JURNAL ILMIAH METADATA, E-ISSN :2723-7737, Vol.7 No.2
Edition May 2025, Published : 30-05-2025, Page 50-64
DOI: 10.47652/metadata.v7i2.612

ANDROID-BASED INVENTORY INFORMATION SYSTEM FOR FOOD EXPIRATION DATE ALERTS AT PEPPER LUNCH RESTAURANTS

By
Taufiqqurrachman[1], Arina Nurrohmah[2], Warno[3], Sanmetha Wahyu Kusumawati[4]
[1,2,3,4] Fakombis Universitas Saintek Muhammadiyah, Jakarta
Email: taufiq1219@gmail.com[1], arinanurrohmah46@gmail.com[2], warnooke@gmail.com[3], sanmethawahyu32@gmail.com[4]

ABSTRACT

Nowadays, many people use information technology, such as cellphones, for communication, entertainment, and even work. In a sense, all aspects of life cannot be separated from information technology. This is no exception in the food and beverage sector, which cannot be separated from the condition of the beverage and food, such as expiration. This indicates that the need for an information system regarding food products and expiry date warnings on food products in order to obtain good quality food products is very important. The aim of this research is to provide a solution through the study of several theories and interviews with managers in order to design an information system for incoming and outgoing food products and Android-based food product expiration date warnings to make it easier and more efficient to check expiry dates. The application development methodology that the author uses is the FIFO (First in First out) and FEFO (First Expired First Out) methods. The programming language used is the Java programming language. It is hoped that the results of this research, entitled "Inventory Information System for Android-based Expired Date Warning for Food Ingredient Products at the Pepper Lunch Restaurant", will make it easier for restaurant employees to check expired date of food stock.

Keywords: System, Information, Product, Android

SISTEM INFORMASI INVENTORY PERINGATAN EXPIRED DATE BAHAN MAKANAN BERBASIS ANDROID PADA RESTORAN PEPPER LUNCH

ABSTRAK

Di zaman sekarang banyak yang menggunakan teknologi informasi, seperti handphone, untuk melakukan komunikasi, hiburan, bahkan bekerja. Dalam arti, seluruh aspek kehidupan tidak terlepas dari teknologi informasi. Tidak terkecuali di bidang makanan dan minuman, yang tidak terlepas dari keadaan minuman dan makanan, seperti kedaluarsa. Hal ini menandakan bahwa kebutuhan akan sistem informasi mengenai produk bahan makanan dan peringatan expired date pada produk bahan makanan agar mendapatkan kualitas produk bahan makanan dengan baik, sangatlah penting. Tujuan dari penelitian ini adalah untuk memberikan solusi melalui pengkajian beberapa teori dan wawancara terhadap manager dalam rangka perancangan sistem informasi keluar dan masuk produk bahan makanan dan peringatan expired date produk bahan makanan berbasis Android agar lebih mudah dan efisien dalam pengecekan expired date. Metodologi pengembangan aplikasi yang penulis gunakan adalah metode FIFO (First in First out) dan FEFO (First Expired First Out). Bahasa pemrograman yang digunakan adalah bahasa

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pemrograman Java. Hasil penelitian ini diharapkan pada judul "Sistem Informasi Inventory Peringatan Expired Date Produk Bahan Makanan Berbasis Android di Restoran Pepper Lunch" akan memudahkan karyawan restoran dalam pengecekan kedaluwarsa pada persediaan bahan makanan.
Kata kunci: Sistem, Informasi, Produk, Android

INTRODUCTION

Nowadays, the world of technology is experiencing rapid progress and development. One of the most significant advances in information technology applications is Android. The development of information technology can be utilized to improve business performance, one of which is in the restaurant industry. The application of information technology progress is an information technology application used to check the expiration date of food products. The use of this application can save time and effort. One of the issues with inventory management is the lack of thoroughness in checking the expiration dates of food products. This Android application can serve as an alternative method for notifications or alerts if any food products have expired, ensuring that food products remain in good quality. The research was conducted after observing and interviewing supervisors, and it was found that the current system still has issues, including the manual process for checking expiration dates, where employees write invoices for newly arrived food products, directly inspect the products, check the expiration dates on paper sheets, and verify the label codes on the product labels. This requires employees to be more meticulous when checking expiration dates.

To resolve the issues at Pepper Lunch restaurants, an application needs to be developed to facilitate employees in checking the expiration dates of food ingredients in stock at the restaurant so that the quality of the food ingredients to be served remains well maintained. Since service is the primary factor in this restaurant business, the business owner must maintain the quality of the food ingredients as a form of good service to ensure customers feel well taken care of, satisfied, and happy, thereby encouraging them to return to enjoy the dishes at Pepper Lunch Restaurant. With this background, the author conducted research at Pepper Lunch Restaurant with the aim of helping Pepper Lunch Restaurant maintain the quality of the food ingredients served to customers by recording and monitoring all expiration dates on food

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inventory. With this Android-based application, employees responsible for food quality will be greatly assisted in checking the expiration dates of food inventory.

RESEARCH METHODS

Research at Pepper Lunch Restaurant located at Trans Studio Metropolitan Cibubur - Jl. Alternatif Cibubur No. 230 A, Harjamukti, Cimanggis District, Depok City, West Java 16454, was conducted through a survey at the restaurant for data collection. The survey was carried out through observation or direct observation at Pepper Lunch Restaurant and interviewing the restaurant supervisor regarding the ordering procedures for food ingredients. Secondary data was obtained from relevant documents, namely audio recordings and notes. The inventory methods used by Pepper Lunch Restaurant are FIFO (First In First Out) and FEFO (First Expired First Out). This study employs a qualitative method. The following is an explanation. Qualitative Methods Qualitative methods focus on collecting and analyzing unstructured data. Qualitative methods can be used to study user experiences, preferences, and expectations regarding Android application features and interfaces. Data collection using qualitative methods is carried out by:

a. Interview restaurant supervisors to obtain information about the challenges they face in managing inventory and expiration dates.

b. Observation, which involves observing to understand how food products and expiration dates are currently recorded and managed.

The types and sources of data used in this study are secondary data and primary data. Secondary data and primary data can be used separately or together. Secondary data can be used to find additional information about more in-depth research by existing parties. Meanwhile, primary data is data collected by researchers directly at the research site to achieve objectives, such as surveys, observations, interviews, and has not been collected by existing parties. The data collection procedure is as follows:

1. Identify data needs The type of data needed is an inventory information system. This includes food stock, expiration dates, and other relevant data.

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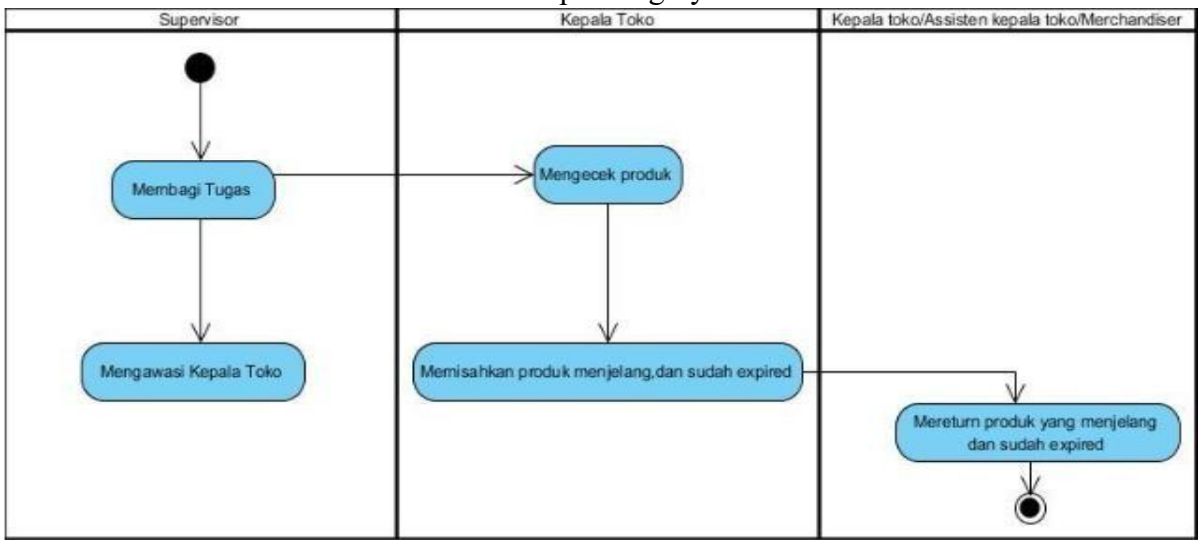
2. Determining the Data Collection Method Determine the appropriate data collection method.

3. Data Validation After the data is entered into the system, the next step is to validate the collected data. Ensure that the data entered is accurate, complete, and relevant. Conduct data checks and verify the accuracy of the information entered to prevent data errors.

The analysis in this study is the expiration date, where this analysis is to monitor the expiration dates of food ingredients stored in inventory and the expiration date data of food ingredients is taken to find out if the food ingredients are about to expire or have already passed their expiration date. This can help in monitoring expiration dates. Based on the analysis of the current system, the process of checking the expiration date at Pepper Lunch restaurants is still manual, using paper on newly arrived food products, then employees record the expiration date on paper in the form of a checklist. The process of checking the expiration date using barcodes on food products that have been opened involves employees recording the expiration date and the barcode of the packaging. The current system is highly inefficient, requiring employees to remember and pay close attention to expiration dates. After analyzing the issues with the existing system, the researcher proposes that food expiration dates be managed using an inventory information system that alerts employees to expiration dates, thereby facilitating employee access to data and the dissemination of available information.

Table 2.1 Operating Systems



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The following is an explanation of the current system:

1. The supervisor assigns tasks to the store manager, then after the tasks are evenly distributed, the supervisor supervises the store manager's work.
2. The store manager carries out their respective tasks and separates products that are about to expire, products that have expired, and then returns products that are about to expire.
3. The stock keeper returns expired food items to the supplier.

Issues with the Current System

a. Internal, The internal issues are as follows:

1. Data inaccuracy: the expiration date data stored in the system may be inaccurate or not updated in a timely manner. This leads to errors in checking the expiration dates of food products.
2. Inventory errors: food product inventory is not properly configured. This results in insufficiently thorough checks of food products.
3. System functional limitations: the system used is still manual, resulting in limitations in managing and monitoring expiration dates. Features such as expiration date alerts are not available.

b. External, The external issues are as follows:

1. Inaccurate Supplier Information: Information regarding expiration dates from suppliers may not always be accurate or complete. This can make it difficult for the system to monitor and provide accurate alerts.
2. Variability in Product Shelf Life: Food products may have varying shelf lives, depending on the type of product and storage conditions. This can make it difficult for the system to manage specific expiration date alerts for each product.

RESULTS AND DISCUSSION

a. System Implementation

Results of implementing the Android-based Food Ingredient Expiration Date Warning Inventory Information System at Pepper Lunch Restaurant:

a) Login Screen

Figure 3.1 Login Screen

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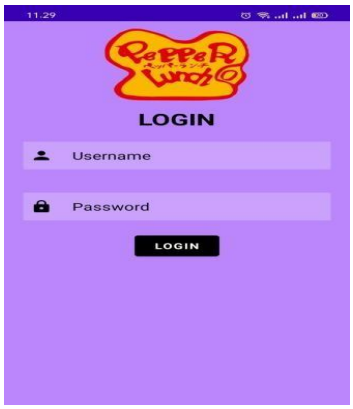

Is a login page used by administrators to access the Food Ingredients Product List.

b. Food Ingredients Product List Display

Figure 3.2 Display of Food Ingredients Product List

Figure 3.2 shows the food product list page used by the admin to add item names and expiration dates.

c. Expired Date Reminder Display

Figure 3.3 Expired Date Reminder Display

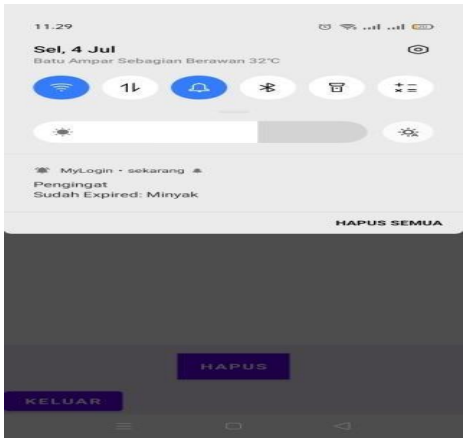

Figure 3.3 shows a reminder that the food product has expired.

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d. Testing

1) Black Box Testing of the Expired Date Reminder Information System for Food Ingredients at Pepper Lunch Restaurants using the black box method

a) Login Page Testing Plan

Table 3.1 Login Page Test Plan

No.	Sub Testing Tested	Test Details	Kind Testing
1	Login	Admin logs in	Black Box

b) Testing Plan Foodstuff Product List Page

Table 3.2 Ingredient List Page Testing Plan

No.	Sub Testing Tested	Test Details	Kind Testing
1	Add	Admin add item name & expireddate	Black Box
2	Wipe	Admin delete item list & expired date	Black Box
3	Out	Admin logs out to the login menu	Black Box

c) Expired Date *Reminder Testing Plan*

Table 3.3 Expired Date Reminder Testing Plan

Yes	Sub Testing Tested	Test Details	Kind Testing
1	Reminder	Expired date reminder	Black Box

2) Validation

User Acceptance Test (UAT) is a testing stage that involves the end users of a system to ensure that it meets business requirements and functions properly in a production environment before it is officially launched.

a) Login

Page Testing

Table 3.4 Login Page Testing

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No.	Name Testing	Activity Testing	Results Expected	Result
1	Enter	Log in to the application when the *username* and *password* entered are incorrect	If *the username* and *password* are wrong, then the application provides information	Succeed
		Log in to the application when the *username* and *password* entered are correct	If *the username* and *password* are correct, then the application enters the list of grocery products	Succeed

b) Testing of Food Product List Page

Table 3.5 Testing of Food Product List Page

No.	Name Testing	Activity Testing	Results Expected	Result
1	Add	Fill in the item name and expired date, press the plus button	Displays a list of item names and expiration dates.	Succeed
2	Wipe	Pressing the item name list and expired date, select the "yes" or "no" button	If you select "yes", the item name list and expire date date are deleted	Succeed
3	Out	Press the back button, select "yes" or "No"	If you select "yes", then the application will return to login page .	Succeed

c) Expired Date Reminder Testing

Table 3.6 Expired Date Reminder Testing

Yes	Name Testing	Activity Testing	Results Expected	Result
1	Reminder	Fill in the item name and expired date	If the foodstuff product has an expiration date, then there is a reminder that the expiration date has been	Succeed

a) Proposed System Design

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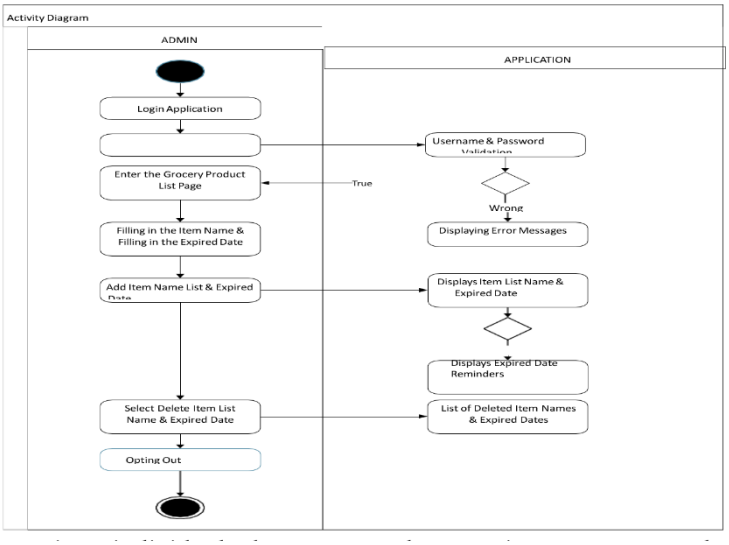
The system design proposed in this study is to check the expiration date of foodstuffs products more efficiently. The proposed system design is:

Figure 3.4 Proposed System Design



b) System needs analysis

is analyzing needs by identifying the needs obtained based on user needs and system needs A user is an individual who uses a product, service, or system. In the context of information and communication technology, users often use certain software, Android applications, websites, or hardware. In running the created application, the users needed, namely:

a. Admins who are in charge of running the system, such as inputs, expired date food products, delete them from the system that has been created.
b. The user is the user of the system that has been created, the user himself is the Expired Date Grocery Product List.

c) System Design System

Design (Entity Relationship Diagram, DFD/UML, Normalization) Proposed UML diagram:

a. Activity Diagram

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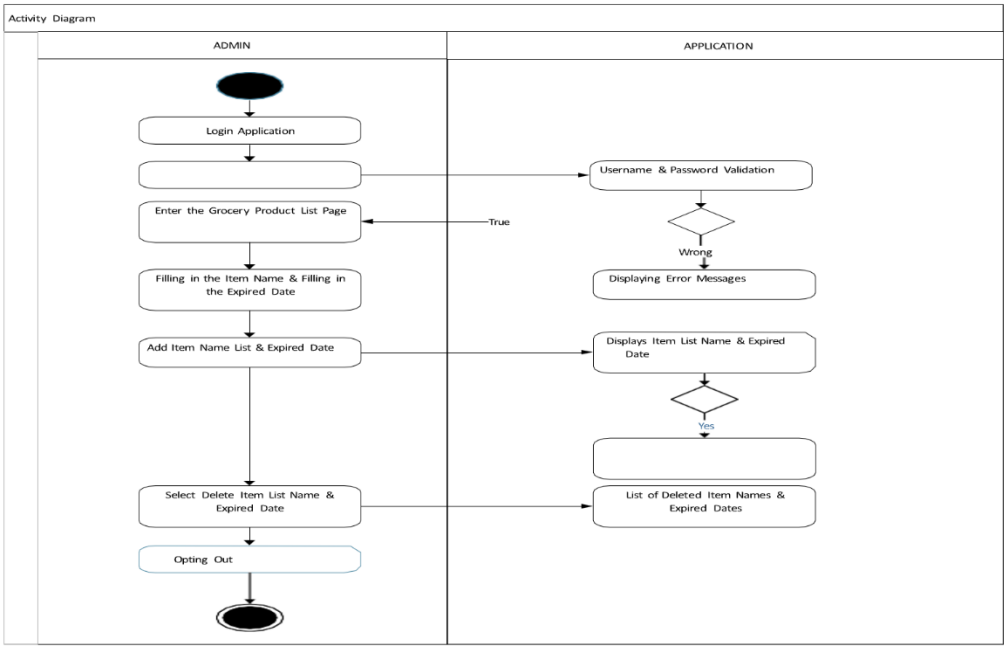
Activity Diagram is used to describe a workflow of a system and draw the activities performed by actors. Figure 3.5 is the activity diagram proposed as follows:

Figure 3.5 Proposed Activity Diagram



The Activity Diagram of the Admin activities carried out is, namely:

a) 1 Initial Node, activity started
b) 2 desicion, displays whether the option is registered or not and displays an expired date reminder.
c) 12 actions, namely: open the application, login, validate username & password, display error message on the food product list page, fill in the item name & fill in the expired date, add the item name list & expired date, display the item name list & expired date, display the reminder that the expired date has expired date, select Delete Item Name List & Expired Date, Deleted Item Name List & Expired Date , Select Exit.
d) 1 final node, end of activity.

b. Sequence Diagram

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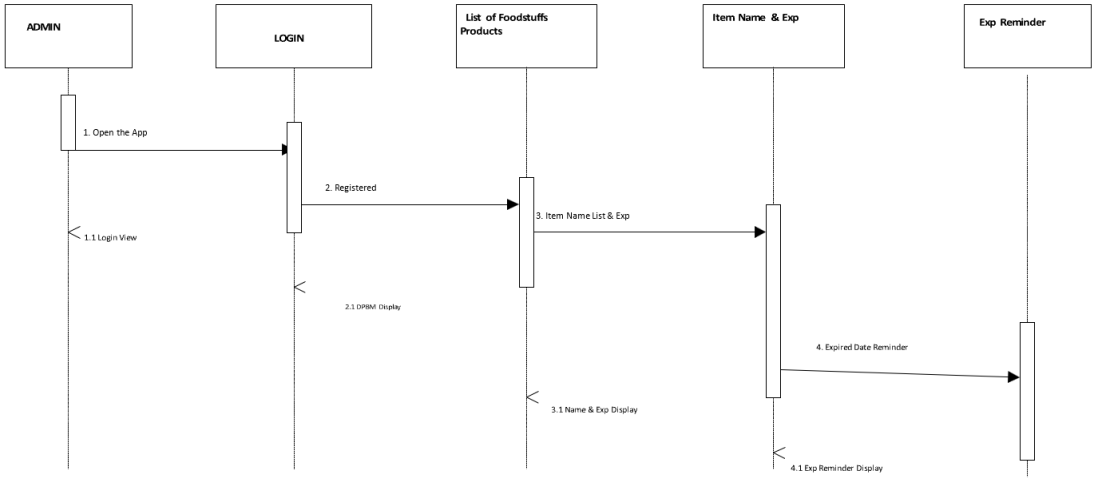
A sequence of activity diagrams that depict participating objects interacting with each other in a system in sequence. In Figure 3.6 the sequence of the admin diagram is described as follows:

Figure 3.6 Proposed Sequence Diagram



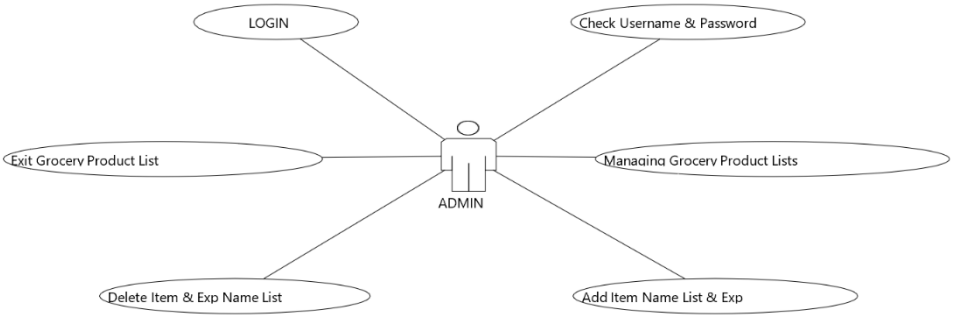
The proposed sequence diagram is as follows:

1. 1 actor, namely: Admin
2. 5 life, namely: login, Grocery Product List, Item Name & expired date, Reminder expired date.
3. 9 massages, namely: open the application, registered, list of item names & expired date, expired date reminder.

1. Use Case Diagram

Activities that describe the relationship between the system and the actor. In figure 3.7. Use case diagram described as follows:

Figure 3.7 Proposed Use Case Diagram



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The proposed Use Case Diagram is as follows:

- 1 system that includes information about the inventory information system for expired date reminders of foodstuffs.
- 1 actor, namely: admin
- 6 use cases, namely: login, check username & password, manage grocery list, add item name list & expired date, delete item name list & expired date, exit grocery product list.

Display Design Design (*Prototype/mockup)*

Application display design :

a. Login View Design

The login page is the page that the admin uses to log in to the list of grocery products, on this page there are username, password, and login buttons. The following is the login page described in figure 3.8.

Figure 3.8 Login View Design

b. Foodstuff Product List Display Design

The display page of the list of food products is a page for adding item names and expiration dates. On this page there are buttons to add item name, date, delete, and exit. The following page lists the food products described in figure 3.9.

Figure 3.9 Foodstuff Product List Display Design

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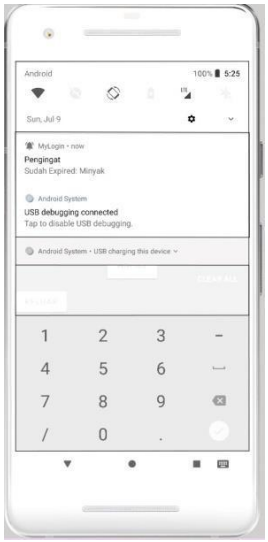
c. Expired Date Reminder Display Design

The reminder display is a reminder display of food products that have an expiration date. Here's what the reminder looks like as described in figure 3.10

Figure 3.10 Expired Date Reminder Display Design



CONCLUSION

Based on the analysis, implementation, and testing of the application, it can be concluded that:

- Food Ingredient Expiration Date Reminder Inventory Information System to monitor foodstuffs products that are close to the expiration date so that the quality of foodstuffs is

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maintained properly able to optimize the work process at Pepper Lunch Restaurant;

- Users who can access this application are stock keepers, employees who are tasked with monitoring foodstuffs that are close to the expiration date, can more optimally perform their duties so that the quality of foodstuffs is monitored more thoroughly;
- This application has provided the right solution to maintain the quality and availability of foodstuffs at Pepper Lunch Restaurant

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