ARCH CAFÉ INVENTORY-MANAGEMENT SYSTEM

Final Presentation Document

Prepared by

Patricia Surf	**620100929**	**patsurf38@gmail.com**
Javier Stewart	**620100960**	**javierlamarstewart@gmail.co**
Fay McIntosh	**620113856**	**fay.mcintosh17@gmail.com**
Ronaldo Willie	**620099445**	**ronaldowillie@gmail.com**

Course Instructor: **Dr Claudine Allen**

Course: **COMP2171 – Introduction to Software Engineering**

Studio Facilitator: **Dr lienius Lidephonce**

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1 1 Introduction

1.1 Problem Definition

Bobbie Bread and Dawn Egan are both located in Missouri, St. Louis. The business has had difficulty in keeping stock of their inventory, resulting in a misrepresentation of their business's performance. Hence, the software, "Arch café Inventory Management System and sales system", is used for recording the information about the day-to-day transaction of stocks of an organization. It stores purchase information of the products from the supplier. Similarly, it stores sales information about the customers. If a product is purchased, then the related information is stored in stocks, that is, stocks are up to date. Another part is it prepares sales report after product is sold. In the sales information, the information about who sold the product is also kept, so there is no problem for misunderstandings in future.

1.2 Scope of the Solution

The main objective of this software is to record the information about the stocks of an organization and perform basic operations, purchase, and sales of the products. It is developed to increase the efficiency of an organization as it can perform tasks quickly

1.3 Product Functionality

- The system shall accept the username and password.
- The system will store inventory for the client in a database.
- The system will record each sale made and update the inventory.

Benefits of the project

- Developed teamwork
- Developed coding and documentation skills
- Increased knowledge about how organization manages its inventory
- To enable the students gain better understanding of different aspects of the working environment and working condition.
- To analyze the real-world problem and find the solution using knowledge obtained.
- To enhance knowledge and skills necessary to be an effective manager.
- To develop and enhance research skills, report writing skills along with presentation and communication skills.

1.5 Operating Environment

The system will be a web-based application. This will allow the user to access the system on any platform, Windows, Linux etc. The system also will be able to be used on desktop or mobile devices, such as cell phones, laptops, tablets, etc. The system will be able to operate on a device running Pentium 4 processor higher and 256MB of RAM

1.6 Design and Implementation Constraints

The business comprises of two clients where only one user needs to use the application at a time. Therefore, security login only needs one username and one password to allow access to the web site for the client's use and maintenance. The applications require a standard mobile web browser (e.g., Safari and chrome). Since the website is accessed on the browser there is no special memory requirement needed for the application. The web application will be designed only for mobile devices such as tablets and smart phones, so therefore on a desktop, it will have a windowed display. (Hence, the time constraints will be at most five seconds per image on each web page.) The database for the application will be updated by the client. Items and issues that will limit the options available to the developer is that the software may not be completely be compatible with the hardware it will be implemented for. The time of execution may vary from hardware to hardware. The software requires the developer to have an understanding of java script as such if the writer does not have a full understanding of the language, it may take a longer time to design and implement the software itself.

1.7 Assumptions and Dependencies

- It is assumed that the client has at least one mobile device that can support the web-based application, for example, cell phone, tablet, or laptop.
- It is assumed that the client will restock inventory on a weekly basis and so will update the software’s database on a weekly basis.
- It is assumed that the client using the software will record each sale made.
- It is assumed that the client will have to use the software after each sale, otherwise they will receive an inaccurate reading
- The software is dependent on regular and consistent updates to the inventory.
- The software is heavily dependent on the database storing information.

1.8 Limitations of the project

Due to the constraints with time, there are certain limitations of this project; some of them are highlighted below:

 Not suitable for large organization

 Main focus was given in the functional requirement of the system.

 Time period was not enough for a comprehensive study and development of the software of Inventory Management System

2 2 Specific Requirements

2.1 External Interface Requirements

2.1.1 Hardware Interfaces

Capacities Touch Screen: A control display that uses the conductive touch of a human finger or even a stylus to enter data.

Hard drive: A storage device that will store the recorded data and allow retrieval. The system will require the user to enter the inventory to the hard drive.

2.1.2 Software Interfaces

The software will rely on a database that will be implemented to record the Arch Cafe inventory. The database will be created using MySQL, the database will also need to do other functions outside of storing inventory, such as calculating the overall sales in a given time period, calculate profit and loss. The database will be compatible with an Android and Windows operating system. The capacities screen will allow the user to interact with the varying parts of the software, which will include a Graphic User Interface (GUI), which will prompt the user to login to the platform.

2.1.3 Communications Interfaces

The software solution is being created to control and monitor Bobby Bread and Dawn Egan and should implement the Hypertext Transfer Protocol (HTTP) and MySQL Protocol. The software should store encrypted data in the database using Advanced encryption standard (AES) also the database will communicate using a Transmission Control Protocol (TCP).

2.2 Functional Requirements

Requirement #1: The system shall store each instance of a sale.

Use Case: Registering a sale

Rationale: To allow the user to update the inventory when a sale is made.

User Requirement:

- The system shall allow the user to update to the system.

System Requirements:

- The system should accept the item and the quantity of the item.
- The system will then subtract the quantity of the items being sold from the total quantity of the items in the database.
- The system will then multiply the cost of the item being sold with the quantity of that item and add the results to the total item sale of that item for the week.
- The system shall also add the total item sale of that item for the week to the total sales for the month.

Acceptance Criteria: The user is able to add item and quantity of item 100% of the time.

Relates to/Dependencies: View Trends

Priority: High

Team Owner: Patricia Surf

Requirement #2: The system shall store each instance of a sale.

Use Case: Record Purchase

Rationale: To allow the user to update the inventory when a sale is made.

User Requirement:

- The system shall allow the user to store a purchase.

System Requirements:

- The system should accept the purchase details the system should store a purchase information and update the inventory accordingly

Acceptance Criteria: The user is able to store a purchase 100% of the time.

Relates to/Dependencies: registering a sale

Priority: High

Team Owner: Patricia surf

Requirement #3: The system shall allow for the update of stock.

Use Case: Update Inventory

Rationale: To allow the user to update the inventory.

User Requirement:

- The system shall allow the user to modify the inventor based on sales made.

System Requirements:

- the system should accept the details of a purchase
- the system should adjust the inventory fields with respect to a sale made

Acceptance Criteria: The user can update the inventory 100% of the time.

Relates to/Dependencies: Record a purchase

Priority: High

Team Owner: Patricia surf

Requirement #4: The system shall be able to generate a list of daily sales.

Use Case: view daily sales

Rationale: To allow the user to update the inventory

User Requirement:

- · The system should daily generate a report on sales made

System Requirements:

- The system should generate a report of the sales based on a specified day .
- The system should also store these reports

Acceptance Criteria: The user is able to generate a report 100% of the times

Relates to/Dependencies: record a purchase

Priority: High

Team Owner: Javier Stewart

Requirement #5: The system shall be able to display the inventory.

Use Case: view inventory

Rationale: To allow the user to view the inventory

User Requirement:

- · The system should display the inventory

System Requirements:

- The system should allow the user to view the current inventory

Acceptance Criteria: The user is able to view the inventory as requested

Relates to/Dependencies: record a purchase

Priority: High

Team Owner: Javier Stewart

Requirement #6: The system should allow the user to search for a specific item.

Use Case: search inventory

Rationale: To allow the user to search the inventory

User Requirement: ·

- The system should be able to search the inventory System Requirements:

- The system should allow accept a search request the system should display the proper results based on the request

Acceptance Criteria: The user is able to search the inventory as requested

Relates to/Dependencies: none

Priority: High

Team Owner: Ronaldo willie

Requirement #7: The system shall allow for modification of the inventory

Use Case: modify inventory

Rationale: To allow the user to modify the inventory

User Requirement: ·

- The system should be able to add or delete from the inventory

System Requirements:

- The system should allow accept new items the system should update the inventory with the new item(s) the system should remove items selected to delete

Acceptance Criteria: The user is able to add and delete an item from the inventory all times

Relates to/Dependencies: none

Priority: High

Team Owner: Ronaldo willie

Requirement #8: The system shall notify the user to restock or when an item quantity hits zero.

Use Case: notify to restock

Rationale: To allow the user to be notified that an item is out of stock

User Requirement: ·

- The system should notify the user that an item is out of stock

System Requirements:

- The system should keep track of the quantity of items the system should display an alert when quantity hits 0

Acceptance Criteria: The user is able to get alerted 100% of the times

Relates to/Dependencies: none

Priority: High

Team Owner: Fay McIntosh

Requirement #9: The owner should be able to register new users and remove users.

Use Case: register user and delete user

Rationale: To allow the user to add new and remove existing users

User Requirement:

- The system should allow for addition and removal of users

System Requirements:

- The system should accept new user details and store it the system should remove a user when prompted

Acceptance Criteria: The user is able to be added or deleted 100% of the times

Relates to/Dependencies: none

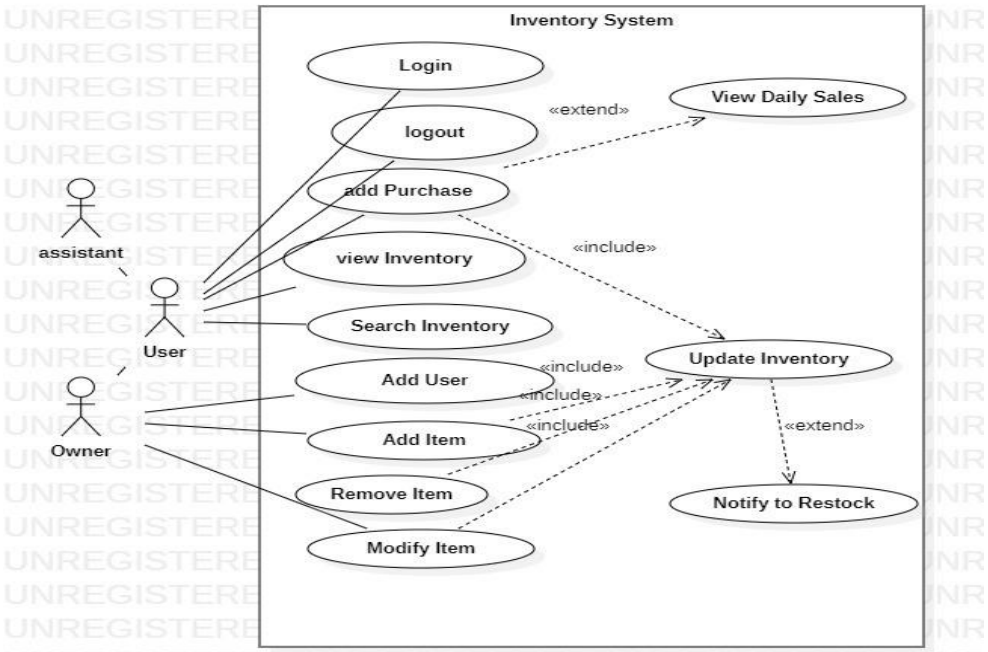
Priority: High

Team Owner: Fay McIntosh

2.3 Behaviour Requirements

2.3.1 Use Case model

A use case diagram is a type of behavioural diagram defined by the Unified Modelling Language (UML) whose aim is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. It is used to identify the primary elements (actors) and processes (use cases) that form the system. The use case technique is used in software and systems engineering to capture the functional requirements of a system from the user's perspective. The use case shows how the different actor will be performing what activity within an application and the following use case diagram show how different user will be performing the different activity within the application.



3 3 Non-functional Requirements

Performance Requirements

The product shall be on the internet, so therefore, the website will be compatible with all web browsers, hence the website shall be hosted on a server that can provide adequate response time and since the software is a single-user system, the internet speed from the server should have an approximate throughput of 4 MB/s. The server shall also require a minimum of 500MHZ processor,

1GB of HDD and 256 MB RAM. The website will take an initial load time on the client's browser, which will depend on the internet connection speed and the user hardware specification. Hence, if the device has a minimum of 20 MB of RAM free. That response time would be as follows:

- Password and username verification will take an average of 2 seconds.
- Response to the next web page will take at most 15 seconds.
- Sales and Inventory remove functions will take 30 seconds per items.
- Inventory add function will take about 20 seconds per item.
- Trends will take a minute to calculate and display profits and trends among items.

The website's main aim is to provide an accurate analysis of the business. Henceforth the system shall provide a simple user interface that a nonprofessional can understand. The software shall accurately consider all factors and return precise and accurate results up to two decimal places. With correct calculations, the system will present simple diagrams and charts.

3.2 Safety and Security Requirements

Safety & Security Requirement 1: Log in Requirement

Safety & Security Requirement 2: Backup Servers will be provided.

Safety & Security Requirement 3: Backup Data should be encrypted.

Safety & Security Requirement 4*:* Duplication Restrictions

The software shall implement security procedures to keep software from being accessed by unauthorized users. Additionally, the software shall implement a defence system to protect against malware, spyware, and breaching attempts by initiating the following:

- Encrypting Database
- Encrypting Backup Database/Servers
- Data Encryption
- Restricting access to the primary users

Additional Safety and security requirements:

- All users of the software must be an employee of the Arch Cafe.
- Any information that is provided must not be sold or used to conduct any illegal activity in or outside of the Arch Cafe.
- Users of the system must accept the terms and use of product before using the software.
- User credentials must remain confidential and shall only be accessible by the system administrator who will be held responsible for any breach in any unethical use of the system.
- Encourage users to logout after they are finished to prevent access by another user.
- The product is expected to have a high level of security to protect user credentials.

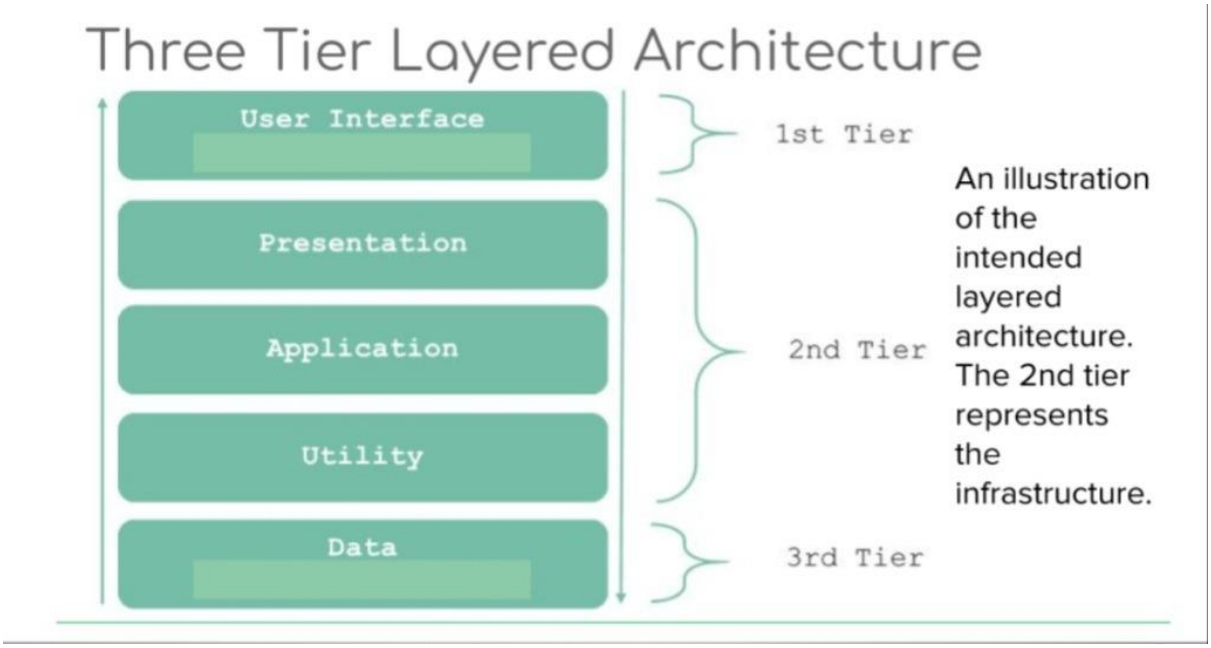
3.3 Software Quality Attributes

- Portability: The user can access the website on any mobile device at full screen and on any desktop at windowed display. System can be log into on both iOS and android operating system.
- Availability: The system will be available for 24 hours daily every day of the week except for a two-hour downtime for system maintenance and repair.
- Reliability: The system will be able to function without error apart from when the user or the server is experiencing network failures.
- Usability: The system shall provide a very user-friendly display with special icons, buttons, and gestures.

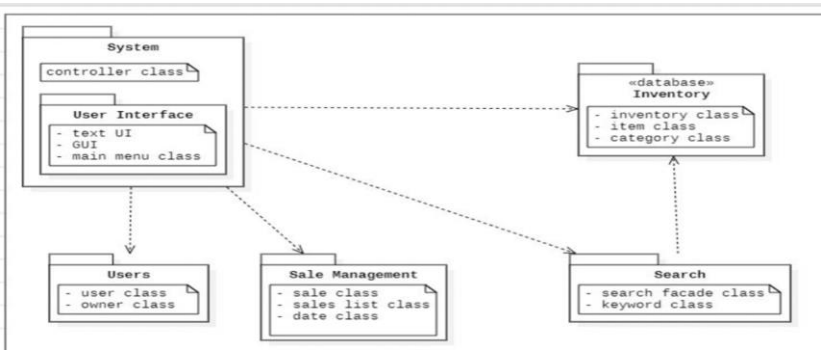
4 Architectural Design

4.1 System Architecture

Three-tier architecture has been implemented in the system development. Three-tier is a client–server architecture in which consists of presentation logic and database logic. Two-tier architecture then will have two processing nodes. Layers refer to a logical grouping of components which may or may not be physically located on one processing node. IMS application will be a desktop application. It will consist of a database server. These server components can exist in the same sever computer or can be different computers such as Database Server.



4.2 Model View

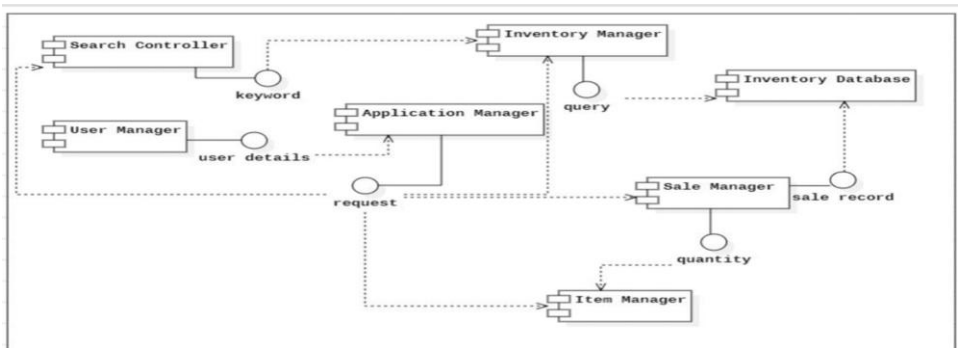


Justification

As depicted by our package diagram, each class that performs the same function or has something in common is grouped for example, sale, date, and sale list class are grouped because both classes contain items common among themselves.

These packages relationship is shown by a dependency arrow.

4.3 Component View

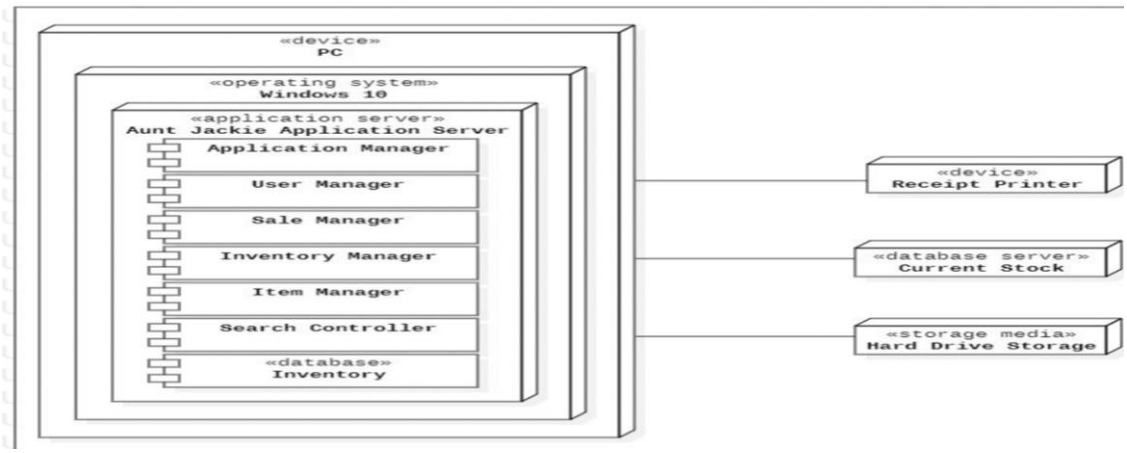


For the system to be most interactive data must flow from one component to the next which is driven by a dependency arrow. So, for example Search Controller has to give its information to Inventory Manager which in turn makes a query and its data is send to the database. This diagram makes dataflow more vivid and where it is transferred.

3.4 Deployment View

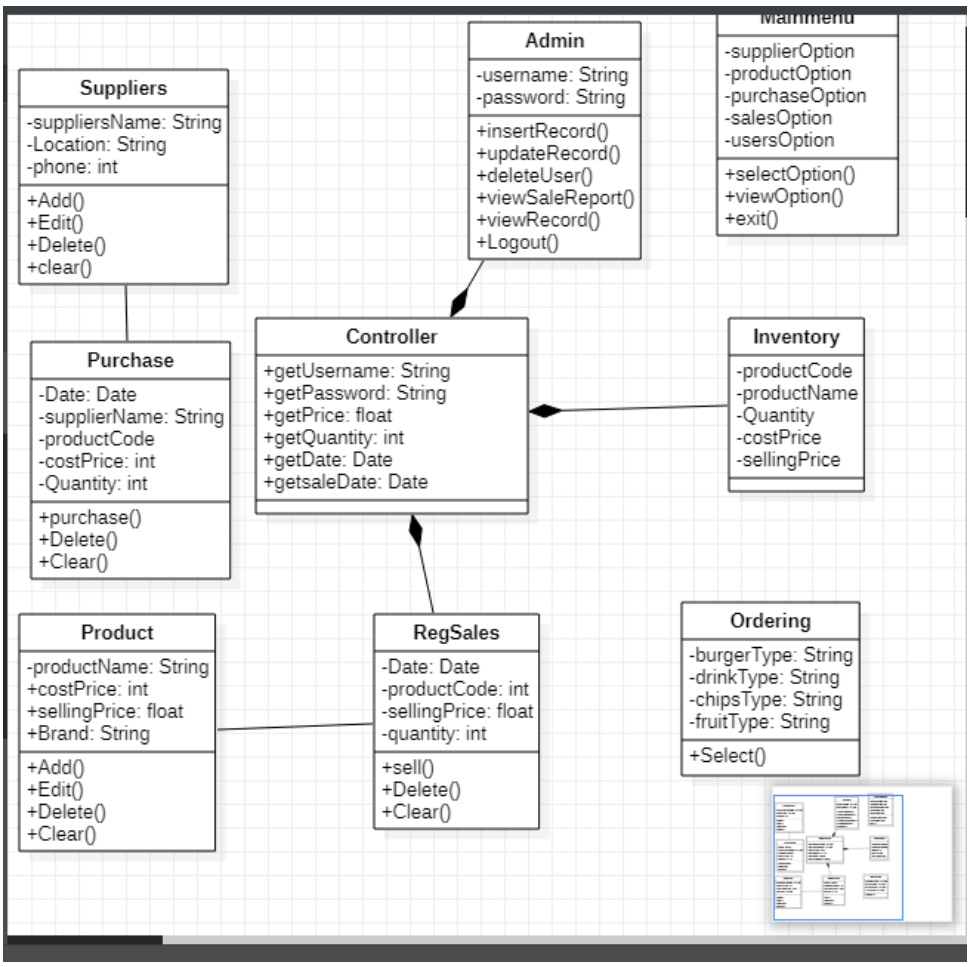
Justification

Shows the hardware and software components of an architecture. The system shows the different devices of the software and where they are deployed for execution eg the inventory system is deployed to the database.

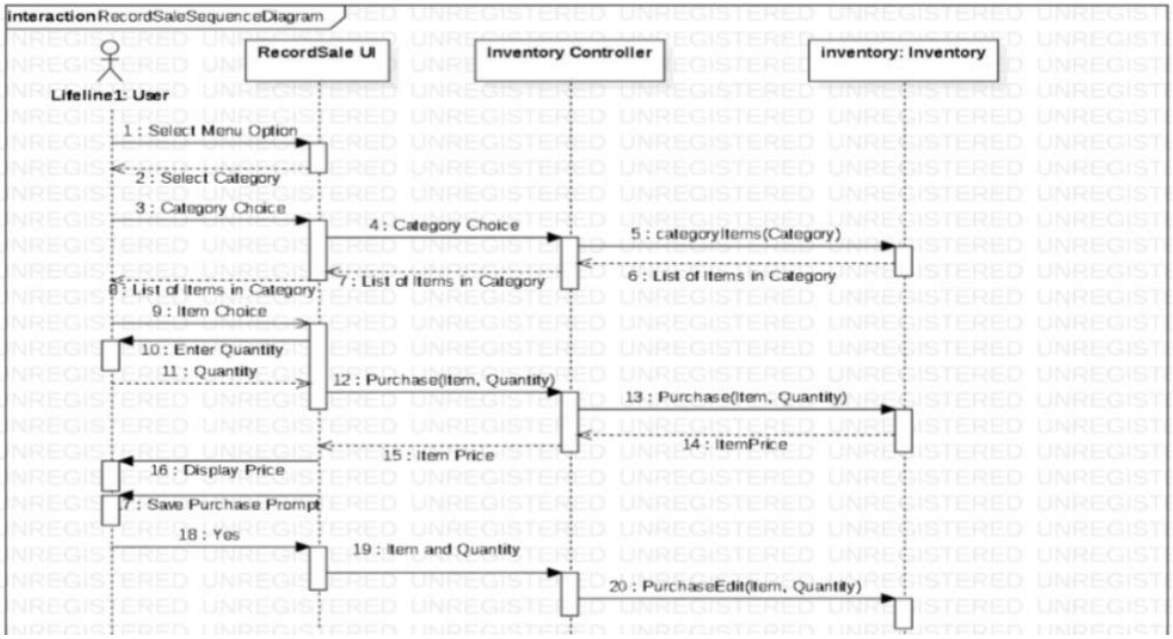


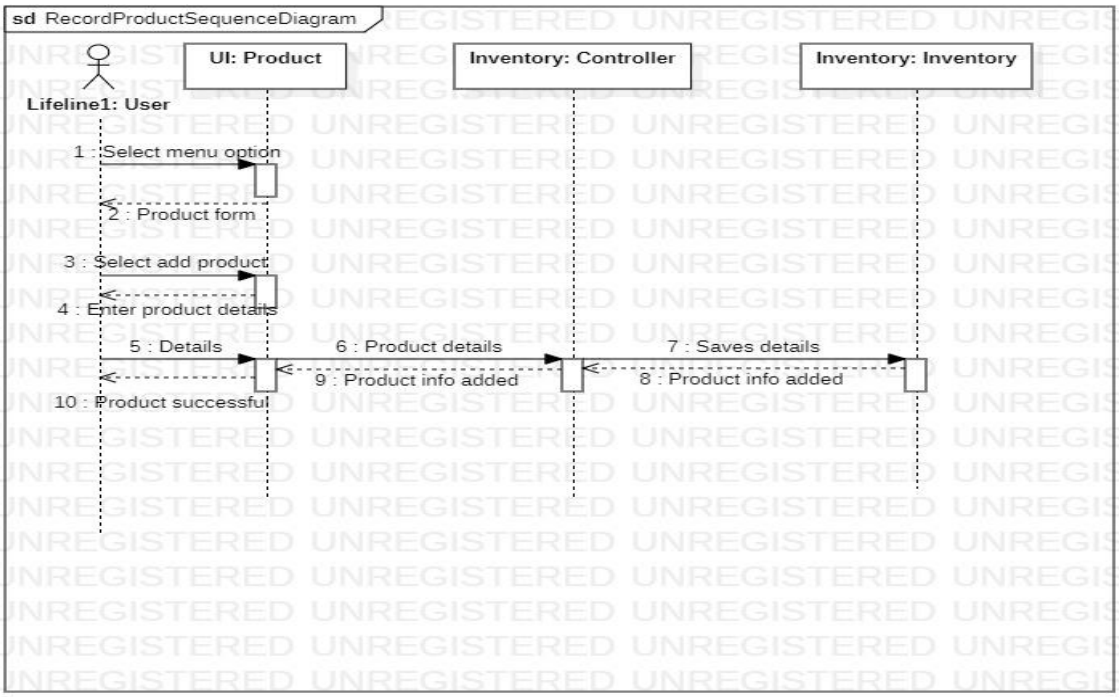
5 Internal Design

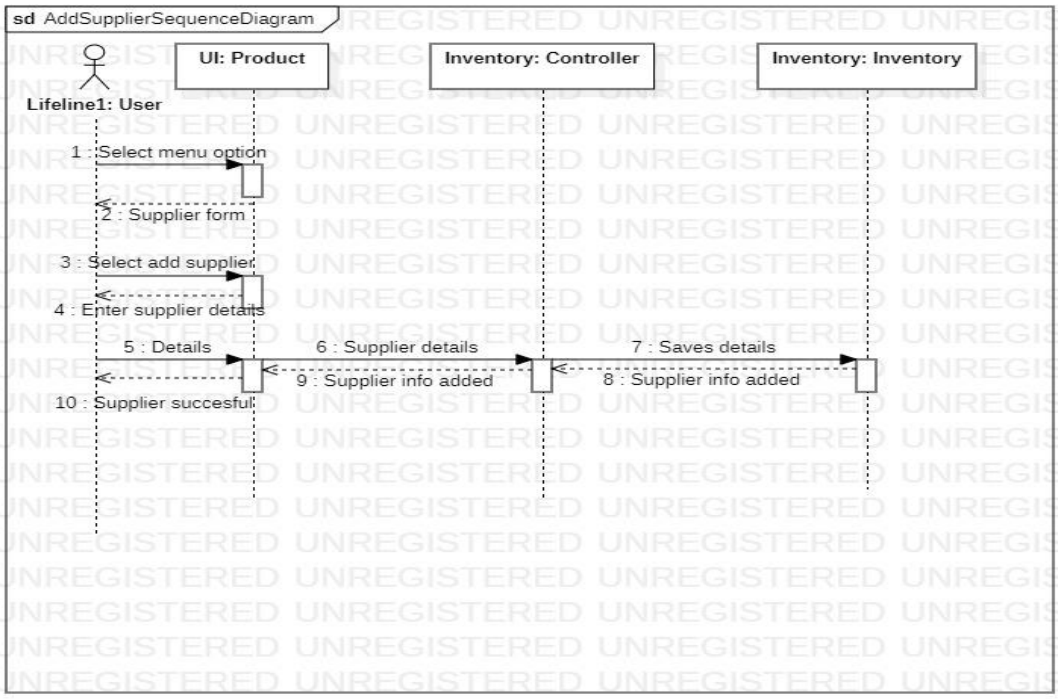
5. 1 Class Diagram



5.2 Sequence Diagrams







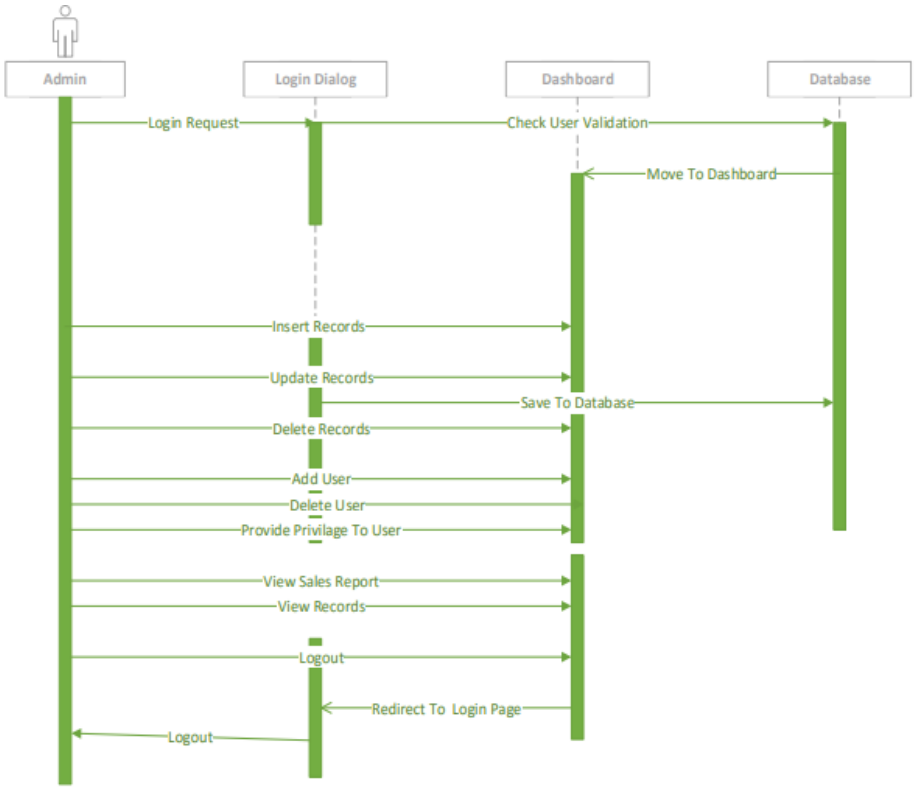


Fig: Sequence diagram for Admin

5.3 State Diagram

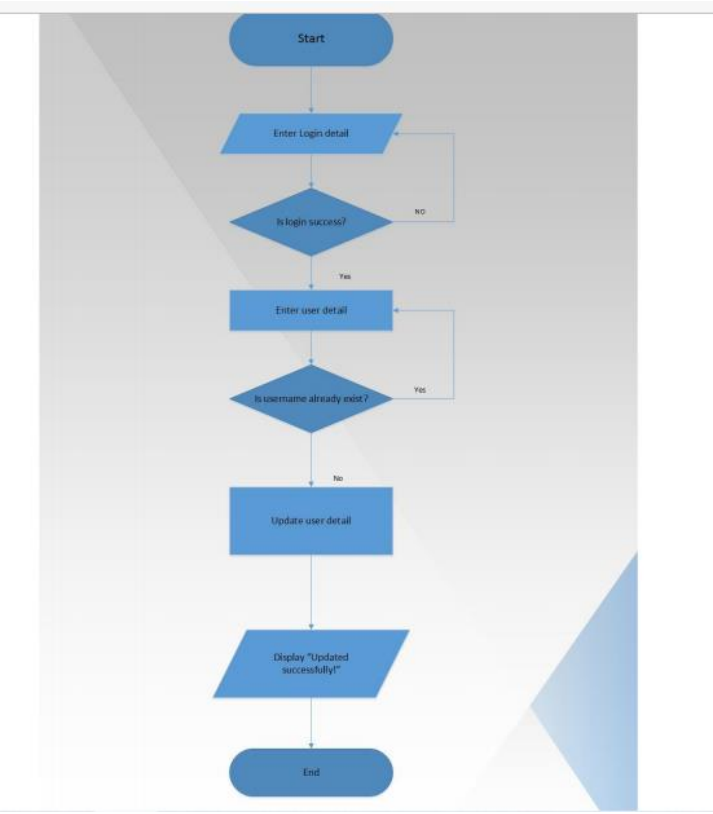


Fig. User details

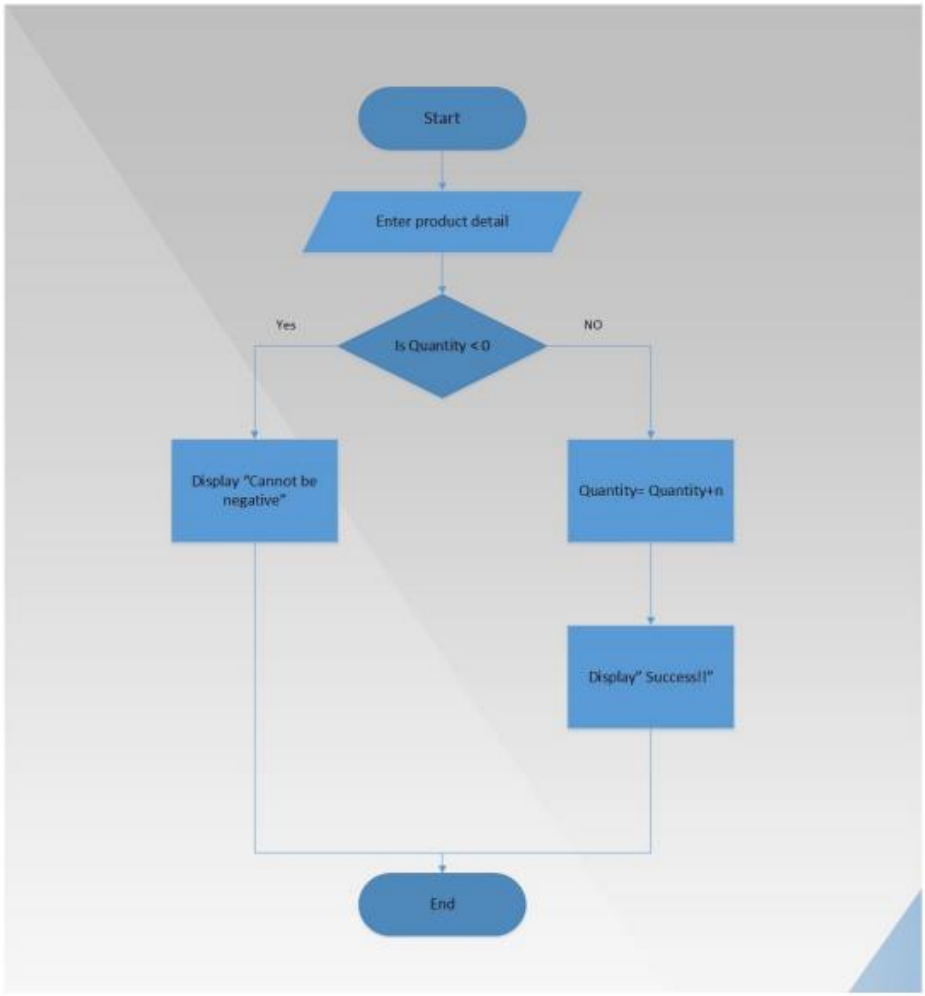


Fig. Receiving products from suppliers

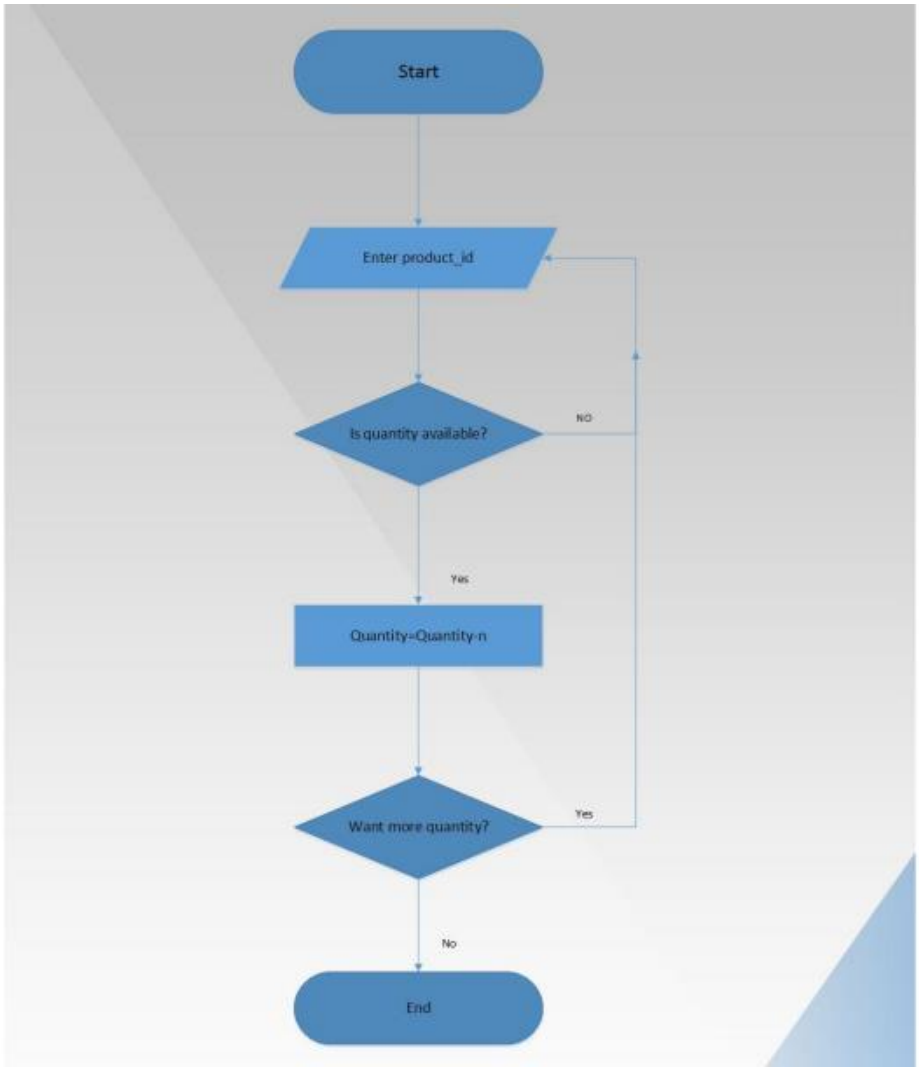
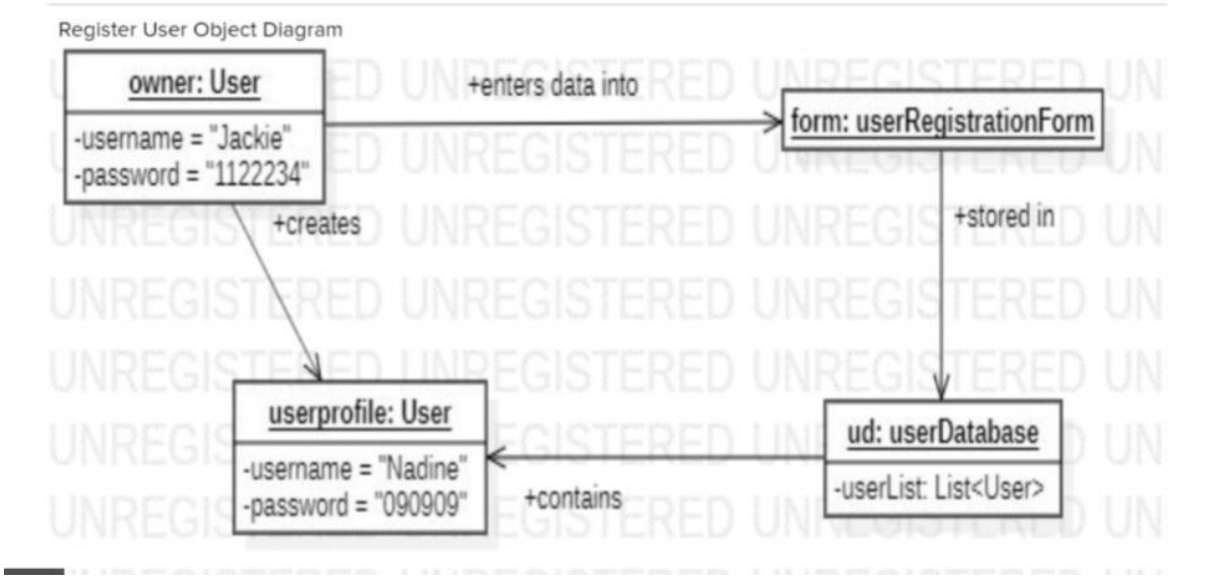
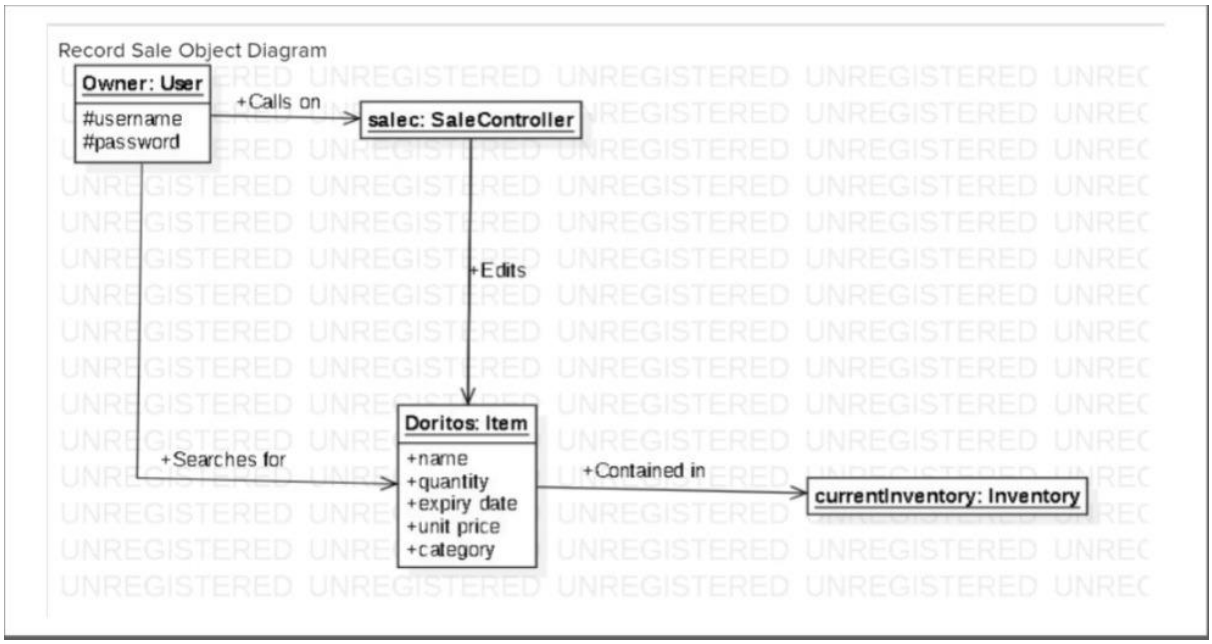


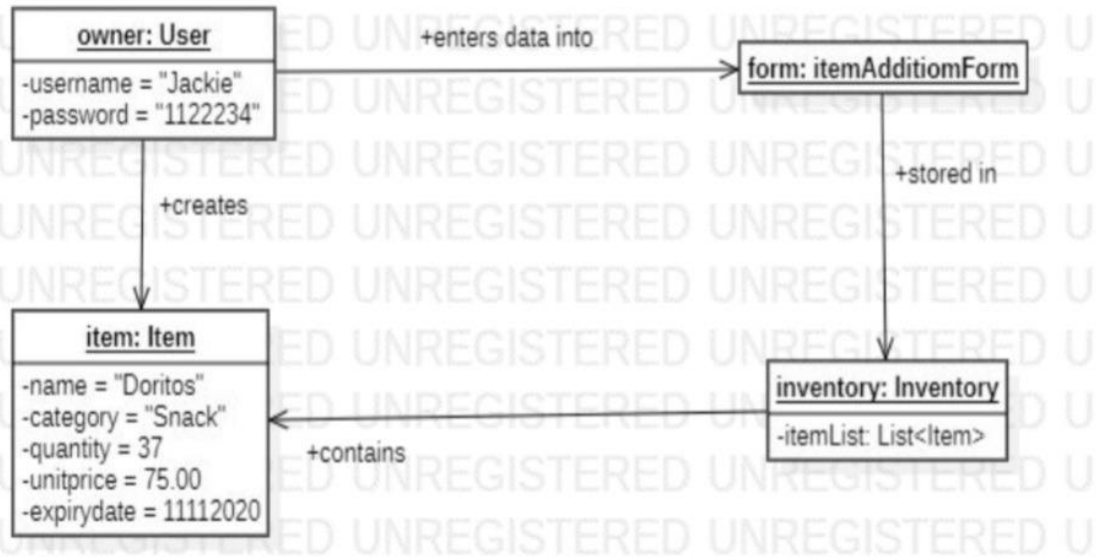
Fig. Selling products to customers

5.4 Object Diagrams

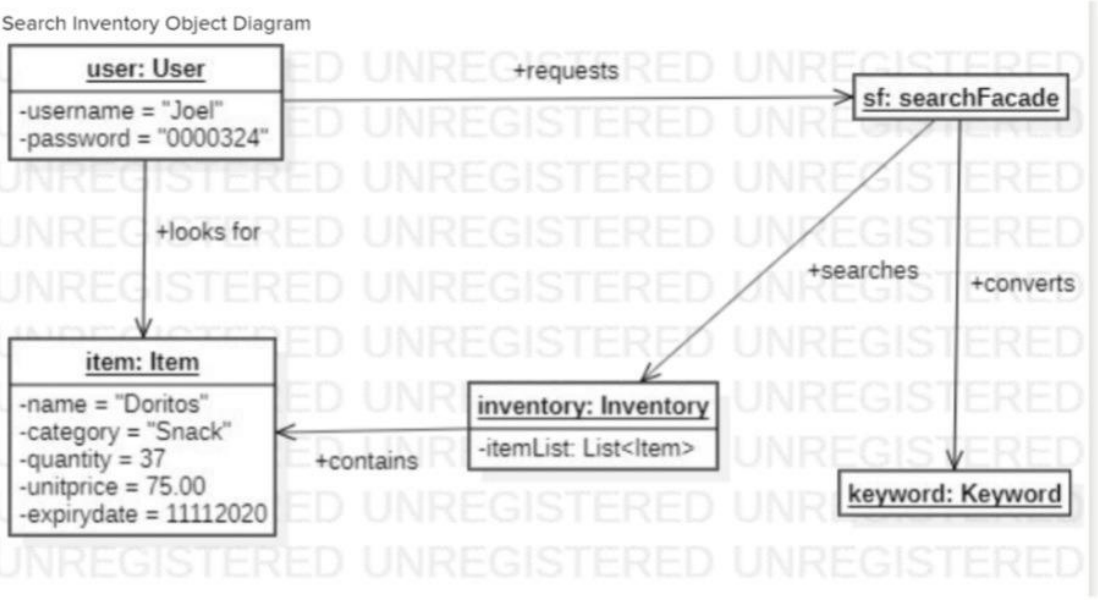




Add Item Object Diagram



Search Inventory Object Diagram



6 6 Coding and Tools used

Based on the software design, it is a web-based application that takes in Java as the backend code also html and CSS for framework. All this coding was done in Net beans IDE along with JDK 1.7.3. Our software caters to eliminating the use of manually completing inventory tasks. It uses a MySQL server along with a database that stores all the inventory details.

For the development of the Arche Café inventory management and sale system a variety of tools and techniques are used. For the development of the system the user requirements have to be written in the understandable form. The use of different graphical representation of the system process has been implemented in development of system for non-technical users to understand the system working process. We used the mostly used Tools and techniques for system development as:

- Net Beans IDE (Coding)
- JDK 1.7_3
- MySQL server
- Java (coding)
- MS Word (Documentation)

7 7 Test Strategies

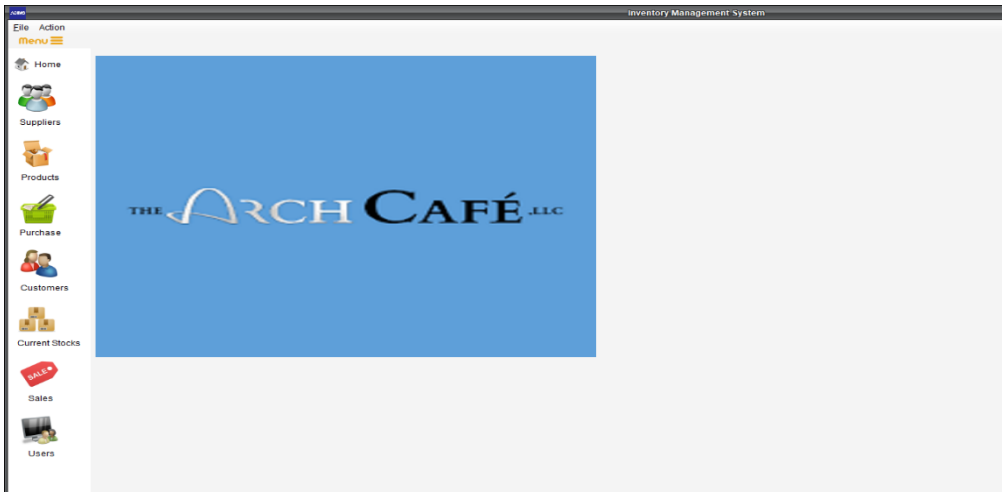
Software Testing is a critical element of software quality assurance and represents the ultimate review of specification, design, and code generation. Once source code has been generated, software must be tested to uncover and correct as many errors as possible before delivery to customer. Our goal is to design a series of test case that have a likelihood of finding errors. So, testing technique provide systematic guidance for designing tests that*:*

- Exercise the internal logic of software component.
- Exercise the input and output domains of the program to uncover errors in program function, behavior, and performance.

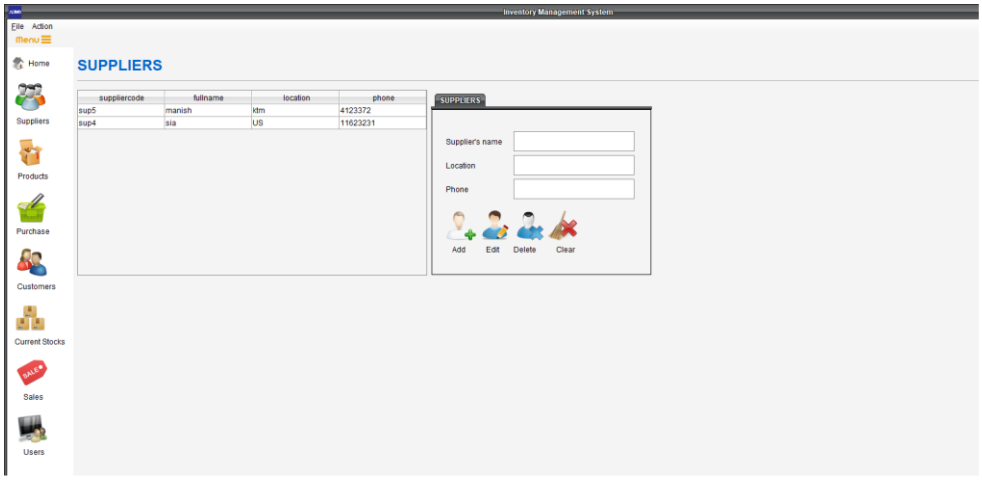
A rich variety of test case design methods has evolved for software. This method provides the developer with a systematic approach to testing. Black box testing focuses on the functional requirements of the software. It is user acceptance testing that has the objective of selling the user on the validity and the reliability of the system. Black box testing is a complementary approach that is likely to uncover different class of error.

8 Execution

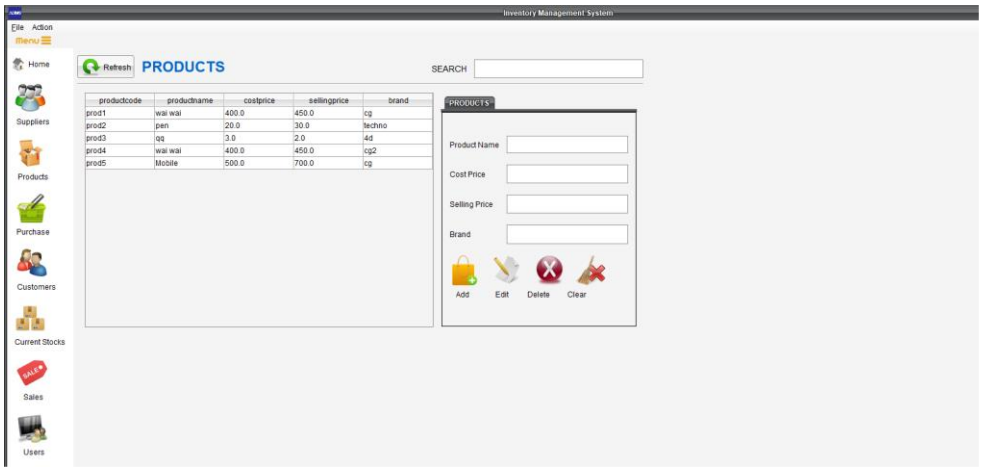
Login Screen



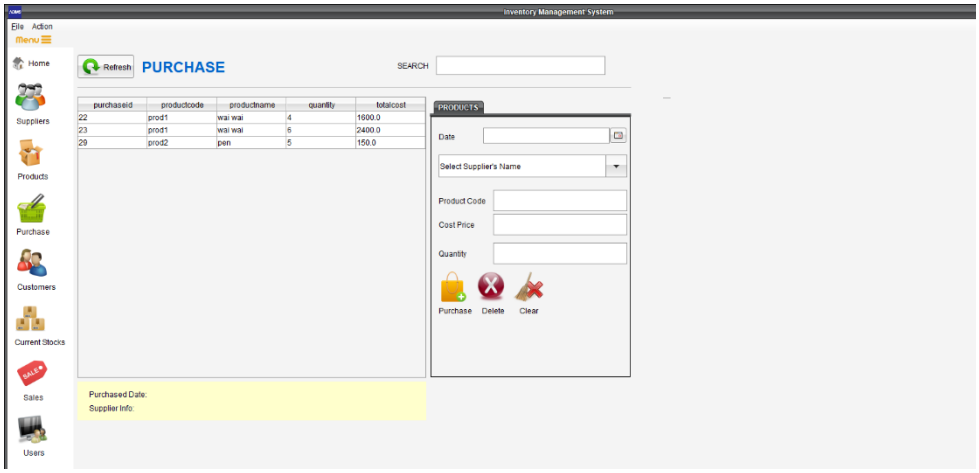
Dashboard



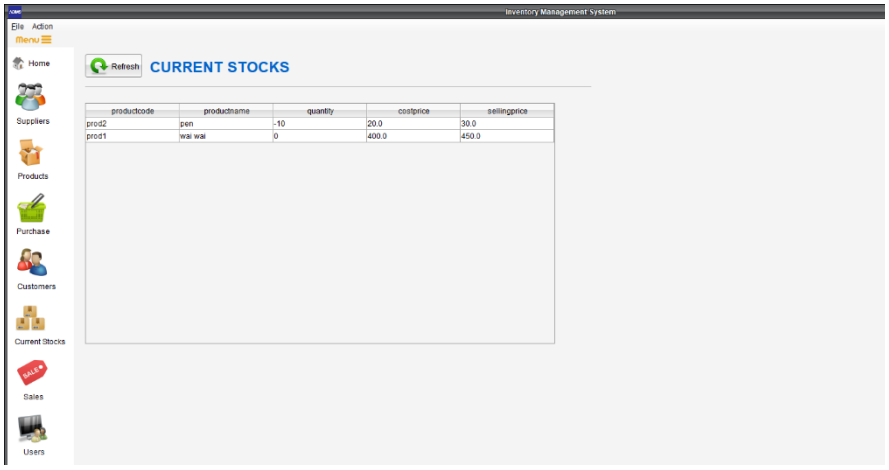
List of suppliers



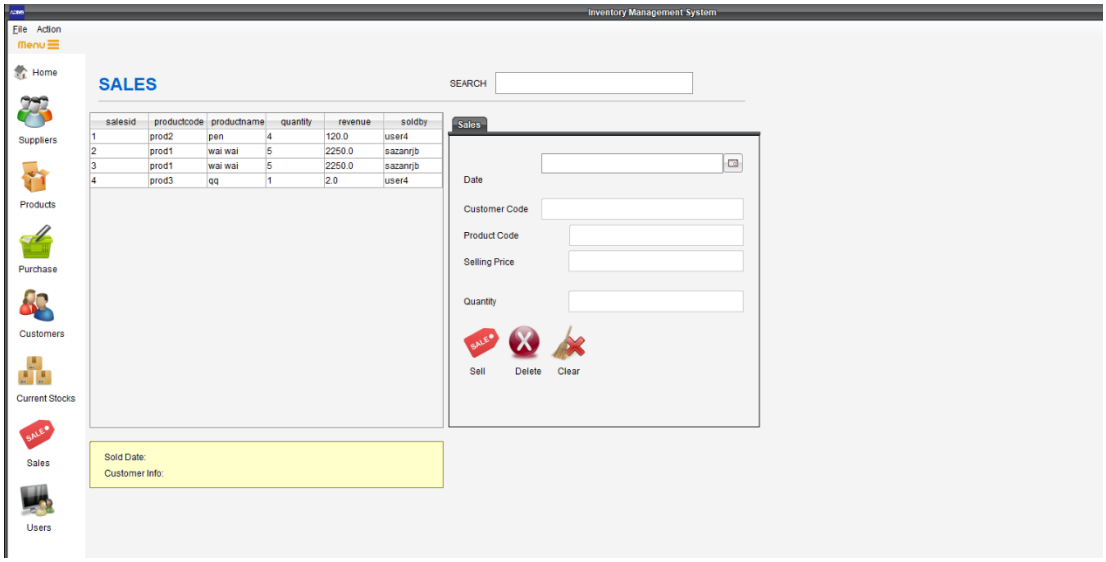
Products



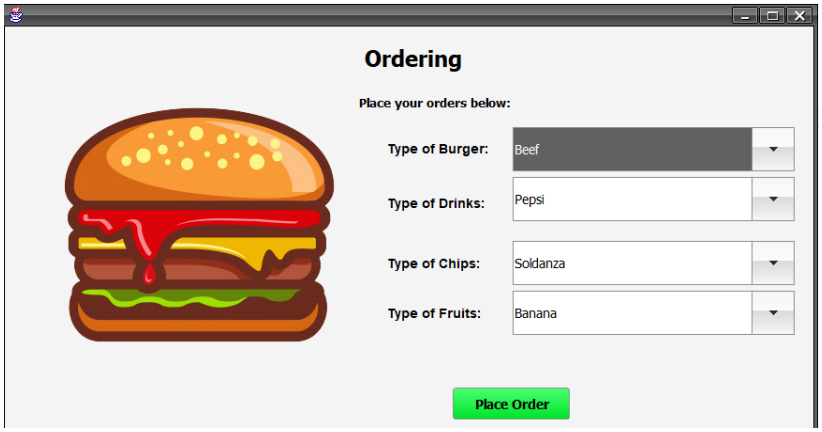
List of purchases



Inventory



List of sales made



Normal user ordering screen

Code Registry link: