Mobile-Based Marketing Application for Coffee Beans and Ground Coffee at Andatu Store

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ABSTRACT: Andatu Store, located in Danau Rata Village, Kisam Tinggi District, Ogan Komering Ulu Selatan Regency, is a single store that sells coffee beans and ground coffee from various selected types. Andatu Store faces several challenges related to the manual marketing process, which is detrimental to product quality. These challenges arise in the areas of coffee beans and ground coffee. The process of handling coffee beans and ground coffee is still mostly done manually, which may result in data loss and incorrect recording. Furthermore, stock monitoring at Andatu Store is still mostly done manually, contributing to delayed decision-making and inaccurate sales recapitulations. All these problems highlight the need for information technology solutions to improve efficiency and accuracy in the selling process, enable real-time stock monitoring, and facilitate communication between Sellers and buyers.

KEYWORDS: Marketing, Coffee Beans, Ground Coffee, Efficiency, Web-Based and Mobile Application.

I. INTRODUCTION

The advancement of information technology is progressing very rapidly. Various components and methods developed in this technology aim to support a more practical life. The development of information technology plays an important role in meeting human needs, such as providing facilities for processing and presenting various information.[1] The rapid advancement of technology has a significant impact on people's activities in various aspects of life. From selling goods, purchasing items, monitoring stock, to conducting transactions, everything can now be done online simply by using internet-connected gadgets[2].

Andatu Store, located in Danau Rata Village, Kisam Tinggi District, Ogan Komering Ulu Selatan Regency, South Sumatra, is one of the stores that markets coffee beans and ground coffee from various selected types. The operational activities in the marketing process of coffee beans and ground coffee are still conducted manually, such as product promotion, which is only carried out in a few nearby local stores. The explanation of prices and types of coffee is still conducted directly with the local store owners, while the management of marketing records is done using paper media. This has the potential to cause the loss of sales records, whether daily, monthly, or annually, which can result in losses for the store because the marketing records do not align with the number of products sold. In addition, the store owners face difficulties in monitoring the product marketing process. This monitoring process is conducted by reviewing sales records from manual entries on paper, which takes a considerable amount of time.

To optimize the marketing of coffee beans and ground coffee at Andatu Store, a "mobile-based coffee bean and ground coffee marketing application" has been implemented. This application is expected to enhance services at Andatu Store and provide convenience for consumers in viewing prices, types, and information regarding coffee beans and ground coffee, as well as facilitate online transactions. Additionally, the application provides store owners with ease in explaining products through a website connected to the consumer application, monitoring product marketing, and reviewing sales records.

II. LITERATURE REVIEW

Several previous studies with similar themes and fields have yielded results relevant to this research.

Research related to a marketplace for processed coffee beans conducted by Rinjeni et al. (2020), titled *"Implementation of Gamification in a Website-Based Marketplace Application for Processed Coffee Beans Sales,"* successfully implemented six gamification elements: points, badges, challenges and quests, levels, leaderboards, and rewards. These elements effectively motivated buyers and sellers to increase the frequency of transactions, with a gamification success rate of 87.37%. The purpose of this analysis is to help streamline the marketing chain used by coffee bean enthusiasts or processors in conducting online sales and purchases [3].

The research conducted by Hafizar et al. (2022), titled *"Design and Implementation of an Information System for Marketing Arabica Coffee Beans and Ground Coffee Based on Android,"* analyzes issues related to the conventional sales

model still in use today. This model is considered inefficient because the coffee ordering process often takes a long time due to unstructured conversations. Customers must explain the coffee they want in detail, and this information is often not conveyed effectively to the seller. This complicates the seller's efforts to find coffee that meets the customer's needs, especially if the customer does not fully understand the type of coffee they want. Therefore, a system is needed to simplify the marketing process of Arabica coffee.[4].

The research conducted by Herimbang and Murtaka (2023), titled *"Sales Information System and Monitoring of Coffee Bean Roasting Activities at Reach Coffee,"* analyzes the challenges currently faced by Reach Coffee Tambun. The sales process is still conducted manually, including transaction recording and inventory management. Additionally, employee attendance is not integrated into the system, sales reports are still prepared manually, and there is no monitoring of the coffee roasting process. By integrating a sales information system with monitoring for the coffee roasting simulation machine, it is expected that these issues can be addressed, thus meeting the needs of the Reach Coffee Tambun sales business. This application enables employees to place orders, conduct sales, and process payments more easily and efficiently without the need for manual recording. Inventory management becomes more efficient, eliminating the reliance on manual methods. Employee attendance can also be managed more effectively, and sales reports are organized and accessible in real-time, anywhere, and accurately. Furthermore, this application simplifies the management and monitoring of the coffee roasting process using a simulation machine[5].

The research conducted by Rastiwi et al. (2023), titled "Design and Development of an Android-Based Application for Selling Original Semende Coffee Powder at UMKM Ibu Nurbaiti," analyzes the challenges faced in the sales process. Currently, Mrs. Nurbaiti's sales process is not optimal because her system lacks a supporting information infrastructure, resulting in ineffective and inefficient sales and promotions. Additionally, this MSME is not well-known to the public. Therefore, an information system is crucial for Mrs. Nurbaiti's MSME to significantly increase sales. By leveraging advancements in information technology and the expanding internet access, an information system can play a vital role in promoting local commodities, including Semende coffee[6].

The research conducted by Selao (2023) titled 'E-Commerce Coffee Beans in the Android-Based Kopiesme SMEs in Ankrekang City' provides an analysis of the problems faced by Kopiesme Coffee, where the sales system in use is still manual and not computerized, making it prone to information errors; therefore, this application was built to make it easier for coffee lovers to choose coffee according to their taste without having to go directly to the coffee shop to buy coffee beans[7].

A. Theory
1. Andatu Store

Andatu Store in Danau Rata Village, Kisam Tinggi District, Ogan Komering Ulu Selatan Regency, South Sumatra, is one of the stores that sells coffee beans and powder from various selected coffee types.

2. Monitoring

Monitoring is the process of collecting and analyzing information based on systematically and continuously established indicators regarding an activity or program. This process aims to implement necessary corrective actions for the improvement of subsequent activities. [3]. Monitoring has several objectives, namely:

a. Reviewing whether the planned monitoring activities are in accordance with the initial plan
b. Observing and monitoring every activity of the monitoring process towards the program object
c. Identifying every problem that arises so that it can be resolved quickly.
d. Adjusting activities to the changing environment without deviating from the initial goals, and conducting assessments and management to ensure that the work patterns used are in accordance with the plan and capable of achieving the activity goals

3. Marketing

Marketing is a managerial process that enables individuals or groups to fulfill their needs. To achieve the planned objectives, individuals or organizations must offer and exchange valuable products or services with others [8] This activity encompasses all aspects of delivering products or services, from producers to consumers. Additionally, marketing also involves activities carried out by companies to promote their products or services. Marketing activities include advertising, sales, and the delivery of products to consumers or other companies. [9]

4. coffee bean

Coffee beans are the seeds of the coffee plant, which belongs to the Rubiaceae family. In Indonesia, there are two known types of coffee beans: Robusta coffee beans (Coffea canephora) and Arabica coffee beans (Coffea arabica). Research findings indicate that the chlorogenic acid content in Arabica coffee beans is 7.73%. Coffee beans also contain various compounds, including caffeine, palmitic acid, linoleic acid, and stearic acid. Additionally, coffee beans are rich in polyphenols, particularly caffeoylquinic acids (CQAs), feruloylquinic acids (FQAs), dicaffeoylquinic acids (diCQAs), and chlorogenic acids. Among these polyphenolic compounds, chlorogenic acid is the most abundant in coffee beans [3].

Coffee is one of the plantation crops that has been cultivated and grown for a long time and holds a relatively high economic value in society. Globally, coffee consumption consists of 70% Arabica varieties and 26%

Robusta species. The origin of coffee can be traced back to Africa, specifically to the mountainous regions of Ethiopia. However, coffee gained worldwide recognition after it was cultivated outside its native environment, particularly in Yemen, southern Arabia, through Arab traders [10].

5. **Coffe Powder**

Coffee powder is a beverage made from ground coffee beans brewed with water and sometimes sugar. When prepared, this coffee drink often leaves a residue. Coffee powder is a popular choice among both older and younger generations[11].

6. **Web**

A website is a collection of interconnected pages that typically includes a combination of data provided by individuals, groups, or institutions. It is usually hosted on a web server and can be accessed via the internet. Websites contain various types of information in digital format, including text, images, videos, audio, and animations, all presented online [8].

7. **Application**

Applications are a subclass of computer software that leverage the capabilities of computers for implementation. An application serves as a repository for data, problems, and tasks, organizing them into a medium or container suitable for addressing specific issues. This enables the application to transform these elements into a new form while preserving the fundamental aspects of the data, problems, and requirements. Additionally, applications function as user-friendly tools, allowing users to efficiently work on the tasks they input[8].

III. RESEARCH METHODOLOGY

The stages involved in the implementation of the research are illustrated in the chart below:
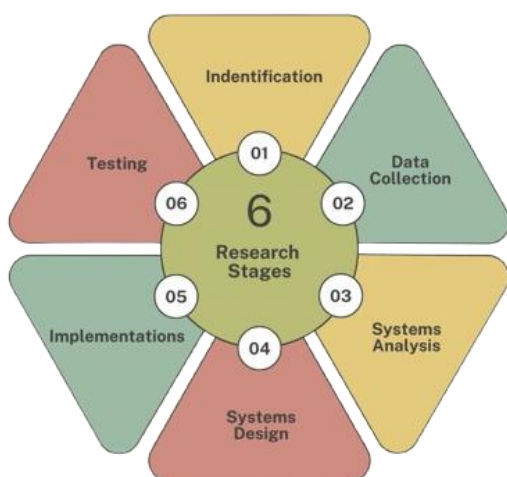

Figure 1. Research Stages

A. Indentification

The first step taken in this research is to identify the problems faced by Andatu Store, including:

1. The manual marketing process limits the effectiveness of promotions and communication regarding prices and types of coffee to consumers.
2. The management of sales recaps using paper media is prone to loss, leading to inaccuracies in sales calculations and potentially resulting in financial losses.
3. Difficulties in monitoring marketing and sales arise from manual recording, which is time-consuming and inefficient.
4. The lack of efficiency in service and transactions indicates that store owners and consumers require a more modern system to facilitate access to information and enable online transactions.

B. Data Collection

At this stage, the researcher conducts observations to collect data by observing and gathering the necessary information for the research [12] The author collects data that will be processed into an information system and monitors sales at Andatu Store using several methods.

1. Observation

At this stage, the author conducts observations to request permission to carry out research at Andatu Store and to collect information related to the data needed for this research.

2. Interview

The interview was conducted directly with the owner of Andatu Store, covering the following topics:

a. First informant: The owner of Andatu Store, discussing the store's history and how data is managed in the store.

b. second informant: The wife of the owner of Andatu Sore, with a focus on how to monitor product availability, manage sales data, and handle transactions or purchases in the store.

C. Systems Analysis

System analysis functions to formulate and explain in detail the needs within the system. Through this process, it is hoped that all system components can be clearly delineated, allowing for the identification and evaluation of various problems and needs that need to be addressed. Based on the analysis conducted at Andatu Store, the following can be identified

1. **Ongoing system analysis**

At Andatu Store, the operational activities in the marketing process of coffee beans and powder are still carried out manually. Product promotion is only conducted in a few nearby local stores, and explanations regarding prices and types of coffee are provided directly to the store owner. The management of marketing recaps using paper media is at risk of losing sales data, whether in daily, monthly, or yearly periods, which can lead to losses for the store as the marketing recap calculations do not align with the amount of products sold. Additionally, the store owner faces difficulties in monitoring the

product marketing process, which is done by reviewing sales recaps from manual records on paper media, requiring a considerable amount of time.

2. Proposed System Analysis

Functional needs analysis is an analysis conducted to provide an overview of the needs regarding the ongoing problems and procedures. [13].

1) Admin

The admin has access rights to manage incoming data, including data on coffee bean and powder purchases, transaction data, and transaction cancellation data. Additionally, the admin can also manage product data, which includes deleting, editing, and adding products.

2) User

Users as customers have access to register and log into the system, purchase coffee beans and ground coffee, as well as conduct transactions and cancel product order.

3. Non-functional requirements

1) Software requirements : DB Sqlite, Android Studio dan windows.
2) Hardware requirements: Laptop dan smartphone.

D. **Systems Design**

The stages carried out in the system design process require several designs to build a coffee bean and powder marketing application. one of which is the system architecture design. The following is the system architecture designed for the application to be implemented at Andatu Store, which can be seen in the image below:
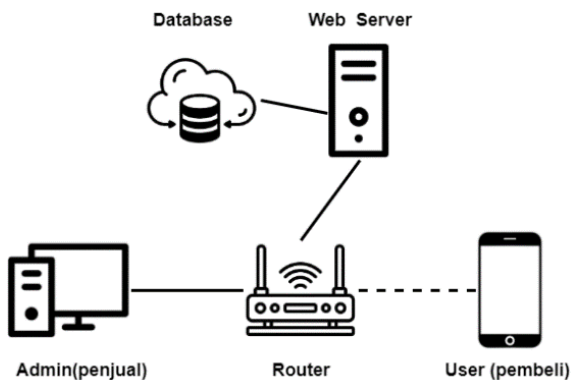

Figure 2. System Architecture

E. **Implementation**

The system implementation stage in the development of a mobile-based coffee bean and powder marketing application is an important step that transforms concepts and designs into operational solutions. At this stage, the designed system is implemented into the final product, with the website used by the admin implemented using Python and the Laravel framework, and the user application used by users and developed using Android Studio with the Kotlin programming language.
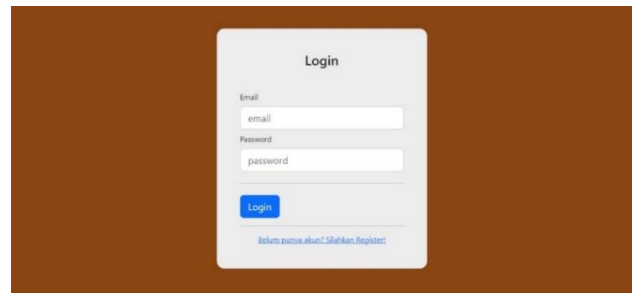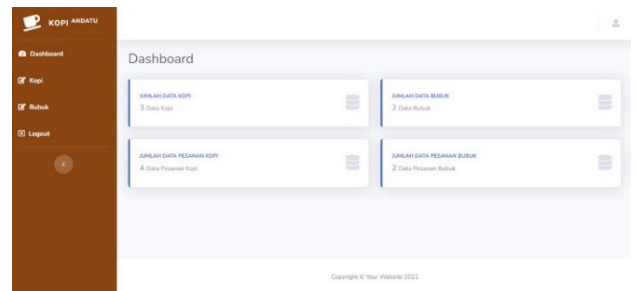
1. **Website**

Figure 3. Login Page

Figure 4. Dashboard Page
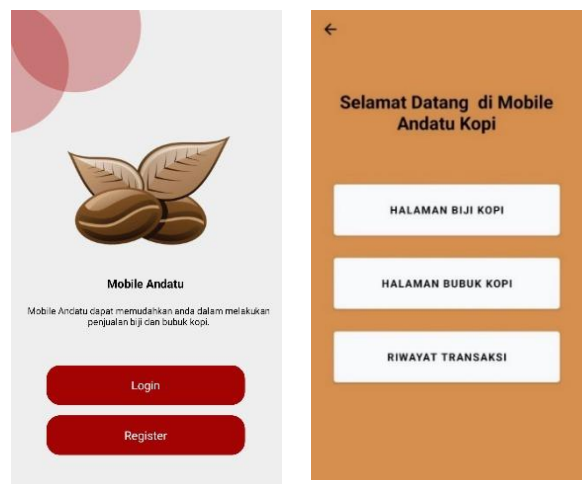
2. **Mobile Application**

Figure 5. Home screen and Dashboard Page

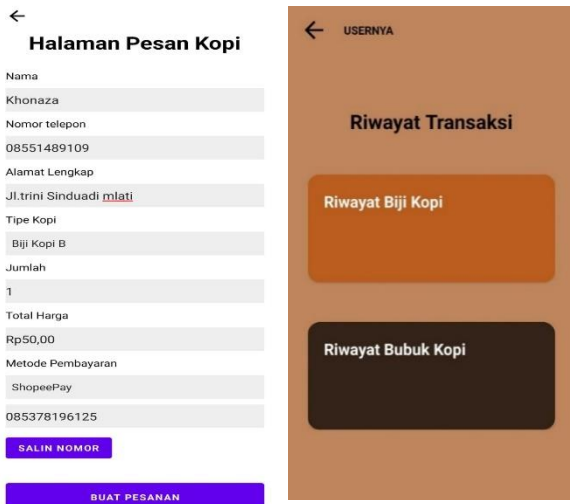**Figure 6. Coffee Bean Sales Page and Coffee Detail Page**

Figure 7. Coffee Order Page and Page to Order Coffee Powder

F. **Testing**

In building a system, one of the important elements that must be carried out is the system testing them. This testing aims to evaluate the accuracy of the system, both in terms of Logic, functionality and interaction with the database [14]. Through this testing, the shortcomings or weaknesses of the built system can be identified. This testing uses the black box method, which is a functional testing of the program. In this method, the system is tested by executing all features to ensure that the expected results align with the specifications of the system to be built.[15][16].

Test Case Name	Coffee Beans and Ground Coffee Purchase Transaction
Description	The user makes a purchase transaction for coffee beans or ground coffee through a mobile application
Initial Condition"	- The user has logged into the application. - Logged in using an account registered in the application - Visits the payment page after selecting the product.
Test Date	17 October 2024

Scenario
1) The user accesses the purchase transaction page after selecting coffee beans or ground coffee. 2) The user fills in the transaction details. 3) The user selects the transaction method (Ovo, Dana, and ShopeePay). 4) Click the "Create Order" button. 5) The user completes the transaction with the selected transaction method.. 6) After successfully completing the transaction, the buyer can view the transaction history in the provided feature.

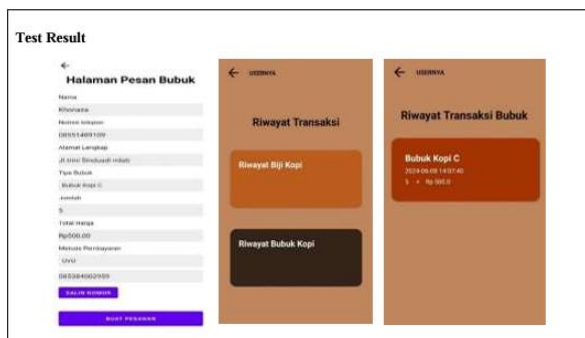| Expected	Observation	Result
The system will process the purchase transaction and will insert the purchase transaction into the transaction history list	The system will process the purchase transaction and add it to the transaction history list	Valid

Figure 8. Testing the Purchase Transaction

No	Testing Scenario	Test case	Expected Outcomes	Hasil
1	All fields are not filled in.	Name: - Phone number: - Full address: - Type of coffee: - Quantity: - Total price: automatically from the server Payment method: -	The system cannot process the order; all textboxes will have exclamation marks and display the message "name must be filled in."	valid
2	Just fill in the name.	Name: khonaza Phone number: - Full address: - Type of coffee: - Quantity: - Total price: automatically from the server Payment method: -	The system cannot process the order and will display the message "phone number cannot be empty."	Valid
3	Just fill in your name and phone number.	Name: khonaza Phone number: 1234567 Full address:- Type of coffee:- Quantity:- Total price: automatically from the server Payment method:-	The system cannot process the order and will display the message "address cannot be empty."	Valid
4	not choosing the order type	Name: khonaza Phone number: 1234567 Full address: hhjjjhjh Type of coffee: - Quantity: - Total price: automatically from the server Payment method: -	The system cannot proceed but will automatically fill in the order type with the top choice.	valid
5	Filling in the data but not filling in the order quantity	Name: khonaza Phone number: 1234567 Full address: hghghghg Type of coffee: A Quantity: - Total price: automatically from the server Payment method: -	The system cannot proceed and will display the message "amount cannot be empty."	valid
6	Not choosing a payment method	Name: khonaza Phone number: 1234567 Full address: hghghghg Type of coffee: A Quantity: - Total price: automatically from the server Payment method: -	The system will continue, but the payment method will automatically use the method in the first option.	valid

Figure 11 shows the test results indicating that the functionality of the features for the user performing the purchase transaction was successfully executed without any errors. The results of the testing are displayed in Figure 12. The conclusion is made based on the alignment between the test results and the expected system outcomes

IV. RESULT

By using the SDLC method and black box testing, the development results of the coffee bean and powder marketing application show conformity with user specifications and needs. This application successfully provides the expected functionality and is easy for users to understand, making it suitable for use in the sales process. This marketing application is designed to improve efficiency in the sales process and facilitate users in purchasing coffee beans and powder online. Users can easily access product information, place orders, and complete payments through their smartphones. In addition, this application also provides convenience for producers to monitor stock, manage orders, and improve customer service. With this application, it is expected that users can experience comfort and ease in transactions, as well as help producers increase sales and optimize business management. This application is equipped with a sales analysis feature that provides insights into purchasing trends, thereby enhancing marketing strategies.

V. CONCLUSION

Based on the discussion above regarding the coffee bean and powder marketing application, it can be concluded:

1. The coffee bean and powder sales application has been designed and developed by providing various features such as a coffee bean purchase feature, a coffee powder purchase feature, and a transaction history feature, which offer convenience for customers in making purchases and viewing their transaction history

2. This system is equipped with transaction history reports, so data storage has been computerized

3. With the presence of this mobile-based coffee bean and powder ordering application, it can assist store owners (admins) in their operational activities

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