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E-Commerce System Design to Expand Indonesian Eels Processed Product for International Market

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Abstract

Limited marketing is the reasons why several industries cannot develop well. Besar kecilnya mobilitas dan liberalisasi jual beli, membuat pihak manajemen harus melakukan inovasi perluasan pasar. E-Commerce application is the objective of this research in order to generate a system that facilitates the effort to introduce Indonesian Sidat processed product worldwide; to expand the potential market and as an effort to increase the sales volume by establishing an interactive communication with customers (buyers). *Waterfall* is used as the method for E-Commerce system design with object orientation approach. The result of E-Commerce system design is expected to be able to display all information on the products which are the processed product of Indonesian Sidat. The marketing system is no longer focus on local community as the target, but also on the community abroad. E-Commerce system provides comfort to the visitors, in this case, E-Commerce is designed to contribute in problem solving to ensure a customer's friendly information services, it displays specific messages to guide the visitors, potential buyers may initate the buying process, and the payment can be made by several methods such as bank transfer, cash on delivery and PayPal, and then the product payment confirmation is made through email. These facts not only broaden the target market, but also create global competition becaue the marketing system is not limited to a certain territory.

Key Words: E-Commerce, Transfer, Cash on Delivery, Paypal, Waterfall

1. Foreword

The use of information technology in marketing sector has been expanding very fast with various significant changes in the digital format, mobilization of the capital and liberation of information [1] (Laudon & Traver, 2013). Customers (buyers) can make the order and purchase without time and space limitation, aware of information update [2](Xiaohui et all, 2014). Business expansion becomes more flexible, reaching more target market, less expensive and interactive promotion media, transparency in the operations cost, digitizing of products/services, simplifying distribution system, providing easy commercial transaction across cultures and countries with relatively more effective costs, facilitating establishment of business network with with different patterns of differentiation as needed with specific product / service specification [3](Li & Hong, 2013).

The success of an E-Commerce is mainly due to the product's speciality with distinct specification. Business of a unique and specific product has higher opportunity and comparative level due to its specification and distinctive from other business, for example Sidat cultivation business in marketing the processed products. The growth of cultivation business is not too significant because it is not easy to sell the product to domestic market since the local community does not consume Sidat processed products. The limited marketing has caused several businesses in Sidat Cultivation canot develop well due to limited buyers. One of the business is PT Luhur Kasih Sakti, because the marketing has not well developed and

tends to be stagnant, the business owner is seeking to a new approach to expand its business opportunity by marketing the product online with E-Commerce system.

The limited mobility and liberalization of the market has caused the Management to try ne innovation to expand the target market by desigining and using E-Commerce. E-Commerce technology is a business mechanism which funtions electronically by focusing on the online business transactions, and it has the possibility of developing a friendly and personalized relations with customer beyond time and space [4](Li & Yang, 2014). This fact creates a global competition because the marketing system is not longer limited to a certain area. Currently, the marketing system is still depend on direct interaction with customer (buyer) and focus on a special location in Indonesia, which makes it hard for the Management to increase the selling and to expand the marketing outside Indonesia.

The objective of this research is to create a system that provides conveniency to introduce and sell Sidal processed product globally. Expanding target market area and increasing selling volume by developing an interactive communication with customer (buyer) through providing an online interface alternative as a media to promote Sidat processed product from PT Luhur Kasih Sakti.

2. Literatures

E-Commerce is part of e-business. In general, a customer who plans to shop online through internet shall need a technology and internet infrastructure to search for online shop or webstrore. From the seller or provider's prospective, E-Commerce can be used to gather information, such as customer's data, since customer usually has to register as a member before their can proceed with the transaction (Laudon & Traver, 2013). At first, a customer needs information on which online shops that sell the product that he wants to buy by using any available search engine technology [5](Lee, 2014). When the online shop is identified, the customer may directly look for the items that he wants to buy through web catalog facilities provided by the E-Commerce site. The web catalog also functions as promotion media (including special price and discount) of the Seller.

Several E-Commerce sites provides services for the customers to negotiate the pice, and several sites only apply un-negotiable fixed price [6](Li, et all, 2011). Online catalog or web based catalog is a display in form of application to promote items to be sold. In an online catalog or web catalog, usually there are several categories of the sale items, including the price list or other promotion, and a shopping cart or other terms for online shopping cart. [7](Schneider, 2012).

The technology behind the online catalog is actually the E-Commerce site or portal itself supporting by web or internet infrastructure. Whereas it is the business process that describes how a customer accesses the online catalog, purchases any item and completes a transaction in an E-Commerce site (Li & Yang, 2014). E-Commerce system on digital transaction for various organization or personal (individual) may reach broad customers and communities, therefore they have the opportunity to boost their target market growth [8](Schneider, 2012). This transaction model gives possibility to conduct commercial transaction across countries and culture in a more convenience way and more effective costs, compared to traditional type of transaction. This mechanism technology can be operated everywhere for any countries worldwide since it has a universal standard [9](Kwahk, 2012).

With E-Commerce system, all micro, small or middle level businesses can participate in global market easily, and even in real time mode. All businessmen can establish a business network, and create a direct connection with customer (Li & Hong, 2013). E-Commerce system as an advanced information technology has create several changes, such as reducing interaction costs between seller and buyer, simplifying interactions beyond time and place, providing more alternatives and promotions, expanding target market opportunity without depending on huge capital and investment, providing business transparency and friendly services to customer or buyer   [10](Bernadi, 2013).

One of the researchs on E-Commerce in Indonesia which is relevant to this research in *"Pemanfaatan Teknologi Ecommerce Merupakan Sarana Penting dalam Menerapkan Strategi dan Promosi secara Online Sehingga dapat Memperluas Pangsa Pasar."* The use of Ecommerce Technology is an Important Media in Implementing Online Strategy and Promotion to Expand Market Target

[11](Antika, et all. 2014). There are many simplicity in the transactopn process and information update which are very helpful in making managerial decision. [12](Anwar et all., 2014). Information distribution has become faster and adaptive toward the changes of the community needs without limitation of time and place [13](Astuti et all., 2013). Reduction to the operations cost and achievement of corporate profitability as well as opportunities to improve the competitiveness of the company [14](Julisar dkk., 2013). The retailing and marketing system become more effective, dynamic and simple in increasing the product distribution [15](Kosasi, 2014).

Marketing digitalization provides several operational advantages such as the processing of ordering data is easier to track, the supply and payment systems are more accurate, and it creates a better relation with customer [16](Kosasi, 2015). E-Commerce system makes possible to reach and access global market (56%), supports product promotions (63%), creates product branding (56%), establishs close connection with customers (74%), simplifies prompt communication (63%), gains customer's satisfaction memberikan kepuasan kepada pelanggan (56%), owning E-Commerce system can derive and improve customer's satisfaction (74%) and competitive advantage (81%).

This research applies System Development Life Cycle (SDLC) method with Waterfall approach, therefore the approach is not identical with the previous researches. This method has several phases namely planning, designing, unit testing, system testing and maintenance [17](Sommerville, 2011). For designing, E-Commerce designer applies base components, and PHP programing language of framework CodeIgniter. Further, E-Commerce system designing applies NetBeans IDE version 7.2., and applies MySQL application in designing the whole database.

3. Research Method

Case study research is through approach of market expansion needs by using target analysis, business model design, customer interface, market communication and implementation design. The research instrument is through interview and observation technique, and for the sampling is through purposive sampling technique. Research data is from primary data and secondary data.

Primary data is data that directly acquired from the company through interview with and observation to the company's representative. Secondary data are daily business transaction data, company's daily and monthly data, and reports published to public. All acquired data will be reprocessed as needed for the research.

Application design is using Waterfall approach (Shelly & Rosenblatt, 2012). This approach is classic and systematic thus it will be easy to understand because all the processes work simultanioustly in certain sequences to create a software (Figure 1).

Figure 1 Waterfall Approach
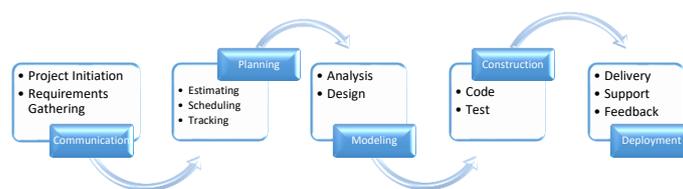
This method starts from planning, developing and will be continuously evaluated to determine if this information system is still suitable to be applied, if not, it will be changed with a new system and it will start with the planning again. System planning begins after receiving a proposal either internally or externally, followed by management decision. After management approval, the plan will be made in a complete work plan structure, and includes the whole system. The development phase will be conducted through survey, analysis, designing, developing, implementation, and maintenance. The purpose of the survey is to identify the scope of work. The analysys phase is to understand the available system, to identify the problems, and to look for the solution. The designing phase is to design a new system to resolve

company's problems. The developing phase is to create a new system through computerizing system coding. The objective of implementation phase is that the system created can resolve the company's problems. Its application will be in sequencial (waterfall), in which each phase has to be completed before it continues to next phase, in order to avoid repetition of a phase. The purpose of maintenance phase is for the system to run properly and can be operated optimally. The evaluation phase is conducted to ensure that the implementation of system development is in line with the planning, from the timing, cost or technical aspects.

Evaluation team includes user/management, and it starts during the system development, during the hand-over and during the operations. Then, the process of designing a prototype E-Commerce system is using basic component with application of CSS (Cascading Style Sheet), PHP (Personal Home Page), javascript framework, jQuery, CI (CodeIgniter), by utilizing MVC (Model View Controller). The system testing will use data that is easy to be checked (easy values), simple and easy to calculate data (typical realistic values), extreme data (extreme values) and prohibited data (illegal values). The structure of the testing is important because the data recording has to be accurate and precise. The validation of input process shall determine the overall output qualification of the system making it easier to make managerial decisions. The needs for opportunity analysis of target market expansion begins by identifying a number of similar competitors, where in this business not many has used the internet media as online marketing model so it is a good opportunity. Limitation of technical factors are such as access speed, server capability and ease of access. Providing easy information access that has become a problem. A dynamic promotion media may boost the number of transactions and customers. However, not all has constant and normal interner infrastructure networks. The products has special specific factor that requires product's digitalized media in virtual market. The design of interface is using 7C approach (Context, Content, Community, Customization, Communication, Connection, and Commerce). As for market communication can use search engirne, online commercial, print media and magazine [18](Mohapatra, 2013).

4. Result and Analysis

The needs for designing business process of E-Commerce system starts off through searching, identifying and analyzing processes to complete all information needed related to the contents and features attributed to the dimension of Sidat processed products. This process is intended to dig up all requirements of the information of each business process, so that the application model and the marketing sites procedure align with conventional business process. This will offer new opportunity as well as a solution to some limitation that a company has by considering the operations procedure and standardization.

Marketing digitization system enables seller and buyer to meet online through E-Commerce sites with no restriction to location and time in conducting the business transaction. Business process analysis scope of the information request process shall be up to validation receive process from customer (buyer). The specification requirement of E-Commerce system shall be differentiated into two important parts, functional and non-functional. The functional requirement is part of the requirement that consists of processes to run E-Commerce system. While the non-functional requirement is focusing on elements of system behavior properties. The interaction and ability to manage the stimulus of all elements of the system can be the most important support for successful relationships with customers and prospects.

The design of E-Commerce system architecture has two main parts, namely front-end and back-end pages. Each section has its own features and content. Front-end is a page that displays the front of Ecommerce site that serves the user with features that have been arranged in such a way to facilitate the process of spending knowledge and searching product information quickly and accurately. Front-end is a user page doing the online shopping process, searching price and product information and interacting with the company. While Back-end is the page that is displayed for the admin and setting the contents of the data in the front-end site. Admin can add, edit, delete existing data, such as product data, administration data, and order data; and on back-end pages admin can also access other useful information. The admin page can not be accessed directly through the menu in index.php, but must by typing a certain address on the browser so that the security level is higher.

One of the principles in designing a site is ensuring that each page has a good navigation system and links that are able to take visitors to the main page. E-Commerce site has a menu section header, in which the Catalog menu will always be updated according to visited links, My Account menu, Trolley menu, Checkout menu. In addition to using the header section menu, this site also uses other alternative navigation links on the left and right sides like Categories, New Products, Search, Shopping Cart, Bestseller, Viewed Product, and Bookmark. In the Footer, there is a trademark of the site and company. E-Commerce system uses client server technology architecture centrally, because it can overcome the problem of duplication of interference. The purpose is that if one customer has a disruption in accessing data from the server then the interference does not affect other customers in doing data access. In addition, it does not require a large amount of costs because the server only serves to store all customer data, transaction data, and product information, therefore all existing data can be used by the client in accordance with the function and purpose. Server provides data in accordance with the needs of the client so that it can directly operate through the available network. This connectivity provides an effective network to ensure and ensure a smooth acquisition of information so that all transaction data and feedback from customers can perform the process more effectively and efficiently.

E-Commerce architecture has a business process management mechanism starts from the customer accessing the site, then the customer purchasing an item by adding the item to the shopping cart. After the shopping is complete, the buyer can enter billing information into credit card or buyer who already has a PayPal account can login to make payment. Before making a payment, the buyer confirms the details of the transaction, next the buyer checks and prints the payment confirmation. The final step is that buyer receives payment notifications via email. The payment method architecture with PayPal starts from a customer shops by stuffing items into the shopping cart. After shopping, the next step is the customer must log in. After successful login, customer can check the shipping data and billing information, then makes payment. After making the payment, the customer can view the order in detail and then the customer sees the confirmation of the ordered item.

The architecture of how payment of invoices work online starts from invoice delivery. The customer then clicks the payment link on the invoice to make a payment. After the payment process is done, the customer's funds are transferred from the customer's bank to the bank with the payment network. After all payment processes are completed, then the final step is the customer matches it with the original invoice.
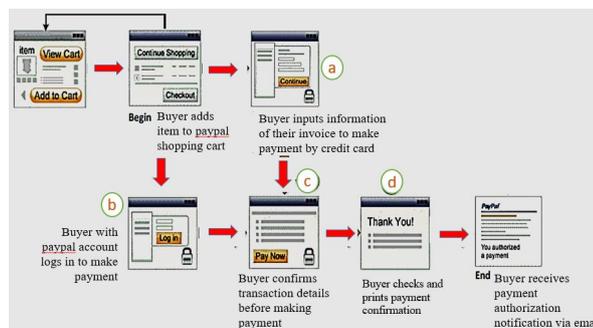
Figure 2 E-Commerce System Architecture

Strategy in the designing stage of E-Commerce site refers to object-based design. *Use-case* diagrams explain the benefits of the system when viewed from the perspective of people outside the system or actor. The Admin's function in the site is when successfully login to the administrator page, the admin can manage the purchasing activities that contains the explanation of how to make transactions, change password, manage product management such as adding, deleting and changing product data and product categories, manage admin module which contains bank data, manage comments and incoming transaction

menus. The Visitor's function in this case the consumer (buyer) is the product ordering activities through the registration process (Figure 3)
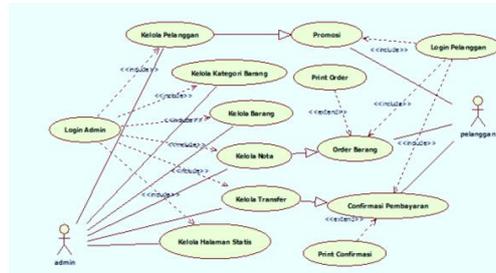

Figure 3 *Use Case* Diagram of E-Commerce System

The data structures design is using MVC framework (Model View Controller). The MVC framework generates a data structure that assigns tasks to each functions so that it is more controllable. CodeIgniter is a framework that enforces the MVC file structure in its structure. The MVC structure in the CodeIgniter framework uses component diagrams. The work unit that manages all the components in the CodeIgniter framework is the core component which is integrated in the system package. The core component oversees or manages the dependent model and controller in which the controller sends the data request and the receiving model retrieves the data that the controller wants from the database. The result of data request will be shown to the view by the controller. The MVC file structure in the CodeIgniter framework is usually placed in the application folders which have been grouped according to their respective functions. Here is a file structure display of each MVC folder in PT Luhur Kasih Sakti's E-Commerce site design.
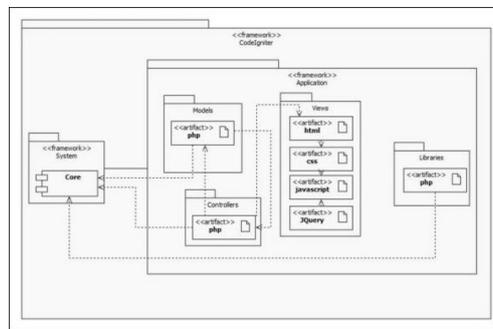

Figure 4 Component Diagram of E-Commerce System

Furthermore, class diagrams can display some classes and packages that exist in the system/software used and the connections therein. The class diagram describes the types of objects in the system and the various existing static connections. The class diagram shows the properties and operations of a class and the restrictions contained in the connection of those object.
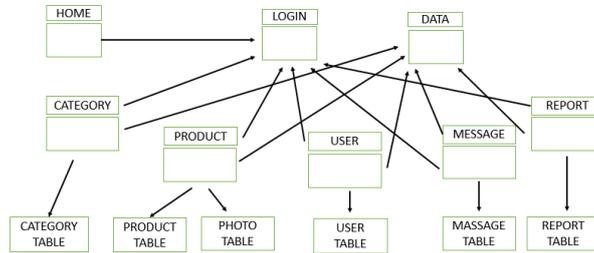
Figure 5 Class Diagram of E-Commerce System

Here is the main page design to manage all contents on **E-Commerce system of cosmetic products**. The design page of the seller/supplier menu format has a function to log all records so it will be easy to find a particular seller/supplier's ID. This information is very important considering all transactions will be interconnected with other items of choice menu. All the options in this menu have permanent inner links. The interface for public pages of this homepage is the default page when the display is first accessed with the base address. This page will display some sections that help users to find the required products through the E-Commerce system's site search engine, categories with parent and child. In addition, there is an automatic slide banner at the top, this is to provide announcements about the policy or information to be conveyed to visitors (consumers / customers)
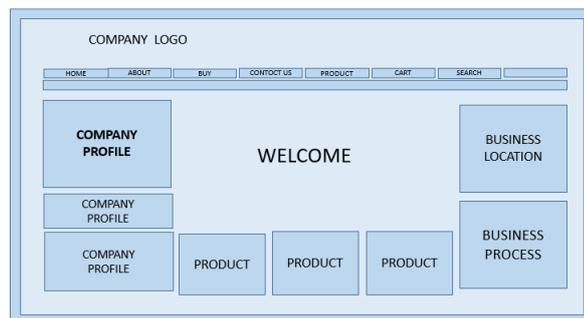

Figure 6 Mockup Design Main Page of E-Commerce System

Having a shopping cart page display on the visitor page. If a visitor makes a transaction by clicking the buy button, the item will go into the consumer's shopping cart. On that page, the data of purchased products and total payments to be paid by consumers will appear. (Figure 7).

For information showing order data such as member's data i.e. name, address, phone number and email as well as the name of the ordered product, the shipping cost, and the total price of the items ordered by e-mail. The system will send the destination account number for the payment through the email of the member ordering the product. If the data has been sent via email and within three days the payment confirmation is not received, then the admin will cancel the order by changing the member's booking status according to the established procedure and the delivery process will not be done or not performed.
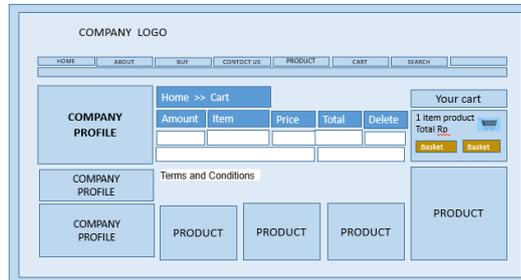
Figure 7 Mockup Design Shopping Cart Page of E-Commerce System

For information showing order data such as member's data i.e. name, address, phone number and email as well as the name of the ordered product, the shipping cost, and the total price of the items ordered by e-mail. The system will send the destination account number for the payment through the email of the member ordering the product. If the data has been sent via email and within three days the payment confirmation is not received, then the admin will cancel the order by changing the member's booking status according to the established procedure and the delivery process will not be done or not performed.
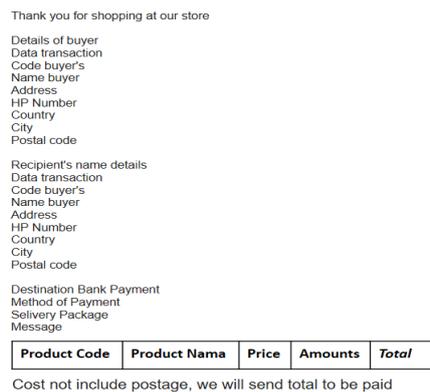

Figure 8 Order Confirmation Email of E-Commerce System

The system has a content to verify and validate. It is important considering all the item's data that have been entered into the shopping cart can not be used as data of the items to be paid. This is because the data has not been entered into the admin's bill of sale. To continue this process, the consumer must click the process button. After the process button is clicked then the the item's data in the shopping cart will proceed to the admin invoice. Below is a display that shows that the existing data in the cart is proceeded into admin's bill of sale. To make payment to the ordered items, the consumer must fill in the data on the confirmation payment form. But before filling in the data, the most important thing that cosumer must know is the invoice number. To get information about the invoice number, the consumer can click on the Invoices menu that is grouped into the shopping cart at the right of the site (Figure 9).
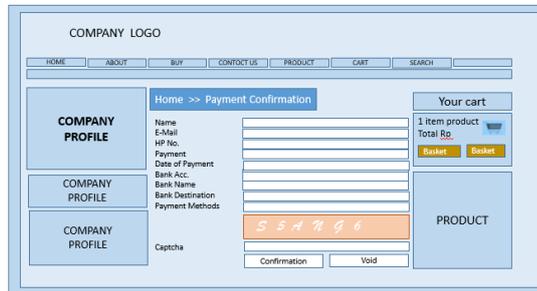
Figure 9. Payment Confirmation in E-Commerce System

This E-Commerce system provides a number of operational advantages, such as data processing is easier to track, payment systems become more accurate with no accounts receivable, inventory information is more accurate, developes personalized relationships with customers to become closer, and it is one of the company's competitiveness aspects. Also, the ability to identify customer needs that has not been met, eliminate time constraints for customers to obtain information about the products offered or the ongoing promotions, communicate with customers in a more clear manner and directly solve their immediate needs. All sidat processed products sold are no longer focusing to the domestic market only.

E-Commerce system has a navigation feature that provides convenience for visitors, in this case either consumers or buyers, while visiting the site's page. It contributes to problem solving as a guarantee for a customer's friendly information services and switch to the sales digitization of sidat processed products. Displaying certain messages in directing visitors, the prospective buyers can start the process of ordering goods online at anytime and anywhere as well as to get the most up to date information about sidat processed products.

The ability of the E-Commerce system offers many new opportunities, especially the opportunity to expand market target with low operating costs because all transactions can take place regardless of the time and place of business transactions.

5. Conclusion

E-Commerce system design for special sidat processed products has the facilities to store personal data members (members) with complete username and password to anticipate being misused by irresponsible people. E-Commerce System also provides payment facilities through bank transfer and Cash-On-Delivery. In addition, this application provides interesting features for members, such as the invite friends program, and gift of discount shopping vouchers when the member is having birthday. The architecture of this application can also be used to enter new data and change existing data as well as provide information about purchases made by the member to the shop owner. Provides information to members about the delivery status of the goods they purchased and the status of payment via e-mail. In order for E-commerce implementation to run well, especially on the client's side, it requires a hosting server that has a large capacity and fast access speed.

For further development, this E-Commerce system site can be added with news facilities on the development of information and technology so that the users and visitors can keep up with the latest developments. Complete with electronic payment system using credit card or other electronic payment system like PayPal. Provide several languages option to provide convenience to customers who are foreigners, and domiciled in Indonesia to place orders or make transactions.

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