate.

After that we will carry out the Test process, the result of the Prototype stage is a list of the best solutions that can answer user problems. Then this solution is realized and tried to develop a product/feature. Even though this is the final stage, this process itself is an iterative process that has no sequence. From this stage, a new understanding of users can be obtained so that other solutions can be created, such as the ability to dynamically determine demand through a vision of the future use of certain products or services that must be possessed by general organizations to develop radical innovation. It requires long-term investment that typically takes 10 years or more through an iterative process, setbacks and a high degree of uncertainty, where ideas often emerge unexpectedly and from unexpected sources while focus and goals may change as they develop. [19], [20].

5 CONCLUSION

By utilizing simplified design thinking in the form of RSM design phases, it can be concluded that:

- Feature Development and Strategy Adjustment:

The Efishery Fresh application has changed its focus from displaying a list and details of farmers' stalls to a new feature, namely a list of fish types and details of fish orders by customers. This is adjusted to market needs to ensure coordinated and equitable sales among cultivators.

- Collaboration in Sales Management:

Even though the Unfair Advantage and Unique Value Proposition theories describe collaboration in the management of fish needs and sales, in practice fish sales still do not utilize harvest prediction data from each cultivation pond to meet customer stock needs.

- Efishery Fund and Revenue Streams:

There are efforts to help farmers who cannot afford to pay the costs of renting feeders and fish food through the Efishery Fund. This is consistent with the Revenue Streams model described in the Lean Canvas, where membership fees and potential revenue from special delivery facilities become part of Efishery's revenue.

- Optimizing Profits and Resolving Business Challenges:

With a price agreement between Efishery and cultivators, there is the potential for increased profits for cultivators. This is in line with resolving the problem of low profit margins in conventional fish cultivation and challenges in selling fish independently.

- Social Campaign and Channel Strategy:

In attracting cultivators, the social campaign strategy is in accordance with the Channel model described in the Lean Canvas, which includes social marketing to build a community of cultivators.

Based on the results of this research, the author can develop better applications. The solution described by the author is in Figure 7.

Based on these results we can make improvements, the solution that the author is currently implementing is only implementing Solution 1 as in Figure 7, by creating an application called Live as a forum and representation for fish farmers in selling fish. The author will continue solutions 2 and 3 in the future. Because for Solution 2 the author needs more knowledge regarding the distribution of each type of fish so that it remains alive when shipping the fish, for Solution 3 the author must complete the Live application so that it can run so that it can determine fish capital. farmers who lack business capital based on the profit margin of the established fish cooperative.

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HISTORY DATES

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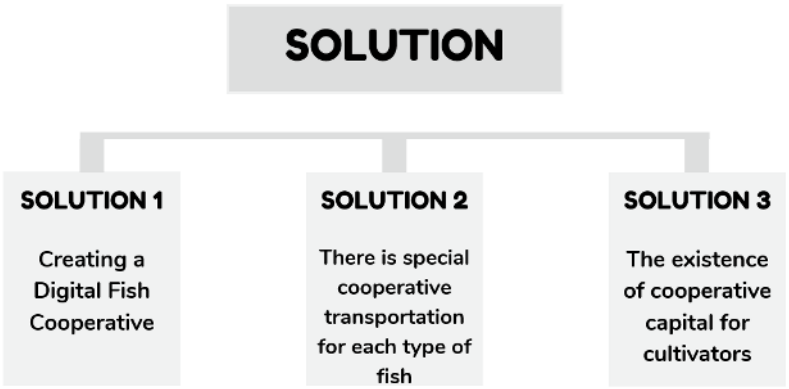

Figure 7: Solution

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