

A
MINI PROJECT REPORT
ON

Inventory Management System

Submitted By

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Has successfully completed their project report on

Inventory Management System

Towards the partial fulfilment of

Bachelor's Degree In Computer Engineering

During the academic year 2021-22

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Chapter 1 Abstract

An inventory management system (or inventory system) is the process by which you track your goods throughout your entire supply chain, from purchasing to production to end sales. It governs how you approach inventory management for your business. Inventory changes constantly. Throughout each day, sales, returns, new receipts – even damage and theft – affect your inventory levels. While daunting, effective inventory management and inventory control are the most important jobs in a successful retail or wholesale business. Effectively managing inventory gets harder as your business scales and the amount of inventory you’re handling increases. Taking advantage of technology can make things easier for yourself and your employees. This is why an inventory management system is invaluable to any retail business.

Chapter 2 Introduction

2.1 Introduction.

An inventory management system project that allows user to manage and maintain his/her inventory with ease. The inventory management system has been developed to allow users to add an inventory, delete an inventory, enter inventory quantity and other details, update inventory status and more. The inventory management system has its own intelligently managed support system that allows user to view and manage various inventories added in the system.

The system provides following features:

- User may add/update/delete inventory.
- User may add/update inventory details.
- Details include cost, quantity and description.
- Includes forms for inventory inwards and outwards.
- User may create sub inventories.
- An interactive user interface.
- A flexible inventory management system.

Inventory management is a very important function that determines the health of the supply chain as well as the impacts the financial health of the balance sheet. Every organization constantly strives to maintain optimum inventory to be able to meet its requirements and avoid over or under inventory that can impact the financial figures. Inventory is always dynamic. Inventory management requires constant and careful evaluation of external and internal factors and control through planning and review. Most of the organizations have a separate department or job function called inventory planners who continuously monitor, control and review inventory and interface with production, procurement and finance departments.

Chapter 3 Manual Testing

Importance

In general, testing is finding out how well something works. In terms of human beings, testing tells what level of knowledge or skill has been acquired. In computer hardware and software development, testing is used at key checkpoints in the overall process to determine whether objectives are being met. Software testing, depending on the testing method employed, can be implemented at any time in the development process. Software testing can be stated as the process of validating and verifying that a software program/application/product.

3.1 Manual Testing

Manual testing is a software testing process in which test cases are executed manually without using any automated tool. All test cases executed by the tester manually according to the end user's perspective. It ensures whether the application is working, as mentioned in the requirement document or not. Test cases are planned and implemented to complete almost 100 percent of the software application. Test case reports are also generated manually. Manual Testing is one of the most fundamental testing processes as it can find both visible and hidden defects of the software. The difference between expected output and output, given by the software, is defined as a defect. The developer fixed the defects and handed it to the tester for retesting. Manual testing is mandatory for every newly developed software before automated testing. This testing requires great efforts and time, but it gives the surety of bug-free software. Manual Testing requires knowledge of manual testing techniques but not of any automated testing tool. Manual testing is essential because one of the software testing fundamentals is "100% automation is not possible." There are various methods used for manual testing. Each technique is used according to its testing criteria. Types of manual testing are given below:

- **White Box Testing :-** The white box testing is done by Developer, where they check every line of a code before giving it to the Test Engineer. Since the

code is visible for the Developer during the testing, that's why it is also known as White box testing.

- **Black Box Testing :-** The black box testing is done by the Test Engineer, where they can check the functionality of an application or the software according to the customer /client's needs. In this, the code is not visible while performing the testing; that's why it is known as black-box testing.

- **Gray Box Testing :** - Gray box testing is a combination of white box and Black box testing. It can be performed by a person who knew both coding and testing. And if the single person performs white box, as well as black-box testing for the application, is known as Gray box testing.

3.2 How to perform manual testing

A complete manual testing process consists of the following steps:

- **Step 1:** First, gather the requirements using the requirement analysis step. Once we gather and understand the requirements, we know what the expected behavior is and what we need to test, and when we say we have found the defect.

- **Step 2:** Secondly, once we understand the requirements, we identify and draft the test cases that will cover all the requirements contained in the project documentation. Additionally, the test cases help us follow a sequence to test functionality and various test scenarios such that we cover the entire application and check expected results.

- **Step 3:** Once test cases are ready, the tester has to review the test cases with the team leader and with the client if need be. By examining the test cases, we will find glitches, if any, and correct them before executing the test cases.

- **Step 4:** Once test cases are ready, and the test environment sets, we execute the test cases one by one.

Each test case will have one of the following states:

Passed: If the scenario under test works as expected.

Failed: If the working is not as expected.

Skipped: If the test case cannot complete. It may be because of some limitations or unforeseen circumstances.

- **Step 5:** As the test cases execute, we have to report the identified bugs and defects to the concerned developer and submit a bug report.

- **Step 6:** Finally, we create a detailed test report that will include detailed information on how many defects or bugs we found, how many test cases need to be rerun, how many test cases failed, and how many we skipped. Once we

fix the bugs and defects, execute the test cases that could not verify the fixed bugs.

3.3 Importance Of Manual Testing

1. **Manually Testing Tests From a Human Perspective:-** Human testers can quickly identify when something looks “off.” Automated test scripts don’t pick up these visual issues. When a tester interacts with software as a user would, they’re able to discover usability issues and user interface glitches. Automated test scripts can’t test for these things.
2. **Exploratory Testing Can Only Be Done Manually:-** Automated tests only perform the actions that you tell them to. They require planning and preparation to write, which restricts the test to certain boundaries. These boundaries mean there isn’t any room to stray from the written test to truly “explore” the application. Exploratory testing (or ad hoc testing) gives us the opportunity to answer questions like, “what happens if I do this?” It enables us to carve our own path throughout the test with little to no boundaries.
3. **Automated Tests Can Contain Errors and Holes:-** Just like code can have bugs, automated test scripts can also have bugs. This means that automated testing has the potential to report false positives and false negatives. By including a human touch throughout the testing process, these errors are avoided.
4. **Some Scenarios Are Not Technically Feasible to Automate or Cost Too Much :-** Let’s take, for example, an iPad app that relies heavily on tap gestures. Automating the “tap” can not only be costly but also may not be the most accurate test compared to a human’s finger touching the user interface. It often makes more sense to manually test certain features. By the time you find a resource to write an automated test, a manual test could be completed with bugs already fixed. Sometimes, it makes more sense to just go the “manual” route.
5. **Manual Testing Helps Us Understand the Whole Problem :-** Over time, automated testing can save time. It is great for getting quick results on a broad level, but manual testing allows us to understand the problem on a conceptual and emotional level. It connects us with the end-user and introduces us to a level of empathy automated testing doesn’t provide.

3.4 Advantages

- Manual testing of an application identifies most of the issues, including the look and feel issues of the application.
- Visual components like text, layout, other components can easily be accessed by the tester, and UI and UX issues can be detected.
- It usually has a low cost of operation as we do not use any tools or high-level skills.
- It is well-suited in case we make some unplanned changes to the application as it is adaptable.
- Humans can observe, judge, and also provide intuition in case of manual tests, and this is useful when it comes to user-friendliness or rich customer experience.

3.5 Disadvantages

- Manual testing is time-consuming.
- It isn't easy to find size difference and color combination of GUI objects using a manual test.
- Load testing and performance testing is impractical in the manual tests.
- When there is a large number of tests, then running tests manually is a very time-consuming job.

Chapter 4 SRS Plan

4.1 Introduction

4.1.1 Purpose

The purpose of this document is to present a detailed description of the Inventory Management System. It will explain the purpose and the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and developers of the system and will be liable for the approval or disapproval of the project by the community of organization.

4.1.2 Scope

A relational database in MySQL or another portable DBMS stores the essential data for subsequent analysis. Only one person is responsible in assigning the details or records. It is security driven.

4.1.3 Definitions and Abbreviations

Term	Definition
SQL Server	Query language to performing DB queries.
IMS	Inventory Management System
Supplier	An entity that supplies goods and services to another organization
Buyer	A person who is intends to buy services.
Inventory	A list of goods or stocks.
User	A person who is maintaining the inventory of organization.
SRS	A document that completely describes all of the functions of a proposed system and constraints under which it must operate.
Stakeholder	Any person with an interest in the project who is not a developer

Table 4.1: Term Index

4.2 General Description

4.2.1 Product Perspective

The client uses MS Excel, and maintains their records, however it is not possible for them to share the data from multiple systems in a multi-user environment, there is a lot of duplicate work, and a chance of mistake. When the records are changed, they need to update each and every excel file. There is no option to find and print previous saved records. There is no security; anybody can access any report and sensitive data, also no reports to summary report. This Inventory Management System is used to overcome the entire problem which they are facing currently, and making complete automation of manual system to computerized system.

The main limitation of the previous system of Inventory Management System:

- The existing system only provides text-based interface, which is not as user-friendly as Graphical user Interface.
- Since the system is implemented in Manual, so the response is very slow.
- The transactions are executed in off-line mode, hence on-line data capture and modification is not possible.
- Off-line reports cannot be generated due to batch mode execution.

Hence, there is a need of reformation of the system with more advantages and flexibility. The Inventory Management System eliminates most of the limitations of the existing software.

4.2.2 Product Function

Inventory Management System must be designed to meet the dictates of the marketplace and support the company's strategic plan. Along with the inventory system Garment industries need some more special attributes. The Software's for Garment are specially made for managing the various steps in order processing of garments manufacturing process. This software is modular in design and is web enabled for remote access as well as intranet usage without the need to install in every machine.

The features of system are as follows:

- User based Login - password based authentication for data protection.
- Dynamic Modular structure – Each and every section related to a production has separate menus.

-
- Manage master details of buyer, supplier and vendor.
 - job Work tracking.
 - law material tracking.
 - Shipment tracking.
 - Product category and product stock information with value.
 - Reports include purchase, issues, stocks & categories.
 - Customized package

4.2.3 Potential User of System

There are two groups of users in our system. They are the production controller and the system maintenance administrators. They have different authorities in our system which is shown as follows:

- **Production Controller:** They are the Controller of the production in each and every section related to total production. They can insert the detail product information which is completed. Besides, they are able to view order sheet and sample sheet to keep their production accurate. But their authentication domain is limited between their field, which can be exemplified as the production controller who is in charge of cutting, will not have the access to the information about payroll or customers.
- **Administrator:** They are authorized staffs to control the system. They are assigned with different level of authority to control different parts of the system like inventory and administrators. In addition, administrators are responsible to maintain database .

4.2.4 User Classes and Characteristics

The users of the software are classified into two categories – Registered user and unregistered user. Both users will be able to visit the homepage of the website but only the registered user is allowed to give input in the system. To work through the system one user should go through some fixed steps-

- First of all, the user should be registered.
- The separate production module will be presented to the user as a catalog for viewing.

-
- The user can browse through the categories to choose the module they desire.
 - The user can input partially complete production quantity of the total production. Finally, the product will be delivered within a fixed and trusted time period to the next production module.
 - And the process will continue until the shipment is completed

4.2.5 Assumption and Dependencies

According to our view that inventory system will Contain module like :

- Information of different products category
- Available stock
- Price of different items transaction details
- One can also extract any reports relating to purchase and Sale.
- The inventory management application will have all the categories,
- Subcategories, items, Stock details and reports

The administrator of this inventory system will have right to create product, add items delete items etc. The application will provide all information of the products. The category will be tagged with subcategory. Again, the subcategories are tagged with different items in the respective category and rate of the item. Each item will have a specific bar code. The rates will be tagged to the bar code.

Using these functions, the user can:

- Add items to inventory
- Edit items in inventory
- Add an action for an item

The application will also help to generate reports to get latest update on

- Master Entry
- Purchase order entry

-
- Receive entry
 - Delivery entry
 - Report

This inventory system also has some dependencies like

- If data are inserted it cannot be deleted except administrator
- User can insert a data but can't delete
- If data are not inserted, user cannot view report.

4.2.6 Design and Implementation Constraints

When the project team is started to design the system, at that time the team always tries to meet all the requirements of their client properly. But some time client's make the job difficult for the team to design the system by raising some last moment requirements. This is considered as main constraints of designing a system.

4.3 Specific Requirements

4.3.1 Functional Requirements

Functional requirements define the functions that are requested by our stakeholders' Different functions are needed by different users of the system. Different administrators have authority to maintain the system. The system specifies the authority of the administrator. The administrator has got control over the database of the system. She/He can make changes to update the total inventory system, and the update will be carried out dynamically.

Data Flow Diagram

DFD level 1, is the representation of the system which can visualize the relation among the functions and the file or database with the inputs and outputs. Control panel and planning entity can give input command to the system, which can process by some functions in this system like interact with user, configure, and update input, display status. There is a database related with configure function which one can modify production information. And display status, notification, check sheet can produce output depend on all the functions which configure inputs.

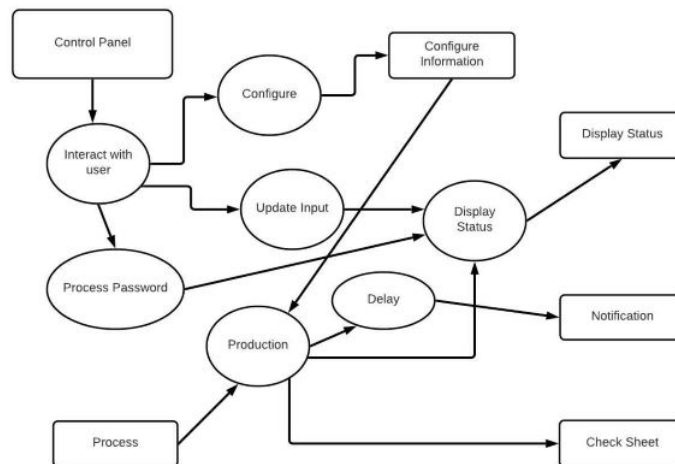


Figure 4.1: Data Flow Diagram

System

- The system should display a login screen where users can access the system by entering their username and password.
- The system should store information about the customers, products, suppliers, orders, delivery order. All the users should have a profile page. The page shall include all the necessary information about them.
- The system shall keep track of all processes and changes happening to the data between login and logout times of the users.
- The system should provide authentication to the users by verifying the user's name and password before accessing the system.
- The system should inform the inventory manager about the low levels of inventory and send alerts to the user when the inventory levels is low.
- The system shall allow the new users to be added or delete the users.
- The system shall provide a feedback/evaluation of the products from the vendor.
- The system should be able to calculate the cost of materials that will be used for different stages of the project.
- The system shall be able to update the inventory data including the order data, supplier data, customer data etc.
- The system should enable the users to logout after using the system when the user clicks on the logout button.

Admin

- Login.
- Browse desired modules.
- Browse desired supervisor portfolio.
- Notify the system about the module requirements.
- Input product quantity after compiled.
- Distribute requirements between the production supervisors.
- Supervise inter-work station combination.
- View production details with delivery date.
- Browse through different production areas.
- Balancing the check sheet System Feature 2 (and so on) External Interface Requirements

4.3.2 User Interface

User interface is one of the most important elements in any software. Most of the software's are used by non- technical persons. So, they always seek of user-friendly environment in their system. And the user interface makes the system more familiar to its user. For our system we do not design a user interface yet. But the process is going on.

4.3.3 Hardware Interface

In the current version of the software, it will have no special hardware interface with other external systems. It will run in a general-purpose computer system with general-purpose hardware and software.

4.3.4 Software Interface

The Current version of this system will be built on the following software:

Server

- Java
- MySQL Server

Client

- Java SE 8

Communication Interface

The customer should connect to Internet to retrieve data from server:

- Dial-up Modem of 52 kbps
- Broadband Internet

4.4 Non Functional Requirements.

4.4.1 Performance Requirements

Our proposed inventory management system will be used in Garment industry. There are lot of internal and external operation which are inter-related with each other for fruit full production. So, the communication among each end system should be tightly scheduled and the notification should be sent in timely manner

4.4.2 Safety Requirements

The production process in the garment industries is a combination of different operations, which generate lots of data. These data lose can cause high damage to a specific module as well as to the total process. So, if the reliability is not confirmed, this lacking will affect the production performance

4.4.3 Availability

This system will be dedicated to a particular client. So, the availability will be restricted of this system.

4.4.4 Maintainability

Software maintenance in software engineering is the modification of a software product after delivery to correct faults, to improve performance or other attributes. Maintainability of software is categorized in four classes

- **Adaptive** – dealing with changes and adapting in the software environment.

-
- **Perfect** – accommodating with new or changed user requirements which concern functional enhancements to the software.
 - **Corrective** – dealing with errors found and fixing it.
 - **Preventive** – concerns activities aiming on increasing software maintainability and prevent problems in the future.

So, to maintain our system we will try to concentrate on these four classes.

4.4.5 Portability

Portability is the degree to which software running on one platform can easily be converted to run on another. Portability is hard to quantify, because it is hard to predict on what other platforms the software will be required to run. So, to make our system portable we have to use languages, operating systems and tools that are universally available and standardized.

4.4.6 Operational Requirements

The system can be viewed by open-source Mozilla Firefox.

- The system is supported by the IIS (Internet information's system).
- The team used MySQL database to develop and maintain the database management systems.

Chapter 5 Use Cases and Class Diagrams

5.1 Use Case Diagram

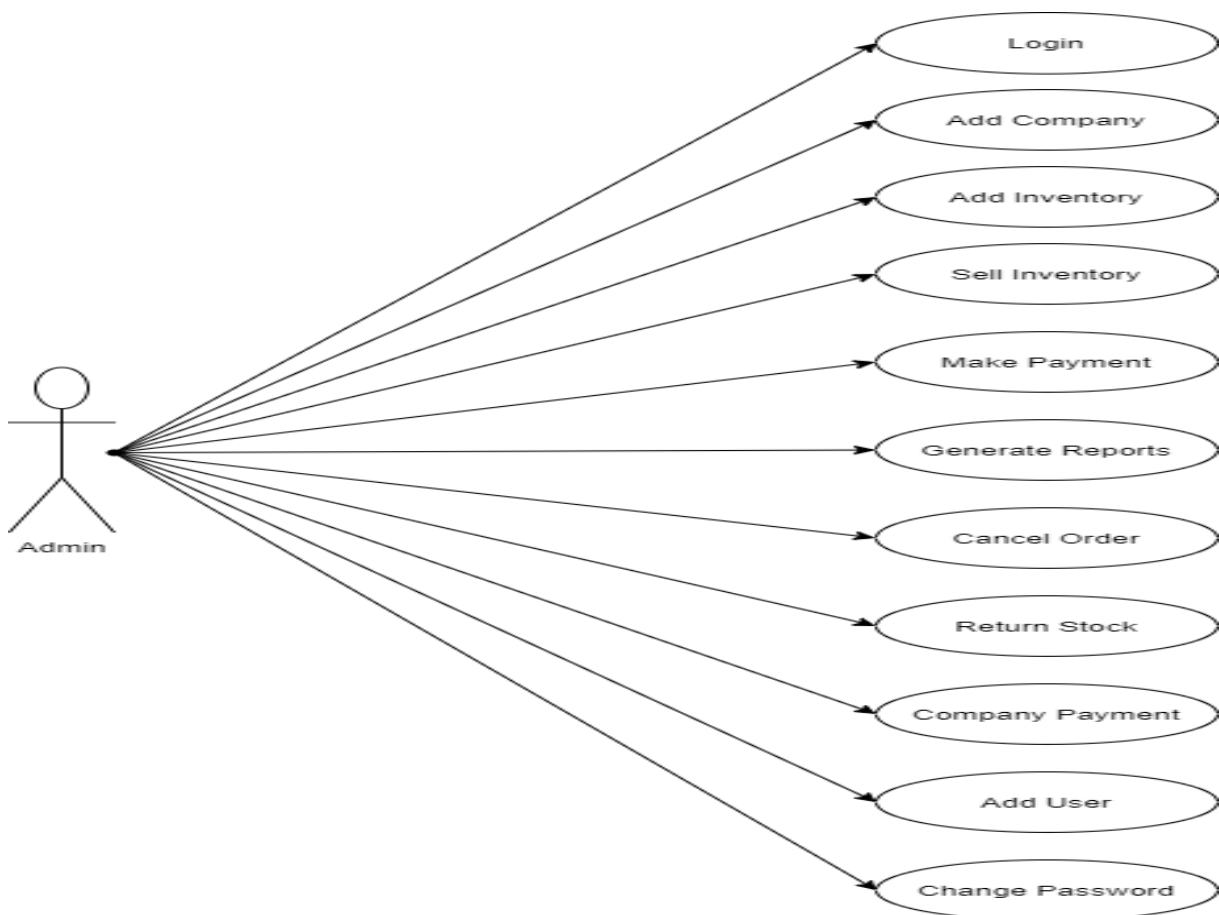
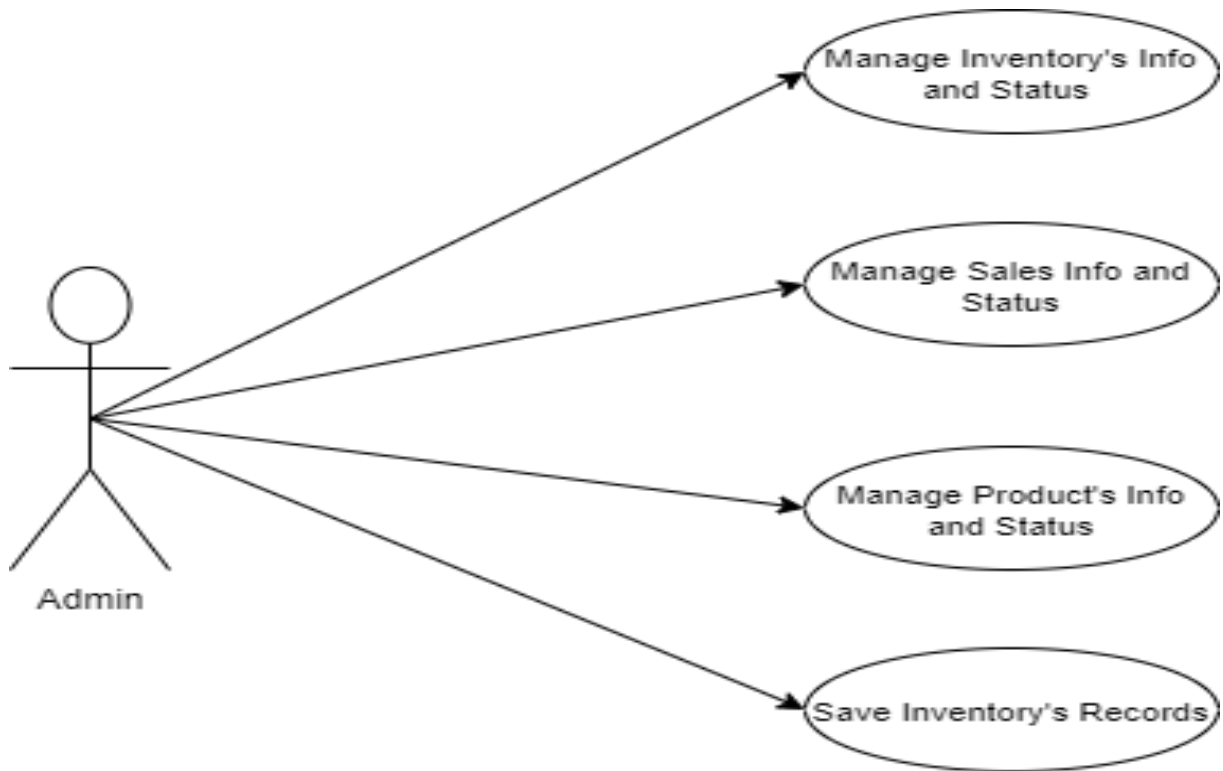
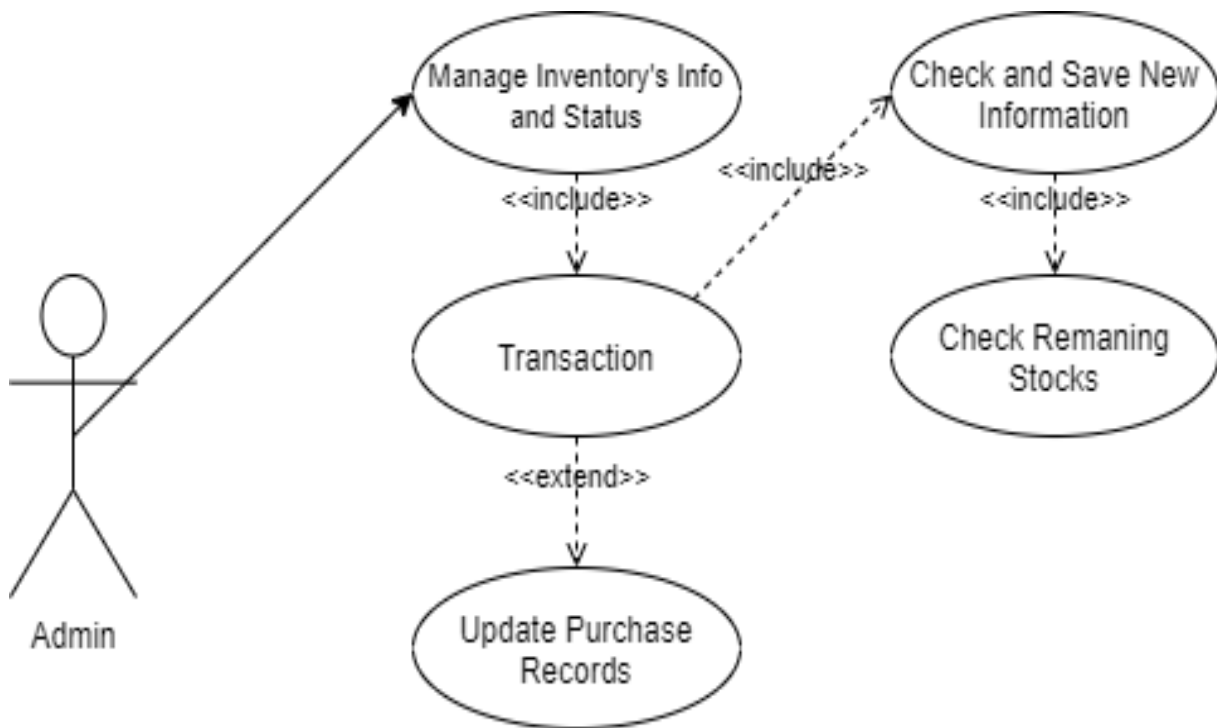


Figure 5.1: Use Case Diagram



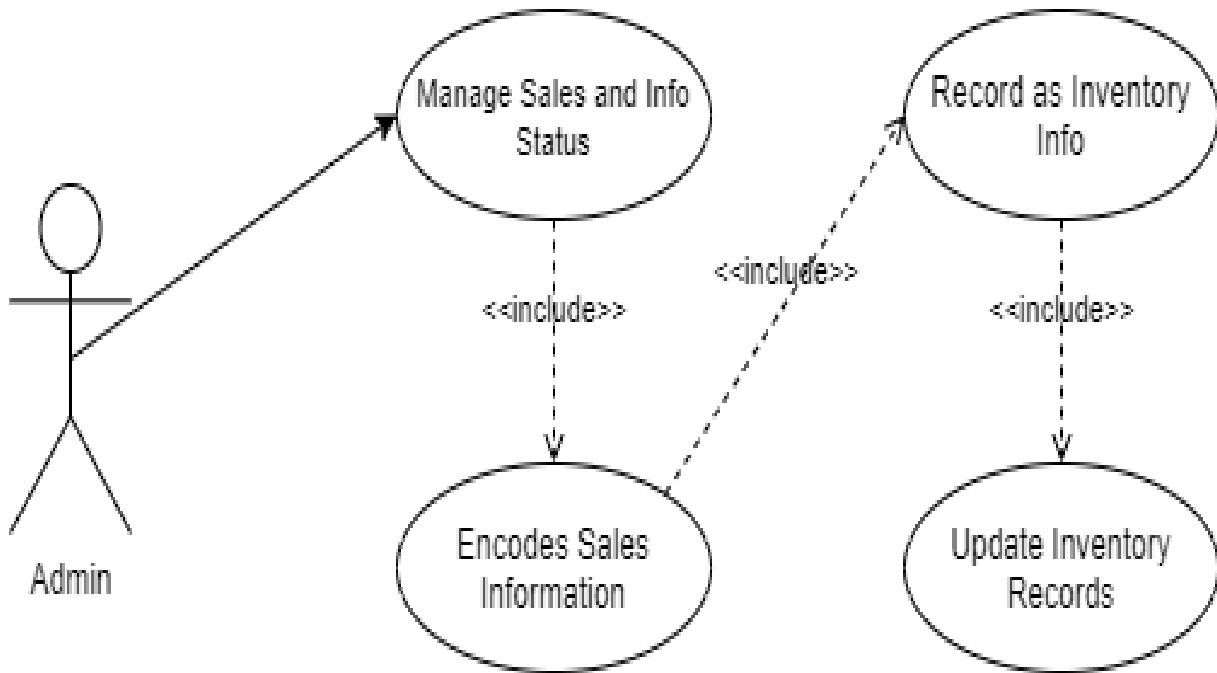
General Use Case

Figure 5.2: Use Case Diagram



Manage Inventory's Info and Status

Figure 5.3: Use Case Diagram



Manage Sales Info and Status

Figure 5.4: Class Diagram

5.2 Class Diagram

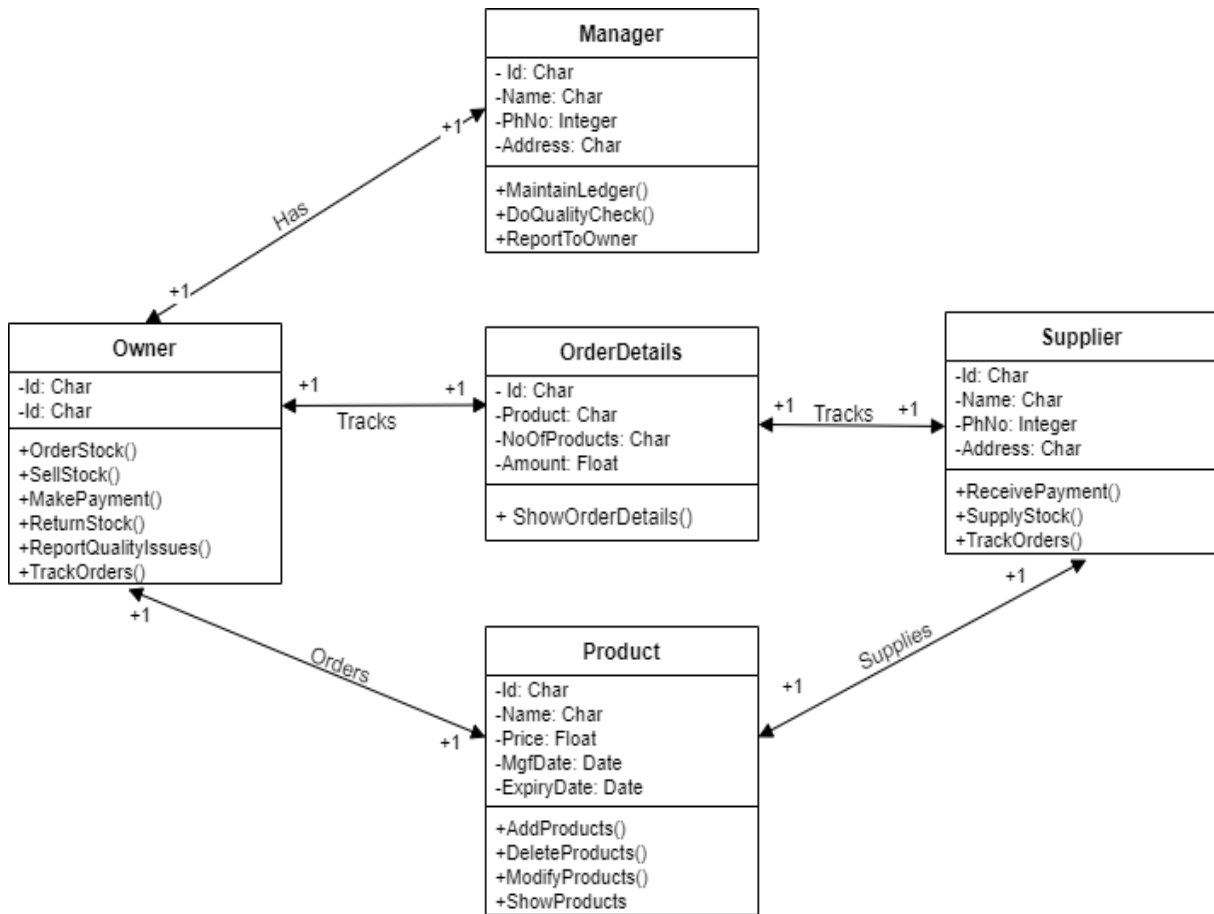


Figure 5.5: Class Diagram

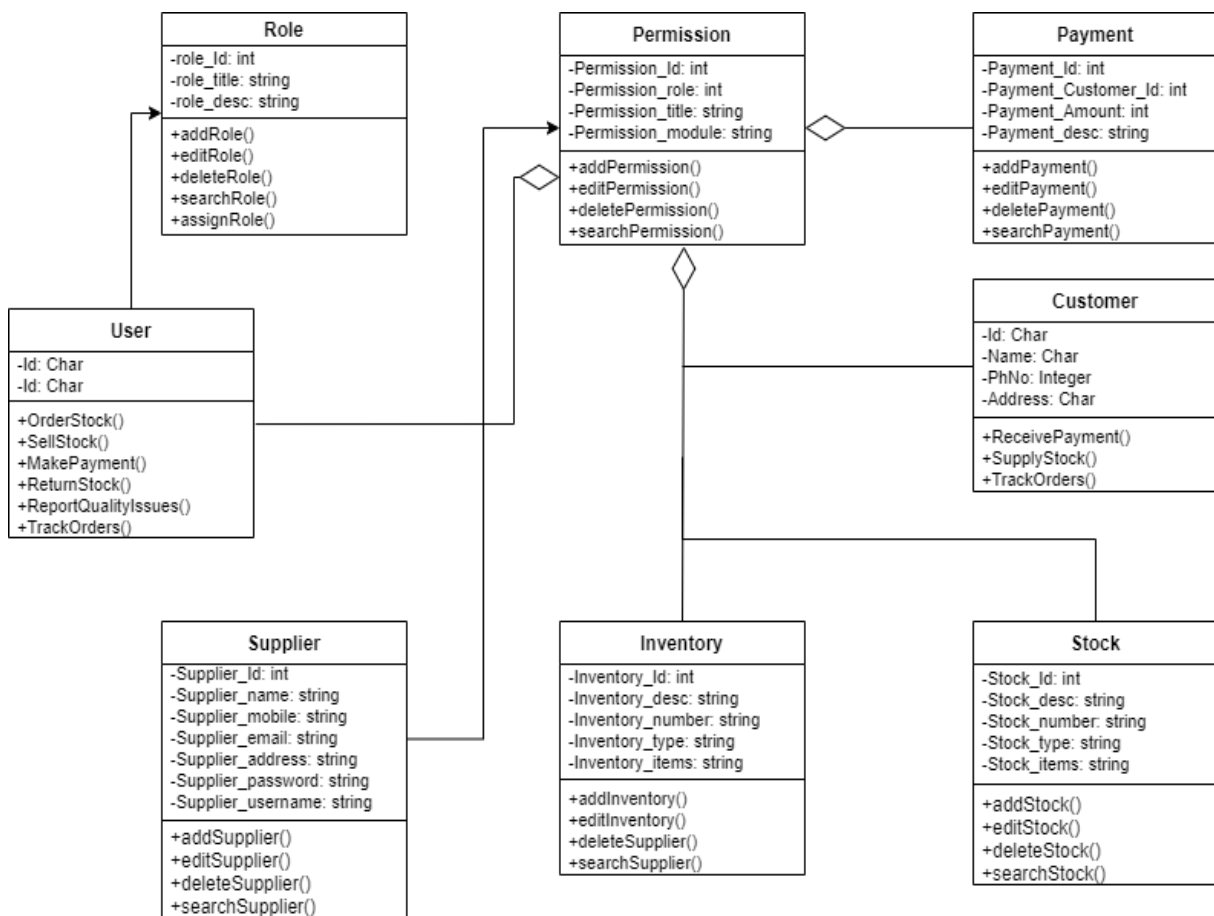


Figure 5.6: Class Diagram

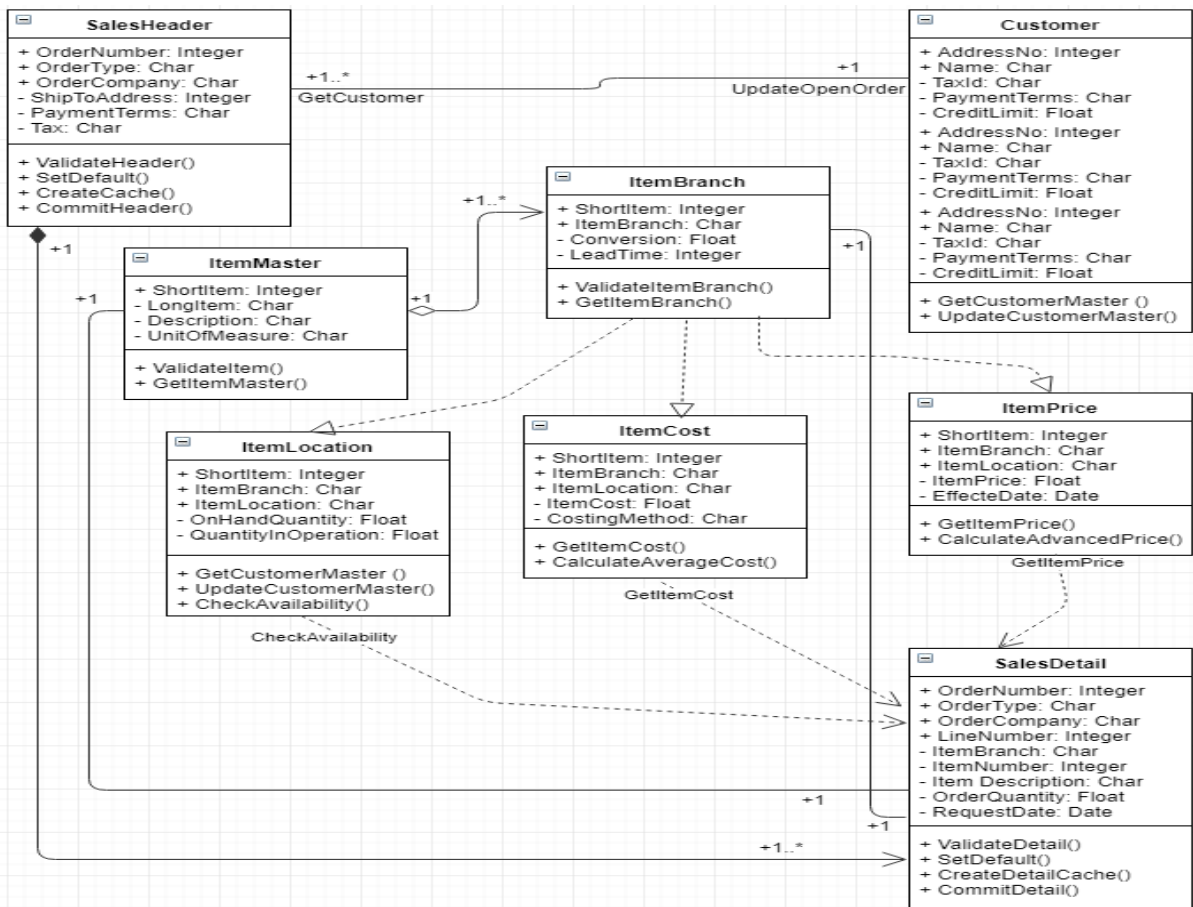


Figure 5.7: Class Diagram

Chapter 6 Requirement Traceability Matrix

REQUIREMENTS TRACEABILITY MATRIX					
Project Name: Inventory Management System					
Business Requirement document BRD		Function Requirements Document FSD			Test case Document
Business Requirement id#	Business Requirement/Business use case	Function Requirement id#	Function Requirement/use case	priority	Test case ide
BR_1	Administrative module	Fr_1	Supplier Operations	High	TC#001 TC#002
		Fr_2	Product Operations	High	TC#003 TC#004
		Fr_3	Purchase Records	medium	TC#005 TC#006
		FR_4	Add/Delete Customer	High	TC#007 TC#008
		FR_5	Current Stock	High	TC#009 TC#008
		FR_6	Sales	High	TC#010 TC#011

Figure 6.1: Requirement Traceability Matrix

Chapter 7 Manual Test Cases

TEST CASE ID	TEST SCENARIO	TSET CASE	PRE-CONDITION	TEST STEPS	TEST DATA	EXPECTED RESULT	POST CONDITION	ACTUAL RESULT	STATUS
TC_LOGIN_001	Verify the login of system	Enter valid user name and valid password	Need a valid account to login	1.Enter valid username	<Valid user name>	Successful login	Homepage	Homepage	Ok
				2.Enter password	<Valid password>				
				3.Login					
TC_LOGIN_001	Verify the login of system	Enter valid user name and invalid password	Need a valid account to login	1.Enter valid username	<Valid user name>	Invalid credentials	Error	Error	Ok
				2.Enter password	<Invalid password>				
				3.Login					
TC_LOGIN_001	Verify the login of system	Enter invalid user name and valid password	Need a valid account to login	1.Enter valid username	<Invalid user name>	Invalid credentials	Error	Error	Ok
				2.Enter password	<valid password>				
				3.Login					
TC_LOGIN_001	Verify the login of system	Enter invalid user name and invalid password	Need a valid account to login	1.Enter valid username	<Invalid user name>	Invalid credentials	Error	Error	Ok
				2.Enter password	<invalid password>				
				3.Login					

Figure 7.1: Login Test Case

TC_SUPPLIERS_001	Verify insertion of supplier's details	Enter full datils	Need a valid information of supplier	1.Enter valid username	<Valid user name>	Successful addition	Supplier added	Supplier added	Ok
				2.Enter other details	<Valid phone>				
				3.add	<Valid address>				
TC_SUPPLIERS_001	Verify insertion of supplier's details	Enter valid user name and invalid password	Need a valid information of supplier	1.Enter valid username	<Valid user name>	Invalid credentials	Give proper details	Give proper details	Ok
				2.Enter other details	<null field>				
				3.add	<Valid address>				
TC_SUPPLIERS_001	Verify insertion of supplier's details	Enter invalid user name and valid password	Need a valid information of supplier	1.Enter valid username	<Invalid user name>	Invalid credentials	Give proper details	Give proper details	Ok
				2.Enter other details	<valid phone>				
				3.add	<null value>				
TC_SUPPLIERS_001	Verify insertion of supplier's details	Enter invalid user name and invalid password	Need a valid information of supplier	1.Enter valid username	<Invalid user name>	Invalid credentials	Give proper details	Give proper details	Ok
				2.Enter details	<invalid phone>				
				3.add	<null value>				

Figure 7.2: Supplier Test Case

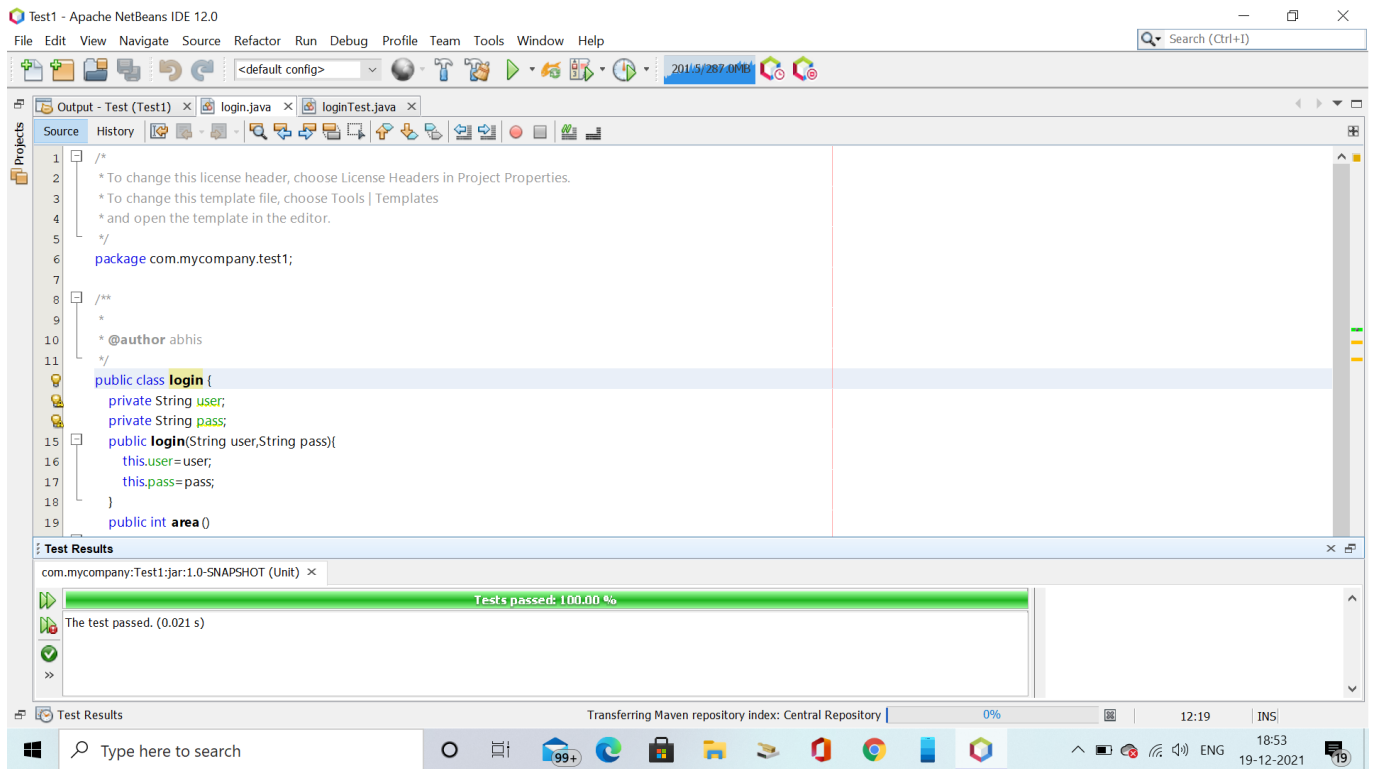


Figure 7.3: Login Test Case

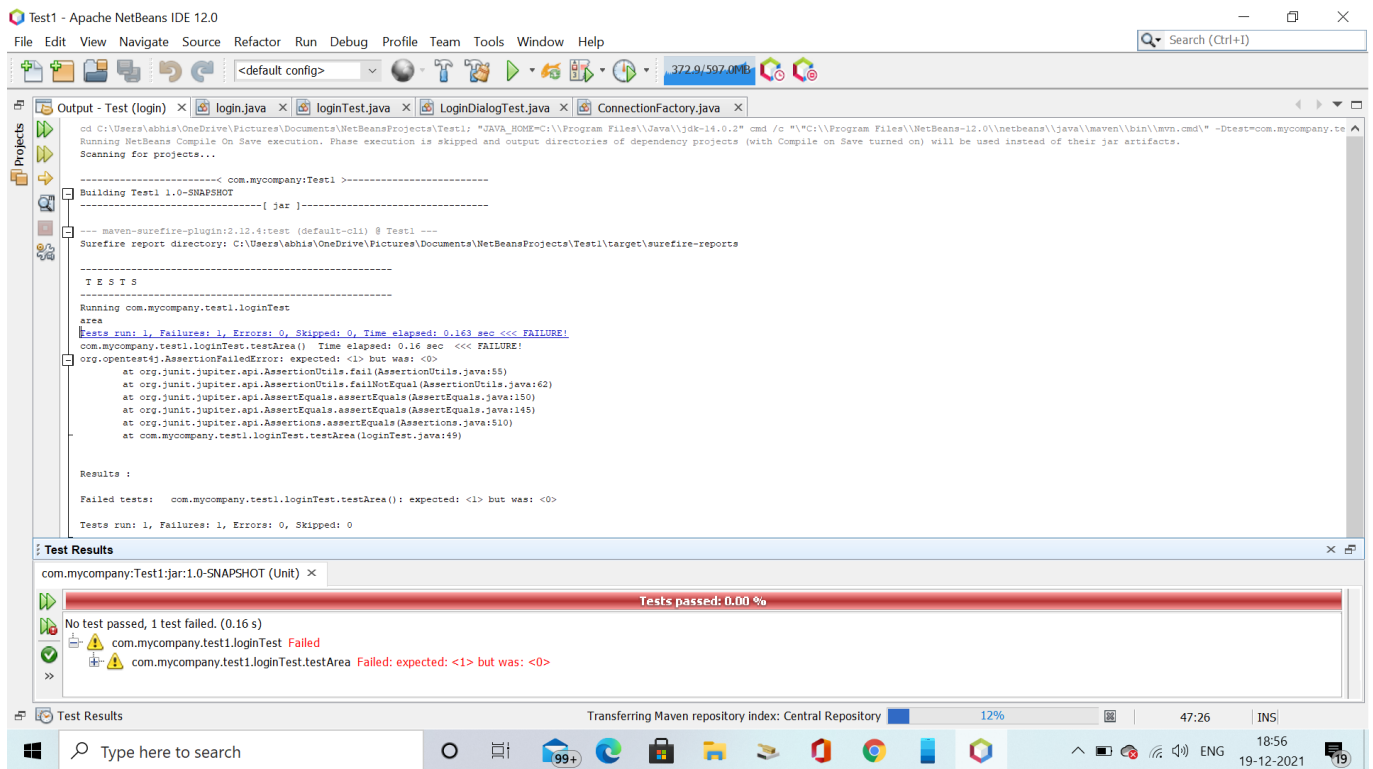


Figure 7.4: Login Test Case

Chapter 8 Conclusion and Reference

8.1 Conclusion

As part of mini project we built inventory management system using java . System contains 7 modules . We used Junit Testing to test each module module unit.

8.2 Reference

1. www.academia.edu
2. scholar.google.com
3. Book:” Software Engineering- A Methodical Approach” by Elvis C. Foster.