**POINT OF SALE AND INVENTORY SYSTEM USING BARCODE**

**TECHNOLOGY**

A System Development Documentation

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ITEC 55A System Analysis and Design

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**BIOGRAPHICAL DATA**

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*“I can do all things through Christ who strengthens me.”*

*-Philippians 4:13*

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**ABSTRACT**

As technology continues to evolve, corporations learn to adapt to growth to develop their industries as well.  Point of Sales System is the market solution focused mainly on software programs used to concurrently tune sales pastime and inventory. The most essential commodity a small company will acquire is inventory. One of the best choices an organization can make is to use the proper POS method to handle inventory. Adaptation of barcode technology offers an invaluable method for monitoring a range of details, from prices to inventory and even customer-seller transactions. This study was geared towards the development of Point of Sales and Inventory System using Barcode Technology. The system will provide an avenue for the administrator and cashier of the business. The study aimed to provide a more accurate, time-saving, and faster transaction business process using the system. The system would provide real-time access to the inventory such as the administrator is responsible for adding quantity and cost of the restocking, adding new products, delete and edit an existing product, manage the different accounts and generate sales reports on the desired date. The system would also provide an order scanning system that the cashier used to scan the ordered items of the customer, print receipt, and view all items ordered as well as the order payment information on the current day. The methodology used for the system is Prototyping Methodology.

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**INTRODUCTION**

The advancement of technology in business industry makes the transaction processing much easier. The computerization of data that flows in the business gives more sense of security and accurate result rather than storing the data by writing down manually. Technology is moving forward even if you are small or big business owner. Retailer who refuses to enhanced their business operation quite possible to be left behind by missing out essential data for the growth of the business.

Agnes Teh Stubbs (2019), a software adviser in Software Advise Website, stated that operating a retail store needs administrative management and marketing skills. It is also needed assurance for right control of stock in inventory and monthly sales reports by that business have the assurance for even business transaction. Having an effective Digital Point of Sale (POS) are vitally in business to meet those needs.

According to Michael Benson Cao (2018), Point of Sales (POS) System takes long way in the business industry in the Philippines because it allows the employee or owner process their business in more convenient and accessible way. POS System is different on the tradition cash register. POS is user-friendly system to use and best system when it comes on tracking transaction in business. Managing your day to day transaction can be overwhelming especially if the business transacting numerous customers, POS is convenient for accurately punch number of sticker or barcode without manually checking all the items one by one. In result, POS system provide quick checkout in serving the customer.

Elijah’s store located at Anabu 1-E Imus City, Cavite. The store offers variety of product like Beverages, Rice, Canned/Jarred Goods, Personal Care, Cleaners, Frozen Food and Snacks. The business is a Sole Proprietorship and has only one branch. The business has three personnel including the owner itself. The business transaction is still conducted manually. Due to manual way of recording the sales and inventory, inaccuracy and safety of data is the business’ utmost concern. With the problems stated, the study has been conducted to provide solution by developing a system that could help the business have its efficiency in transacting through the use of barcode technology that would provide convenience to the customer and a Point of Sales and Inventory System that would help the business in having an efficient and accurate way of storing records. The use of the system would be beneficial to the business because it requires lesser man power which means lesser cost in hiring and paying for additional employee. The implementation of the system would be of big help for the business to thrive and success.

**Statement of the Problem**

The Elijah’s Store uses pen and paper to record their inventory, the admin encountered problems in their innovatory because they manually count the quantity left in each item to identify which of items needs to be restocked. The admin sometimes also misplace the record of their inventory so they need to record it again. *How to provide a better solution for the restocking to be more time saving?*

The store encountered problems on access to their sales because the admin is inconsistent in the recording of sales, and the owner cannot determine if they are gaining

profit or losses money. The transparency of the sales’ report is also an issue because there is no proof of purchase in each transaction. *How to have an accurate sales report?*

The location of the store is close to factories and construction sites in result, plenty of customers purchase items to the store everyday. The cashier manually checks for the price of the item and calculates the total amount, which causes inconvenience on the sales transaction between the customer and the cashier.  *How to resolve the inconvenience of manual transactions that the establishment is using?*

**Importance of the Study**

The development of POS and Inventory System using Barcode Technology will redound to the following people:

**Client.** The System will help the client to achieve quicker and accurate transaction process on their business. It will also guide them in making profitable business decision based on the data presented in the system.

**Users**. The system will help the admin and cashier to perform their role in the store in efficiently. It will also help them to present an accurate report to the owner of the store.

**Researchers.** The development of the system will be beneficial for them to enhance their skills in programming by making the system improved and develop. The researchers will also build on their planning and designing technique that will meet standard of the client. Lastly, Engaging in this serious kind of project will also enhanced their ability in teamwork, patience and problem solving.

**Future Researchers.** The propped study can be used as a suggestion and reference for their future research. These findings will help future researchers to propose entirely new avenues to explore in their studies and also addressing the limitation of the research.

**Objectives of the Study**

Generally, they study aims to develop a Point of Sales and Inventory Management System for Elijah’s Store to address the problem being encountered by the organization.

Specifically, it aims to:

1. plan a system that would address the owner’s problem such as manual mode of transaction in selling the products, inaccuracy of sales, and inefficiency of manual inventory.
2. analyzing the requirements needed to come up with a solution to the problem which the system should meet.
3. design a prototype for the system that would make cashier and administrator role performed easier and more convenient.
4. test the system to ensure the system function met the client needs.

**Time and Place of the Study**

The study commence on September 27, 2020. The researcher find business client and interviewed the client on October 5, 2020. The proposal and approval of title occurred on the same day of October 27, 2020. The beginning of documentation was planned and conceptualized on October 24, 2020. All of the events study takes place through online platform such as google meet and Facebook messenger.

**Scope and Limitation of the Study**

The study focuses on managing the business cycle of the client grocery store. The researchers aim to develop a digital Inventory and POS System with the use of barcode technology. The significant modules in order to satisfy the business needs are Account Module, Product Information Module, Order Scanning System Module, Inventory Module and Report Module. On the other side, the levels of access in the system are admin and cashier.

**Account Module.** In this module, the system will have an account for the administrator and employee. The admin will control the management of the product available on the store, restocking of the product quantity in hand, managing the account, generating sales report based on the chose timeframe. On the other side, the cashier manages the scanning of items to be purchased. They also can view and print the current order payment information and the items sold on that day.

**Product Module**. In this module the admin can view the entire product available on the store presented in a table. They can add new product available by inputting product information such as barcode, name, variant, price and category. They can also update product information mentioned above and delete product if the admin wanted to phase out the product from the store. The admin can also add new product category if store offer new product variation. They can also search in the search bar to look for specific product and combo box to categorize the product based on product category.

**Order Scanning System Module**. In this module the transaction between the cashier and the customer happens. The cashier scans the barcode of the item and it will automatically show the product name, variant, and price. Cashier needs to input the

quantity of the item to be purchased and click enter to be able to generate the total amount of the item and it will be shown on the order scanning table. When the barcode scanner is not working the cashier can input the barcode manually or look out for the product in the search product button. When the scanning of the item is complete, the cashier asks for the payment and input the cash tendered and it will show the change of the customer. When the payment transaction is complete, they can now print out the receipt and hand it out to the customer. It will also have a button for new transaction to clear out the last order information of customer and remove items when the customer decided not to buy specific item.

**Inventory Management Module** In this module the admin can view the table of all the product stock information such as inventory number, product code, name, variant, stock in, date, stock out, quantity, cost, and category. The admin can add stock in hand on the product and the cost of the product stock added. They can also print a report of the stock management based on the chosen date.  The admin can search in the search bar to look for specific product and combo box to categorize the product based on product category.

**Sales Reports Module.** In this module, the report is generated by both admin and the cashier. The cashier can have access to the order and item sold transaction in the current day only. In the order transaction, it consists of order id, total items, total amount, cash tendered and change while on the item sold, it has the transaction code, order id, product, code, product name, variant, price, quantity, and total amount. The cashier can print out both order and sold items transaction to give to the admin.  On the other hand, the administrator has the authorization to view all of the sales of the store no matter what date

is needed. It is presented in a table form consisting of information about the account id and name of the cashier who transact the order, the date, order id, total items and total amount. They can print out sales by showing all the data based on the summary of sales, chosen date, week, month and year. It also included in the report, the total of items sold and total sales.

The limitation of the research is that no alternative form of payment, such as e-payment, is approved by the shop. The framework does not include information on VAT or value added tax that the corporation has to deal with in the billing or receipt statement. System functions do not offer another menu or configuration that helps the administrator to conveniently monitor, add, modify or remove certain category of items.

**Definition of Terms**

**Inventory** – a process used to check the remaining stocks available by subtracting the sold products to the primary stocks.

**Point of Sales –** a system that uses barcode scanner for sales transactions and is used to track real-time sales of the business.

**Sole Proprietorship –** it is an unincorporated business with only one owner who pays personal income tax on profits earned.

**VAT or Value Added Tax-** It is a sales tax form. Consumption tax is imposed on the sale, selling, trade or lease of products or commodities and services.

**GUI or Graphical User Interface**- User interface in which users communicate through visual indicator representations through devices

**Prototype**- Early screening, modeling, or release of a system that sis constructed to validate the features and process

**REVIEW OF RELATED LITERATURE AND STUDIES**

This chapter discusses and encompasses the studies and literature from in-depth searching conducted by researchers. It will also present the relation of the previous studies and literature from the current study of the researchers.

**Related Literature**

**Point of Sales System**

According to Hopkins (2019) in his article entitled “7 Benefits of POS System for Small Retail Stores”, it can save a lot of time on the cash register operation because the POS screen is functionally organized, actions and decision are taken without thought and transaction are extremely fast processed. It does not require an internet connection to operate, to make all the procedures seamless, it is also easy to make connection to your current printer, barcode scanner, and cash drawer. POS helps you to gather costumer data in store during the sales. The reporting process in business can be easier like printing out daily totals. In result, having POS can gathered all your required data that helps to do quick and accurate analysis and scale your system growth. Having a POS system can make the business inventory management smooth because employees will not consume a lot of time and effort to check whether the product is in stock.

The benefits of POS stated above are related to the study addressing the solution for statement of the problem in the researchers study. POS helps the client to provide a more efficient way on managing inventory system, it will also easier to have an accurate

sales report and it results for more faster and convenient transaction between the customer and employee.

**Barcode Technology**

In the article “How to Make a Barcode Inventory System for a Small Business”, stated that in managing business it is always take time to control the inventory. Whether it is a small or big kind of business, it is essential to have an effective inventory system. Having a Barcode Technology results to time saving, money, and unnecessary work in managing the inventory system. It also more accurate than keeping the manual method of inventorying and users can quickly figure out what is item is stored or item that is out of stock. User can check the barcode every time a customer orders a product and automatically take it out on inventory records. All of the product barcodes can be read and transferred to a computer, this will result to a faster process of checking out the total price instead of manually entering each product barcode(Kostanecki, 2020).

In relation to the study, the researchers used a barcode technology also to manage the stock of the item in inventory system by decreasing the number of stocks available per item will whenever the employee scan the barcode of the item.

**Inventory Management Software**

According to the article in Business News Daily, Software for inventory management is a must to monitor and manage the inventory, especially as your business scales. It is a platform that automates inventory and warehouse management, streamlines the activities needed to monitor inventory efficiently, handles recording and updates

accounting records. The key features that the business must consider in their inventory management software. First is Point of Sale integration, this feature combined with automatic reordering ensuring that they still have suitable stock number on the inventory to meet the orders quickly. Second is Inventory Catalogue, distinguish the product in their different characteristics such as size, color, and other characters. Third is Automated Reordering, when the inventory system is getting low, it is very important to supply the items especially to those bestselling item, it is important to simply set a minimum quantities for each item then if the number is reached, the admin must refresh the stock available. Last feature is E-commerce Integration, most of business uses several channels like websites and online marketplace, the inventory software will help the admin to avoid accidentally fulfill more orders than you have in a stock (Uzialko, 2020).

The key features stated above specifically the POS Integration, Inventory Catalogue and Automated Reordering. It is similar to Inventory Management Module of the study wherein it is integrated to the POS that auto decrement the stock available whenever the employee punch an item. The researchers provide category button that itemized different items available in the inventory for much faster management. It will also provide an information in dashboard tab under the module wherein it will display the items that is lower 15 stock available remaining that notify the admin what item should be refreshed.

**Java Programming Language**

According to Jones (2020),most the enterprises whether it is small or medium-sized uses java as their preferred choice for different business software applications. Java

is one of the old and famous in technology world. It is famous because of the numerous number of advantages it offers. The is known for WORA or “Write Once Runs Anywhere” principle, this features helps the developer to write the code on one system and use it with other system without much changes. It also has a great memory management that increase or decrease during the execution of the application and fast response time and better performance even in multi-tasking.

In relation to the article state above, since the java offers WORA, the researchers used java programming language to have a collaborative development of the system between 2 people without considering if the code will run in different devices.

**Data Flow Diagram**

According to Bilyk (2019), in his article entitled ‘Data Flow Diagram (DFD) Explained”, having knowledge about DFD is a good start for those who are newbie in studying Business Analysis and business process visualization. In Business analysis, it is used for assessing the existing systems and its elements because provides useful toolset for discovering possible some possible structural flaws while in Software Development, it is used to explain and visualize the project’s requirements. DFD shows the movement of information from one place to another which makes things understandable and consistent. According Bilyk, DFD is designed to answer the question “how it works”.

In relation to the study, the efficiency and clarity of the process in Data Flow Diagram is of big help for the researchers in the process of analyzing and visualizing their POS system. DFD helps structure each component of the framework, keep them coherently unblemished and interconnected.

**Related Studies**

**2H Hosnie GEN. Merchandise Sales & Inventory System with Barcode Scanner**

The study was developed by Colot, Papic and Taghap. The study takes place at College of Engineering and Technology of Western Mindanao State University on February 23, 2017.

Under this study, the researchers came up with computerized sales and inventory system since the company current status is still using the traditional counting process. The system helps the company in maintaining an efficient flow of operations while generating fast and accurate reports needed for submission and compilation such as, it limits to simplify the work of the sales and inventory personnel and generate reports such as the Sales Invoice, Sales Reports, Purchased order Form and Inventory Reports. The methodology the researchers used in this study is spiral method. It consists of Identification Phase wherein the researchers figure out what are the system requirements of the client, Design Phase where in involves architectural design, logical design of modules, physical product design and final design in the subsequent spirals, Construct or Build Phase involves the production of the actual software and Evaluation and Risk Analysis wherein the it includes identifying, estimating, and monitoring technical feasibility and management risks. The features available in the proposed system are log in, cashiering, sales, Inventory, Stock in, My account, All Account, Help and search bar.

In relation to the current study, both study uses barcode for much faster transaction, it also used a Log in Button and uses different account for employee and admin wherein the access of the employee to the features is limited based on what are their capabilities, while the admin has an access to view the reports of the employee. In sales history module

of the study of the researchers it is both allow the admin to set specific date, daily, monthly or annually.

**Point of Sale System with Inventory for ARM’s Food and Delicacies**

The study was created by Agustin, Cabral, Mendoza and Santos in the College of Computer Studies Trimex Colleges located at Binan Laguna. The study duration happened in the month March to April 2019.

Based on the study, having a POS system with Inventory that is computer-based is faster and more robust instead of physical method. It makes the business increasingly gainful, proficient and helpful to the company and its clients. The ARM’s Food Delicacies still uses the standard method in their business that result to several issues they encountered. The researches proposed a framework that will significantly help the company addressing the processing, calculations, and the rundown of every single budgetary record of pay rates, decreasing the cost on the business and screening the accessibility and the amounts of the stocks to avoid under stocking. The researchers use the methodology of SDLC model which includes Planning, Analyzing, Testing, Design, Implementation and Maintenance. The design of the study is the users such as the administrator who manages user accounts and reports, the cashier who manages the transaction, the barcode scanner module to read the barcode of the product and the receipt printer to generate the receipt of the customer. It also include other module like stock module that will demonstrate a warning for the item that is leaving a stock and offer module that help make the transaction quicker and improve clerks work.

The relation to the study stated above to the current research are they both have a barcode scanner module or in the researchers study scanning system module which responsible for the reading of barcode, printing of the receipt, and the reason for fast transaction between customer and employee. It also has a stock module or in the current research inventory module that gives information for an item that has a lessen stock.

**POS System (Shoe Retail System) Documentation**

The research was developed by Hasan and it was developed on November 14, 2015. The study takes place at Asia Pacific University of Technology and Innovation inKuala Lumpur, Malaysia.

EFSI is a shoe retail company located in Chittagong, Bangladesh. The company facing some difficulties for keeping the records of their sales, stock as well as the customer service since they writing it down on a record book manually. The company requested the researchers to develop a POS system and it must be functional and does not require an internet connection to manipulate. The research does not state an exact methodology but it includes a Requirement Analysis consisting of Functional Requirement and Non Functional Requirement. The researcher presented different features or interfaces that their system offers. Log in Interface, every admin and employee has their following account and roles. When logging in, the users will direct in either Admin Panel or Staff Panel. In Admin Panel it has capabilities of managing stock, sales report, services, update password and staff registration. In stock button it has a add, delete, update, view button for managing the stock, in Sales Report button it has a data time picker for easier summary of sales of report, in Service button it include the management of the employee account and also the registration button that will display the information needed to fill out if there is new employee. The Staff Panel it consists of New Sales, Customer Service, Reports and Log

out. In New Sales button it is responsible whenever a customer purchase a shoes, in Customer Service it is the management of the information of the customer since the company offers services, in Sales Reports it can be either sales on the product or in the services, the last is the Stock Report from this report staffs can check all the completed and pending customer services.

In relation to the current study, both system features a staff or employee panel different from the admin panel. It also features add, edit, delete, and view item of item and sales report in admin panel. While in staff panel both can also tract the reports or transaction they perform in that day.

**Conceptual Model of the Study**

**INPUT PROCESS OUTPUT**

**POS AND INVENTORY SYSTEM USING BARCODE TECHNOLOGY**

**System Requirements**

1. Client interview
2. Analyze gathered information and provide solution
3. Interview Report and System Request
4. Methodology Selection

**System Design**

1. Context Diagram
2. Data Flow Diagram
3. Entity Relationship Diagram
4. Use Case Diagram
5. Sequence Diagram
6. Design Prototype

**Prototype Methodology Model**

1. Planning
2. Analysis
3. Design
4. System Prototype
5. Implementation
6. System

**Knowledge Requirements**

1. Business Process
2. Java Programming Skills

**Software Requirements**

1. Microsoft Visio 2016
2. Java (JDK and JRE)
3. NetBeans IDE 8.0.2
4. Apache Derby Client 10.1.3
5. Operating System (at least window 7 Recommended)

**Hardware Requirements**

1. Computer
   * Intel Core i3
   * 4GB RAM
   * At least 280GB
   * Keyboard
2. Barcode Scanner

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Figure 1. Conceptual Model of Point of Sales and Inventory System Using Barcode Technology

**MATERIALS AND METHODS**

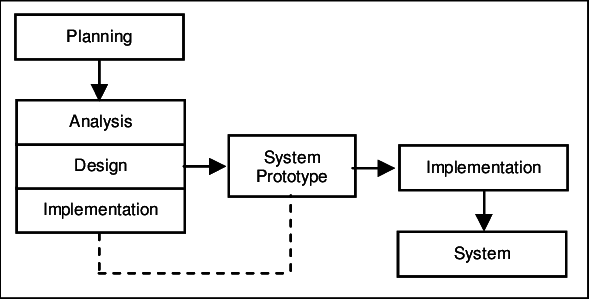
This chapter discusses the hardware and software used in developing the system. It also provides the figure and discussion for each phase of methodology that the researchers employed for the system development.

**Materials**

While developing the system, the researcher used a laptop with Intel i3 processor, 4GB ram and 280 GB Hard Disk Drive. Windows 10 is the operating system that the researchers used in developing the system. Barcode Scanner device is also needed in the development of the system operation.

The Java programming language used is Netbeans IDE Platform for coding and implementation of the design prototype. Apache Derby package is added to the Netbeans for the database of the System. They used Microsoft Visio 2016 in illustrating different diagrams that represent the system development and Microsoft Word 2016 for the documentation and other deliverables like System Request and Interview Report.

The system can be deployed to a laptop or computer with at least i3 processor, 4GB RAM and 280 GB Hard Disk Drive specification. The software requirements needed to run the system is at least Windows 7 operating system version.

**Methods**

Prototyping Methodology (Hassan and Wahab, 2007)

Prototyping methodology is software methodology process under Iterative Approach. The highlight of this method of development is when the prototype is built, it will first demonstrate functionality of every features to clients. The client can have comments or suggestion regarding the model and the developers modified the system prototype It helps the developers to present an application that already solved possible issues that the users may encounter while using the application.

The researchers used this methodology in study because the client wanted to make sure that the system created was in the preference of her employee. Since one of the main problem they encounter was the slow transaction between the customer and employee, they are particular on how the system features is understandable and easy to use. The researchers also decided to use this type of methodology because they wanted to avoid modification that may happen in the actual presentation of the application.

In **Planning Phase**, the goal is determined the plan for the intended project. It includes evaluation of the project teams and leadership structure, the interview between

the developer and the client to figure out the current status of their chosen business. Lastly, try to get feedback from the potential consumer or the users of the system.

The researchers begin by assigning the 4 members of the team on their different roles in developing the system. One member is for the documentation, the other 2 member is for the developing of the system and the last member is for the database management. After that process, the researchers execute an online interview to ask for the status, issues and the development the client wanted in their business. Since the business has a 2 employee which is the admin and a staff, the researcher gathered information on what will be the benefit of the system to them.

In **Analysis Phase**, it is considered as a part wherein the business requirements are analyzed and project goals converted into the defined system functions that the organization intends to develop.

The researchers analyze all the gathered information and create a System Request containing what are the Business needs, Requirement, Value and Constraints proposed for client. They also provide an Interview Report summarizing the details on the interview that happened. When the document is created, the research team come up on what methodology they apply that met the criteria of the business requirements.

In **Design Phase**, it is responsible for describing the desired features and operation in the system which means that all information gathered and analyze are presented visually for the client.

The researchers transform the System Request document into logical structure containing the detailed and complete specification that can be implemented in programming language. The key deliverables that the researchers execute in this phase are

Context Diagram, Data Flow Diagram and Entity Relationship Diagram showing the data and the process inside the business.

**System Prototype Phase**, it includes the client initial evaluation of the system prototype. It helps to find out the strength and weakness of the working model. Comment and suggestion are collected from the customer and provided to the developer.

The researchers send the proposed system prototype to the client through online. The client point out features they wanted to eliminate for more easily and understandable interface based on the employee preference.

In **Implementation Phase**, in this phase the suggestion of the client regarding the interface will consider on the prototype.

The researcher modified their system prototype and eliminates the features that the client suggests. After this process they again consult the updated system prototype to the client.

In another **Implementation Phase**, the developing finalized system features based on the final prototype.

The researcher started the developing of the system in Java Programming Language using NetBeans Platform. They design the GUI of the system based on the final prototype that is approved by the client.

In **System Phase**, the application system is now deliverable to the client. The system will undergo routine maintenance to minimize trouble in using the system.

The researchers deliver the application to the client. Since all the features are accepted, the delivered device does not require any alteration of the function. They will just direct the users of the system to the business phase at the real beginning of the system's operation.

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**APPENDICES**

**APPENDIX 1**

**INTERVIEW REPORT**

**Person Interviewed:** Cristy Bersaba

**Position:** Business Owner

**Interviewer:** Joycel H. Empanto

         Alexandra Veluz

         Kenji Christopher Zapanta

         Alexis Riszan Olivar

**Purpose of Interview:**

* Determine the current problem of the store and how those problem affects her business
* To know gather sufficient information for us to construct MRP or Materials Requirement Planning.

**Summary of Interview:**

* The current problem of the owner of the store that needs a solution:

1. Slow transaction between the vendor and customer since the ratio of customer is increasing.
2. Inaccurate inventory management that leads to shortage of the sale.
3. Does not have a track record on the system of her business

* The major findings regarding the business of the interviewee is the outdated way of managing the business that leads to several problems.
* The client requirements that she wanted to be acknowledge while doing the system development which is the following:
  + The use of barcode technology for much faster transaction
  + Effective and ease to use inventory system.
  + POS system for better tracking of their sales in business.

Approved by:

**Name of Interviewee**

Cristy Bersaba

October 6, 2020

Date

Submitted to:

**Ronel E. Asas**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Date

**APPENDIX 2**

**SYSTEM REQUEST**

**Project Title**

Point of Sale and Inventory Management System using Barcode Technology

**Company Background**

The Elijah’s Store Located at Anabu Hills Subdivision, Anabu 1-E Imus City, Cavite. The store offers variety of product like Beverages, Canned/Jarred Goods, Personal Care, Cleaners, and Snacks. The business is a Sole Proprietorship and only has one branch.

**Problem Background**

The business is located near factories and construction sites, because of the location the owner receives plenty of customer everyday. The store only has one worker and it is difficult for her to transact the entire customer per day without confusion, since the mode of transaction they applied is still the manual way. Sometimes the owner does not accurately manage her inventory because she manually writes all her inventory. The owner has a several experience of shortage of her sale without knowing the reason because she does not have a record of the payment and product sold on that day.

|  |  |
| --- | --- |
| Business Needs | The business improvements that the client targets to acquire are the following:   * The project system operation will ensure quicker and accurate inputs in inventorying * **Reduces Time Spent on Managing the business** * **Increase store profitability** * Effective stock control system |
| Business Requirements | With the use of proposed project system for the  store, these are the  system features that will addressed the problem of the client:   * The applications of barcode technology that will auto decrement the stock of product. * Payment Receipt for the track record of sales. * Inventory System that is effective for managing the stock of the products. |
| Business Value | The benefits that we expect to deliver to client are the following:   * Easier transaction between the staff and the customer * Avoidance of stock-outs and excess stock * The ability to make more profitable business decisions  Optimize Check out processAccurate Reports |
| Special Issues or Constraint | The following listed below are the possible issues and constraint we can encounter while developing the system:   * Not to complex features of the system especially in the inventory system since the client want a system that is easy to use. * Considering backup plan to prevent  chance of losing details of your inventory |

|  |  |
| --- | --- |
| Project Roles | These are the person who will participate to be able to accomplish proposed system   * Joycel H. Empanto- assigned to be the system developer * Alexis Riszan Olivar- assigned to be the database administrator for the project * Alexandra Veluz- assigned together with Joycel Empanto for the system development * Kenji Christopher Zapanta- assigned to the documentation and designer for the project. |

Project Proponents

**Joycel H. Empanto**

**Alexis Riszan Olivar**

**Alexandra P. Veluz**

**Kenji Christopher A. Zapanta**

Presented to

**Ronel E. Asas**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Date

**APPENDIX 3**

**Context Diagram**

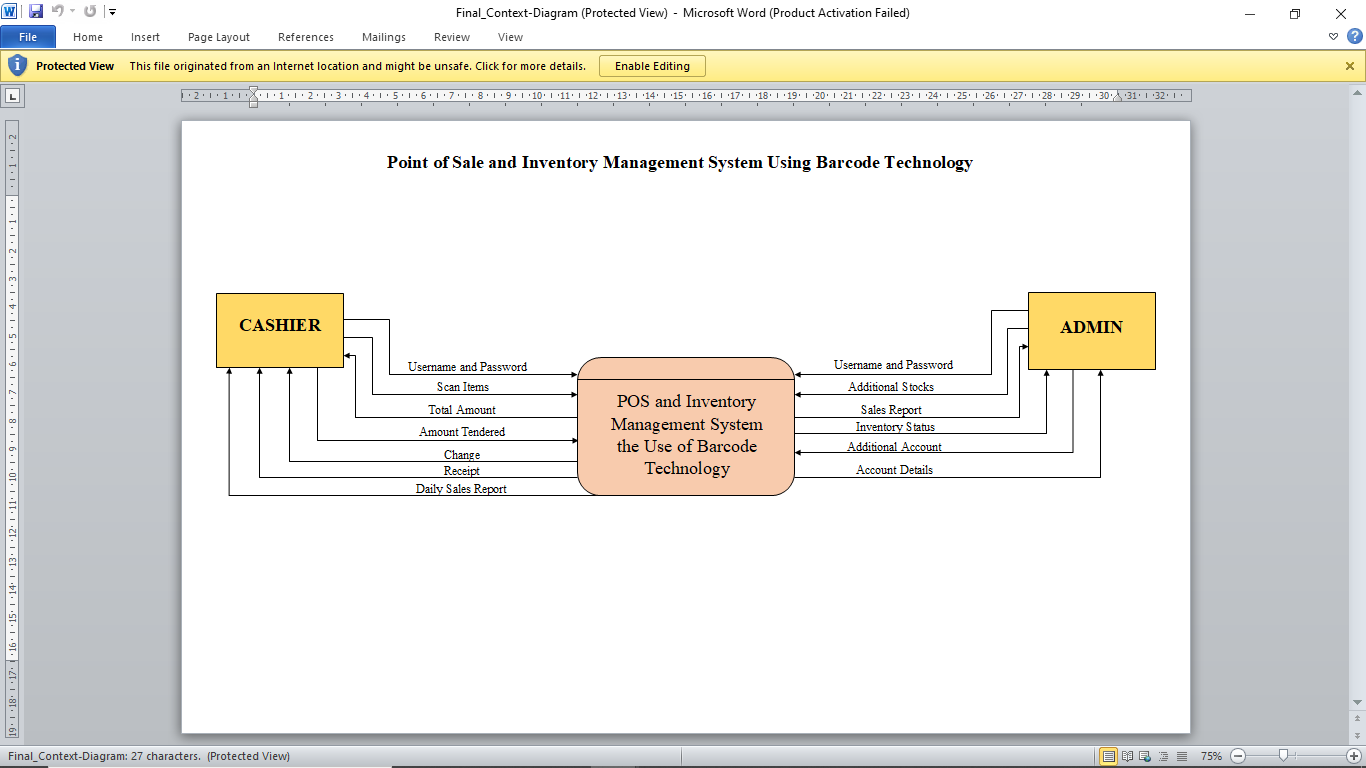


Figure 3. Context Diagram for Point Of Sale and Inventory System Using Barcode Technology

**APPENDIX 4**

**Data Flow Diagram**

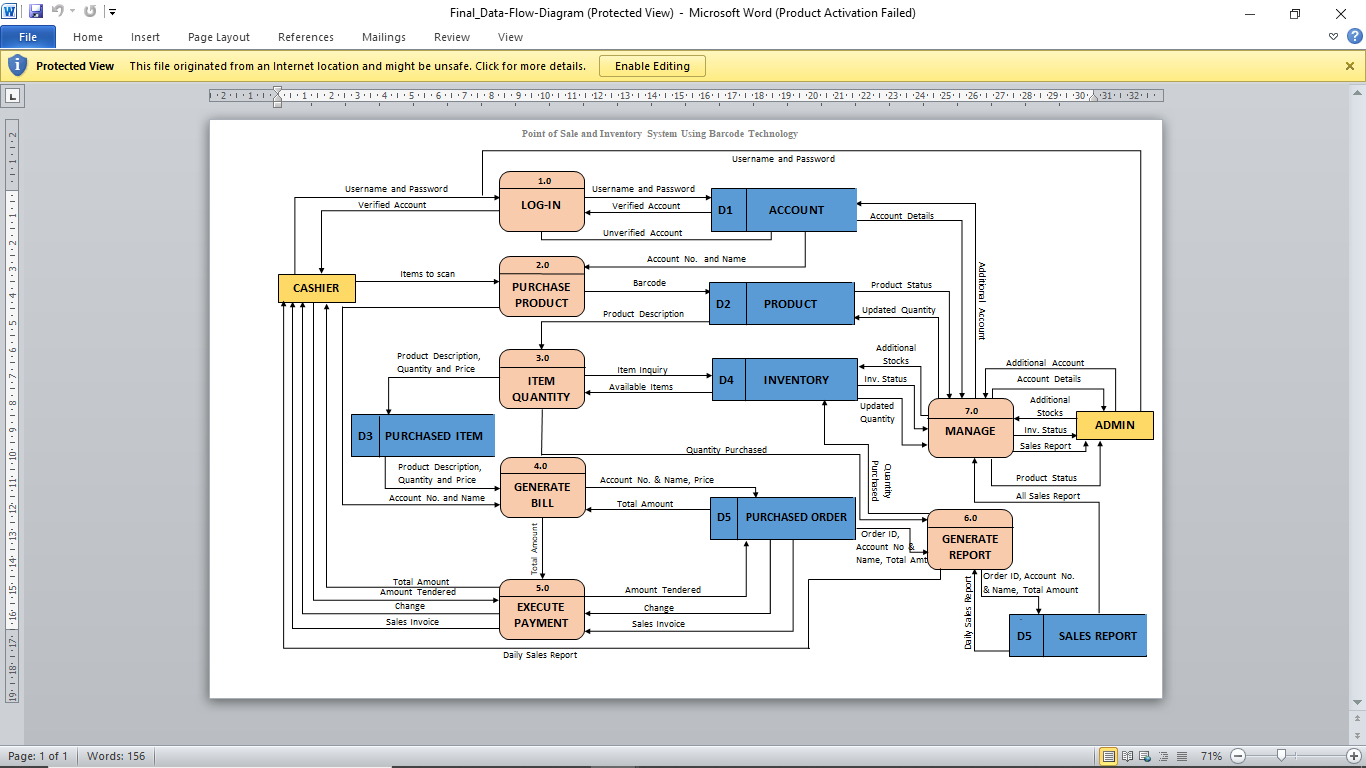


Figure 4. Data Flow Diagram for Point Of Sale and Inventory System Using Barcode Technology

**APPENDIX 5**

**Entity Relation Diagram**

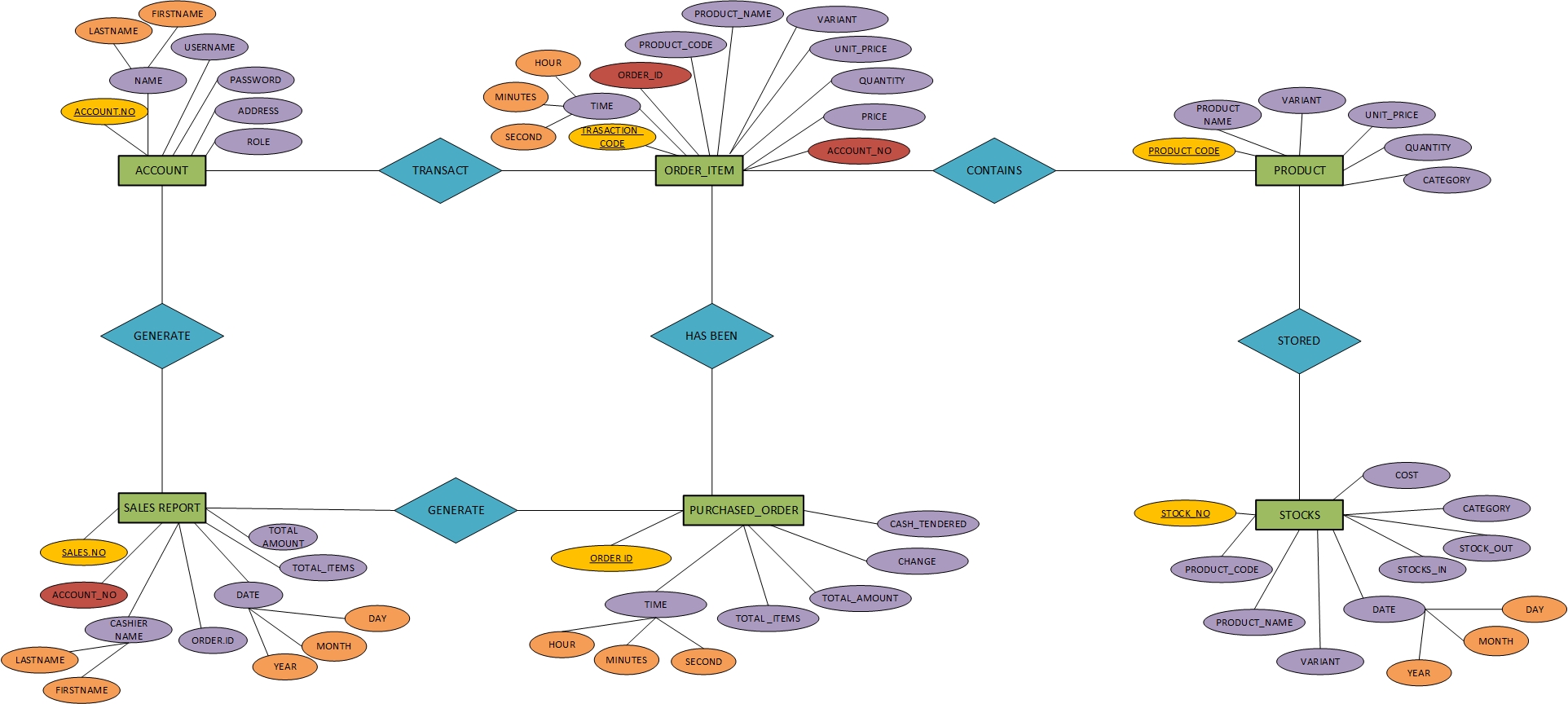
****

Figure 5. Entity Relationship Diagram for Point Of Sale and Inventory System Using Barcode Technology

**APPENDIX 6**

**UML Use Case Diagram**

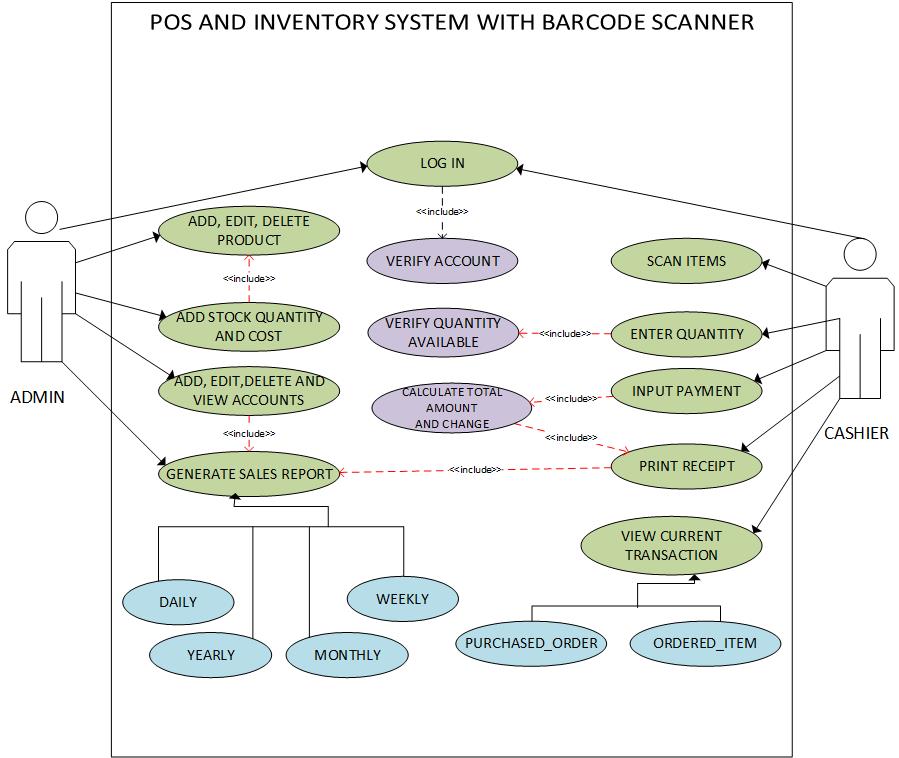
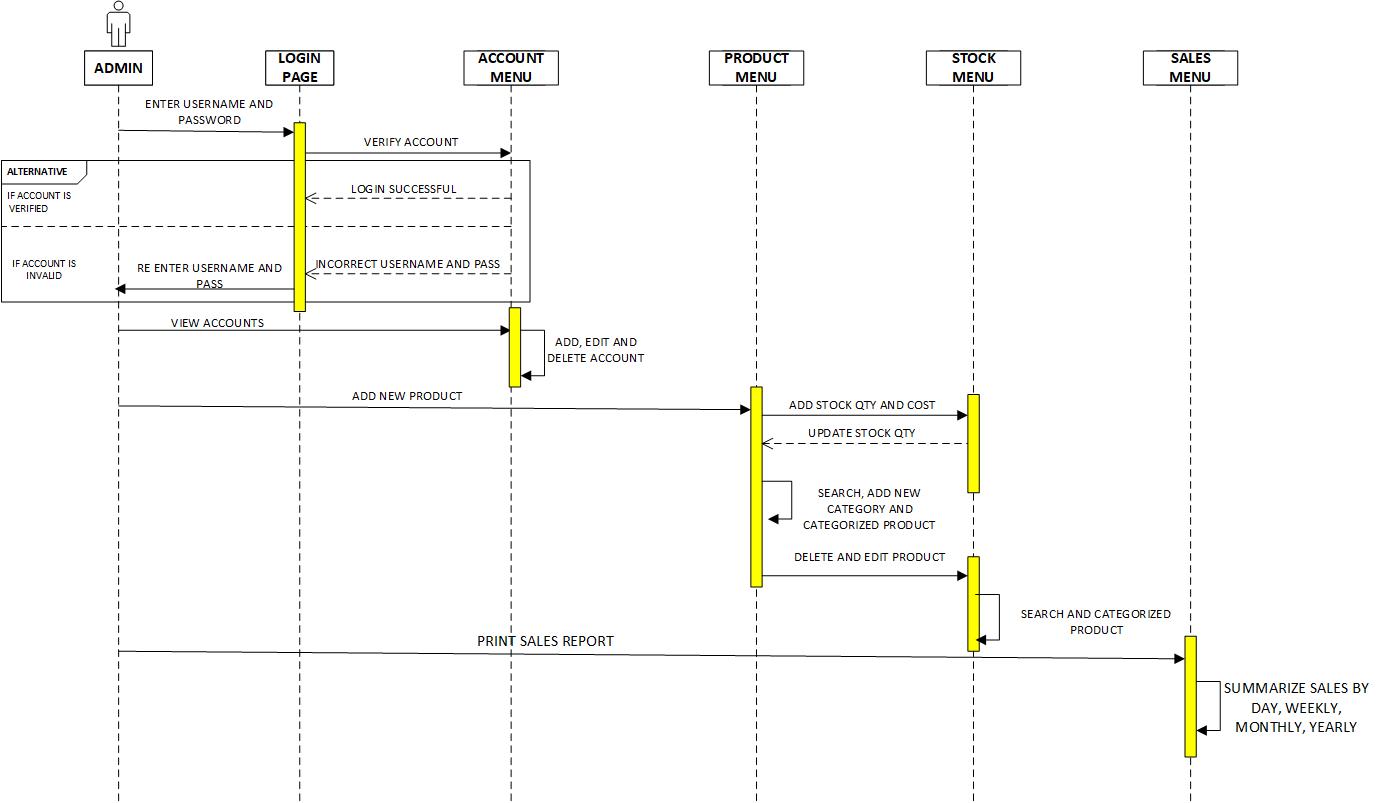
****

Figure 6. Use Case Diagram for Point Of Sale and Inventory System Using Barcode Technology

**APPENDIX 7**

**UML Sequence Diagram**

****

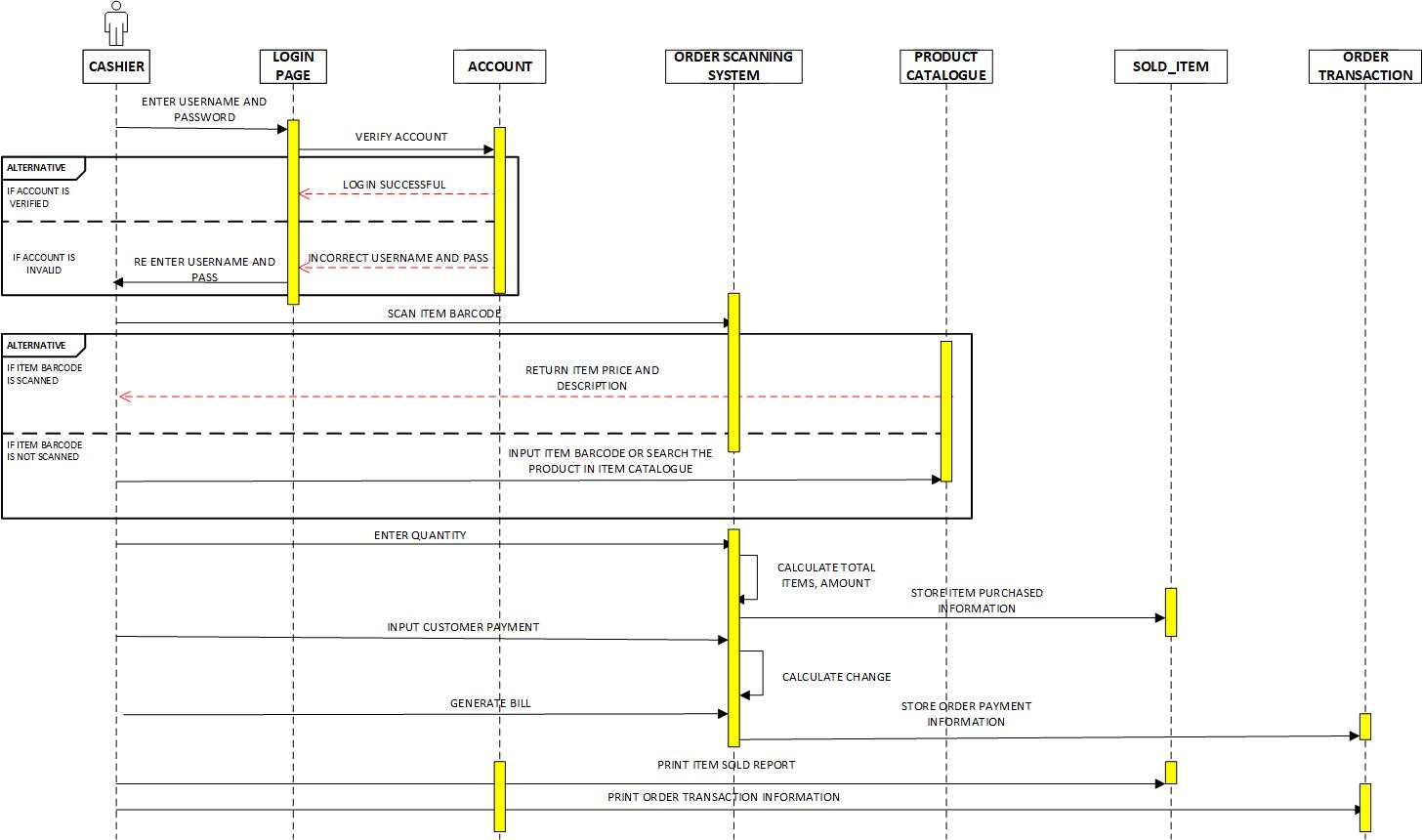
 Figure 7. Sequence Diagram of Administrator in Point Of Sale and Inventory System Using Barcode Technology

Figure 8. Sequence Diagram of Administrator in Point Of Sale and Inventory System Using Barcode Technology

**APPENDIX 8**

**Screenshot of the System**

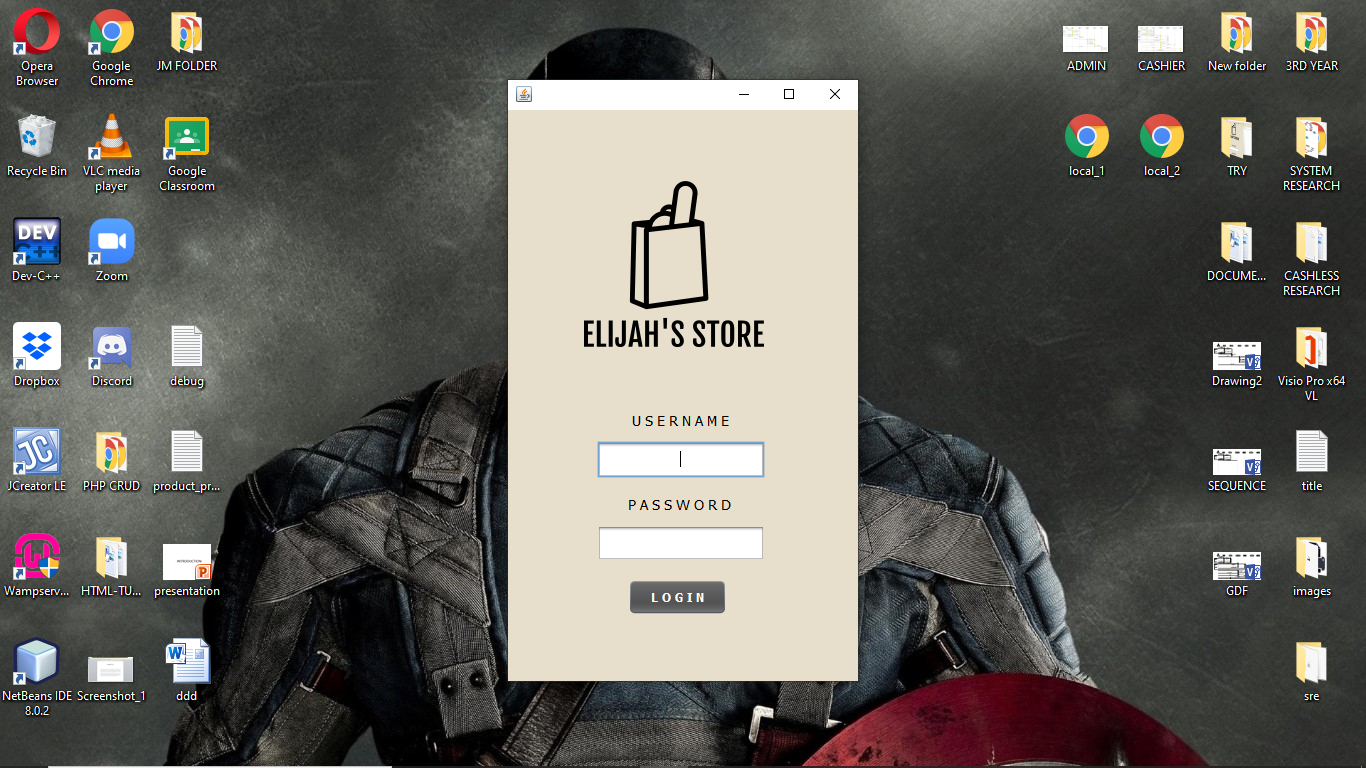


Figure 9. Picture for Login Menu

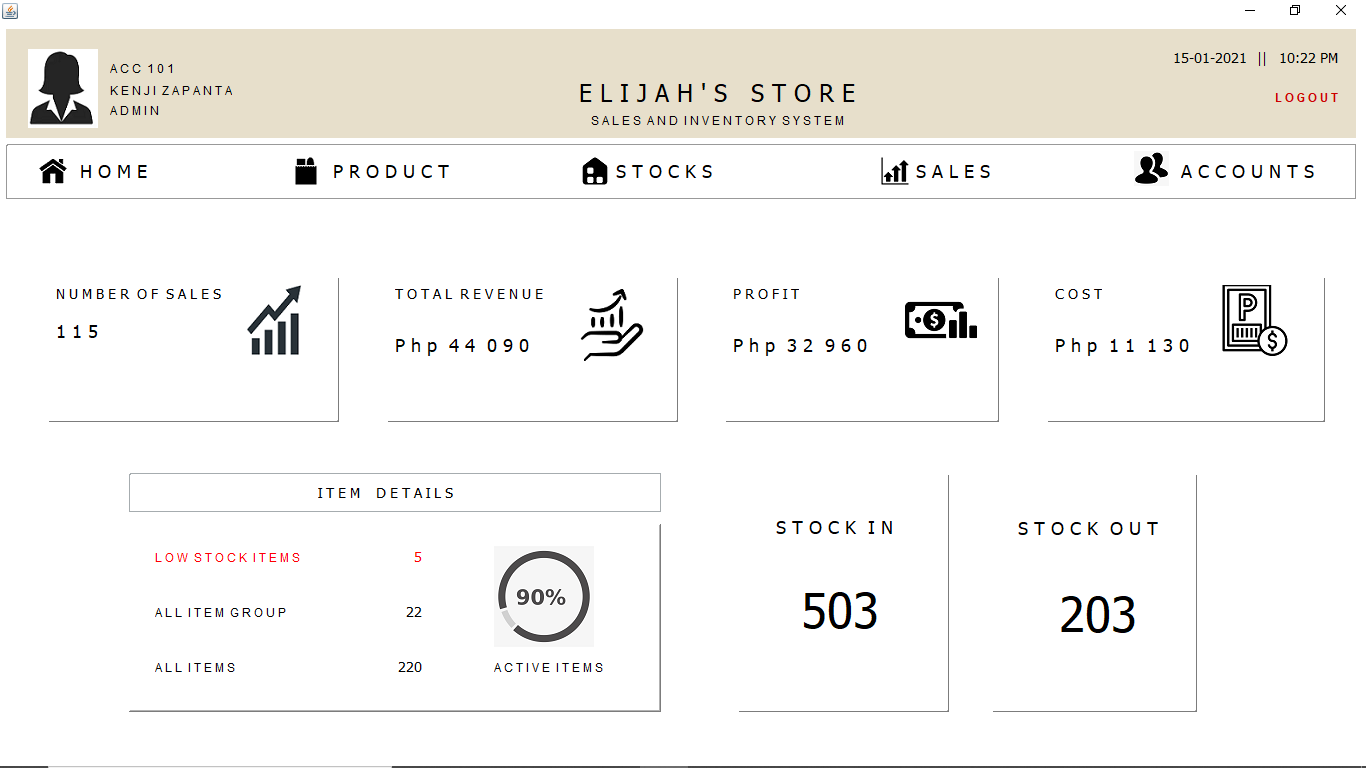


Figure 10. Screenshot of Homepage

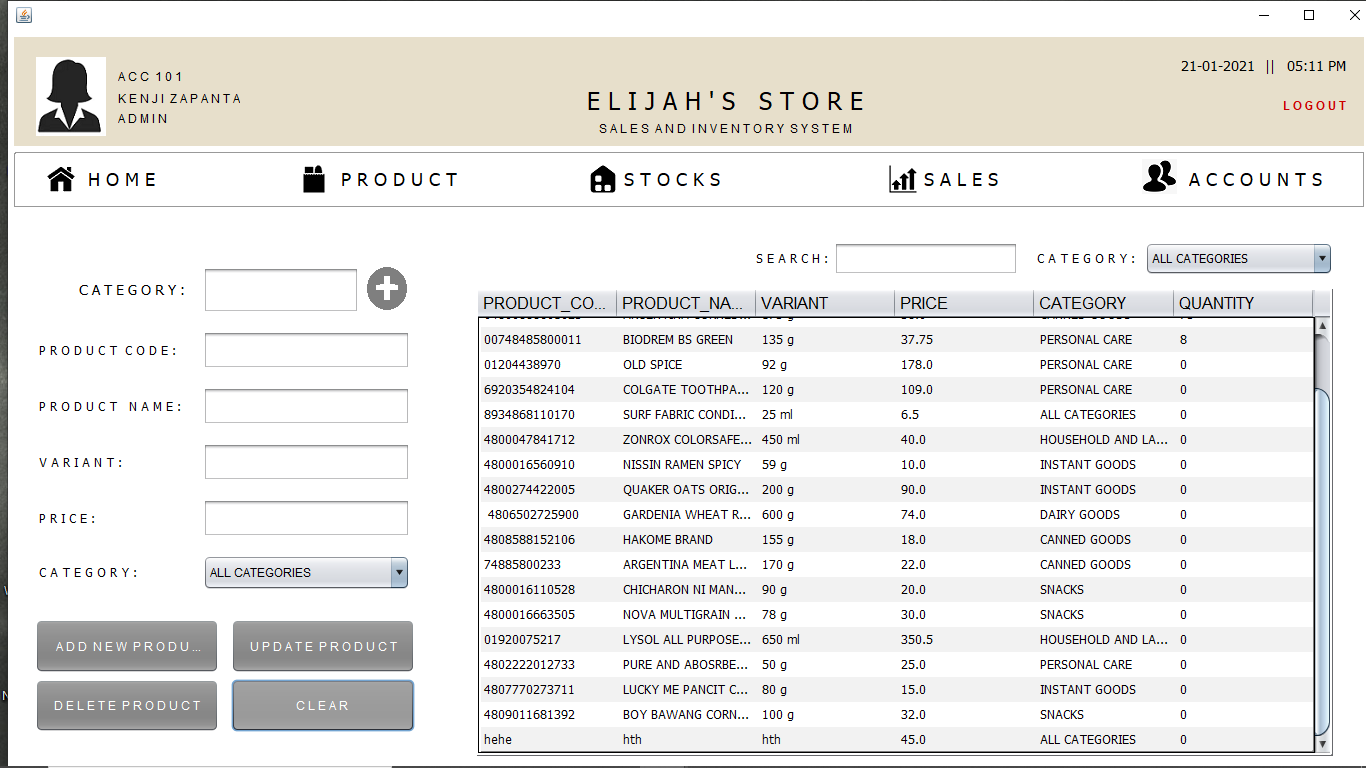


Figure 11. Screenshot of Product Menu

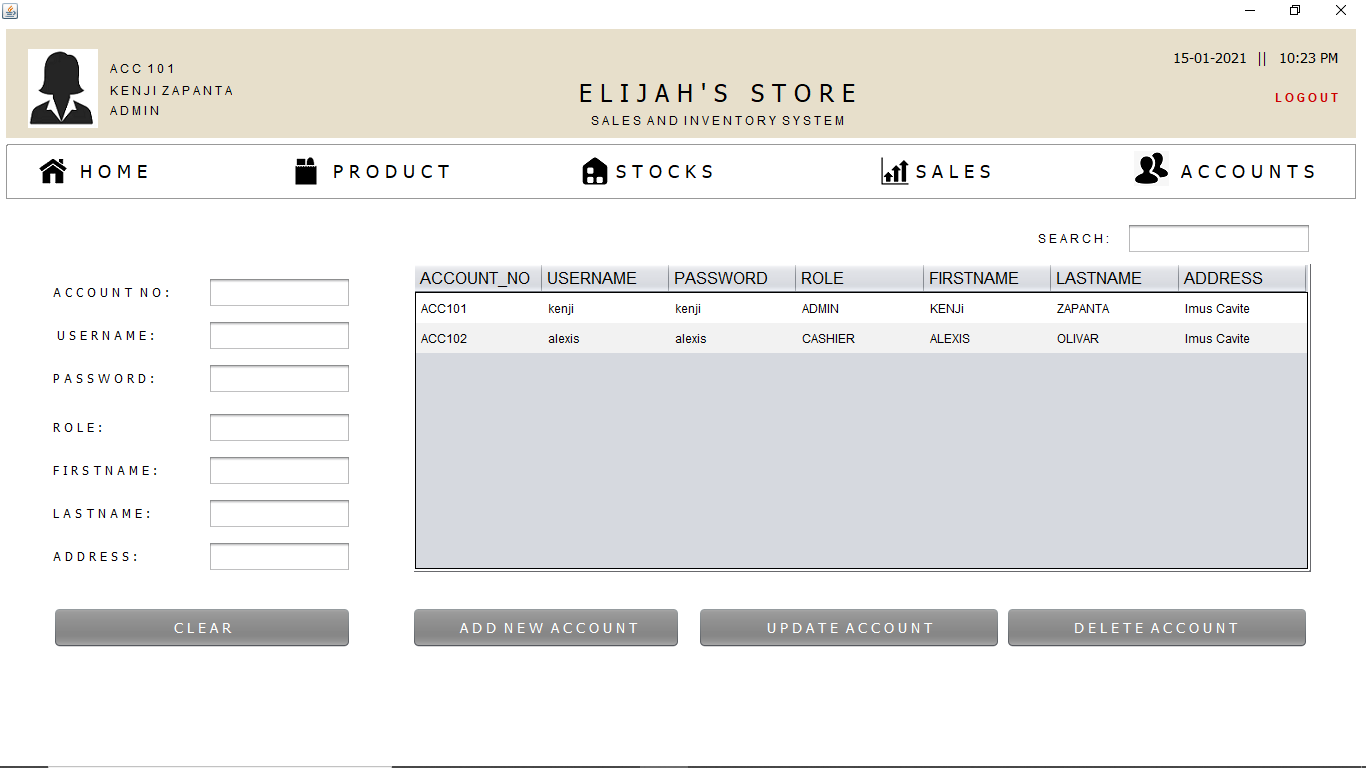


Figure 12. Screenshot of Account Menu

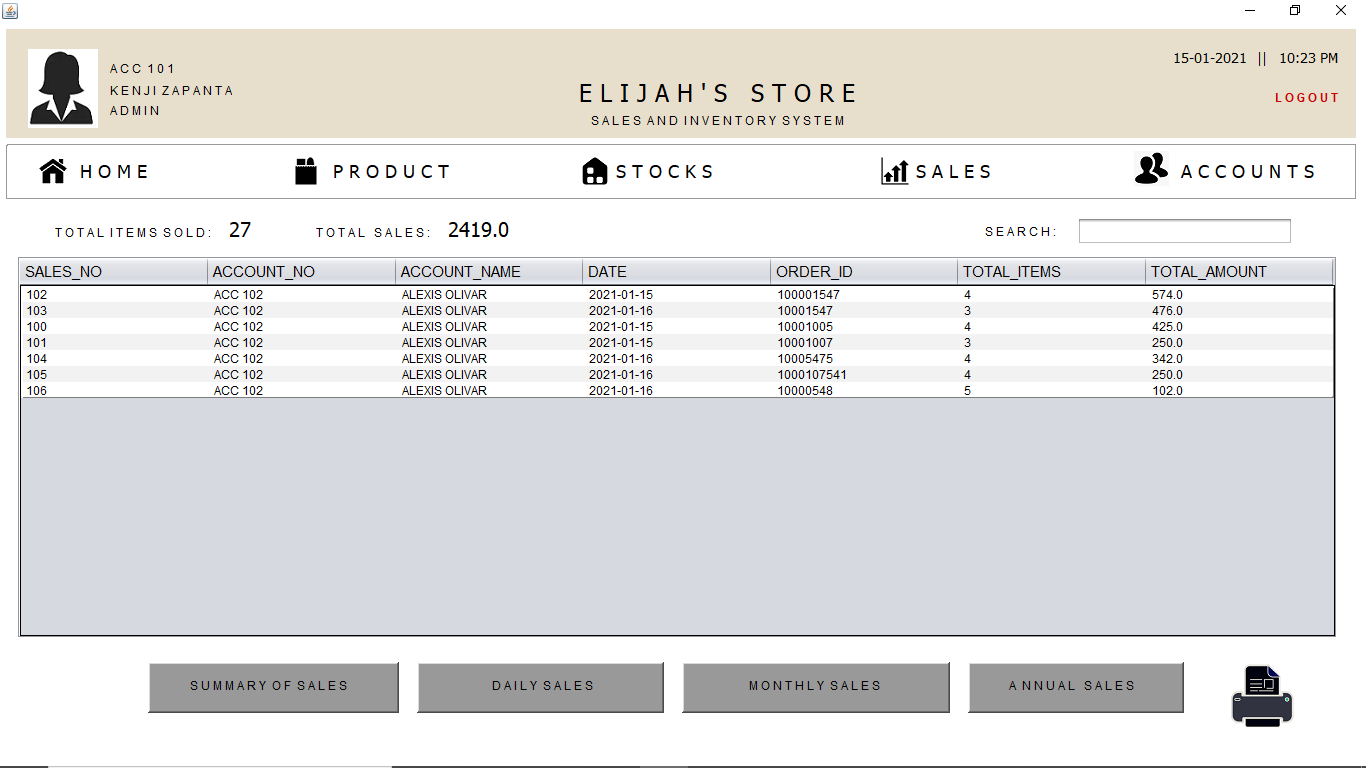


Figure 13. Screenshot of Stock Menu

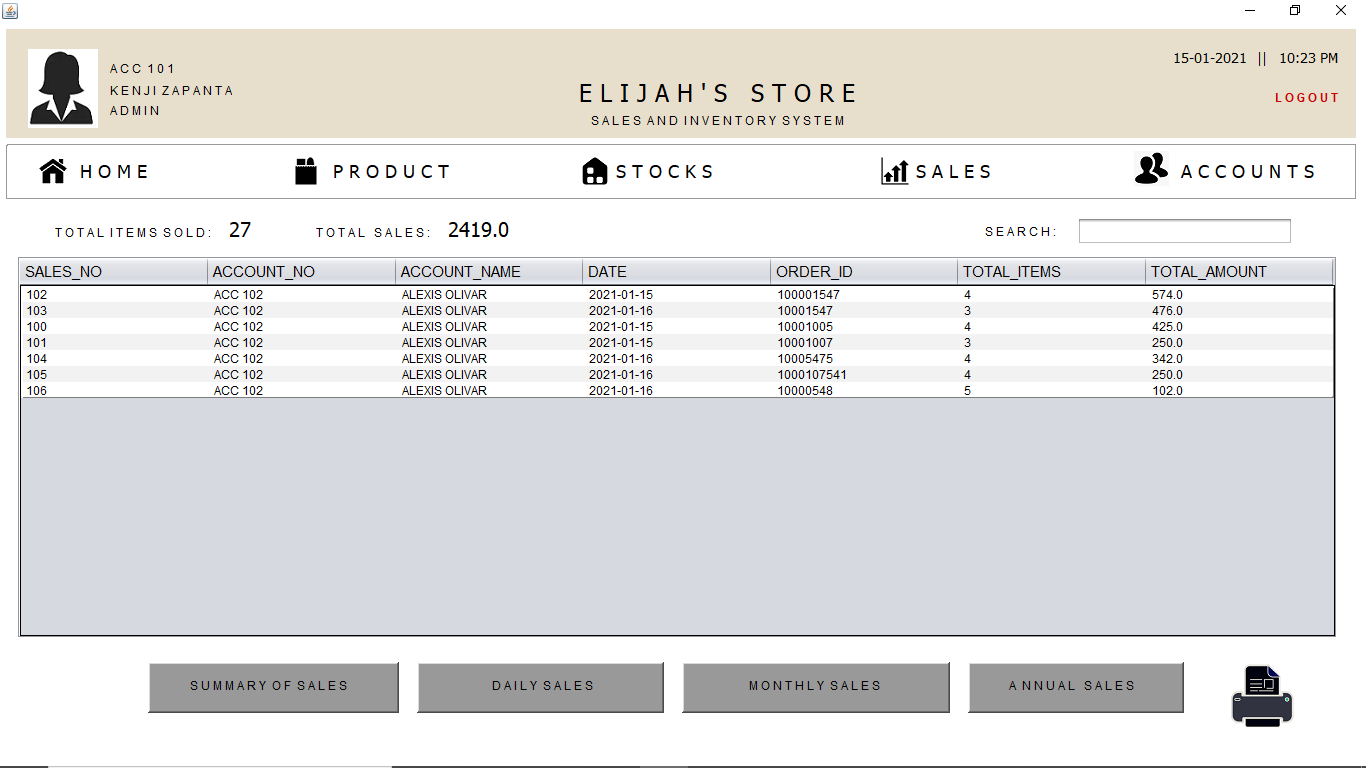


Figure 14. Screenshot of Sales Menu

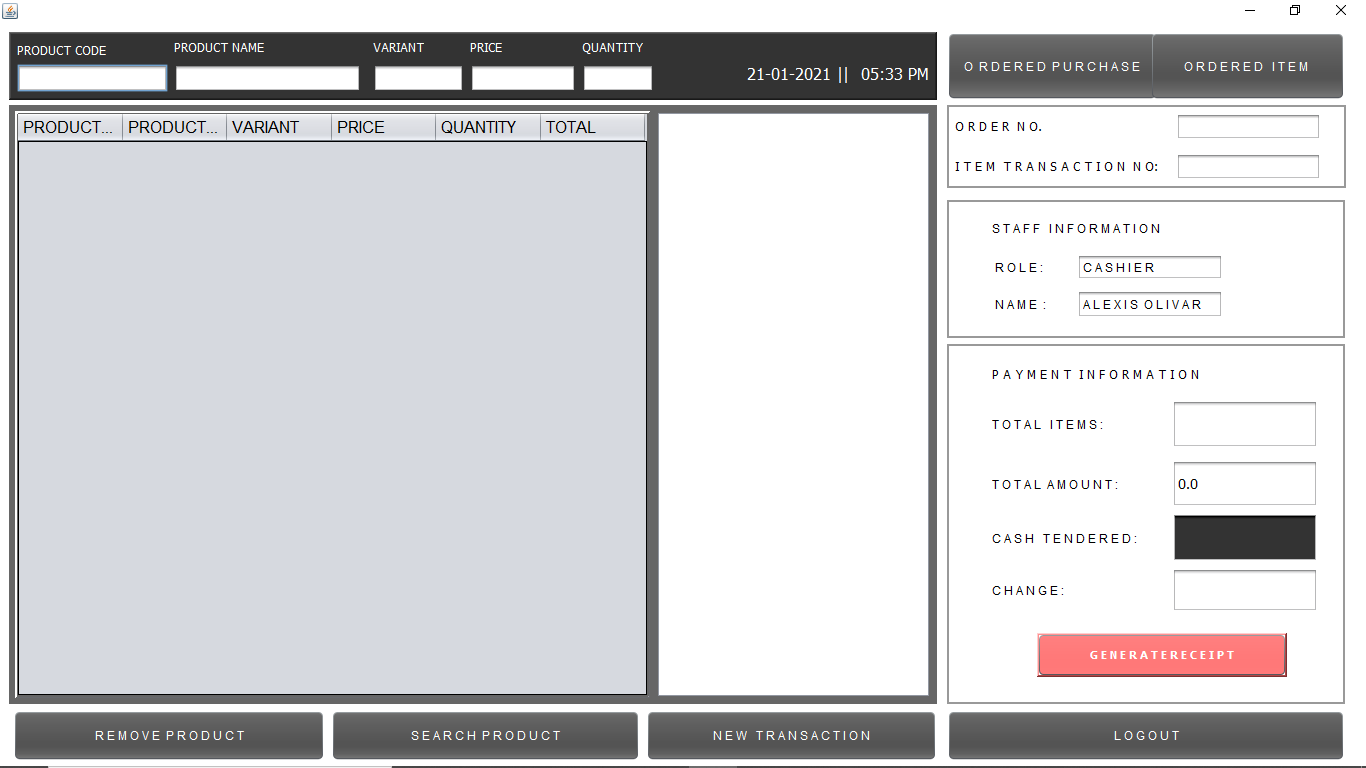


Figure 15. Screenshot of Order Scanning System

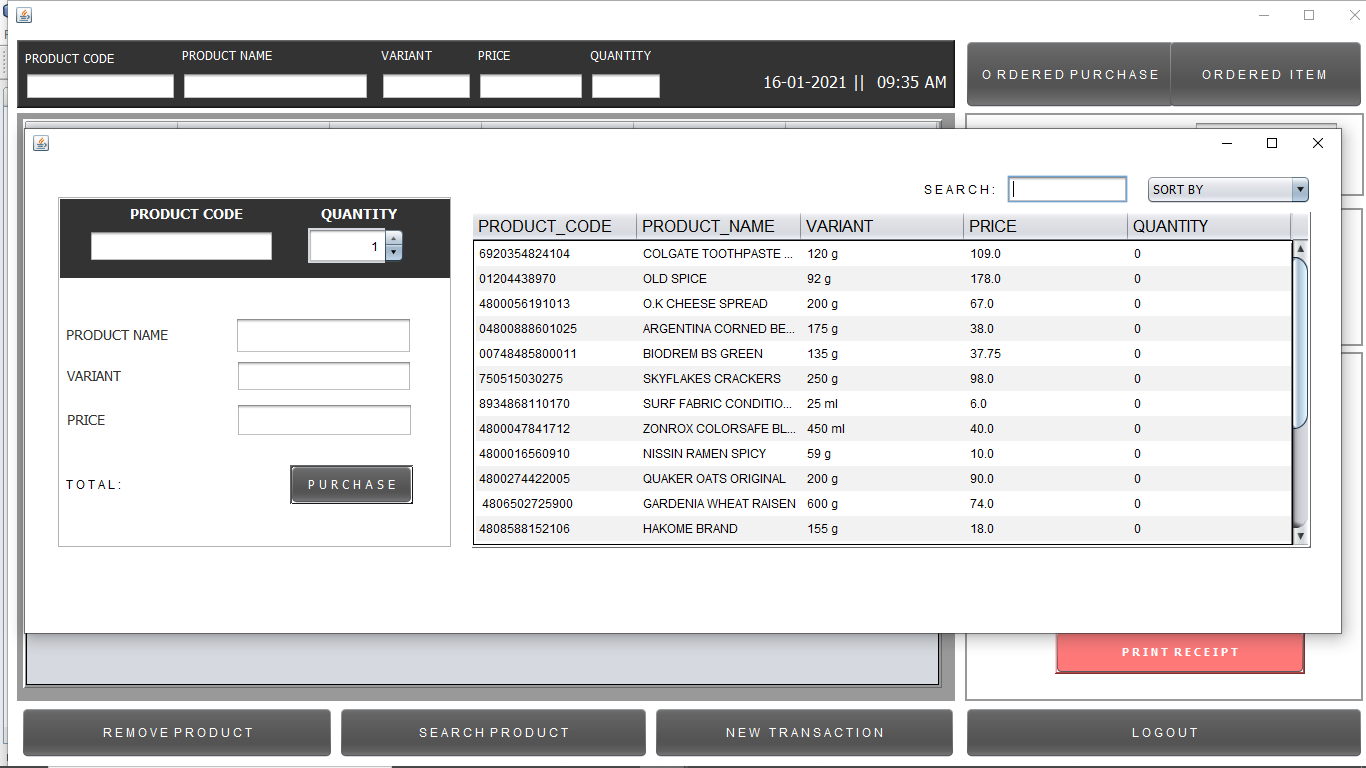
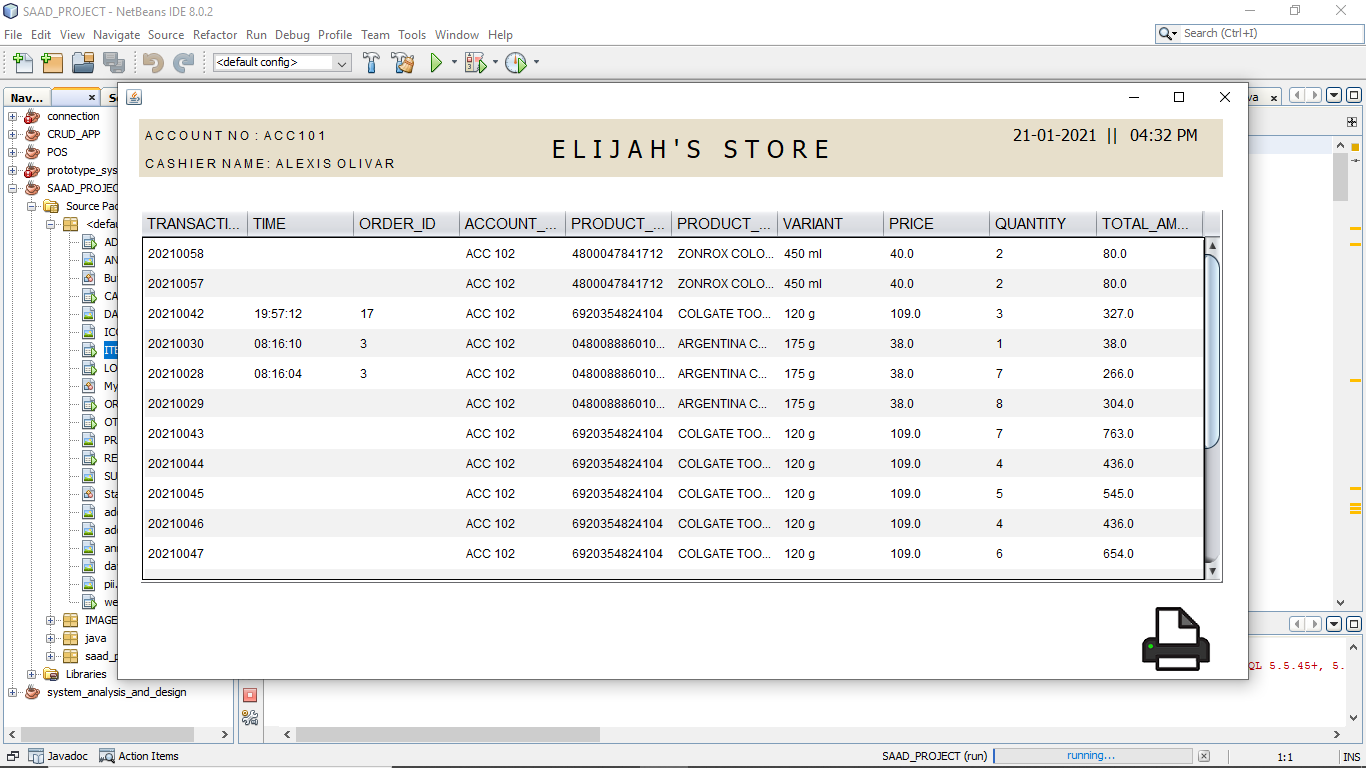


Figure 16. Screenshot of Option for Adding Order



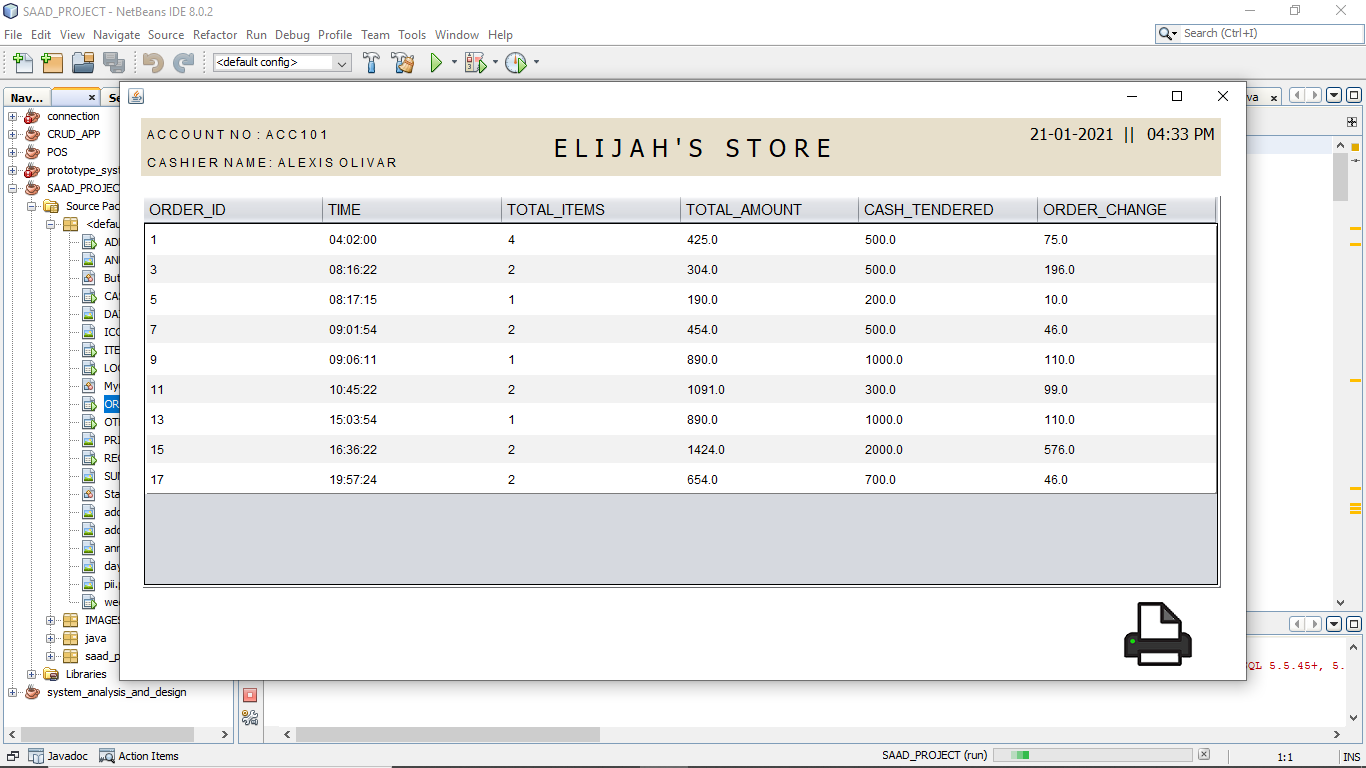
Figure 17. Screenshot of Order Item

Figure 18. Screenshot of Ordered Purchase

**APPENDIX 9**

**Sample Codes**

ADMIN\_PANEL.JAVA

public class ADMIN\_PANEL extends javax.swing.JFrame {

    Connection con = null;

    PreparedStatement pst = null;

    ResultSet rs = null;

    public ADMIN\_PANEL() {

        initComponents();

        TableHeader2();

        TableHeader3();

        TableHeader4();

        TableHeader34();

        sales();

    }

    @SuppressWarnings("unchecked")

     public void TableHeader34(){

       JTableHeader header=jTable4.getTableHeader();

       header.setOpaque(false);

       header.setBackground(Color.YELLOW);

       header.setForeground(Color.BLACK);

       header.setFont(new Font("Tahome", Font.PLAIN, 15));

     }

        });

        pack();

    }// </editor-fold>

    void showDate() {

        Date d = new Date();

        SimpleDateFormat s = new SimpleDateFormat("dd-MM-yyyy");

        jLabel7.setText(s.format(d));

    }

    void showTime() {

        new Timer(0, new ActionListener() {

            @Override

            public void actionPerformed(ActionEvent e) {

                Date d = new Date();

                SimpleDateFormat s = new SimpleDateFormat("hh:mm a");

                jLabel8.setText(s.format(d));

            }

        }

        ).start();

    }

    private void STOCKS\_MENUMouseClicked(java.awt.event.MouseEvent evt) {

        HOME\_PANEL.setVisible(false);

        PRODUCT\_PANEL.setVisible(false);

        STOCKS\_PANEL.setVisible(true);

        PRODUCT\_PANEL.setVisible(false);

        SALES\_PANEL.setVisible(false);

    }

                con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql);

            pst.setString(1, acc1.getText());

            pst.executeUpdate();

            JOptionPane.showMessageDialog(null, "Account is Deleted");

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        showTableDataAccount();

    }

    private void addAccountActionPerformed(java.awt.event.ActionEvent evt) {

        try {

            String sql = "INSERT INTO `account\_table`(`ACCOUNT\_NO`, `USERNAME`, `PASSWORD`, `ROLE`,`FIRSTNAME`,`LASTNAME`,"

                    + "`ADDRESS`) VALUES (?,?,?,?,?,?,?)";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql);

            pst.setString(1, acc1.getText());

            pst.setString(2, acc2.getText());

            pst.setString(3, acc3.getText());

            pst.setString(4, acc4.getText());

            pst.setString(5, acc5.getText());

            pst.setString(6, acc6.getText());

            pst.setString(7, acc7.getText());

            pst.executeUpdate();

            JOptionPane.showMessageDialog(null, "NEW ACCOUNT ADDED");

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        showTableDataAccount();

    }

        } catch (Exception e) {

        }

    private void jTable2MouseClicked(java.awt.event.MouseEvent evt) {

        DefaultTableModel model = (DefaultTableModel) jTable2.getModel();

        int selectedRowIndex = jTable2.getSelectedRow();

        stockfield1.setText(model.getValueAt(selectedRowIndex, 1).toString());

    }

    private void ADD\_STOCK\_BUTTONActionPerformed(java.awt.event.ActionEvent evt) {

        try {

            String sql = "UPDATE stocks\_table SET QUANTITY=QUANTITY+ ?, STOCK\_IN=STOCK\_IN+? WHERE PRODUCT\_CODE=?";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql);

            int stock;

            stock = Integer.parseInt(stockfield2.getText());

            pst.setInt(1, stock);

    private void updateAccountActionPerformed(java.awt.event.ActionEvent evt) {

        try {

            String sql = " UPDATE account\_table SET USERNAME=?,PASSWORD=?,ROLE=?,FIRSTNAME=?,LASTNAME=?,ADDRESS=? WHERE ACCOUNT\_NO=?";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql);

            pst.setString(1, acc2.getText());

            pst.setString(2, acc3.getText());

            pst.setString(3, acc4.getText());

            pst.setString(4, acc5.getText());

            pst.setString(5, acc6.getText());

            pst.setString(6, acc7.getText());

            pst.setString(7, acc1.getText());

            pst.executeUpdate();

            JOptionPane.showMessageDialog(null, "ACCOUNT IS UPDATED");

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        showTableDataAccount();

    }

    private void deleteAccountActionPerformed(java.awt.event.ActionEvent evt) {

        try {

         String sql = "DELETE FROM `account\_table` WHERE ACCOUNT\_NO=?";

            int stock\_in;

            stock\_in = Integer.parseInt(stockfield2.getText());

            pst.setInt(2, stock\_in);

            pst.setString(3, stockfield1.getText());

            pst.executeUpdate();

            JOptionPane.showMessageDialog(null, "STOCK IS UPDATED");

            String sql2 = "UPDATE stocks\_table SET DATE=?COST=COST+? WHERE PRODUCT\_CODE=?";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql2);

            java.util.Date date = new java.util.Date();

            java.sql.Date sqlDate = new java.sql.Date(date.getTime());

            pst.setDate(1, sqlDate);

            String a=stockfield3.getText();

            Double cost=Double.valueOf(a);

            pst.setDouble(2, cost);

            pst.setString(3, stockfield1.getText());

              pst.executeUpdate();

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        showTableData();

        showTableDataStocks();

    }

    private void jLabel1MouseClicked(java.awt.event.MouseEvent evt) {

        String item;

        item = categoryfield.getText();

        jComboBox1.addItem(item);

        categoryfield.setText("");

        categoryfield.grabFocus();

        JOptionPane.showMessageDialog(null, "New Product Category Added");

    }

    private void deleteButtonActionPerformed(java.awt.event.ActionEvent evt) {

        try {

            String sql = "DELETE FROM `product\_table` WHERE PRODUCT\_CODE=?";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql);

            pst.setString(1, field1.getText());

            pst.executeUpdate();

            JOptionPane.showMessageDialog(null, "Product is Deleted");

            String sql1 = "DELETE FROM `stocks\_table` WHERE PRODUCT\_CODE=?";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql1);

            pst.setString(1, field1.getText());

            pst.executeUpdate();

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        showTableData();

        showTableDataStocks();

    }

   public void sales(){

    try {

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            String sql1 = "select \* from sales\_table";

            pst = con.prepareStatement(sql1);

            rs = pst.executeQuery();

           jTable4.setModel(DbUtils.resultSetToTableModel(rs));

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        DefaultTableModel model = (DefaultTableModel) jTable4.getModel();

    }

    private void updateButtonActionPerformed(java.awt.event.ActionEvent evt) {

        try {

            String sql = "UPDATE `product\_table` SET `PRODUCT\_NAME`=?,`"

                    + "VARIANT`=?,`PRICE`=?,`CATEGORY`=? WHERE PRODUCT\_CODE=?";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql);

            pst.setString(5, field1.getText());

            pst.setString(1, field2.getText());

            pst.setString(2, field3.getText());

            pst.setString(3, field4.getText());

            String selectedValue = jComboBox1.getSelectedItem().toString();

            pst.setString(4, selectedValue);

            pst.executeUpdate();

            JOptionPane.showMessageDialog(null, "PRODUCT IS UPDATED");

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        showTableData();

        showTableDataStocks();

    }

    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {

        try {

            String sql = "INSERT INTO `product\_table`(`PRODUCT\_CODE`, `PRODUCT\_NAME`, `VARIANT`, `PRICE`,`CATEGORY`"

                    + ") VALUES (?,?,?,?,?)";

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            pst = con.prepareStatement(sql);

            pst.setString(1, field1.getText());

            pst.setString(2, field2.getText());

            pst.setString(3, field3.getText());

            double price;

            price = Double.parseDouble(field4.getText());

            pst.setDouble(4, price);

            String selectedValue = jComboBox1.getSelectedItem().toString();

            pst.setString(5, selectedValue);

            pst.executeUpdate();

            String sqla = "INSERT INTO `stocks\_table`(`PRODUCT\_CODE`, `PRODUCT\_NAME`, `VARIANT`,`CATEGORY`"

                    + ") VALUES (?,?,?,?)";

            pst = con.prepareStatement(sqla);

            pst.setString(1, field1.getText());

            pst.setString(2, field2.getText());

            pst.setString(3, field3.getText());

            String selectedValue1 = jComboBox1.getSelectedItem().toString();

            pst.setString(4, selectedValue1);

            pst.executeUpdate();

            JOptionPane.showMessageDialog(null, "New Product Added");

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        showTableData();

        showTableDataStocks();

    }

    private void jTable1MouseClicked(java.awt.event.MouseEvent evt) {

        DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

        int selectedRowIndex = jTable1.getSelectedRow();

        field1.setText(model.getValueAt(selectedRowIndex, 0).toString());

        field2.setText(model.getValueAt(selectedRowIndex, 1).toString());

        field3.setText(model.getValueAt(selectedRowIndex, 2).toString());

        field4.setText(model.getValueAt(selectedRowIndex, 3).toString());

    }

    public void showTableData() {

        try {

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            String sql1 = "SELECT product\_table.PRODUCT\_CODE, product\_table.PRODUCT\_NAME,product\_table.VARIANT ,"

                    + "product\_table.PRICE,product\_table.CATEGORY,stocks\_table.QUANTITY\n"

                    + "FROM product\_table, stocks\_table\n"

                    + "WHERE product\_table.PRODUCT\_CODE= stocks\_table.PRODUCT\_CODE";

            pst = con.prepareStatement(sql1);

            rs = pst.executeQuery();

            jTable1.setModel(DbUtils.resultSetToTableModel(rs));

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        DefaultTableModel model = (DefaultTableModel) jTable1.getModel();

    }

    public void showTableDataAccount() {

        try {

            con = DriverManager.getConnection("jdbc:mysql://localhost:3306/system\_database", "root", "");

            String sql1 = "SELECT \* from account\_table";

            pst = con.prepareStatement(sql1);

            rs = pst.executeQuery();

            jTable3.setModel(DbUtils.resultSetToTableModel(rs));

        } catch (Exception ex) {

            JOptionPane.showMessageDialog(null, ex);

        }

        DefaultTableModel model = (DefaultTableModel) jTable3.getModel();

    }

    public static void main(String args[]) {

        try {

            for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {

                if ("Nimbus".equals(info.getName())) {

                    javax.swing.UIManager.setLookAndFeel(info.getClassName());

                    break;

                }

            }

        } catch (ClassNotFoundException ex) {

        }

        java.awt.EventQueue.invokeLater(new Runnable() {

            public void run() {

                new ADMIN\_PANEL().setVisible(true);

            }

**APPENDIX 10**

**Curriculum Vitae**

****

**Joycel H. Empanto**

Dreamville VI Brgy. Anabu 1-E

Imus City, Cavite

09669906564

[joycel.empanto@cvsu.edu.ph](mailto:joycel.empanto@cvsu.edu.ph)

**Objective**

To be able to have experiences in the field of Information Technology for the enhancement of my skill and to be more knowledgeable. To create a stepping stone for achieving a successful career in the future.

**Skills Summary**

Basic knowledge in Web Development.

Familiar in Java, PHP and Python.

Familiar in MySQL.

Proficiency in Microsoft Office Applications (Excel, Word, PowerPoint).

**Job Experience**

Park ‘n Go

Cashier

Bacolod City, Negros Occidental

April 2009 – January 2012

**Education**

**Tertiary: Cavite State University**

Bachelor of Science in Information Technology

January 2017 – Present

**Secondary: Toboso National High School**

Toboso Negros Occidental

June 2004 – March 2008

**Primary: Toboso Central School**

Toboso Negros Occidental

June 1998 – Apri 2004

**Personal Details**

Date of Birth: February5, 1992 Place of Birth: Toboso Negros Occidental

Gender: Female Age: 28

Heigt/ Weight: 5’1” / 4 kgs. Status: Single

**Character References**

*Ms. Juvelyn M. Enesimo*

Software Analyst

09665944218

*Ms. TeenaVertudazo*

Software Engineer

09124890963

*Tita Chavez*

Supervisor

09124890570

I declare that this Comprehensive Resume has been accomplished by me, and is a true, correct and complete statement. I also authorize the agency head/authorized representative to verify/validate contents stated herein. I trust that this information shall remain confidential

**JOYCEL H. EMPANTO**

****

**Alexis Riszan Olivar**

Villa Luisa Homes 3 San Agustin 3

Dasmarinas Cavite

09465781261

[olivaralexis5@gmail.com](mailto:olivaralexis5@gmail.com)

Objective

To be able to expand the knowledge of being a future software developer, bringing critical thinking and problem solving skills in researching.

**Skills Summary**

Computer Literacy

Time Management

Can work under pressure

Positivity

Patience

Attentive listening, empathy

**Education**

**Tertiary:** Cavite State University- Imus Campus Bachelor of Science in Information Technology August 2018 – Present

#### Secondary: Philippine Christian University- Dasmariñas Campus

## June 2015- April 2017

New Era National Highschool June 2011-April 2015

**Primary**: Imus Pilot Elementary School June 2006- April 2012

Personal Details

Date of Birth: May 19, 2000 Place of Birth: Silang Cavite

Gender: Male Age: 20

Height/Weight: 5.6/55kg Status: Single

Character References:

Mr. Joshua Seraspe

Crew

09753773184

Ms. Jerica Jerish De Villa

Online Seller

09197814276

I declare that this Comprehensive Resume has been accomplished by me, and is a true, correct and complete statement. I also authorize the agency head/authorized representative to verify/validate contents stated herein. I trust that this information shall remain confidential

ALEXIS RISZAN OLIVAR

****

**Kenji Christopher A. Zapanta**

37 Orbiter Street, Moonwalk Village

Laspiñas City

09957649214

[zapantakenjiii02@gmail.com](mailto:zapantakenjiii02@gmail.com)

Objective

Responsible College student seeking for a software developer position someday where I can showcase my ability as an IT student to my future company.

**Skills Summary**

## Familiar in Java Programming Familiar in PHP Programming Familiar in C++ and mySQL Proficiency in Microsoft Applications

**Education**

**Tertiary:** Cavite State University- Imus Campus Bachelor of Science in Information Technology August 2018 – Present

## Secondary: Augustinian Abbey School June 2011- April 2015

**Primary**: Father Angelico Lipani School June 2007- April 2011

Personal Details

Date of Birth: May 14, 1998 Place of Birth: Laspiñas City

Gender: Male Age: 22

Height/Weight: 5.5/60kg Status: Single

Character References:

Ms. Janica Mae B. Cariaga

Certified Public Accountant

09279213340

Ms. Eunice Arcega

Teacher

09936749314

Ms. Jean Abellaneda

Nurse

09989209500

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**KENJI CHRISTOPHER A. ZAPANTA**

****

**Alexandra P. Veluz**

1032 Bayan Luma 8

Imus City, Cavite

09186549427

[xanderpascual2018@gmail.com](mailto:xanderpascual2018@gmail.com)

Objective

To gain more knowledge and experience in various fields of technology in preparation for future career endeavors. To be exposed in real life engagement in the industry for personality development and maturity.

**Skills Summary**

## Familiar in Java Programming Familiar in PHP Programming Familiar with HTML and CSS and MySQL Proficiency in Microsoft Applications (Word, Excel, Powerpoint,)

**Education**

**Tertiary:** Cavite State University- Imus Campus Bachelor of Science in Information Technology August 2018 – Present

## Secondary: Imus National High School School June 2012- April 2016

## STI College Dasmariñas June 2016-April 2018

**Primary**: Imus Pilot Elementary School June 2006- April 2012

Personal Details

Date of Birth: June 5, 2000 Place of Birth: Imus City, Cavite

Gender: Female Age: 20

Height/Weight: 5.1/65kg Status: Single

Character References:

Mr. Dennis Abingona

Application Specialist

0927-3658427

Mr. Carlo Angeles

Process Executive 09166584311

Ms. Nathalie Christine Peralta

Nurse

09657132789

I declare that this Comprehensive Resume has been accomplished by me, and is a true, correct and complete statement. I also authorize the agency head/authorized representative to verify/validate contents stated herein. I trust that this information shall remain confidential

ALEXANDRA P. VELUZ