# Implementation Of Point Of Sales Using Laravel Framework on Matahari Motor

**Dea Erlinda Thendy Salim[*1], David[2], Gusti Syarifuddin[3], Sandy Kosasi[4], I Dewa Ayu Eka Yuliani[5]**
[1,2,3,4,5]STMIK Pontianak, Indonesia
E-mail: [*1]**deaerlinda02@gmail.com**, [2]davidliauw@gmail.com, [3]gustisyarifudin-stmik@stmikpontianak.com, [4]sandykosasi@gmail.com, [5]dewaayu.ekayuliani@gmail.com

***Abstract***

*One of the developments in technology in the modern era is computers as a alternative for human labor. The development of advanced technology must also be balanced with the right application. Web application is one of them because it makes easier to access information on any device as long as it's connected to the internet. This research aims to create a POS application that can help in facilitating more structured data management with the features provided. The method that this research used is Action Research. Website design using Prototype method, modeling in design using Unified Modeling Language (UML), and database modeling using Entity Relationship Diagram (ERD). Website development using the Laravel framework, and testing using the Black Box method with Equivalence Partioning. The results obtained from this study are the Live Search feature which helps in searching for item data, the notification feature for minimal stock so as not to be late in placing an order, Authentication Login using Jetstream Laravel, there are barcodes and print invoice to assist in the transaction process, error messages feedback or succesfull. successful, the calculation of the income reports, and this research was developed using the Model View Controller (MVC) concept architecture.*

***Keywords*** *— Javascript, Black Box, Point Of Sales, Laravel Framework, UML*

## 1. INTRODUCTION

Technological developments in the modern era are currently using sophisticated technology, with existing technological developments having an impact on human life patterns and also business processes in a company[1]. The development of advanced information technology must be balanced with the right mastery and application to face global challenges in the future. The application of information technology developments facilitates the dissemination of information so that it can be seen anywhere and anytime[2]. web-based which makes it easy to access data anywhere and anytime as long as it is connected to the internet without installing applications because it uses a browser[3]. The website is means of delivering information to users, in producing effective web design and design is important because it involves user satisfaction in its use[4]. In this era where mobile phones are used, almost every company has provided a website as a means of communication or promotional media between the company and its customers or users[5].

The Point of Sales (POS) system or cashier system is an activity related to sales and data collection of goods in the retail business sector[6]. The POS application can manage

what transactions occur and who is responsible for each sales transaction[6]. Researchers built this Point Of Sales application based on a Web Application. The web-based POS application makes it easier to access information using the internet, such as owners who want to check reports or other data because it can be accessed on any device as long as it is connected to the internet[7]. If a software-based POS application it requires a special device that has quite an expensive cost, such as having to buy PC equipment with the minimum specifications needed[8]. The solution is to make it web-based so that it can be accessed using the internet using any device without the need for high specifications because it only requires a web browser.

The Point Of Sales application can be used or applied to several areas of the trading business, for example in the sale of machinery and spare parts such as the Matahari Motor Store. Variable item data makes it more difficult to search for item data using conventional methods or recording it in a book. Therefore, with the Laravel framework, the Searching feature was developed with Laravel Livewire which makes live search by searching data without entering or reloading the page. This software also provides barcodes for item data so that the barcode can be scanned and displays item data in sales transactions. There is a notification feature on the admin page which contains a minimum stock notification which provides information on the remaining stock that has exceeded the minimum limit so that it can be ordered again and notifications when making a new transaction at the cashier. According to the features above, the goal of the researchers is to develop a Point Of Sales web application at Matahari Motor Pontianak with the Laravel Framework to overcome some of the problems experienced by the Matahari Motor Pontianak Store.

Previous research resulted in a web-based point of sale application system that supports a shorter transaction process, record all transactions in full and sales reports needed by users as convenience in transactions and digital data management[6]. Previous research conducted research on point of sale applications which include displaying sales transactions, sales transaction reports and setting user data, category data and product data, with the aim of assisting store owners in checking sales transactions online[9]. Previous research concluded that the existence of a web-based point of sales information system can provide information in data processing at stores with maximum results, with the implementation of this application the process of managing transactions will be tidy and reduce the occurrence of data errors because the data is stored in file form, by utilizing this application the process of managing transactions will be much more effective and efficient because the data is stored and can be searched in one application in detail[10].

The novelty of this research is to have a minimal stock notification feature which helps to be on time in ordering goods as well as barcodes which assist in the transaction process so as to minimize errors in cutting stock sales of goods because there are similar types of goods.

## 2. RESEARCH METHOD

In this research, the form of research conducted was a case study at the Matahari Motor Pontianak Store. A case study is a process of investigating or examining in detail a particular event that occurred, with the data needed are the results of direct interviews with the owner

and direct observation as primary data as well as complementary data such as notes or data documents on goods owned. The research method used is Action Research. Action Research defined as a disciplined process of inquiry conducted by and for those who take action, the reason this method is widely used is that this Action Research focuses on organizational learning as part of the research process, Action Research consists of Diagnosing, Action Planning, Action Taking, Evaluation and Learning[11] as shown in figure 1.

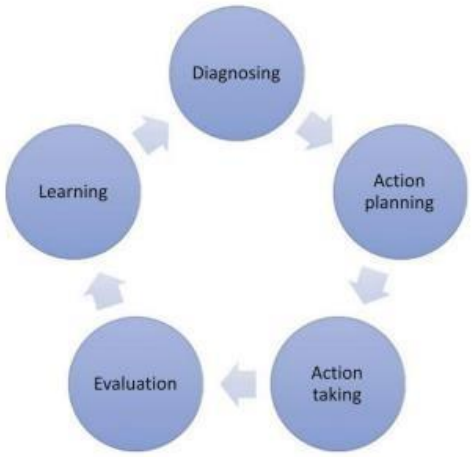


**Figure 1**. Stages of the Action Research Method

The design method uses the Prototype method. The Prototype method is a system development technique with a prototype depiction so that the system owner has a clear picture of the system to be built by the development team or developers[12]. Software design uses the HTML and PHP Programming Language with the Laravel Framework with the Model, View and Controller architecture. MVC is a software approach that separates application logic from presentation. MVC separates software based on software components, such as data manipulation, controllers, and user interfaces[13]. Modeling uses the Unified Modeling Language which allows system developers to create models that are easy to understand and equipped with effective mechanisms for sharing and communicating their designs with others[14]. Management of stored data using the MySQL database, with database modeling using Entity Diagram Relationship (ERD) which is a model or design for creating a database, to make it easier to describe data that has a relationship or relationship in the form of a design[15]. The Interface Implementation uses the CSS programming language with the Bootstrap Framework with the aim of decorating and adjusting the display style or web layout to make it more elegant and attractive.

## 3. RESEARCH RESULTS AND DISCUSSION

This research produces a website-based Point Of Sales application using the Laravel framework at the Matahari Motor Pontianak Store which can assist in overcoming the problems described at the problem diagnosis stage with features made at the action planning stage.

3.1. Diagnosing (Problem Diagnostics)

In diagnosing a problem, the first thing to do is to collect the necessary data from the object of research. In this research the object is the Matahari Motor Shop, the problems encountered are : Difficulties in the process of searching for goods data, data is often lost or corrupted, admin's error in reducing stock due to error in recognizing goods because many products are of a similar type and a large number of products makes all data unable to remember, delays in the ordering process, and making income reports to be submitted to the owner takes a long time because the calculations are done one by one from existing sales and purchase records.

3.2. Action Planning

This stage is carried out after diagnosing existing problems, the planning that will be carried out for the problems encountered are to create a Live Search feature to help the process of searching for item data, data storage in the database so that data is more secure, barcode feature that helps in the sales transaction process, minimum stock notification feature to prevent delays in ordering goods, as well as an income report feature that helps in calculating existing sales and purchases to be submitted to the owner.

3.3. MVC Website Architecture Analysis

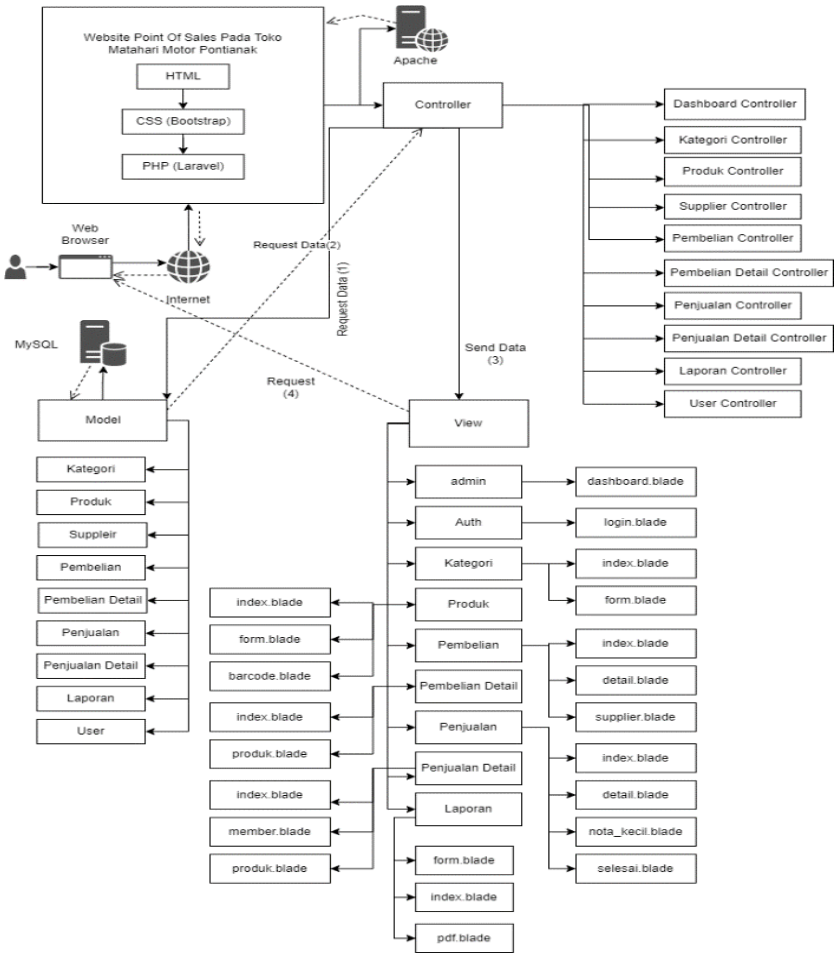


**Figure 2.** MVC Website Architecture

In Figure 2 the website architecture is the structure of how the website point of sales for Matahari Motor Store works, on this website the admin will access via a web browser connected to the internet, the web server used is Apache and the data is stored and retrieved from the MySQL database and continued in the MVC process which is responsible for each part until it is displayed again for the user.

## 3.4. Design

### 3.4.1. Use Case diagram

Use case diagrams describe the running functions carried out by actors from the user's point of view or what is commonly called a behavior diagram. The following is a use case diagram for Matahari Motor Store in figure 3:

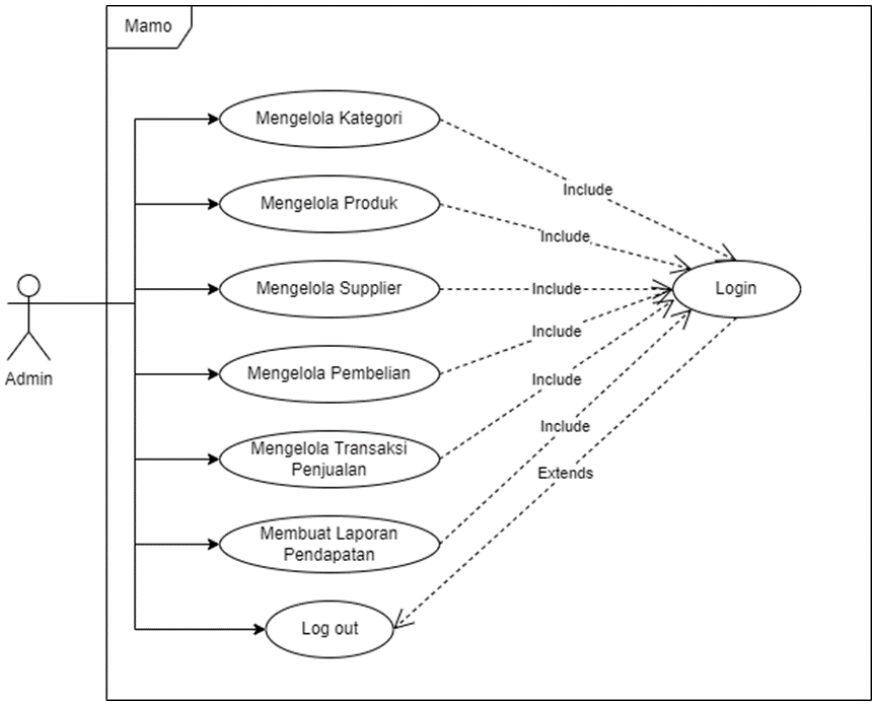


**Figure 3.** Use Case Diagram

In Figure 3 the use case diagram shows the interaction of each actor on the application being developed, which are: Admin is the actor in charge of managing data management at the store, the actor manage category data, goods, suppliers, purchases and sales transactions by performing CRUD operations, the admin also prepares an income report that will be reported to the owner.

### 3.4.2. Activity Diagram

Activity diagrams show application activity in the form of a collection of actions and focus on who or what is responsible for the performance of a particular activity. Activity diagrams do not describe what actors do, but the flow of work that occurs in the application. The following is the Activity diagram for the Matahari Motor Store point of sale application:

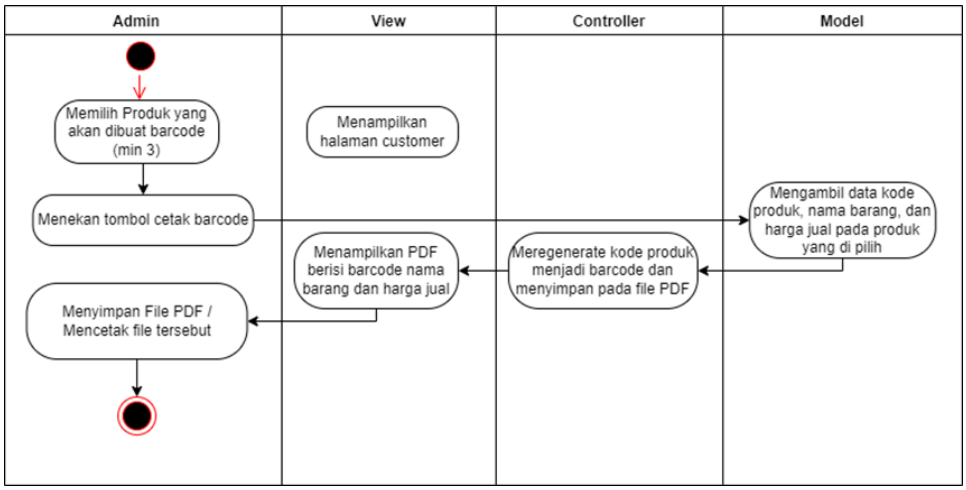


**Figure 4.** Barcode Printing Activity Diagram

Based on Figure 4, the barcode printing activity diagram shows the activity of the admin who wants to print barcodes, the admin will select the product data to be printed (minimum 3 products) then the admin will press the print button which displays a PDF containing the product code that has been changed to a barcode along with the item name and selling price.

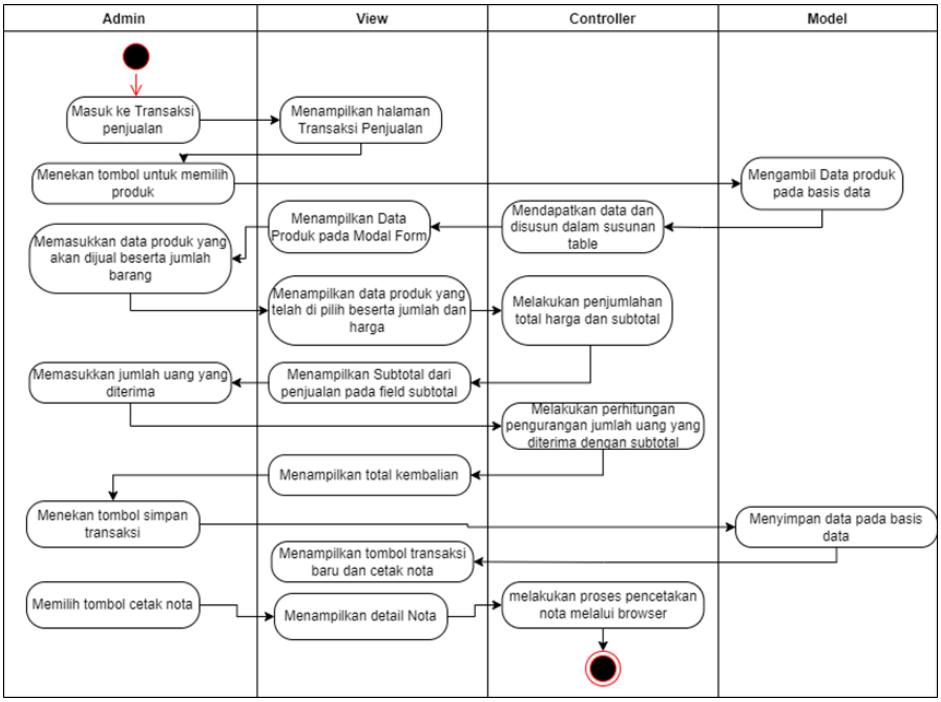


**Figure 5.** Sales Transaction Activity Diagram

Based on Figure 5 activity diagram of sales transactions, shows the activity of admin who make sales transactions, by inserting the product purchased by the consumer, the system will display a list of products that have been selected with the desired amount and calculate the total and get the subtotal, after that the admin will insert the total money received and the system will perform calculations and display returns and transactions will be stored in the database and displayed again on the sales page.

3.4.3. Sequence Diagram

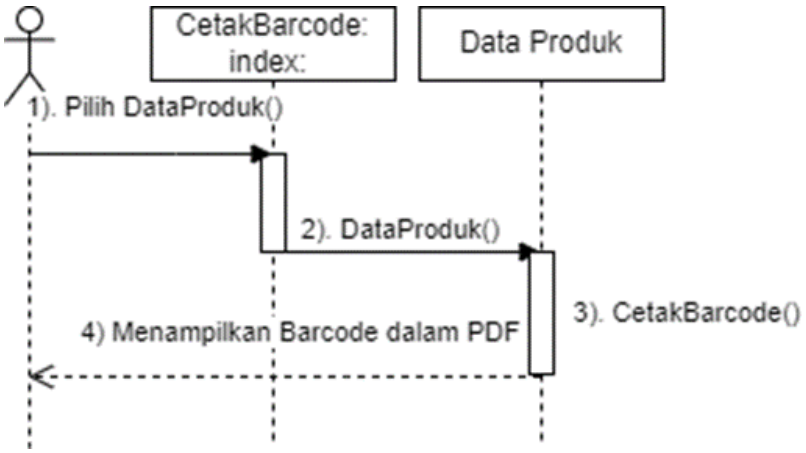


**Figure 6.** Barcode Sequence Diagram

Based on Figure 6 Barcode Printing Sequence Diagram, first select the product that will be printed the barcode, after that the product data received is product code, product name, selling price and product code will be generated into a barcode and displayed in PDF.

3.4.4. Class Diagram

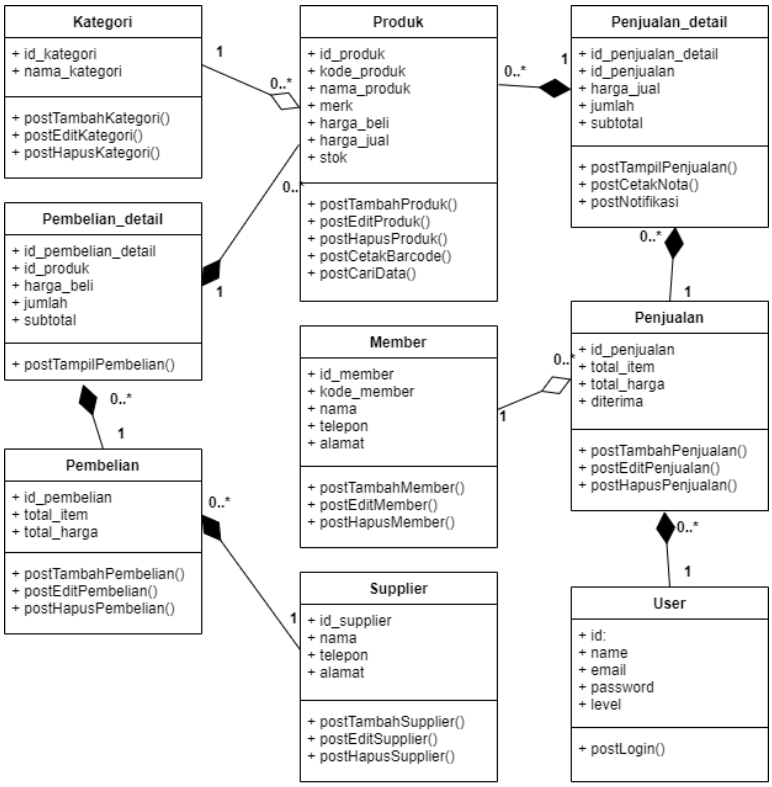


**Figure 7.** Class Diagram

Based on Figure 7, the class diagram shows the relationships between classes consisting of categories, products, sales, sales_details, purchases, purchase_details, members, suppliers, and users, which are aggregation and composition relations.

### 3.5. Action Taking

The Action taking stage is the implementation of the results of the planning at the Action Planning stage. At this stage the features that have been designed in the previous stage are implemented so the problems that have been diagnosed in the first stage can be resolved, as well as a dynamic website interface design so that stored data can be displayed again or the data that has been input can be successfully stored properly.

#### 3.5.1. Input Interface Implementation

a. Login Page

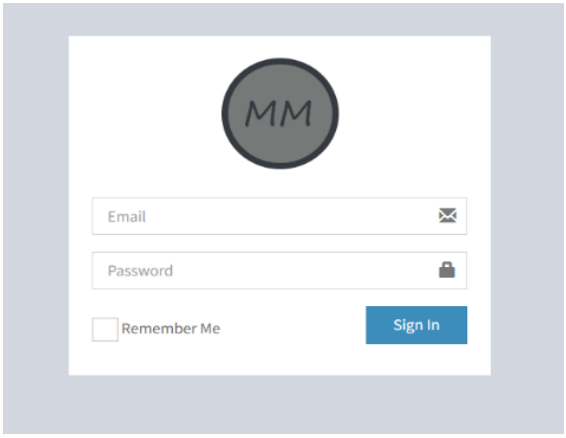


**Figure 8.** Login Page

Based on Figure 8 is the user login page, there are 2 access rights, which are admin and cashier. If it is admin then the admin will log in with the email and password that has been registered and if the data is incomplete or incorrect then it will be returned to this page, if the data is correct then it will enter the main page, whereas if the cashier will only load the sales transaction page.

b. Barcode Printing Page

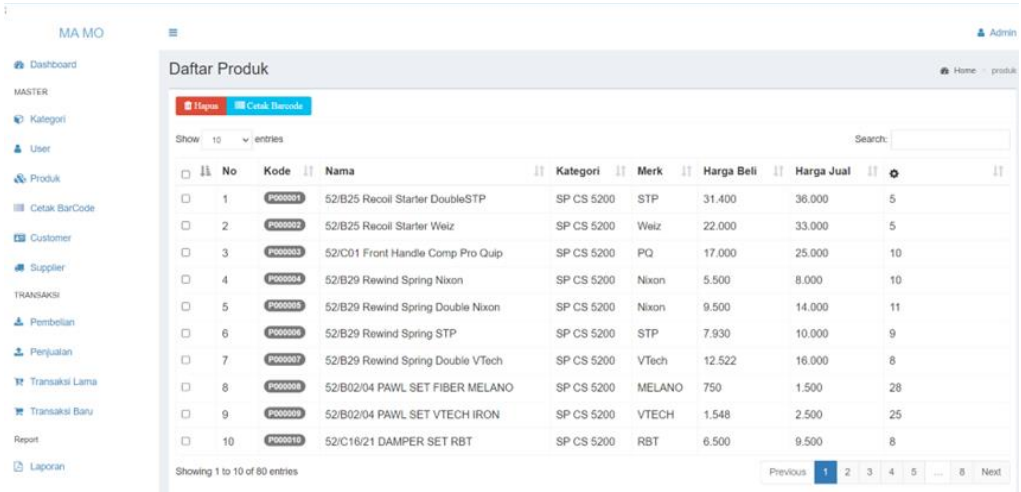


**Figure 9.** Barcode Printing Display

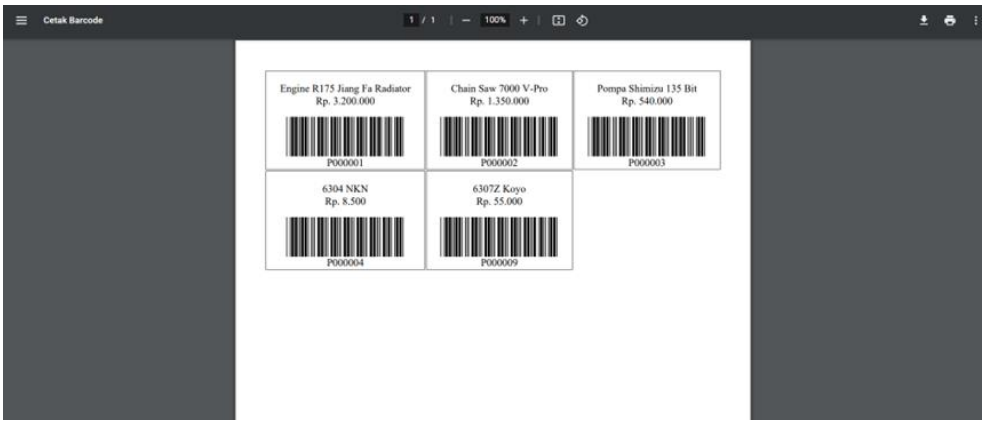


**Figure 10.** PDF page of barcode printing

Based on Figure 9 and Figure 10 is the product selection page and barcode display which can be printed in pdf. The product code is generated into a barcode with the barcode feature by installing the barcode package on Laravel and the domPDF feature to convert files into PDF+

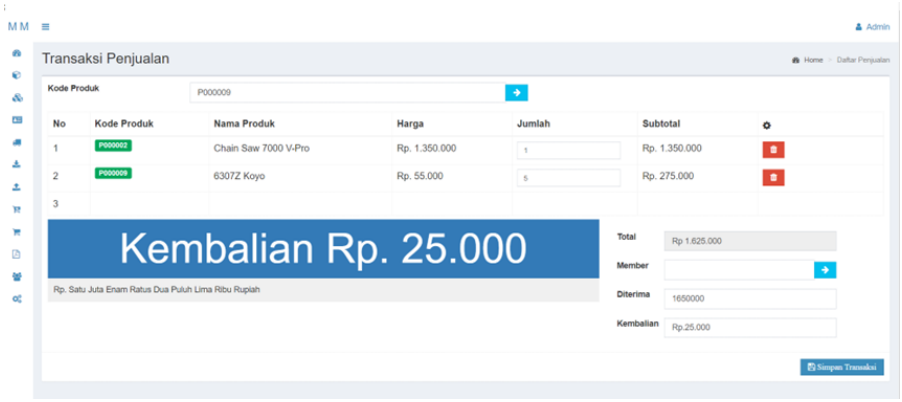


**Figure 11.** Sales Transactions

Based on Figure 11, is a display of sales transactions that contain goods to be sold with the amount filled in according to sales, then the overall subtotal and change will be calculated according to the amount of money inserted.

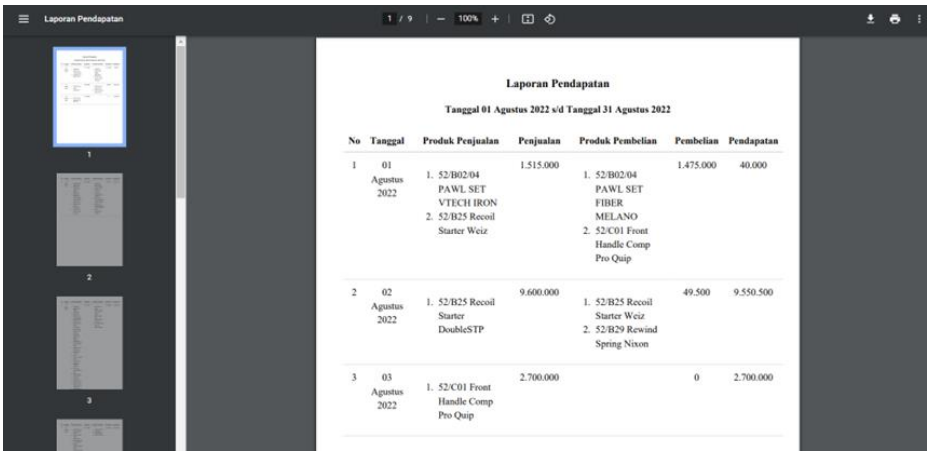


**Figure 12.** Income Report

Based on Figure 12, this page appears when pressing the export PDF button on the report page and this page can be saved in pdf format or printed.

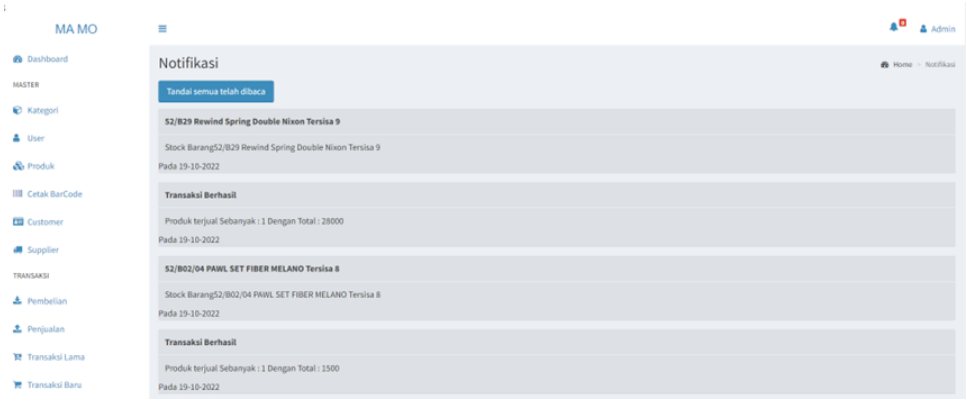


**Figure 13.** Notification

Based on Figure 13, there is information on products whose stock has reached a minimum stock along with the remaining stock is displayed and if there is a new transaction, the transaction will also appear briefly along with the total transaction.

## 3.6. Evaluation

### 3.6.1. Laravel Testing

Testing is needed to ensure the website runs as it should. Before carrying out black box testing, it is necessary to do a test on Laravel in the form of unit testing to ensure that the data sent is correct. The following is a PHP Unit test for the route uri login status and login validation as shown in Figure 14:

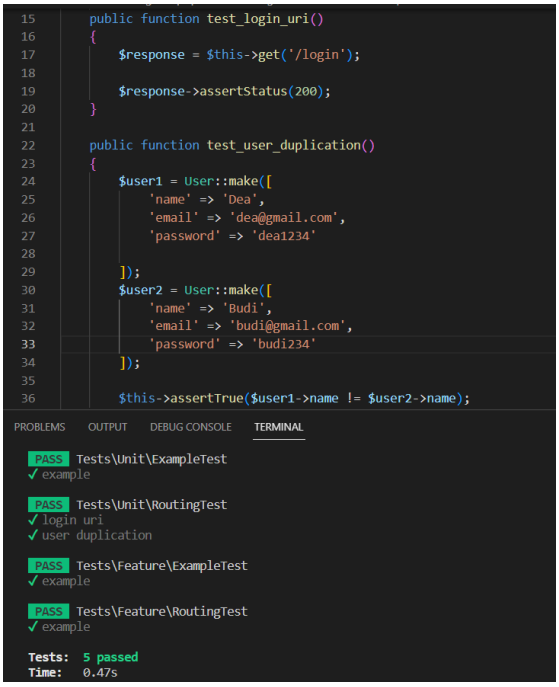


**Figure 14.** PHP Unit Testing

3.6.2. Black Box Testing

At this stage testing is carried out by the client using the Blackbox method. The product testing is in table 2 below:

| No. | Skenario Pengujian | Test case | Hasil yang di harapkan | Kesimpulan |
|---|---|---|---|---|
| 1. | Login | Admin / Cashier insert an email containing "@" and the correct password that has been registered in the database | Admin / Cashier has successfully entered the main page with the logged in account | *Valid* |
| 2. | Dashboard | Admin clicks on the “product” menu on the dashboard | Displays product pages along with product data that has been stored in the database | *Valid* |
| 3. | Add Category Data | Admin adds new data on the category page: category_name = "Bearing" and presses the save button | The new category data is successfully stored in the database | *Valid* |
| 4 | Edit Category Data | Admin edits the data in the "Bearing" category and changes it to "Oil Seal" and presses the save button | The data was successfully changed from "Bearing" to "Oil Seal" and stored in the database | *Valid* |
| 5 | Delete Category Data | Admin deletes data by pressing the delete button in the "Oil Seal" category | Data category "Oil Seal" successfully deleted from the database | *Valid* |
| 4. | Barcode Printing | Admin selects product data "52/B29 Rewind Spring Nixon", "52/C01 Handle Pro-Quip", and "52/C16/21 Damper STP" to print barcodes. The minimum data selected is 3 products so that they can be converted into barcodes | Product codes “52/B29 Rewind Spring Nixon”, “52/C01 Handle Pro-Quip”, and “52/C16/21 Damper STP” are generated into barcodes with information of the product name above the bacode. | *Valid* |
| 5. | Stock Notification | Admin / Cashier makes sales transactions on the product "52/C16/21 Damper STP" with a qty of 2 pieces, which has an initial stock of 11 pieces | There will be a notification that a new transaction has been made and also a notification that the product “52/C16/21 Damper STP” has 9 pieces left and can be reordered because there are less than 10 items a notification will appear after the transaction is made | *Valid* |
| 6. | Live Search | Admin looks for data "ChainSaw 9900 Motoyama Black" in the search column in the product data | Automatically displays the data of “ChainSaw 9900 Motoyama” without reloading the page on the product data page | *Valid* |

## 4. CONCLUSION

Based on the conducted research, to solve the problems, the results obtained in this research are a point of sales website at the Matahari Motor Pontianak Store which is equipped with features in the form of more structured data management so that it makes it easier to group data and the live search feature in searching for item data , barcode printing feature for product data, with data storage in a database, data can be stored safely and can be stored for a long period of time as well as income reports to monitor purchases and sales and income received to owners. Minimum stock notification feature to inform that the item has reached the minimum stock limit and must be reordered.

The shortage of this website is that there is no price difference for the wholesale system because it only examines retail sales, this website is not yet responsive so the display for mobile is not yet available and not discuss about sales returns.

## 5. SUGGESTED

There are some suggestions for other researcher in developing this research such as: add price differences for wholesale and retail by adding members, eliminate the use of the mouse to make it more user friendly, and add a sales return section because there is the possibility of returning goods that have been purchased for further research in order to expand the scope of this research.

## 6. REFERENCES

[1] Mastan, I. A., dan Kurniawan, R., 2020, Perancangan Sistem Persediaan Berbasis Website pada PT. Asahi Fiberglass, Journal of Industrial Engineering and Management System, No. 2 , Vol. 13, hal. 100-110, ISSN:1979-1720.

[2] Nugroho, E. C., David, Kosasi, S., Gat, Syariffudin, G., dan Wingdes, I., 2022, Rancang Bangun Web Penjualan Toko Sahabat Stiker, InfoSys Journal, No.2, Vol.6, hal. 205-215, ISSN:2087-3085.

[3] Runda, O. R., David, Gat, Kosasi, S., dan Syarifudin, G., 2021, Implementasi Progressive Web Application Pada Toko Online Widman Store Pontianak, Jurnal Sistem Informasi dan Teknologi Informasi , No.2, Vol.10, hal. 170-179, ISSN:2552-6102.

[4] Kurniawan, H., 2021, Pengembangan Website Sebagai Wujud Implementasi Keterbukaan Informasi Publik Kabupaten Sintang, Jurnal Sistem Informasi dan Teknologi Informasi, No.1, Vol.10, hal. 74-84, ISSN:2252-6102.

[5] Alip, Kosasi, S., Yulianti, I. A., Syarifudin, G., dan David., 2021, Implementasi Arsitektur Model View Controller pada Website Toko Online, Jurnal Bumigora Information Technology(BITe), No. 2, Vol. 3, hal. 135-150, ISSN:2685-4066.

[6] Azizah, F., Novyanti, L., Amri, N. O., Oktaviani, A., dan Nurfalah, R., 2022, Perancangan Aplikasi Point Of Sale Pandita Coffee Berbasis Web dengan Kombinasi Model SDLC Waterfall, Jurnal Sistem informasi Kaputama, No.1, Vol.6, hal. 69-74, ISSN:2548-9712.

[7] Wijaya, E. P., Kosasi, S., dan David., 2021, Implementasi Aplikasi Web Full Stack Pendataan Cloversy.id, Jurnal SISFOKOM, No. 3, Vol. 10, hal. 320-327.

[8] Sugumonrong, D.P., Ray, R., dan Victorio, V., 2019, Perancangan Sistem Informasi Point Of Sales (POS) Berbasis Web Pada Rumah Makan Kokobop Chicken, Information System Development , No. 1, Vol. 4, hal. 78-85

[9] Widyastuti, R., Dhiana, A. S., Hartati, T., dan Amalia, N., 2021, Penerapan Point Of Sales Pada Sistem Informasi Penjualan Kedai Sulam, Jurnal Sibertenika, No. 1, Vol. 6, hal. 136-154, E-ISSN 2745-5831.

[10] Zaitunnisaa, L., dan Arifin, R. W., 2021, Sistem Informasi Point Of Sales Berbasis Web Pada Toko Usaha Mandiri, Information System Educators And Professional, No. 2, Vol. 5, hal. 141-150.

[11] Staron, M., 2020, Action Research in Software Engineering, Springer, Gothenburg, Swedia.

[12] Pressman, R. S., dan Maxim, B. R., 2020, Software Engineering A Pactitioner's Approach, Ninth Edition, MC Graw Hill, New York.

[13] Supardi, Y., dan Sulaeman, 2019, Semua Bisa Menjadi Programmer Laravel Basic, Elex Media Komputindo, Jakarta.

[14] Munawar, 2018, Analisis Perancangan Sistem Berorientasi Objek dengan UML(Unified Modeling Language), Informatika, Bandung.

[15] Shalahuddin, M., dan Rosa, A. S., 2018, Rekayasa Perangkat Lunak, Informatika Bandung, Bandung.