



Development of Seternak, Marketplace Application for Production Facilities and Livestock Products

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Abstract. The livestock industry, especially poultry, was one of the economic bases of Indonesian people, which has a high potential to increase inclusive economic growth. Moreover, Indonesia has a high advantage in the livestock sector, as illustrated by the competitive edge in the workforce and the potential for the livestock industry based on local resources. Livestock actors consist of farmers (providers of livestock production products), livestock industries (providers of livestock production facilities), and consumers of livestock products. Payakumbuh City was one of the cities with the most significant poultry population in West Sumatra. Most livestock actors still sell products conventionally, open shops, and sell livestock products to intermediaries or collectors. Sales in this way make it difficult for farmers to sell specific goods, and it took a lot of work to maximize business profits due to limited marketing media. Access to crucial information, such as knowledge of commodity price renewal, was still carried out from one person to another conventionally. Based on these problems, an application was needed that integrates a digital product for buying and selling transaction media and the media for providing information related to commodity price updates. Seternak application was based on a marketplace in that sellers, and buyers did not make transactions directly and were carried out in one digital market. Seternak application could help livestock actors sell production facilities and livestock products without being limited to territory, and it could increase consumers' income from livestock actors.

Keywords: Application, Commodities, Digital Marketing, Marketplace, Livestock.

1 Introduction

Information technology in Indonesia is developing very rapidly and quickly. The existence of information technology can make it easier for a human ecosystem to run various things, including in the business world. Today, many entrepreneurs have utilized information technology to develop their businesses [1]. According to Abualoush, more and more companies are currently using information technology to do business electronically. The rapid development of the information technology era, especially the internet, opens broad horizons as a medium of communication, entertainment, and a source of information to conduct buying and selling transactions. Based on data from APJII (Indonesian Internet Service Users Association) through its survey

in 2021, internet users in early 2021 reached 202.6 million people. This Fig. increased by 15.5% or 27 million people in 2020 [2]. This dynamic phenomenon shows that business has the potential to be carried out beyond direct buying and selling transactions. But also by conducting indirect trade transactions or online business.

One of the business sectors that can adapt to the development of this era is the agribusiness sector, which is one of the important industrial sectors in terms of food supply in Indonesia. Although agribusiness comes from the word *agros*, which means field, the definition of agribusiness includes livestock activities (cows, chickens, ducks, goats) and fishery activities, seawater, and brackish water [3]. The sub-sector that will be the research object is agribusiness in the poultry industry. The poultry industry is the economic base of the people with a high potential to increase inclusive economic growth. This is reinforced by the statement of [4], which states that Indonesia has a competitive advantage in input costs for labor, which is relatively cheaper than other countries in ASEAN. This statement is supported by data on the minimum wage in ASEAN countries from the Philippines National Wage and Productivity Commission in 2017, which shows Indonesia has a minimum salary of \$99.91 to \$250.63.

As well as the opportunity for poultry products is one of the products favored by the people of Indonesia because it has good organoleptic quality. The following is a projection of consumption of one of the poultry products, purebred chicken eggs, in Indonesia in 2017-2021 [5], which can be seen in Table 1. Therefore, promoting a quality livestock sector can be a strategic step to realize national development.

Table 1. Projected consumption of purebred chicken eggs.

Year	National Consumption (tons)	Consumption Growth (%)
2017	1.461.448	4,10
2018	1.521.349	4,35
2019	1.587.462	4,25
2020	1.654.916	4,04
2021	1.721.830	4,23

If studied in more depth, based on its role, poultry industry products such as chicken eggs have higher protein levels than tempeh and tofu. The protein content in eggs can reach up to 12.5%, and chicken meat reaches 18.5%. This is reinforced by a statement from UNICEF (United Nations International Children's Emergency Fund) that improved nutrition based on meeting protein needs has a share of around 50% in the economic growth of countries in Western Europe in the past century [4].

Based on data from the Central Statistics Agency regarding poultry population in 2019, Payakumbuh City is one of the cities with the most significant poultry population in West Sumatra Province. The people of purebred in Payakumbuh City amount to 1.1 million heads, and broilers amount to 2.8 million (Badan Pusat Statistik Provinsi Sumatera Barat). Currently, most livestock entrepreneurs are still selling products conventionally, opening shops, and selling livestock products to intermediaries or collectors. Sales in this way make it difficult for farmers to sell specific goods, and it is difficult to maximize business profits due to limited marketing media [6]. This problem is strengthened by the results of an interview conducted with Mr. Syahrial

Syarif, the owner of CV Nusa Maulana Abadi, which consists of subsidiaries in the form of poultry shops and laying hen farms in Payakumbuh City, West Sumatra. He stated that the business problems of the livestock sector after this pandemic period were unstable marketing of chicken eggs and dependence on intermediaries or collectors. This instability leads to a level of sales that, although it falls little, is only at the same point for an extended period (stagnant). He also stated that the digitalization solution is one of the right ideas to solve the current problems.

Based on the potential points of advances in information technology and the poultry industry in Indonesia, as well as the discovery of problems faced in the field. Then, a digital product can be initiated that can be a solution to marketing problems. Therefore, in this study, a platform will be developed with marketplace features to optimize the digital marketing management of livestock commodities in the form of production facilities and livestock products. According to Wardhana in [7], one of the advantages of digital marketing is that it cuts costs much lower when compared to conventional marketing processes. The low cost of marketing by utilizing digitalization is expected to affect competitive selling prices to attract more customer attention. In addition, digitalization of marketing is also carried out by using internet technology, which makes consumers comfortable with ease of access and practicality. Customers can make transactions anytime and anywhere simply using a device.

A marketplace system is a medium for buying and selling products carried out between sellers and buyers, but the two parties do not do it directly. Transactions are carried out in a place referred to as the electronic market. By utilizing this system, farmers can inform their agricultural products to other parties with faster use of time through the marketplace system [6]. Marketplace will be equipped with supporting features of a business dashboard, digital payment integration, invoice generators, and sales reports from digital transactions. The business dashboard will display graphical data visualizations of various indicators of the business status of partners (poultry shop owners and breeders). Digital payment integration is a feature provided that end-users / consumers can make payments digitally (via bank transfers or digital wallets), and proof of transfer will be uploaded in the column provided. The invoice generator will attach transaction records through the marketplace, which will be integrated with sales reports. Also, the sales report will display details of income, products sold, and sales quantity from digital transactions.

The potential for online sales with the media of this marketplace product is supported by research by Ipsos Group S.A. in [8] 73% of Indonesian consumers admit that shopping online is more accessible than in conventional stores. And 83% of the total respondent population believes in the online site or application recommendations. In another study, it was stated by the Ministry of Cooperatives and Small and Medium Enterprises that of the 56 million Micro, Small, and Medium Enterprises, only 3.75 million, or around 8%, had utilized digital marketing technology to support their business activities. Regarding Syarizka's statement (2018) in [9], the use of digital marketing as a marketing medium for products and/or services is proven to increase the income of MSMEs by up to 26%.

Based on the study's results in [10], digital sales of livestock products have proven to have a positive impact. From the point of view of breeders and livestock industry players, digital sales can help to sell their livestock products to users without being limited to regions to increase consumers and can see product information as well as the price of competitors' products. Meanwhile, from a consumer point of view, this

helps to get information on livestock products quickly and can compare livestock products before making a purchase.

The urgency of implementing digital sales (through marketplace platforms) can be seen from the state of economic recovery after the COVID-19 pandemic. Based on the results of the study [11], An effective strategy for economic recovery after the COVID-19 pandemic is to rely on community businesses, Micro, Small, and Medium Enterprises (MSMEs), cooperatives, and Village-Owned Enterprises (BUMDes) that process natural resources and are businesses that the community has carried out with their local wisdom. There is a need to strengthen business in the form of capital, telecommunications networks, business digitization, forming business networks, and marketing expansion.

In addition to problems related to the digitization process of the marketing process, one more problem was obtained from the results of an interview with Mr. Agung Perdana, the owner of the *Sari Optical* (SO) farm and chairman of the *Perhimpunan Insan Perunggasan Rakyat Indonesia* (PINSAR) in West Sumatera. The problem is that farmers in Payakumbuh are still figuring out the daily price updates of conventional production products. Conventionally, it is meant to be asked through voice calls, written messages, or in person daily (usually done in the morning). The price change of one of the production results (chicken eggs) can be seen in Fig. 1, and the price change of one of the means of livestock production (corn) can be seen in Fig. 2.

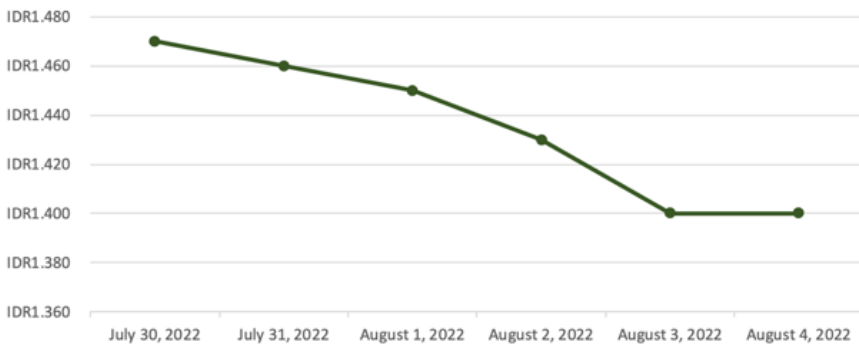


Fig. 1. Egg/grain price update.

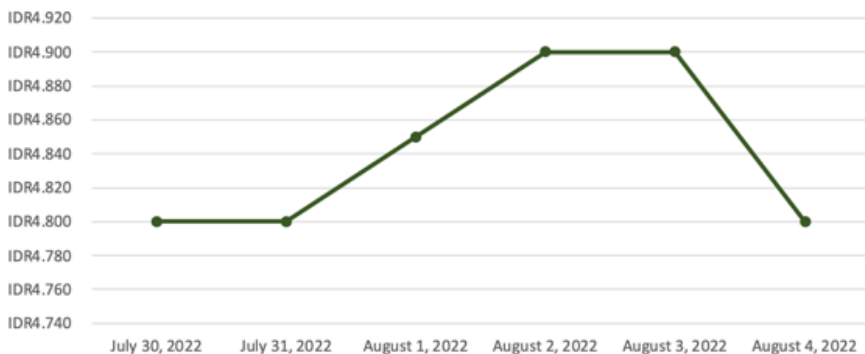


Fig. 2. Corn price update per kilogram.

The formulation of the solution to this problem is to provide the feature "*berita*" in the application. The feature will provide updates on livestock commodity prices from both production facilities and livestock products every day and present news related to market conditions through articles and information related to the livestock sector. With this feature, livestock industry players can see commodity price updates daily through one integrated medium without having to be done conventionally.

The application as a proposed solution is called *Seternak*. *Seternak* is an idea that has been initiated since 2021 in the context of a startup idea competition in the field of culture held by the Ministry of Education and Culture (Kemendikbud), Republic of Indonesia. This idea has reached 1st place in the regional stage and 4th place in the national stage. In this study, *Seternak* will be optimized from features, supporting backgrounds, and implementation to potential users. The unique advantage of the *Seternak* application from other livestock marketplace or e-commerce applications is that in addition to providing marketplace features as a solution to sales problems, the *Seternak* application is also integrated with a feature called "*berita*" that will display daily commodity price updates. This feature is an integrated solution in solving problems found in animal husbandry and the livestock industry in Payakumbuh and is a unique value and advantage of *Seternak* from other similar products.

2 Methods

The method used to carry out this web-based application development process is the agile method, specifically the scrum method. The Scrum method was chosen because it was known for its excess flexibility, and researchers could return to an earlier phase if there were necessary changes. This method is also one of the effective and efficient software development methodologies, which needed to have defined the procedure in detail for creating a given model type. However, there were ways to become an effective modeler. The scrum method was also carried out by prioritizing an iterative and incremental approach. [12], explained scrum was a process framework used to manage complex product development with various processes and techniques. In the scrum method, there was a product owner responsible for maximizing the business value of the products produced by the development team. The product owner was responsible for managing the scrum work series, starting from user stories, product backlog, sprint planning, sprint, daily scrum, sprint review, and retrospective.

In general, the process of the scrum method could be described as follows:

- a. User Story was a description that explained the system's needs in the form of a language that could be easily understood from the end-user perspective and will later be used as a guideline for creating a product backlog. The data obtained at the data collection stage through the interview process will be analyzed to explain who the application user will be (in this study, it consists of admins, livestock industry players, and end-users) along with their duties and goals. The results of the user story will be used for the application development process as a reference to create a product backlog. Application development needs and models will be compiled using unified modeling language (UML), which consists of use case diagrams, activity diagrams, sequence diagrams, and entity relationship diagrams to simplify various complex problems to be easily understood.
- b. Product Backlog is a sequence list of all needs in the system and product. The content of the product backlog is a feature that would be applied to a system ac-

accompanied by an estimated processing time. This document is subject to change periodically as the series of product development activities progresses to produce the appropriate product. The calculation of the availability of days to determine the amount of time and labor available during development (person-days) is done by multiplying the working days in the sprint by the labor. While the approximate speed of work is carried out with the following formula:

$$\text{Est Velocity} = \text{ManDays} \times \text{Focus Factor} \quad (1)$$

In addition to the estimated speed of work on the sprint, a focus factor will also be considered to estimate the developer's level of focus calculated using the following formula:

$$\text{Focus Factor} = \frac{\text{Actual Velocity}}{\text{Available Monday}} \quad (2)$$

After obtaining a statement (which has been simulated through a user story) between the prospective user, the task, and the purpose of the application, the results are then grouped into a list of features that must be completed along with the estimated processing time. Currently, the features needed based on the description of the problem are the marketplace feature for digitizing product marketing and the feature "berita" that provides daily livestock commodity price updates and information related to market conditions through articles.

- c. After obtaining the product backlog, it will then be described in its entirety from the output of the past stage into four sprint parts. Each sprint would have an estimated processing time that matches the estimated time of working on the features in the sprint. The estimated processing time would be calculated by calculating the story point and the work speed based on person-days and focus factors. The result of the sprint planning is a job description based on the product backlog that will be carried out for each sprint, the provisions of the application development, and estimates of the processing time in the sprint phase.
- d. Sprint is a time cycle with a maximum duration of one month. The duration of the sprint throughout product development is invariable. This cycle aims to complete the product target (sprint goal).
- e. Daily Scrum was a daily activity in a sprint that was carried out to check what has been done, what will be done, and what may be an obstacle in working on the project in the future. Daily Scrum is used to improve product development so that sprint goals are achieved. At this stage, daily performance monitoring will be carried out in accordance with the sprint planning that has been prepared. Monitoring will be carried out based on the progress of each product backlog, which will be visualized with a burndown graph that displays the amount of work left and must be completed in the actual sprint, compared to the story points that have been compiled when sprint planning.
- f. Sprint Review was an activity held at the end of the sprint to conduct incremental inspections and adapt backlog products if needed. A Sprint review was carried out to evaluate and ensure the completion of sprints, carried out 1 (one) day before each sprint was completed. If features have not been met or did not work according to development expectations on the sprint, they will be completed or improved in the next sprint. Meanwhile, retrospective sprints were carried out as an oppor-

tunity to inspect yourself and make plans regarding the improvements that would be made in the next sprint, which was done after the sprint review and before the next sprint planning based on the burndown graph, carried out on the last day of the sprint.

Our approach is building the Formation of Cross-Disciplinary Scrum Teams between researchers, poultry owners, and PINSAR as the association of poultry businessmen.

3 Results and Discussion

In this section, we have built an application called Seternak. Seternak is a marketplace application where users (sellers of livestock production facilities, sellers of livestock production products, and end consumers) make buying and selling transactions. The Seternak Marketplace application was developed for web platforms using PHP (*Hypertext PreProcessor*) as a server-side programming language that runs on the server and client sides and MySql as a database.

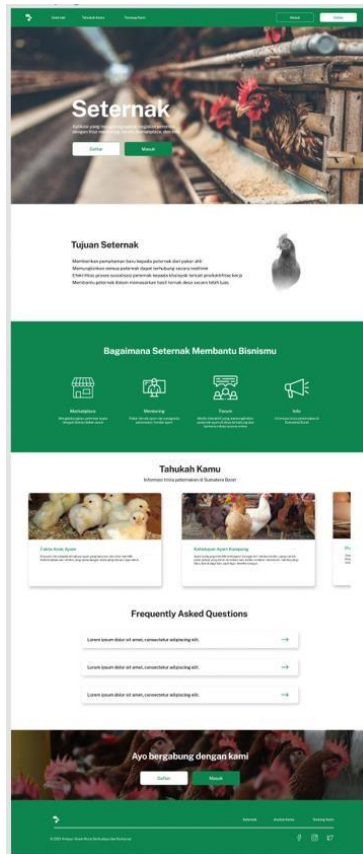


Fig. 3. Homepage.

The main page of the Seternak Marketplace was a homepage display that instructed users to log in or register when they first visited Seternak. The main page of this homepage displays the destination, features provided, list and/or login menus, and

frequently asked questions (FAQ). The main page view of the Seternak homepage can be seen in Fig. 3.

The login and register page are menus to register an account (as a partner or consumer user) or log in for users who already have one. The appearance of the login and register page can be seen in Fig. 4 and Fig.5.

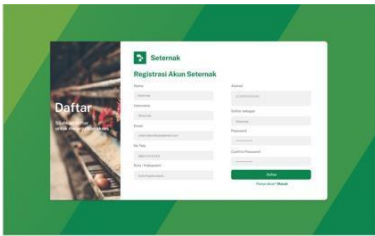


Fig. 4. Register Page.



Fig. 5. Login Page.

Marketplace page is a page that displays all products from different categories, such as chicken meat, chicken feed, chicken eggs, medicines, vaccines, and others. The appearance of the product page can be seen in Fig. 6. The product page was a page that displayed product descriptions, sellers, product photos, order quantities, and product ratings. The product detail page view can be seen in Fig. 7.

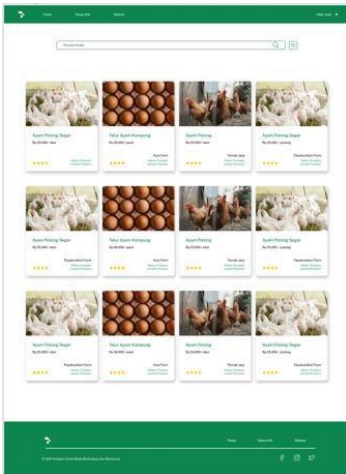


Fig. 6. Marketplace.

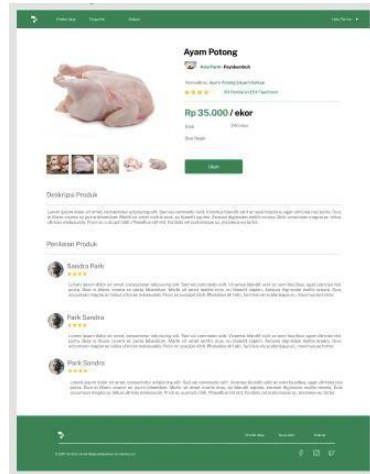


Fig. 7. Product.

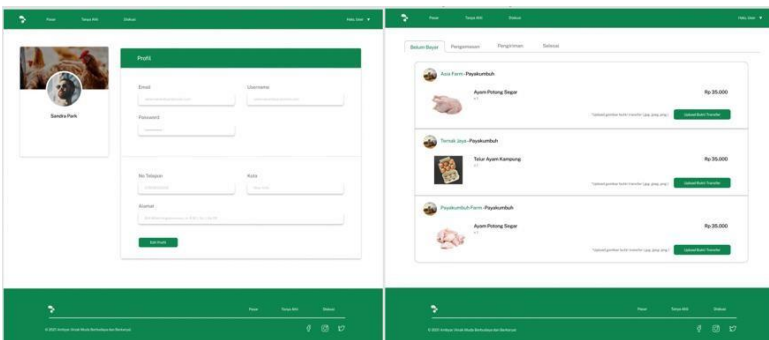


Fig. 8. Product Status (left) and User Profile (right).

The product status page was a menu that displays the status of transactions on a particular product, consisting of "unpaid," "packaged," "shipped," and "completed." A user profile page is a page that displays the user's data. Showing the product status page and the user's profile page can be seen in Fig. 8.

This application will be an intermediate system between the shop/seller (poultry owner) and the customer. The candidate sellers can register individually as a member of this app and display their products independently. In ensuring the price of livestock products was daily, an app administrator became a system updater in maintaining this system. The association became an initiator who is credited with developing the system and promoting it widely.

4 Conclusions and Suggestions

The results of the research carried out and the conclusions obtained in the study that has been carried out have successfully built a web-based Seternak Marketplace System using the PHP programming language. The method used for the development of the system uses scrum methodologies. The Seternak Marketplace can assist providers of livestock production facilities (chicken feed, medicines, vaccines, and other facilities) and providers of livestock production products (chicken meat and chicken eggs) in marketing and distributing goods with an easy process.

This promoted system implies that it has a potential market because the poultry association in this region supports it. And by join-implementation and join-support, technically and administratively enhancing this system implemented well.

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