Research Article

The Development of the Aquatic Product System Using Agile Model: An E-Commerce Application

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About Article

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ABSTRACT

For people, aquatic products from freshwater, marine, and aquaculture ecosystems are essential sources of nutrition and a diversity of culinary options. Nonetheless, the seafood sector suffers difficulties, such as a lack of openness in product procurement and ineffective market information distribution. An inventive e-commerce application has created to overcome these issues. This all-inclusive platform addresses the issue of ineffective market information dissemination by providing fish farmers with real-time market updates through agile software development approaches. Furthermore, the platform offers sellers simplified inventory management features, improving product source transparency. To further encourage openness and well-informed decision-making, a user-friendly interface also enables customers to order directly from fisherman or sellers and obtain product details. The application aims to close the gap between stakeholders by integrating cutting-edge technologies advocating for sustainable practices specific to the cultivation and harvesting of aquatic products. The application ultimately foster transparency, efficiency, and sustainability within the seafood supply chain, improve consumer accessibility to and quality of aquatic products, and propel the growth and success of the seafood industry.

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1. INTRODUCTION

Aquatic products are goods derived from marine and freshwater aquatic species like fish, shrimp, shellfish, crabs, algae, and aquatic plants. These contain various minerals, proteins, vitamins, and medications. Aquatic products are the vital components of the global food chain that provide economic support. Aquatic products are available in various forms to cater to diverse consumer preferences and needs. Micro, small, and medium-sized enterprises (MSMEs) seen these as a means of sustaining human consumption. With the aid of technological advancements enable the market and consumer expectations to be realized. Aquatic products become more widely available on the market. In the contemporary landscape, technology has become an indispensable tool for marketers, reshaping engagement, and promoting products or services. Social media platforms offer unprecedented opportunities for targeted advertising, influencer, collaboration, and community engagement, allowing businesses to reach their target audiences with precision and creativity. Moreover, advancements in data analytics empower marketers to glean actionable insights from vast troves of consumer data, enabling them to tailor their campaigns for maximum effectiveness and ROI. Marketers adjust and take advantage these technological advancements to maintain a competitive edge in a constantly changing industry. Fish farmers may encounter problems and difficulties in their line of work. The environment, health and disease control, quality and safety standards, market access and distribution, financial management, and access to innovation and technology are some of the main difficulties that fish farmers may encounter. Through technological advancements, issues and challenges may overcome. Fish farmers can reach a wider consumer base outside of their local area by using e-commerce platforms and digital marketplaces for market access and distribution. Even in places with inadequate infrastructure, logistics technology, like route, planning, software and cold chain management systems can increase the effectiveness of product delivery. Access to innovation and technology greatly aids fish farmers sell more aquatic products by reaching more audience, developing more effective marketing plans, and increasing consumer interaction. By reaching a larger audience outside their immediate neighborhood, e-commerce platforms let farmers sell directly to customers and lessen their dependency on conventional middlemen. Additionally, farmers may target particular client categories, customize marketing campaigns, and maximize product promotions for better outcomes because to technology improvements in marketing analytics and digital advertising. Farmers may exhibit the quality of their products, give comprehensive product information, and interact with customers through reviews and feedback on online platforms, all of which help to build customer loyalty and confidence. Access to innovation and technology generally transforms the selling process for fish farmers opening up new markets, increasing sales, and strengthening their relationships with customers. Selling aquatic products presents a number of difficulties for vendors, customers, and fish farmers alike. Fish farmers frequently face challenges that make it difficult to sell their catch profitably, such as restricted market access, erratic demand, and transportation limitations. Vendors encounter difficulties locating consistent and fresh seafood, controlling inventory, and guaranteeing adherence to safety regulations and product quality standards. However, customers could have trouble finding reliable seafood suppliers, confirming product quality, and gaining access to an extensive range of seafood goods. These difficulties draw attention to the intricacies of the seafood supply chain and emphasize the necessity of creative solutions to increase market efficiency, accessibility, and transparency for all parties engaged in the sale of aquatic products. To address these challenges, it was determined to use the Agile software development paradigm to create an application that would help fish farmers, suppliers, and customers. Specifically, the program provides fish farmers with tools like real-time market updates, allowing them to modify their sales strategies accordingly. Enhanced contact with suppliers and consumers, a user-friendly interface to discover local seafood options, view product details, and place orders conveniently. By employing the Agile methodology, this application aims to deliver value quickly and effectively, addressing the complex challenges faced by the seafood industry while fostering collaboration and innovation among all parties involved.

2. LITERATURE REVIEW

Marketing includes advertising, selling, and delivering products to consumers either on the market or online services. Marketing helps farmers and consumers achieves goals, improves branding, and increases its sales and profit. Marketing can be conventional and online. Online marketing relies on websites to connect with products and consumers. Online marketing bridges the gap between profit and fish scarcity. Shrimp, tuna, milk fish, flying fish, tilapia, crabs, squid, snails, clams, and many more are the aquatic products that are commonly marketed online. Sometimes, farmers are dealing with problems like low prices, poor transportation, restricted access to ready markets, and large losses after harvest (Asogwa, et. al., 2019). Through MSMEs, farmers get a chance to overcome these problems. MSMEs buy the products and sell it online. According to 2020 data from the Asian Development Bank (ADB), there are roughly 71 MSMEs in Southeast Asia. These businesses account for 97% of all businesses in the region and employ 67% of the working population. The real number might be higher because of unofficial operations. According to a recent International Labor Organization study, MSMEs contribute even more to employment globally than previously thought. MSMEs in Southeast Asia, despite their sizeable numbers, account for 19.2% of total export value and, on average, 40.5% of each nation's GDP in 2020. Most nations' long-term economic growth strategies heavily emphasize their development, with digitalization playing a pivotal role. The rise of online-to-offline (O2O) platform companies enable transactions both digital and physical components, like food delivery and e-commerce, is a noteworthy trend in the region. These platforms could boost MSMEs' growth by improving their productivity, growing their clientele, and improving their access to financing (Tan, 2022). Based on the most recent data from the Philippine Statistics Authority, 1,080,810 commercial businesses are active in our nation. Micro, small, and medium-sized businesses make up 99.58 percent of these. Moreover, 63% of the workforce in the

nation is employed as MSMEs. This explains why the support for MSMEs is being prioritized by our current administration (Santiago, 2023). MSMEs frequently experience internal issues such as poor human resource quality, a lack of technological and marketing expertise, and restricted access to capital, information, and other production factors (Ratnasari, 2016). According to e-marketers, 123 million people used the internet in 2018, up from the in the year prior by 112 million users (Kumm, et. al., 2016). MSMEs' effects on employment, income, and general economic development make them essential to the Philippine economy. The Philippine Statistics Authority reports that in 2019, 99.5% registered MSMEs are responsible for 25% of all exports, 36% of gross value added, and 62.4% of all employment in the nation. (Yabut, nd). By displaying information about special offers and warranties on their website, MSME players take advantage of internet media and engage in direct marketing of their products online. This is done for products that have already been sold, as the products displayed on the players' websites occasionally do not live up to buyer expectations (Hidayati & Yansi, 2020). MSME membership has expanded to include consumers and fish farmers in tandem with the rising global aquaculture production. At all market levels, the trade in numerous aquaculture products based on high- and low-value species has grown impressively. Furthermore, the inclinations and choices of consumers regarding aquaculture products are diverse, with markets meeting the needs of those seeking both live aquatic animals and a range of processed products. While the market for aquaculture products is still expanding, consumers are becoming more aware of high-quality and secure products. Concerns like these have led to the importance of issues like food safety, traceability, and ecolabelling growing, and countries that engage in aquaculture prioritize these issues highly (Thefishsite, 2011). Online trading platforms in the Philippines are widely used across the country which makes investing very convenient and available for most Filipinos. In the mobile-first world, people want to provide the best buying and selling experience for fish and seafood wholesale companie. Electronic commerce has been becoming the new driver of the retail industry (Zhao, et. al., 2019). It has several types like C2B, B2B, and B2C. B2C e-commerce is where businesses sell and buy goods to consumers and individuals (Bharath, 2020). This is enabled by online marketplaces and stores. While C2B E-commerce converts "enterprises push products sales" into "consumers pull production". In addition, electronic or e-commerce is defined here as the buying and selling of retail goods or services over the internet, e.g by computer or mobile device (Alfonso, 2021). Under the background of "Internet", it is the trend of the times to realize the low-cost and high-efficiency sales of ocean aquatic products through the construction of large-scale e-commerce platforms (Chang, 2020). However, consumers cannot physically examine products when buying online, which leads to product uncertainty (Song, et. al., 2020). E-commerce platforms have special chances for growth and advancement in the aquatic products sector. According to studies, small-scale producers can reach a larger market and boost their sales revenue by participating in online marketplaces specifically for aquatic items. Furthermore, effective inventory management,

marketing, and customer involvement can be facilitated by customized e-commerce solutions made to meet the demands of MSMEs in the aquatic industry (Zhang, et. al., 2020).

3. METHODOLOGY

Agile is a fluid and iterative strategy that prioritizes cooperation, adaptation, and delivering value to stakeholders. It is the methodology selected for this system's development. The Agile methodology allows for continual feedback and improvement by breaking the development process down into smaller increments known as sprints or iterations. By using this method, the development team may react swiftly to shifting priorities and requirements, making sure that the finished product successfully satisfies user expectations. With an emphasis on cross-functional cooperation, continuous feedback loops, and iterative development, we at Agile aims to create a solid and user-focused application that tackles the intricate problems that fish farmers, suppliers, and customers in the seafood sector confront.

3.1 Requirements Gathering
This stage entails determining and recording the preferences and needs of fish producers, suppliers, and customers. To ascertain the needs and pain points of target consumers, it entails doing market research, surveys, and interviews.

3.2 Agile Planning
In agile planning, the project is broken down into smaller and more manageable tasks known as user stories. User stories serve as representations of the specific functionalities that the software needs to have. It decides collectively which user stories are most crucial and how much effort they should require.

3.3 Iterative Development
Throughout several iterations, or sprints, the application is developed incrementally as part of an iterative process. It works on implementing a set of user stories throughout each sprint, which usually lasts for a predetermined amount of time, like two weeks.

3.4 Continuous Feedback
Feedback is continuously provided on the features and functionalities of the application by stakeholders, such as fish farmers, vendors, and users, during the development process. In later iterations, the application is improved and adjusted based on these inputs.

3.5 Cross-Functional Teams
Members of the development team come from different backgrounds, including design, quality assurance, software development, and product management. It guarantees that every facet of the project is addressed and that the program satisfies user needs.

3.6 Collaboration and Communication
Two of Agile methodology's main tenets are cooperation and communication. Throughout the process, the development

team works closely with stakeholders, ensuring alignment and openness through regular meetings, demos, and reviews.

3.7 Continuous Integration and Testing

To guarantee the dependability and caliber of application, procedures for continuous integration and testing are adhered to. New additions and functionalities are tested using automated testing tools, and the application is frequently deployed to a staging environment for validation and testing.

4. RESULTS AND DISCUSSION

WordPress, MySQL, and Windows 10-64 bit are used in the development of e-commerce platform. With its user-friendly interface, compatibility with common programming languages and frameworks, and powerful development tools, Windows 10 is a popular operating system that presents several benefits for e-commerce application development. WordPress's adaptability and user-friendly interface make it the platform of choice for creating e-commerce websites. An open-source relational database system called MySQL is used as the central repository for data on goods, orders, clients, and transactions.

4.1 Presentation of Outputs

The system was made to help the suppliers and fish vendors to post their products online. This system is a web-based platform that lets the admin operates the overall functions in the system. The system also caters to customer reservations who live in distant places, hence the customer is the other user of the system.
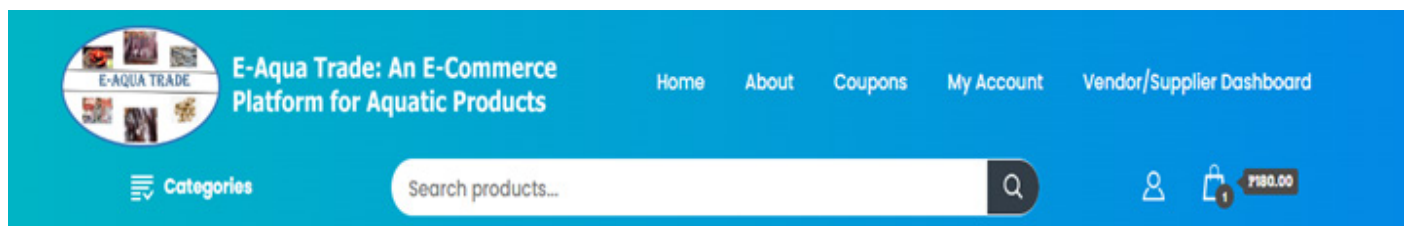

Figure 1. Home Page

Figure 1 displays the home page composed of Home, About, Coupons, MyAccount, and Dashboard.
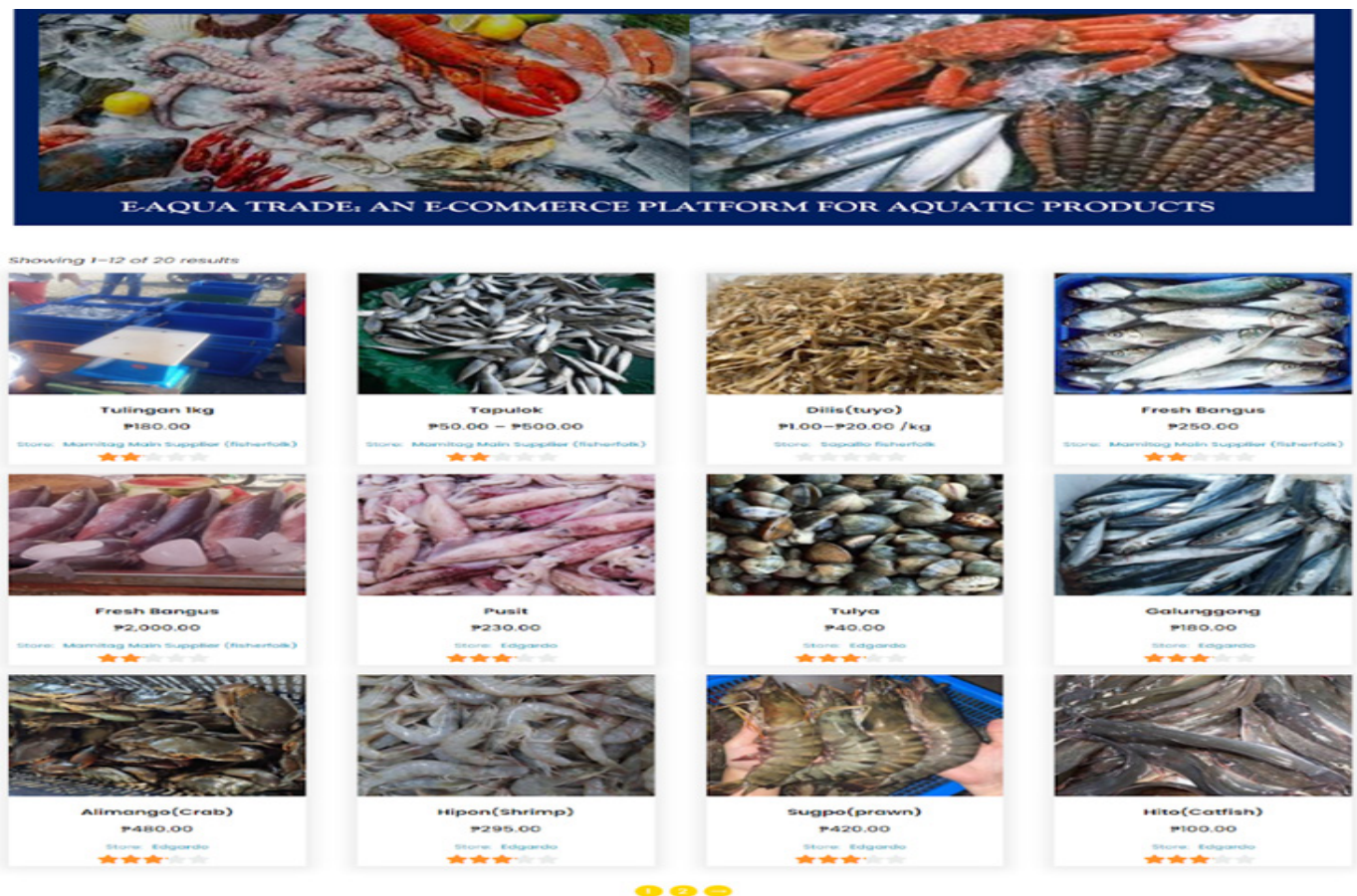

Figure 2. Dashboard

Figure 2 is the designed dashboard that displays aquatic products for those who want to purchase any aquatic products.
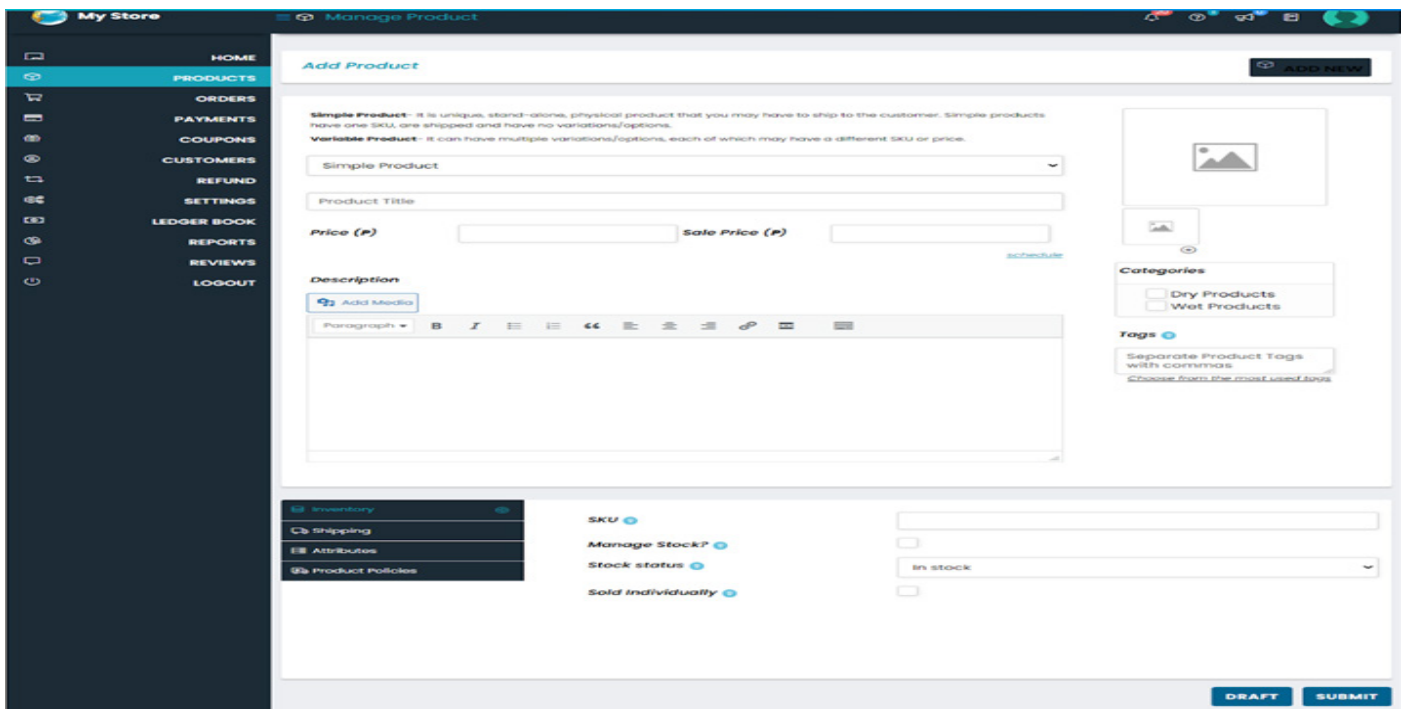
Figure 3. Product Page

Figure 3 shows the product page where information on aquatic products, including name, price, kind, description, categories, stocks, shipping method, attributes, and product policies, can be added. To upload another, the merchant can add more products. Users can also view the product's price, date of purchase, and stock status.
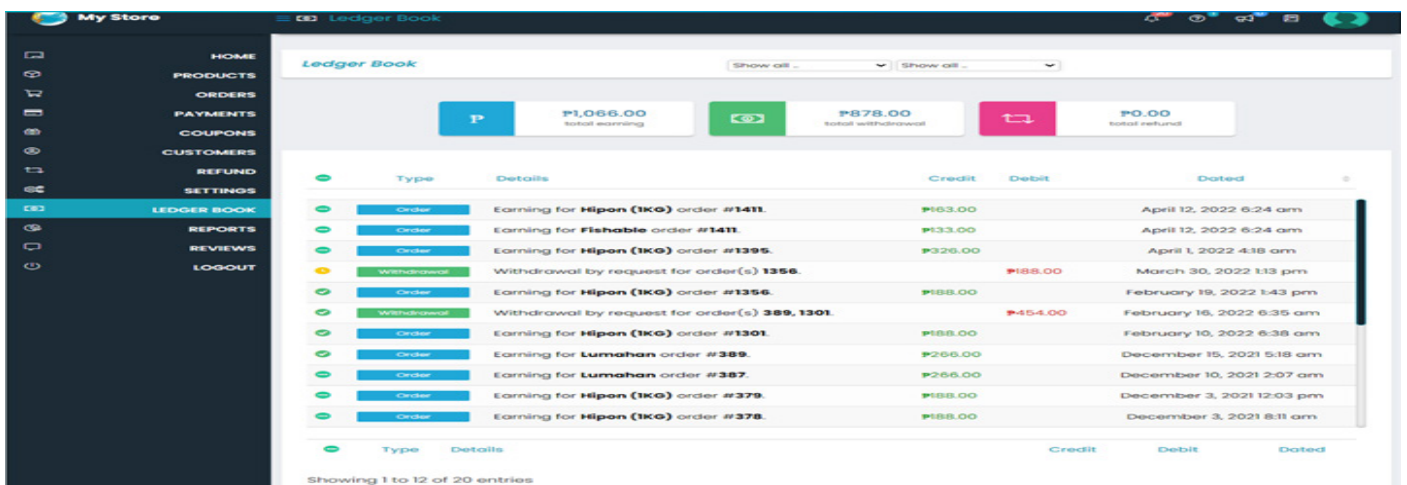

Figure 4. Supplier/Vendor Dashboard

Figure 4 displays the seller's dashboard. The seller has access to notifications, store statistics, sales breakdowns by products, queries, and announcements
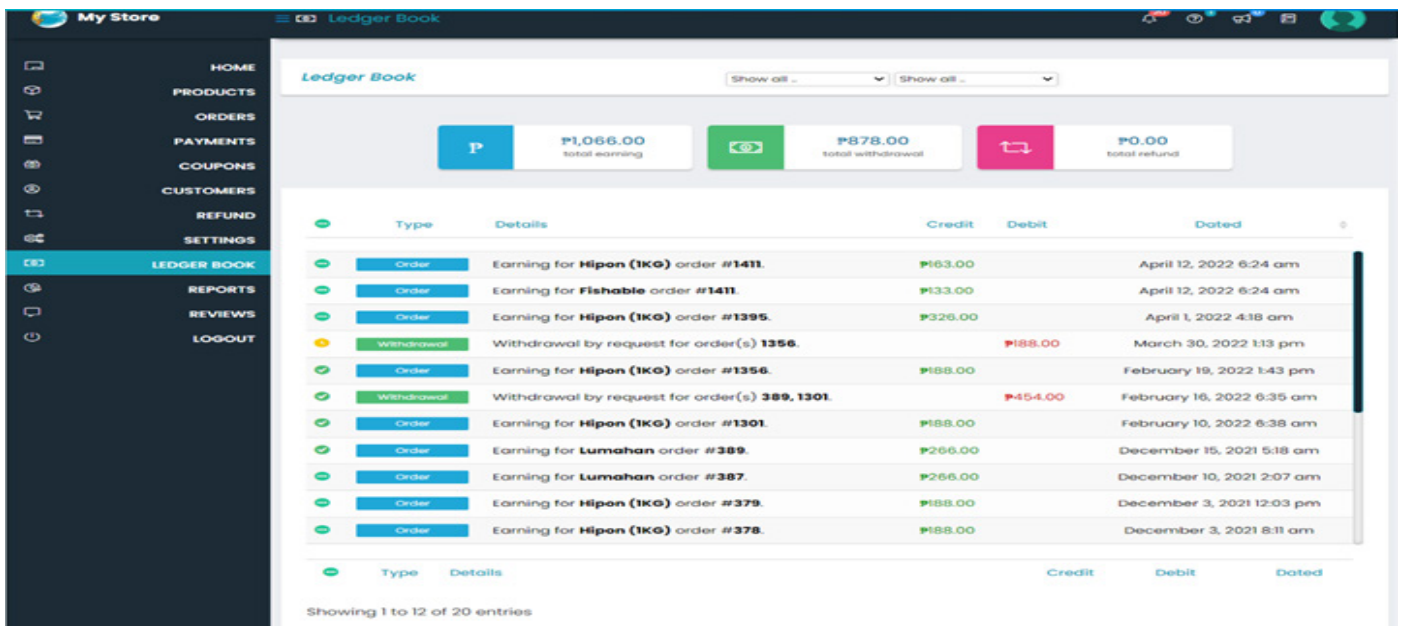
Figure 5. Transaction Report Page

Figure 5 shows the transaction order listings, withdrawal listings, and earning listings with credit, debit, and date.
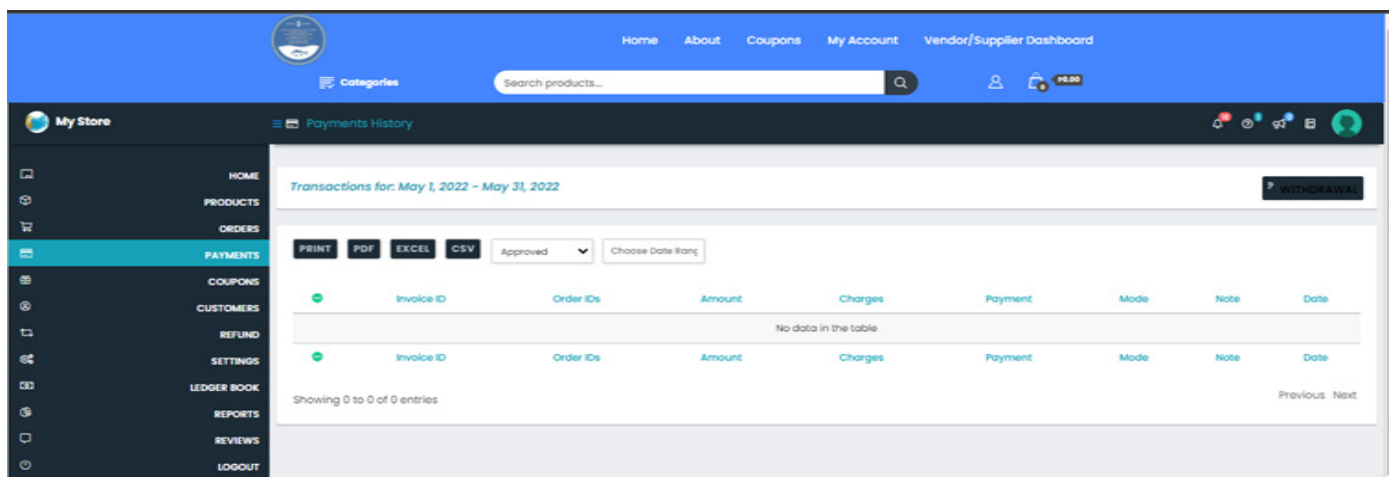

Figure 6. Payment Page

Figure 6 shows the payments page the supplier and vendor will use to request a withdrawal to cover the admin charge. The product amount, associated charge with the transaction, payment information, mode, note, date, and invoice ID are all visible to the seller. Additionally, the supplier/vendor can obtain a copy of the payment via print, PDF, Excel, and CSV on the payment page. The user has the ability to track payment transaction proof on a daily basis.
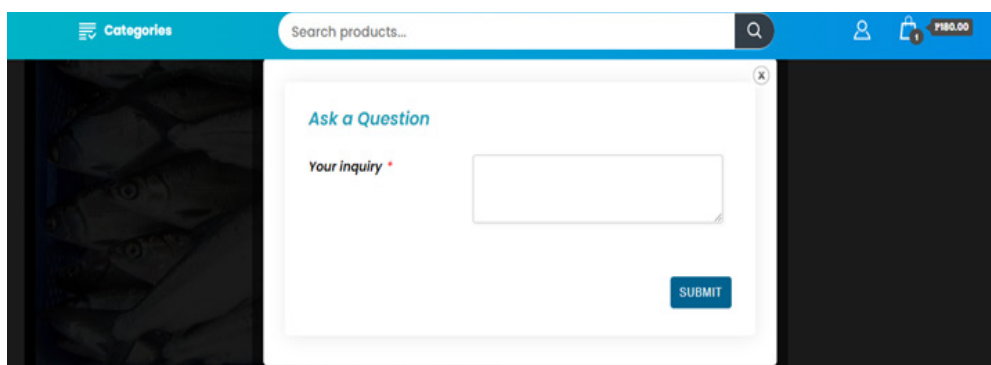

Figure 7. Inquiry Page

Figure 7 depicts the supplier/vendor inquiry page where buyers can send queries to the seller's store. The system offers a forum for conversation between the buyer and vendor on this page.

5. CONCLUSIONS

An e-commerce application has created to simplify the purchasing and selling of aquatic products in order to solve the issues that fish farmers, suppliers, and customers in the seafood sector encounter. This all-inclusive platform provides vendors access to a larger network of buyers and suppliers, real-time market updates to help them make educated selling decisions, and an easy-to-use interface that allows customers to find local seafood suppliers, get product details, and place direct orders. Through the utilization of cutting-edge technologies, the application endeavors to foster greater understanding among stakeholders and advance sustainability, efficiency, and transparency in the seafood supply chain. It also strives to improve user experience.

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