

# Web-based E-Commerce Development for the Embroidery Creative Industry in West Sumatra

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## ABSTRACT

The purpose of this research is to develop a WEB-based E-Commerce system as an effort to empower the embroidery creative industry in West Sumatra, precisely in the “Asli Sandal” embroidery business. The research method used is the R & D (Research and Development) approach with the Waterfall method. System design using UML (Unified Modeling Language), as well as making web-based application programs using the PHP programming language based on the Codeigniter framework and MySQL database server which will be used as backend storage for e-commerce applications. This research produces a web-based e-commerce application that is used to optimize marketing aspects, expand market share, increase sales volume, promote media, make it easier for buyers to find product information and facilitate transactions for embroidery products as well as an effort to preserve local culture in synergy with progress.

**Keywords:** *web, e-commerce, embroidery, creative industry*

## 1. INTRODUCTION

The use of information technology has brought about a number of significant changes in the business transformation process through digitalization, capital mobility and liberalization [1]. One of them is E-Commerce (Electronic Commerce). It is easy for business people to have a business relationship with other businesses, and have a direct relationship with consumers [2]. E-Commerce as a form of advancement in information technology has brought about a number of changes, including lowering the cost of interaction between buyers and sellers, easier interaction without time and place restrictions, more alternatives and easier promotion, opportunities to expand market share without having to have large capital, increased transparency and service to consumers [3]. The use of E-Commerce technology is a business mechanism that works electronically by focusing on online business transactions and has the opportunity to build a more humane and personalized relationship with customers [4]. This fact can foster competitiveness globally because the marketing system is no longer limited to certain areas. E-Commerce can strategically act as a differentiator that can shape a company's competitiveness through a number of uniqueness of both its products and service systems [5]. The success of E-Commerce lies in the specificity of products with certain specifications. Business ventures with unique and specific products can create business opportunities and have a high level of comparability because they

have distinctive features and do not exist in other business ventures, such as businesses that sell embroidery products, which are creative products in West Sumatra.

West Sumatra embroidery products have their own characteristics; their specialty is the strength of the traditional Minang Kabau motifs used. Decorative motifs used include *kaluak paku* (fern curved), *pucuak rabuang* (shoots of bamboo shoots) *itiak pulang patang* (ducks coming home in the evening), and *saik ajik* (cut diamonds). West Sumatra embroidery craft is not only applied to clothing, such as *kebaya* but nowadays it has developed in the form of various other crafts, such as sandals, souvenirs, hats, worship equipment, shoes, bags, and so on.

Asli Sandal is one of the embroidery businesses in Bukittinggi, West Sumatra which initially only produces sandals made of leather, but seeing market opportunities, eventually produced handicraft products made from embroidered fabrics such as various tote bags, sandals, wallets, wedding souvenirs and other typical Minang souvenirs. The sales system used by Asli Sandal is currently using traditional seller facilities, still concentrated in certain locations, especially Bukittinggi and social media sellers because they do not have e-commerce so that sales are not maximized. The recording of sales transactions is still manual, so mistakes often occur in making reports. By using social media facilities as a means of selling, the scope of sales and promotion is still not optimal. This of course makes

it difficult for management to increase the number of sales and expand the scope of its marketing area. The number of competitors is increasing, making it difficult for management to maintain its business performance and performance in achieving its profitability target level. Difficulty accessing various information about products, the latest price information, limited promotional media, tends to be inflexible, personalization barriers, and operational costs that increase over time.

Limited mobility and market liberalization make Asli Sandal's management have to innovate to expand the target market through the design and utilization of E-Commerce. With E-Commerce, consumers can make orders and purchases without limitation of place and time, be responsive to current information [6]. Business expansion becomes more flexible, reaches a wider target market, promotional media is cheaper and more interactive, transparency of operational costs, digitization of products / services, streamlines the distribution system, facilitates commercial transactions across cultural and national boundaries with relatively more effective costs, makes it easier to build business partnerships with differentiation patterns according to the needs of certain product / service specifications. Therefore, the main requirement in E-Commerce design is an important means of expanding the market share area with the aim of achieving more competitive advantages and competitiveness [7].

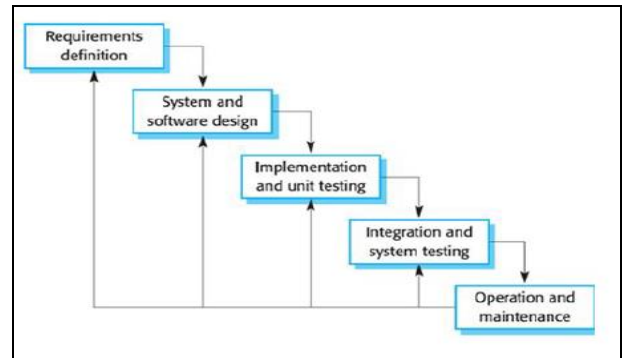
The purpose of this research is to develop an e-commerce application system that can be used by Asli Sandal embroidery business. Application development using the waterfall software development model will produce an application that suits user needs. This application is designed with user access rights, namely: administrator, shop owner (owner), and consumers. This application is built using website-based technology so that any new information will be easily accepted by every user. This application development is designed for online ordering and purchasing systems. The security of online buying and selling transactions is one of the variables that affect consumer interest which will be the most concerned discussion. Consumers will be given a choice of payment systems, namely COD, paypal system, and transfer.

E-Commerce research or the like has been done a lot. The results of the study found that through the use of E-Commerce technology is an important means of implementing online strategies and promotions so as to expand market share [8]. Lots of convenience in the transaction process and current information is very supportive of the managerial decision-making process [9]. Information dissemination becomes faster and adaptive to various changing needs of society without limitation of time and place [10]. Decreasing operating costs and achieving company profitability as well as

opportunities to increase company competitiveness [11]. The marketing system is becoming more effective and easier in increasing product expansion [12].

**2. METHOD**

The form of this research is Research and Development (R&D) with a market expansion needs approach using target market opportunity analysis, business model design, customer interface, market communication and implementation design. The research instrument used interview and observation techniques, and for sampling using purposive sampling technique. The research data comes from primary data and secondary data. Primary data is data obtained directly from the business actor through the process of interviews and observations with the company. Meanwhile, secondary data comes from all internal company documents. All data obtained will be reprocessed according to research needs. The application design uses the Waterfall approach [13]. This approach is a classical model and is systematic in nature so it is easy to understand because all processes work sequentially in the stages of building a software [14].(Figure 1).



**Figure 1** Waterfall Approach (Waterfall)

This study uses the System Development Life Cycle (SDLC) method with the Waterfall approach so that the approach used is not the same as the previous research. This method includes the phases of requirements planning, design, unit testing, system testing and maintenance [15]. For E-Commerce architectural design using a component base, and the PHP programming language with the Codeigniter framework. Codeigniter is a PHP framework that can accelerate developers to create web applications [16]. The advantages of using a framework are: saving development time, reuse code, community assistance and a collection of best practices [16] (Daqiqil, 2011). Making e-commerce web using a codeigniter framework with the stages of identifying problems through needs analysis, creating designers then implementing them and conducting testing [17]. Furthermore, the system design uses UML (Unified

Modeling Language) and uses the MySQL application in designing the entire database.

The system development stage is carried out through survey activities, analysis, manufacture, manufacture, maintenance and maintenance. The application is sequential, where the stages must be before the next stage, with the aim of repeating these stages.

Furthermore, for the process of designing an E-Commerce system prototype using a component base by implementing the CSS (Cascading Style Sheet) framework, PHP (Personal Home Page), java script framework, jQuery, CI (Code Igniter), by empowering the MVC (Model View Controller). The testing system uses easy data (easy values), simple and easy to calculate data (typical realistic values), extreme data (extreme values) and unauthorized data (illegal values). This test structure is important because the data must be accurate and precise. The input process validation will determine the output qualification of the system as a whole, making it easier for managerial decision making. In the approach using the 7C approach is (Context, Content, Community, Customization, Communication, Connection, and Commerce). Market communication can be done through search engines, online advertising, print media, and magazines [18] (Mohapatra, 2013).

### 3. RESULTS AND DISCUSSION

This study develops an e-commerce application for marketing Asli Sandal embroidery products. The result of this research is an applied technology that will be used as a promotional media for Asli Sandal, so that it can expand its market. The results are as follows:

#### 3.1. System planning

The implementation in this study is to design a system using UML (Unified Modeling Language), as well as create web-based application programs using the PHP programming language based on the Code Igniter framework and the My SQL database server which will be used as backend storage of e-commerce applications.

#### 3.2. Use case diagram

Use case diagrams are a description or representation of the interactions that occur between the system and its environment (the actors involved). Figure 2 is a use case diagram that is used to describe the process of ordering and purchasing products made by consumers on the Asli Sandal e-commerce application.

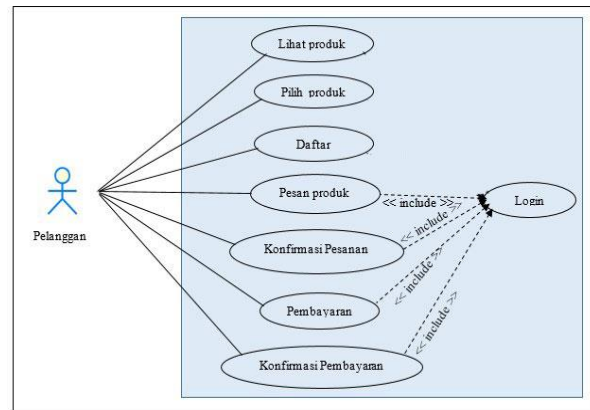


Figure 2 Use Case Diagram of Customers Ordering Products

Based on Figure 2, if the customer wants to make a product purchase, they must first see the product they want to buy. Then choose the product you want to buy, place an order, make an order confirmation, make a payment and finally confirm the payment. Part of the process is carried out after logging into the Asli Sandal e-commerce application. To log in, customers must register as a user on the Asli Sandal e-commerce application. On the other hand, the original Sandal business owner, in this case the admin, enters products, product categories, accepts orders, processes orders, and manages users and transaction reports.

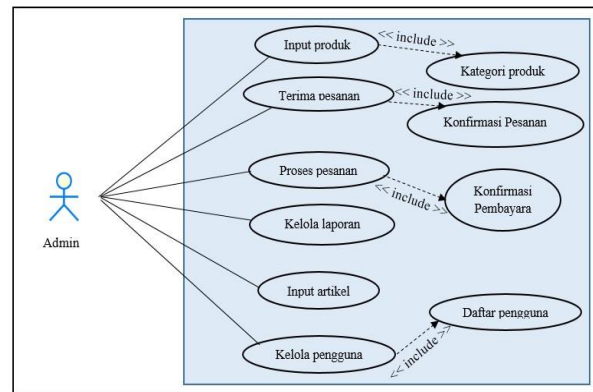
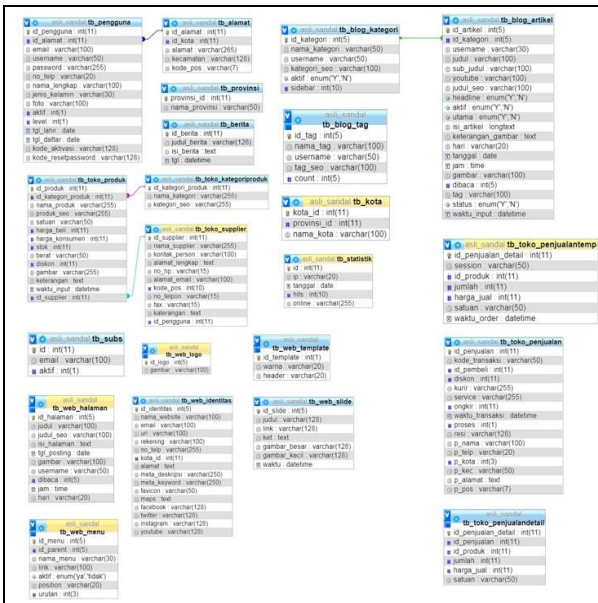


Figure 3 Use Case Diagram for E-Commerce Manager

Figure 3 describes the admin doing the product input process based on product categories. Product input based on pre-made categories. Admins receive orders based on the order confirmation made by the customer. Admin performs order processing based on payment confirmation made by the customer. In addition, the admin also enters the necessary articles for the Asli Sandal e-commerce application. Use case diagrams also explain the admin managing users based on user registration data. Finally, the admin manages transaction reports.

### 3.3. Class diagram

Class diagrams are one of the most useful types of diagrams in UML, this is because they can clearly map a particular system structure by modeling classes, attributes, operations and relationships between objects. Figure 4 shows the class diagram used in the Asli Sandal e-commerce web application. The class diagram specifications used are based on the database specifications owned by the Asli Sandal e-commerce web application which is the result of system design in year 1 of this study which is tailored to the needs of the original Sandal owner.



**Figure 4** The Asli Sandal E-Commerce Class Diagram

### 3.4. The Asli Sandal E-commerce Application Implementation

The Asli Sandal e-commerce website application has been tested and implemented. The following is a display of the output of the Asli Sandal e-commerce application that has been implemented, where not all web pages are displayed in this article.

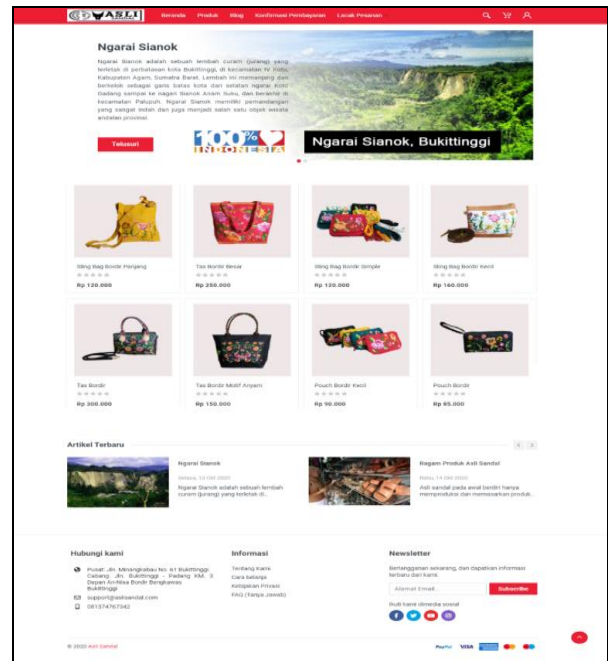
### 3.5. Front page

The appearance of the front page of the website is important in communicating indirectly with website visitors. The appearance of the front page or homepage of the site greatly determines the next interest in what is on the website. On an e-commerce website, of course, the hope is that visitors are interested in seeing the products offered and then buying. The front page is made simple, unique but elegant so that it is attractive to visitors. Figure 5 shows the front page, contains the Sandal Sandal business logo, then the main menu of the website which consists of Home, Products, Blog, Payment Confirmation and Order Tracking. At the top right there is a product search menu, a shopping cart and

a login link to the system. This section will always appear on every page of the website.

Next there is a slider in the form of a large image at the bottom of the main menu. This slider serves to emphasize or highlight certain information / news / products that the website manager wants to convey. This slider can be filled with the latest products, best-selling products or important information related to Asli Sandal. Products as the main part of the e-commerce application are displayed at the bottom of the slider. The products displayed are the eight latest products entered by Asli Sandal's manager. On the homepage, products are displayed in the form of product images, product names, product ratings and prices.

Next displayed on the front page are the two most recent articles published by Asli Sandal's manager. In addition, there are also three additional menus at the bottom of the front page that serve as information for visitors. The three menus are the Contact us menu, the Information menu and the Newsletter. The Contact us menu contains the address and contact number of Asli Sandal's business. The Information menu contains Information about Asli Sandal, How to Shop, Privacy Policy and FAQ. The end of this front page is the footer or feet. Like the header, this section will always appear on every page of the website.



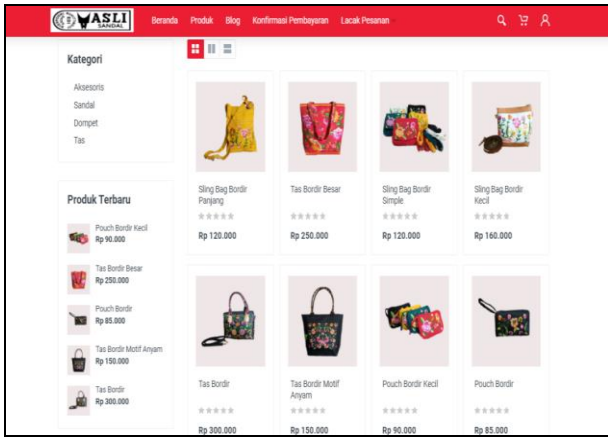
**Figure 5** The Home Page of the Original Sandal E-Commerce Application

### 3.6. Product Menu Page

Products on e-commerce websites are a very important part because they affect visitors' buying interest. Product information is displayed briefly and clearly. Detailed information for each product can be obtained by clicking on the desired product. Figure 6



shows product information on the Asli Sandal e-commerce website.

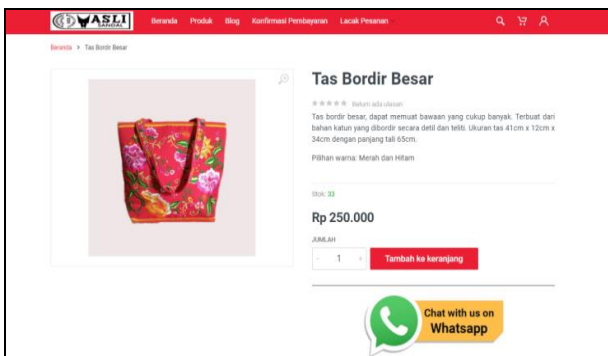


**Figure 6** Product Information Menu

The product menu also displays Product Categories and Latest Products. Important product categories are displayed so that visitors can immediately browse for the specific product they want based on product category information on the website.

**3.7. Product Detail Page**

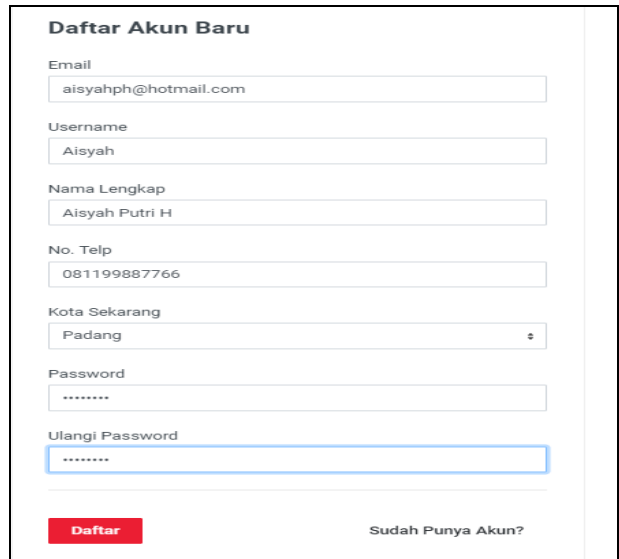
On this page, visitors can view detailed product information such as product name, product description, amount of available stock, and product price. On this page, visitors or consumers can buy products by clicking the Add to cart button. In addition, there is an interaction facility with Asli Sandal managers in the form of a Chat with us on Whatsapp button if a visitor or consumer wants to ask something related to the product. Product detail page is shown in figure 7.



**Figure 7** Product Detail Page

**3.8. Account Registration Page**

Visitors who want to make a purchase must first register to become a user on the Asli Sandal e-commerce website. Registration can be done manually via the Account menu on the top right of the website or during product purchase checkout. Visitors are asked to complete the form as shown in Figure 8.

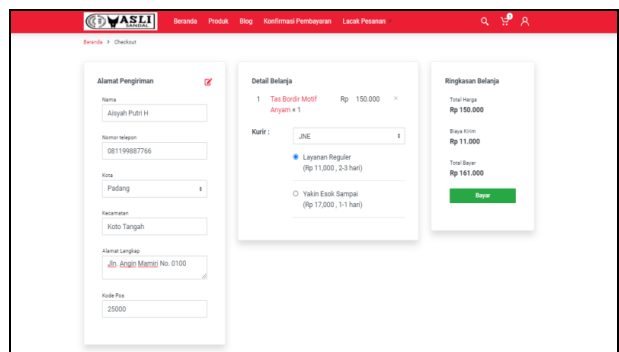


**Figure 8** New User Registration Form

In order for the user account to be active and usable, after the account registration process is complete an email will be sent to the visitor for the activation process. Furthermore, in this e-commerce system, visitors who already have an account are called consumers / customers.

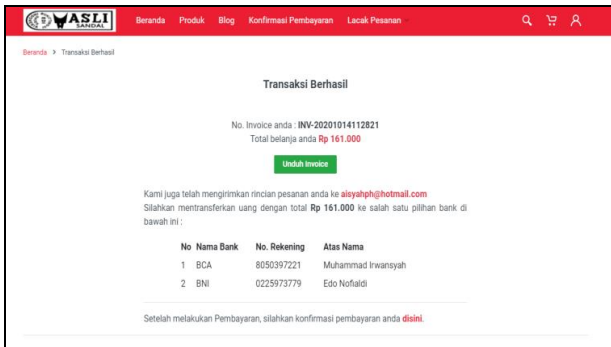
**3.9. Order Confirmation Form page**

This page serves to make sure the visitor or customer order is correct. If there is an error in the order, the customer can remove the product from the basket and add the corresponding product back to the cart. On this page, customers are also asked to enter their shipping address and choose the courier they want to use for the delivery process. Figure 9 displays the order confirmation form page.



**Figure 9** Order Confirmation Form

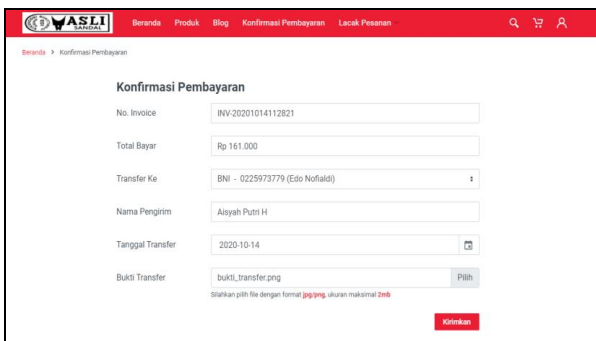
After the customer clicks the Pay button, information will appear stating the transaction was successful. Figure 10 displays the transaction confirmation page.



**Figure 10** Transaction Information

**3.10. Payment Confirmation Page**

For every transaction made in the Asli Sandal e-commerce application, the payment process accepted to date is via bank transfer. Customers who have made a payment are asked to confirm payment so that the product ordered by the customer can be processed, packaged and sent to the customer. Payment confirmation can be made via the Payment Confirmation menu at the top of the website page as shown in Figure 11.



**Figure 11** Payment Confirmation page

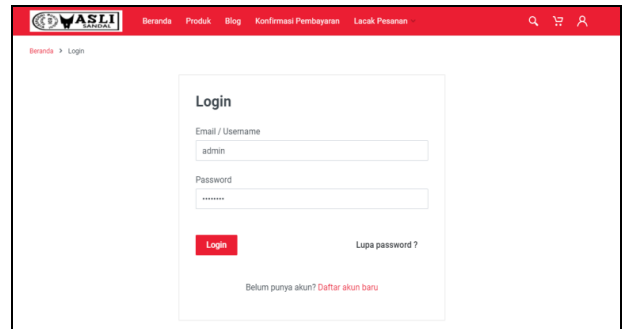
Customers simply type no. invoice, then asked to complete the form as can be seen in Figure 11.

**3.11. Admin Management page**

All content in the Asli Sandal e-commerce application is entirely the responsibility of the business owner, in this case the admin appointed by Asli Sandal. Admin is responsible for tracing product details, product categories, latest articles, tips and tricks, managing users, managing order reports and other content. To do this, the admin must first log into the Asli Sandal e-commerce application system.

**3.12. Admin Login Page**

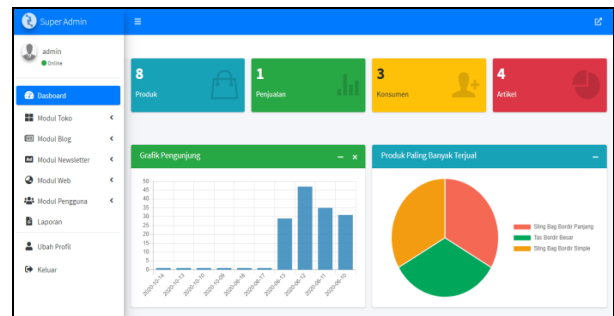
The admin must log in to manage the Asli Sandal e-commerce application. Figure 12 displays the admin login page.



**Figure 12** Admin Login Page

**3.13. Admin Dashboard page**

After the login process is successful, the admin can manage the dashboard. The dashboard is the main admin page for managing and monitoring the entire process in the Asli Sandal e-commerce application. The admin dashboard page can be seen in Figure 13.



**Figure 13** Admin Dashboard page

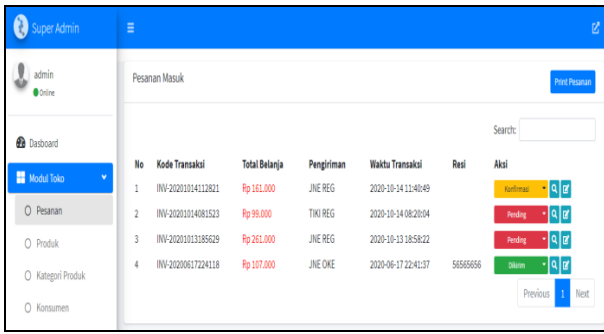
There are several menus on the admin dashboard, including the Shop Module menu to manage Orders, Products, Product Categories, Consumers / Customers, Suppliers / Providers, Accounts. Then there is the Blog Module menu. On the Blog Module menu, admins can manage Articles, Article categories and Article Tags. The next menu is the Newsletter menu which contains Newsletter Send and Subscriber management.

Admin can also manage the Web Module menu which consists of web identity, web menu management, page management, company logo management, and Slider management. Another management admin can do is user management. Admin can add or remove users to the Asli Sandal e-commerce application. Admin can also reset each user's password if the user forgets the password.

The most important part of the dashboard is the Reports menu. Through this menu, the admin can view all transaction reports. Transaction reports can be saved and converted into CSV, EXCEL, PDF file formats or printed directly.

**3.14. Order Management page**

Admin can manage all orders that occur through the dashboard. All orders will appear on the Order menu. The order page can be seen in Figure 14.

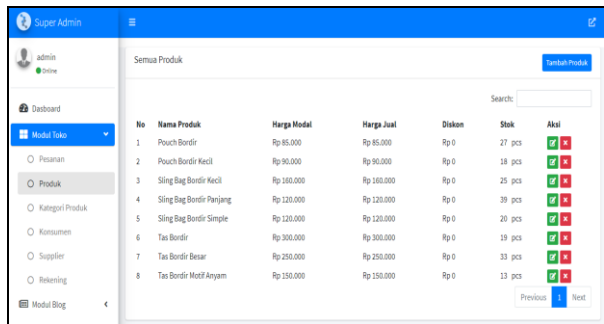


**Figure 14** Customer Order Page

Each order will be marked with a status with a specific color highlight. This serves to make it easier to manage orders, all orders that have been sent will display a green color on the order status. Orders that have not been paid for and confirmed by a customer are colored in red, and orders that have been paid for, confirmed by the customer but have not been processed will be in yellow.

**3.15. Product Management page**

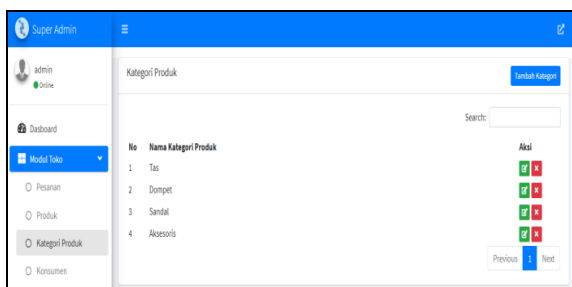
Each product to be sold and displayed on the Asli Sandal e-commerce application must be identified according to the product entry form. Admin can add new products, edit or delete existing products. The product management page can be seen in Figure 15.



**Figure 15** Product Management page

**3.16. Product Category Management page**

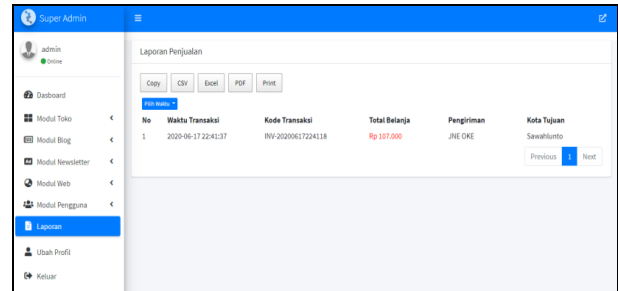
As with product management, admins can also add, edit or delete product categories. The product category management page can be seen in Figure 16.



**Figure 16** The Product Category Management Page

**3.17. Transaction Report page**

Transaction reports are an important part of managing e-commerce applications. Admins or business owners can view transaction reports through the Reports menu on the dashboard page. Transaction data can be downloaded and saved in CSV, Excel, PDF or print formats directly. The transaction report page can be seen in Figure 17.



**Figure 17** Transaction Report Page

**4. CONCLUSION**

With the existence of an e-commerce website that utilizes the internet as a marketing medium, it can make it easier for Asli Sandal owners to provide services to consumers optimally and provide 24-hour information and can be accessed anytime and anywhere. The appearance of the website is designed as simple and attractive as possible, and is equipped with member registration instructions, shopping instructions, and payment confirmation instructions. So that it makes it easier for visitors to make transactions. The developed website can increase Asli Sandal's business income, this is because the income is no longer sourced from the store but also through online marketing. If at any time the shop cannot open, orders can still be made online. E-commerce transaction system security is a major issue that has received special attention from various technology experts, particularly researchers in the field of security technology and computer networks. Further research is also being conducted, to optimize security in e-commerce system transactions.

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