THE IMPLEMENTATION OF BARCODE IN ANDROID POINT OF SALES APPLICATION AT PT. BERCA RETAIL SPORTINDO

Frederico_Fitz[1], Viny Christanti Mawardi[2*]

[1] Informatics Engineering Department, Universitas Tarumanagara, Jakarta, Indonesia
Email: fitz.535190068@stu.untar.ac.id
[2] Informatics Engineering Department, Universitas Tarumanagara, Jakarta, Indonesia *
Email: vinym@fti.untar.ac.id

ABSTRACT

The use of point-of-sale cashier systems in commercial companies is still limited to using networks and computers in some areas of the store, resulting in transaction performance being suboptimal when customer traffic is high. However, the lack of speed in cashier machines serving customers forces them to wait for a long time in front of the cashier counter, making it difficult for other customers to see products while shopping and disturbing their comfort. The purpose of creating a barcode in mobile-based point-of-sale is to distribute cashiers throughout the store to facilitate customer purchases and add cashless features that will reduce expenses such as computer repair costs and monthly electricity bills.

The mobile-based point-of-sale application is created in the Dart language using the Flutter platform and Visual Studio Code to write the code. The result of this application is a mobile point-of-sale display that can conduct sales transactions simply by scanning the barcode to obtain the product code, followed by size selection and finally the last transaction, which is cashless payment. This can make it easier for customers to avoid waiting too long and reduce crowding in the store during peak hours. This application can also be connected to a Bluetooth printer to easily send receipts and issue payment receipts efficiently, smoothly, sophisticatedly, and quickly.

Keywords: Barcode, cashless, point of sales, visual studio code

1. INTRODUCTION

The rapid development of technology has made information delivery efficient and fast. Good and fast information delivery can increase productivity, both in obtaining, processing, and using information correctly. [1] The rapid development of technology makes information easily accessible through mobile devices or smartphones. Mobile devices or smartphones have become a basic necessity. One of them is the use of smartphones in the process of buying and selling transactions. Nowadays, many stores use digital cashier applications to simplify the transaction process. However, there are still stores that conduct transactions in a traditional way, for example. PT Berca Retail Sportindo is a retail company that sells fashion items such as sports clothes, pants, and shoes. The company has 13 branches throughout Indonesia, including Jakarta, Surabaya, Bali, Riau, and several other major cities. Currently, PT Berca Retail Group uses a web-based POS application to manage sales transactions in all of its store, this Process transactions is have been helpful however However, several problems often occur in the use of the Point of Sales application, such as difficulty in finding product information, slow service, and errors in sales transaction input. To overcome these problems, PT Berca Retail Group will develop a mobile-based Point of Sales application with a barcode scanner feature to be integrated with the mobile-based POS application. The barcode scanner in the mobile-based point of sales can help cashiers select products faster using the scanner, as well as make payments more quickly and efficiently using cashless systems or debit and credit cards.

Based on the background of the problem described above, the design that will be made is a Point of Sales (POS) in a mobile application with a barcode scanner feature that functions to make cashiers not focus on one corner of the store to serve customers, but can make cashiers walk around to provide extra and up-to-date service to customers. So that customers don't have to spend a long time waiting for shoes to be prepared by salespeople and waiting for payment transactions at the cashier's desk. All of that can be done directly by cashiers who are ready to serve customers at the customer's store point and can immediately complete the payment transaction right there without having to queue and wait long. The programming language used for this program is Dart using the Flutter platform in Visual Studio Code. The dataset used in this design is a company article dataset taken from the company's SQL server. Then, design and implement a barcode scanner in the point of sales as well as a cashless or card payment system to improve service efficiency in the Point of Sales (POS) in terms of making it easier and faster for customers to transact and increasing customer satisfaction when shopping in this store.

2. RESEARCH METHOD
2.1 Literature Review
2.1.1 Previous Research

There are several studies that have been conducted on Point OF Sales, one of which is research that was conducted with the title "Design of Android POS (Point OF Sale) Cafe Applications for Portable Cashiers and Bluetooth Printers. a portable cashier application that helps process sales transactions in several cafes that do not yet have a digital sales system where when recapitulating income from sales and purchases it is still done using the Microsoft Excel application which is done by filling out a special form containing a list of food and drinks then filling in a list of orders into the form which is then used as a tool to record transaction data and proof of sales for buyers. Transaction data recording is done after the cafe has closed which then Inserting all sales evidence. After all transaction data is entered, it can be known in real-time how many and what items have been sold, which can happen because there is already its own format for data collection. However, the shop owner still struggles because they have to record them one by one every day in Excel format. This is what inspired the creation of this application to simplify the transaction process and accurately, quickly, and clearly recap cafe transaction reports" [2].

In another study entitled "Design of Desktop-based Point of Sales Application in Zone Cafe Purwokerto," "The sales system that is currently running at Zone Café Purwokerto, with the increasing number of transactions, an existing transaction system-based Point of Sales application was created to overcome the problem. Employee data processing, food and beverage menus, transactions, granting admin and cashier access rights, and password security systems work well and smoothly. The security system on the application and the database is equipped with a login password limited to 3 mistakes. This Point of Sales application has input design specifications in the form of a billing order document that is used to record customer orders and a list of product menus that is used to view food and beverage menus. The data specifications generated by this application are payment receipts, inventory reports, transaction reports, and sales data" [3].

Another study entitled "Design and Development of Point of Sales Distro Management System Application using React Native Framework" "Teenage fashion development is experiencing an interesting and innovative increase. The rapid development of teenage fashion with increasing consumer demand. The business process that runs in this distro still uses conventional processes without utilizing current technology, so they have difficulty in recording

transactions and managing products. Based on this problem, a Point of Sales application was created to simplify distro workers' work. The research method used is the classic life cycle method, for data collection by conducting interviews, observations, and documentation at the distro location of the research. Based on the results of the interview and observation, a system design, database design, and user interface design were made. Then all of these designs were made into applications using the React Native framework, and after the application was complete, the system was tested on the application using the Black Box testing method. The results of the system testing on this Point of Sales application are in line with what is expected by the distro" [4].

Based on research related to POS (Point of Sale), for the development of research, research was conducted on the Design of POS (Point of Sale) Application based on Android at PT. Berca Retail Sportindo to simplify users in the transaction process. This research is expected to provide convenience for users at PT. Berca Retail Sportindo in the sales process. The technology used is for scanning goods using barcode or QR code, and SQL server is used for recording sales data and other data during the transaction process.

2.1.2 Android

Android is a Linux-based operating system designed for mobile devices. This operating system is owned by Google Inc along with 34 other companies that aim to develop this operating system. Android has become a very popular operating system and has surpassed other operating systems. Android provides an open platform for its users so that they can develop their own applications [5]. Android is an operating system. An operating system that does not differentiate between core applications and third-party applications, Android is an open platform that makes it easy for developers to create applications [6].

2.1.3 Dart

Dart is a versatile programming language that can be used to develop various types of applications and programs, including web applications, mobile applications, desktop applications, servers, and more. It is a cross-platform or platform-independent programming language, which means it can run on different operating systems such as Windows, Linux, Unix, MacOS, and others. Initially developed by Google, Dart was later approved as a standard by Ecma and is now used to build web, server, desktop, and mobile applications.

Dart was originally designed as a client-optimized programming language for rapid web and mobile application development. As one of the many programming languages that support multi-paradigm, Dart is imperative, functional, reflective, and object-oriented. Additionally, Dart follows all object-oriented programming approach concepts such as classes, inheritance, abstraction, encapsulation, and polymorphism, among others. Dart is also a very powerful programming language that provides automatic garbage collection features. The Dart language itself is open source and licensed under BSD. Its syntax is a simple C-style syntax. [7]

2.2 Use Case diagram

A Use Case Diagram is a diagram that describes the interaction between actors and the system being created. Use Cases are also used to identify the functions that exist.
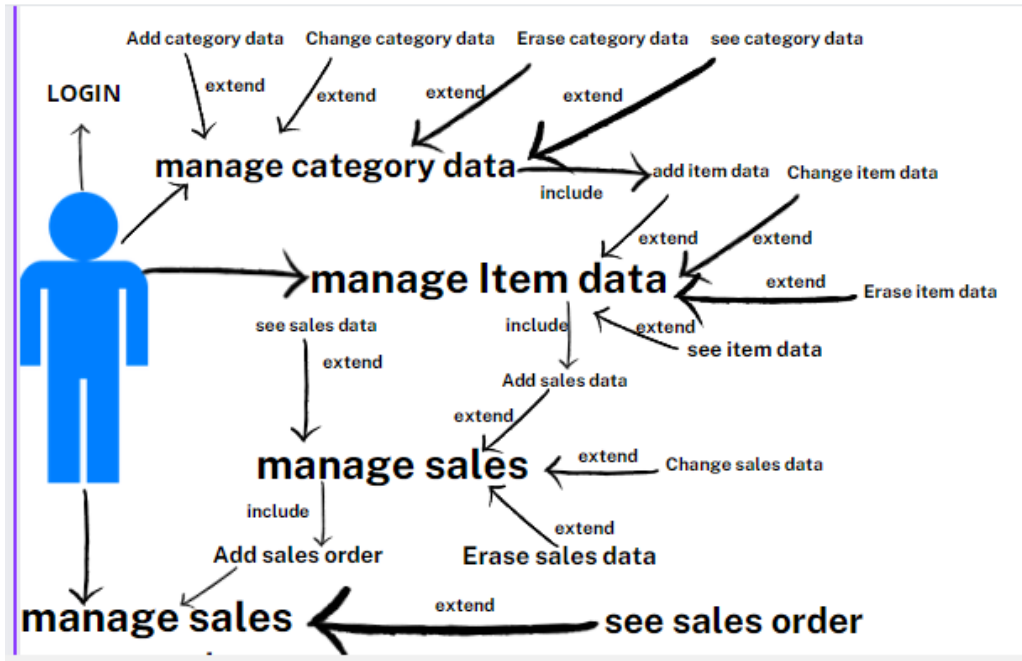
Figure 1 use case diagram

Figure 1 Use Case Diagram In Figure 1, there is one actor, the cashier, who plays a role in managing the information system such as managing sales data containing items to be sold. The cashier actor also manages item category data, item data, and sales reports.

2.3 Activity Diagram

An Activity Diagram is a system design that will be executed. Activity Diagrams are also used to define the flow of the system's display.
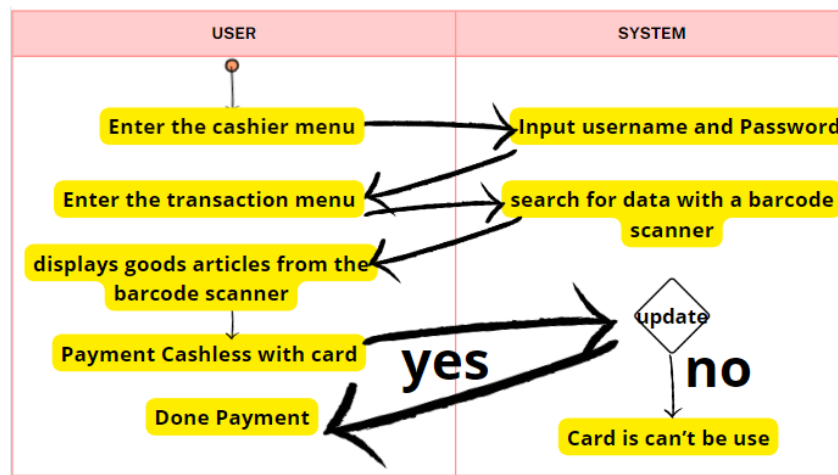

Figure 2 activity Diagram

In the second Figure above, it can be explained that the user enters the cashier menu to serve customers where the cashier has to input a username and password that will be read by the system. After being read, the system will display the home menu where the transaction menu is available. When entering the transaction menu, the cashier can use a barcode scanner to search for product data and speed up the payment process, which will make the customer not have to

wait long. Then, payment is made cashless or with a card, and if it is with a card, a "payment completed" message will appear if the card can be used, but the transaction will fail if the card cannot be used and a different card must be used.

3. RESULTS AND DISCUSSIONS

From the design made in the previous chapter using Dart Flutter language, a mobile application was created to facilitate the work of cashiers and improve customer comfort when making purchases in the store. When the application is used, a login screen will appear, as seen in the Figure 3.1 and Figure 3.2.
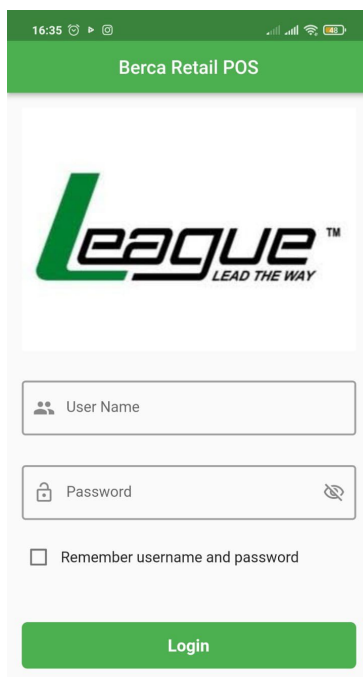
Figure 3.1 Mobile POS login
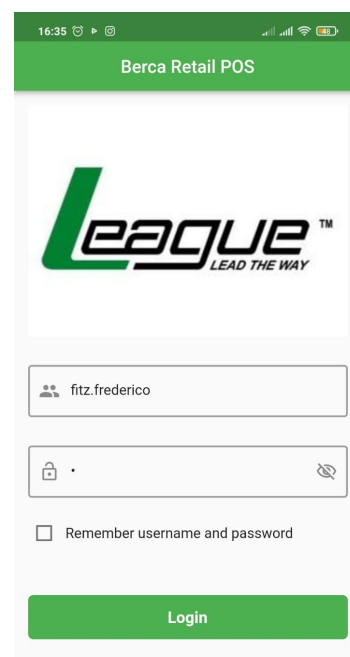
Figure 3.2 login with username

The Figure above shows the login page that can only be used by cashiers and admins to access the application. This login screen displays the company logo and has a table to enter the username and password that have been registered on the admin's SQL server, so that not just anyone can use and open this application. The password is set to default. Once the login is successful, the display will change to the home page. The home page will show the name of the logged-in cashier as well as the location of the cashier's store. The home page can be seen in the Figure 3.3 and Figure 3.4.
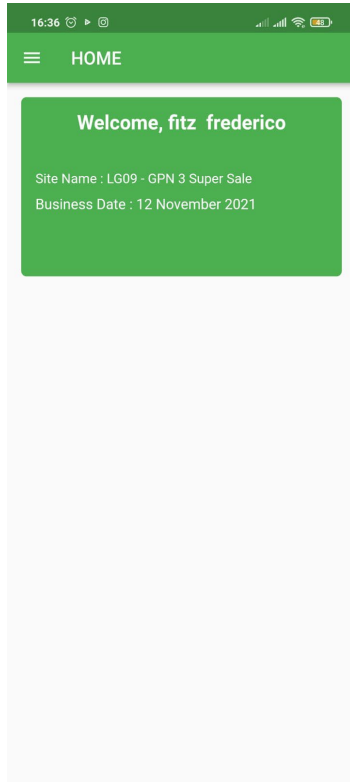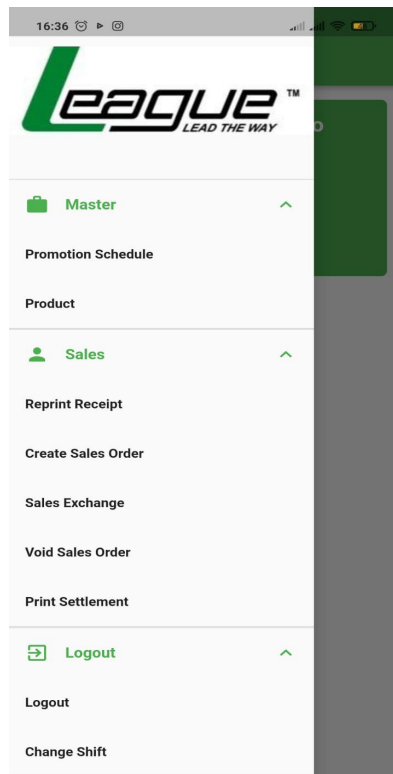
Figure 3.3 Homepage POS   Figure 3.4 Drawer homepage

The Figure above shows the home screen which features a drawer that can be used to view product stock, vouchers and promotion schedule, reprint receipt, void sales exchange, perform settlements, and of course, to carry out product sales transactions by using the barcode scanner on this mobile-based point of sales application and the last one is of course log out and change shift. When we want to make a sales transaction using a mobile-based POS application, we can open the "create sales order" option where the home display will change to the sales order display as shown in the Figure 3.5 until Figure 3.7
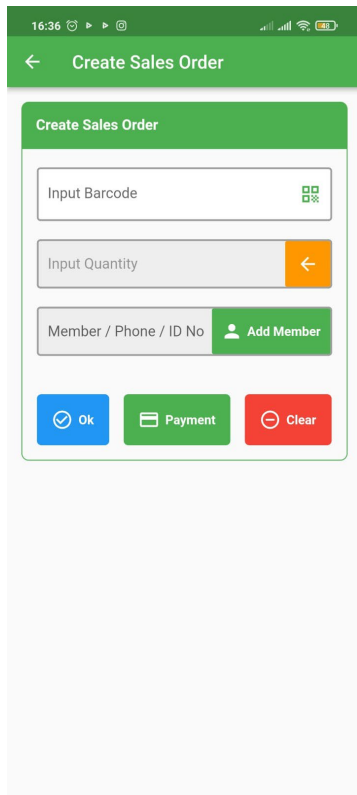
Figure 3.5 sales order
transaction

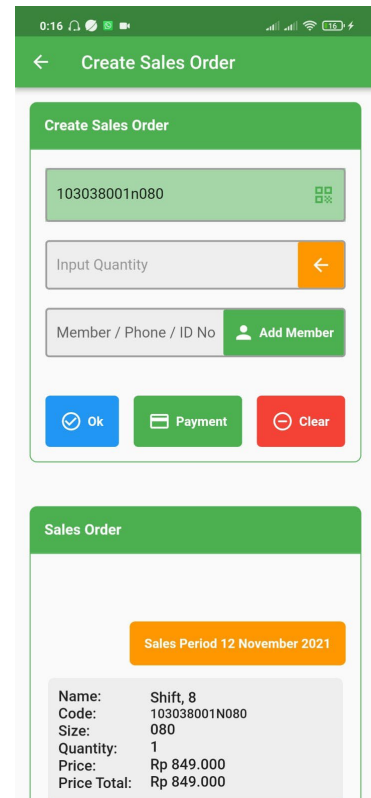
Figure 3.6 scanner barcode

Figure 3.7 sales order

The Figure above shows the display of a sales order and sales transaction that utilizes a barcode scanner feature to search for the desired product and simplify and expedite the payment transaction process when the customer wants to purchase the product. As seen in Figure 3.5, there is an input barcode table that can be filled out manually and can also use the barcode scanner feature designed to reduce the time-consuming manual input process, and can be seen in Figure 3.6, and has quantity and member tables that can input the desired quantity and member number to provide additional promotions. When using the barcode scanner, the desired product article along with the price and desired size will automatically appear, as seen in Figure 3.7. After reading the product article, the page will then move to the payment display where the payment display can be seen in the Figure

Figure 3.8 payment card

Figure 3.9 payment transaction

On the payment screen Figure 3.8 and Figure 3.9, the cashier must enter the name of the cashier or salesperson who assisted the customer, and then the cashier can enter the payment method with a card and select the card used by the customer and enter the customer's card number, then input the approval code that will appear when the customer enters their ATM PIN. After all the requirements have been entered, the transaction screen will appear and the transaction is completed, and a receipt will be printed from the Bluetooth printer held by the cashier. The customer can continue their journey without having to stand and wait for a long time at the cashier desk to make the payment transaction using a computer and web for the payment method.

During the design and development of a barcode scanner for a mobile point-of-sale application, testing and program testing were conducted to determine if the barcode scanner could read the product article barcode displayed on the shoe or on the shoe box. The testing was conducted on 10 different product articles, taken from both the barcode on the shoe display and the barcode on the shoe box. The results of the testing showed that there were still some limitations where the barcode could not read articles that were damaged by water, faded, or torn. However, the testing showed that undamaged articles with barcode could be used and the article could be read. Some examples of testing Figures along with their results can be seen in the following Figure, which shows an article with a barcode on its box, a barcode with the article on a shoe display, and then opening the barcode scanner. The barcode scanner will read and display the name of the article along with its price
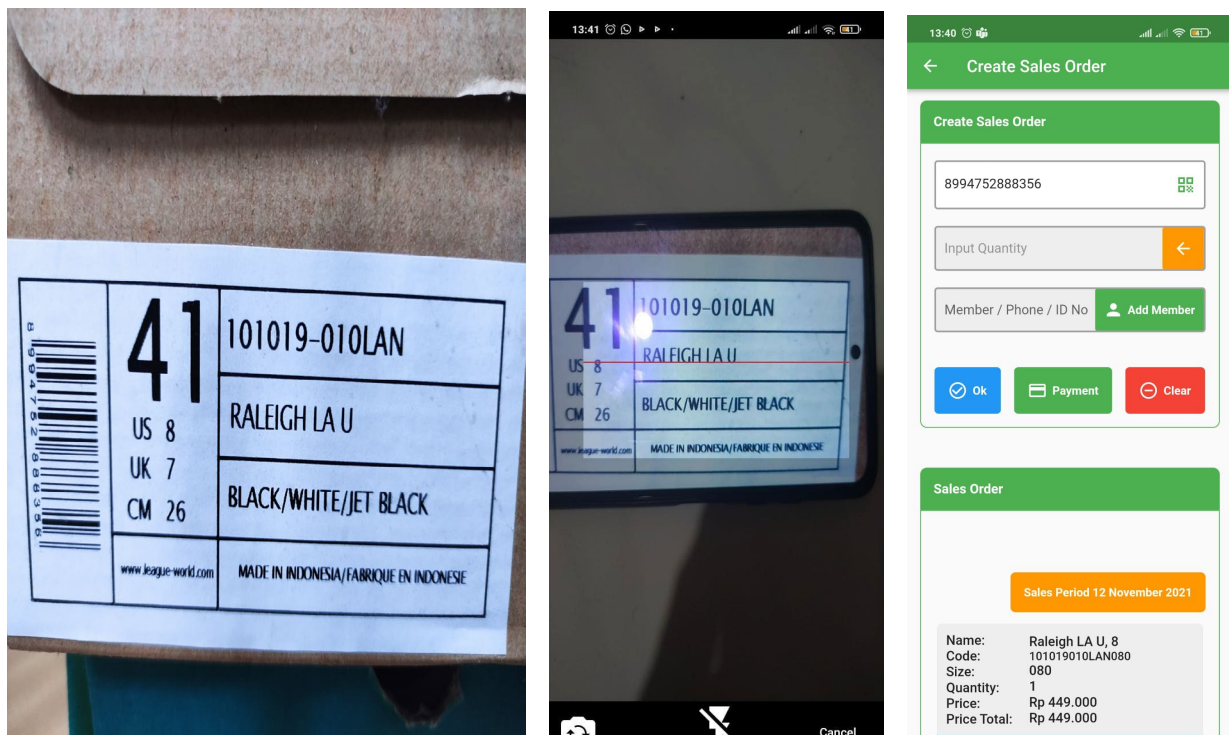
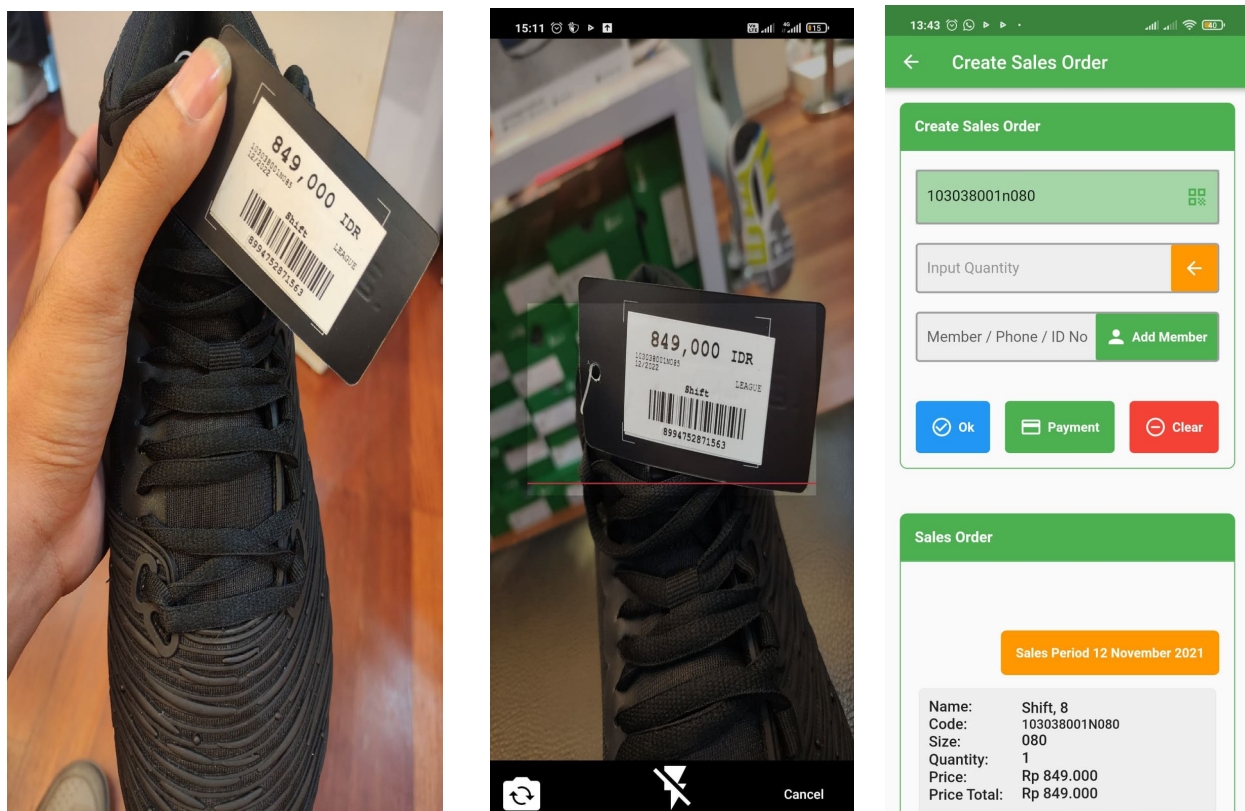Table 1 Figure of program test results
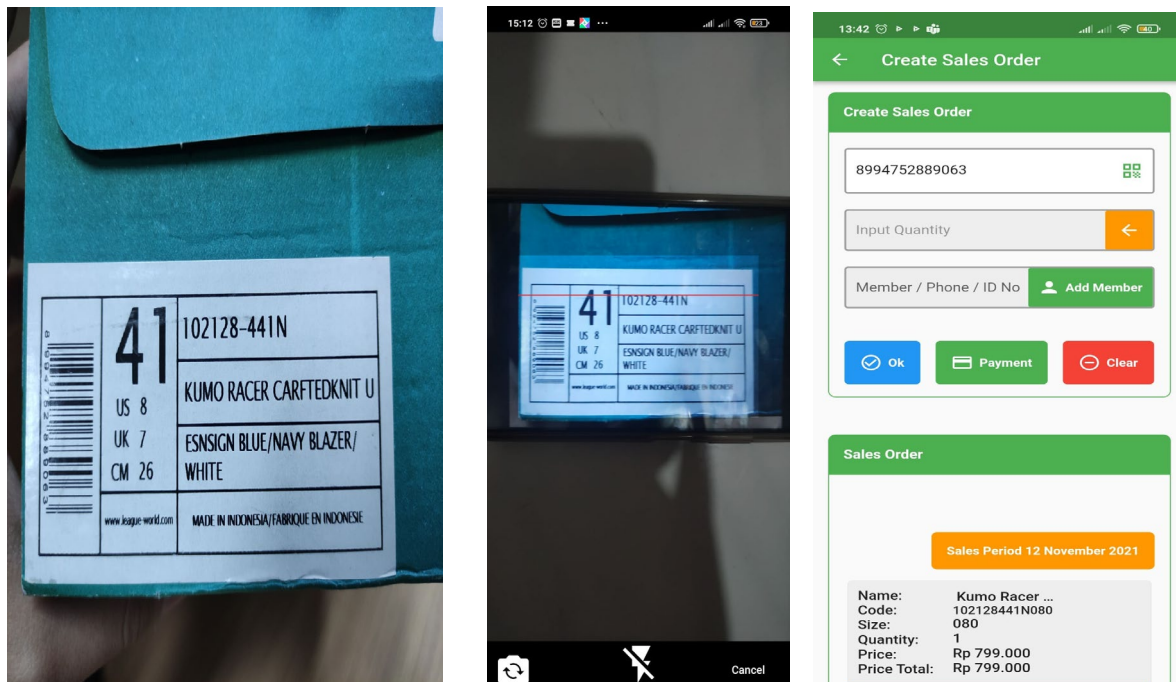

Table 2 Figure of program tes result

Table 3 Figure of program result

The table above shows the results of several barcode scanner testing examples that have been successful in reading the barcode. The testing was done 10 times using various different article samples and various challenges, such as damaged, wet, or faded articles with scratches. The barcode scanner was able to read articles on shoe boxes as well as articles displayed on shoes that were not damaged or facing any issues that prevented the barcode from being read.

4. CONCLUSIONS AND SUGGESTIONS

The development of a mobile-based point of sales application is designed to keep up with the technological advancements in the retail industry. This application aims to facilitate cashier work and improve their performance in serving customers more efficiently, quickly, and more advanced than before. The application is built using Dart and Flutter in Visual Studio Code, with backend data taken from the company's SQL Server Management System containing information about the articles sold by the company. The suggestion for this application is that it is hoped that it can be used wisely and more carefully by cashiers to provide comfort to buyers and enhance the company's reputation with fast and advanced service. The drawback of the design and development of the mobile-based point of sales application that has been tested 10 times is that the barcode scanner cannot read the barcode of damaged articles. For example, articles that are scratched, wet, torn, or crushed.

ACKNOWLEDGEMENT

REFERENCES (APA 7th Edition)

[1]Fauziah, N. (2022, February 22). Bahasa Pemrograman Dart - Pengertian, Sejarah, Fitur, dan Aplikasi. Blog | Alterra Academy. Retrieved March 31, 2023, from https://academy.alterra.id/blog/bahasa-pemrograman-dart/

[2] G. Pamungkas dan H. Yuliansyah, 2017, "Rancang Bangun Aplikasi Android Pos (Point of Sale) Kafe Untuk Kasir Portable dan Bluetooth Printer,"JST (Jurnal Sains dan Teknol., Vol. 6, No. 1, hal. 199–208, doi: 10.23887/jst-undiksha.v6i1.8828.

[3] N. K. Ceryna Dewi, I. B. G. Anandita, K. J. Atmaja, dan P. W. Aditama, 2018, "Rancang Bangun Aplikasi Mobile Siska Berbasis Android,"SINTECH (Science Inf. Technol. J., Vol. 1, No. 2, hal. 100–107, doi: 10.31598/sintechjournal.v2i1.291.

[4] P. D. A. Wiguna, I. P. A. Swastika, dan I. P. Satwika, 2019, "Rancang Bangun Aplikasi Point of Sales Distro Management System Dengan Menggunakan Framework React Native,"J. Nas. Teknol. dan Sist. Inf., Vol. 4, No. 3, hal. 149–159, doi: 10.25077/teknosi.v4i3.2018.149-159

[5] P. Pramono dan H. M. Nur, 2013. "Perancangan Aplikasi Point of Sales Berbasis Desktop (Studi Kasus: Zone Cafe Purwokerto)," hal. 214–219

[6] S. C. Cahyodi dan R. W. Arifin, 2017. "Sistem Informasi Point of Sales Berbasis Web pada Colony Amaranta Bekasi,"Inf. Syst. Educ. Prof., Vol. 1, No. 2, hal. 189–204

[7] S. Surahman dan E. B. Setiawan, 2017, "Aplikasi Mobile Driver Online Berbasis Android Untuk Perusahaan Rental Kendaraan,"J. Ultim. InfoSys, Vol. 8, No. 1, hal. 35–42, doi: 10.31937/si.v8i1.554.