

Development of Web-based Coffee Management Information System to support the Management of Regional Superior Products

Abstract. One of the areas in Alor Regency which the majority of people like to drink coffee is South of Alor. Coffee is considered a reliever of fatigue and drowsiness and provides additional energy before activity. The management of coffee in South of Alor is carried out by the Koperasi Beringin using raw materials from farmer groups from surrounding villages and sold in the form of packaging under the name Lonsilar Coffee. So far, Lonsilar's coffee production process has been using roasted machines, but the administration of the management still uses cash books and sales are limited to cooperative showrooms and souvenirs. Even though in terms of Telecommunications and Information Technology support, telecommunications infrastructure has reached the South of Alor District, moreover the majority of the people have used mobile phones/smartphones as communication media. This condition allows the development of a web-based coffee management information system so that administrative, promotional and sales processes are carried out through the website. The system is built using PHP language structure with database management using MySQL. The interconnection between users, products, and Koperasi Beringin is organized using detailed and integrated diagram algorithms. The system page can be accessed by the admin and user. Users can process transactions when they have passed the registration/registration stage, while the admin has full rights in managing, changing and verifying all processes. The system test results can run correctly according to recommendations in the Data Flow Diagram.

1. Introductions

Coffee is one of the drinks favored by people in Alor Regency. The hobby of drinking coffee causes people to be able to make coffee as a favorite drink or continuously drink coffee because it is considered as a reliever of drowsiness and giving stimulus (additional energy) before carrying out strenuous activities during the day. One area that the majority of the people like to drink coffee is South of Alor District. This area is ± 30 km from Kalabahi, the capital city of Alor Regency. Some villages in the South of Alor area are mountainous areas with altitudes between 1500 - 2000 m above sea level so that besides vanilla, the community also grows coffee plants and is processed through farmer groups. The annual coffee harvest is processed into coffee and sold to the Beringin KUD in the sub-district capital (Apui) (Microhidro & Power, 2014; Wabang, Laumal, Suharto, & Plaimo, 2018). KUD Beringin then processes and sells in the form of 100 grams and 250 grams. Packaging which was originally only in the form of ordinary plastic packaging, but a touch of mechanization through the

Community Service Program of the Republic of Indonesia Ministry of Research and Technology has changed the coffee processing model in KUD Beringin using a roasting machine with a capacity of > 5 kg, grinding using grinding machines, packaging using electric packaging machines, so that currently the ground coffee products named Lonsilar Coffee have been processed with better, cleaner, faster mechanization and packaged in more attractive attractive packages (Laumal, Wabang, Hattu, & Plaimo, 2017).

The administration, distribution and sale of packaged coffee from Alor Regency, namely Kopi Lonsilar and Kopi Cita Rasa Typically, only rely on manual administration systems using cash books, sales in cooperative showrooms and coffee as souvenirs. Whereas in terms of taste, aroma and protein content, Lonsilar Coffee has a distinctive smell and delicious taste (soft), 14.6 % Protein content and 35.18 % Carbohydrate, the content of antioxidant compounds to ward off free radicals in the body (Drug and Food Testing Center, 2018). With sales in showrooms, there has been an increase in demand for Lonsilar coffee by 2.5 % from the total production of 2 tons from 2016 when it was still conventionally processing into 3.5 tons of production a year.

As one of the superior products from Alor Regency (especially from South of Alor District), the management of Lonsilar Coffee continues to be improved both from the quality of its coffee powder, packaging and promotion. However, locations far and mountainous topography have limited coffee sales. Lonsilar Coffee sales have not yet come out of Alor Regency. On the other hand, South Alor district has quite good telecommunications infrastructure because several Telecommunication towers are available and serve the communication needs of the community through the use of mobile / smartphone communication devices. The use of manual cash books has provided several problems when making recapitulation of production and sales for Annual General Meetings (RAT). Cooperative staff must take more time to summarize all records of production and sales, not to mention getting sheets that have been lost due to water, the paper is damaged or has been torn. In the end the recapitulation produced was also invalid because of these problems. In terms of the development of communication and informatics (ICT) techniques, with the support of telecommunications infrastructure and the ease of designing online information systems, a web-based coffee management information system was developed to change the management, sales, and conventional reporting mechanisms using books to be web-based management that can accessed online.

2. Methods

WEB-based management system development is carried out with several stages, namely designing Context Diagrams, Designing Data Flow Diagrams, Designing Entity Relationship Diagrams (ERD) and designing data dictionaries that will be utilized in making information systems. The first stage is designing a Context Diagram as part of a data flow diagram that functions to map the environmental model, which is presented with a single circle that represents the entire system. Context Diagram highlights a number of important characteristics of an information system, namely groups of users (users), organizations or other systems that make communication or as terminators. Entry data, namely data received by the system from the environment and must be processed in a certain way. Data comes out, namely data generated by the system and given to the outside world (Suryati, 2015). The Context Diagram mechanism in the Web-based Coffee management information system is given in Figure 1

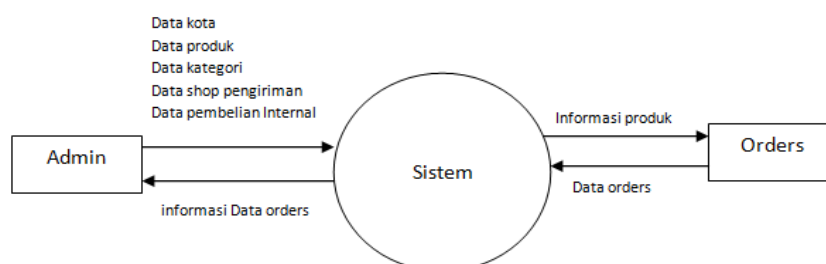


Figure 1. Context Diagram of a Web-based Coffee Processing System

In Figure 1, the Coffee management information system consists of 3 main parts, namely Admin as a system manager who can enter purchase data, sales and data recap, can see and change all data entered into the system. The second part is orders (parties), namely parties who will use the system to view the appearance of products, order, make payments and monitor the delivery process carried out by the system. The third part is the information system, in the form of an interface that displays information on products sold by cooperatives, prices and all stages of ordering, payment and monitoring, management of purchase and sale data and management process records that can be stored, displayed and printed. The second stage is designing Data Flow Diagrams (DFD) which is a logic data model or process that is made to describe where the data comes from and where the data that comes out of the system, where data is stored, what processes produce the data and the interaction between stored data and the process imposed on the data (Afyenni, 2014). DFD is generated in System Analysis and System Design, resulting in an Alternative Evaluation Hierarchy [7]. DFD for Coffee Management Information System is given in Figure 2. This DFD displays an overview of each process in more detail starting from the event of inserting coffee products as input, managing raw materials into packaged coffee (process) to packaging coffee distribution to buyers or customers / users (output).

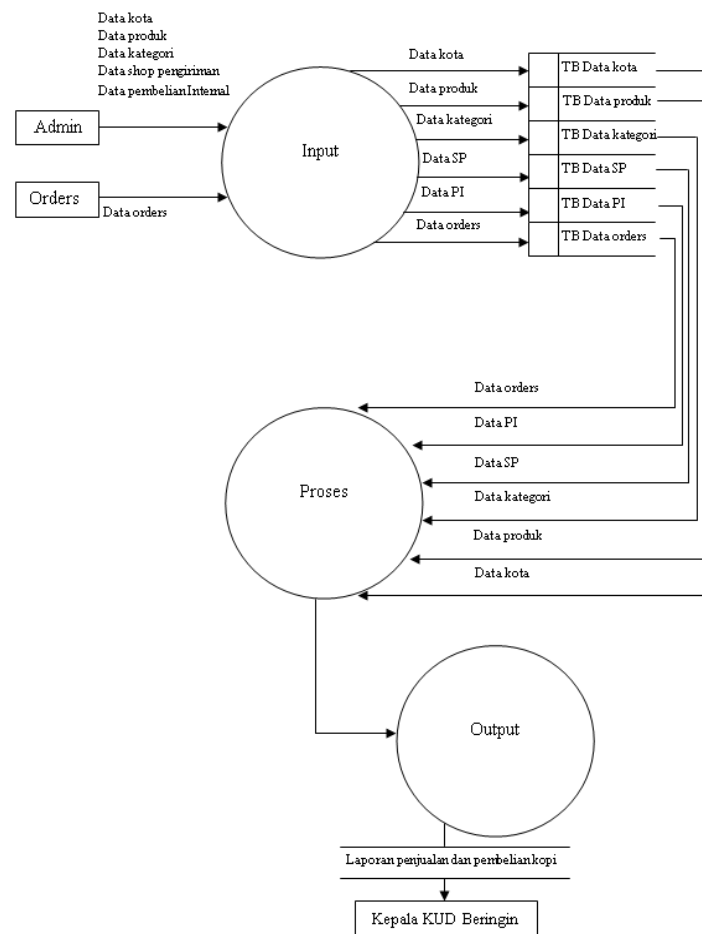


Figure 2. DFD Web-based Coffee Management System

DFD in Figure 2 consists of 3 parts, namely process input and output. The input data section consists of admin as inputting data, with inputted data in the form of coffee products in the form of packaged coffee and coffee beans purchased from farmers, data on categories of coffee beans, packaging of 100 g, 200g or 250 g, sales data , shipping data and purchase data carried out internally

both coffee beans from peani and keamsan coffee purchases carried out in the showroom. Orders or buyers as inputting data on orders to be purchased. The Process section consists of product data manipulation, category data, shipping shop data, internal purchase data and data orders in the coffee management information system. The Output section is the result of manipulating data from the coffee management information system that produces reports according to the processing process and transactions that occur in the system. The third stage is designing the Entity Relationship Diagram (ERD) which is one technique to form an activity development through an action diagram (Brinkkemper, 1996; Teorey, T., Lightstone, S., Nadeau, T., & Jagadish, 2011). ERD is also a conceptual model that describes the relationship between data storage (data files) using a number of notations and symbols to describe the structure and relationships between data, or ERD shows the relation or relationship between the tables to be made [10]. The ERD design for the Coffee Management Information System consists of 6 entities, namely orders/products, products, internal purchases, shop purchases, cities and categories. Entities are individuals who represent something tangible (existence) and can be distinguished from something else. Each entity has a relation to aribut, namely the description of the characteristics of the entity, described in the form of a circle or ellipse and becomes the key to the entity or key that is underlined. These entities are then developed into data dictionaries as tables in the database that are used as data storage locations inputted to the coffee management information system. The fourth stage in the development of a lonsilar coffee management information system, namely the design of the Data Dictionary. Data Dictionary is a list of data elements (parts of a database) that are used in the application of an information system (Anwar, Nugroho, & Lestariningsih, 2013). Some of the Coffee Management system Data Dictionary schemes are given in Table 1 and Table 2.

Table 1. Data Dictionary orders

No	field	Data Type	Length	Description
1	<u>id_orders</u>	Int	(5)	Primary Key
2	nama_kustomer	Varchar	(100)	
3	address	Text		
4	telpon	Varchar	(20)	
5	email	Varchar	(50)	
6	status_order	Varchar	(50)	
7	date_order	Date		
8	hour_order	Time		
9	id_kotaordering	Int	(3)	

This section as in Table 1 has 9 fields, namely id_orders (as primary key), nama_customer, address, telephone, email, status_order, time_order, jam_order, kota. Masing-masing also has a data type and length of data that is tailored to the data processing requirements in the information system.

Table 2. Product Data Dictionary

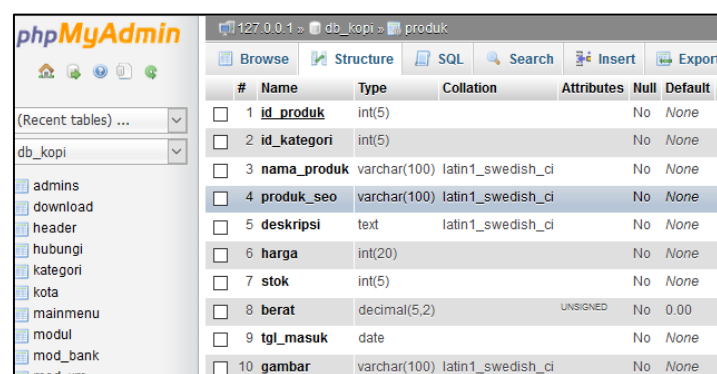
No	field	Data Type	Length	Description
1	<u>product ID</u>	Int	(5)	Primary Key
2	id_category	Int	(5)	Foreign Key
3	product_name	Varchar	(100)	
4	produk_seo	Varchar	(100)	
5	description	Text		
6	price	Int	(20)	
7	stock of	Int	(5)	
8	weight	Decimal	(5.2)	
9	date	Date		
10	picture	Varchar	(100)	
11	purchased	Int	(5)	
12	discount	Int	(5)	

Whereas the Parts of Product in Table 2 have more fields due to being objects that can be processed by information Systems. Twelfth product field includes id_product (as primary key), id_kategori (as a foreign key), nama_produk, produk_seo, description, price, stock, weight, date of entry, image, purchase, discount.

3. Result and Discussion.

3.1. Making a Database for a Web-based Coffee Management Information System.

The database created is a database management that will accommodate all the data in the information system. The database is blinded using the Xampp application. The database that has been created contains tables with parameters specified in the system creation method. Display of one of the tables in the database is given in Figure 3.



#	Name	Type	Collation	Attributes	Null	Default
1	id_produk	int(5)			No	None
2	id_kategori	int(5)			No	None
3	nama_produk	varchar(100)	latin1_swedish_ci		No	None
4	produk_seo	varchar(100)	latin1_swedish_ci		No	None
5	deskripsi	text	latin1_swedish_ci		No	None
6	harga	int(20)			No	None
7	stok	int(5)			No	None
8	berat	decimal(5,2)		UNSIGNED	No	0.00
9	tgl_masuk	date			No	None
10	gambar	varchar(100)	latin1_swedish_ci		No	None

Figure 3. Display of tables in database management of coffee management information system

After filling in the table name and number of fields in the column provided, the creation is continued by filling in the teacher table fields according to the name fields, data types of fields and sizes of data from fields and stored. In the same way, the other tables are developed according to the design made. Tables in the database will correlate with each menu option that will be displayed on the system interface. Login menu with user table, product menu with tables of categories, descriptions, prices, stocks and other related tables. The ordering process also correlates with tables purchased, discounts, prices, banks and recapitulation.

3.2. Making and Implementing a Web-based Coffee Management Information System.

Lonsilar Coffee management information system was developed using the PHP programming language with the main display as in Figure 4.

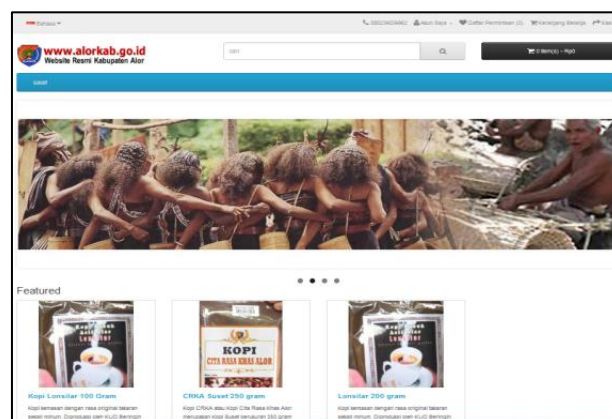


Figure 4. The main view of the Coffee Management Information System

3.2.1. There are 3 main parts in Figure 4, namely the header section that contains a display menu that can be used to log in, registration, view shopping documents (basket) and search links. In the second part, the program body displays a list of products that can be ordered by choosing which type of product you want. Each product has included product photos, prices and information about the product. The third part, the footer, displays additional information about the lonsilar coffee management information system.

Customers who will place an order can order directly through the front page of the information system or can also register first through the available login menu. The Login page displays 3 parts, namely if you register as a new customer, then the buyer can register through the new customer section. If the buyer has already made a transaction / order, then he can continue through the loyal customer section. Accounts that have been owned can be used to log into the lonsilar coffee management information system. In the third part, displays additional information about the user including changes to passwords, order history, periodic payments, purchases and rewards. The programming footage for the login menu is given in Figure 5.

```
<h2>Pelanggan Setia</h2>
<p><strong>Saya adalah pelanggan setia</strong></p>
<form action="http://www.kopialor.com/new/index.php?route=account/login" method="post"
  enctype="multipart/form-data">
  <div class="form-group">
    <label class="control-label" for="input-email">Alamat E-Mail</label>
    <input type="text" name="email" value="" placeholder="Alamat E-Mail" id="input-email"
      class="form-control" />
  </div>
  <div class="form-group">
    <label class="control-label" for="input-password">Kata Sandi</label>
    <input type="password" name="password" value="" placeholder="Kata Sandi" id="input-
      password" class="form-control" />
    <a href="http://www.kopialor.com/new/index.php?route=account/forgotten">Lupa Kata
      Sandi</a></div>
    <input type="submit" value="Log Masuk" class="btn btn-primary" />
  </form>
```

Figure 5. Snapshot of the program language for the login menu

Figure 5 shows that there is one menu named "I am a loyal customer" which if clicked will run the login page and request to fill in the email address label and password. But if the user accidentally forgets his account, then the user can run the "Forgot Password" menu for the password request procedure. When a user makes a transaction through product ordering, the user will select photos and product information found on the front page. After selecting the product, the system will display information such as Figure 6.

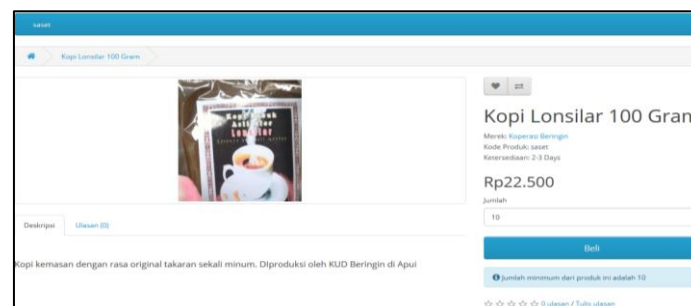


Figure 6. Early Ordering Stage

Figure 6 displays the start page when the user orders the product. The user will be faced with the stage of filling the product into the basket and choosing the number of products to be purchased. If it has finished and ensures the product, the system will allow the user to reconcile the entire order, enter the identity (including the destination of the shipment) and validate the certainty of funds transfer in accordance with the amount calculated by the system. The system also provides an opportunity to have a coupon if provided by the seller. If not, the user can process payments to the bank account that is

informed by the system, validate the transaction by uploading proof of delivery and the product will be sent to the user. The appearance of the recapitulation in the user's basket is shown in Figure 8.

Keranjang Belanja (3,50kg)					
Gambar	Nama Produk	Model	Jumlah	Harga	Jumlah
	Kopi Lonsdale 100 Gram ***	seket	10  	Rp22.500	Rp225.000
	CRKA Suset 250 gram	Kopi CRKA	10  	Rp22.500	Rp225.000
Apa yang ingin anda lakukan selanjutnya? Pilih jika Anda memiliki diskon kode atau poin reward yang ingin digunakan atau ingin untuk memperkirakan biaya pengiriman anda. Gunakan Kode Kupon ▾ Perkiraan Pengiriman & Pajak ▾					

Figure 7. Recapitulation of Shopping (Basket)

Figure 7 displays one of the stages of the transaction when the customer orders the product. On the order page, a list of products that have been selected appears, but the customer can still change both the product category and type. If the customer makes sure the data is correct, then the system page will recommend to proceed to the payment process. The payment system regulated in this system only uses bank transformers, so customers need to make payment transactions first, then the transfer proof document is submitted to the system. The payment receipt status will be received by the Admin and confirmed to the customer via the customer's e-mail address as proof that the product being spent temporarily is processed to be sent to the customer's address.

Admin has its own management page in a web-based coffee management information system. The Admin page is shown in Figure 9.

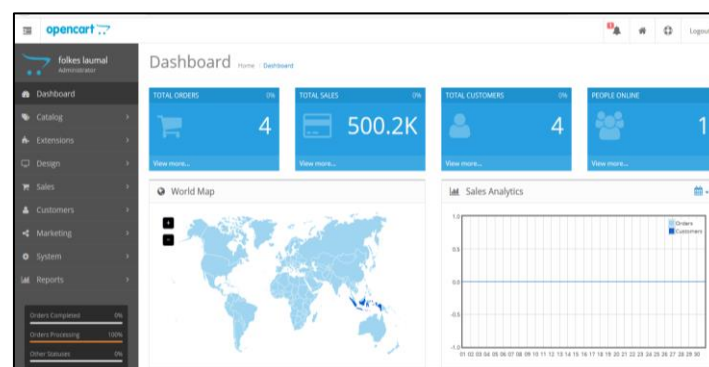


Figure 8. Periodic Coffee Management Recapitulation

Admin page designed consists of 2 parts, the left part displays menus that can be accessed for page management, while the right part displays the contents of each menu on the left. The Admin page has full access to a Web-based Coffee management information system. The Admin page as shown in Figure 9 displays the development of product introduction in graphical form that can be displayed weekly, monthly or yearly in preparation for the periodic evaluation. The Admin page also displays a catalog menu for entering products, reviewing products and customers, deleting customers and setting the layout of the webpage itself. The results of testing the implementation of a web-based coffee management information system show the data as in Table 3.

Table 3. Results of Testing the implementation of the use of a web-based coffee management information system.

No	Data Input	Recommended	Results achieved	
			True	False
1	Admin Login.	Admin page displayed	√	
2	Adding coffee products for sale.	All product categories can be input into the system.	√	
3	Add system and product descriptions.	The description results can be accessed by customers.	√	
4	Register as a customer and login.	The registration process is received and can log in to display the customer's page.	√	
5	Verify customer transaction data in the form of payment.	The transaction was successfully received and confirmed to the customer.	√	
6	Creating a transaction report is displayed on the Admin page.	Transaction reports appear on the admin page in the form of numbers and graphs.	√	

Table 3 shows that the web-based coffee management information system developed can work well when the admin and customer carry out transaction tasks. Admin managed to log in and manage admin pages, while customers also managed to register and make transactions from the account page.

4. Conclusion

The web-based coffee management information system is one of the efforts to develop superior products in the NTT area, especially processed coffee from Alor Regency. One of the processed coffee products from Alor is Lonsilar Coffee produced by the KUD Beringin in Apui and the typical Alor Coffee Taste produced by the Plantation Cooperative. Both are produced in the form of packaging. Coffee management in Alor Regency even though the processing has used machines, but the administration and sales management are still manual, so to avoid damage to management data and increase sales and promotions, a web-based management information system is developed. This system consists of 2 user bases, namely admin and customer. Admin has the right to full access to change and regulate the information system, while the user is only limited to seeing, ordering and making product shopping transactions. The test results show that the 6 parts of this information system testing can work well when accessed by the admin or by the customer.

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