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Research Article

Design Of Fisheries E-Commerce As A Marketing Media In The Covid-19 Pandemic

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Abstract

The use of good marketing methods for fishery products can make it easier for consumers to reach them even during the COVID-19 pandemic. The decline in public interest in consuming products is influenced by marketing methods that were still manual during the COVID-19 Pandemic. The utilization of e-commerce information technology is planned as a marketing medium for fishery products to realize fishery product offerings between consumers and producers despite restrictions on social activities. The collection of data on bidding activities is carried out by direct observation of fishery product producers located in the northern coastal region of the island of Kalimantan with the surrounding community and local aquaculture and aquaculture farmers. E-commerce makes it unnecessary for users to meet before the offer occurs. The design is done by using the design thinking method and diagram modeling using UML. The results of the assessment show that the experience of using the e-commerce interface in displaying the products offered until the product order occurs has a high success value.

Keywords

Fishery, e-commerce, Covid-19

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Introduction

It is widely recommended that we consume at least two servings of fish a week. Consuming ≥1 serving of fatty fish or lean fish per week reduces the incidence of ischemic stroke (Hengeveld et al., 2018). But around the world, few people can do it except for the majority of people in Japan and certain Arctic societies. However, with the increase in wealth per capita, seafood consumption has also increased especially in East Asia, Southeast Asia, China, and North Africa (Lund, 2013). Indonesia itself is a country where the team is divided into islands and part of its territory is quite extensive waters. According to Hardiana & Trixie (2014) geographically, Indonesia is an archipelago that has an ocean area two-thirds larger than its landmass. It can be seen from the coastline where almost every island in Indonesia has it (± 81,000 km), this is what makes Indonesia second after Canada as one of the countries with the longest coastline in the world. The sea area as the largest part of the Indonesian territory which has a strategic position and value from various aspects of life including politics, economy, socio-culture, defense, and security is the basic capital of national development (Government of the Republic of Indonesia, 2014). Products that are produced from the marine in the form of food ingredients also have such high nutritional content that they are recommended for consumption from a young age. Toddler age is an age that is very prone to nutritional problems, because the growth and development of children physically, mentally, socially, and emotionally is influenced by nutrition (Saidah, 2003).

According to Bappenas (2014), the Indonesian territory which consists of a large number of islands has become an obstacle in obtaining fish supply, where remote areas are generally located in the eastern part of Indonesia which have large resources but have difficulty distributing and this is the cause of the lack of per capita fish consumption. the economic condition of the community, and it is still difficult to get fish in remote areas. With the slow distribution flow, finally fresh fish is no longer cheap to consumers. Even the problem of marketing food products originating from the sea such as anchovy is also experienced by some people in the western part of Indonesia, such as what happened on the island of Pasaran, Bandar Lampung, where the marketing system for Siger anchovy on Pasaran Island is sold by sending it to brokers (brokers) who located at the Kapok estuary in Jakarta, after arriving in Jakarta, the purchase price for the fish is determined by the broker who is then informed to the anchovy processing on the island of Pasararan, as a result of this marketing system, fishermen and processors do not have a bargaining value for their products (Imron, Atika, & Sulistio, 2019). Fishery products in each region have their diversity, while based on SNI (Indonesian National Standard) fishery products are divided into capture fisheries and aquaculture which are then indexed by SNI in various categories, namely frozen products, dry products, boiled products, fermented products, fresh products. and cold, live products, and canned products (Minister of Marine Affairs and Fisheries of the Republic of Indonesia, 2014). Coupled with the outbreak of the COVID-19 pandemic which has affected the sustainability of activities in the production and marketing of fishery products. There has also been a policy of closing several regions so that it affects the fisheries' fishery production income. People who work as fishermen in several regions of Indonesia face difficulties in selling fish or getting a fair price (Ratri, 2020). Another cause of the decline in fish selling prices is the reduced purchasing power of the community and the prohibition of activities for residents during the COVID-19 outbreak (Efrizal, 2020). With this gap, information communication technology comes with a breakthrough, namely electronic commerce (e-commerce) in which buying and selling activities are carried out online using a smart device (computer or cell phone) connected to the internet. Online social networking and e-commerce are complementary electronic marketing tools and are not a substitute. With a high number of users and owned traffic, this network provides good conditions and is ideal for advertising brands and products (Mata & Quesada, 2014). Moreover, during the conditions of the Covid-19 pandemic, consumers are more interested in accessing orders through online media, rather than having to buy directly from the place of manufacture (Pasaribu, 2020).

Literature Review

In previous research, there have been several discussions regarding e-commerce design in the fisheries and aquatic sectors, including:

Research conducted by Adrie Frans Assa, Gidion Putra Adirinekso entitled "Digital Platform Utilization for Indonesian Marine Products Marketing: A Study Case on Aruna Indonesia" focuses more on utilizing the Aruna Indonesia digital platform for marketing Indonesian fishery and marine

products (Assa & Adirinekso, 2020). Meanwhile, what distinguishes their research from researchers is the focus on discussing e-commerce design for marketing media for fishery products during the COVID-19 pandemic. Research conducted by Gøril Voldnes, Ingelinn Eskildsen Pleym, Tatiana Agaev, Siril Alm, Thomas Nyrud & Jan Thomas Rosnes entitled "E-commerce of Seafood - A Review of Existing Research" focuses more on reviewing various studies on the use of e-commerce in foodstuffs. perishables including seafood, indicating the need for special attention to handlers in securing product quality (Voldnes et al., 2021). Meanwhile, what distinguishes their research from researchers is the focus on the design of marketing media for fishery products using e-commerce during a period of social restrictions. Research conducted by Zne-Jung Lee, Zhi-Yong Su, Jia-Ying Xiao, Huang-Mei He, Yi Chen, Jing-Chao, entitled "Design an Online Aquarium with Intelligent Recommend System" focuses on designing an online aquarium with intelligent recommendations. system (Lee et al., 2020). Meanwhile, what distinguishes their research from researchers in the e-commerce design method using design thinking. In several previous studies, there were differences in theory to the object studied, whereas this study is focused on the use of e-commerce as a marketing medium during social restrictions during the COVID-19 pandemic. Previous research used theories and scientific disciplines that were quite complicated to describe the problems discussed, while in this study design thinking and UML methods were used to describe the discussion simply.

Methodology

Research Methodology

This study aims to design the user experience of fisheries e-commerce as a medium for marketing various fishery products for the community in the current Covid 19 pandemic condition using the design thinking method. Tim Brown (2008) states that design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.

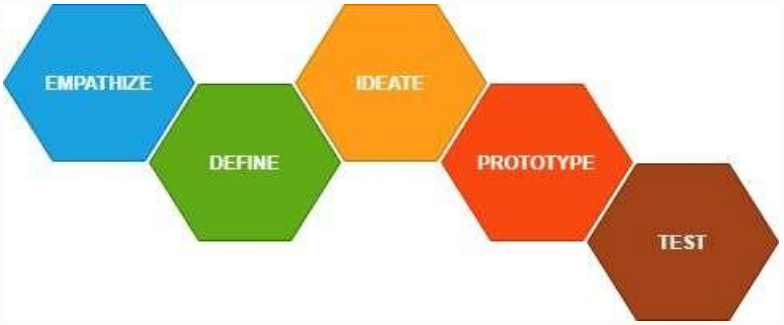

Figure 1. Design Thinking Method (Duangtaweesub, 2018).

Unified Modeling Language (UML)

UML provides a lightweight extension mechanism to allow the adaptation or file extension of standard UML model meta elements for different software platforms or application domains (Kim, 2018). UML can also be used for business modeling as well as modeling other non-software systems (Object Management Group, 2005). Unified Modeling Language is a form of notation developed with the main objective of creating a standardized representation of general-purpose models in software engineering and systems development. The use of a modeling language is to manage the complexity of an existing subject, be it systems, software design, or any other subject entirely. Because the model is basically an abstraction of reality, it allows users to characterize the subject design in an effective way (Platt & Thompson, 2014).

Use Case Diagram

Use case diagrams are used for modeling behavior in a system, subsystem, or class. Each represents a set of use cases and actors and their relationships. For the most part, this involves modeling the context of a system, subsystem, or class, or modeling the behavior requirements of an element. Use case diagrams are important for describing, defining, and documenting the

behavior of elements so that systems, subsystems, and classes can be understood by providing an external view of how these elements can be used in a system context (Booch et al., 1998).

Activity Diagram

Activity Diagram is a flow diagram that describes the control flow from one activity to another (Booch et al., 1998). With Activity Diagrams, we can model the dynamic aspects of a system as well as model the flow of an object as it moves from one state to another at various points in the control flow.

Class Diagram

Class diagrams are diagrams that are generally found in the object-oriented modeling of systems. Class diagrams contain a set of classes, interfaces, and collaboration and their relationships. Class diagrams are used to model static design views in the system. One of the benefits of class diagrams is also to build executable systems through forwarding and backward engineering.

Results and Discussion

In this section, we will describe a research report using the design thinking method of designing a fisheries e-commerce user experience. In the design thinking method, there are 5 descriptions of the stages that compose it, namely empathize, define, ideate, prototype, and test.

Empathize

In this section, observations will be made on problems with an empathetic approach to identify the various habits, needs, and difficulties that occur. At this stage, 4 participants were used, in the form of fishermen and export marine cultivators who were affected by restrictions on trade in fishery products due to the COVID-19 outbreak. The interview process was conducted by focusing the main questions on what policies and bidding methods were used during the COVID-19 pandemic, how to determine prices or commissions for these products when demand decreased due to social restrictions.

Marketing Process Overview

From the results of observations (online and directly involved) as well as interviews with several fishermen and marine cultivation, as well as to intermediaries for selling fishery products (middlemen), it is known that the marketing process is still direct, namely fishermen selling to middlemen. Then marketed by offering to consumers through company contacts or through visits for face-to-face meetings to consumers by bringing samples of goods. This method a result, requires more handling costs and the current pandemic condition is making marketing even more hampered.

Define

From the description of the marketing process that runs on fishery products, several weaknesses and problems can be found. Look at table 1 to find out the weaknesses and solutions that can be done.

Ideate

Based on the results of a review of the marketing system that runs on the sale of fishery products, it can be found that it still uses manual methods and makes the sales process ineffective and efficient, especially for products that require fast and sanitary confectionery. In this study, the design was carried out with UML (Unified Modeling Language) diagrams using three diagrams, namely Use Case Diagrams, Activity Diagrams, Class Diagrams. The proposed marketing method

is expected to provide a good overview of the marketing process using e-commerce to expand customer coverage and face marketing limitations in pandemic conditions.

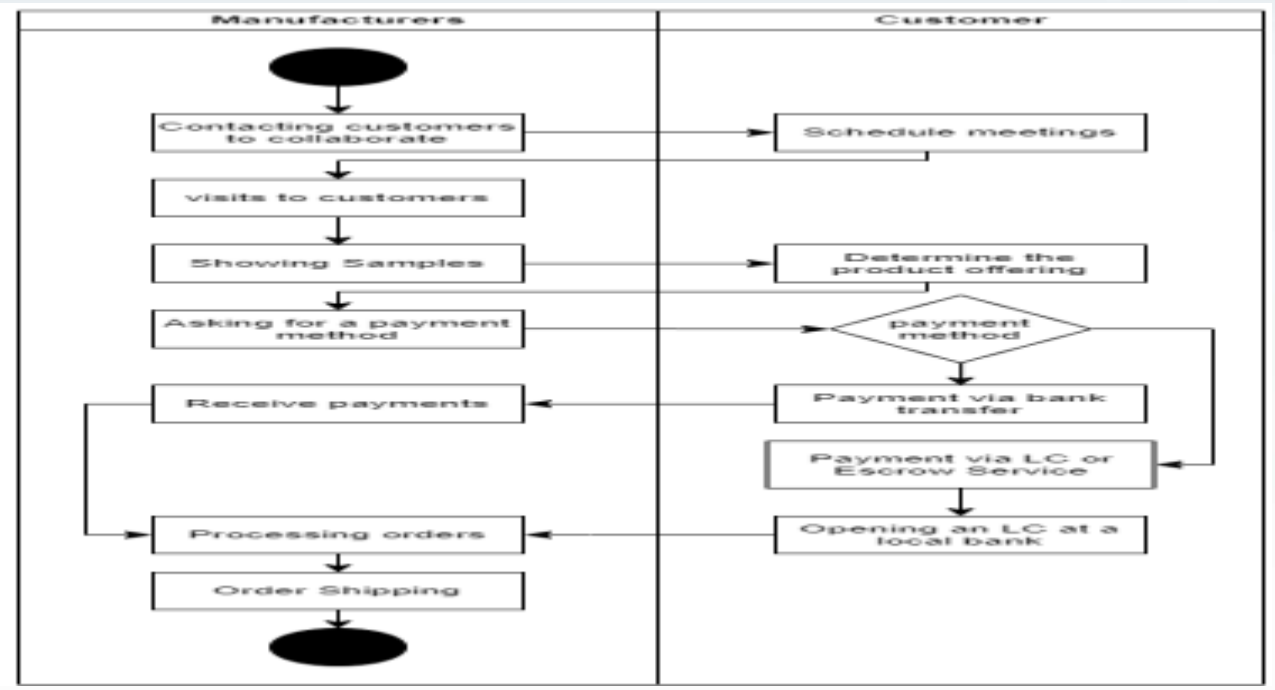

Figure 2. Current Marketing System

Table 1.
Overview of the Current System

No	Problem	Solution
1.	Product sales do not yet have a good marketing system	E-commerce can be used as a product marketing medium
2.	The sales process is still manual, with visits and meetings to consumers that require a large amount of money, but this does not guarantee the creation of the expected sales contract	With e-commerce, manufacturers can communicate more efficiently with sales contracts.
3.	Fishery producers do not have information media related to fishery products and the location of the business	E-commerce can be used as a medium for information and product marketing to consumers and to accommodate customer reviews
4.	In pandemic conditions, social restrictions occur which hinder the marketing process	Manufacturers can carry out sales communications with e-commerce to consumers to send samples without the need to pay a visit.

The activity diagram above illustrates the flow of activities and processes that occur in the e-commerce system. Customers who want a sample can choose the option of submitting a sample when placing an order by first filling in the sample request form (Figure 5). There are 2 types of payment methods when a Customer makes a payment (Figure 6), namely using L / C or by bank transfer method (including TT or Telegraphic transfer). The process of managing requests in Figure 7 aims to check and validate the request form submitted by the customer, whether it is following the request requirements and sample availability. The request that is approved will then be notified to the Customer to make a transfer payment so that the sample is processed. Payment using the L / C method requires the customer to submit a request for L / C at a local bank. While the bank transfer method, customers only need to make payments via transfer to further confirm the manufacturer regarding incoming payments and process orders (Figure 8).

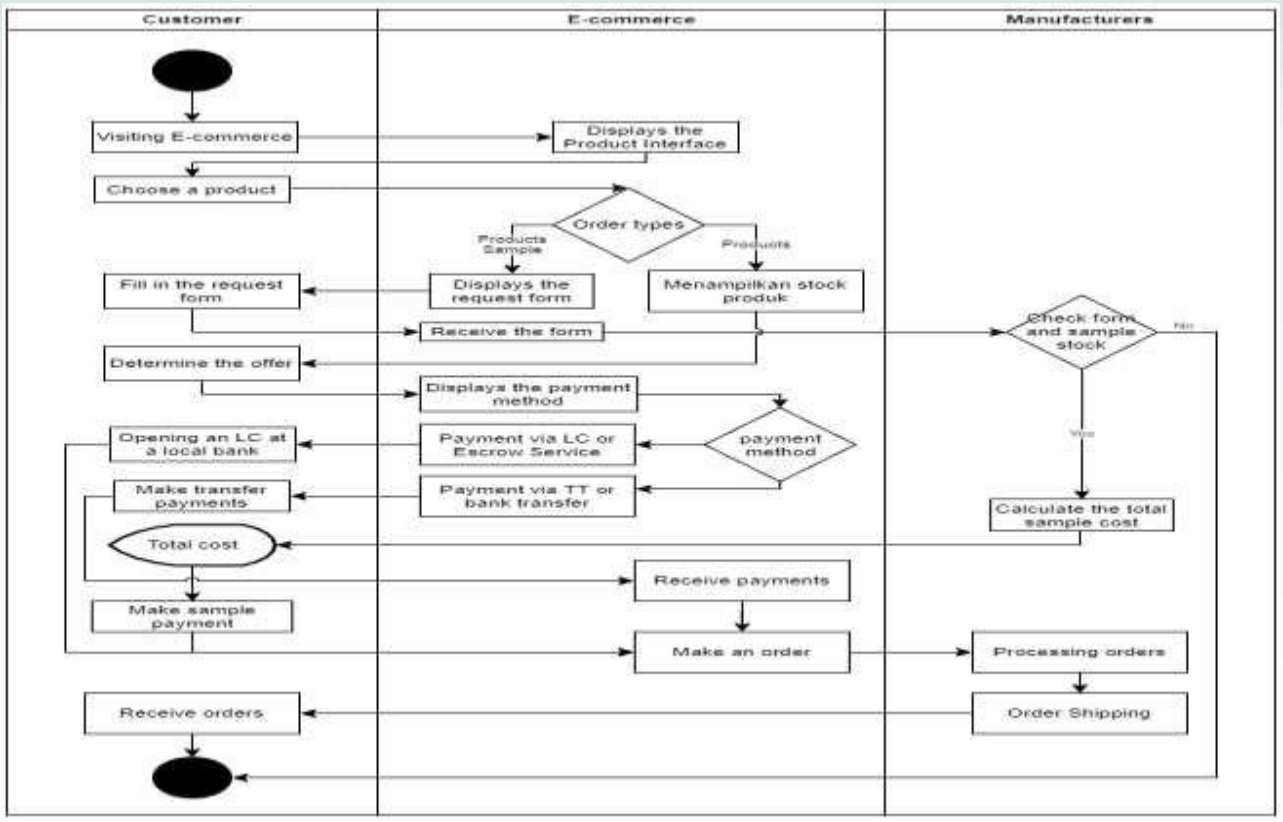

Figure 3. Proposed Marketing System

Use Case Diagram

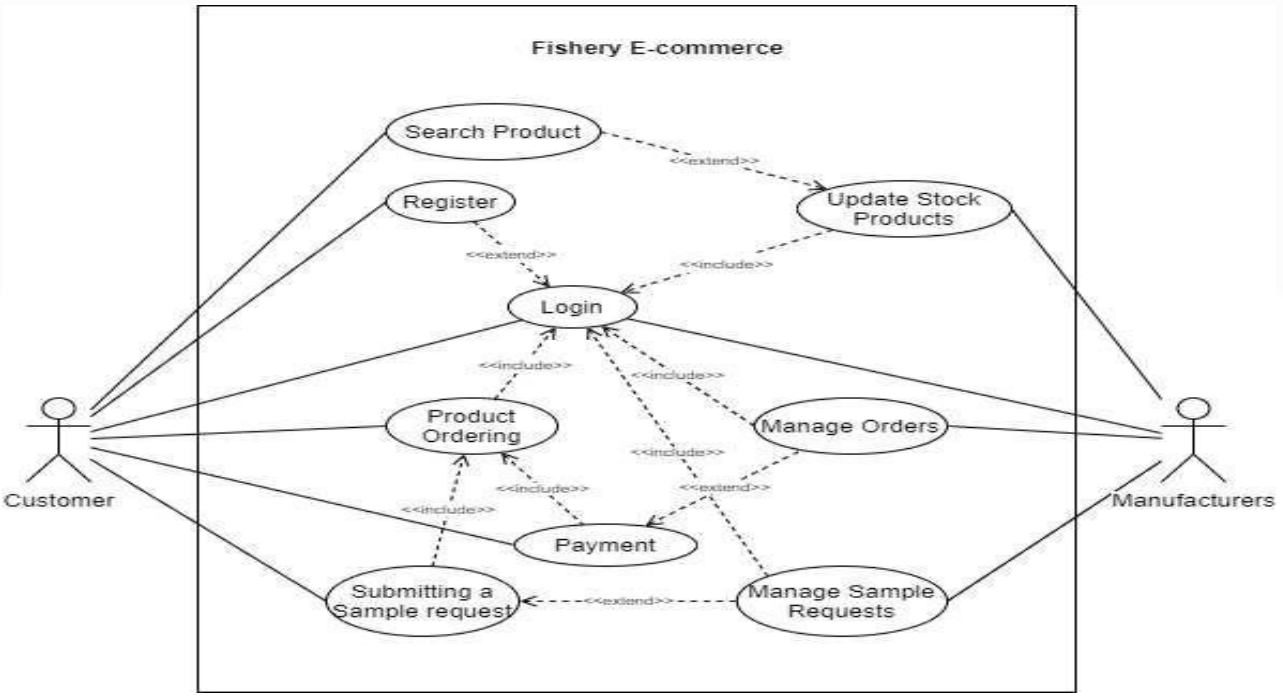

Figure 4. The proposed E-commerce Use Case Diagram

Figure 4 is a use case diagram that explains the interaction between users and the e-commerce system. Two types of users are directly related to e-commerce, namely Customers and Manufacturers. In the use cases above, 11 use cases can be done in e-commerce.

Activity Diagram

Product Ordering Activity Diagram

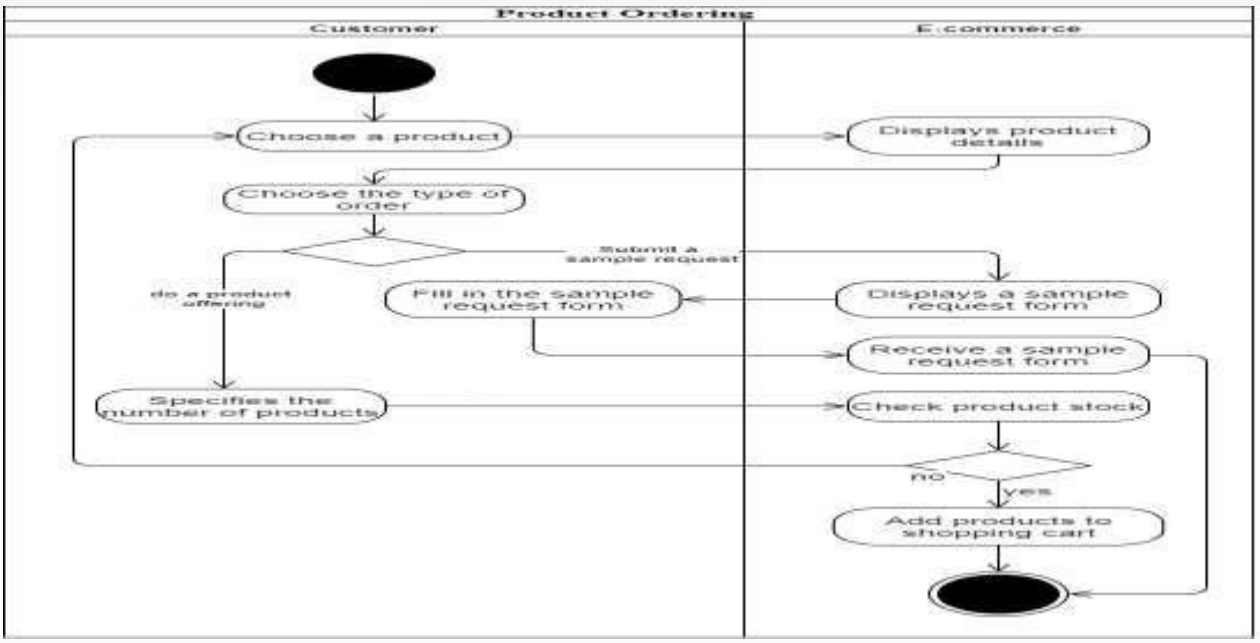

Figure 5. Product Ordering Activity Diagram

Payment Activity Diagram

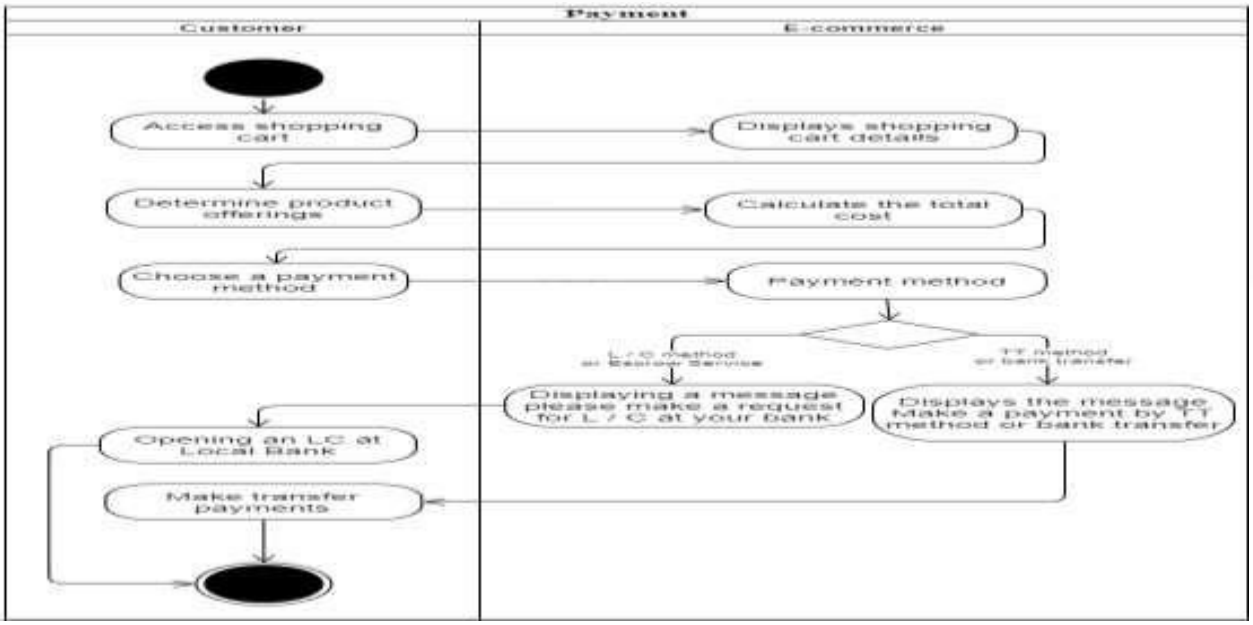

Figure 6. Payment Activity Diagram

Activity Diagrams Manage Sample Requests

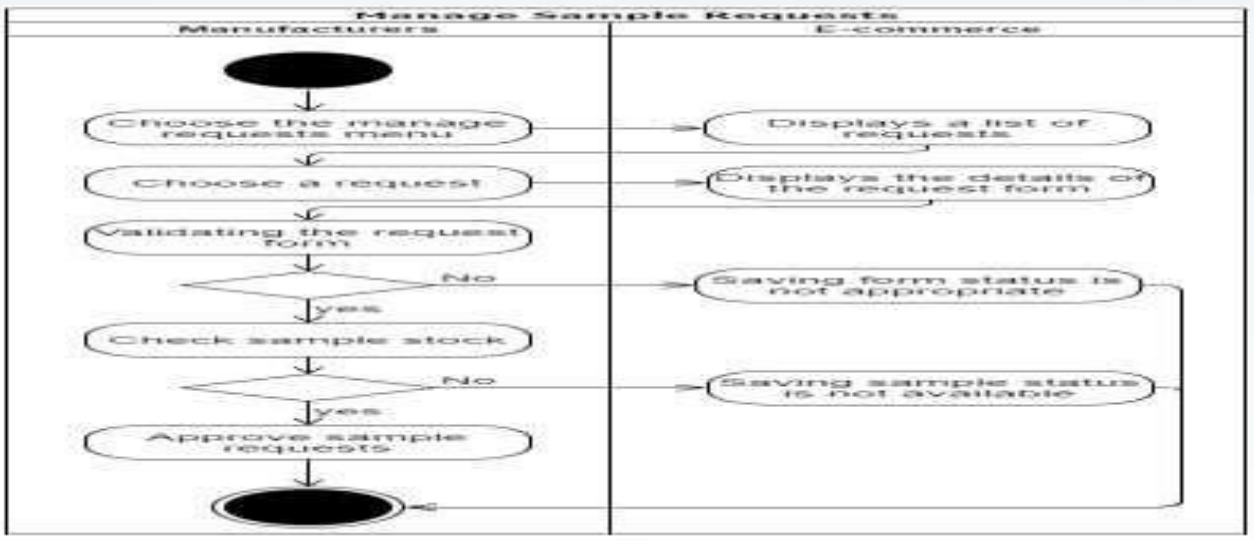

Figure 7. Activity Diagram of Manage Sample Request

Activity Diagram Manage Orders

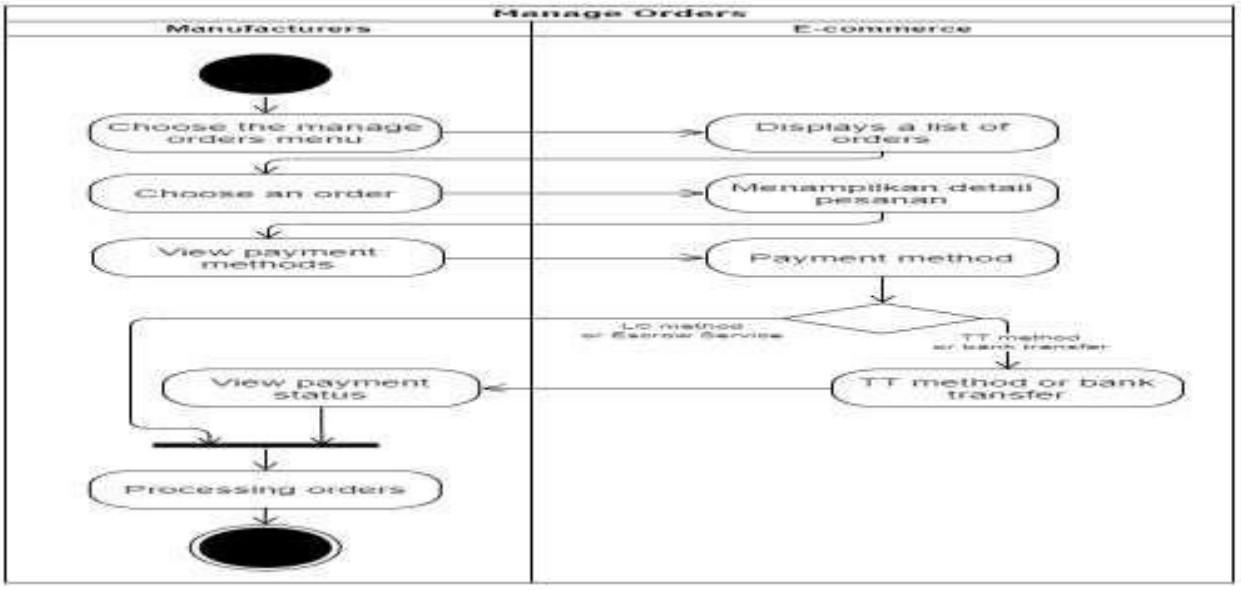

Figure 8. Activity Diagram of Manage Orders

relationship table figure above represents the relationship between objects in the database based on information on objects in the real world. Table one obtains data from other tables through the relations it has.In the picture above, there was a decrease in success to 42.9% in displaying the admin page with 14.3% of the page switching actions performed by participants. After checking, it turns out that the access link to the admin page has an error in the form of incorrect placement of the access button which makes it difficult to access the admin page. The following is the assessment given by the participants.

Class Diagram

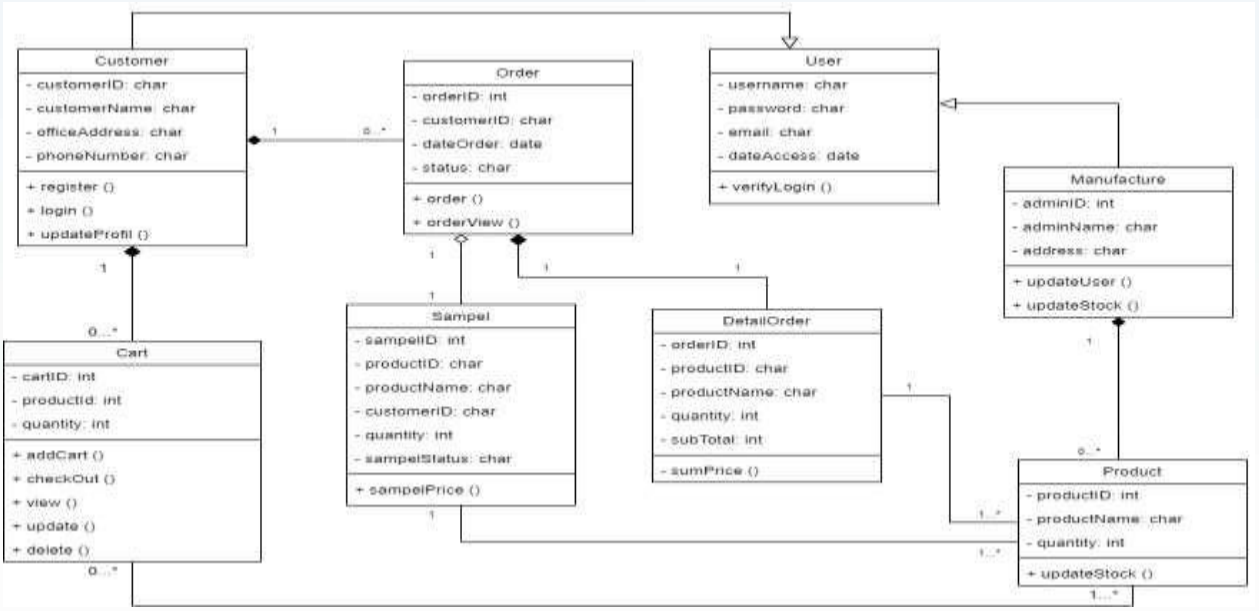

Figure 9. Proposed E-commerce Class Diagram

Figure 9 statically describes the class structure, attributes, and blueprint of objects and the relationships that connect them to this e-commerce. Class relations show their influence in creating collaboration. This class diagram is an activity in the e-commerce system design process that will later affect the e-commerce architecture.

Prototype

Database

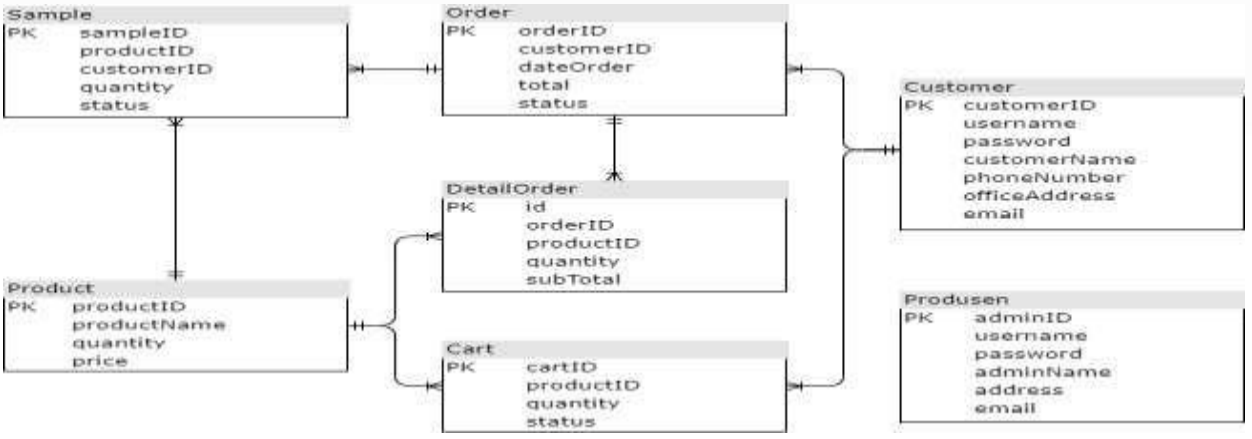

Figure 10. E-commerce Table Relationships

Desain User Interface

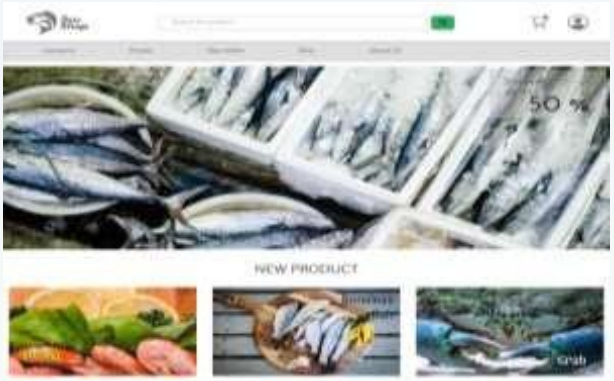

Figure 11. E-commerce Home Page

Figure 12. Login page

Figure 13. Product Details Page

Figure 14. Order Details Page

Figure 15. Request Form Page

Figure 16. Order Notification is Generated

Figure 17. Admin Page

Test

Usability Testing

This section testing the user interface (mockup) using the maze.design tool. This tool is useful for usability testing by checking the accuracy of the usability of the designed user interface.

Login Page

Figure 18. Percentage of Login Page tests

The picture above shows the mission of this test is to successfully enter the e-commerce start page. With 7 participants there were only 14.0% incorrect clicks and an overall success rate of 92/100. The following is the participant's assessment of the login page

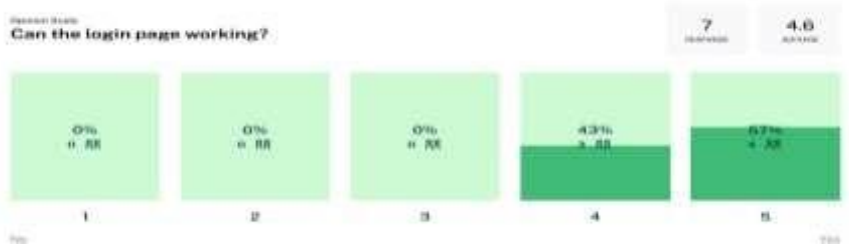

Figure 19. Login Page Testing Assessment

Based on the picture above, participants experienced 43% of wrong clicks with an average duration of product selection of about 6.0 seconds. The product selection score itself ranges from 79/100, here are the ratings given by participants:
In the picture above, the success rate of ordering products is 71.4% with an overall score is 76/100. This value is slightly below the value at the time of product selection which was 79/100. Below do the participants give the assessment?

Product Selection

Figure 20. Percentage of Product Selection

Figure 21. Product Selection Testing Assessment

Product Purchase

Figure 22. Percentage of Product Purchase

Figure 23. Product Purchase Testing Assessment

Show Admin Page

Figure 24. Percentage of Show Admin Page

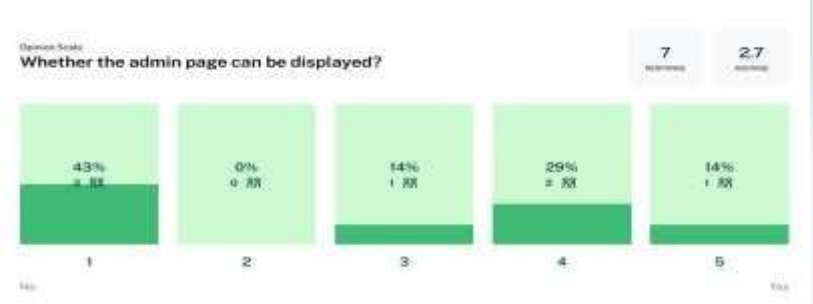

Figure 25. Show Admin Page Testing Assessment

Below is an assessment of the overall ease of use provided by participants in using this e-commerce UI.

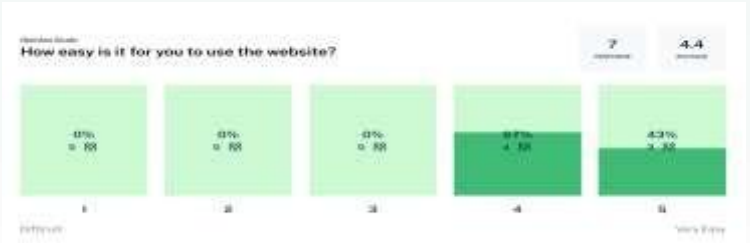

Figure 26. Overall assessment

Conclusion

Conclusion

The use of information technology in the form of e-commerce helps to market fishery products which are also export commodities even though in the COVID-19 pandemic, social restrictions have occurred. E-commerce design is modeled with UML to get an overview of the processes that occur in the proposed marketing system. The results of usability testing show that the use and ease of user experience have a good value with an average of 4.4 / 5. One of the capabilities of e-commerce marketing in product distribution will increase efficiency by reducing some parts and having a direct impact on export performance. Specific e-commerce marketing will lead to efficiency in the export market strategy (marketing efficiency) and improve export performance. Finally, there is strong support in the literature that marketing capability is very important to increase the excellence of export position and performance (Gregory, Ngo, & Karavdic, 2019).
For further research, usability testing can be carried out with more participants and carried out in person to obtain more advice and accuracy of information compared to being carried out online. In this study, the shortcomings were only obtained from the e-commerce prototype. By continuing this research at the direct application stage, it will have more impact and become a solution to product marketing problems, especially fishery products which require fast handling and sanitation to consumers.

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