

**Bakery Management System  
For Drew Bakes**

A Software Engineering 1 Project by

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Submitted to the Computer Science Department  
Technological Institute of the Philippines Quezon City

In Partial Fulfillment  
of the Requirements for the Degree

Bachelor of Science in Computer Science (BSCS)

December 2023

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## Chapter 1

### Introduction

A bakery is more than just an establishment that produces and sells baked goods, but also a place where one can have a glimpse of art, showing creativity and precision that can be seen and taste in their pastries. A Bakery Management System (BMS) is a specialized software solution designed to streamline and optimize the diverse facets of bakery operations. It acts as the central nervous system for a bakery, overseeing functions such as order processing, inventory management, financial tracking, and customer relationship management. Bakery Management System (BMS) enables bakery owners and staff to efficiently manage their business, from receiving customer orders and tracking stock levels to handling financial transactions and fostering lasting customer relationships. It enhances the bakery's overall performance by providing real-time insights, reducing wastage, ensuring product consistency, and simplifying various management tasks. By integrating a BMS, bakeries can not only enhance their operational efficiency but also focus on the artistic aspects of their craft, delivering a delightful and consistent experience to customers.

A Bakery Management System (BMS) can be considered a Management Information System (MIS) which is under Computer-Based Information System (CBIS). According to MBA Knowledge Base (2021), CBIS is a broad category of information systems that use computers to process and manage data, facilitate decision-making, and support various business functions. On the other hand, Management Information System (MIS), is a specific type of CBIS that is designed to support managerial activities within an organization. It focuses on providing information and tools to help managers make informed decisions, coordinate activities, control operations, and analyze performance. Within the domain of CBIS, there are specialized systems tailored to specific industries or business types. The CBIS provides a comprehensive and

integrated solution, specifically for a Bakery Management System. For one, it can handle various organizations in terms of production, inventory, finances and customer transactions. Moreover, the system also provides quality and reliability for the bakery as it can reduce errors and inconsistencies in data processing and information delivery.

Having a bakery management system will aid the owners and employees in managing the bakery business. It will be able to provide improvement to stock and inventory management, ensuring consistency of products and will be able to reduce waste production.

### **Background of the Study**

Drew Bakes is a local bakery owned by Kristine Sison and her fiancé, Andrew Simeon. Established in 2021 in Cogeo, Rizal, it operates from their home, offering a variety of pastries, including banana bread and chocolate cake. All ordering and delivery operations are conducted on social media platforms, such as Facebook, with couriers like Lalamove handling the deliveries. Kristine is responsible for inventory management, while Andrew oversees pastry production. Kristine also manages customer interactions through Facebook and Ads.

According to the business owners, Drew Bakes does not currently employ an automated system. Kristine purchases ingredients from a store called "All About Baking" in Robinsons Antipolo. After obtaining the ingredients, Kristine and Andrew manage the inventory using manual methods, such as individually measuring each inventory item and stock. Subsequently, Andrew is responsible for counting the available stocks one by one. Drew Bakes maintains multiple stock and inventory locations, one at Andrew's house in Cogeo (Lower Antipolo) and another at Kristine's house in Upper Antipolo. They rely on each other to inquire about the availability of stocks and inventory in their respective locations.

After the production of stocks, Kristine manages customer interactions by using Facebook to post advertisements on their page. When a customer views the advertisement, Kristine handles transactions and order placement, utilizing Lalamove for product delivery. The customer completes the transaction by paying the Lalamove rider. Following the handling of all production and transactions, Kristine checks the inventory again by inquiring with Andrew regarding the sufficiency of inventories for the upcoming week. However, there are instances when Andrew forgets to inform Kristine of inventory shortages, resulting in insufficient inventories to meet demand. Kristine stores and maintains multiple records of inventory, stocks, and customer logs, recording information such as order date, customer name, quantities ordered, and payment and delivery status, all manually stored in Google Sheets.

The primary challenges faced by Drew Bakes due to its reliance on manual systems include inefficiency, human error, a lack of data security and reliability, and limited functionality, all of which hinder the company's performance and growth. Implementing an automated system would enhance Drew Bakes' efficiency, boost sales, and improve customer interactions. The system would streamline operations, paving the way for further business growth.

### **Statement of the Problem**

Drew Bakes relies on manual methods for inventory management and order processing, resulting in operational inefficiency, increased potential for human errors, and a limited capacity to expand and enhance their bakery business.

The manual systems have been used for a long time but when the businesses are growing, they become more prone to problems that includes the following:

1. The current manual system used by Drew Bakes introduces several security risks. Data loss is a significant concern due to the use of paper-based records

and Google Sheets, with accidental deletion or damage putting critical information at risk. Decentralized inventory storage increases vulnerability to theft, potentially disrupting operations and incurring financial losses. The use of Google Sheets for customer and financial data may expose sensitive information to unauthorized access. Inconsistent inventory tracking can lead to discrepancies, potentially facilitating fraudulent activities.

2. The current manual system utilized at Drew Bakes emphasizes challenges associated with the lack of a comprehensive Dashboard System. This absence of an intuitive and user-friendly interface for administrators hinders their ability to efficiently manage various aspects of the bakery's operations. There is a notable absence of a centralized hub that could provide easy access to critical functionalities related to inventory management, order processing, customer interactions, and more. The result is a lack of streamlined administrative tasks and less efficient decision-making processes. Without such a dashboard system, Drew Bakes currently lacks a user-friendly tool that could simplify complex operations, enhance overall efficiency, and facilitate well-informed decisions. This absence of a user-friendly tool is impeding the bakery's potential for growth and success.
3. The use of a manual system increases the chance of mistakes in handling orders and managing inventory, resulting in higher costs for the business. These errors can lead to problems like mishandled orders and poor management of ingredients, which can affect customer satisfaction and the bakery's financial health.
4. The inefficiencies in the current processes may lead to overproduction and the accumulation of excess inventory, which can result in both waste and potential sales losses. Overproduction often arises from a lack of real-time insights into

inventory levels and customer demand. This excess inventory can become wasteful when products expire or lose freshness, incurring costs for disposal and affecting revenue.

5. The existing system presents difficulties in tracking vital metrics like inventory levels, sales data, and customer satisfaction, adding complexity to informed decision-making in the business. The absence of real-time data and effective tracking mechanisms makes it challenging to gauge inventory status, monitor sales trends, and assess customer feedback promptly. This hinders the bakery's capacity to make well-informed decisions efficiently.

### **Objectives of the Study**

The primary objective of this study is to design and implement an automated system for Drew Bakes that will improve the efficiency and effectiveness of their operations. The specific objectives are as follows:

1. To develop a security module designed to limit access to sensitive data, including customer information, financial records, ingredients, and other confidential data, exclusively to authorized personnel, with administrators having the highest level of access. This module aims to establish a secure and controlled environment, ensuring that only individuals with the proper authorization can access and manage sensitive information. By developing this security module, Drew Bakes aims to bolster data protection, reduce the risk of unauthorized access, and protect the integrity and privacy of critical business data. This security module will include a user-friendly "forgot password" feature. In the event that authorized personnel, including administrators, forget their login credentials, this feature will allow them to initiate a password recovery process. Upon selecting the "forgot password" option, users will be prompted to provide their registered email

address associated with their account. A secure link or code will then be sent to the provided email, enabling the user to reset their password and regain access to the system. This feature enhances user convenience while maintaining the security of the system by ensuring that only authorized individuals can initiate the password recovery process.

2. To design a comprehensive Dashboard System with the primary goal of offering administrators an intuitive and user-friendly interface for efficiently managing various aspects of the bakery's operations. This dashboard will serve as a centralized hub, providing easy access to critical functionalities related to inventory management, order processing, customer interactions, and more. The objective is to streamline administrative tasks and enhance decision-making processes. By creating this dashboard, Drew Bakes aims to empower its team with a user-friendly tool that simplifies complex operations, improves overall efficiency, and facilitates well-informed decisions, ultimately contributing to the bakery's growth and success.
3. To develop an automated system designed to record, store, update, and retrieve essential data seamlessly from a device. This transformative system will provide the bakery with enhanced capabilities for managing inventory, stocks, and customer logs with unprecedented effectiveness. At its core, this system incorporates a robust database that acts as a centralized repository for all critical data, ensuring accessibility and consistency across the organization. By implementing this automated system with a dynamic database, Drew Bakes anticipates streamlining operations, optimizing inventory management, and offering a unified platform for enhanced decision-making, irrespective of the user's device or location. This innovative approach is expected to contribute significantly to the bakery's operational efficiency and growth.

4. To enhance operational precision by implementing a system that elevates the accuracy of inventory tracking. This initiative seeks to mitigate waste and overstocking concerns by furnishing the bakery with data essential for proactive baking and inventory restocking. A pivotal feature of this system is its capability to operate seamlessly across multiple locations. By enabling Drew Bakes to access critical data in advance and plan baking and restocking activities efficiently, this innovative approach is poised to have a substantial impact on the bakery's performance, curbing waste and streamlining inventory management.
5. To design a system to generate a range of vital reports, including sales reports, real-time stock levels for each product with alerts for low stock, and insightful data on sales and inventory performance. The primary objective is to equip the bakery with critical information necessary for planning and decision-making. By implementing this reporting system, Drew Bakes aims to analyze data systematically, gain a deeper understanding of its operational performance, and harness these insights to make strategic decisions that optimize sales, inventory management, and overall business efficiency.

### **Significance of the Study**

This study carries the potential to introduce innovative technological solutions that can revolutionize Drew Bakes' business operations. By harnessing technology effectively, Drew Bakes could secure a substantial competitive advantage in the bakery industry. This advantage results from the implementation of technology to enhance efficiency and effectiveness in various aspects of their operations. The automation of key processes stands out as a means to minimize errors and amplify productivity. Additionally, technology facilitates multi-location inventory management, simplifying the tracking and control of inventory across numerous outlets. This technological upgrade is

also pivotal in providing a superior customer experience through swift and precise order processing, resulting in reduced wait times. Furthermore, this study fosters academic and professional growth among its proponents, equipping them with invaluable experience in designing and implementing automated systems. It also contributes to future research by offering data that can inform subsequent studies on technology utilization within bakery businesses.

From an operational standpoint, automating key processes holds the promise of significantly reducing errors within the system while concurrently enhancing productivity. This transformation equips Drew Bakes with a robust operational foundation that's capable of delivering more consistent and efficient services. The facilitated multi-location inventory management streamlines the traditionally complex task of monitoring and managing inventory across several locations. This operational enhancement ensures resource allocation is optimized, diminishing inefficiencies and waste. Moreover, a positive customer experience is an immediate operational benefit, as fast and accurate order processing leads to reduced wait times, ultimately improving customer satisfaction.

Viewed through an economic standpoint, this technological upgrade can potentially lead to substantial cost savings. The optimization of resource allocation and the reduction of waste are two pivotal elements contributing to this economic benefit. Efficient resource allocation means Drew Bakes can make better use of available resources, reducing unnecessary expenditures. The reduced waste, driven by automation and streamlined inventory management, further supports cost savings. Fewer spoiled or expired goods mean less financial loss, which, in turn, contributes to a more economically sound operation. In essence, this study presents an opportunity for Drew Bakes to achieve a healthier bottom line by maximizing cost-efficiency.

## Scope and Limitation

Drew Bakes, a local home-based bakery, has been utilizing a manual system since the start of their business. This traditional approach has led to data loss, human error, and difficulty in generating reports. As Drew Bakes continues to grow, the need for a more efficient bakery management system becomes increasingly apparent. The proposed system will be developed using VScode 1.83 as the integrated development environment (IDE). The frontend and backend of the system will be built using Java 21, providing cross-platform compatibility and scalability. MYSQL 8.0.33 will serve as the relational database management system. It will be responsible for storing critical data related to customer information, financial records, ingredient inventory, product details, and more. The system will be compatible with Windows 10 PCs and laptops, ensuring a seamless user experience for individuals using this operating system.

## Scope

The scope of this system assists Drew Bakes in managing their business more efficiently and effectively. The system can automate various tasks with the aid of system modules, such as the security module. The security module aims to enhance data security by restricting access to sensitive information. Administrators are always required to enter the correct username and password when accessing the entire system.

The security module will include a user-friendly "forgot password" feature. In the event that authorized personnel, including administrators, forget their login credentials, this feature will allow them to initiate a password recovery process. Upon selecting the "forgot password" option, Administrators will be prompted to provide their registered email address associated with their account. A secure One Time Password (OTP) will then be sent to the provided email, enabling the Administrator to reset their password and regain access to the system.

The security module will also implement user logic to grant Administrators highest level of access, allowing them to configure and manage the system. Only authorized administrators will have the ability to access and modify sensitive data, including customer information, financial records, and confidential business data. The system uses a LAN-based database. It ensures the protection and privacy of critical business information, reducing the risk of data breaches and unauthorized access, which is especially important in maintaining customer trust and business integrity.

The next module is the dashboard module. The dashboard serves as the primary interface for administrators, providing an at-a-glance view of the system's functions. It offers a user-friendly experience, simplifying navigation and access to various modules, including inventory, order management, production management, sales, and the reports and analytics module. An intuitive dashboard improves the efficiency of system use, allowing administrators to manage the bakery's operations more effectively. It streamlines the user experience, making it easier to oversee the various aspects of the business.

The registration module is a fundamental component of Drew Bakes' bakery management system, aimed at simplifying and optimizing the management of bakery products and its Administrators. This module maintains a comprehensive record of its product offerings, encompassing a range of cakes, pastries, and baked goods, and it also maintains records of Administrators that can access the system. This module allows bakery Administrators to record and store detailed information about each bakery product. This can include product names, descriptions, prices, images, quantity, expiry and ingredients. It also integrates seamlessly with the Inventory Management Module. This ensures that the product registered is linked to ingredient inventory levels. Whenever ingredient inventory levels are low, the module can simultaneously mark related products as temporarily unavailable to prevent orders that cannot be fulfilled. The

system will also facilitate Admin registration. Administrators will need to complete a registration process, which will include verification steps to confirm their identity within the bakery. And when the Admin registration is complete, the newly added Admin can access the system.

The inventory management module is designed to efficiently handle bakery ingredients. It tracks ingredient quantities, manages inventory levels, and provides alerts when stock levels are low or inventories are expiring. Admins can also manipulate the data by adding and removing information such as quantity and ingredient information. It's a vital component in reducing waste and ensuring that ingredients are available for production. Effective inventory management minimizes waste, reduces costs, and ensures that ingredients are always in stock. By streamlining this process, it enhances the bakery's overall efficiency.

The order management module is responsible for handling customer orders. It tracks orders from placement to delivery, managing the database that stores order details, including order date, pastry specifics, quantities ordered, payment status, and delivery status. This module streamlines the order processing system, ensuring that customer orders are processed accurately and efficiently, which contributes to a positive customer experience.

The production management module assists in planning production schedules, monitoring batch sizes, and ensuring ingredient availability. It issues warnings when stocks are expiring and allows for data manipulation. Efficient production management reduces overproduction, shortages, and the wastage of expired products, ensuring that the bakery's products are consistently fresh and available.

The sales module is responsible for recording sales transactions. It is essential for assessing the financial health of the bakery and identifying areas for improvement.

Monitoring sales and financial data helps the business make data-driven decisions to enhance profitability and operational efficiency.

The report and analytics module generates reports on key performance indicators, such as sales reports, product performance, financial reports, and production efficiency. It also includes analytical tools for assessing trends and making data-driven decisions. Data analysis and reporting provide valuable insights into the bakery's performance, allowing the business to adapt, grow, and improve.

The search module allows the Administrators to search for specific data, such as customer orders, product details, and inventory information. This feature enhances data accessibility and retrieval.

The maintenance module will be included to manage Admin account and system configurations. Administrators can use this module to maintain and optimize the system's performance.

The help module will provide the Administrators with information about the system, including guides, system documentation, and contact information for support. It serves as a resource for Administrators seeking assistance and understanding system functionalities.

And lastly, the 'about' module will simply provide the developer, software version, history and information about Drew Bakes.

## **Limitation**

Although there is a lot of potential for using an automated system, there is a limitation. It cannot address all of a bakery's problems that still need a user to operate the system. Many tasks can be automated using the system, but they will still require the Administrators to operate and provide decisions. The system's effectiveness will base on the accuracy and completeness of data provided by the Admin. It can also be costly to

implement and sustain. The system also does not include a payroll system since it does not have any employees to manage or pay. And lastly, there's always a risk of data loss due to unforeseen circumstances like hardware failure, natural disasters, or human error.

## **Chapter 2**

### **System Design**

System design is a meticulous process that involves defining the architecture, components, modules, interfaces, and data for a system to meet specific requirements. It's the blueprint that lays the foundation of a system.

When applied to a bakery management system, system design is like creating a comprehensive recipe. It provides a structure for the system that integrates various operations within the bakery, such as inventory management, order processing, sales tracking, and customer relationship management.

The role of system design in a bakery management system goes beyond establishing an efficient and organized way to manage bakery operations. It's a strategic initiative aimed at simplifying processes, reducing errors, improving customer service, and ultimately increasing the bakery's productivity and profitability. The system design acts not just as a guide, but as a crucial roadmap for developers and stakeholders during the system's development and implementation. It ensures the smooth integration and operation of all components of the bakery management system, thereby helping to achieve the desired results.

### **Narrative Description of Existing System**

A Narrative Description of an Existing System provides an in-depth overview of the current system, highlighting its features, operations, and constraints. In relation to a

bakery management system, it would detail the existing procedures for managing stock, processing orders, monitoring sales, and maintaining customer relations. This narrative acts as a reference point for the design of a new system, pinpointing areas that need enhancement to boost efficiency, minimize errors, and ultimately increase overall productivity and profitability.

**Inventory Management** - It is the strategic process of regulating a company's raw materials, components, finished goods, and their storage. It aids in deciding when and how much stock to order.

1. The owners manually check the inventory one by one.
2. The owners discuss what ingredients they should purchase.
3. The owners purchase ingredients from a store called "All About Baking" in Robinsons Antipolo.

**Production** - The process of making and preparing baked goods, managing recipes, controlling inventory, scheduling, ensuring quality, and minimizing waste to meet demand efficiently.

1. The owners manually check the stocks stored in their chiller.
2. When the pastries in the chiller are nearing insufficiency, the owners bake the pastries needed for the orders.

**Customer Interaction** - It involves communication, service, and feedback to enhance customer satisfaction and loyalty.

1. The owners post advertisements on their page using Facebook Advertisements.
2. When a customer views the advertisement, the owners handle transactions with the use of Facebook Messenger

3. The owners handle order placement, using Lalamove to charge customer's product delivery.
4. The owners inquire with each other, and check the inventory again regarding the sufficiency of inventories for the upcoming week.

**Record Keeping** - It Involves maintaining detailed and organized records of various aspects of the bakery's operations.

1. The owner's stores and maintains multiple records of inventory, stocks, and customer logs, recording information such as order date, customer name, quantities ordered, and payment and delivery status, all manually stored in Google Sheets.

### **Narrative Description of Proposed System**

This is an overview of a planned system, highlighting its expected features, operations, and potential advantages. In terms of a bakery management system, it would present the suggested strategies for inventory management, order processing, sales tracking, and customer relationship management. This narrative acts as a guide for the new system, emphasizing the improvements aimed at boosting efficiency, minimizing errors, and enhancing overall productivity and profitability.

**Security Module** - It is a critical component designed to protect the integrity, confidentiality, and availability of data. It encompasses Admin authentication, access control, data encryption, and audit trails.

#### **Admin login**

1. Admin inputs the credentials with email and password.

2. If credentials are verified, generate security logs, update the database and proceed to the dashboard module.
3. If credentials are not verified within three (3) attempts, the system will suggest the forget password mechanism.

### **Admin register**

1. System asks for Email, first name, last name, username and password.
2. Admin fills out the fields
3. Passwords should have eight (8) characters minimum, and have at least one (1) uppercase letter.
4. If password does not meet the requirement, system will ask Admin again for the new password
5. System will verify by sending an email OTP (One Time Password) to the Admin's email address.
6. If the account is verified, upload and update the database.
7. If the account is not verified, The system will ask the Admin to try again and redirect at the start of the Admin registration.

### **Forgot Password**

1. System will ask for the E-mail or username of the account.
2. Admin inputs the credentials.
3. If Email or username does not exist in the database, redirect to login.
4. If Email or username exists in the database, send email OTP then proceed to changing of password.
5. System will ask for a new password and confirm the password.
6. Passwords should have eight (8) characters minimum, and have at least one (1) uppercase letter.

7. If the password does not meet the requirement, system will ask Admin again for the new password
8. If both passwords are mismatched, the system will ask the Admin to enter again.
9. If both passwords are correct, update account details and database.
10. Redirect to login to the screen.

**Dashboard Module** - It serves as a centralized interface presenting a comprehensive overview of various operations and functionalities within the bakery. It acts as a control center, allowing Administrators or users to access and navigate through different modules efficiently.

1. Dashboard displays the main screen.
2. Main screen includes the following: system modules, alerts and notifications.
3. Alerts and notifications display if inventories or stocks are running low, or expiring.
4. System modules include the following: Search, registration, inventory management, order management, production management, sales, report and analytics, maintenance, help or about.
5. System will redirect the Admin to the respective module based on their input.

**Search Module** - Serves as a tool that allows the system Administrator to swiftly find specific information within the system. This module facilitates streamlined access to relevant data, simplifying navigation across the system.

1. Admin can search using keywords or phrases.

2. Displays the search results.
3. Admin clicks the search result.
4. Admin will be redirected to the respective module depending on the search parameters.

**Registration Module** - It facilitates the process of registering Administrators and products, contributing to efficient management of the system.

### **Admin Registration**

1. System asks for Email, first name, last name, username and password.
2. Admin fills out the fields
3. Passwords should have eight (8) characters minimum, and have at least one (1) uppercase letter.
4. If password does not meet the requirement, system will ask Admin again for the new password
5. System will verify by sending an email OTP (One Time Password) to the Admin's email address.
6. If the account is verified, upload and update the database.
7. If the account is not verified, The system will ask the Admin to try again and redirect at the start of the Admin registration.

### **Product Registration**

1. Admin must enter the product name, description, price, expiry of the product and quantity.
2. When a Product is registered, update the database and fetch the data from it to display in the system.
3. Admin is also able to update the data in the module by adding or update product quantities, or archiving the product from the list.

4. When product quantities are manipulated, inventories are also updated.
5. This module will also update the production management module by adding new products that are registered and the quantity of the product.

### **Ingredient Registration**

1. Admin must enter Ingredient name, price, expiration date, and quantity
2. When an ingredient is registered, the database will update and fetch the data from it to display in the system.
3. Admin able to update the data by adding or updating ingredient quantities and removing/deactivating the ingredient from the list.
4. When ingredient quantities are manipulated, the database will also update.

**Inventory Management Module** - It serves as a crucial component within the Bakery Management System, responsible for overseeing and regulating the bakery's ingredient levels. It ensures the efficient handling of raw materials.

### **Product List**

1. This will display the added products from the database in table format.
2. Admins can also add, update, or archive product information and search for specific products.

### **Ingredient List**

1. This will display the added ingredients from the database in table format.
2. Admins can also add, update, or archive ingredient information and search for specific ingredients.

**Order Management Module** - serves as a centralized hub for handling customer orders effectively. It facilitates the seamless capture of vital order information. Once entered, this module updates the system's database with the latest order data.

1. The Admin takes the customer's order such as, name of customer, date ordered, pastry ordered, quantity, address, payment status and delivery status.
2. Admin enters it into the order management module.
3. The system will update the database.
4. The module will display the database and display it in a table format.
5. The Admin is able to modify the data in the table at any time.

**Production Management Module** - It is responsible for overseeing the creation and management of baked goods. This module coordinates various aspects of the production process, including managing recipes, controlling inventory, scheduling baking tasks, ensuring quality, and minimizing waste to meet demand effectively.

#### **Schedule Baking Production**

1. Admin can create a production schedule.
2. The module displays alerts if stocks are expiring, if inventory is insufficient for producing stocks and if stocks are running low.

#### **Monitor Production Progress**

1. The Admin continues to monitor the production management module until all of the production tasks for the day are complete.
2. Admin can modify the data, such as adding or removing scheduled productions.

**Sales Module -** It is a comprehensive component that facilitates the handling and recording of transactional data. It serves as a centralized hub for managing and inputting receipts of transactions, integrating data retrieved from the Order Management Module.

1. Admin can input receipts of transactions here.
2. This module also retrieves data from the order management module.
3. Admin can update the data inside this module.

**Report and Analytics Module -** It serves as a vital tool within the Bakery Management System, designed to facilitate data retrieval, analysis, and presentation. It harnesses the data stored within the system's database and various other modules to generate insightful reports and conduct thorough data analysis.

1. System will retrieve data from the database and other modules for data analysis.
2. System displays a list of pre-built reports.
3. Pre-built reports include: Sales, Inventory, Performance Analytics
4. Admin can change if he/she wants to view a specific report or all of them, and change the date of the report.

**Maintenance Module -** It serves as a crucial administrative area where system upkeep and user management take place. It encompasses two primary functions: managing Admin accounts and configuring system settings.

#### **Manage Accounts**

1. Admin can manage accounts logged in the system.
2. Admin can change passwords in this module.
3. Admin can edit the account information in this module.

#### **System Configuration**

1. Admin can back-up the data within a module.
2. Admin can update the data of a specific module.

**Help Module** - It is a resourceful section designed to provide assistance and guidance to users interacting with the Bakery Management System. It typically includes two main components: FAQs (Frequently Asked Questions) and User Manual.

1. FAQs can answer common questions about the system.
2. User Manual can provide more detailed information about how to use the system.

**About Module** - It serves as a designated space to present information regarding "Drew Bakes" and provides an overview of the system itself. It typically includes details about the bakery, its background, mission, vision, and core values. Additionally, this module offers insights into the functionalities, features, and purpose of the Bakery Management System.

1. Display information and history about the Drew Bakes.
2. Display information about the developer and software version

### Procedural Flowchart of the Proposed System

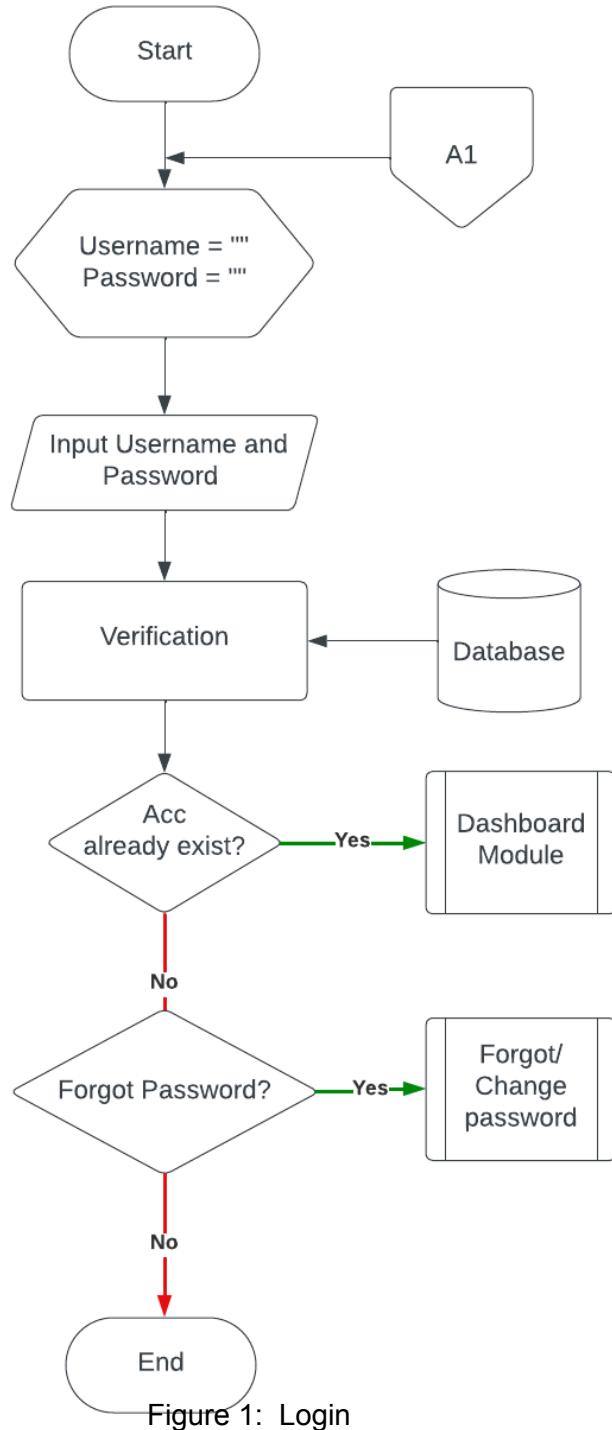


Figure 1: Login

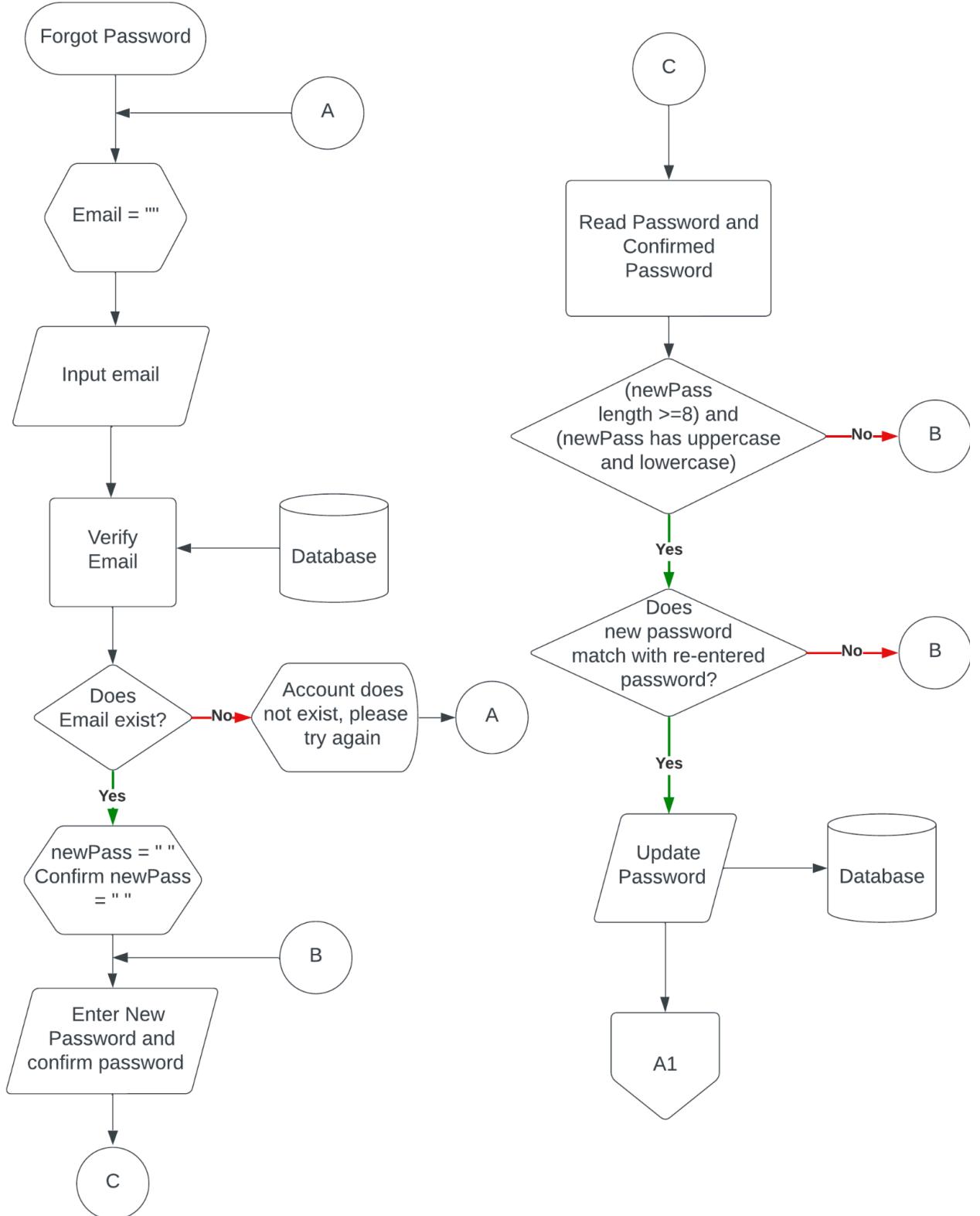


Figure 2: Forgot Password

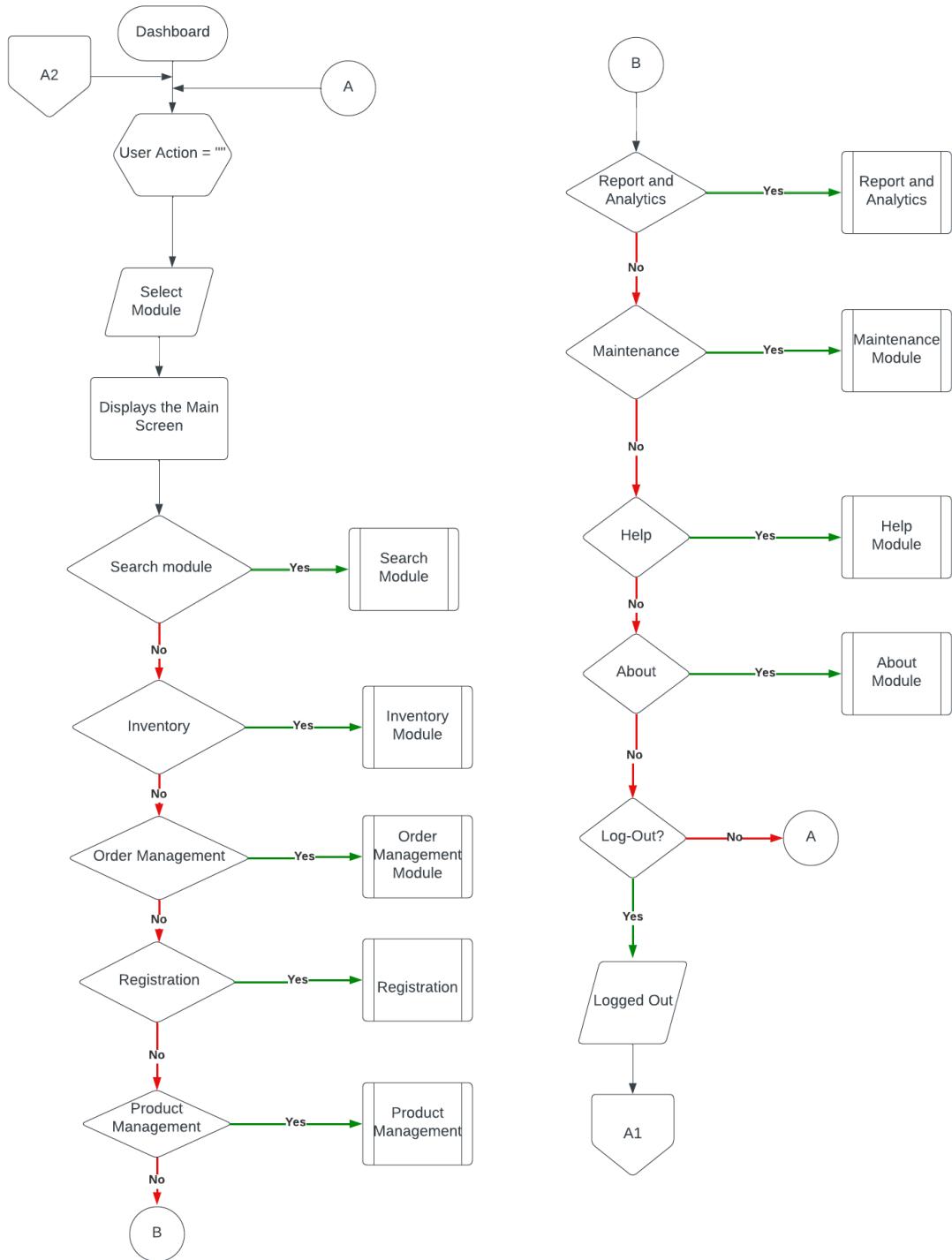


Figure 3: Dashboard

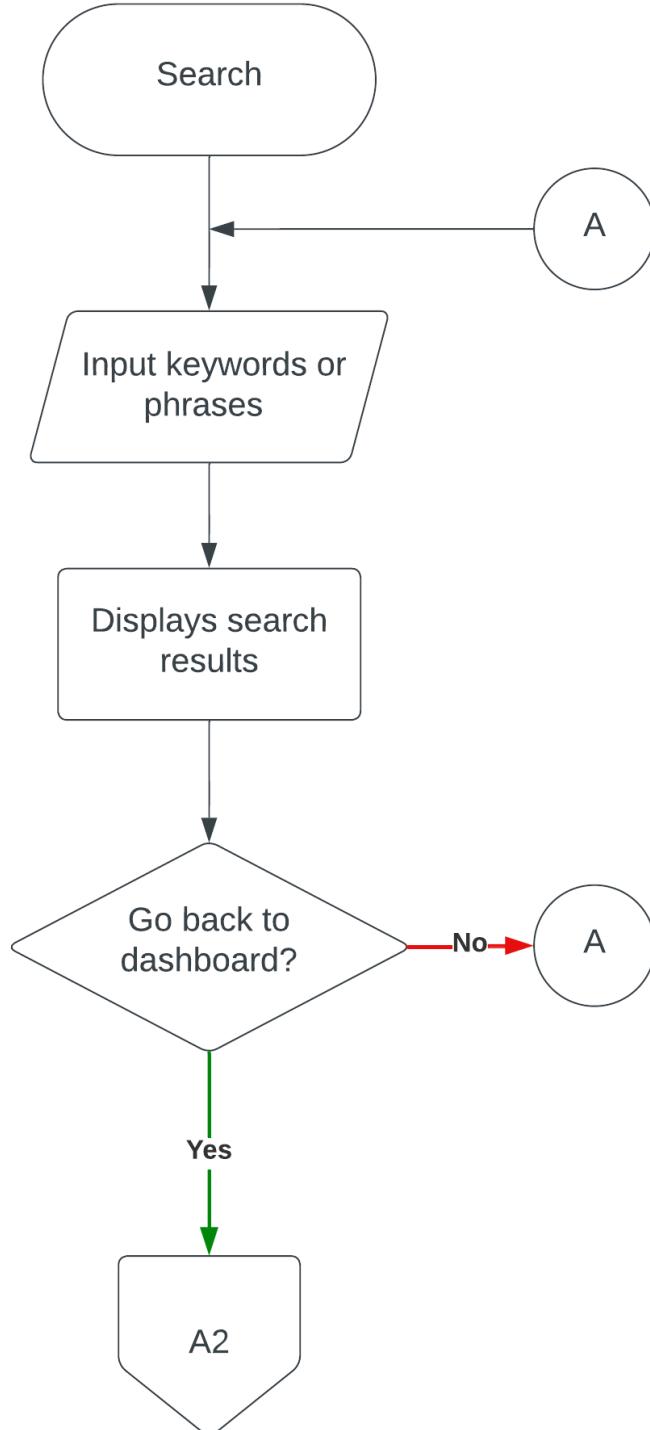


Figure 4: Search

### Registration Module

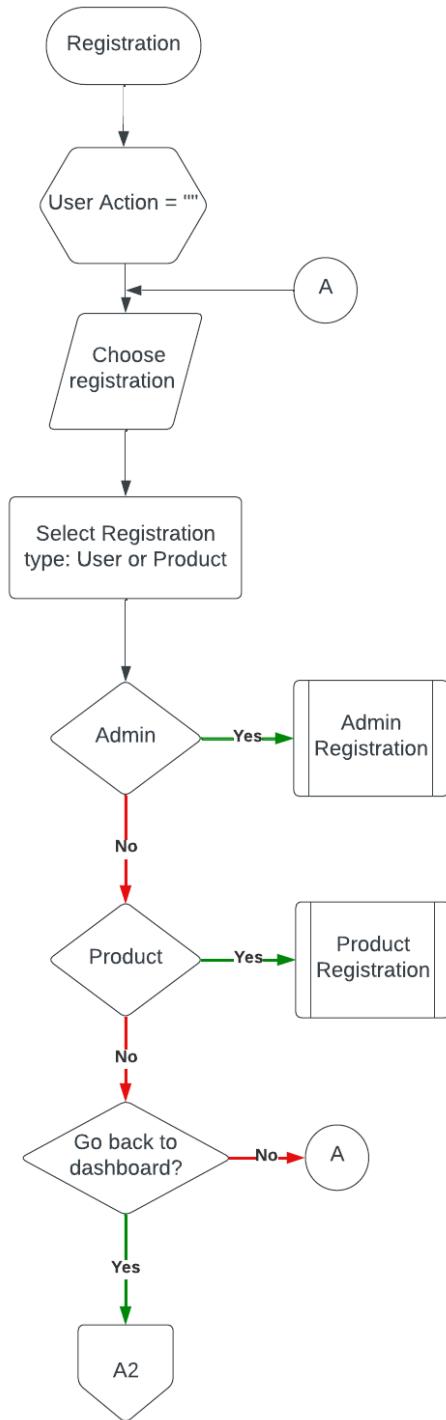


Figure 5: Registration selection

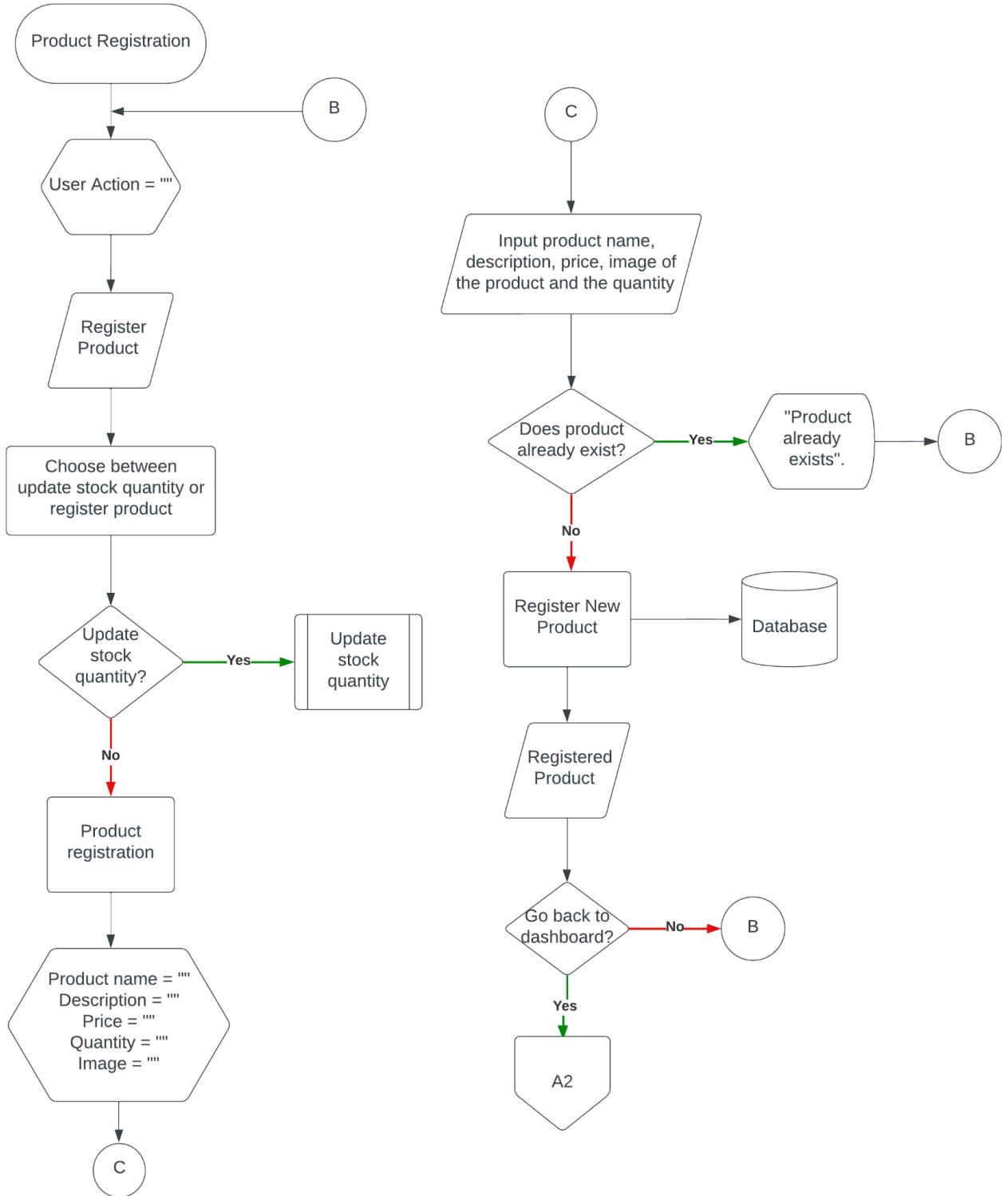


Figure 6: Product registration

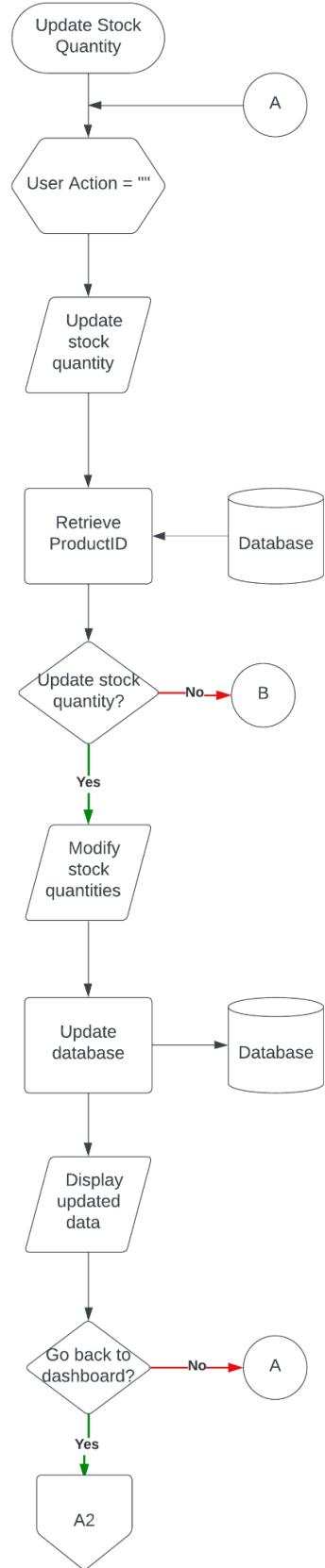


Figure 7: Updating stock quantity

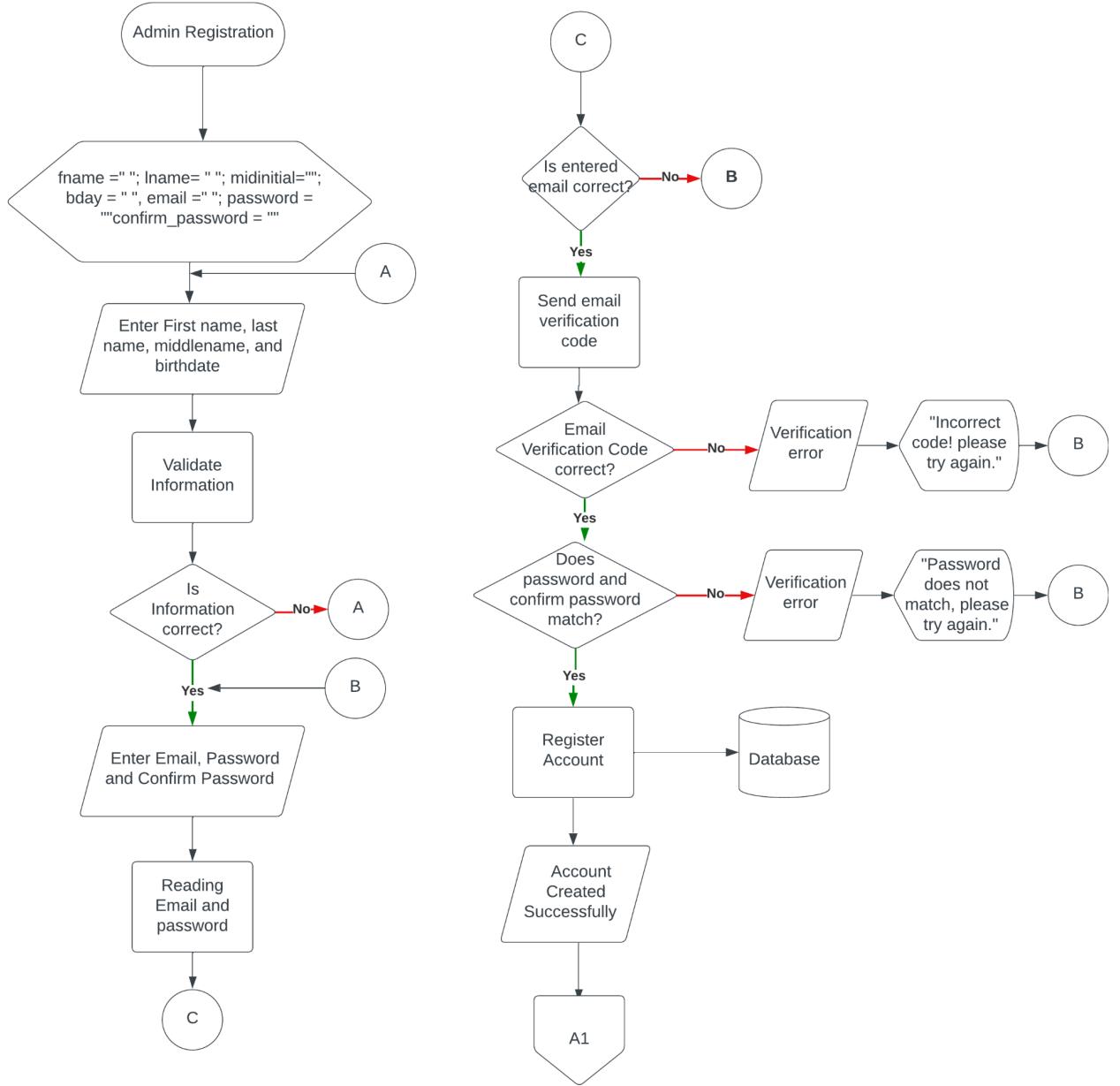


Figure 8: Admin registration



Figure 9: Inventory module

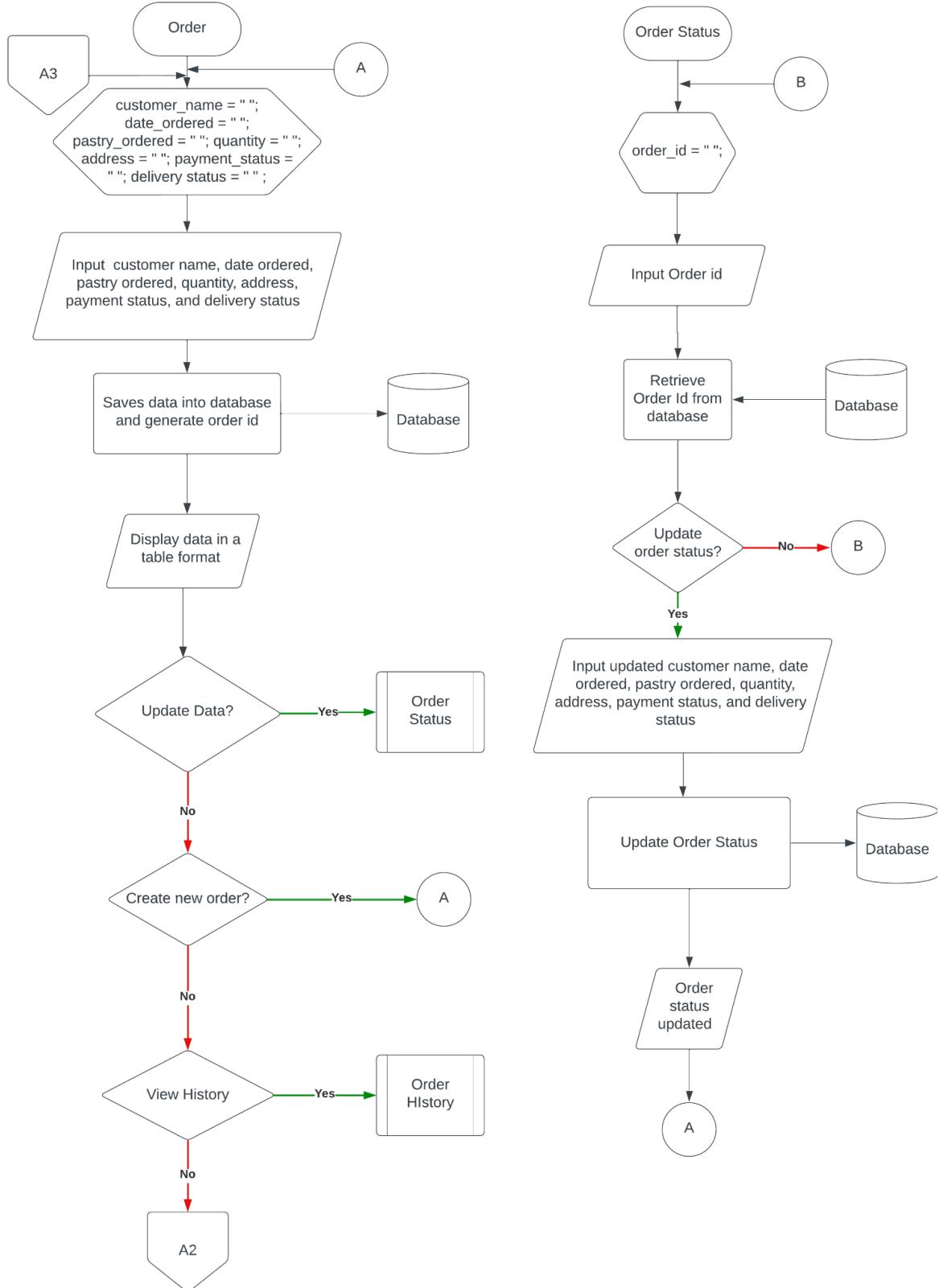


Figure 10: Order management

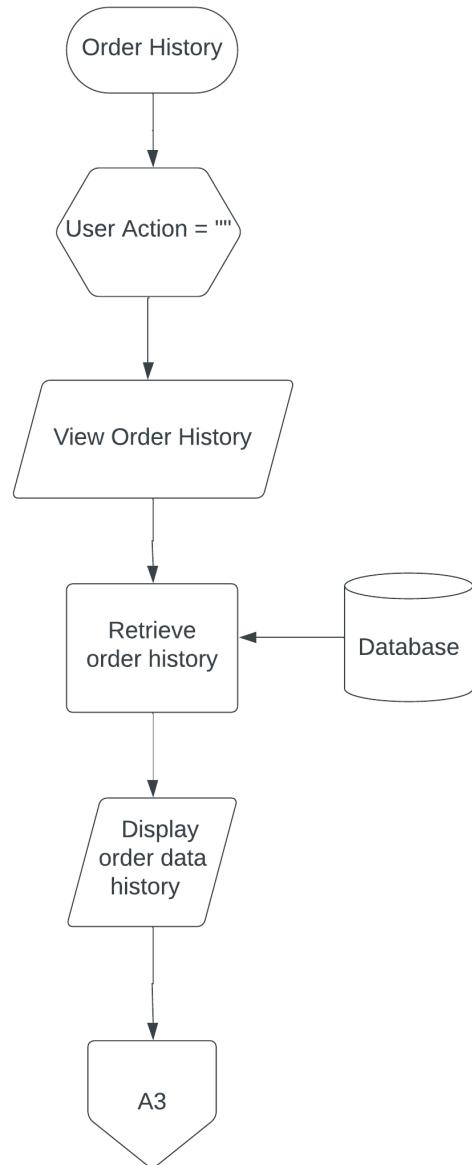


Figure 11: Order History

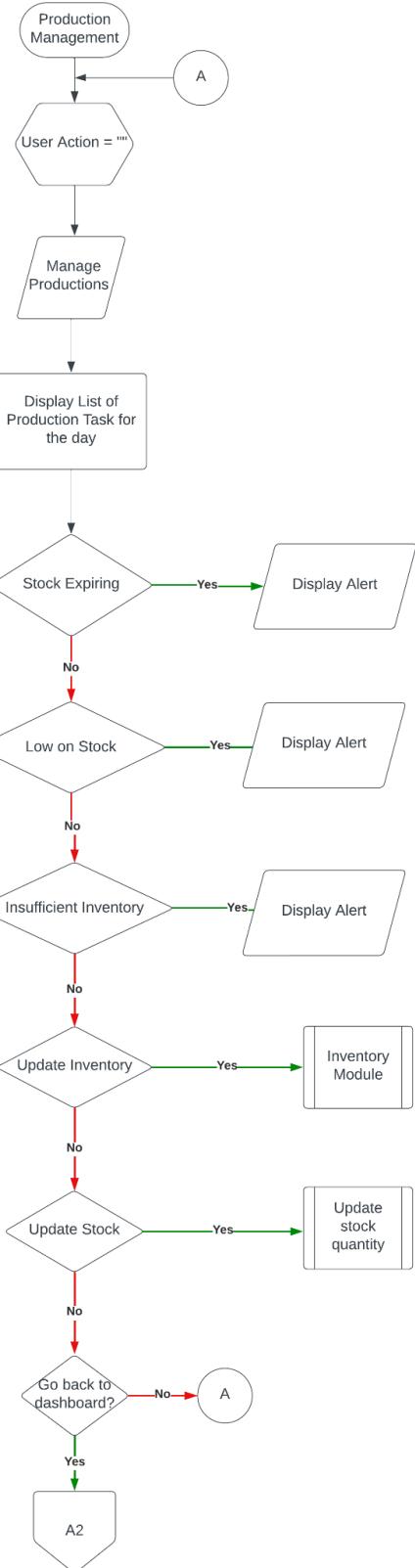


Figure 12: Production management

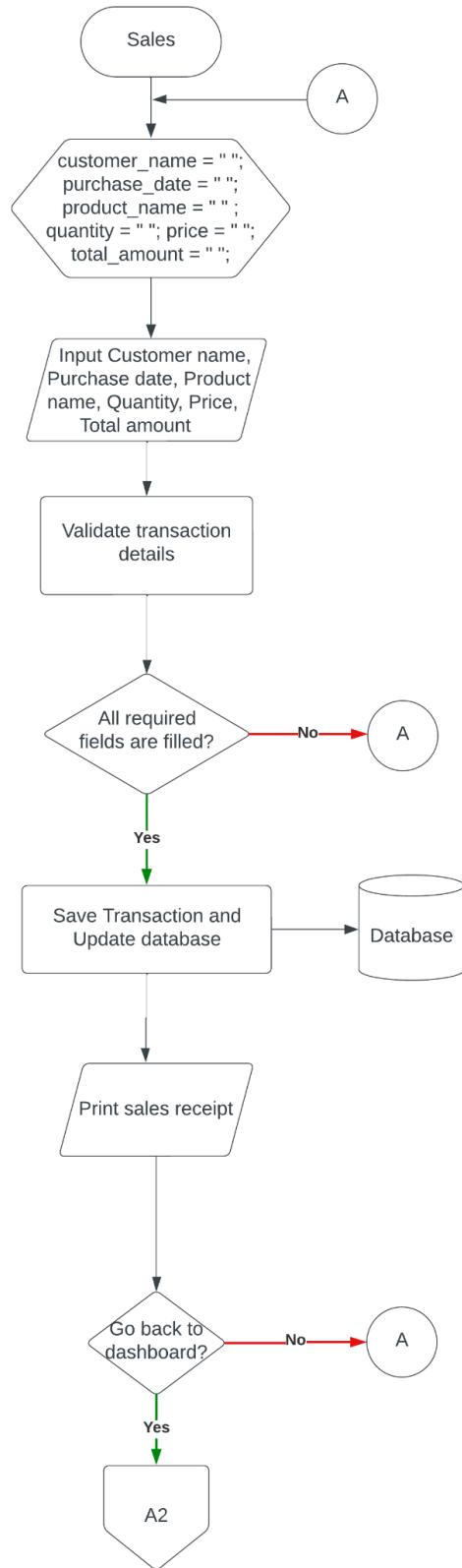


Figure 13: Sales

**Reports and Analytics Module**

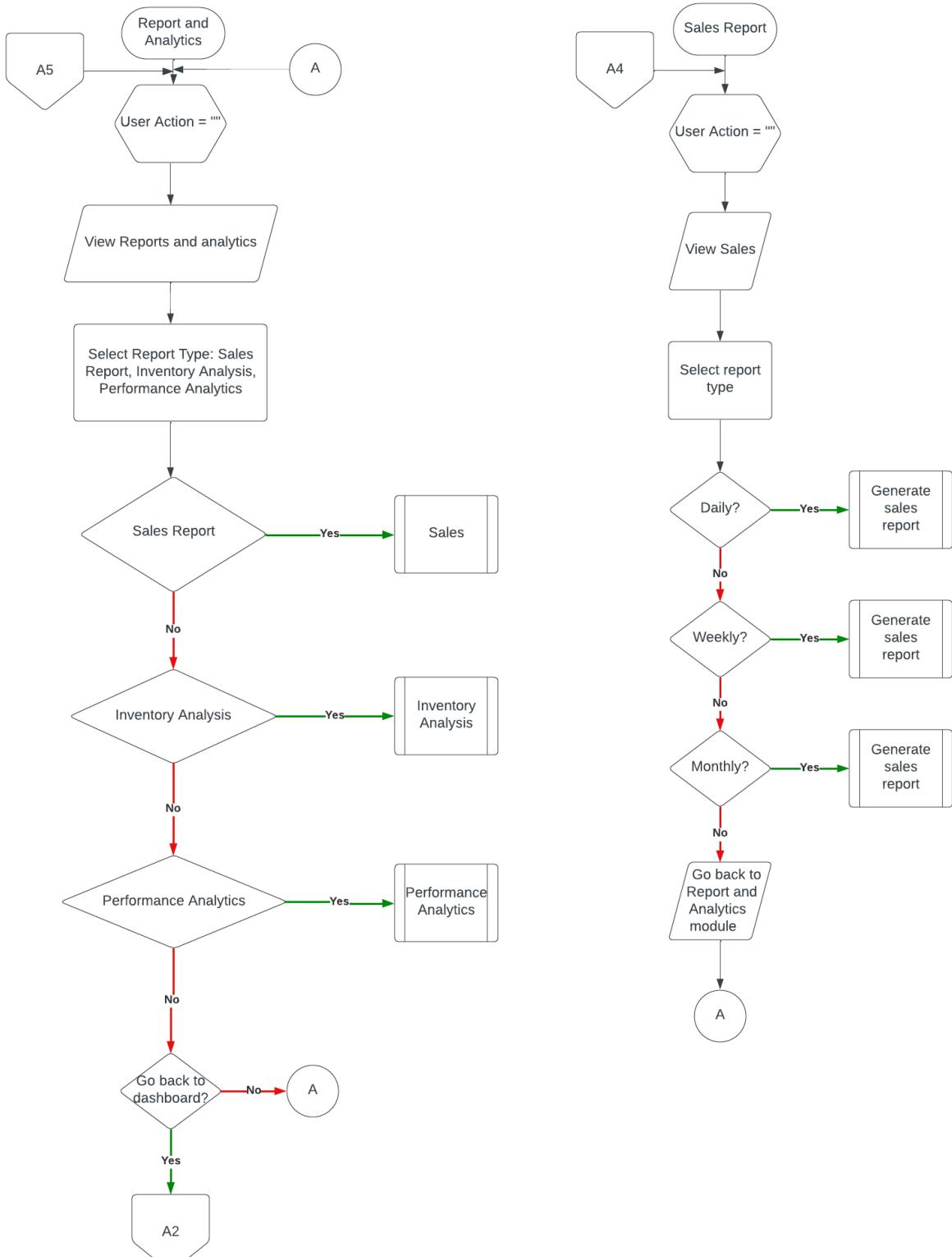


Figure 14: Reports and analytics

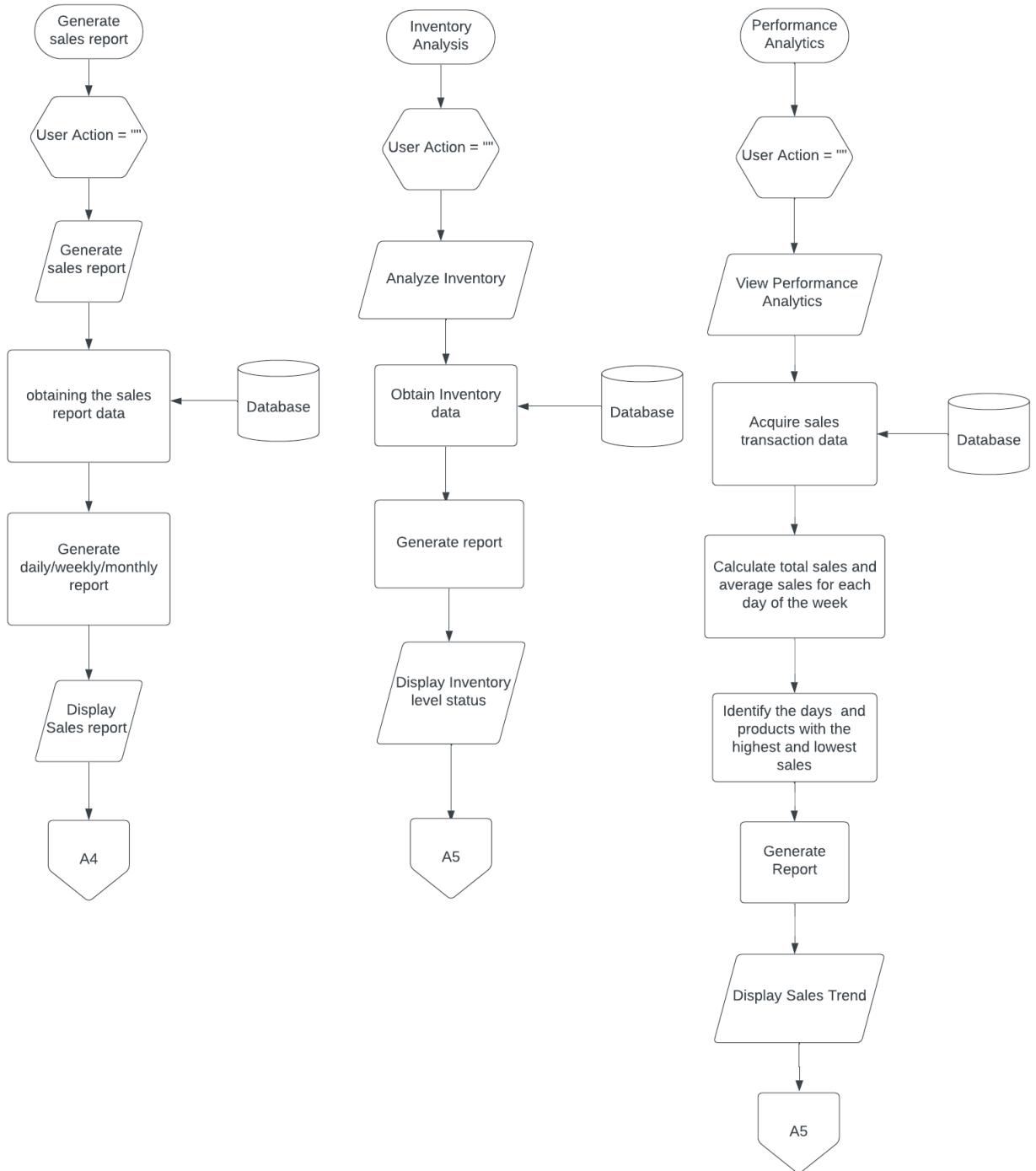


Figure 15: Generated Reports

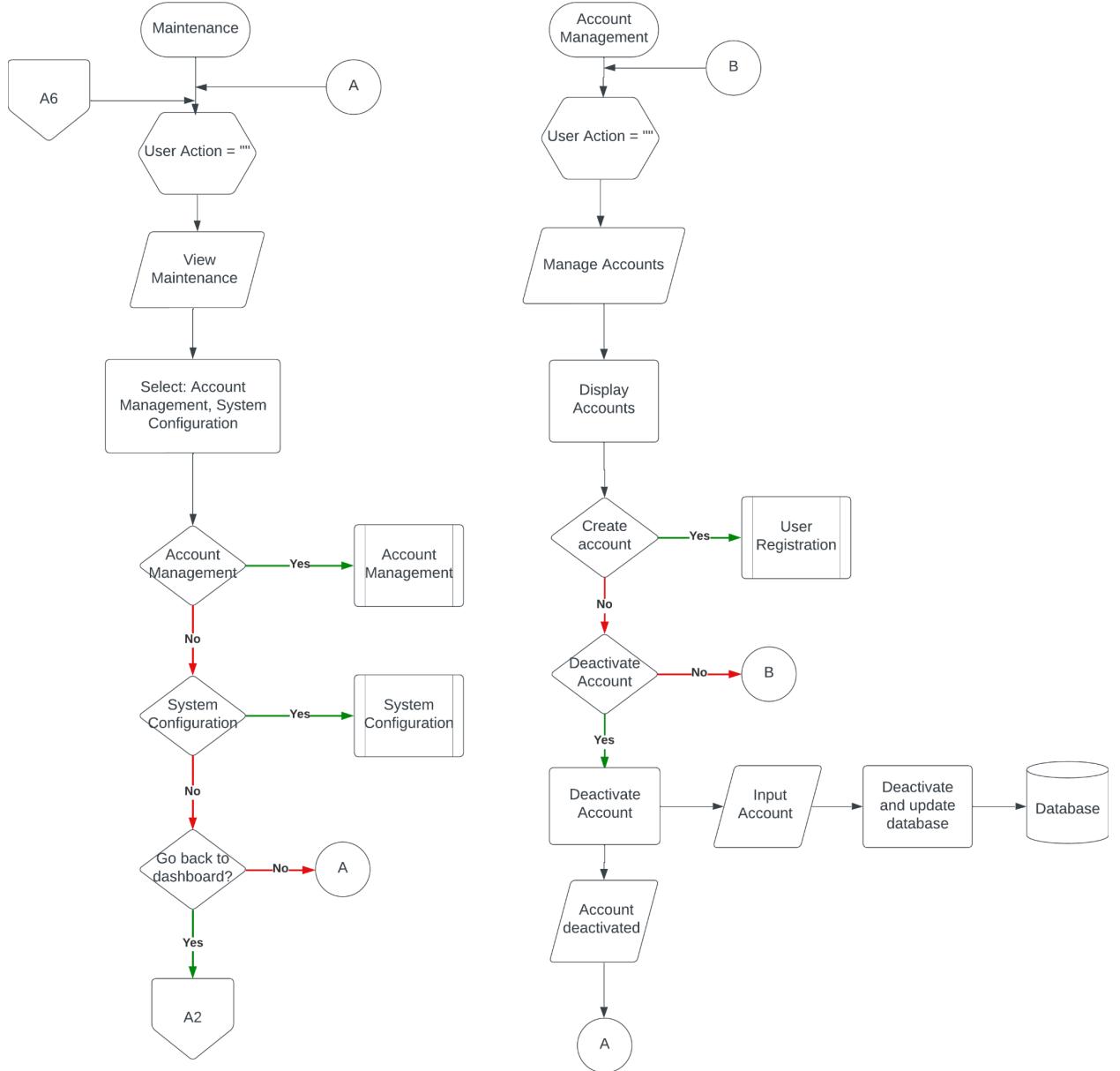


Figure 16: Maintenance

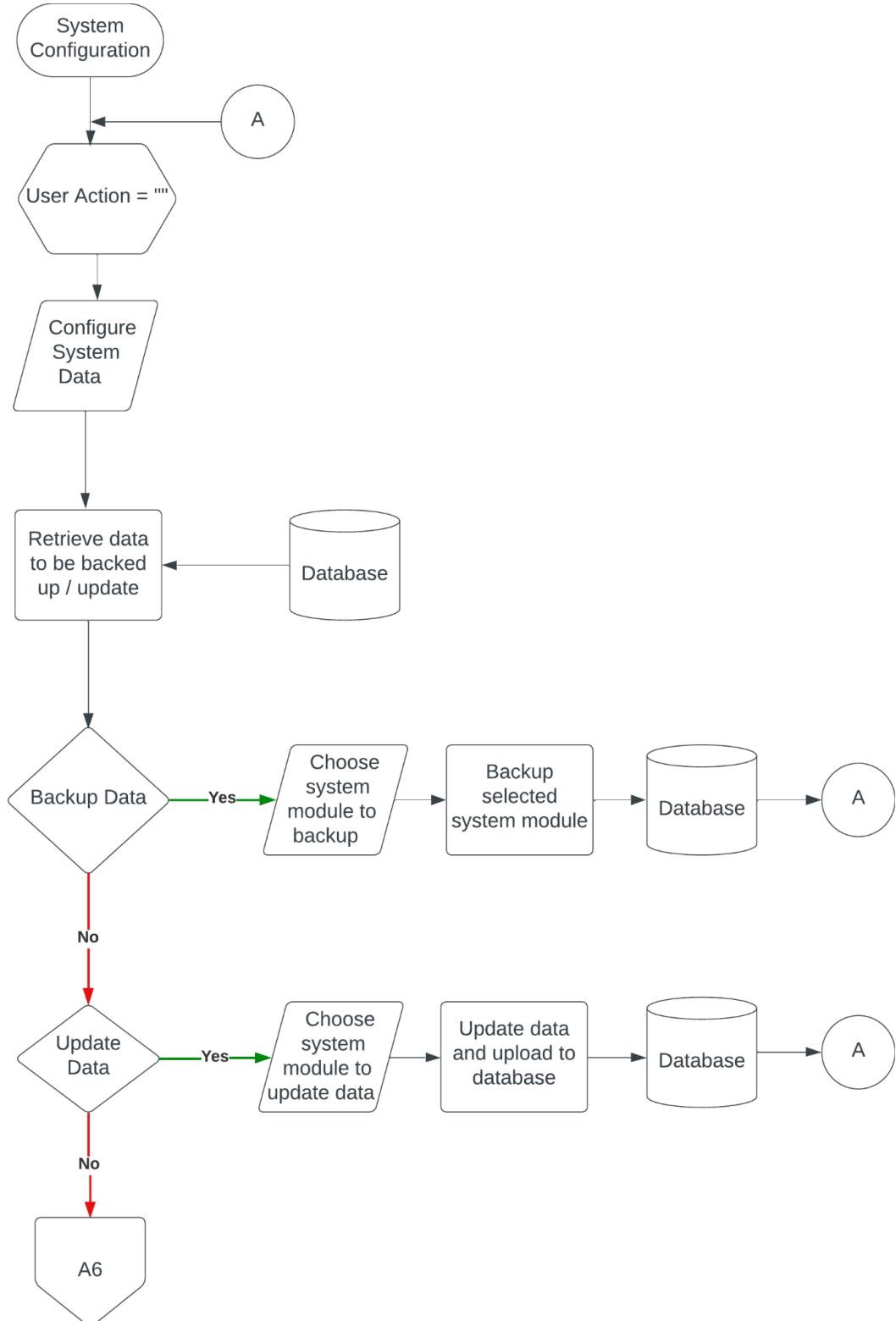


Figure 17: System configuration

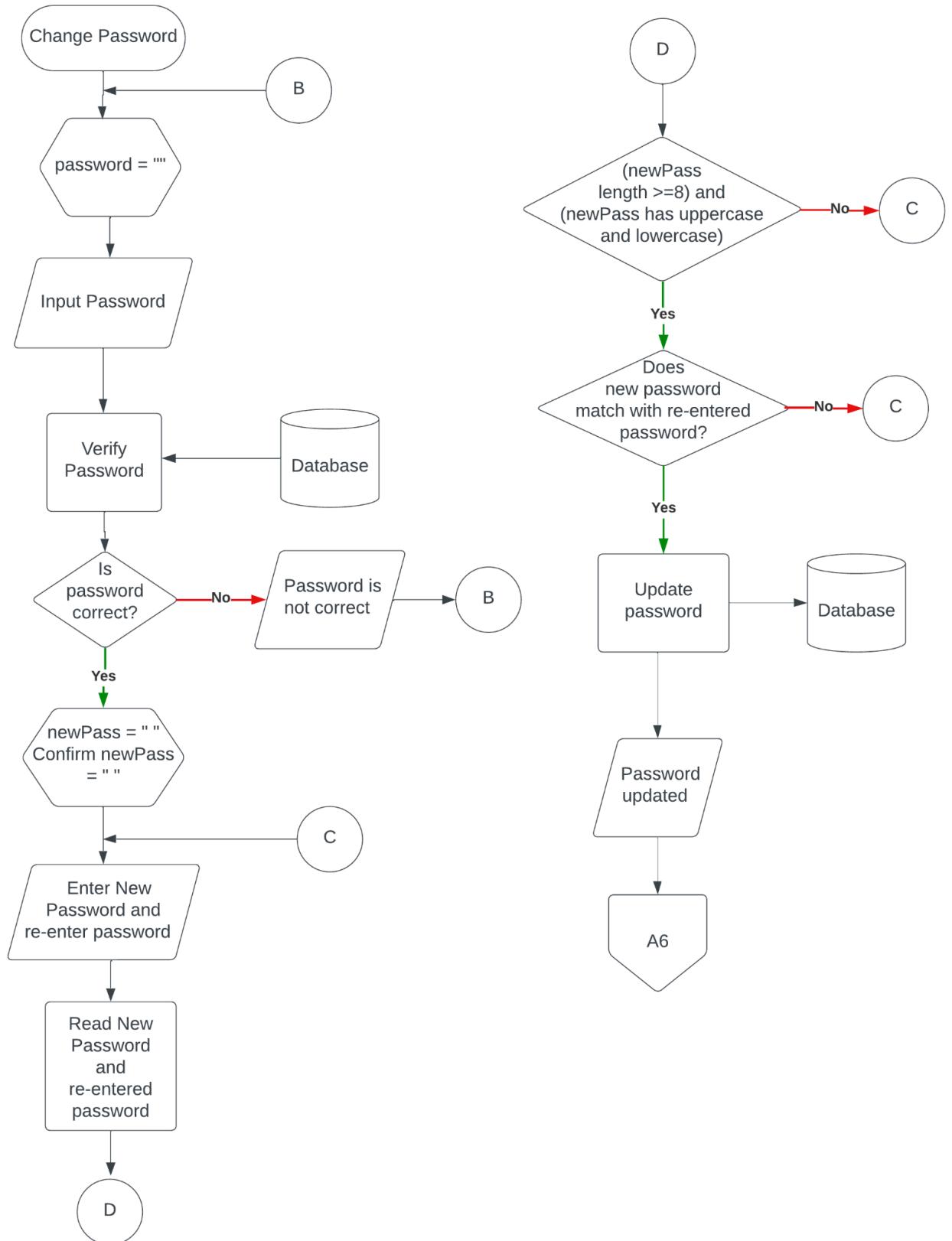


Figure 18: Change Admin password

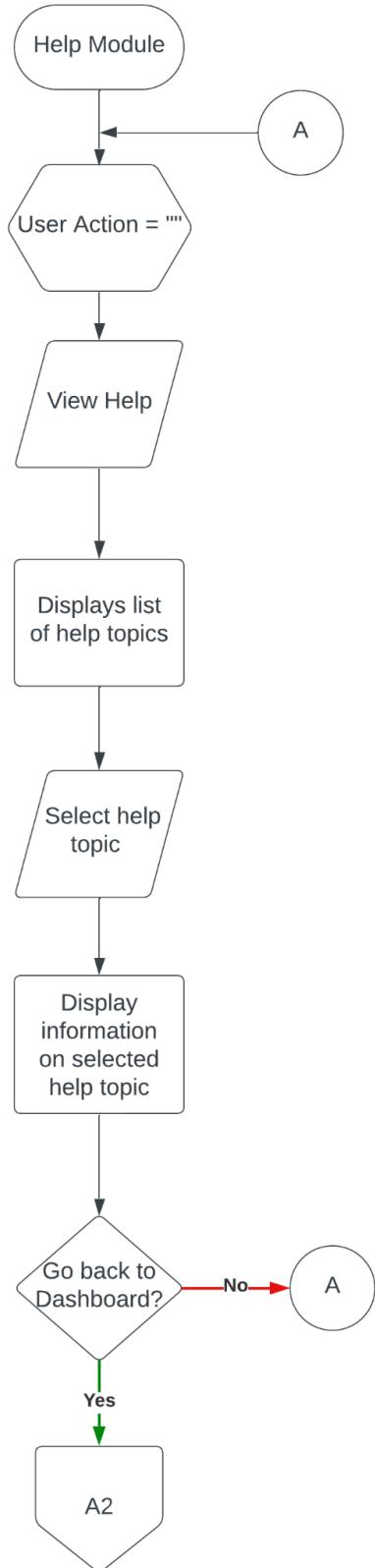


Figure 19: Help

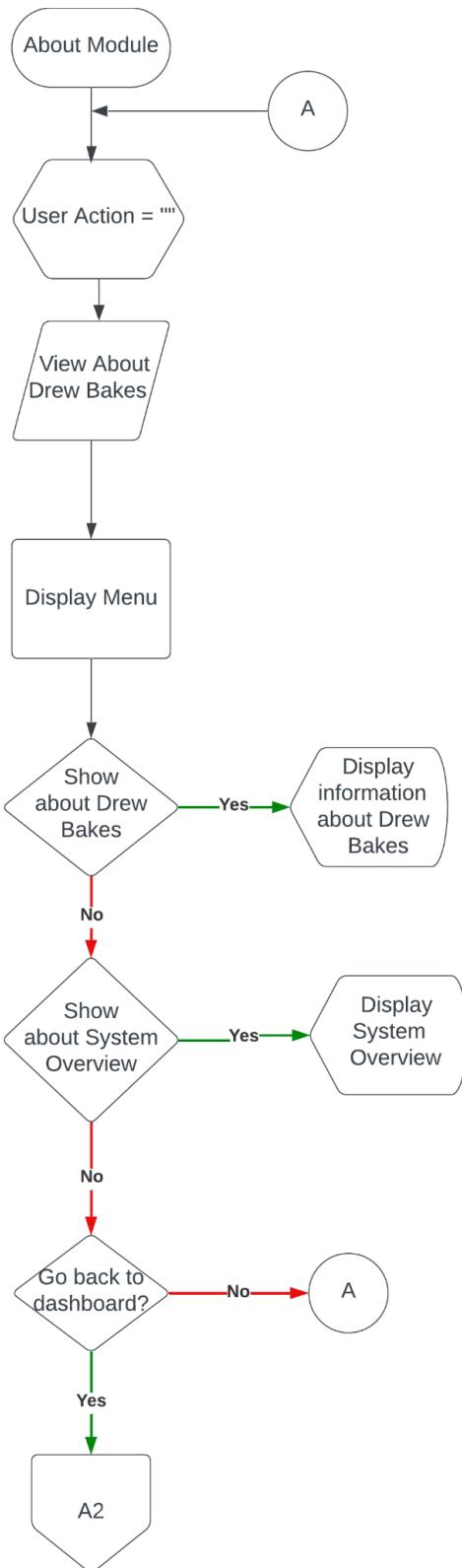


Figure 20: About

## Context Diagram of the Proposed System

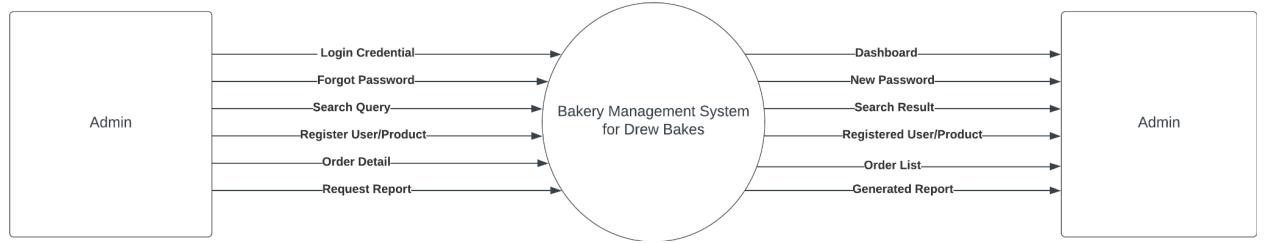


Figure 21: Context Diagram of the Proposed System

## Data Flow Diagram of the Proposed System

### Level 1

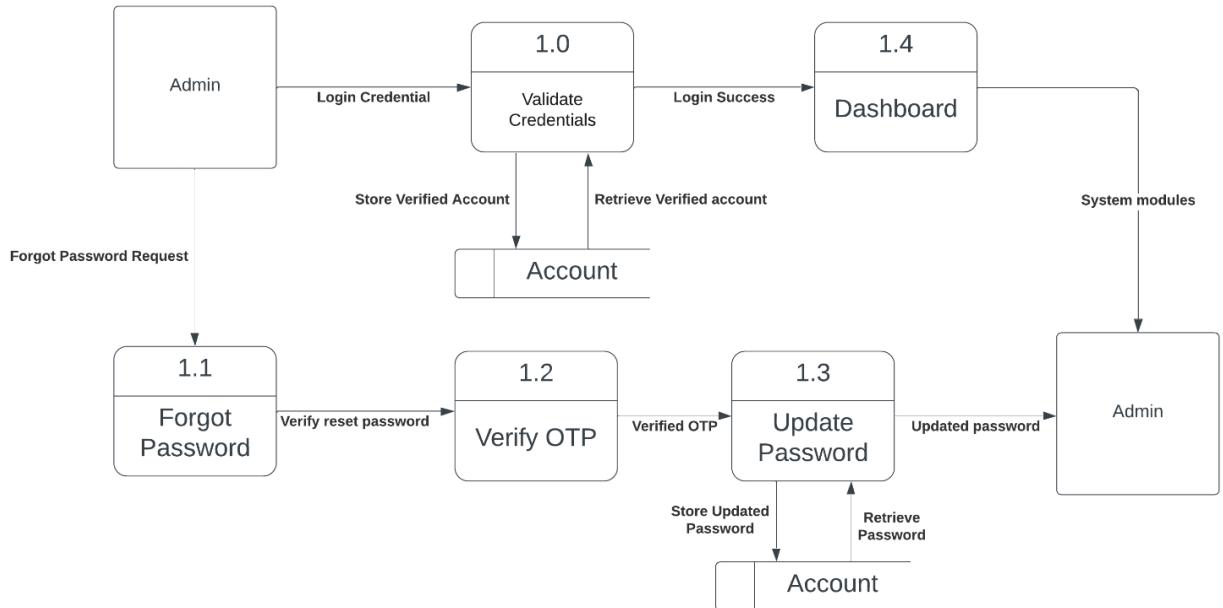


Figure 22: Security Module

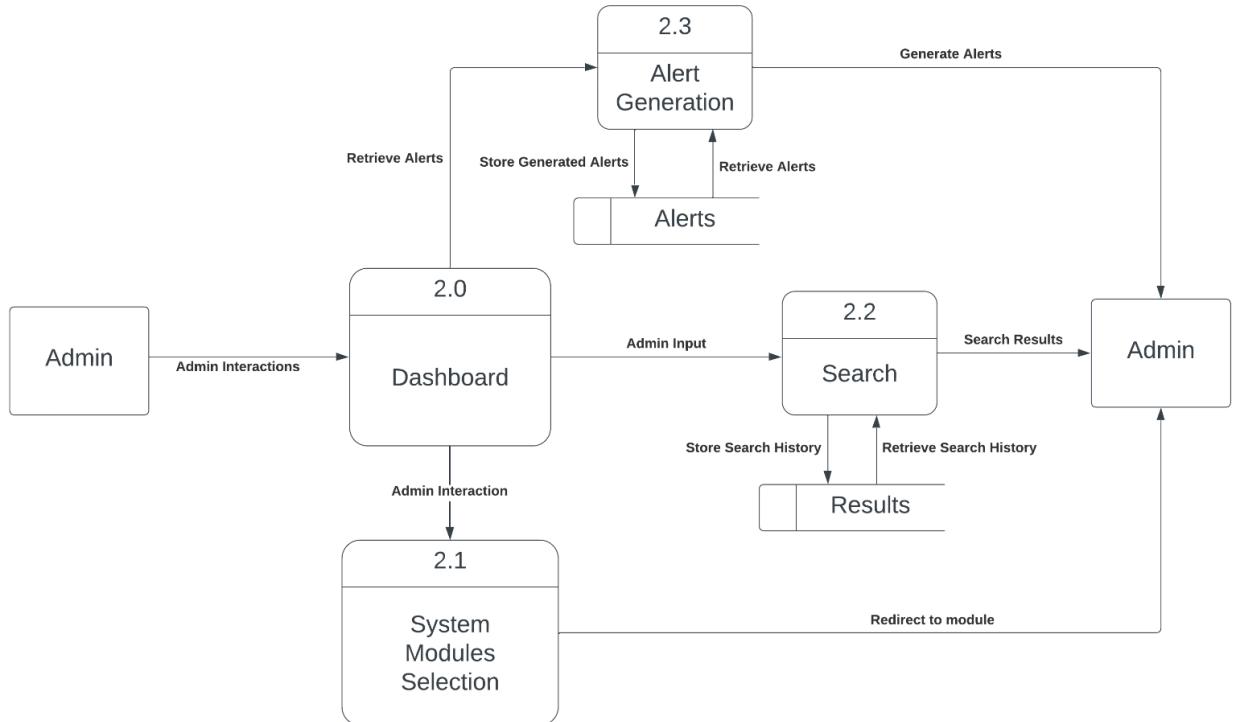


Figure 23: Dashboard Module

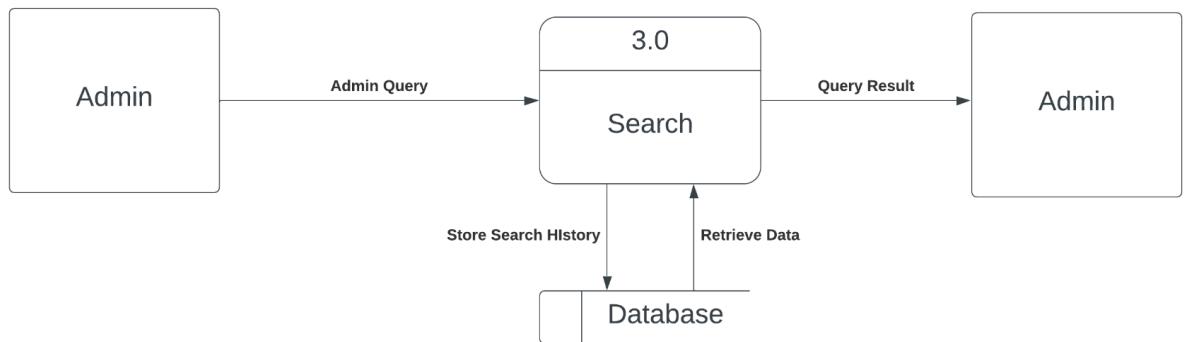


Figure 24: Search Module

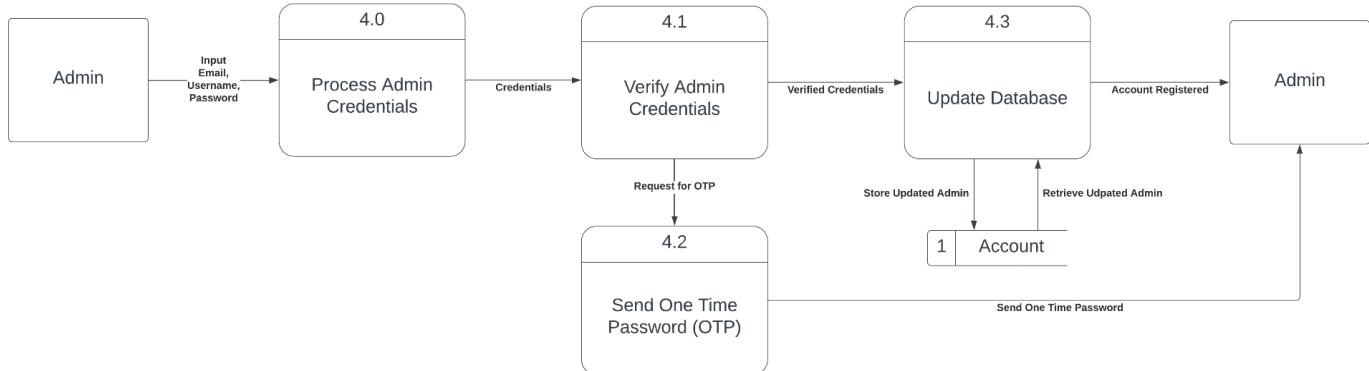


Figure 25: Admin Registration

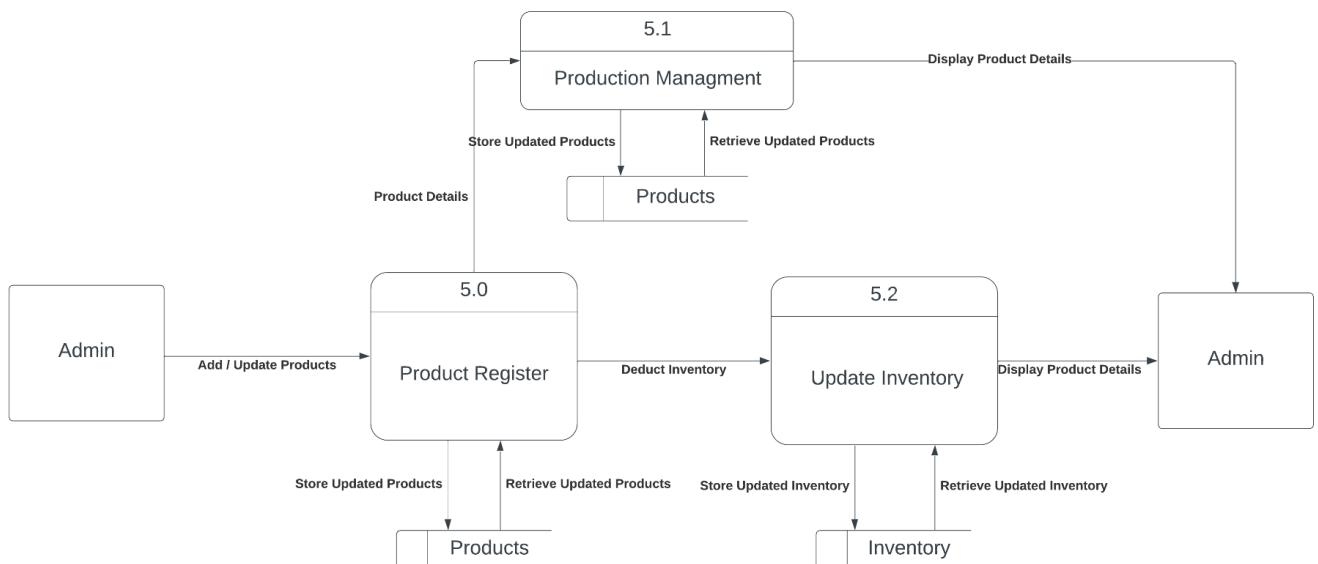


Figure 26: Product Registration

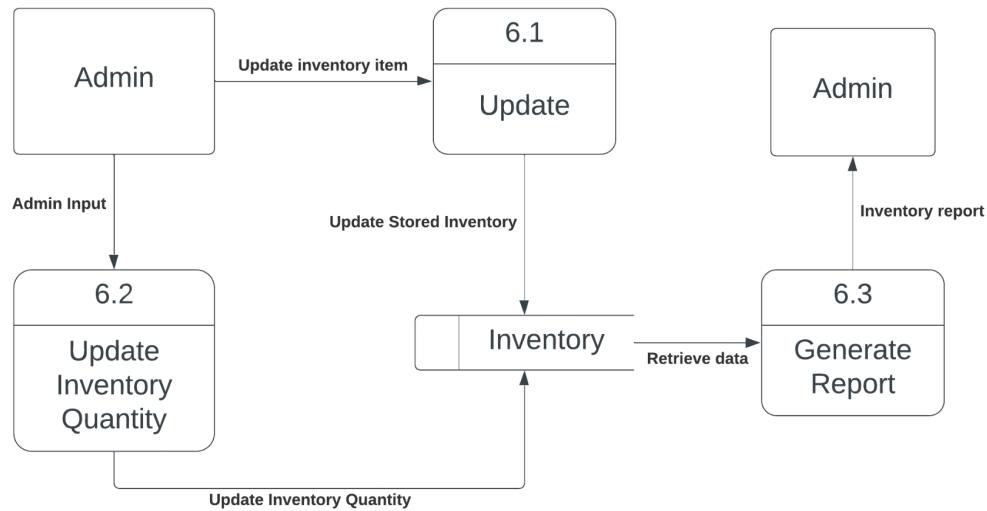


Figure 27: Inventory Module

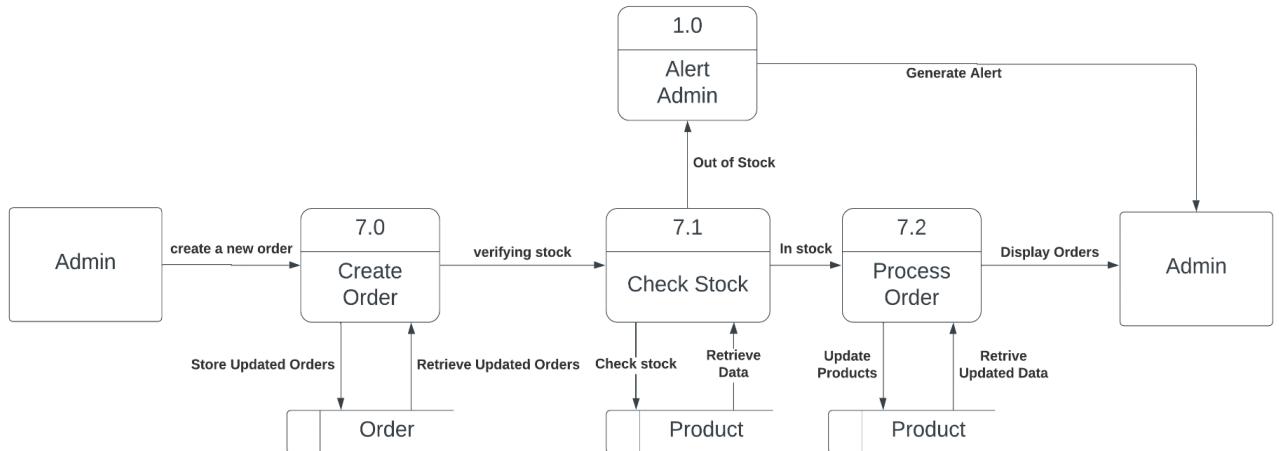


Figure 28: Order Module

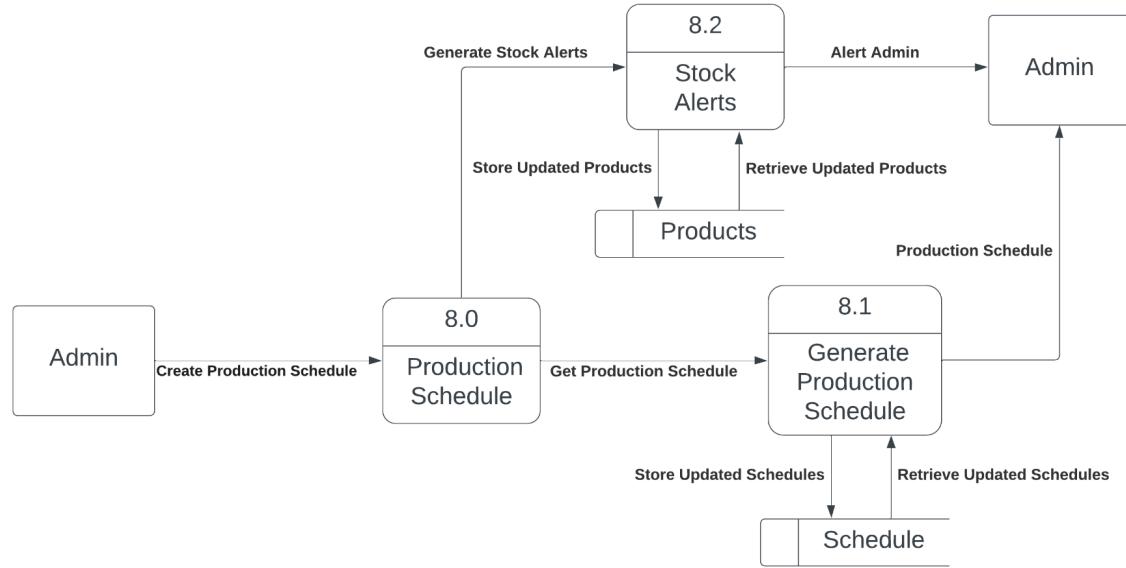


Figure 29: Production Module

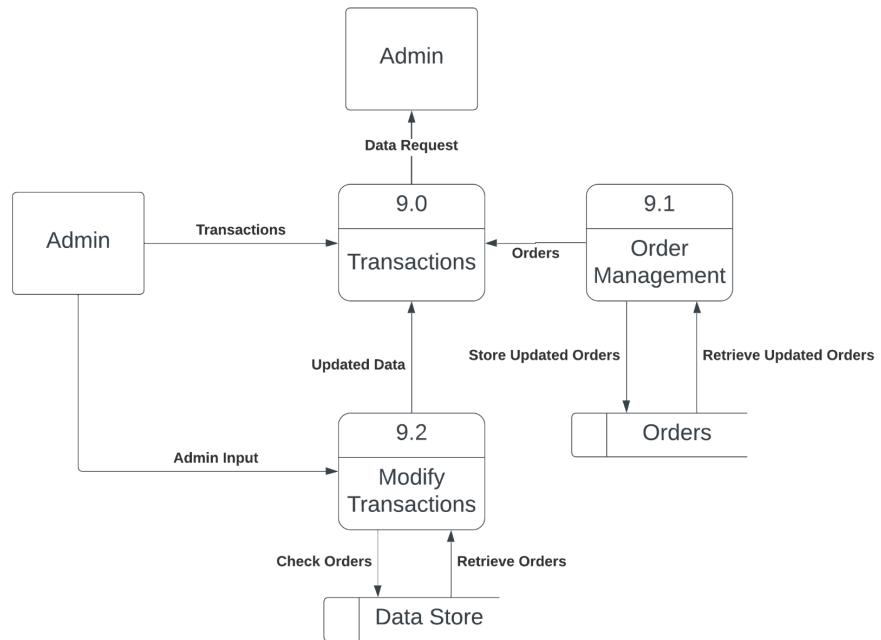


Figure 30: Sales Module

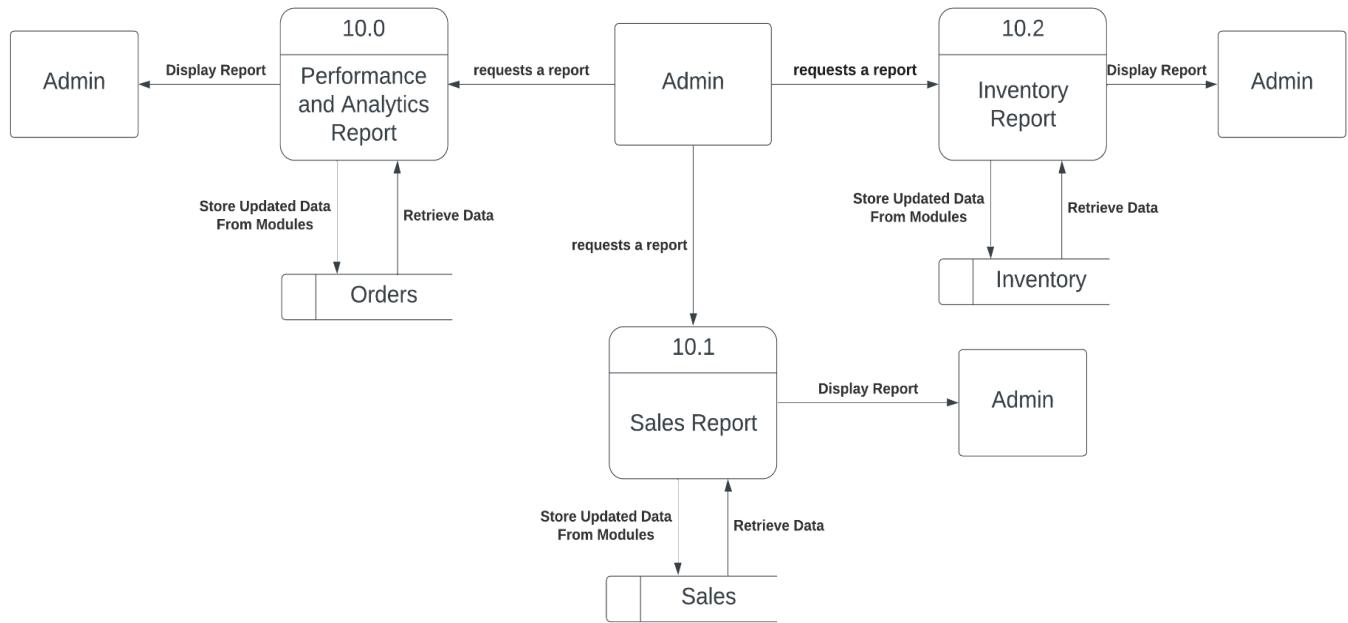


Figure 31: Report and Analytics Module

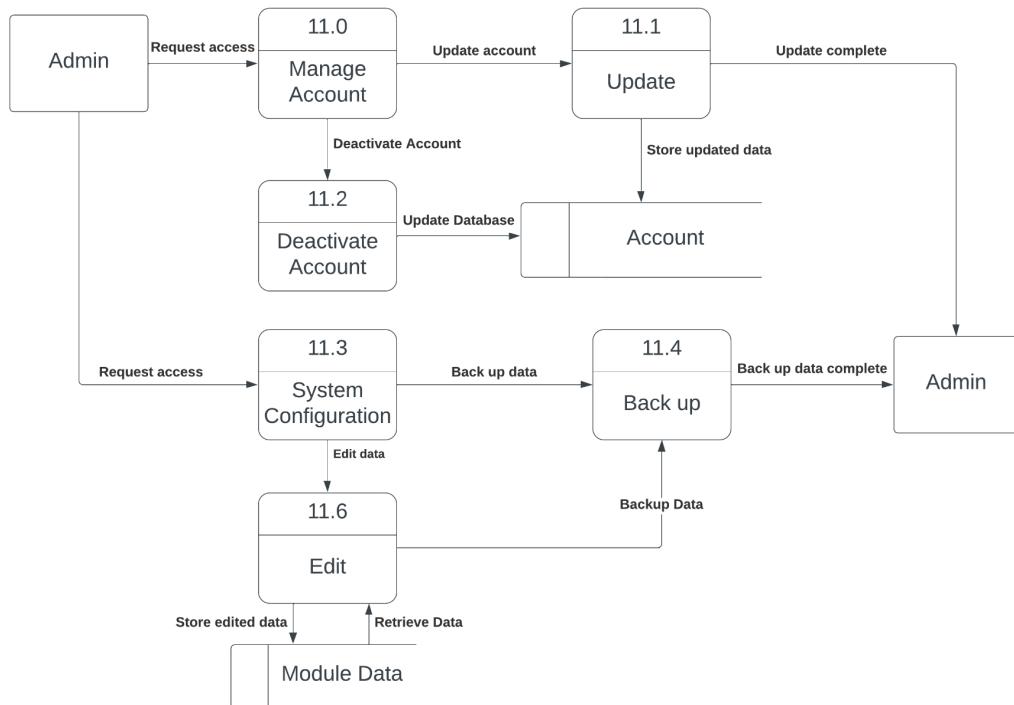


Figure 32: Maintenance Module

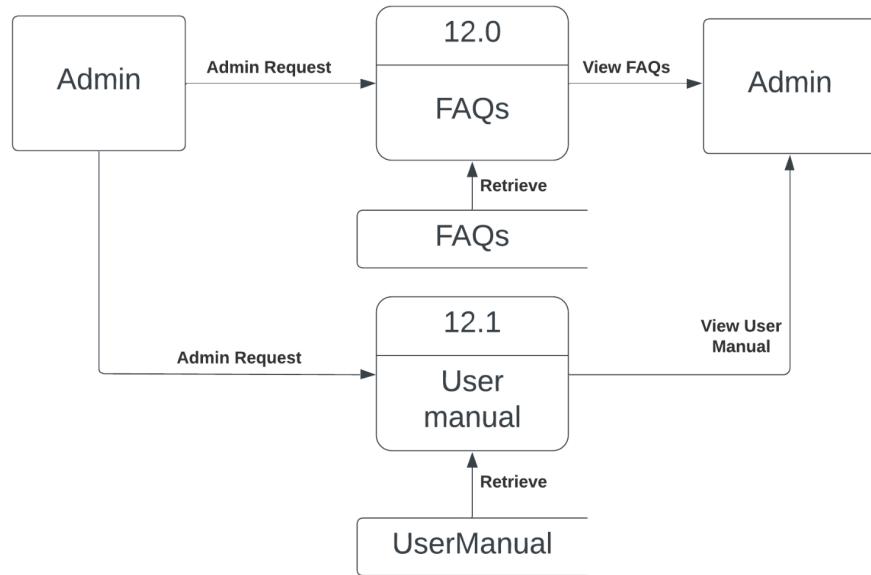


Figure 33: Help Module

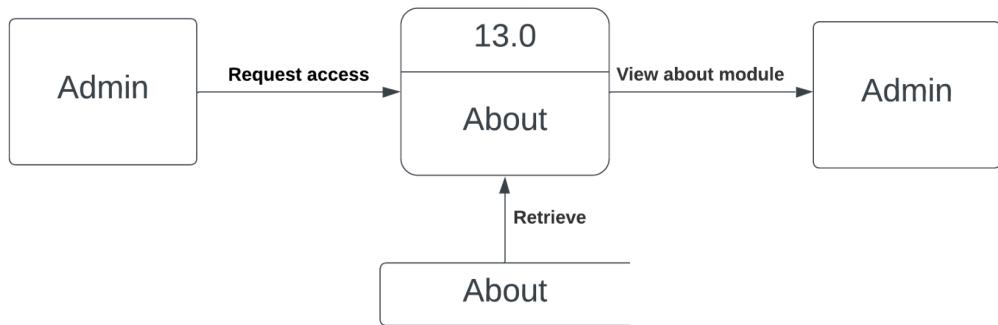


Figure 34: About Module

## Use Case Diagram



Figure 35: Use Case Diagram

**Hierarchical Input Process, and Output**

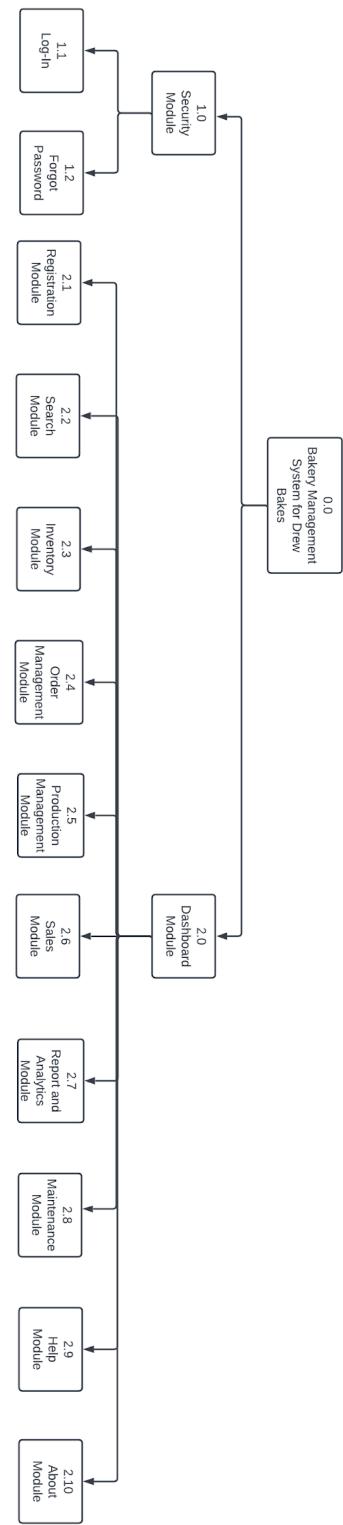


Figure 36: Bakery Management System Hierarchy

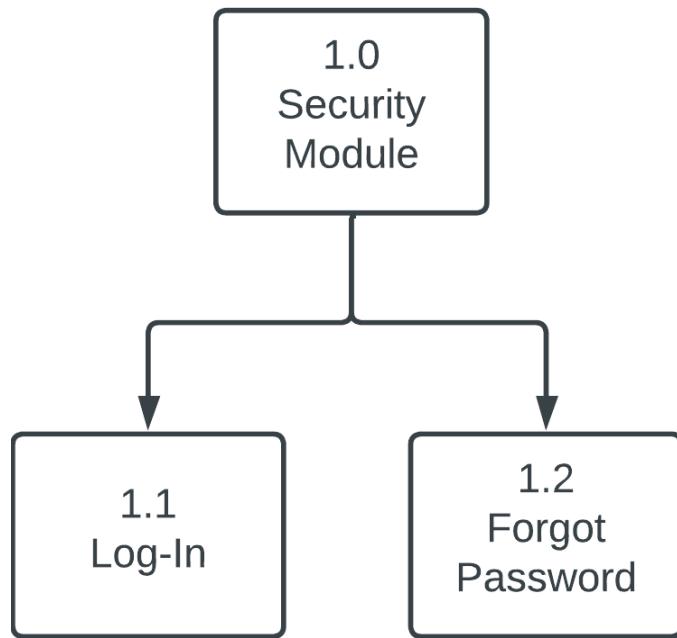


Figure 37: Security Hierarchy

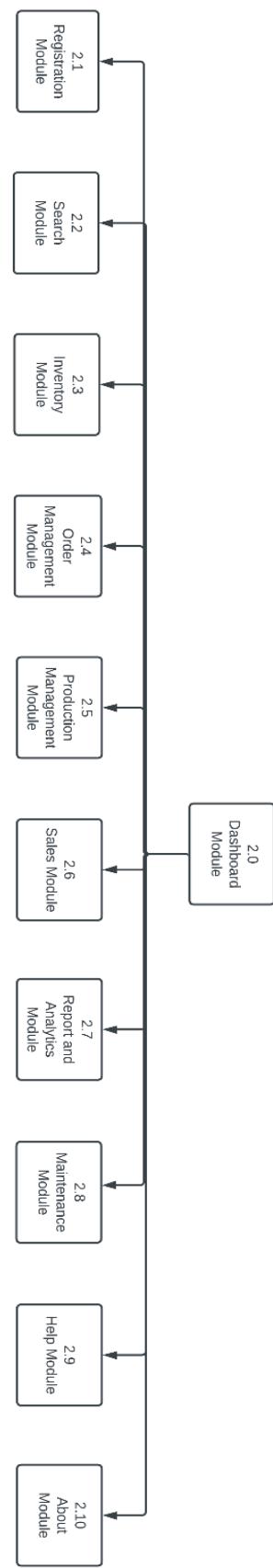


Figure 38: Dashboard Hierarchy

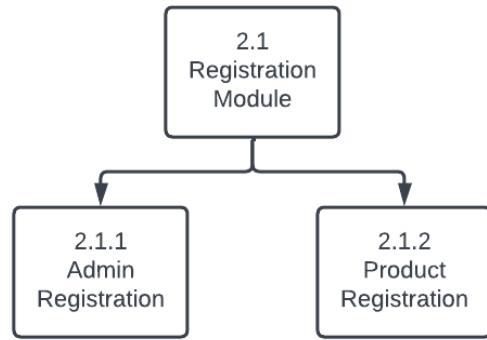


Figure 39: Registration Hierarchy

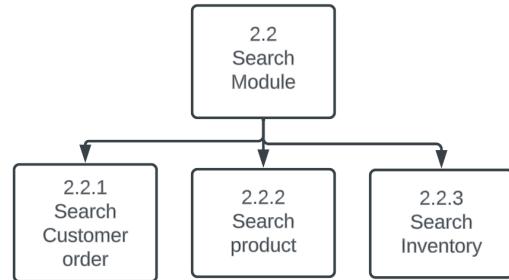


Figure 40: Search Hierarchy

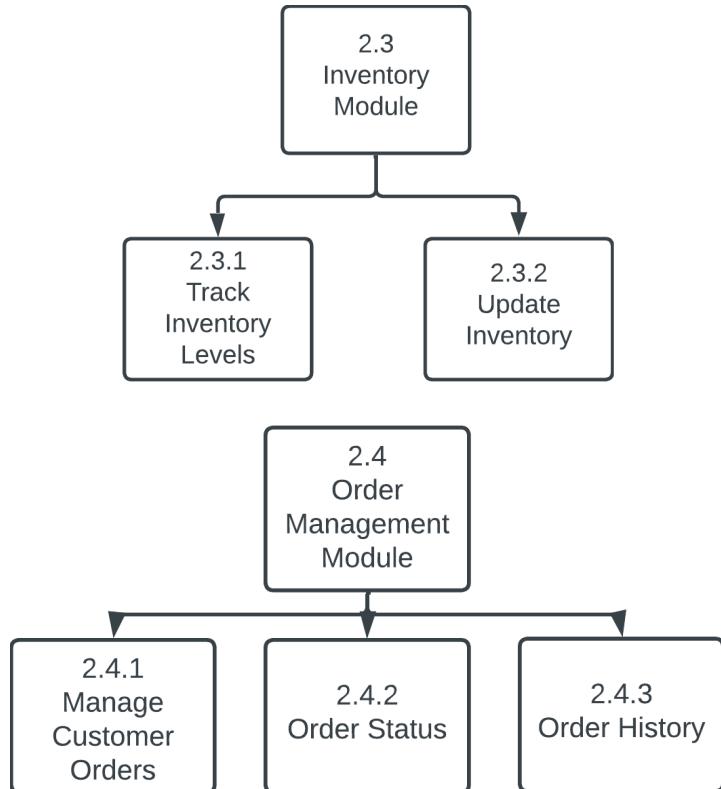


Figure 41: Inventory and Order Hierarchy

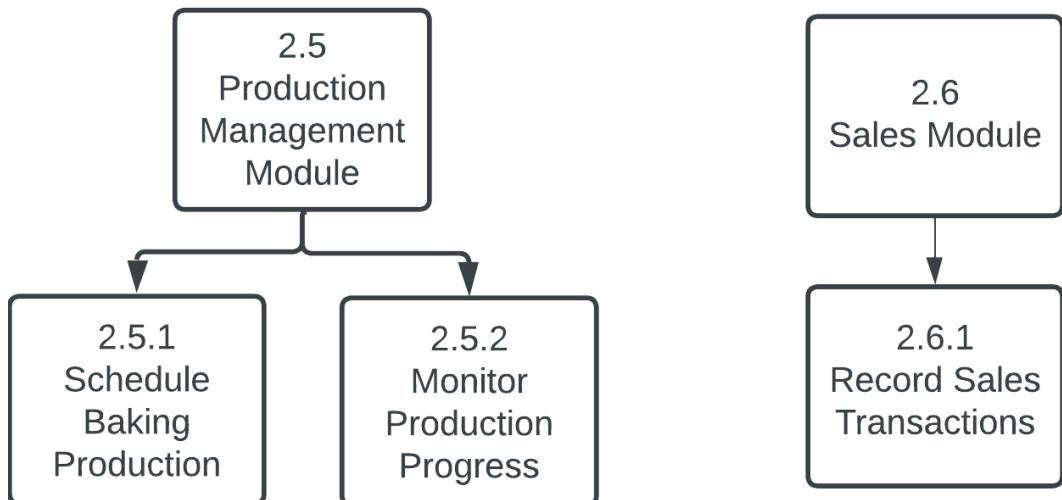


Figure 42: Production and Sales Hierarchy

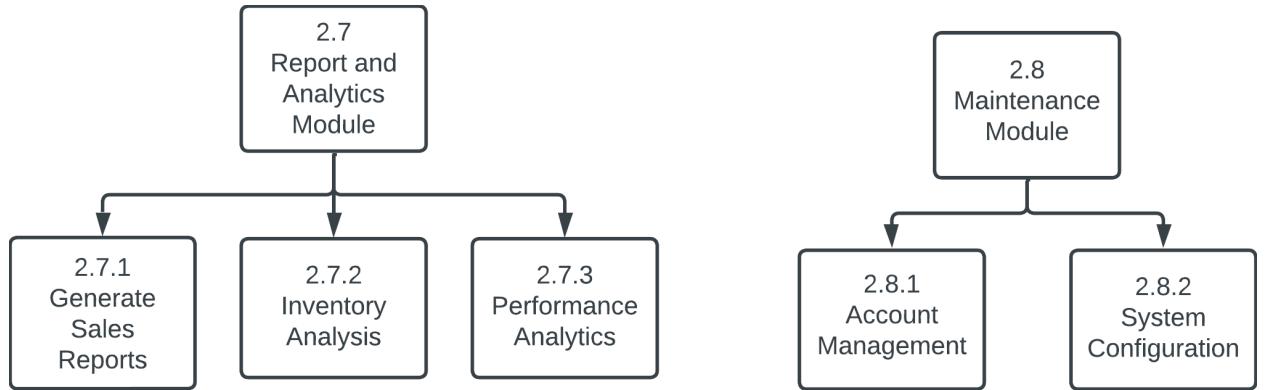


Figure 43: Reports and Maintenance Hierarchy

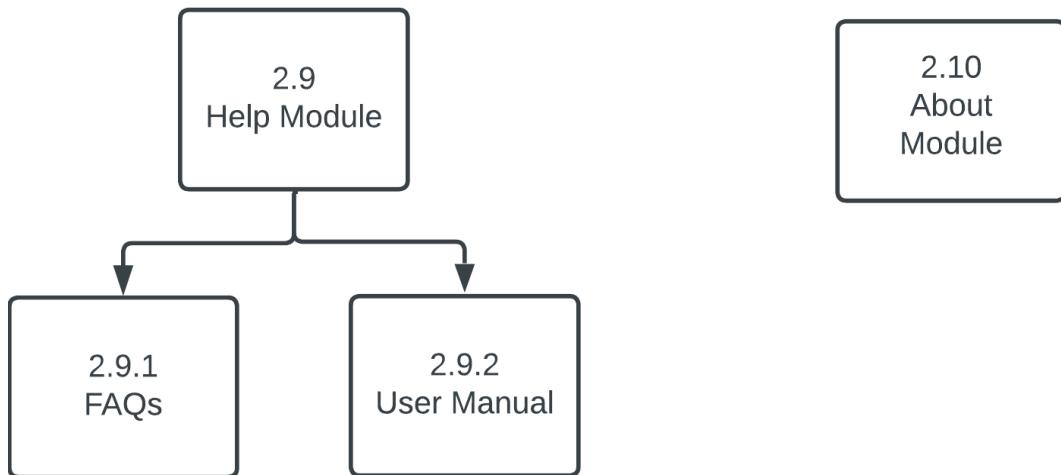
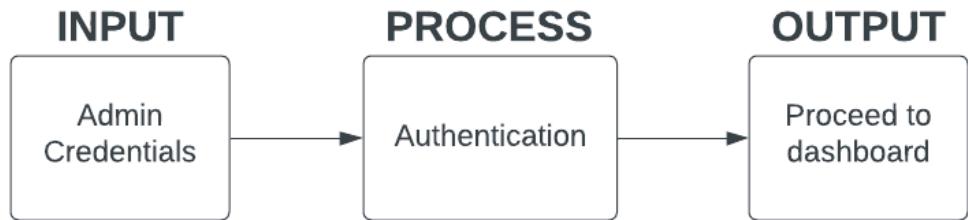


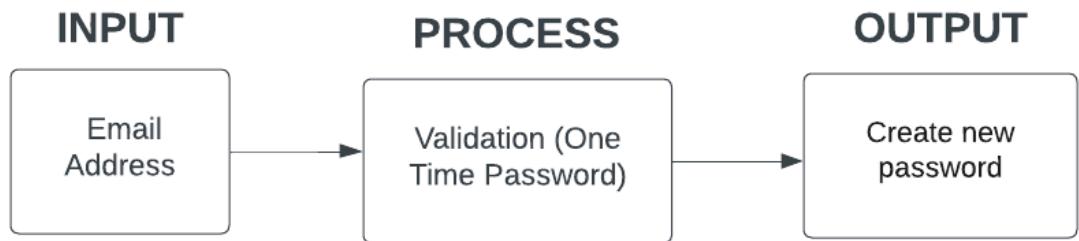
Figure 44: Help and About Hierarchy

**Input, Process, Output**

1.0  
Security module



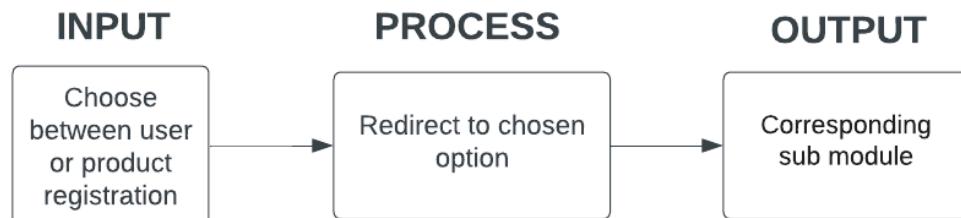
1.2  
Forgot  
password



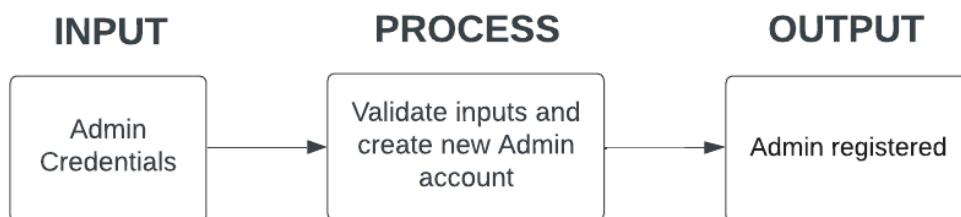
2.0  
Dashboard  
Module



2.1  
Registration Module



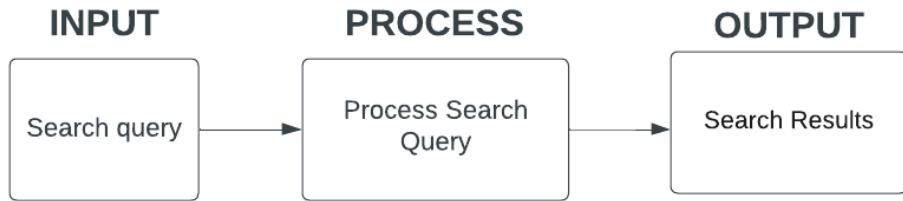
2.1.1  
Admin Register



2.1.2  
Product Register



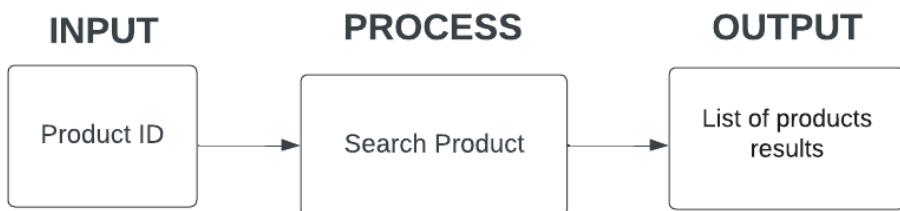
2.2  
Search Module



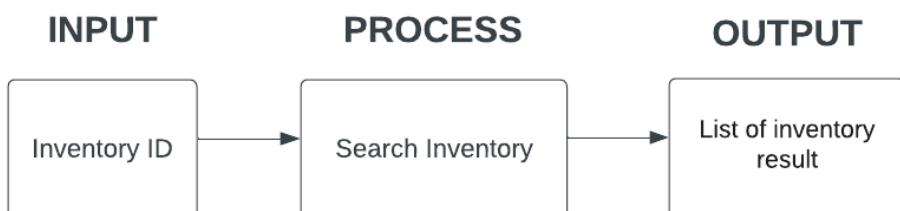
2.2.1  
Search Customer  
order



2.2.2  
Search Product



2.2.3  
Search Inventory



### 2.3 Inventory Module



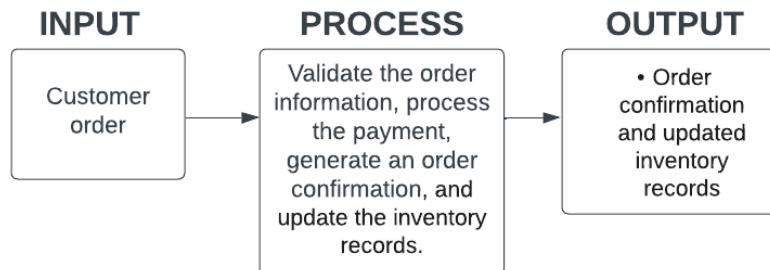
#### 2.3.1 Track Inventory Levels



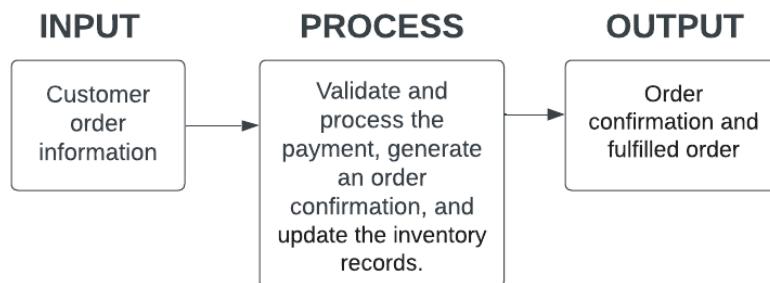
#### 2.3.2 Update Inventory



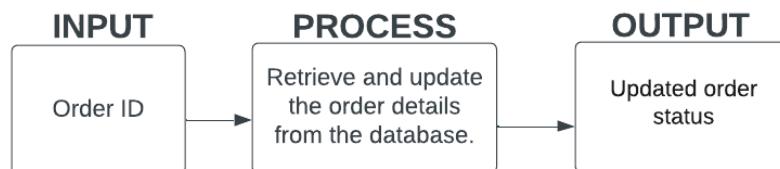
2.4  
Order Management  
Module



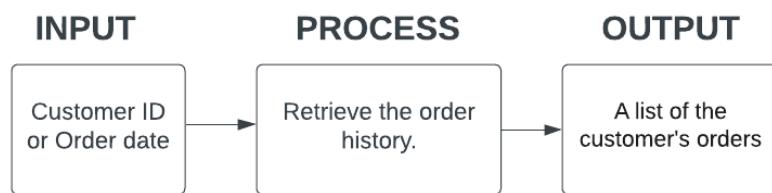
2.4.1  
Manage Customer  
Orders



2.4.2  
Order Status

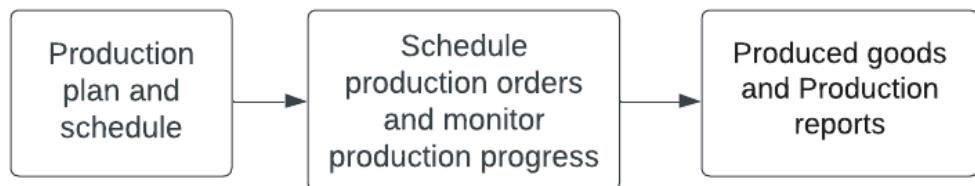


2.4.3  
Order History

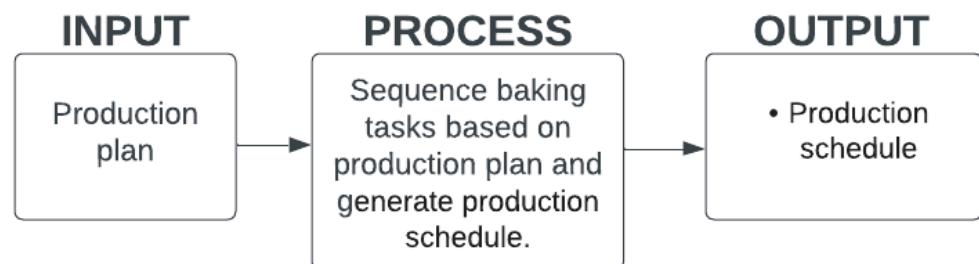


2.5  
Production  
Management Module

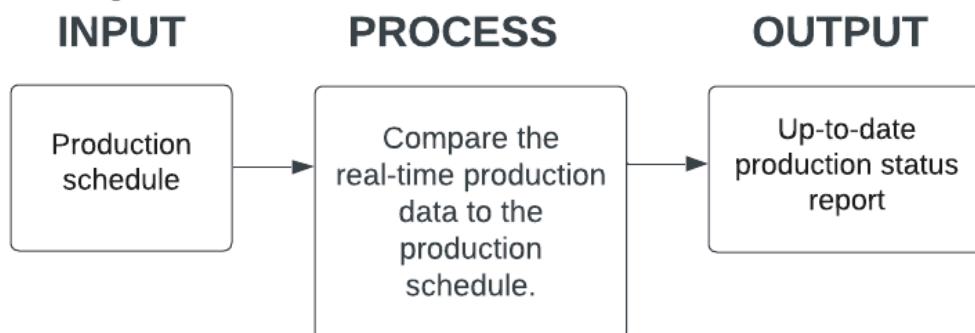
**INPUT                    PROCESS                    OUTPUT**



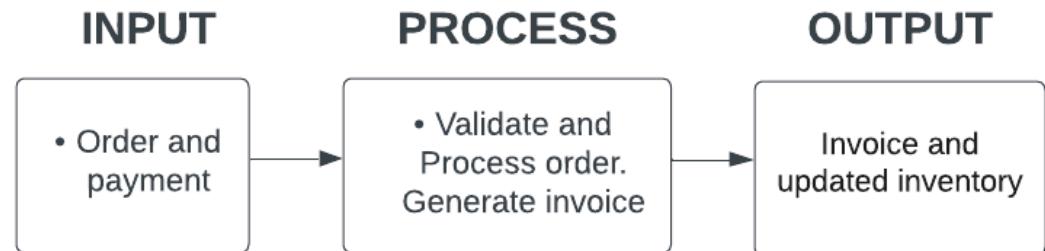
2.5.1  
Schedule Baking  
Production



2.5.2  
Monitor Production  
Progress



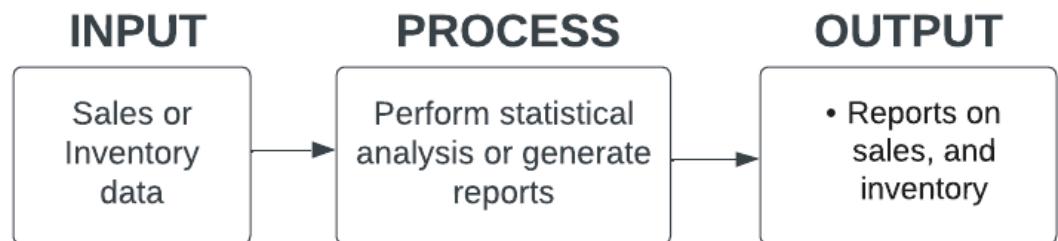
2.6  
Sales Module



2.6.1  
Record Sales  
Transactions



2.7  
Report and Analytics  
Module



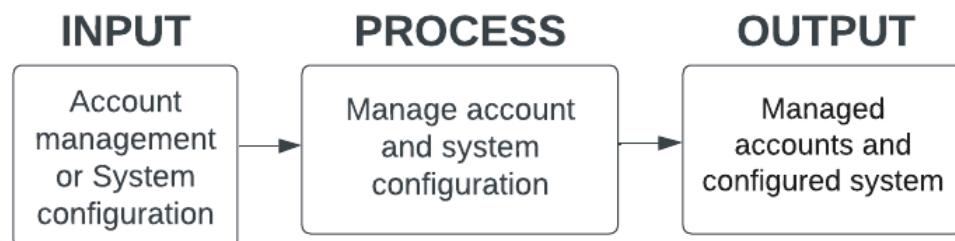
2.7.1  
Generate Sales  
Reports



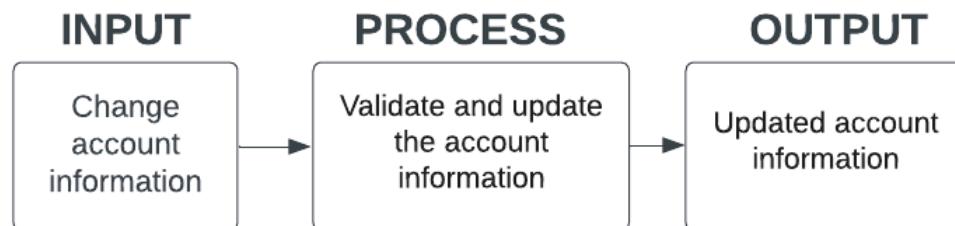
2.7.2  
Inventory Analysis



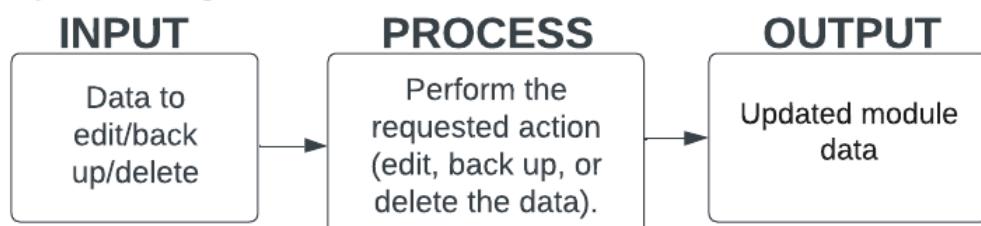
2.8  
Maintenance Module



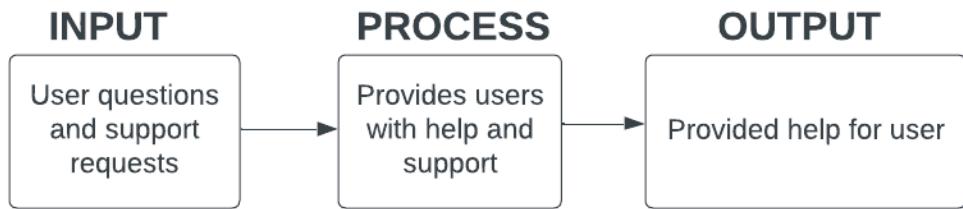
2.8.1  
Account Management



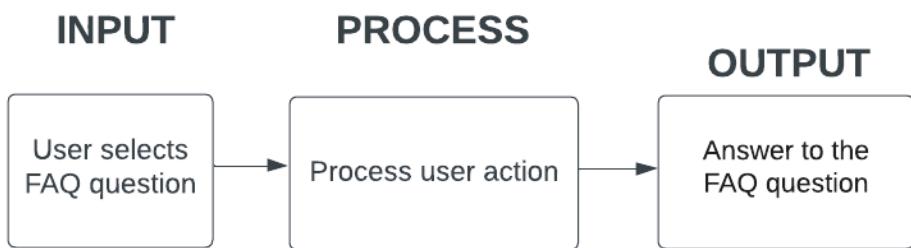
2.8.2  
System Configuration



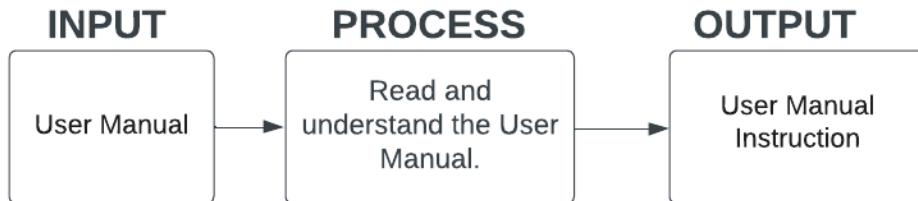
2.9  
Help Module



2.9.1  
FAQs



2.9.2  
User Manual



2.10  
About Module



## **Chapter 3**

### **Methodology**

This chapter outlines the methodology concerned in the proposed project for a bakery management system for drew bakes. The primary objective of this project is to change the existing manual system and implement a comprehensive bakery management system that enhances the operational efficiency, improves customer satisfaction, and ultimately increases profitability.

It began with the identification of a suitable bakery for the study. Once the bakery was selected, a formal request for an interview was sent to the owner of the bakery's operations, challenges, and needs. It also allowed the proponents to explain the purpose of the system in more detail, as well as ask the owner for any information about their existing system and suggestions for the proposed system. Following the initial interview, the proponents began the processing of the concept proposal for the bakery management system. This involved analyzing the information gathered during the interview, identifying areas for improvement, and developing solutions to address these areas.

### **Software Process Model**

Iterative development is a method of software creation that breaks the project into smaller, manageable pieces, known as iterations. Each iteration goes through a cycle of planning, building, testing, and reviewing. This approach differs from traditional waterfall methods where the entire project is planned in advance and executed in a linear fashion. Iterative development provides flexibility, adaptability, and continuous enhancement throughout the development process.

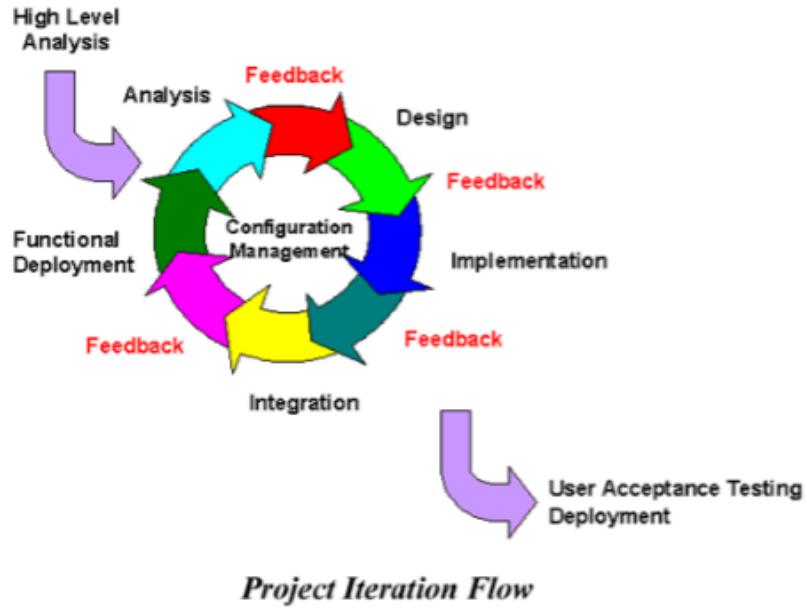


Figure 45: Iterative Model

- 1.) Analysis - This is the phase of gathering requirements by consulting the bakery owners and understanding the workflows, needs, potential problems and areas for improvement of the system.
- 2.) Design - The phase where the creation of the design for the proposed system. This will include both the architectural and detailed design of the system, outlining components like inventory databases, order modules, and user interfaces for the admins, alongside detailed wireframes illustrating how users interact with the system.
- 3.) Implementation - the implementation phase involves the building of the system according to the design. This includes the program code, creating the user interface and developing the databases. Design intuitive user interfaces for admin tasks and create databases for storing crucial bakery data.

- 4.) Integration - Once the individual modules are implemented, they must be integrated into a working whole for the system. This will involve the testing of the components to ensure that they work together correctly.
- 5.) Functional Deployment - The phase of functional deployment involves the process of launching the system into a live environment. This could include tasks such as installing the system onto the hardware, setting it up, and providing training to the bakery admins.
- 6.) Feedback - Once the requirements are collected, they undergo a review process with feedback gathered from users. This feedback is instrumental in fine-tuning the requirements to ensure they align with the system's capabilities, refining the system for better alignment with bakery needs.
- 7.) User Testing and Deployment - Once the system is deployed, it's crucial to conduct user testing to ensure it fulfills their requirements. The feedback gathered during this process can be instrumental in spotting any glitches or issues with usability that need to be addressed. This phase allows extensive use of the system by bakery staff for feedback on usability and functionality, addressing reported issues to further refine the system's effectiveness.

### **Data Gathering Instruments and Procedures**

The data gathering started with formal and informal interviews with the business owner. The formal interviews, structured with pre-set questions, helped the proponents understand the business operations and system requirements. On the other hand, the informal discussions were more relaxed, offering open-ended responses that gave deeper understanding of the daily operations and challenges of the bakery business.

Proceeding, the proponents then conducted a comprehensive research through the internet for similar businesses and their systems. This step was vital in understanding industry norms and identifying potential features for the proposed system.

Furthermore, to ensure accuracy, all interviews and discussions were meticulously transcribed, capturing every detail from the interactions with the business owner.

The proponents also had consultations regarding the proposed system, providing invaluable feedback and guidance, enabling to fine-tune the proposal to meet the business's needs. After collecting all the data, there was an in-depth analysis to identify patterns, trends, and key points. This analysis guided the system design and helped to develop a proposal that addressed the business's needs.

## **Feasibility Study**

Drew Bakes is a local based bakery which utilizes a manual system for their operation, such that the bakery encounters various challenges in handling inventory and managing customer's orders. The proposed system has potential benefits in organizing such tasks, enhancing the operation and service.

## **Technical Feasibility**

The proposed bakery management system for Drew Bakes demonstrates strong technical feasibility. It leverages modern technologies to automate processes, centralize data, and provide robust security measures. Its capacity for integration and scalability ensures adaptability to future technological advancements and business expansions. The system's architecture and design align with the existing technology infrastructure of Drew Bakes, facilitating seamless implementation and reducing technical barriers. The proposed system will be crafted using VScode 1.83 as the primary integrated development environment (IDE). The system's frontend and backend will be constructed using Java 21, ensuring compatibility across different platforms and scalability. MYSQL 8.0.33 (Community Edition) will be the chosen database management system,

facilitating efficient data storage and retrieval. This relational database management system will store vital data such as customer details, financial records, ingredient inventory, product information, and more. The system will be compatible with Windows 10 PCs and laptops, providing a smooth user experience for those using this operating system.

### **Operational Feasibility**

The system's operational feasibility is evident as it addresses key operational challenges faced by Drew Bakes. It streamlines bakery operations by automating manual tasks, improving inventory management, enhancing customer interaction, and providing comprehensive reporting and analytics capabilities. The proposed system aligns with the bakery's workflow, and its user-friendly interface ensures easy adoption by staff members, thereby contributing to increased operational efficiency and productivity.

### **Economical Feasibility**

From an economic perspective, the proposed system presents considerable feasibility. While initial development and implementation costs may arise, the system's long-term benefits in terms of operational efficiency, reduced labor costs through automation, and improved decision-making from data-driven insights promise a favorable return on investment. Additionally, the system's adaptability allows for incremental enhancements and updates, minimizing the risk of technology obsolescence.

## Gantt Chart

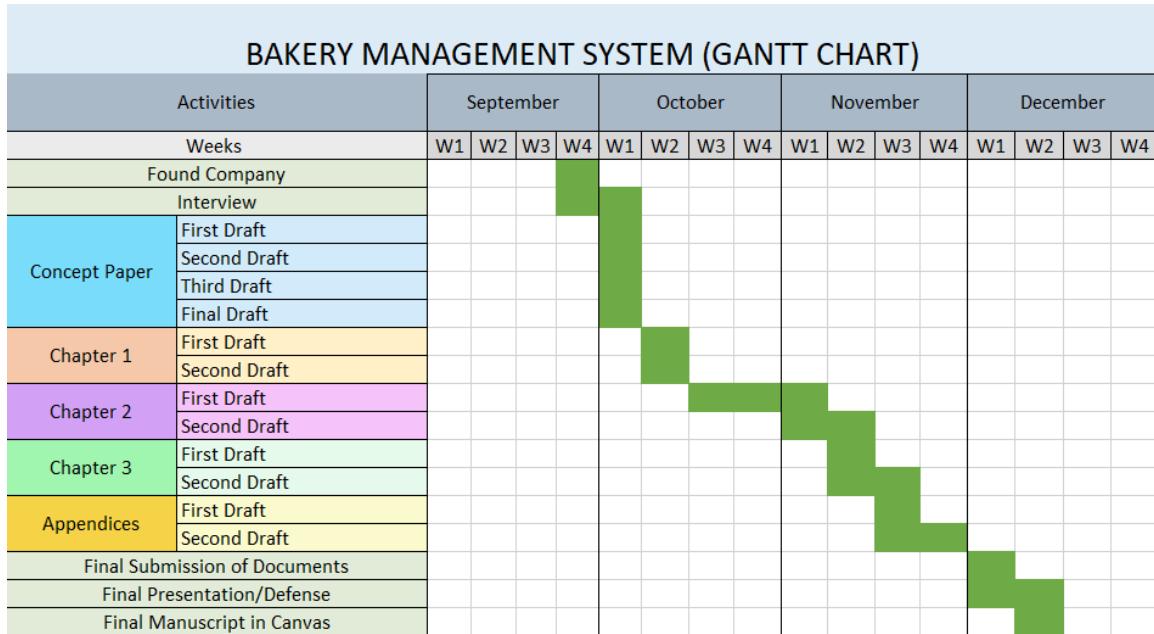


Figure 46: Gantt Chart

The development of the bakery management system, as outlined in the provided Gantt chart, follows a systematic and organized process over a four-month period. The project commences with finding a company following an interview, which serves as a platform for gathering essential requirements and understanding the bakery's specific needs. This stage is succeeded by the creation of a Concept Paper, which provides a comprehensive outline of the proposed system and its functionalities. The next phases include the composition of Chapter 1, Chapter 2, and Chapter 3, which cover different aspects of the system such as its design, implementation, and testing methods. The Appendices phase include supplementary documents or resources related to the project. The project then advances to submission of the documents then the Defense stage, where the proposed system is likely presented and defended in front of a panel for ultimate review and approval.

### Cost Benefit Analysis (CBA)

#### I. Hardware Cost

Recommended Requirements	Specifications	Quantity	Unit Price	Cost
Not to purchase new hardware	None	0	0.00	0.00
<b>Total:</b>				<b>₱0.00</b>

Table 1: Hardware cost

#### II. Software Development Cost

Personnel	No. of Personnel	Salary
Programmer	2	37,000.00
System Analyst	1	50,000.00
<b>Total:</b>		<b>₱124,000.00</b>

Table 2: Software development cost

Source: <https://www.jobstreet.com.ph/>

Personnel Salary for 60 Days:

Programmer:  $37,000 / 60 = ₱616.17$

System Analyst:  $50,000 / 60 = ₱833.33$

#### III. Operational Cost

##### A. System Cost

Items	Specification	Costs
Operating System	Windows 10 Home	1,809.22
Front End	Java 21	Free
Back End	MySQL 8.0.33	Free
<b>Total:</b>		<b>₱1,809.22</b>

Table 3: System cost

Source: [www.ebay.com](http://www.ebay.com)

##### B. Stationeries and Supplies

Items	Quantity	Price	Total

Bond Paper	5 Reams	175.00	875.00
Ink Refill	2	188.00	376.00
Ballpen	3	10.00	30.00
Folder	6	7.00	42.00
Envelope	5	4.00	20.00

**Total: ₱1,343.00**

Table 4: Stationeries and supplies

Source: [www.nationalbookstore.com](http://www.nationalbookstore.com)

### C. Utility Expenses

Particulars	Cost
Electricity	1,000.00
Internet	1,500.00

**Total: ₱2,500.00**

Table 5: Utility expenses

Computer Usage 50.00/day for 10 hours in 20 days

Source: [www.meralco.com.ph](http://www.meralco.com.ph)

[www.convergeict.com](http://www.convergeict.com)

### D. Training Cost

Personnel	Amount per day	Days	Hours	Total
Administrator	300.00	3	5	900.00

**Total: ₱900.00**

Table 6: Training cost

(60.00 / hour \* 5 Hours) \* 3 Days = **₱900.00**

### Summary Cost

Description	Amount
I. Hardware Cost	0.00
II. Software Development Cost	124,000.00
III A. System Cost	1,809.22
III B. Stationeries and Supplies	1,343.00
III C. Utility Expense	2,500.00
III D. Training Cost	900.00

**Total Costs: ₱130,552.22**

Table 7: Summary cost

**Estimated Benefits:**

Accuracy and efficiency of the software at approximately 85%

$$\text{Total estimated Benefits} = 130,552.22 * 85\%$$

$$\text{Total} = \text{P}110,969.387$$

**Payback Period**

$$\text{Payback Period} = (\text{Total Cost} / \text{Total Estimated Benefits}) * 12$$

$$= (130,552.22 / 110,969.387) * 12$$

$$\text{Total} = 14 \text{ months or 1 year and 2 months}$$

**Return of Investment (ROI)**

$$\text{Return of Investment} = (\text{Total Estimated Benefits} / \text{Total Cost}) * 100$$

$$= (110,969.387 / 130,552.22) * 100$$

$$\text{Total} = 85\%$$

The cost-benefit analysis (CBA) was conducted to assess the feasibility of implementing a bakery management system for drew bakes. It considered the costs of hardware, software development, operations, training, as well as the estimated benefits of increased accuracy and efficiency. It found that the estimated benefits outweigh the costs by 85%, and the payback period is relatively short at 14 months or 1 year and 2 months. These findings suggest that the bakery management system for drew bakes is likely to generate a significant return on investment for the bakery.

## **APPENDICES**

### **Appendix A Proposal**

### **Appendix B**

**Letter of Endorsement**

**Appendix C  
Interview Transcribe**

Date: October 28, 2023

Time: 3:30 pm

Location: Antipolo

Participants: Owner - Ms. Kristine Sison

Proponent 1 - Krysteen Clare R. Belen

Proponent 2 - Ma. Clarissa C. Marasigan

Proponent 3 - Alex Wilhelm D. Sison

**Proponent 1:** So, first question, When did you start your business?

**Owner:** started in 2021, actually I didn't start it because my fiance started it and then i came in the business last year around september also

**Proponent 1:** Why did you decide to become a business owner?

**Owner:** Because, well for my fiance, baking was his passion and he wanted a job that he would enjoy and at the same time, he would have control over his time so he could make pastries or bake something whenever he wanted to, right? Because if it's a business, you'll be the one in charge.

**Proponent 2:** What was your at the start of your business?

**Owner:** To come up with a set of products that a certain group of customers would love. So for example, there's a concept called 'finding product-market fit' which means that if you're the customer or if you're the one we want to buy from, we'll look for the product that you'll like, you know, your favorite.

**Proponent 3:** What product or service do you offer?

**Owner:** We offer pastries.

**Proponent 1:** Do you use any professional services for your business?

**Owner:** So far, none. We are considering getting a customer success representative and an accountant but in terms of a sales on the baking side, not yet

**Proponent 1:** What are your business goals?

**Owner:** Our business goal is to be: number 1, to grow, so that means expanding our product or offering and expanding our customer base also. But other than that, to be profitable.

**Proponent 1:** How long have you worked in business management?

**Owner:** Honestly, only when it started or rather when I came in the business because the set up with my boyfriend is that he started it but at that time the business was very informal. And then when I came in September, that was when we also decided that I would be the sole proprietor and I would be the one to process the papers. So in terms of business management, if you're asking who really started the business, he started around 2017 but as for me, I only started last 2022.

**Proponent 2:** How do you allocate resources at your business?

**Owner:** We allocate resources based on the demand and also what is already available in the market?

**Proponent 3:** How do you attract and retain customers?

**Owner:** Mostly through social media marketing because we don't have a brick and mortar or physical store, all of our operations are online. That's also what I put in the background of the business. So, in terms of attracting customers and getting their buy-in, it's through social media. We make posts, we make ads, and

only recently have we explored pop ads, the ones where you really have a booth like that, but in terms of everything else, it's all online.

**Proponent 1:** What specific challenges in your current baking process are you hoping to address with an automated system?

**Owner:** The tracking? It's so hard to manage the inventory levels knowing that we use so many ingredients. For example, making sure that there's enough flour all the time. For instance, if our stocks of banana cake run out quickly, we can immediately bake a new batch because there's readily available flour. And then there's also something we don't - it's like what happened to me and my boyfriend, I do the order fulfillment, he does all the production, he has the stocks but it's also up to me to order the inventory. I would only know that I need to order when he tells me. If he forgets to tell me and he needs to bake, there's a delay because I have to be able to order it at once instead of being able to order it ahead of time before the inventory runs out.

**Proponent 1:** Can you describe the key functionalities you envision for this automated system in your baking business?

**Owner:** Number one, Inventory system. So everything is there, I can see the levels, I can see what's running low, so that's also what I mentioned to Alex, like hopefully we can see when the flour is running out, like it would alert us saying "oh it's time to buy this", at a certain level, so, for example, we set it so that when it gets down to three kilos of flour, the system will alert us to re-order. So that's one., so that's one.[6:04] Number two, generate transaction logs because, you know, like a POS system where when I say that someone ordered this, it can immediately log it which makes it easier for us to fill up our manual (proof of account?), all our transactions, all in one place. And then the automatic or

automated updating of inventory, for example, if we make a batch of banana cake or brownies and we input in the system, "Oh we made two butters", it will automatically deduct from the inventory levels based on the attributes? base on the attributes that we set for each butter of a certain type of product. And I think also crucial lastly, I don't know if you're familiar with Microsoft VI or something, it's for sales, it has a dashboard where you can see the trend of sales, month on month, so you can see on the dashboard "ah there's a transaction log", it also automatically generates reports, like "okay this month, this is the level of sales and then the next month, it goes like this", you know like a trend chart.

**Proponent 3:** So how do you currently manage the inventory and how do you foresee the automated system assisting in inventory control?

**Owner:** So right now, we do it manually, actually not even, like we don't have a log of all the inventory, we only know the inventory levels when we see it. So, our flour is there, placed in a container, and then there's a part that would tell me 'okay, it's getting less', that's my only indication of the inventory level. But if we have that system that I described earlier, I would see, 'oh in its place, there are already 5 kilos of flour, there's only 2 kilos of sugar left, like that', so it would really be helpful to see everything in one place.

**Proponent 2:** What are the main types of baked goods you produce and how will the automated system accommodate different recipes and production processes?

**Owner:** Okay, so our main products are brownies, banana cake, chocolate cake, blueberry cheesecake, and lately we've been exploring cookies. So I think those five are our most mainstay products. And for the system, of course, managing all of those, seeing which is the most sellable or even what's running low in terms of stock level, everything can be seen there, like when there are sales or after a

certain month, I would see how much is left, or after a certain week, right. And also in terms of production, like what I've mentioned earlier, it automatically deducts from the inventory levels when something is made or a new stock is produced

**Proponent 2:** So are there any specific regulatory or compliance requirements in your industry that the automated system should adhere to?

**Owner:** Top of mind, and I'm not sure if there's a restriction, if- I don't think it's a restriction but it's better if the measurements are standard, so is it kilos, or is it what, like this, like that. Most of it is fine, I think we just need to observe the proper metric system for the different ingredients. I think that's it.

**Proponent 1:** How do you currently handle order management and customer interactions and how should the automated system integrate with these processes?

**Owner:** Okay, so right now, for example, you're the customer, you reach out to me on Facebook because you saw the ad. So this is the customer journey for all our customers, they reach out through Facebook upon seeing the ad, and then when they message, I function as a chatbot so I also handle answering the customers, answering them. I mean, after I answer them and then I get their order, from there, I have a sheet where the date, the order, the customer's name, and quantities are written, and then I just have an indicator if it's created and delivered. So, how the system, if I'm imagining how it's going to be part of the process, for example, the customer placed an order through Facebook, and then, I don't know maybe the system is accessible on the phone, that would also be very great, if the system can be accessed on the phone, I would just enter 'okay' I'll just enter the customer name, click what they ordered, how many, total and

then, I can check if it's already delivered and paid.

**Proponent 3:** How do you envision the success and ROI of the automated system once it's implemented?

**Owner:** I would be [inaudible] because I don't know how to measure efficiency, but that's the end goal, efficiency and you know, everything is easy to report because there's a system. So ROI I guess would come from...because it's straightforward, POS, but the ROI reduces delivery cost, because what happens is, we order on the dot, one by one. So for example, if only the flour ran out, I would only order flour, so the delivery is just for the flour and then when the sugar runs out, I would order again, and then there's still delivery for the sugar. But if we're able to see all of the inventory in one place, I know what can be ordered together in one batch, the delivery cost would be reduced, because, I can order ahead of time the others that are running low, and I can include it with the ones that are really running out

**Proponent 2:** what data analytics reporting capabilities are important for your business and how should the system provide insights in baking operations?

**Owner:** So, the trends, sales trends, that's one, and then number two, fastest versus slow moving stocks so that means what sells the fastest or the slowest. And then, ideally, although I'm not sure how we're going to integrate this in the system, I would also see the price per unit of the ingredients, so, it would be very handy, if the system could also generate a report when we input that the price for a certain ingredient has changed.

**Proponent 1:** What are the security and data privacy considerations for the automated system especially in handling customer information and proprietary recipes?

**Owner:** It should only be accessible to me and my partner. So, should we ever

have employees, we only need to give them the password and the login to that system. And then it has the capability that after that employee leaves, for example, we can change the password.

**Proponent 3:** Have you identified any potential scalability requirements for the system as your baking business grows?

**Owner:** Potentially, it's not just for sales and production level, hopefully it can also handle marketing insights. For example, on Facebook, if ever we [inaudible], then it can pull the data from Facebook like, 'okay this ad generated this much leads'. Then from there we can form insights on how effective our ads are, our campaigns.

**Proponent 3:** How do you plan to ensure minimal disruptions during the transition from manual processes to the automated system?

**Owner:** I think it's very crucial that my partner and I are involved when it comes to creating the system because if we know what's going in the system or what's going into the creation of the system, it makes it slightly easier to transition especially since you are very involved in asking us what are our business needs. So from there, we somewhat know or we know what to expect when it comes to using that system so it makes it easier for us to adapt.

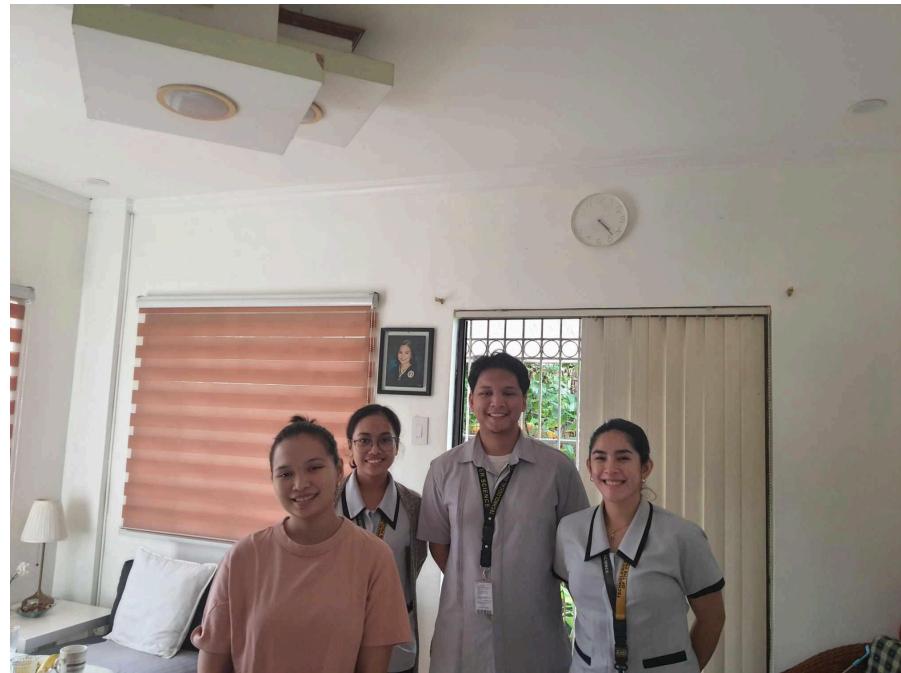
**Proponent 2:** Lastly, Do you have any policy for return products?

**Owner:** Actually, we don't have any, we only have a refund policy, because when it comes to food, it's difficult, you know there are so many external factors. It could be the rider's fault, it could be that there was an accident along the way during delivery, so it's not valid like when it arrives damaged and it's returned to us because what else can we do with the product. So instead of a return policy, we only have a refund policy. When it comes to our refund policy, number one,

there must be photo or video evidence, number two, it must be within 3 hours of delivery. Since we use Lalamove, we can immediately see if it's delivered or not, from there I know if the [inaudible] was reported within 3 hours. And then they have to reach out to us, that's really crucial, so they must have evidence and then they describe what happened, or what they noticed about the product and then after that we can start refunding. Actually, I just thought of it now that it would also be good, for example, the sale is generated, and then below, there's also tracking, so for example, it will alert me, when it pulls the data from Lalamove that the products have been delivered, although I'm not sure how that would work but that could also be a good function.

**Proponent 1:** What do you consider as a valid reason ng customer to refund?

**Owner:** Spoiled, spoiled or tastes funny or something like that but so far, no one has complained to us. There's one more, the wrong product was delivered.





**Appendix D**  
**Entity Relationship Diagram (ERD)**

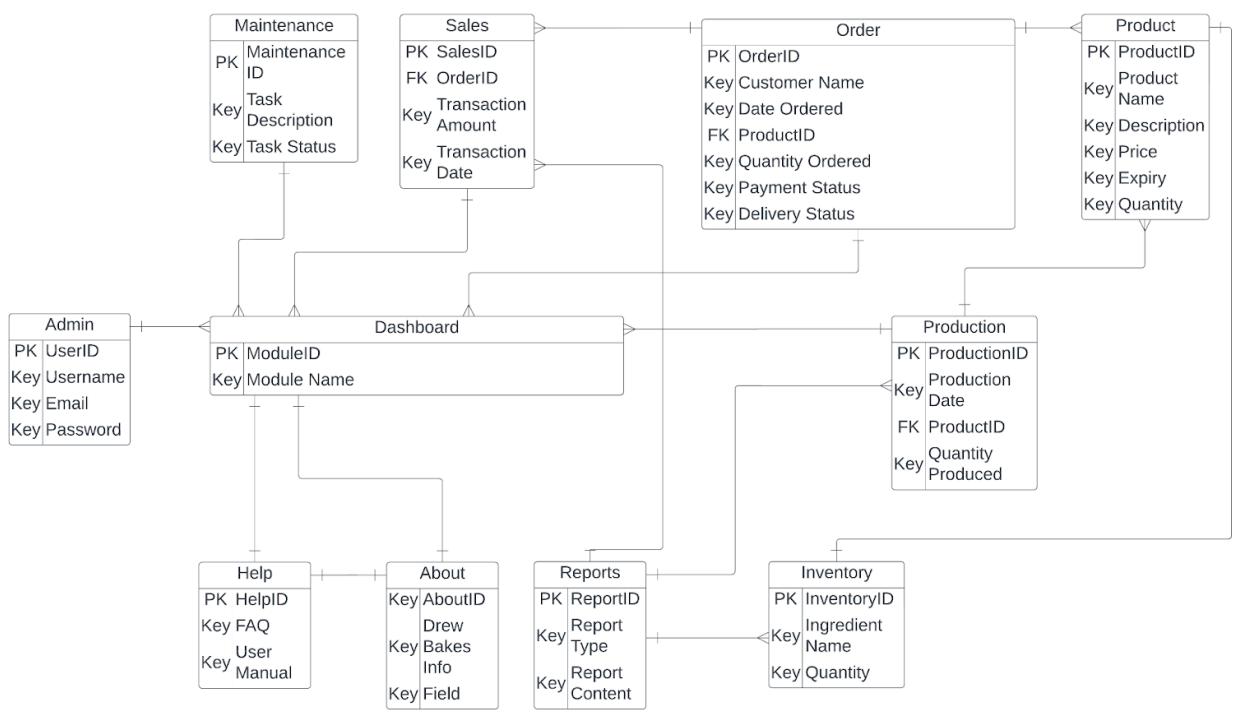


Figure 1: Entity Relationship Diagram (ERD)

**Appendix E**  
**User Interface (UI) Design**



ØREW  
BAKES

## Login

Username



Password



[Forgot password?](#)

**Login**



ØREW  
BAKES

## Forgot Password

Email

OTP

Password

Repeat Password

**Register**

Figure 2: Login

Figure 3: Forgot Password

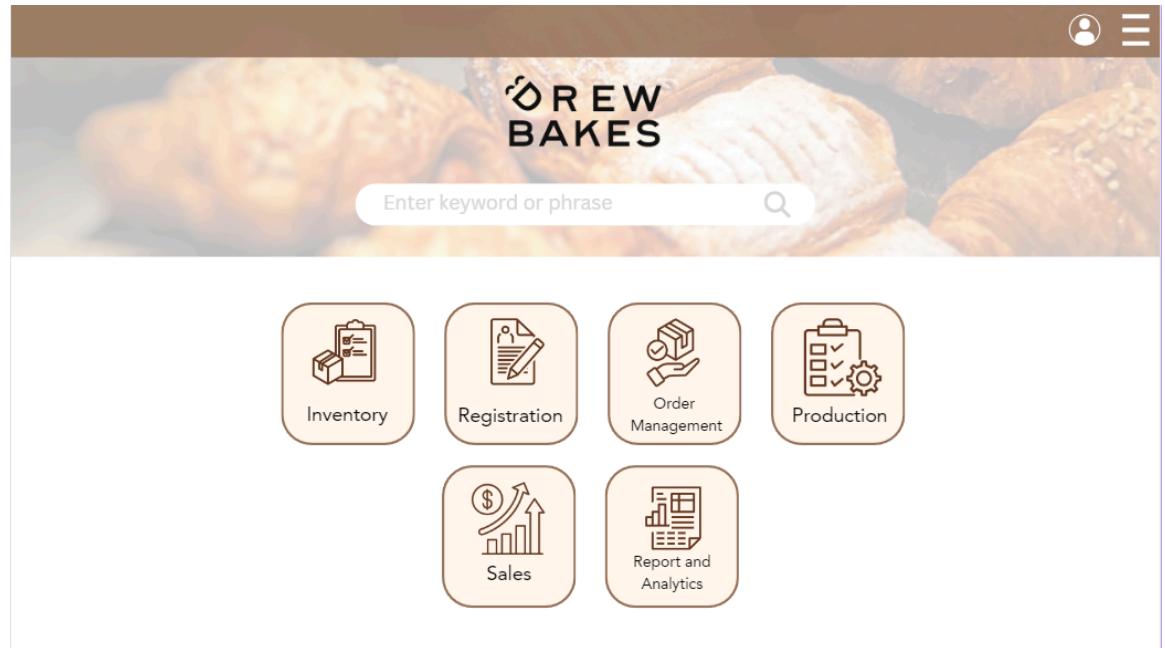


Figure 4: Dashboard

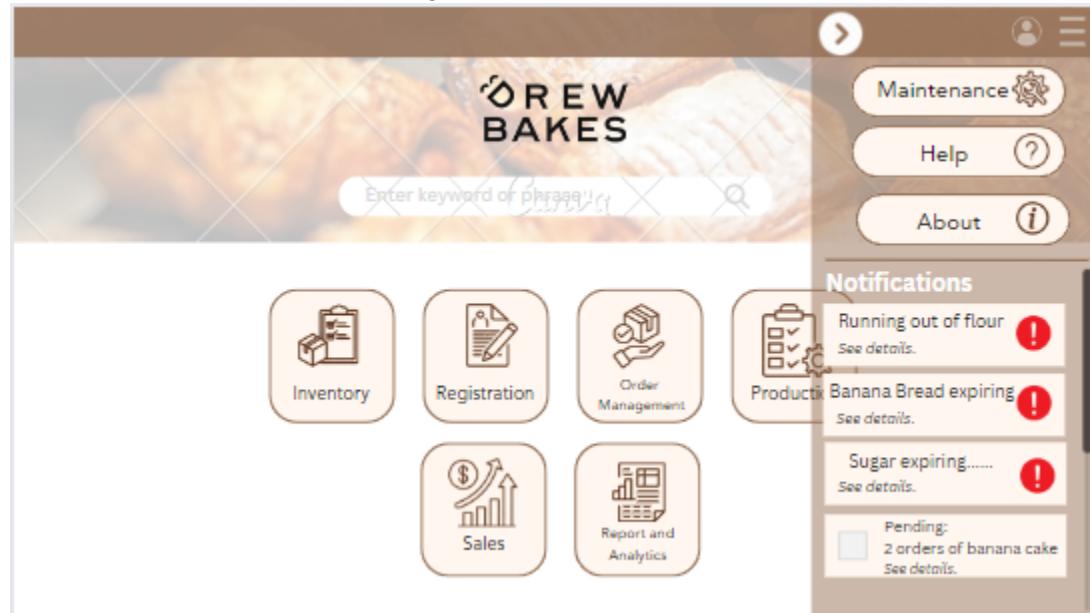


Figure 5: Dashboard Notification

**Inventory**

**REW BAKES**

Quick Search

Item	Quantity	Level	Expiry
flour	3kg	Low !	November 30 2024
yeast	4kg	Low !	November 30 2024
sugar	2kg	Sufficient	November 30 2024
cocoa powder	1kg	Low !	November 30 2024

Figure 6: Inventory

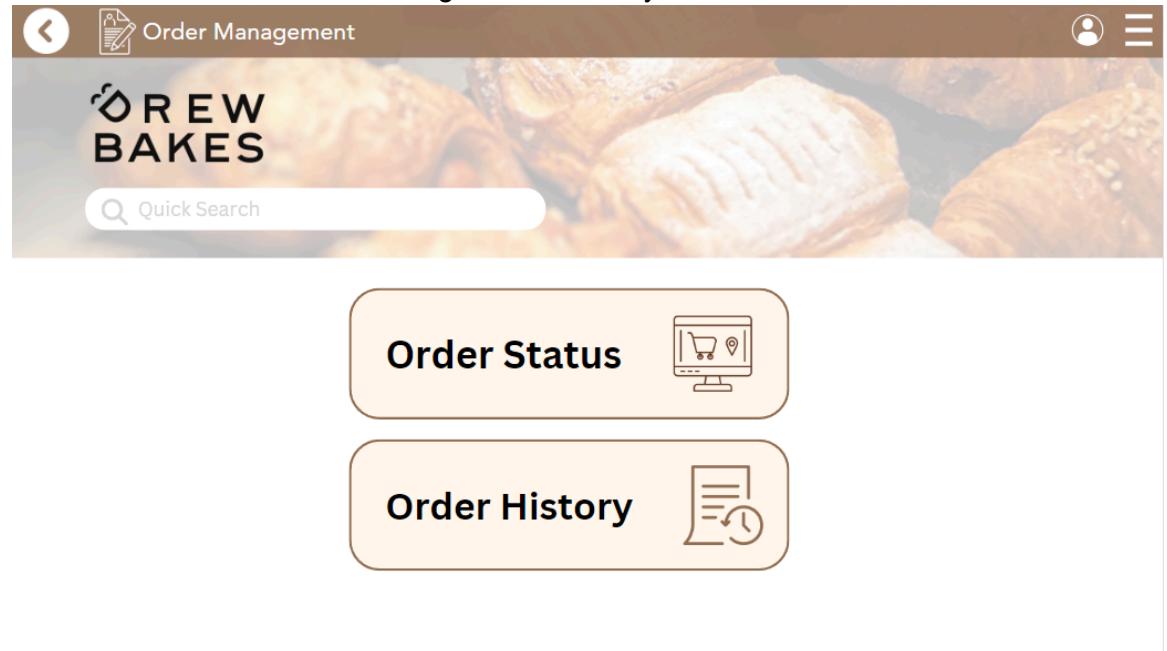


Figure 7: Order Management

The screenshot shows the Order Management app interface for 'OREW BAKES'. At the top, there's a navigation bar with icons for back, home, and menu. Below it is a header with the 'OREW BAKES' logo and a 'Quick Search' bar. The main title 'ORDER STATUS' is prominently displayed. A table below lists four orders:

Customer Name	Date Ordered	Quantity	Address	Payment Status	Delivery Status
John Doe	2023-11-24	5	Antipolo, Rizal	Paid	Delivered
Jane Smith	2023-11-23	2	Caloocan City	Pending	In Transit
Alice Johnson	2023-11-22	1	Novaliches, Quezon City	Paid	In Transit
Bob Williams	2023-11-21	6	Taytay, Rizal	Paid	Delivered

Figure 8: Order Status

The screenshot shows the Order Management app interface for 'OREW BAKES'. At the top, there's a navigation bar with icons for back, home, and menu. Below it is a header with the 'OREW BAKES' logo and a 'Quick Search' bar. The main title 'ORDER HISTORY' is prominently displayed. A table below lists four orders:

Customer Name	Date Ordered	Quantity	Address	Payment Status	Delivery Status
Charlie Brown	2023-11-21	4	Pasig	Paid	Delivered
Daisy Miller	2023-11-21	2	Pasig	Paid	Delivered
Ethan Foster	2023-11-21	2	Pasig	Paid	Delivered
Grace Lee	2023-11-21	1	Pasig	Refunded	-

Figure 9: Order History

The screenshot shows a mobile application interface for a bakery named "Drew Bakes". The top navigation bar includes icons for back, sales, and user profile. Below the header is a search bar labeled "Quick Search". The main content area displays a table of sales data:

Customer Name	Date Purchased	Product	Quantity	Price	Total Amount
Miles Miller	2023-10-04	Cheesecake	3	250.00	750.00
Kurt Brown	2023-10-05	Banana Cake	1	150.00	150.00
Sandra Johnson	2023-10-05	Brownies	3	90.00	270.00
Evans Foster	2023-10-08	Cookies	4	65.00	260.00

Figure 10: Sales

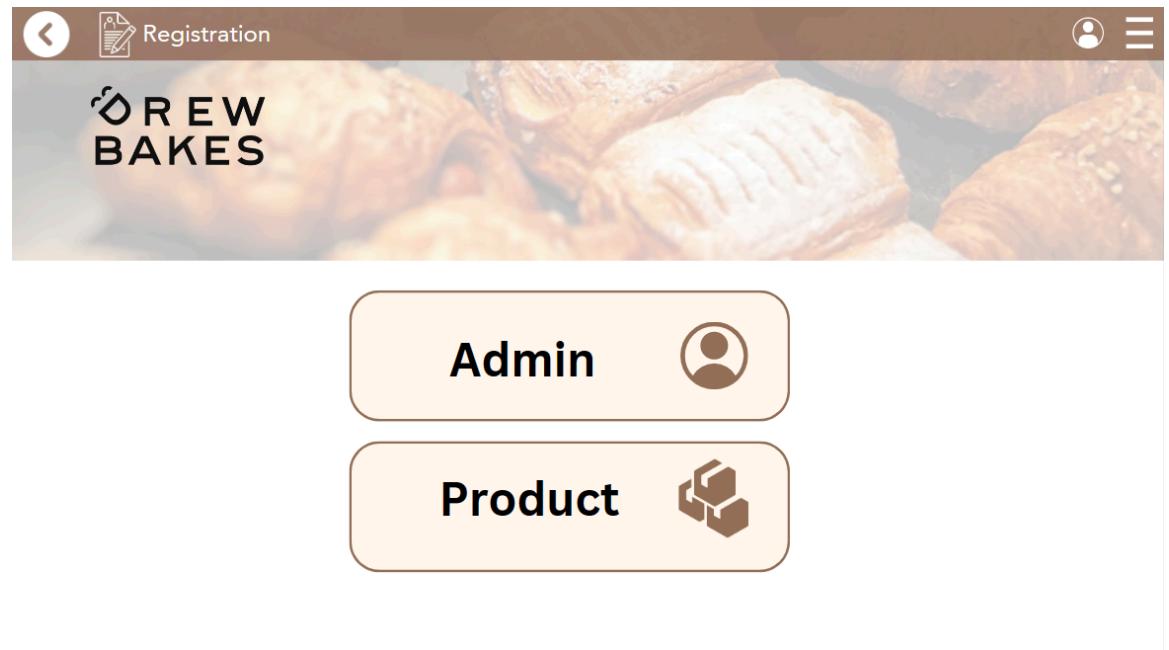


Figure 11: Registration

The screenshot shows the 'ADMIN REGISTRATION' page. At the top, there is a navigation bar with a back arrow, a registration icon, and a profile icon. The main header features the 'OREW BAKES' logo and the title 'ADMIN REGISTRATION'. Below the header, there are six input fields for registration details:

- Email: qmcmarasigan@tip.edu.ph
- Name: Ma. Clarissa
- Surname: Marasigan
- Username: qmcmarasigan
- Password: \*\*\*\*\* (with eye icon)
- Confirm Password: \*\*\*\*\* (with eye icon)

A 'Register' button is located at the bottom right of the form area.

Figure 12: User Registration

The screenshot shows the 'PRODUCT REGISTRATION' page. At the top, there is a navigation bar with a back arrow, a registration icon, and a profile icon. The main header features the 'OREW BAKES' logo and the title 'PRODUCT REGISTRATION'. Below the header, there are four input fields for product registration:

Product Name	Expiry
description	quantity
price	Insert image

A 'Register' button is located at the bottom right of the form area.

Figure 13: Product Registration



Figure 14: Production

Product	Quantity	Level of Inventory	Date of Production	Expiry	Expiring	Level of Stocks
Brownies	50	Sufficient	2023-10-04	2023-11-30	57 day(s)	Sufficient
Banana Cake	20	Sufficient	2023-10-04	2023-10-10	6 day(s)	Sufficient
Cheese Cake	25	Low !	2023-10-04	2023-10-15	12 days	Low !
Cookies	50	Sufficient	2023-10-04	2023-12-04	61 days	Sufficient

Figure 15: Production Schedule

**MONITOR PRODUCTION**

Product	Production Task	Status	Quantity(All)	
Brownies	50	Done	-	76
Banana Cake	20	Done	-	45
Cheese Cake	25	Pending(15)	-	32
Cookies	50	Done	-	56

Figure 16: Monitor Production

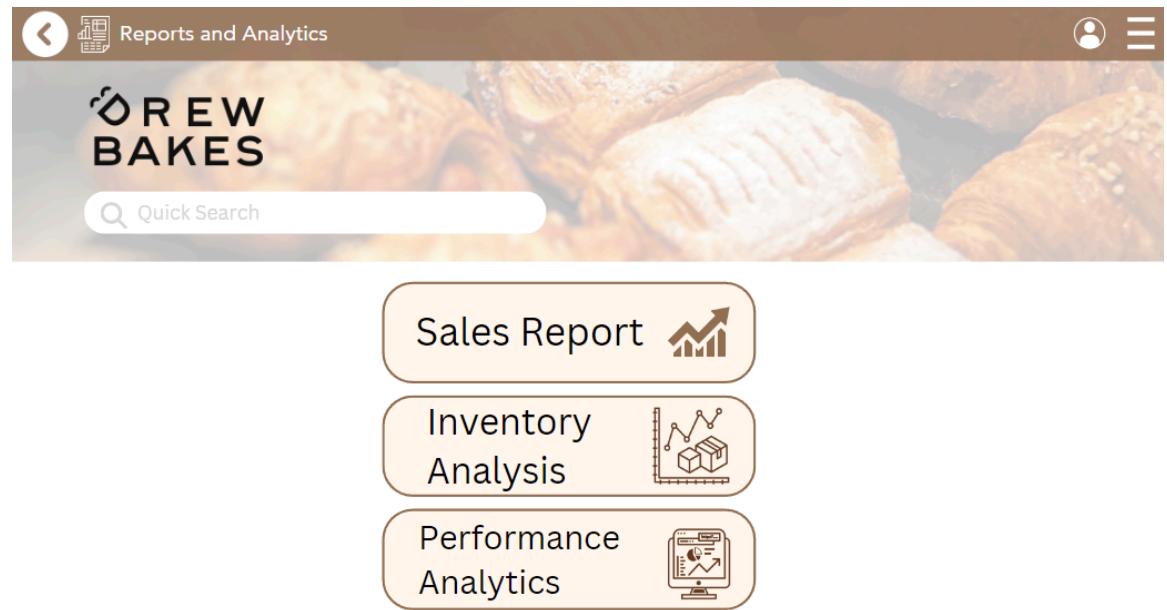


Figure 17: Reports and Analytics

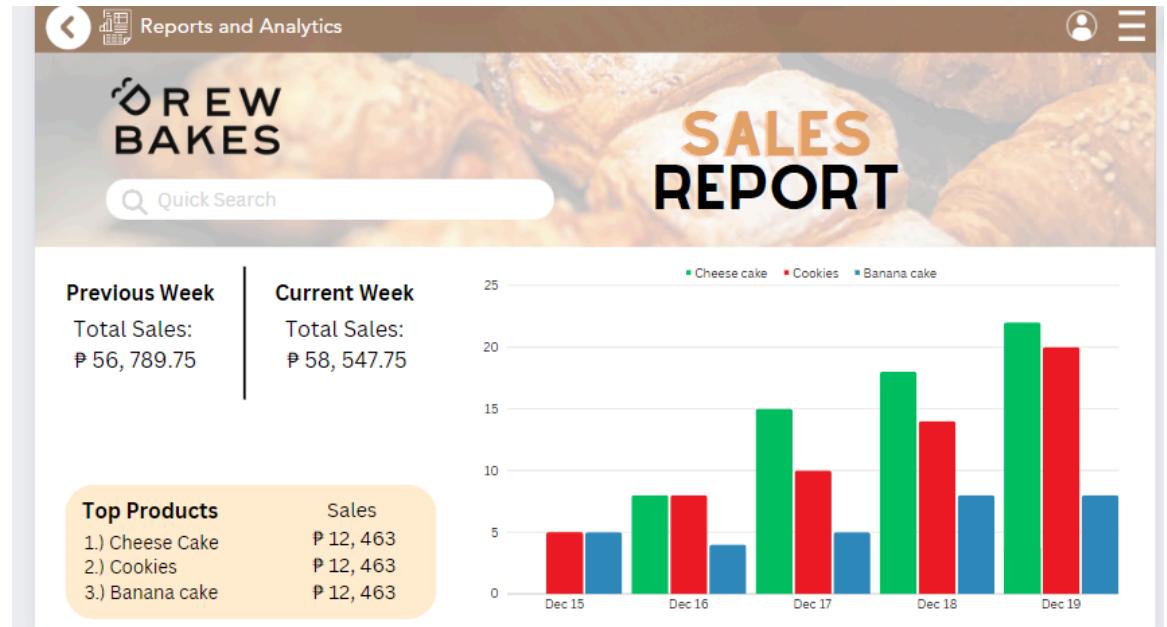


Figure 18: Sales Report

**REPORTS AND ANALYTICS**

# BREW BAKES

## INVENTORY ANALYSIS

Quick Search

Product Id	Product Name	Quantity	Unit Price	Total Price
1	sugar	15kg	54.50	817.50
2	yeast	13kg	34.50	448.5
3	flour	30kg	35.00	1050.00

Figure 19: Inventory Analysis



Figure 20: Performance Analytics

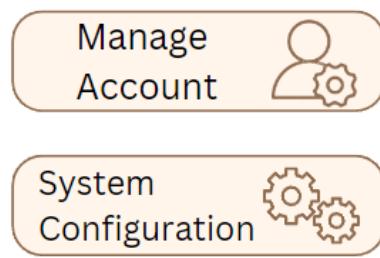
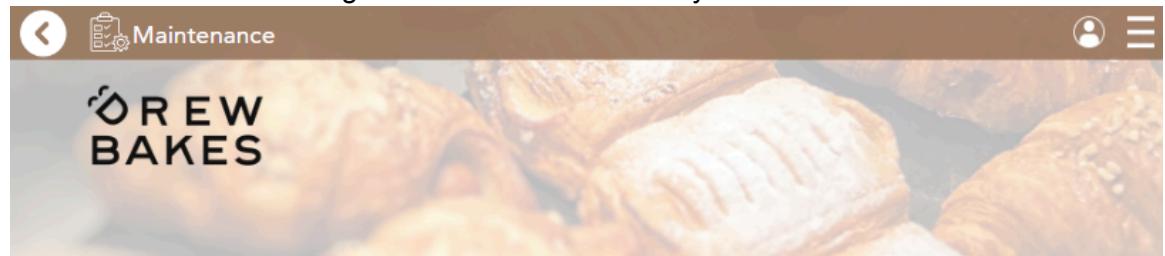


Figure 21: Maintenance

User ID	First Name	Last Name	Username	Password
1	Johnny	Depp	Jdepp	password123
2	Angels	Burger	Aburger	WordPass152
3	Mario	Anderson	Manderson	Drowssap321
4	Dunkin	Donut	Ddonut	ssapdrow251

Figure 22: Manage Account

User ID	First Name	Username	Password
1	Johnny	Jdepp	password123
2	Angels	Aburger	WordPass152
3	Mario	Manderson	Drowssap321
4	Dunkin	Ddonut	ssapdrow251

Figure 23: Manage Account - Deactivating Account

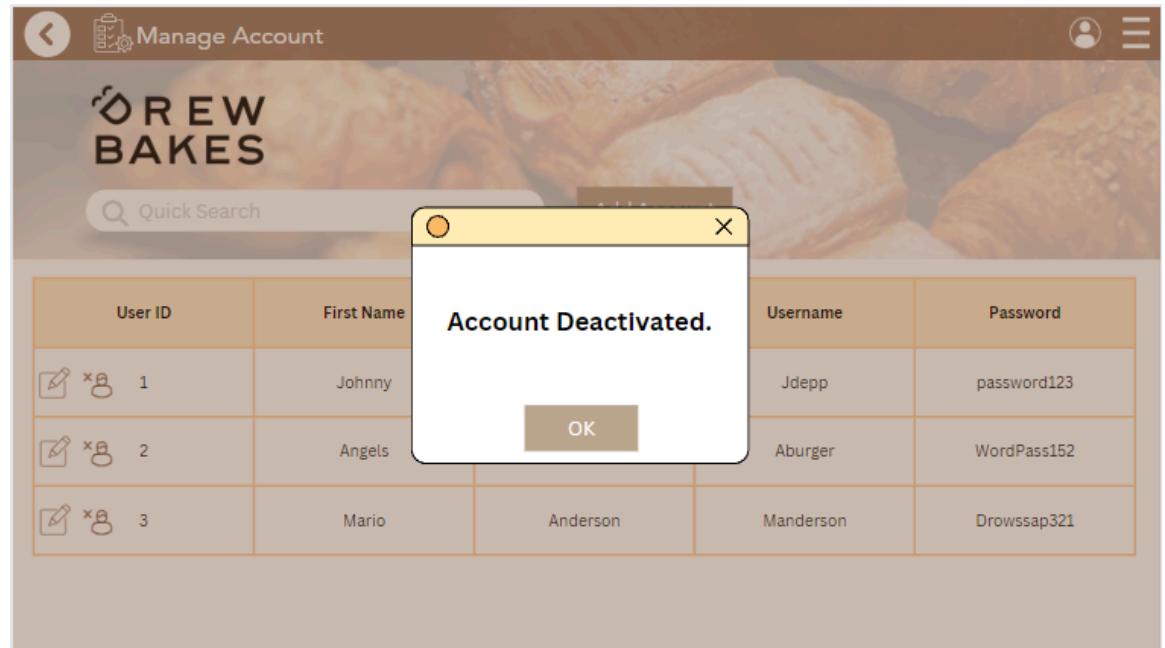


Figure 24: Manage Account - pop up account deactivated

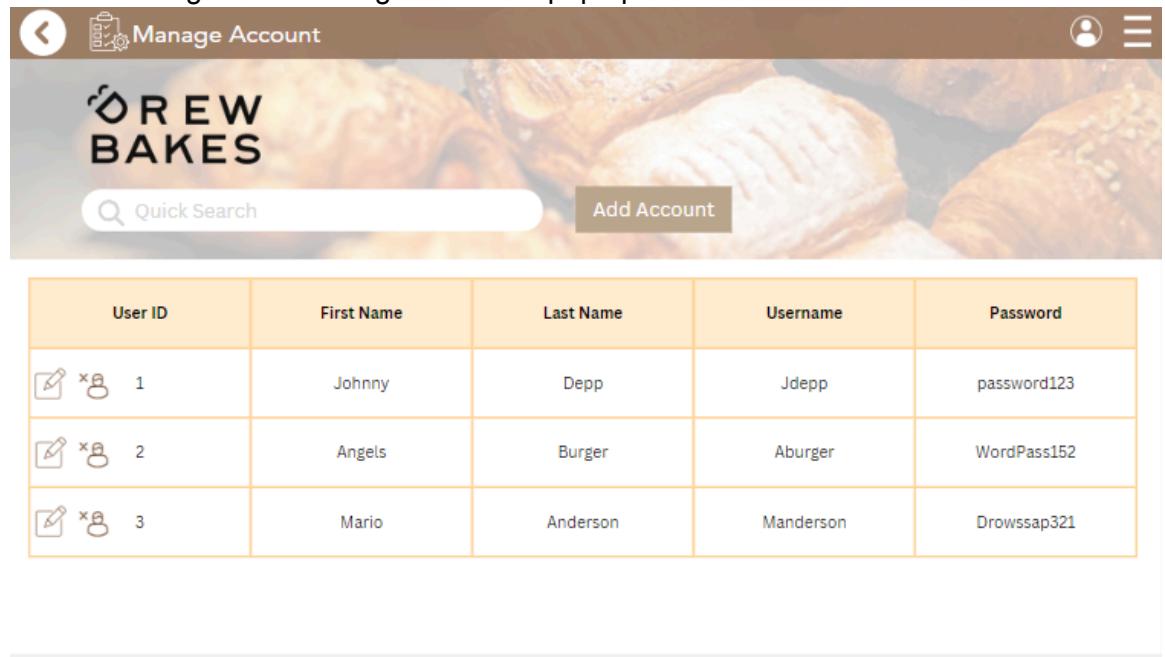


Figure 25: Manage Account

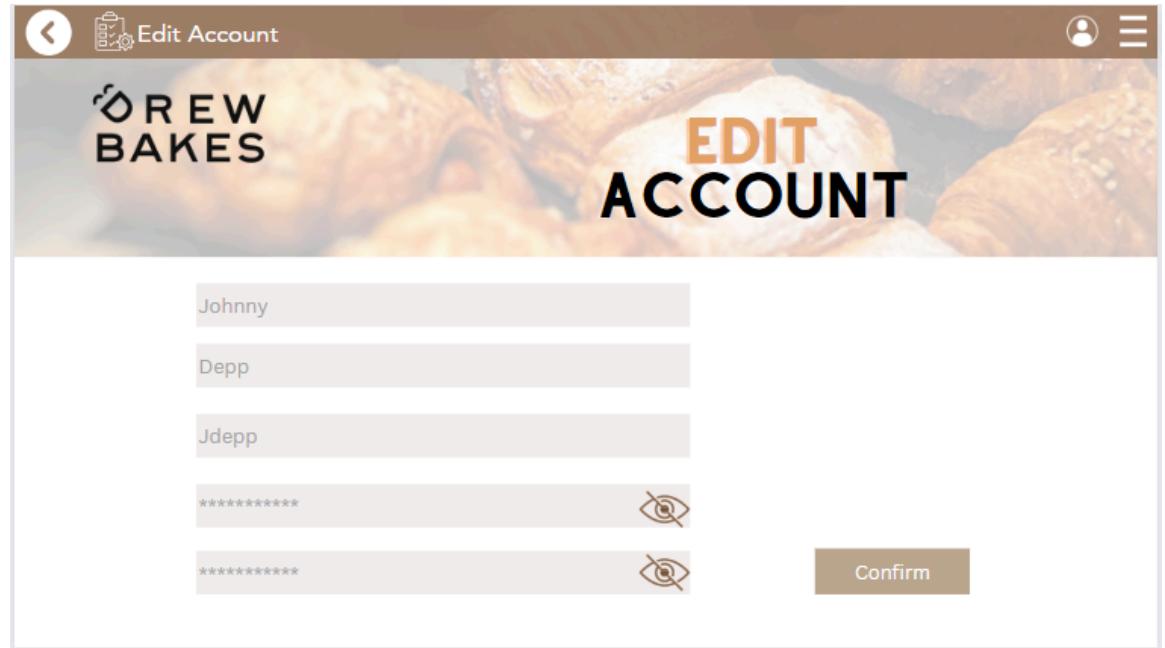


Figure 26: Edit Account

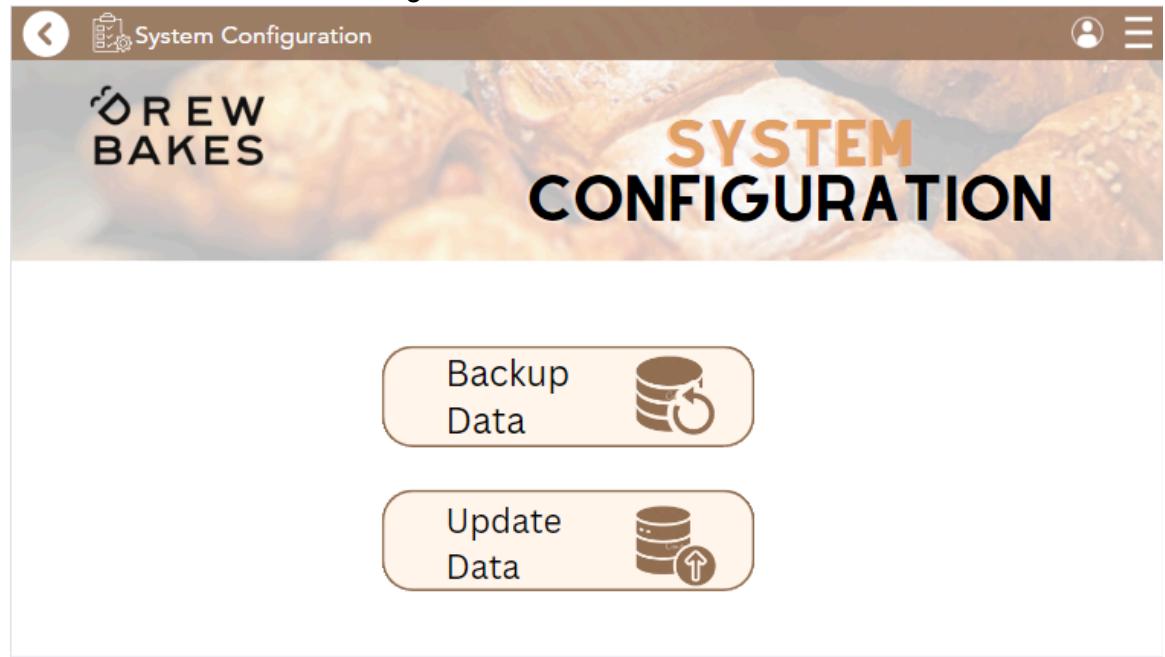


Figure 27: System Configuration

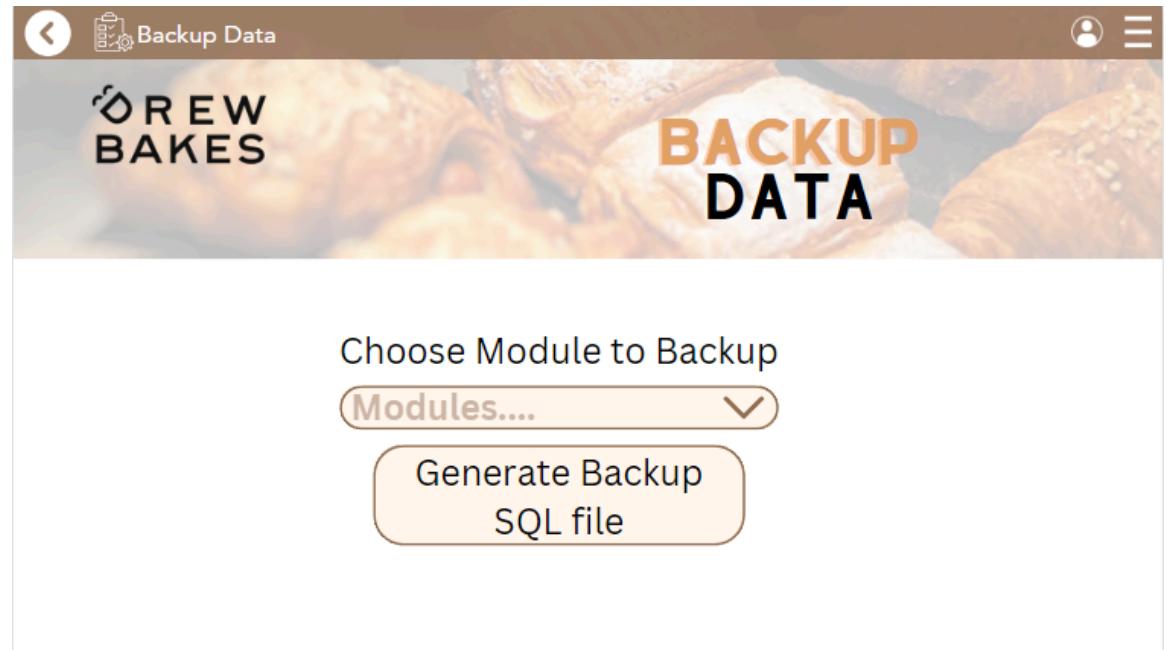


Figure 28: Backup Data

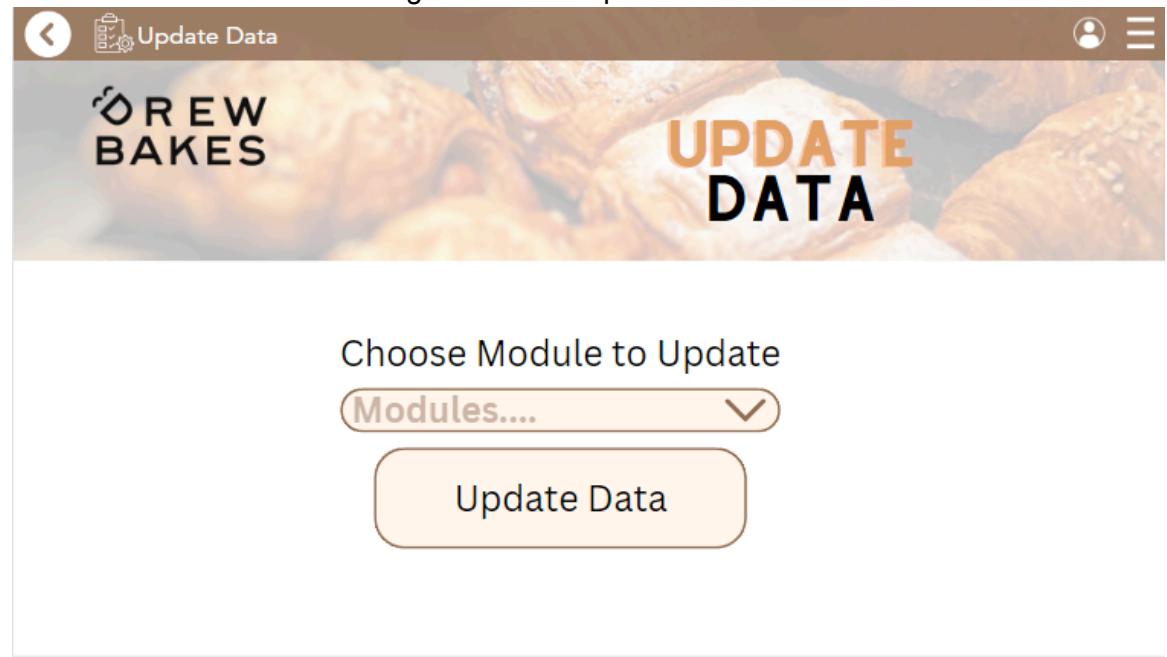


Figure 29: Update data

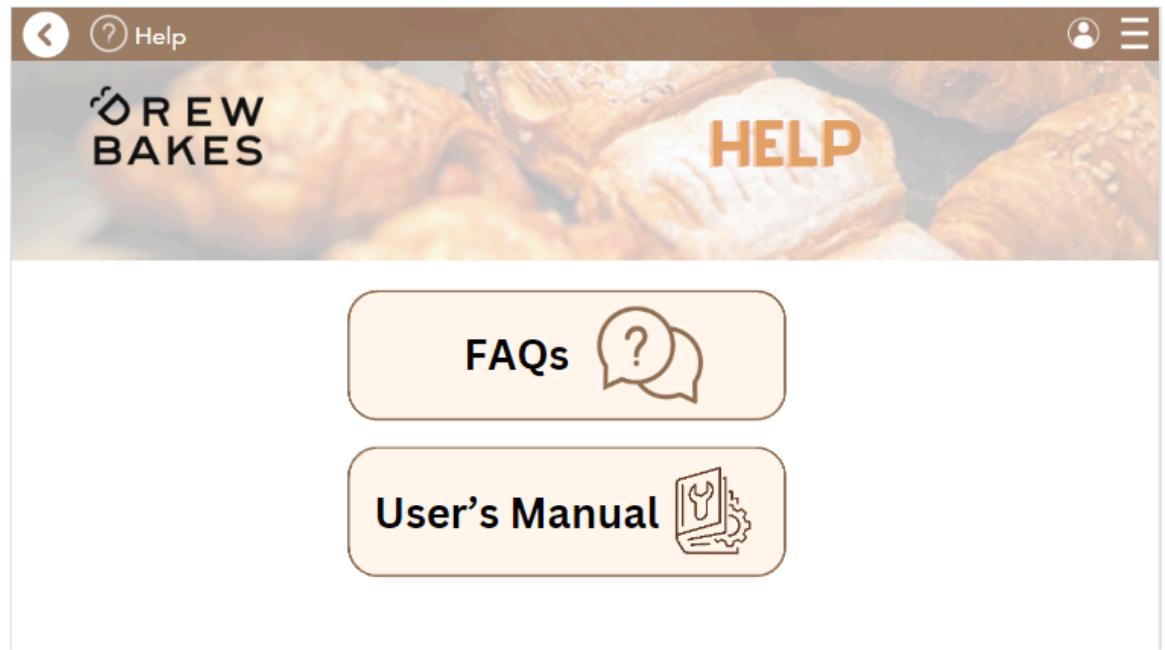


Figure 30: Help module

The screenshot shows the 'FAQs' page. The top navigation bar includes a back arrow, a help icon, and a user profile icon. The 'REW BAKES' logo is on the left, and a search bar with the placeholder 'Quick Search' is below it. On the right, the words 'FAQS' and 'FREQUENTLY ASKED QUESTIONS' are displayed in large, bold, orange text. The main content area features a large, bold, black text 'Any Questions?' on the left. To its right is a list of five frequently asked questions, each preceded by a plus sign and followed by a horizontal line.

- + How to create an account?
- + What functionalities does the Bakery Management System include?
- + How to reset my password?
- + How to delete an account?

Figure 31: FAQs



Figure 32: User's Manual



Figure 33: About Us

**Appendix F**  
**Curriculum Vitae**



# KRYSTEEN CLARE R. BELEN

3rd Year College Student  
Program - Computer Science

## About Me

A computer science student with a strong drive for innovation and technology. Has a knack for problem-solving. Keen to apply theoretical knowledge and practical skills to make significant contributions in the ever-evolving field of computer science.



09157370980



qkcrbelen@tip.edu.ph



Blk.12 Lot 4 Sapphire St.  
Ciudad Grande, Brgy. Muzon,  
Taytay, Rizal

## SKILLS

- Familiarity with relational databases. (MySQL)
- Experience with front-end web development technologies (HTML, CSS, and JavaScript)
- Actively listening to others
- Ability to work well with others to achieve a common goal
- Ability to learn new skills and technologies
- Ability to accept feedback and use it for improvement
- Ability to adjust to new conditions
- Proficiency in both written and spoken English.

## LANGUAGE

- English
- Filipino

## AWARDS AND ACHIEVEMENTS

- Honor Student since grade 7 to grade 12
- VPAA's Lister in College 2nd year -First and Second Semester of S.Y. 2022 - 2023

## EDUCATION

### **Elementary (2008 - 2014):**

Taytay United Methodist Christian School Inc.

### **Junior High School (2014 - 2018) :**

Casimiro A. Ynares Sr. Memorial National High school

### **Senior High School (2018 - 2020) :**

Harris Memorial College

### **Undergraduate (2021 - Present):**

Technological Institute of the Philippines - Quezon City Campus



# MA. CLARISSA C. MARASIGAN

3rd Year College Student  
Program - Computer Science

## About Me

A motivated and results-oriented computer science student with a passion for programming and problem-solving. Eager to apply knowledge to make significant contributions to the ever-evolving field of computer science. Possesses expertise in programming languages like Python, Java, and C++.



09614351790



qmcmarasigan@tip.edu.ph



Blk 14 C Lot 12 Matthew St.  
Cielito Homes Brgy. 177 Caloocan  
City

## LANGUAGE

- English
- Filipino

## AWARDS AND ACHIEVEMENTS

- Honor Student since grade 6 to grade 12
- VPAA's Lister in College 2nd year -First and Second Semester of S.Y. 2022 - 2023

## SKILLS

- Proficient in C++, Java, Python, and JavaScript.
- Ability to understand data structures.
- Familiarity with relational databases. (MySQL)
- Experience with front-end web development technologies (HTML, CSS, and JavaScript)
- Ability to identify, analyze, and solve complex problems.
- Ability to work effectively with others in a team environment.
- Ability to communicate technical concepts.
- Ability to manage time effectively and meet deadlines.
- Ability to learn new skills and adapt to changing environments.
- Proficient written and verbal communication skills in English.
- Familiarity with statistical concepts and methods.

## EDUCATION

### Elementary (A.Y. 2008 - 2014)

Cielito Zamora Memorial School

### Junior High School (A.Y. 2014 - 2018)

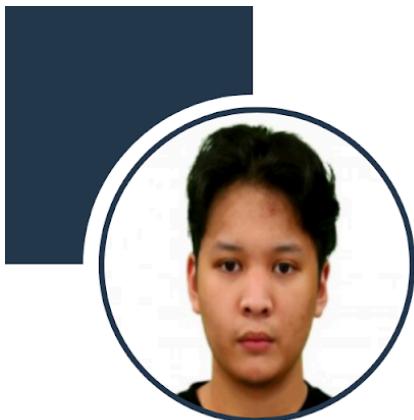
Cielito Zamora Junior High School

### Senior High School (A.Y. 2018 - 2020)

AMA Computer College - Fairview Campus

### Undergraduate (A.Y. 2021 - Present)

Technological Institute of the Philippines - Quezon City Campus



# ALEX WILHELM D. SISON

3rd Year College Student  
Program - Computer Science

## About Me

A motivated and results-oriented computer science student with a passion for programming and problem-solving, eager to apply their knowledge to make significant contributions to the ever-evolving field of computer science. Possesses expertise in programming languages like Python, Java, and C++.



09129855474



qawsison@tip.edu.ph



Blik.12 Lot 4 Jasmin St.  
Bermuda Heights, Brgy. San Luis,  
Antipolo, Rizal

## LANGUAGE

- English
- Filipino

## AWARDS AND ACHIEVEMENTS

- VPAA's Lister in College  
2nd year -First and  
Second Semester of S.Y.  
2022 - 2023

## SKILLS

- Proficient in C++, Java, React Native and Flutter.
- Ability to understand data structures.
- Familiarity with relational databases. (MySQL)
- Experience with front-end web development technologies (HTML, CSS, and JavaScript)
- Ability to identify, analyze, and solve complex problems.
- Ability to work effectively with others in a team environment.
- Ability to communicate technical concepts clearly and concisely.
- Ability to manage time effectively and meet deadlines.
- Ability to quickly learn new skills and adapt to changing environments.

## EDUCATION

### **Elementary (2008 - 2014):**

La Salle College Antipolo (Grade 1)

Montessori Integrated School (Grades 2-4)

### **Junior High School (2014 - 2018):**

Our Lady Of Peace School (Grades 5-10)

### **Senior High School (2018 - 2020):**

Our Lady Of Peace School (Grade 11)

AMA East Rizal (Grade 12)

### **Undergraduate (2021 - Present):**

Technological Institute of the Philippines -  
Quezon City Campus

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