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Department of Software Engineering, FSIT

Project / Thesis SWE-431

Project Documentation

Garments ERP System (Commercial And Audit)

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Approval

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Acknowledgement

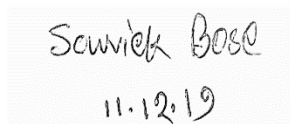
First of all, I am very much blessed as I have successfully reached towards the final semester. And so this is why I am pleased to my almighty. From the very beginning of my university life, I have learned a lot about software engineering as well as core computer science related knowledge from my course teachers. Moreover, they teach us ethics, morality and politeness.

Besides, I am so much thankful to my parents that, I was always supported by them. They always prioritize my opinion and inspired me as well.

I am also so many grateful to my supervisor **Ms. Tapushe Rabaya Toma** for allowing me to work with this project. He always supports me to make this projects successful.

DECLARATION

We hereby declare that we have taken this thesis under the supervision of **Ms. Tapushe Rabaya Toma, Senior Lecturer, Department of Software Engineering, Daffodil International University**. We also declare that neither this project nor any part of this has been submitted elsewhere for award of any degree.



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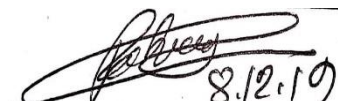
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Abstract

I have started to develop this project from April. From the very starting of development of this project, it demands hard working, patients, persistency to meet the requirements of stakeholders. After that I have proposed the design. And then started to work.

Database plays a vital role for any application software. And so this is why, I have designed the database diagram having tables with proper relationship. After that, I have prepared the user interface and take their approval to continue to the next part. It is to be said that, the interface of my application is very simple and easy to understand. After completing that, I have started to write the core functionality of the project.

Developing project is not end of all tasks actually. There are some other important tasks to perform. And that is testing. It is also known as quality assurance also. Almost at every software company there are a quality assurance team. Their main responsibility is to find the loop holes or vulnerability of software. If there any bug remains before handover to the stakeholders, there is a change to ruin the whole project. So testing plan is very important. And after developing the project, I have tried to assure the quality of this project.

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Chapter 1

Introduction

1.1 Project Overview

Nowadays digital system itself becomes an essential component for every business infrastructure. Nowadays paperless communication enables people to access to everything by their unique identity like fingerprints or passwords. It has also successfully reduced the clutters of disorganizations which may arrive from files related to papers. Digital papers reduce the office space that required for business and gives more ability to access to information. Digital collaboration or payment gateway seems to be possible by digitization also. Bangladesh is a big number of garments. Also, there are so many big and small garments and have so many garments worker. But every garment does their everyday work with analog system. That's why they face so many problems, loss their documents, money also they get a low amount of profit from their garments business.

Every garment has so many workers for their daily necessary work, but garments need to pay them every month a big amount. Garments face a lot of difficulties for this analog system though garment sector is a big source for earning foreign money that's why we need to develop this system. For this difficulties Garments ERP System helps our garments sector. Reduce their unnecessary paying worker bill also reduce unnecessary worker. This solution supports multi-currency and multi-location-based operations. It's also integrated with other modules of Garments ERP including finance, accounts, HR, supply-chain etc. With this automated solution

We are going to make a web-based application especially for desktop based. By using this system, garments can be benefited as they would not face any hassles to make a good profit from their investments. Then this garments sector are developed with our country.

1.2 Project Purpose

The main purpose of this project named “Garments ERP System” is to make an automation system which might be helpful for a big number of garments from different perspective by solving their a few problems and also do their daily work in a short time with a short amount worker. So that’s why we are going to develop such a project.

1.2.1 Background

Suddenly we notice that, Garments owners from our country is facing a lot of problem at the time of their production. A big Number of garments owners are being suffering, but there is not any solution. So, considering that, we have brainstormed and thinking that our problem is going to solve their problems.

1.2.2 Advantages & Beneficiaries

Our system would be useful for a few purposes of read. Now, I’m mentioning those below:

- ☐ Manage & integrate all aspects of the business key functions as well as order entry, sample, IE, inventory, marketing, production & Finance.
- ☐ Determination to attain lower costs, higher quality and faster delivery, as a result, increase in confidence from business partners and consumers.
- ☐ Provides right data to the proper folks at the proper time anyplace within the world, sectionalize you to enhance productivity, enhance deciding capabilities and promote communication between co-workers, suppliers and consumers.
- ☐ Reduce and eliminate duplicate work and alter operational tasks to avoid wasting time & money.
- ☐ Turn the method of access data straightforward with correct confidentiality.
- ☐ Standardizes the producing processes and improves quality inside multiple business units across the corporate.

I have conjointly mentioned some advantages similarly as beneficiaries. So, I feel this technique is incredibly a lot of useful for users.

1.2.3 Goals

The main goals of this project is to develop a system desktop based on pc. As more than 80% office use windows operating based device, so we are targeting to implement our system firstly for windows users. Our proposed system has six modules. And we have limited time and resource, so this is why I am developing the module named “Commercial And Audit”. Because we really believe in quality products.

1.3 Stakeholders

There are two types of stakeholders in our “Commercial and Audit”. Such as:

- Auditor

Now, I will write a brief description about stakeholders.

Auditor: Auditor can check all order, supply, Import, export proforma invoice. The auditor also edits the order also he can add product, edit product from store. Auditor receive report and verify the report and also inquiry the report then send it for store and also send update to bank, garments owner also.

1.4 Proposed System Model

Before going to develop a system, it is very important to have a system model. We have already prepared a system model. This model will clarify our proposed system in brief.

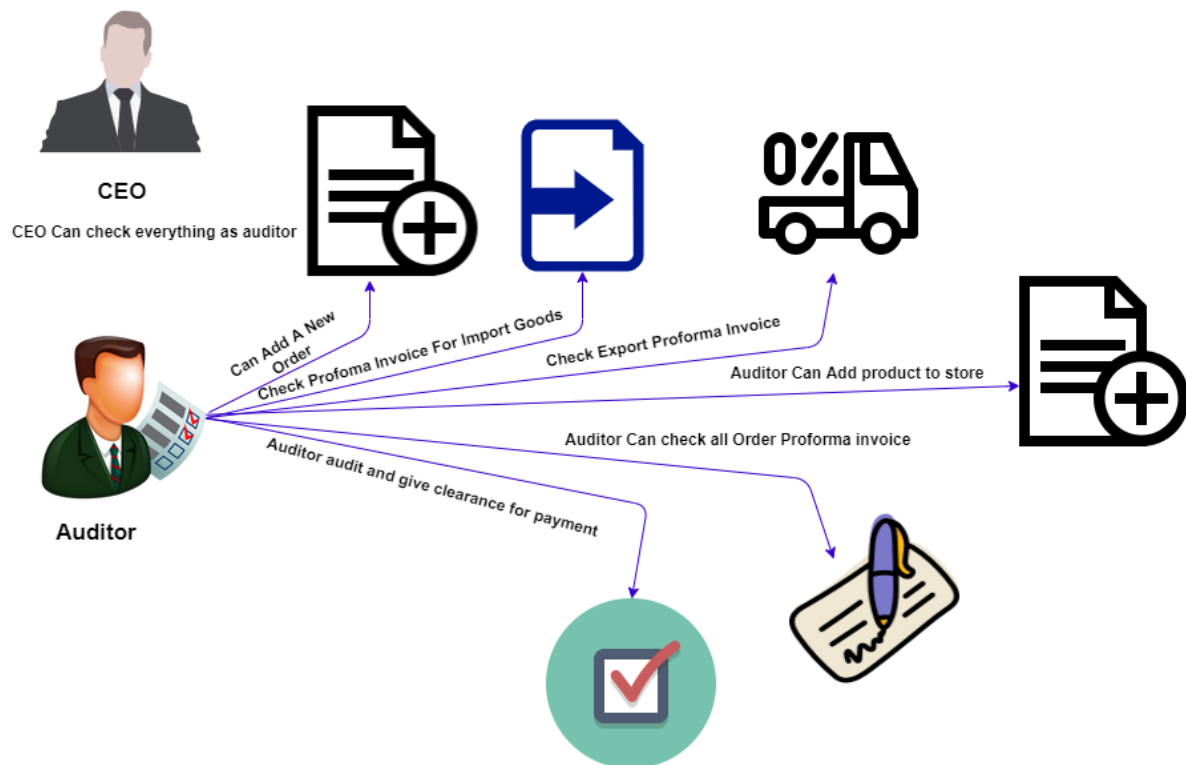


Figure 1.1: Proposed system model (Commercial and Audit)

Our project named “Garments ERP System” is going to be developed based on desktop base, especially on windows operating system. This system reserve different types of modules as well as user privileges. And each module architecture is different from another one. Before describing project overview, I need to expose about our system module architecture.

Such as:

- Add A New Order Module
- Edit New Order and Check Proforma Invoice Module
- Check Import Proforma Invoice Module
- Check Export Proforma Invoice Module
- Add Products on Store Also Can Edit Module
- Check Whole Proforma Invoice for Individual Order Module

1.5 Project Schedule

We need to prepare a scheduling plan to complete the project on time. It also refers to make communication with what task need to get done within timeframe.

1.5.1 Gantt Chart

Gantt chart is mainly a production control tools. It remained us to complete our assigned tasks within a certain period of time. For developing software, it is mostly used. Now I will show a Gantt chart for our project.

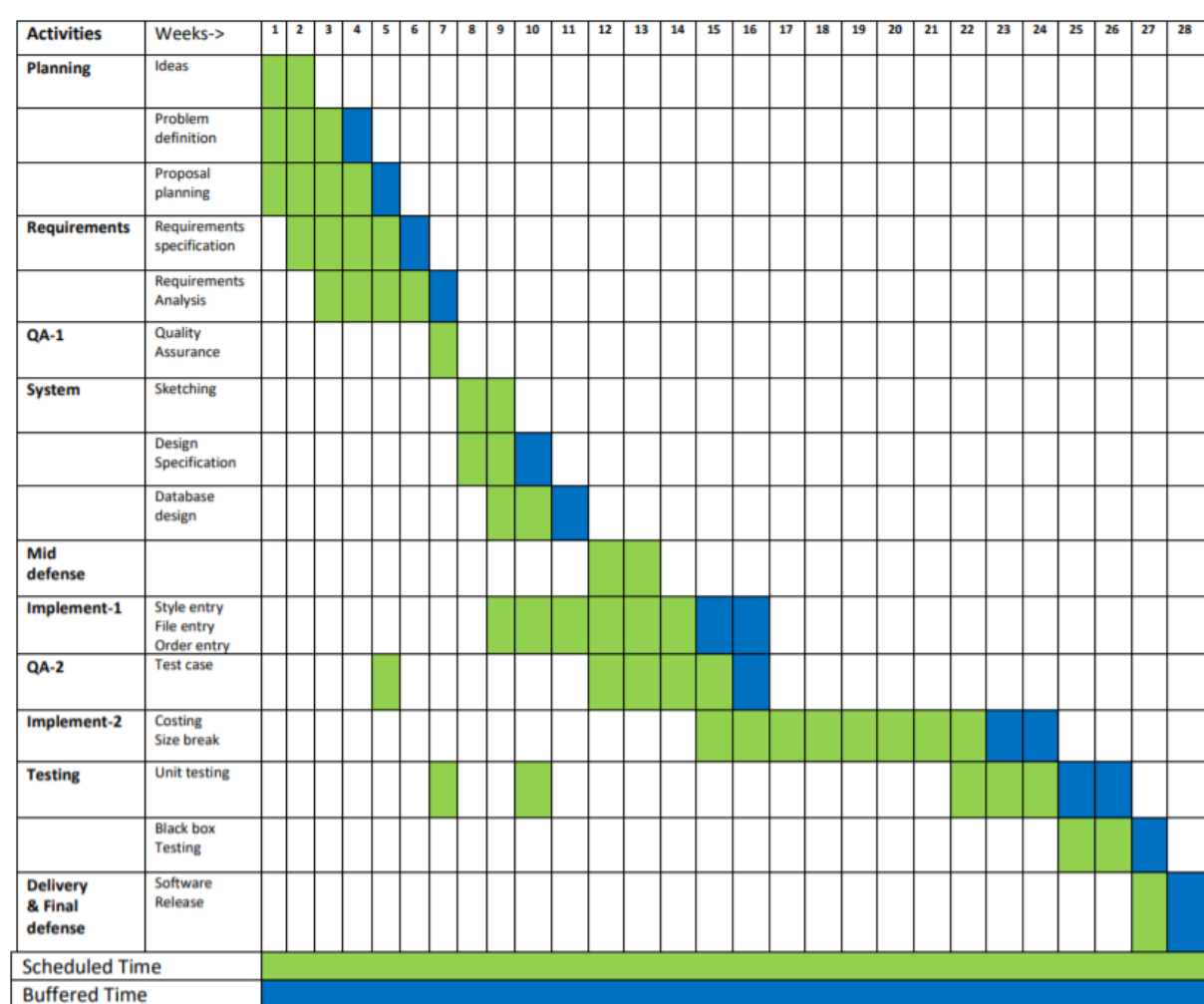


Figure: Gantt Chart

Figure 1.2: Gantt Chart

1.5.2 Release Plan or Milestone

The release plan or milestones are given below:

Activities	Duration in week	Total Week
Brainstorming	Week 1	1
Problem identification	Week 1, Week 2	2
Requirement specification	Week 2	1
Requirement analysis	Week 2	1
Sketching	Week 4	1
Design specification	Week 4	1
Database design	Week 5	1
Vehicle search	Week 5, Week 6, Week 7, Week 8	4
Quality assurance	Week 3,	1
Test case	Week 3, Week 7, Week 8, Week 9	4
Impose case & demerits	Week 10, Week 11, Week 12, Week 13	4
Unit testing	Week 11, Week 12	2
Black-box testing	Week 13, Week 14, Week 15	3
Software release	Week 16	1

Chapter 2

Software Requirement Specification

2.1 Functional Requirements

Functional requirements refer to the functions which are mandatory to the system. Functional requirements must be able to perform on the software system. Every system must have some functional requirements. Now, we are going to mention functional requirements associating with our project.

2.1. Manager Manage Account

Requirements 1	Commercial manager manage account
	Commercial and audit manager can manage account for go through the activity.
Stakeholders	Commercial and audit manager

2.1.2 Manager Make Order

Requirements 2	Commercial manager make order for production
Description	Commercial and audit manager set order with proper information and set the order individually. And also, can edit.
Stakeholders	Commercial and audit manager

2.1.3 Manager Check Order

Requirements 3	Commercial manager can check order
Description	When commercial and audit manager view order then he can search them individually with order ID and check order .
Stakeholders	Commercial and audit manager

2.1.4 Manager Check Imports Goods

Requirements 4	Commercial and audit manager check import goods list
	After getting the order manager can check the imports goods list for the order and give the clearance.
Stakeholders	Commercial and audit manager

2.1.5 Manager Check Export Order

Requirements 5	Commercial and audit manager can check export order
Description	Then the manager can check export order details for give the clearance for shipment.
Stakeholders	Commercial and audit manager

2.1.6 Manager Check Storage

Requirements 6	Commercial and audit manager can check storage
Description	Commercial and audit manager check storage for investigate and add products on store.
Stakeholders	Commercial and audit manager

2.1.7 Manager Check Final Report

Requirements 7	Commercial and audit manager can check final report
Description	Commercial and audit manager can check the final report for give the shipment clearance for the order.
Stakeholders	Commercial and audit manager

2.2 Data Requirements

For defining data requirements, we need to build the model. For our system maximum data would be loaded from remote user. And for that purpose, we need to focus on some major points. Such as:

- Types of entity of the system
- Route data locations
- Capacity and resources of the data requirements
- Data source sequence
- Data availability schedules
- Quantity of data
- Availability of data

2.3 Performance Requirements

It is very important to maintain performance of any software system. To ensure performance, we need to maintain some steps. Now, I will explain some perspective by which we are going to enhance the performance of our project.

2.3.1 Speed & Latency Requirements

Speed and latency requirements must be ensured while retrieving data from the cloud server.

SLR-1	Search result must be faster.
Description	When Manager search for a order details, then the search result must show within seconds.
Stakeholders	Commercial and audit manager

2.3.2 Precision & Accuracy Requirements

Results that is to be shown to the end user needs to be accurate. Because, wrong information might be ruined the whole business process.

PAR-1	Search result must be accurate
Description	When manager search for a order, then the search result must be according to the input value given by commercial manager.
Stakeholders	Commercial and audit manager

2.3.3 Capacity Requirements

The developed system by us must be capable to handle user data, provide accurate information, handling database, manage http request etc.

CR-1	The system will handle thousands of data.
Description	The system needs to handle data thousands of data every moment.
Stakeholders	Commercial and audit manager

2.4 Dependability Requirements

The term dependability is measured based on four dimensions. Such as:

- Availability
- Reliability
- Safety
- Security

If we want to say that our system is dependable then it must fulfill the four dimensions. But there are other tasks. Like there is no way to make mistakes or our system should have the ability to detect and then remove errors. Besides that, it is also very important to limit the damage which might be caused by system failure.

2.4.1 Reliability & Availability Requirements

Now, I will mention requirements which is related to reliability and availability.

RAR-1	The system must be available on 24 X 7
Description	<ul style="list-style-type: none">• Our system must be available all day long, every day in a week• The system must be updated regularly• System must be malware free
Stakeholders	Commercial and audit manager

2.4.2 Robustness or Fault-Tolerance Requirements

To ensure robustness and fault-tolerance facilities to the end users, it is urgent to ensure 0% crash. Moreover, it must show accurate results.

RFT-1	The system handles all user access without system errors
Description	Thousands of user might hit our application system at a time. All their requests must be handled without any fault.
Stakeholders	N/A

2.4.3 Safety-Critical Requirements

There are no safety-critical requirements in our project.

2.5 Maintainability & Supportability Requirements

It is very important to provide after service or support to the end users.

2.5.1 Maintainability Requirements

MR-1	System helps to update order
Description	It is very important to update order.
Stakeholders	Commercial and audit manager

2.5.2 Supportability Requirements

Supportability requirements may have related to some extends. Like:

- Testability
- Extensibility
- Adaptability
- Maintainability
- Compatibility
- Configurability
- Serviceability
- Install ability

Our system meets all of the above requirements related to supportability.

2.5.3 Adaptability Requirements

There are no adaptability requirements in our system software.

2.6 Security Requirements

Making software security as a requirement is very important. Software security requirements should be its functional requirement. Software security enforces security of an application system. Functionality related to software security can either be directly tested or observed. Some security related requirements are given below:

- Signing in a Manager
- Get access according to logged in CEO
- Set order for the individual order
- Signing out as a manager
- Handling encrypted passwords

While accessing to the system, each module must provide a central authentication mechanism. There is also a process to prevent entering into the system by ensuring hashed password for the unauthenticated users.

2.6.1 Access Requirements

For accessing to our application system, there remains some authentication and authorization techniques. And every module of our system will provide it. Now I will provide an explanation below.

AR-1	Application provides security mechanism.
Description	Every module is designed in such a way that it only give access to the authorized and authenticated users.
Stakeholders	Commercial and audit manager

2.6.2 Integrity Requirements

Integrity requirements refers to a security system which ensures an expectation of data quality. It also ensures that all data of the system would never be exposed to the malicious modification or accidental destruction. For that reason, we will store our user passwords as encrypted format which is impossible to decrypt. It is also called hashed password.

2.6.3 Privacy Requirements

It is very important to ensure privacy of the system users. Privacy requirements enhances to protect stakeholder's privacy. In this way, all data or a partial part of data are going to be disclosed according to system's privacy policy. To ensure privacy, the central database should be protected by the anonymous. Users are permitted to get access to those data which are being associated by them which can be ensured by the user log in system.

2.7 Usability and Human-Interaction Requirements

The main target of developing any system is to make the system user friendly and easy to usable for the end users.

2.7.1 Ease of Use Requirements

Our system is easy to use and also easily understandable.

EUR-1	Application must be usable for the end users.
Description	This ERP is enough usable to the commercial manager by which they can operate this system easily.
Stakeholders	Commercial and audit manager

2.7.2 Personalization and Internationalization Requirements

There are not any personalization and internationalization requirements to our system. This maiden version of our application is only be operated by Bangladesh.

2.7.3 Understandability and Politeness Requirements

It is already said that the system which we are going to develop, is understandable enough. The system provides hints to users whether any error occurred or wrong. By reading those errors users can be able to operate the system easily.

2.7.4 Accessibility Requirements

There are no specific accessibility requirements associated to our system yet.

2.7.5 User Documentation Requirements

Documentation are mainly two types. One is internal documentation which is generally written by the application engineers. It is prepared to make development life cycle easier for the system engineers or system analysts.

UDR-1	The system engineer documentation.
Description	To develop our system named smart Commercial ERP System, firstly we have make a system analysis team as well as documentation team.
Stakeholders	Commercial and audit manager

2.7.6 Training Requirements

Training requirements involved in after service of any system. It is very necessary to properly train up end users to the system so that they would be capable to operate easily. After launching the full package to the market, firstly we provide training to the different end users like commercial manager, auditor, CEO.

2.8 Look and Feel Requirements

Look and feel requirements mainly refers how the system will look like and how the user interface or graphical user interface of our system will display to the user.

2.8.1 Appearance Requirements

Commercial manager and all other user must know which input fields are required and which are not. For that reason, we will use labels for all input fields. Input fields might be text type, radio, checkbox, spinner etc.

AR-1	Labels of mandatory fields must be bold.
Description	The mandatory field's label must be bold, and all input fields must have placeholder to make it easier for the users.
Stakeholders	Commercial and audit manager

2.8.2 Style Requirements

After keeping all contents, it is very essential to load stylesheet to the system. For desktop application like windows system, extensive markup language or desktop base is used. It is to be said that we are going to develop our system at php. Style makes the system lucrative.

SR-1	The appearance must be controllable using stylesheet file.
Description	For desktop base system php is best. So, all stylesheet must be controllable by the php file.
Stakeholders	Commercial and audit manager

2.9 Operational and Environmental Requirements

Operational and environmental requirement refers to the capabilities, performance measurements, process, measurements of effectiveness, measurements of performance, measures of sustainability, measurements of technical performances etc.

2.9.1 Expected Physical Requirements

There are no expected physical requirements in our system.

2.9.2 Requirements for Interfacing with Adjacent Systems

There are no requirements for interfacing with adjacent system for our project.

2.9.3 Release Requirements

There are no specific release requirements in our system.

2.10 Legal Requirements

Legal requirements normally refer to the terms and conditions or privacy policy of any organizations. The terms and condition of our application is that, no third-party software or person are allowed to engage to use our data for their business purpose.

2.10.1 Compliance Requirements

There are no specific compliance requirements for our system.

2.10.2 Standards Requirements

There are no specific standards requirements for our system.

Chapter 3

System Analysis

3.1 Use Case Diagram

We have use case diagram. And there are one actor. Each actor plays different role. And those are already indicated to this use case diagram. This diagram will clarify our system in brief.

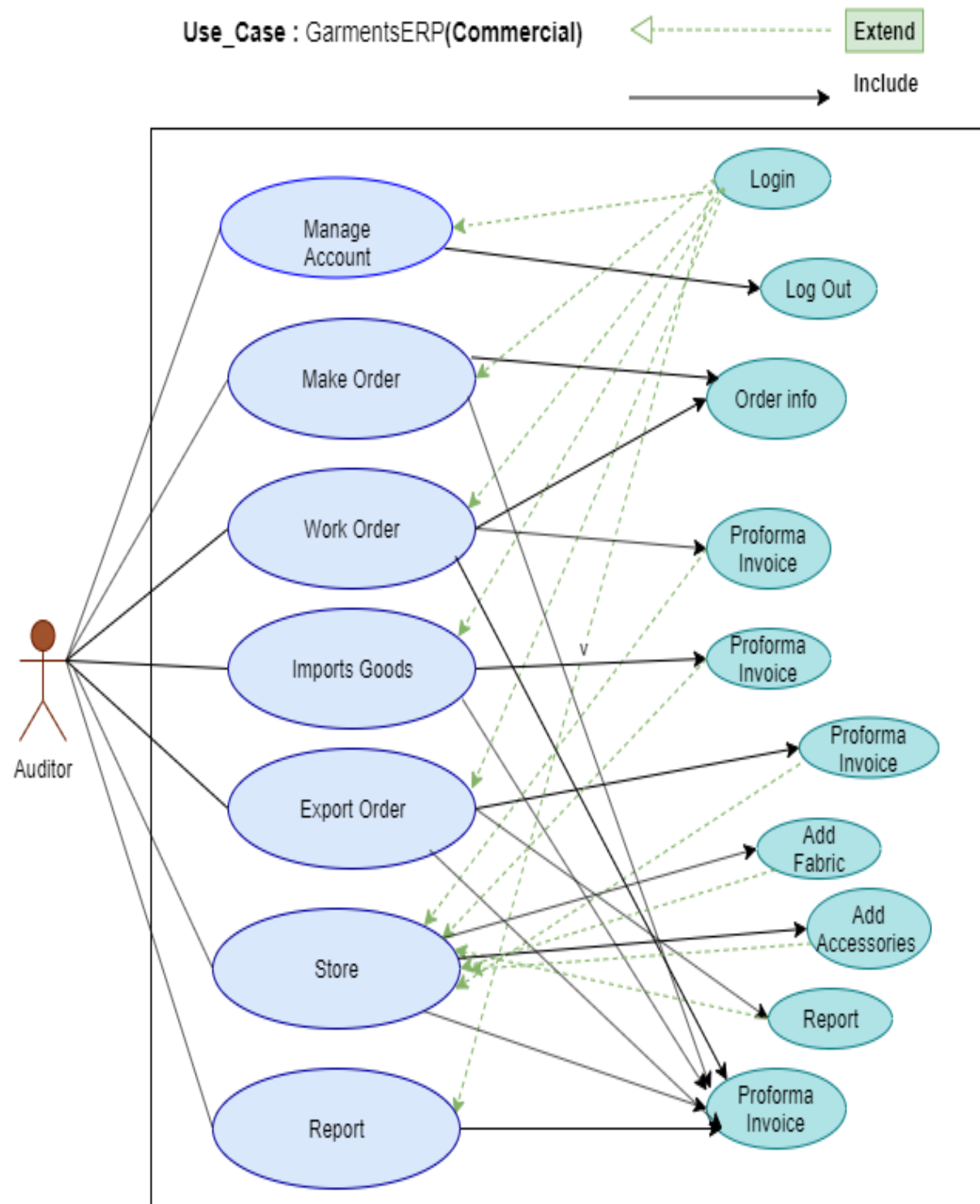


Figure 3.1: Use Case diagram for “Garments ERP System Commercial”

3.2.1 Commercial manager manage account

Use Case Title	Manager can login to the system
Goal	Manager can login for inquiry all information
Preconditions	<ul style="list-style-type: none">• User must be authenticated.• User type must be commercial manager
Success End Condition	Manager can view all related data.
Failure End Condition	Others cannot be able to save data
Primary Actors: Secondary Actors:	Commercial and audit manager N/A
Trigger	Order data visible to commercial manager
Description / Main Success Scenario	Commercial manager login to our platform for Making new products.
Alternative Flows	N/A
Quality Requirements	N/A

3.2.2 Commercial manager make order

Use Case Title	Manager can make order
Goal	Commercial manager can make a order details
Preconditions	<ul style="list-style-type: none">• User must be authenticated.• User type must be commercial manager
Success End Condition	Commercial manager can logout
Failure End Condition	Manager cannot be able to edit/delete the information
Primary Actors: Secondary Actors:	Commercial and audit manager
Trigger	Data come to the manager
Description / Main Success Scenario	Order data will be visible to the manager after providing Information.
Alternative Flows	N/A
Quality Requirements	N/A

3.2.3 Commercial manager check order

Use Case Title	Manager can check work order details
Goal	Manager can check the order details for investigation
Preconditions	<ul style="list-style-type: none"> • User must be authenticated. • User type must be commercial manager.
Success End Condition	Manager can make a new order for adjusting requirements
Failure End Condition	Manager can set order information
Primary Actors: Secondary Actors:	Manager N/A
Trigger	
Description / Main Success Scenario	When manager logged in successfully the he get a big amount of information about order. Then manager set a new order for production inquiry.
Alternative Flows	N/A
Quality Requirements	N/A

3.2.4 Commercial manager check import order list

Use Case Title	Manager can check import order list
Goal	Order related data view manager
Preconditions	<ul style="list-style-type: none"> • Manager must be registered. • User must set order.
Success End Condition	Manager can see the order information
Failure End Condition	Manager can view order related data
Primary Actors: Secondary Actors:	Manager
Trigger	Order related data can view manager
Description / Main Success Scenario	Manager can view all information about order. He can justify the information and then give the gat pass for assembly.
Alternative Flows	N/A
Quality Requirements	N/A

3.2.5 Commercial manager can check export order list

Use Case Title	Commercial manager can check export order data
Goal	Manager view a short number of export information
Preconditions	<ul style="list-style-type: none"> • Manager must be authenticated. • Manager must be authorized
Success End Condition	Manager can successfully edit information
Failure End Condition	Manager can edit but can't delete
Primary Actors: Secondary Actors:	Manager
Trigger	Order related data
Description / Main Success Scenario	Manager must provide required information to the Edited edition and It will be submitted for checking.
Alternative Flows	N/A
Quality Requirements	N/A

3.2.6 Commercial manager can check storage

Use Case Title	Manager can check storage
Goal	Manager can check storage and add product in storage
Preconditions	<ul style="list-style-type: none"> • Manager must be authenticated. • User type must be Manager.
Success End Condition	Manager see order related data in PI
Failure End Condition	Others can see the data properly
Primary Actors: Secondary Actors:	Manager
Trigger	Order related data come to manager site
Description / Main Success Scenario	Manager get proforma invoice for order and check them all For Next step work .
Alternative Flows	N/A
Quality Requirements	N/A

3.2.7 Commercial manager can check final report

Use Case Title	Manager can view and check final report data
Goal	Manager can view and check the final report data for investigation
Preconditions	<ul style="list-style-type: none">• Manager must be authenticated.• User type must be Commercial manager.
Success End Condition	Commercial Manager can view and give the clearance
Failure End Condition	Others can't view the information's
Primary Actors: Secondary Actors:	Manager
Trigger	Related data come to commercial approval
Description / Main Success Scenario	Commercial Manager can view .
Alternative Flows	N/A
Quality Requirements	N/A

3.3 Activity Diagram

We have prepared some activity diagram according to our use case. These activity diagrams are properly referring the flow of the individual conditions of our project.

3.3.1 Activity Diagram (Manage Account)

The activity diagram for commercial and audit manager for full system. The activity diagrams have all briefly information about work order, import, export, store, report.

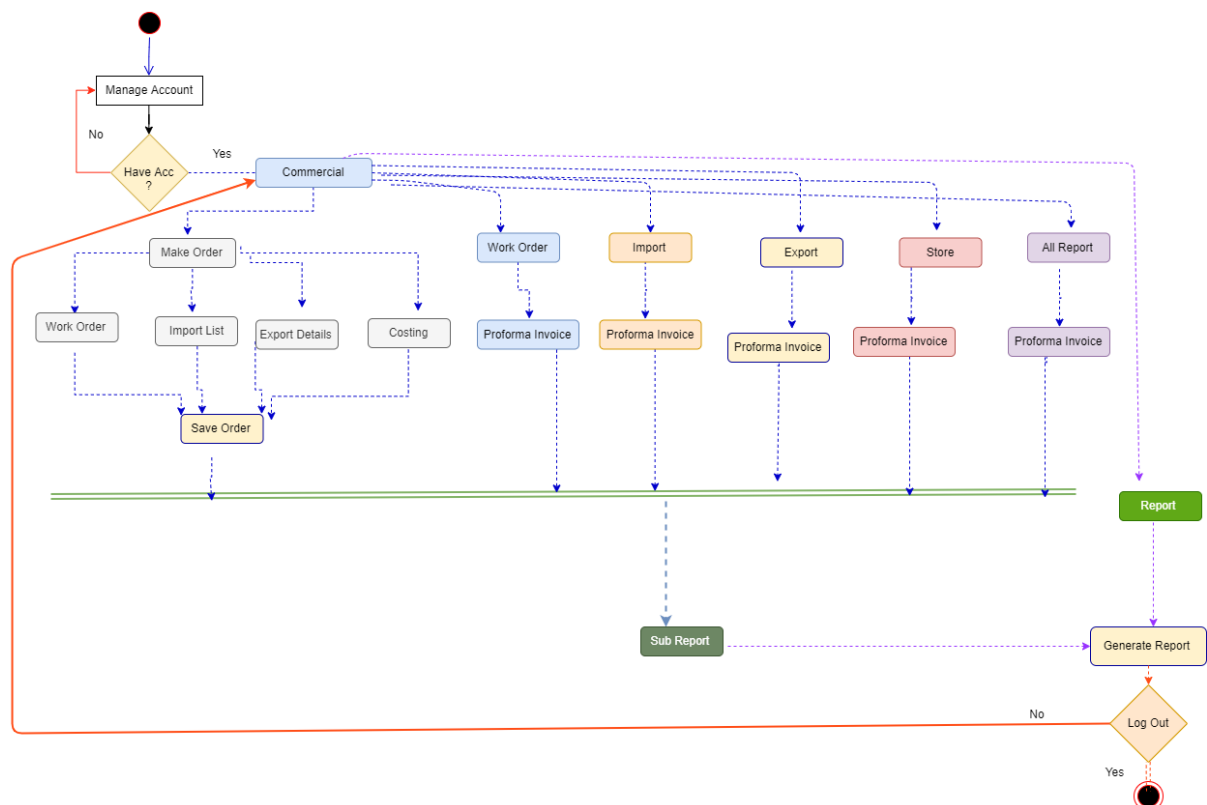


Figure 3.2: Activity Diagram for Commercial

3.3.2 Make Order

Commercial and audit manager can make order for supplying new order and save data for future investigation. For making new order manager want to give some information for input and then the order makes successfully.

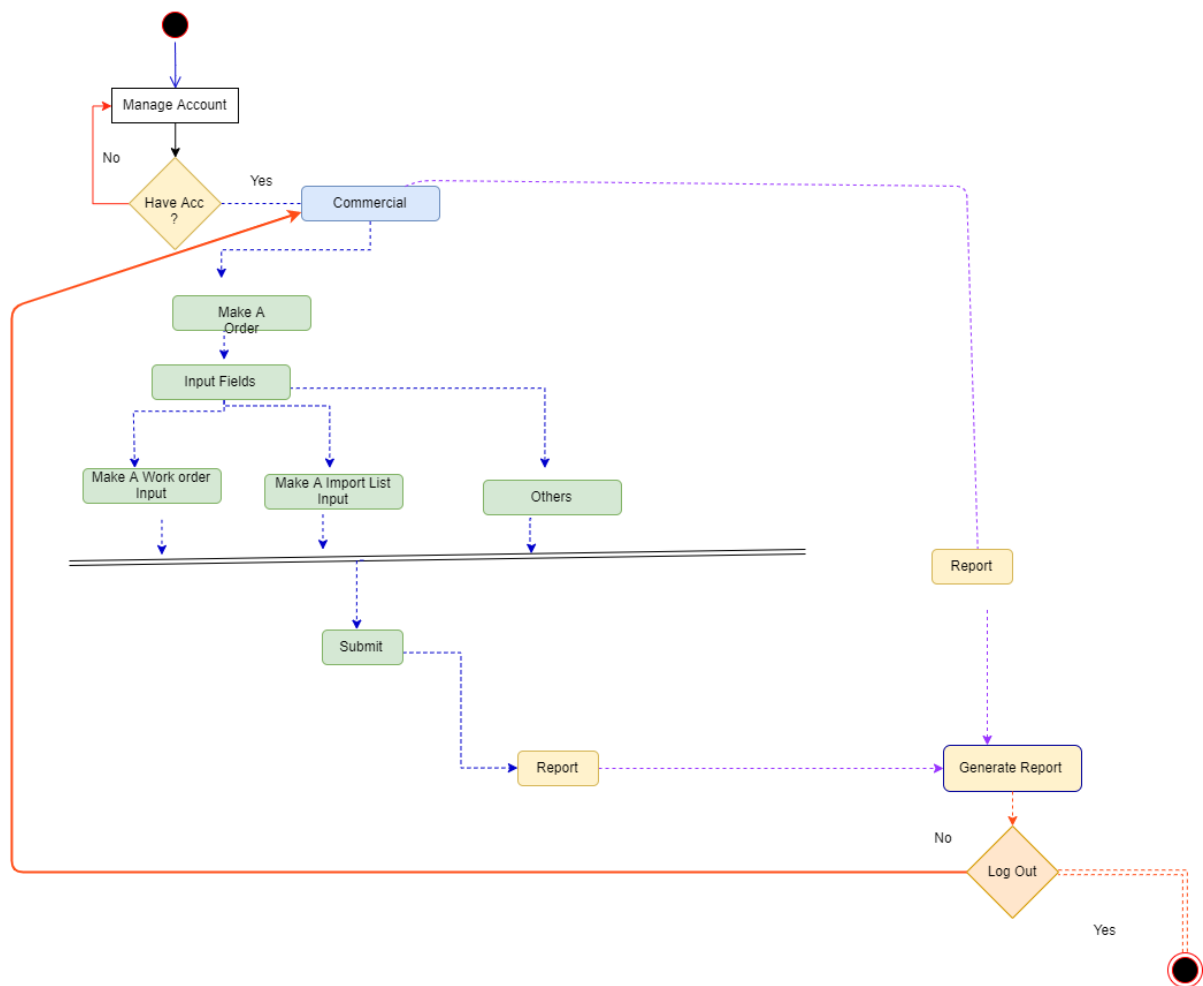


Figure 3.3: Activity Diagram for Make Order

3.3.3 Check Order

After completing the order making process, it is very important to Check the information and match the information all for good work. And commercial and audit manager can check the information's and check the proforma invoice and save the document for future inquiry.

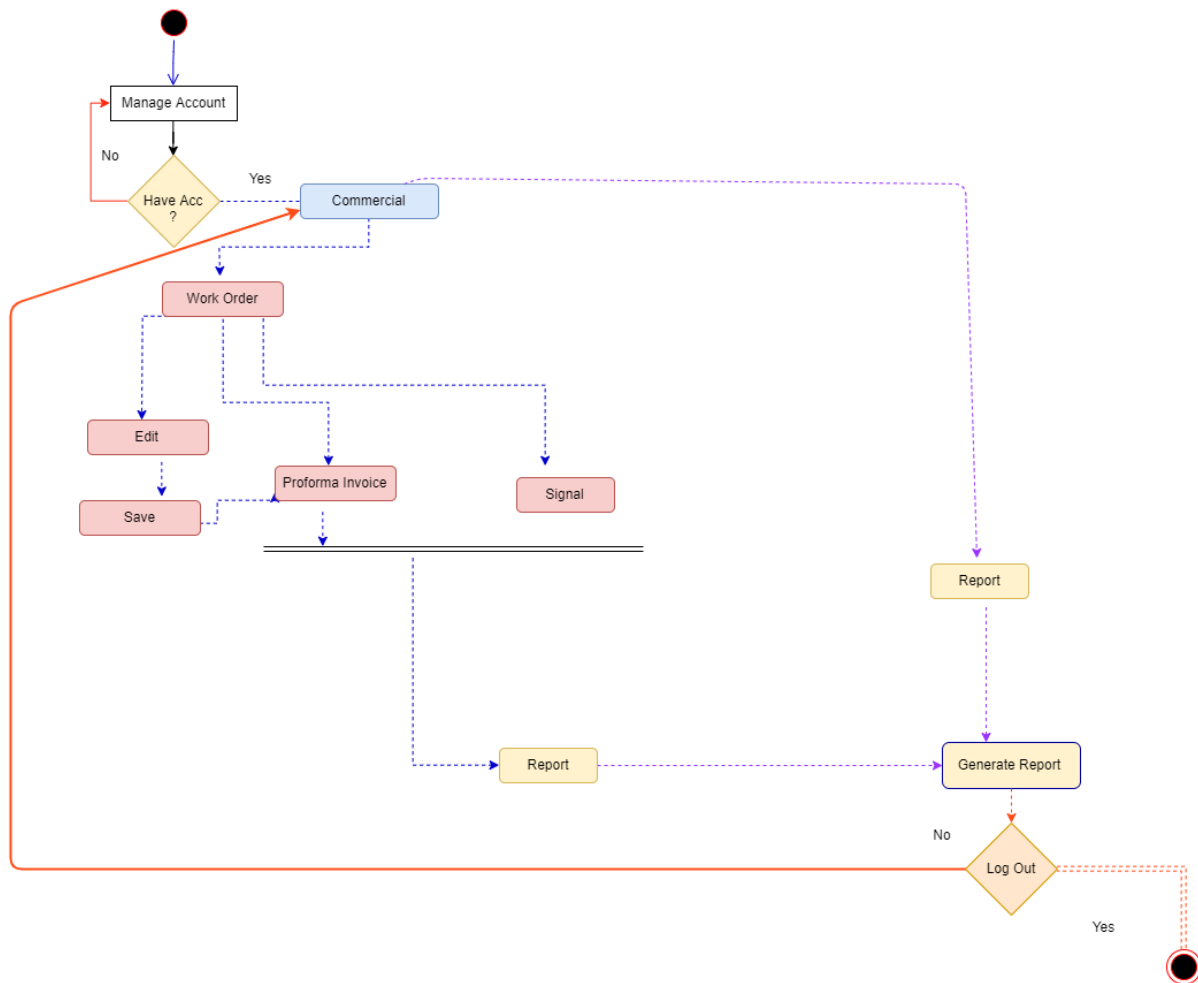


Figure 3.4: Activity Diagram for Work Order

3.3.4 Check Import Order

It Is very important part in commercial. When planner set the plan for import then commercial manager get the information and set a order then the information come to import goods list window then commercial and audit manager check the proforma invoice for import order.

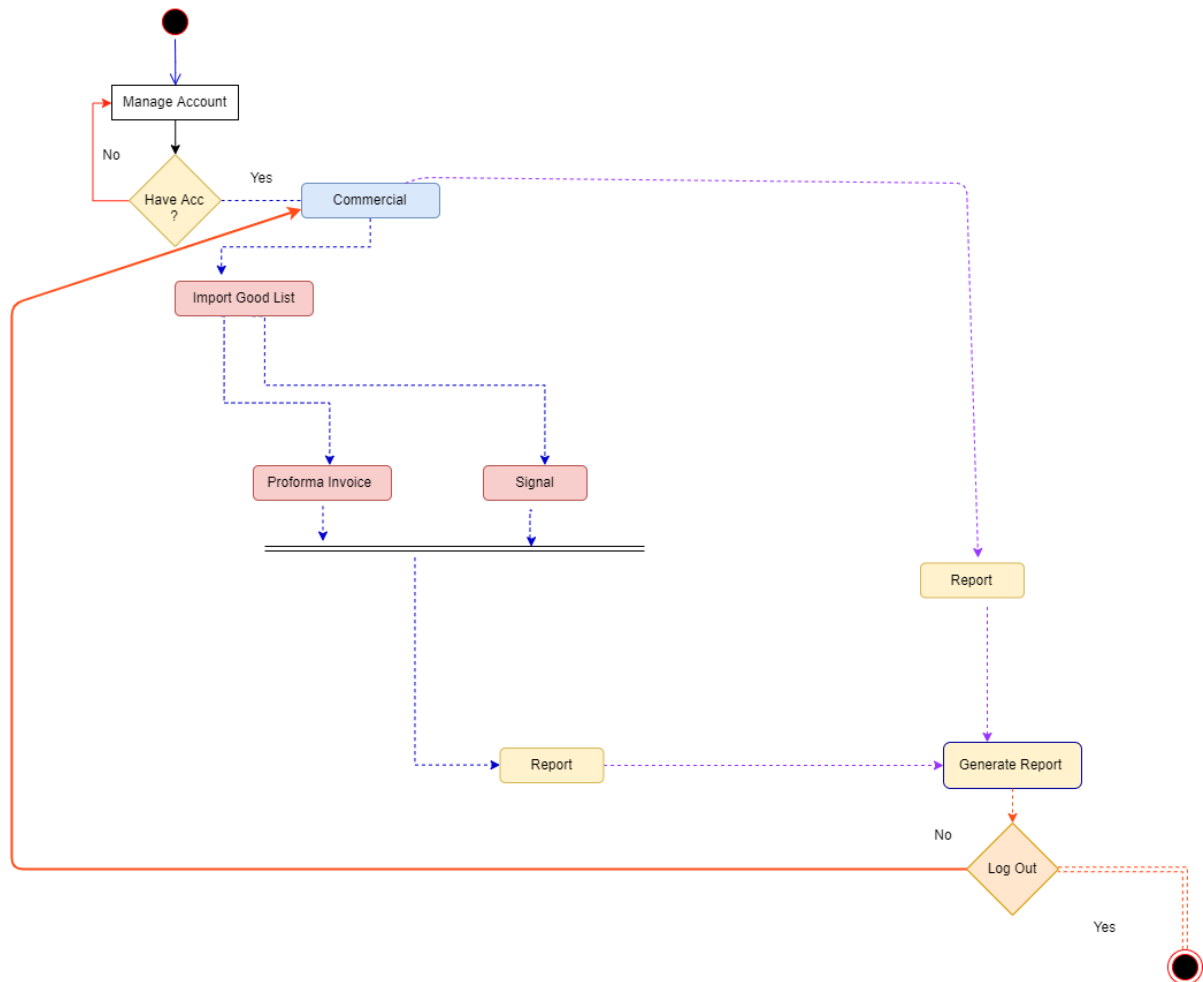


Figure 3.5: Activity Diagram for Import Order

3.3.5 Export Order

When all work is complete then commercial manager need to check export information's. Export part is one of the valuable parts of this project. In export order list there are so many information related with export. Then commercial and audit manager need to check the export information and give the clearance for shipment.

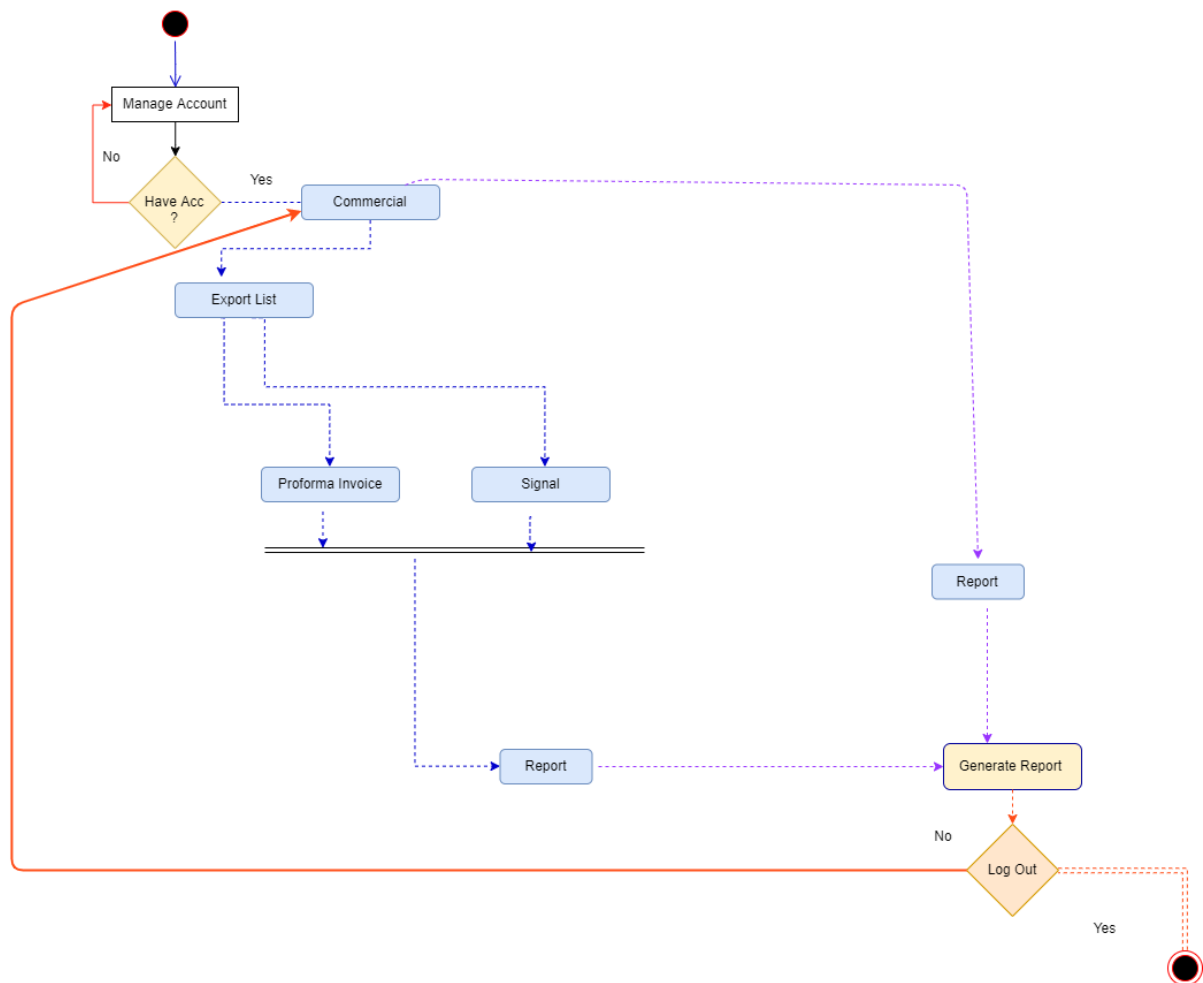


Figure 3.6: Activity Diagram for Export Order

3.3.6 Store

After complete import and export list then, commercial manager can check the store for reserve goods. If manager want then he adds fabrication, other materials and also can edit but can't delete. For site product manager can verify first the list then he add the products in store.

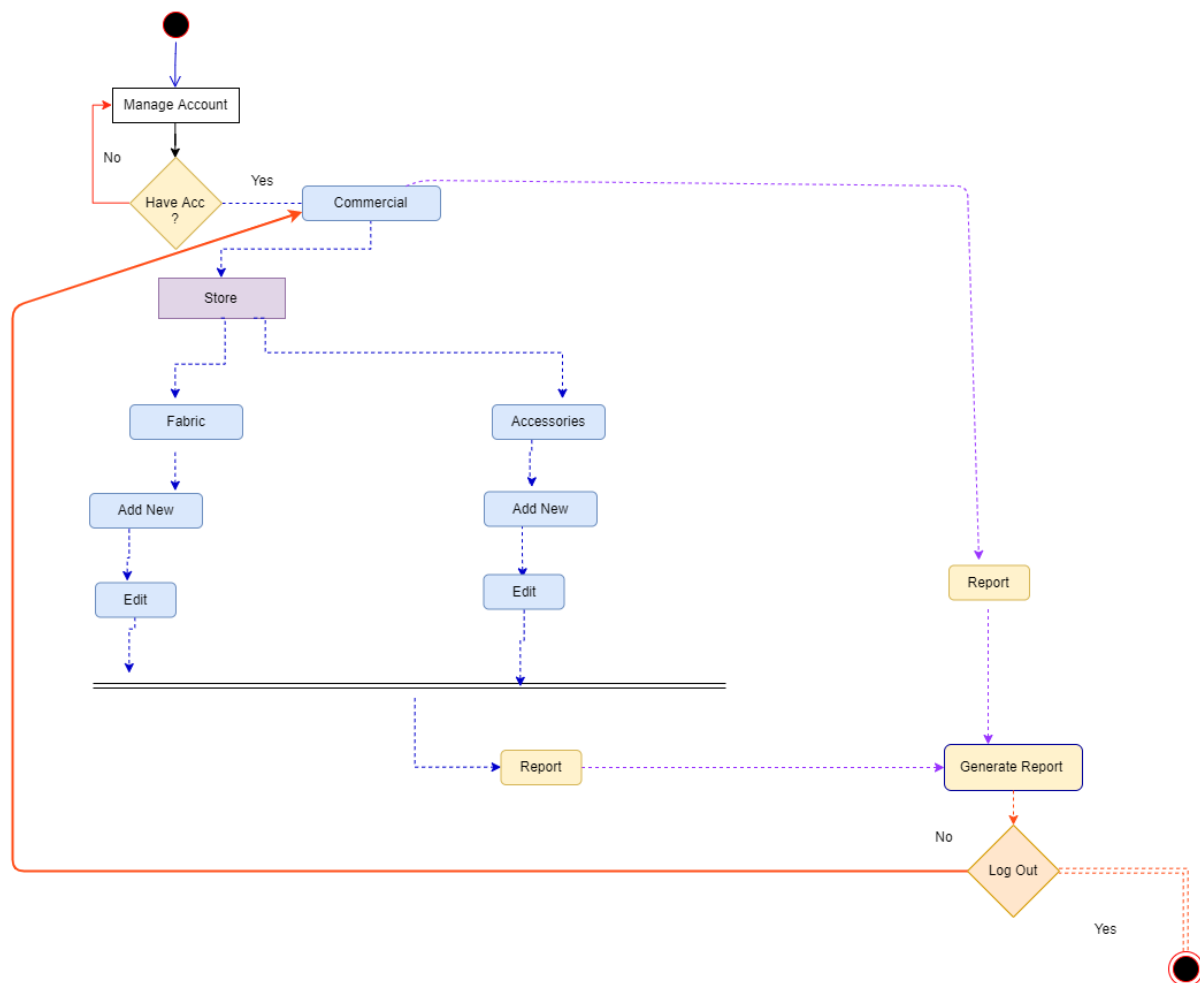


Figure 3.7: Activity Diagram for Store

3.3.7 Report

When manager get the all proforma invoice for a order like import, export, order list, store then the commercial and audit manager can audit the total proforma invoice for a individual order. Then manager need to check the final report proforma invoice clearly and save the data for future investigation.

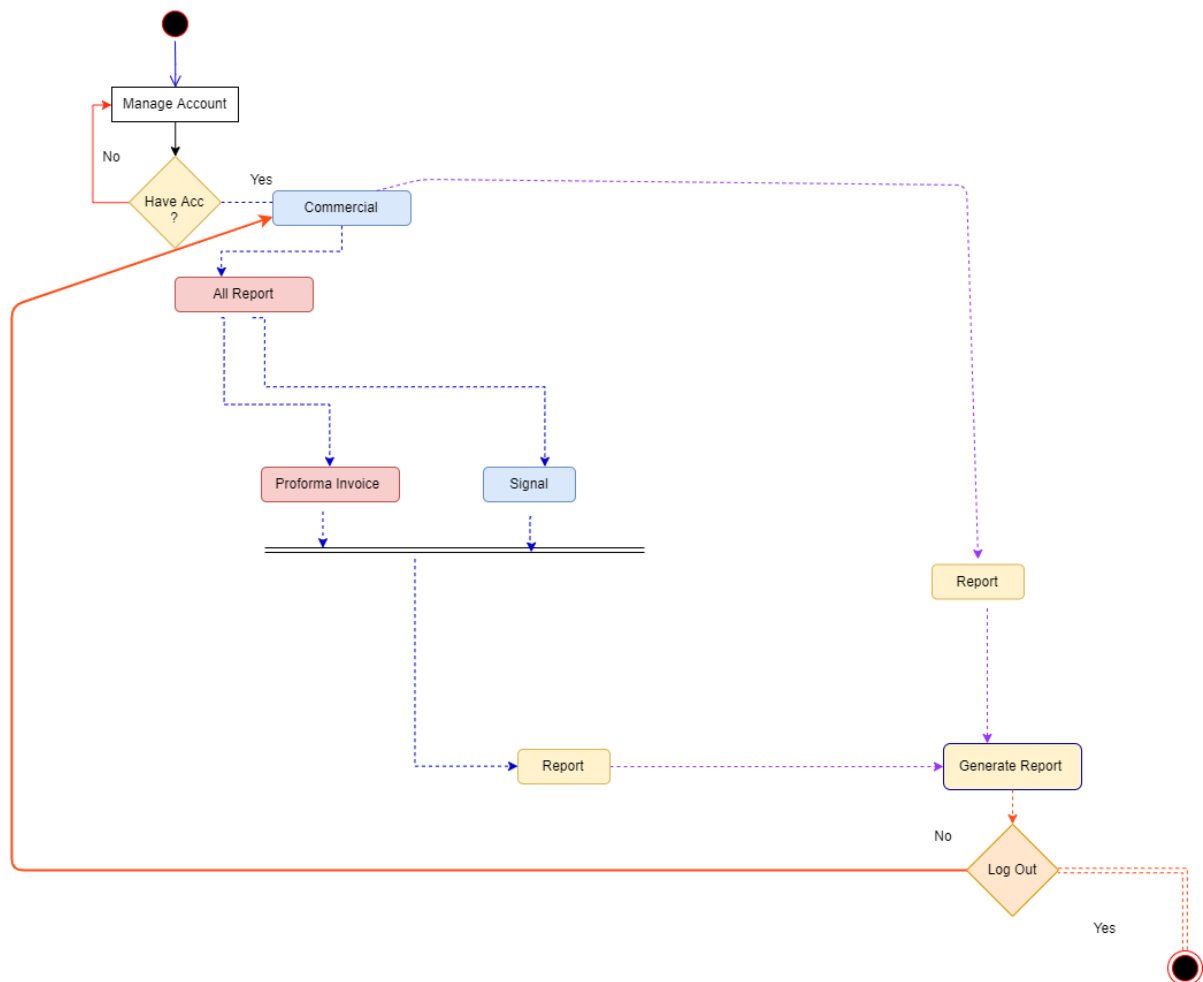


Figure 3.8: Activity Diagram for Report

3.4 Sequence Diagrams

Mainly sequence diagrams understand us how the data will be followed in any system. Now we are going to show some sequence diagrams.

3.4.1 Commercial:

Commercial and audit system..

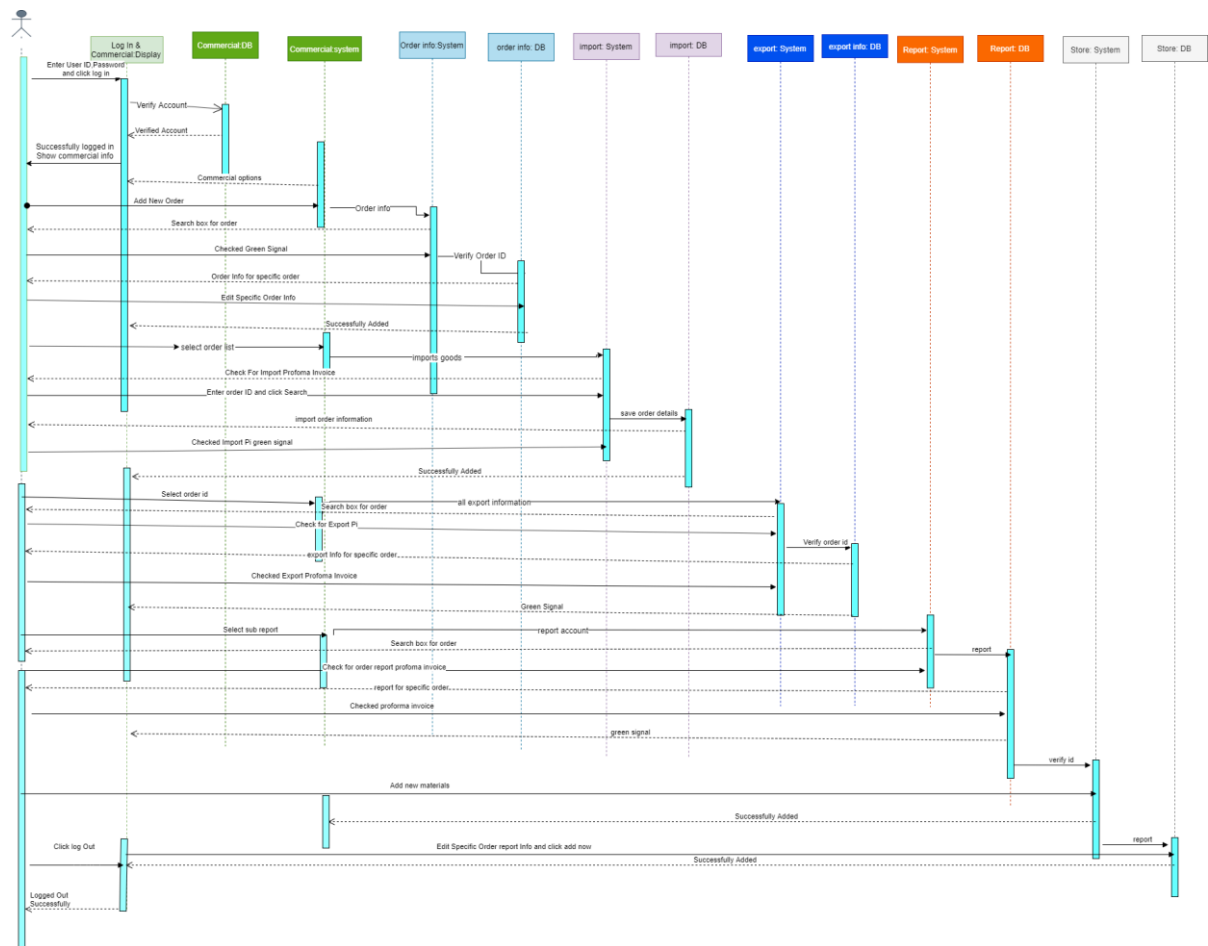


Figure 3.1.1: Sequence Diagram for Commercial

3.4.2 Make Order

Commercial and audit manager make order. For making order manager give order information, import information and others information.

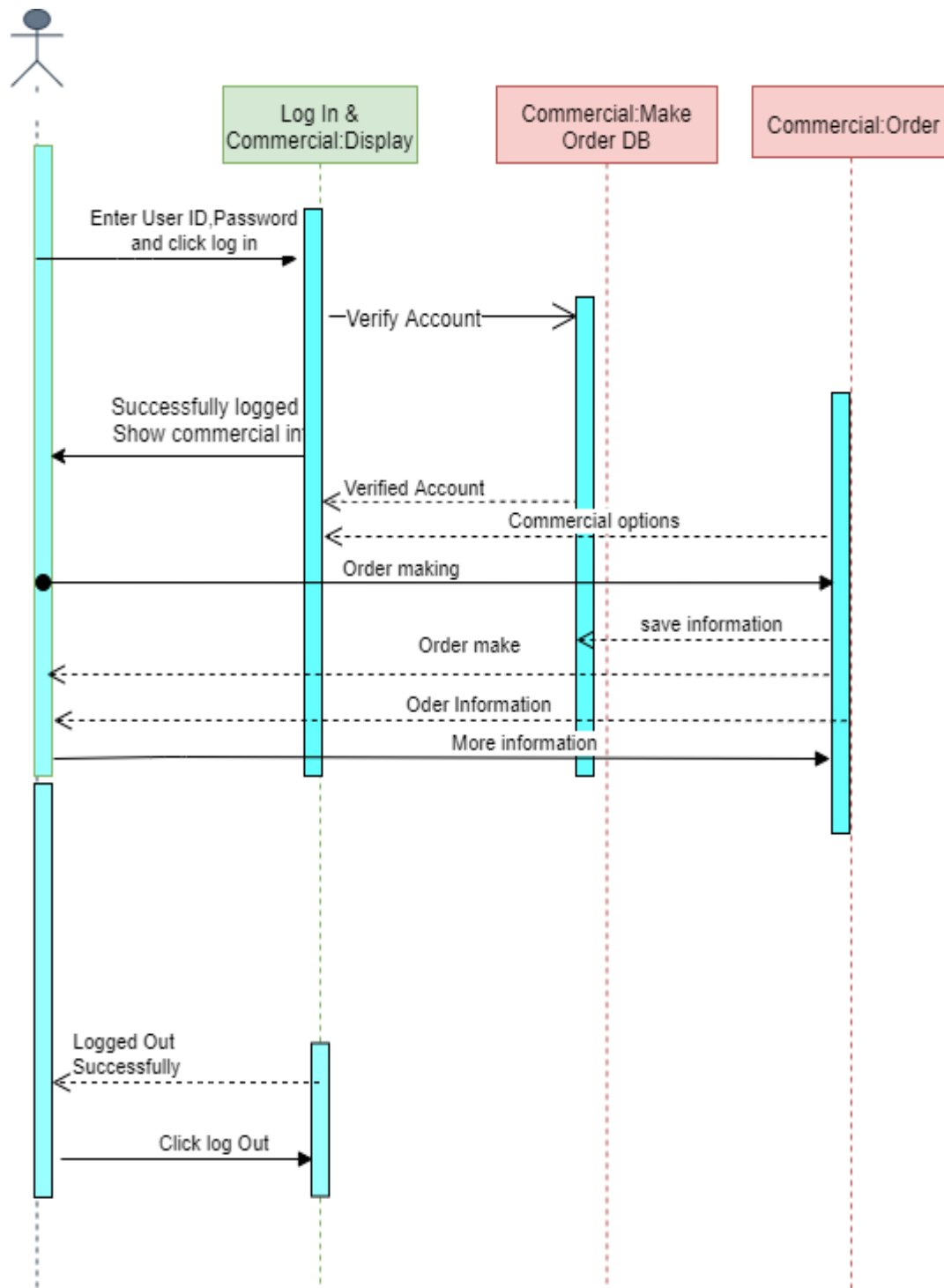


Figure 3.1.2: Sequence Diagram for Make Order

3.4.3 Work Order

Manager check work order proforma invoice. After adding new order manager need to check order proforma invoice.

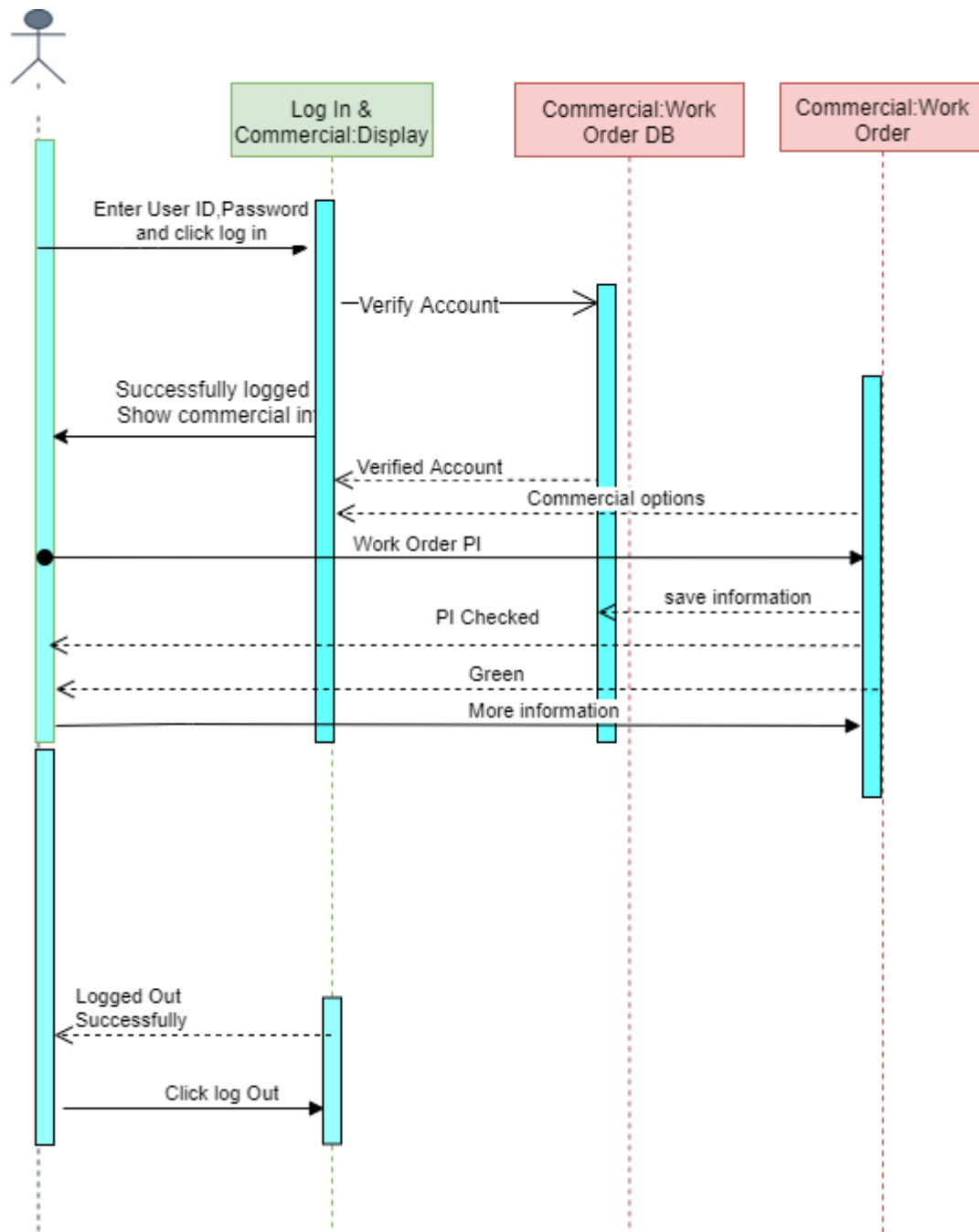


Figure 3.1.3: Sequence Diagram for Work Order

3.4.4 Import

Commercial and Audit Manager can check import proforma invoice. After checking import proforma invoice manager give clearance.

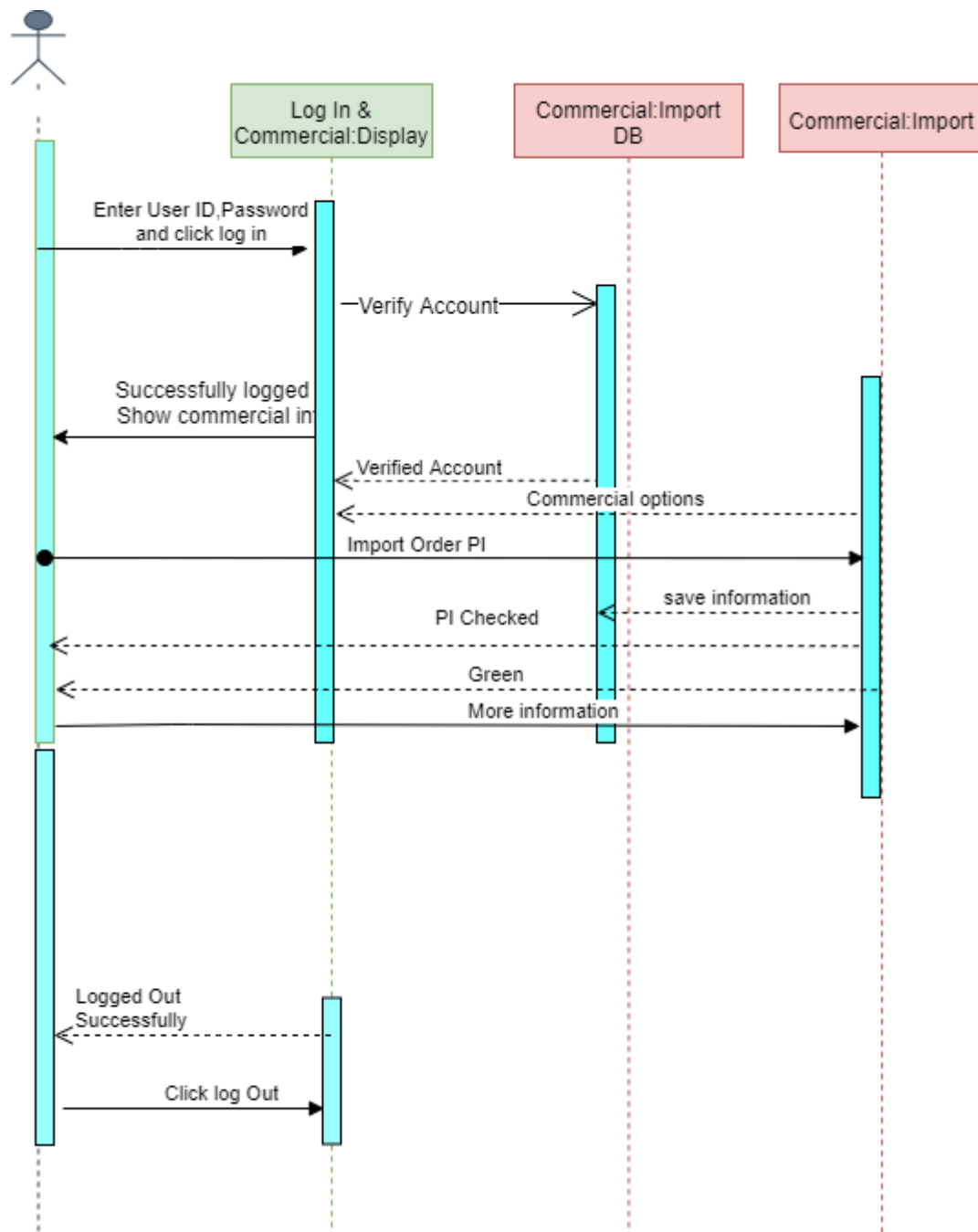


Figure 3.1.4: Sequence Diagram for Import

3.4.5 Export

Commercial and Audit Manager can check Export proforma invoice. After checking export proforma invoice manager give clearance for export order.

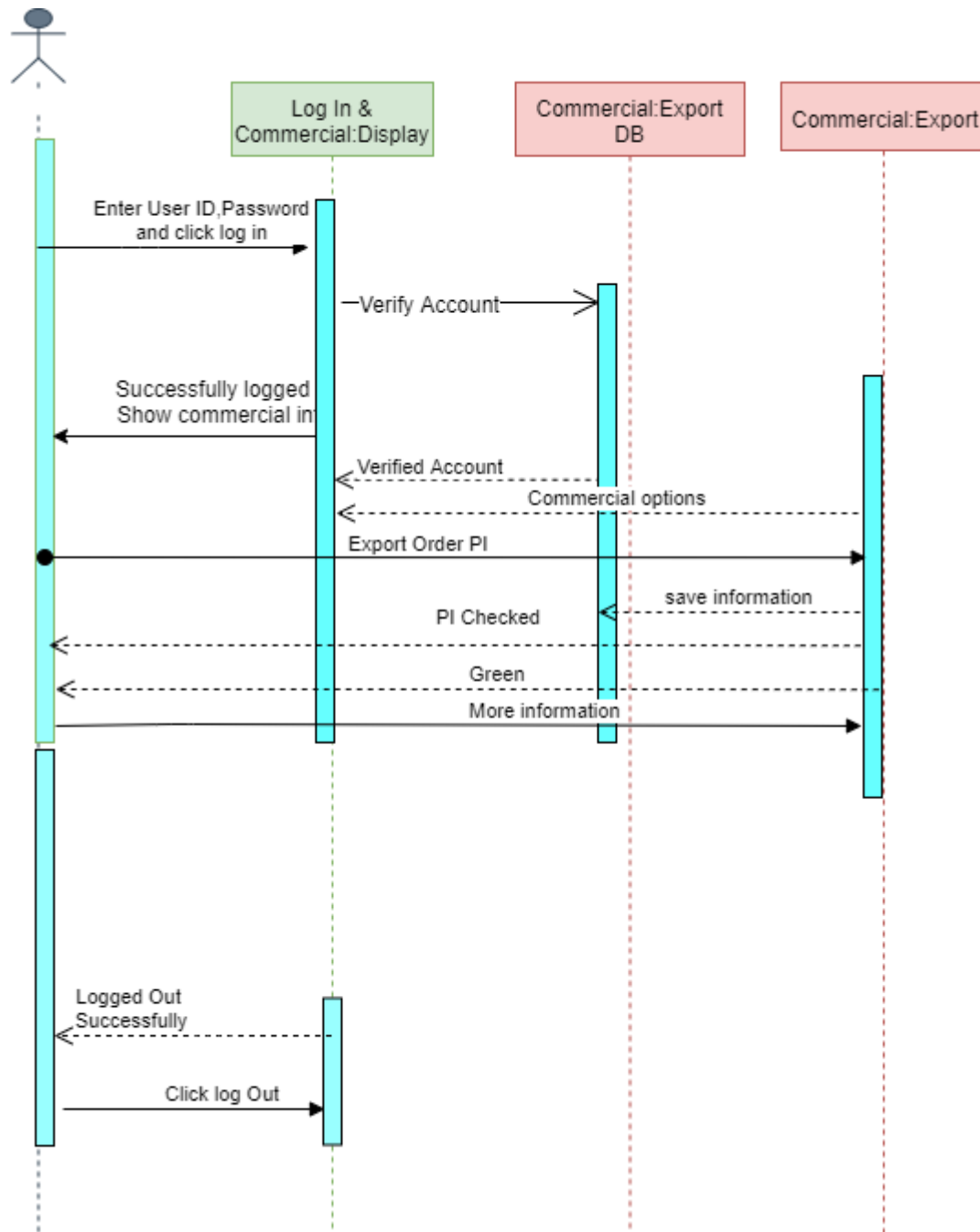


Figure 3.1.5: Sequence Diagram for Export

3.4.6 Store

Commercial and audit manager can add new fabrication and other materials in store. Also manager can audit store for future investigation.

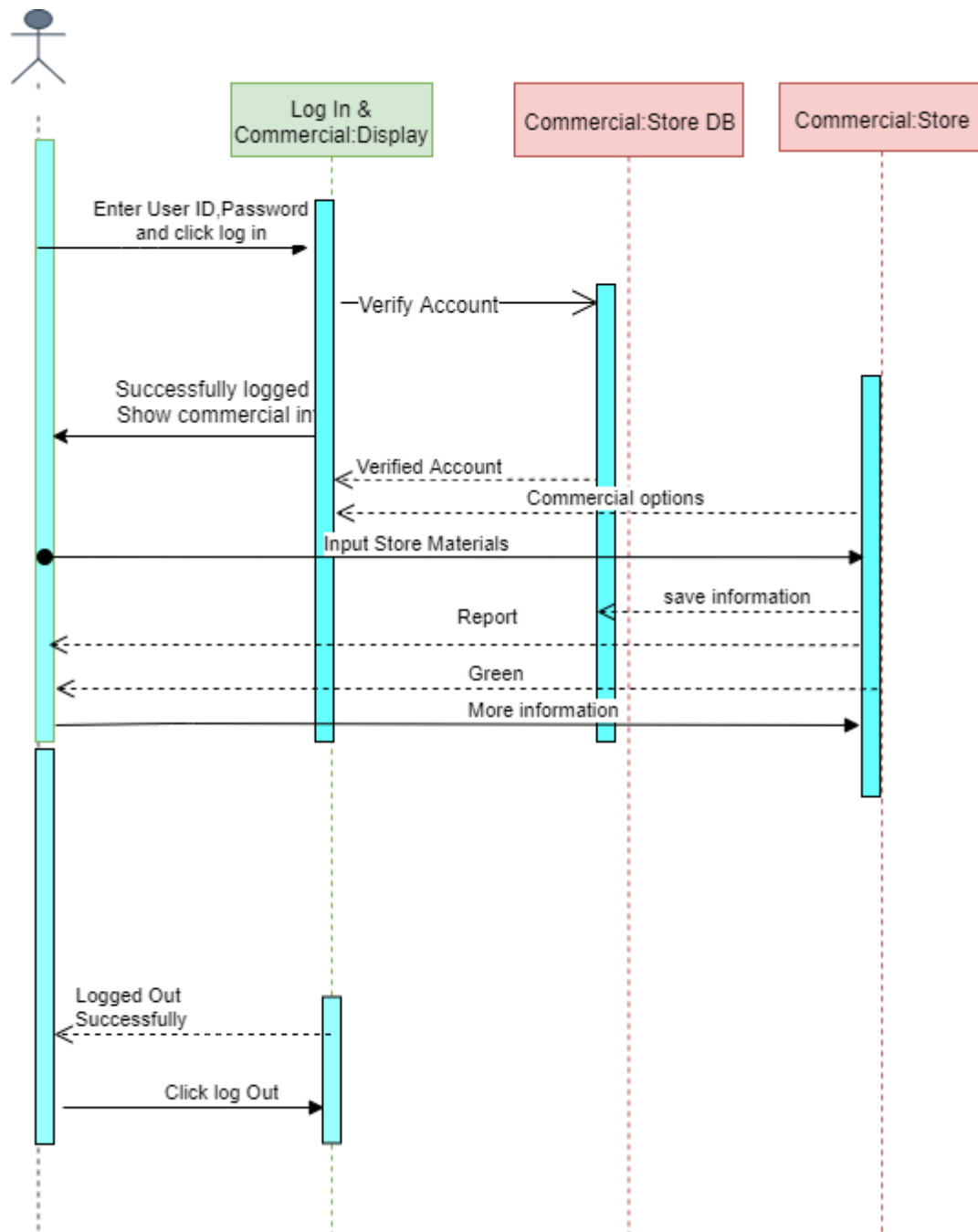


Figure 3.1.6: Sequence Diagram for Store

3.4.7 Report

Commercial and Audit Manager can check total proforma invoice for individual report. Commercial and audit manager save and print total report for future inquiry and give the clearance to the order.

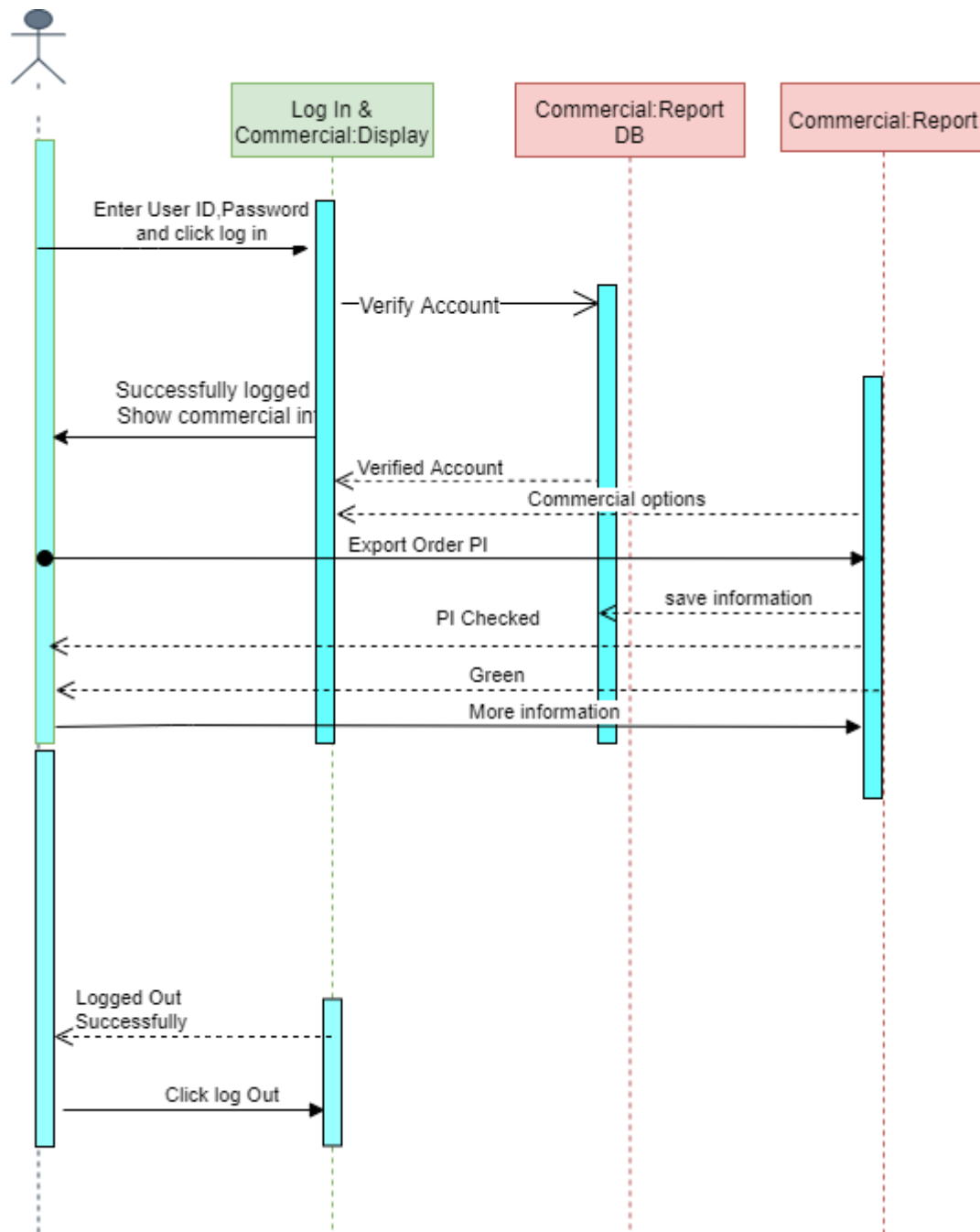


Figure 3.1.7: Sequence Diagram for Report

Chapter 4

System Design Specification

4.1 Development tools and technology

Software development tools are accustomed develop computer code. There are totally different varieties of tools for computer code developers to form the method of software development very smooth. However currently I'll mention a number of tools that I'm using to develop my project.

4.1.1 User Interface Technology

First of all, after landing any system, interface of that software is appeared to the user. So, the importance of user interface is very high. For success of any software, a good looking user interface plays a vital role. User interface includes using good image, graphics, typography, stylesheets, scripting etc.

4.1.1.1 CSS framework or Bootstrap

After completing markup, cascading style sheets are designed. It generally explains how HTML elements will display. There are three ways to write stylesheet. One internal CSS, another is external CSS. And last one is inline CSS. But most of time external CSS is used. Because, by using external CSS, all CSS data can be kept in different files. But nowadays CSS framework seems to be very popular. In our application, I have used Twitter Bootstrap framework. This framework is highly used for designing website and web application also. This framework supports almost every browser. Bootstrap also provides media query which features responsive layout for different devices with different screen size. Bootstrap provides a set of some files which contains stylesheets which gives basic definition.

Bootstrap also provides some JavaScript components also. There are some built in components like JQuery UI. But before start designing an application interface with Bootstrap, one may have some basic knowledge about this framework. It will increase the efficiency.

4.1.1.2 JQuery UI

JQuery UI is a name of library which uses JavaScript as core programming language. It simplifies codes of a programming language named JavaScript. Generally, it interacts with Graphical User Interface (GUI). It also provides visual effects with animation. It can also override cascading style sheets. It is also a subset of JavaScript. By using AJAX no page reloading is required. It is also compatible with any browser like Google Chrome, Mozilla Firefox, Opera, Safari, Internet Explorer etc

4.1.1.3 Programming Language

For developing any application system minimum one programming language is essential. In my application, there are two different programming language is used. One is for front-end side. And another is for server side. The front-end language that I have used to my application is HTML. And the server side programming language name is PHP which stands for Hypertext Preprocessor. Both of them are open source general purpose scripting language.

4.1.2 Implemented tools and platform

As I have said before, there are some tools and technologies that need to be used for developing software. It is very important to determine which tools and platforms are the best match of my requirements. After making a proper decision, one need to start using them

4.1.2.1 Integrated Development Environment

IDE stands for Integrated Development Environment. Programmers write code on IDE. After that IDE provide the feature to execute the source code. For developing my web application, I have used an IDE.. To develop my web version, I have used “Sublime Text” which is powered by Sublime HQ Company. It is a commercial IDE for cross platform environment. It is able to suggest code to the programmers also.

4.1.2.2 Web Server

We have used xampp apache server. It is a free and open source software to use. It can be used on cross platform. It supports a wide range of features and most of them are already implemented as compiled modules. This module can extend the main features or core functionality.

4.1.2.3 Database Server (MYSQL Server V-10.1.36-MariaDB)

For developing our whole project, we have followed Relational Database Management System or RDBMS. And we find that MySql provides the feature of RDBMS. So we should not have any issue to use MySql database. It is also very easy to use. It can also ensure the security, scalability, high performance and many things.

4.3 Database Design Diagram

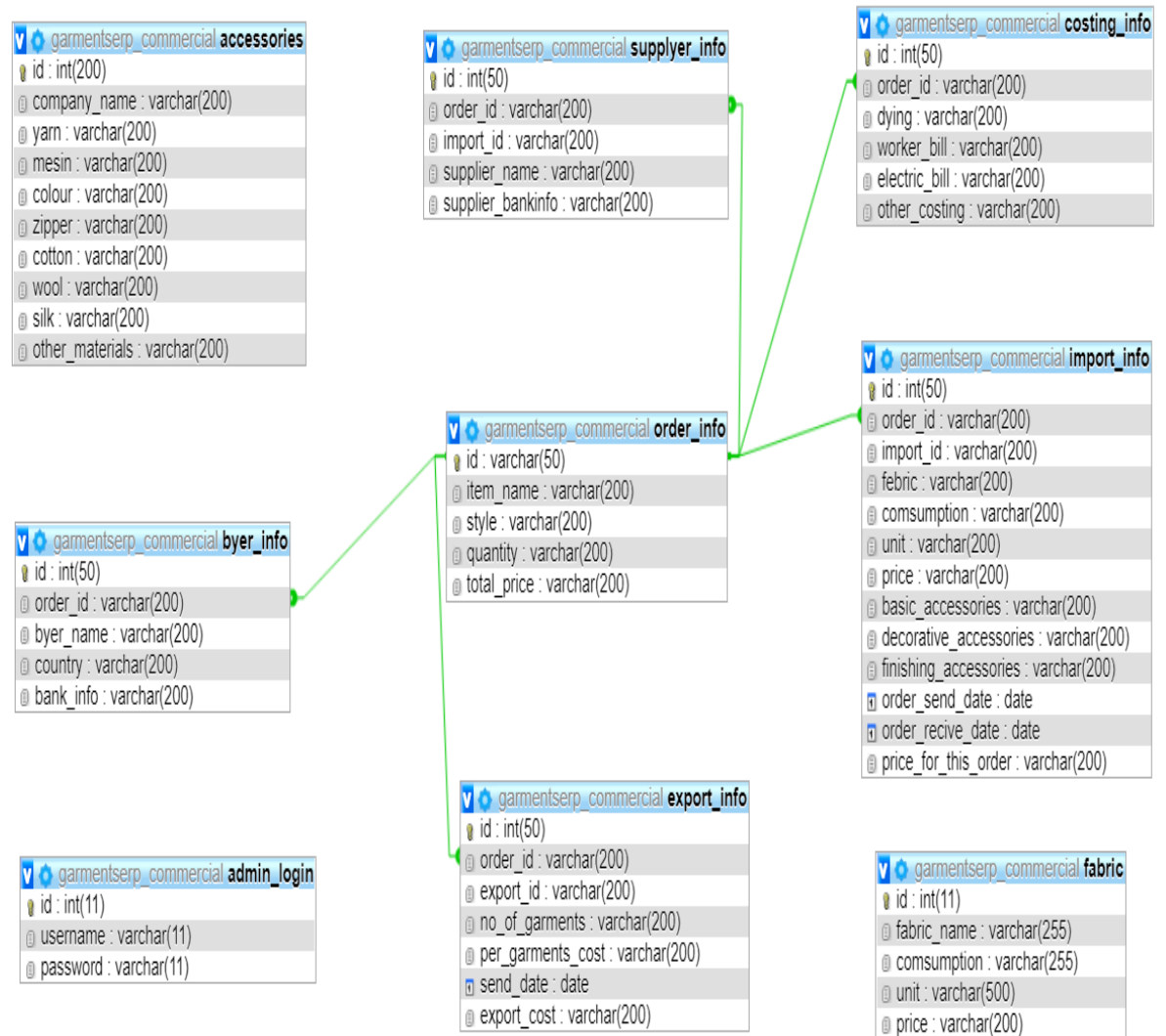


Figure 4.1: Database Diagram

Chapter 5

System Testing

5.1 Testing Features

Feature testing can be considered as making change to add or modify the new functionality to the existing project. To test the features and functionality, a new test set is to be written for testing purpose. Almost every feature and functionality have different characteristics. Those are designed to make the application more useful, intuitive, reliable, secured, scalable, effective and efficient.

5.1.1 Features to be tested

Features	Priority	Description
Login	1	User must be authenticated by login
Logout	1	Session must be destroyed after logout
Insert order data	2	Order data must be inserted properly
Insert fabrication data	2	Fabrication data must be inserted properly
Insert other's data	2	Other's data must be inserted properly
Insert report	2	Report data must be inserted for Manager approval
Assign manager	3	Manager must be assigned only by the system by their registration numbers.
Check data	3	Manager want to check total process
Approve report	2	Manager approve those data that are pending.
Export	3	Manager check data and give permission for export
Apply demerit	3	Auditor give clearance
Technological Features		
Database	1	Database will be used at almost every operation. So this is why, this part must be controlled tightly.

Here, 1 = Low Priority, 2 = Medium Priority, 3 = High Priority

5.2 Testing Strategy

Object, testing function methods, total available resources are included to the testing strategy. It is also the indicator of test levels that are to be performed on the whole software development life cycle. Those strategies that are prepared by the quality assurance team should be reviewed by the developers of the application. Different kinds of testing strategies can be performed according to the type of application system that need to be tested.

5.2.1 Test approach

- **Automation testing:** Automation testing is a name of testing technique by which test engineers prepare some scripts according to test plan and after that they use suitable tools to perform testing of the software. Nowadays, almost every software company follow the approach of automation testing.
- **Manual testing:** Manual testing is also a name of technique of testing by searching out the bugs or vulnerability in an application. In this process, test engineers manually test and execute the test cases without having any automation tools.

5.2.2 Pass / Fail Criteria

They will prepare the pass / fail criteria on the basis of which input data are worked and which are not works well. Those data that are worked well will considered as pass criteria. And rest of input data will be considered as fail criteria.

- System crash will not be considered as pass case.
- If any criteria pass 100% times, then it will be considered as pass criteria only.
- If data can't be displayed to the application properly, then it is also to be considered as fail criteria.

5.3 Testing Schedule

Test Phase	Time
Testing plan create	1 week
Test specification	2 week
Unit testing	During development time
Component test	1 week
Test Phase	Time
Integration testing	1 week
Validating use cases	1 week
Testing user interfaces	1 week
Load testing	1 week
Performance testing	1 week
Release to production	1 week

5.4 Trace Ability Matrix

Project Manager			Business Analyst Lead		
QA Lead			Target Implementation Date		
BR#	Category / Functionality / Activity	Requirement Description	Use Case Reference	Test Case Reference	Comments
BR-1	Functional	Log In	Use case 3.2.1	Test case 5.6.1	
BR-2	Functional	Input field is required in all pages Input field is required in all pages	Use case 3.2.2	Test case 5.6.2	
BR-3	Functional	Add Order	Use case 3.2.3	Test case 5.6.3	
BR-4	Functional	Order List	Use case 3.2.4 3.2.4 3.2.4	Test case 5.6.4	
BR-5	Functional	Import Goods	Use case 3.2.5	Test case 5.6.5	
BR-6	Functional	Export List	Use case 3.2.6	Test case 5.6.6	
BR-7	Functional	Store	Use case 3.2.7	Test case 5.6.7	

5.5 Testing Environment

Testing environment means to prepare the environment with hardware and software so that test engineers can be able to execute test cases as required. Besides hardware and software usage, network configuration might be needed to execute test plans.

For making the environment for testing, some key area need to setup. Those are:

- Test data
- Database server
- Client's operating system
- Front end running environment
- Browser
- System and application
- Network
- Hardware with server operating system
- Documentation is also required. Like: user manuals, installation guides, configuration guides, documents etc.

5.6 Test Cases

A test case refers to some rules and regulations or conditions by which it can be determined whether a system can be able to meet the works or requirements under test cases properly. We know, there is a chance to have some fault or break holes in any application. This is very common scenario. And those issues are solved usually by software testing approaches. But if we don't care of those issues, then the full application development might be ruined. So proper testing must be needed. For testing our application, I have prepared some test cases. Now, I am going to provide them.

5.6.1 Log In

Test case #1			Test case name: Log in		
System: Garments ERP System (Commercial And Audit)			Subsystem: Manager, CEO		
Designed by: Sowvick Bose			Designed date: 24-Aug-2019		
Executed by:			Executed date:		
Short description: The registered users need to login to the system. And before that our system will check the authentication and authorization.					
Pre-conditions: <ul style="list-style-type: none">• Manager are always redirected to the login page whether they have not authenticated by our system while entering into the dashboard.• Assume that, the user id is ‘Sowvick001’ and password is ‘1234’					
Step	User ID	Password	Expected result	Pass/Fail	Comment
1	Sowvick001	1223455	Invalid		
2	Sowvick001		Password can’t be blank		
3		sowvick	User id can’t be blank		
4	Sowvick001	1234	Successfully login to the application and redirected to the dashboard		
Post-conditions: Users including Manager will successfully login to the system.					

5.6.2 Input field is required in all pages

Test case #2	Test case name: Input field is required in all pages			
System: Garments ERP System (Commercial And Audit)	Subsystem: N/A			
Designed by: Sowvick Bose	Designed date: 24-Aug-2019			
Executed by:	Executed date:			
Short description: Manager including new order, fabrication, others materials need to fill up all that fields which as marked as required.				
Pre-conditions: <ul style="list-style-type: none">• User login first to be authenticated by the application program.• Every required field must be filled up by that manager.				
Step	Action	Response	Pass/Fail	Comment
1	All required fields are not filled yet.	Fields must not be empty.		
2	All input filed is filled up by the user.	Application will save those information.		
Post-conditions: Every information is saved to the database of the application program properly.				

5.6.3 Add Order

Test case #3		Test case name: Add Order		
System: Garments ERP System (Commercial And Audit)		Subsystem: N/A		
Designed by: Sowvick Bose		Designed date: 24-Aug-2019		
Executed by:		Executed date:		
Short description: Manager need to add new order for future investigation.				
Pre-conditions: <ul style="list-style-type: none">• User must be authenticated by our system.• User type must be manager.				
Step	Action	Response	Pass/Fail	Comment
1	All data is not provided	Application push order to provide all required data to the application.		
2	Data provided properly	Data saved successfully for approval of Manager		
Post-conditions: After providing add new order data to , it will be in all system.				

5.6.4 Order List

Test case #4		Test case name: Order List		
System: Garments ERP System (Commercial And Audit)		Subsystem: N/A		
Designed by: Sowvick Bose		Designed date: 24-Aug-2019		
Executed by:		Executed date:		
Short description: Manager need to check order list proforma invoice				
Pre-conditions: <ul style="list-style-type: none">• User must be authenticated by our system.• User type must be manager.				
Step	Action	Response	Pass/Fail	Comment
1	All data is not provided	Application push car manager to provide all required data to the application.		
2	Data provided properly	Data saved successfully for approval of insurance.		
Post-conditions: After checking order data to the system, it will be in the pending list for approval from the Manager.				

5.6.5 Import Goods

Test case #5		Test case name: Import Goods		
System: Garments ERP System (Commercial And Audit)		Subsystem: N/A		
Designed by: Sowvick Bose		Designed date: 24-Aug-2019		
Executed by:		Executed date:		
Short description: Manager need to check import list for proforma invoice				
Pre-conditions: <ul style="list-style-type: none">• User must be authenticated by our system.• User type must be manager.				
Step	Action	Response	Pass/Fail	Comment
1	Import list is incorrect	System manager to provide real data to the system.		
2	Import list	Data will be shown to the manager with related information.		
Post-conditions: After providing import list to the system, it will retrieve data from the server and show them.				

5.6.6 Export List

Test case #6		Test case name: Export List		
System: Garments ERP System (Commercial And Audit)		Subsystem: N/A		
Designed by: Sowvick Bose		Designed date: 24-Aug-2019		
Executed by:		Executed date:		
Short description:				
Pre-conditions: <ul style="list-style-type: none">• User must be authenticated by our system.• User type must be Manager.				
Step	Action	Response	Pass/Fail	Comment
1	Export List is incorrect	System ask to provide real data to the list.		
2	Export List exists	Data will be shown to the Manager Export list scores and all other related information.		
Post-conditions: After providing export list to the system, it will retried.				

5.6.7 Store

Test case #7		Test case name: Store		
System: Garments ERP System (Commercial And Audit)		Subsystem: N/A		
Designed by: Sowvick Bose		Designed date: 24-Aug-2019		
Executed by:		Executed date:		
Short description: Manager give input data for fabrication and other data instore				
Pre-conditions: <ul style="list-style-type: none">• User must be authenticated by our application.• User type must be Manager.				
Step	Action	Response	Pass/Fail	Comment
1	Data is not approved yet.	Data will be shown on pending list.		
2	Data approved by Manager	Data will be approved and they are not visible to the pending list of users.		
Post-conditions: After signing up to our system, user must be approved by manager and after that they can use system features as well.				

Chapter 6

User Manual

6.1.1 Home Page

This is the Home page for Garments ERP System. Manager need to login first for get access and do their work.

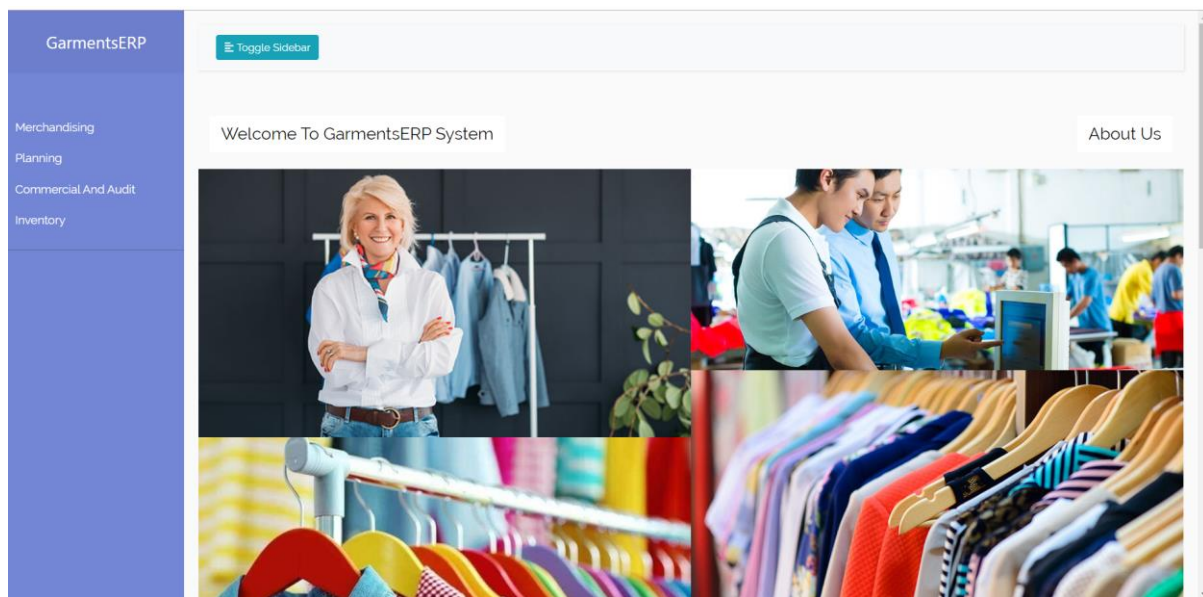
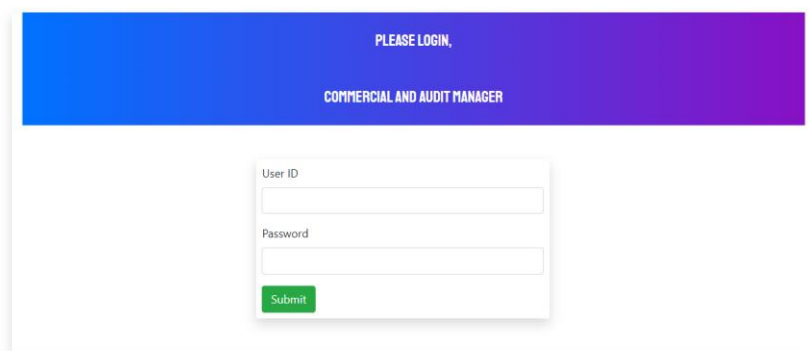


Figure 6.1: Home Page

6.1.2 Login Page

User need to login first to get access to our system. But if the user has not signed up before then they need to register to our application first. Manager need to login to our system for using this system. But before that they need to be authenticated by our system. First, they need to enter into the login page and fill up the required information. After that they will get access. Now I will provide the screenshot of login page below.



The screenshot shows a login interface. At the top, there is a horizontal bar with a blue-to-purple gradient. Inside this bar, the text "PLEASE LOGIN," is centered in white, and below it, "COMMERCIAL AND AUDIT MANAGER" is also centered in white. Below the gradient bar, on a white background, is a login form. The form contains two input fields: the first is labeled "User ID" and the second is labeled "Password". Below these fields is a green button with the text "Submit" in white.

Figure 6.2: Login Page

6.1.3 Landing Page

After signing up, Manager can view this page. This is the home page for Commercial and audit system.

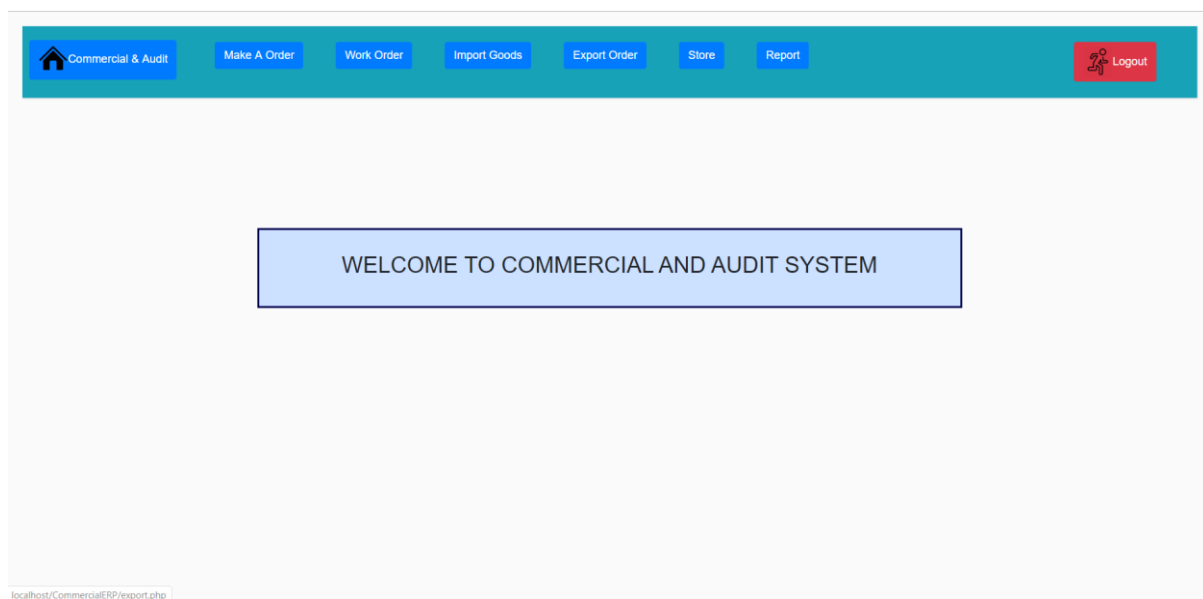
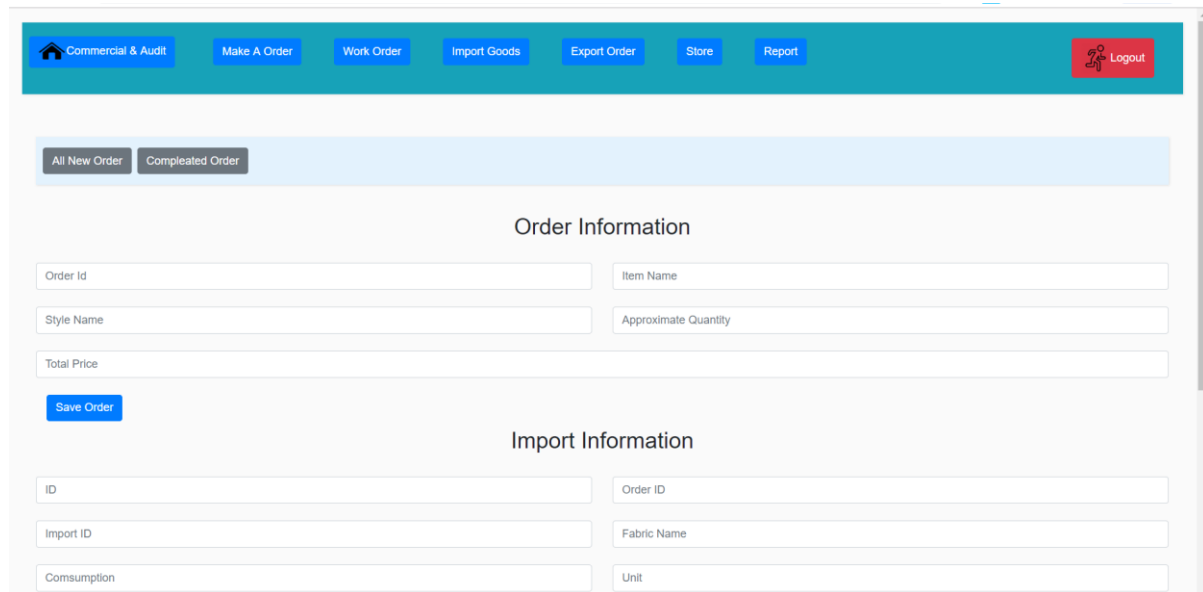


Figure 6.3: Landin Page

6.1.4 Make A New Order

For making order Commercial manager need to fill up some information then the order can make and save into database. Manager need to give import information, Order information, export information all of them for make a new order.



The screenshot displays a web application interface for creating a new order. At the top, a teal navigation bar contains several menu items: 'Commercial & Audit' (with a home icon), 'Make A Order', 'Work Order', 'Import Goods', 'Export Order', 'Store', 'Report', and a 'Logout' button (with a user icon). Below the navigation bar, there are two tabs: 'All New Order' (active) and 'Completed Order'. The main content area is divided into two sections. The first section, titled 'Order Information', contains five input fields: 'Order Id', 'Item Name', 'Style Name', 'Approximate Quantity', and 'Total Price'. A blue 'Save Order' button is positioned below these fields. The second section, titled 'Import Information', contains five input fields: 'ID', 'Order ID', 'Import ID', 'Fabric Name', and 'Unit'.

Figure 6.4: Make A New Order

6.1.5 Order Information

After making a order then the data can view in order information table. The manager can search order information for individual order id .

Warning: mysqli_fetch_assoc() expects parameter 1 to be mysqli_result, boolean given in C:\xampp\htdocs\CommercialERP\all_new_order.php on line 105

Order Id	Item Name	Style Name	Approximate Quantity	Total Price	Import ID	Fabric Name	Consumption	Unit	Price	Basic Accessories	Decorative Accessories	Finishing Accessories	Order Send Date	Order Receiving Date	Total Price For This Order	Buyer Name	Country	Buyer Bank Info
----------	-----------	------------	----------------------	-------------	-----------	-------------	-------------	------	-------	-------------------	------------------------	-----------------------	-----------------	----------------------	----------------------------	------------	---------	-----------------

Figure 6.5: Order Information

6.1.6 Work Order

When manager give the order information then system make a running order table for check information.

#	Order ID	Style name	Item name	Approximate Quantity	Total Price	Option	Proforma Invoice	Signal
1	Shirt 1000001	Shirt	Jack & John	25,000 Pc	33,000 \$	Edit	Proforma Invoice	Not Check
2	T-shirt 1000002	T-shirt	Denim	85,000 Pc	10,00040 \$	Edit	Proforma Invoice	Checked
3	Jeans-Pant1000004	Jeans-Pant	H&M	10,000 Pc	17000 \$	Edit	Proforma Invoice	Not Check

Figure 6.6: Work Order

6.1.7 Order Information Edit

Manager can edit the order information but can't delete anything.

The screenshot shows a web application interface with a teal header bar. The header contains several navigation buttons: 'Commercial & Audit' (with a home icon), 'Make A Order', 'Work Order', 'Import Goods', 'Export Order', 'Store', 'Report', and a 'Logout' button (with a user icon). Below the header, the main content area is titled 'Pre-Order'. It contains a form with the following fields: 'Order ID' (a single-line text input), 'Style Name' (a single-line text input), 'Item Name' (a single-line text input), 'Approximate Quantity' (a single-line text input), and 'Total Price' (a single-line text input). A blue 'Save' button is located below the 'Total Price' field.

Figure 6.7: Order Information Edit

6.1.8 Order Proforma Invoice

After making order manager can check Order proforma invoice for give clearance for next step. And save data for next investigation.

Work Order Proforma Invoice	
Order ID:	Shirt 1000001
Style name:	Shirt
Item name:	Jack & John
Approximate Quantity:	25,000 Pc
Total Price:	33,000 \$
Buyer Name:	MR. Jorgen Koopman
Buyer Bank Info:	BSB No. 939-200, Bank Australia

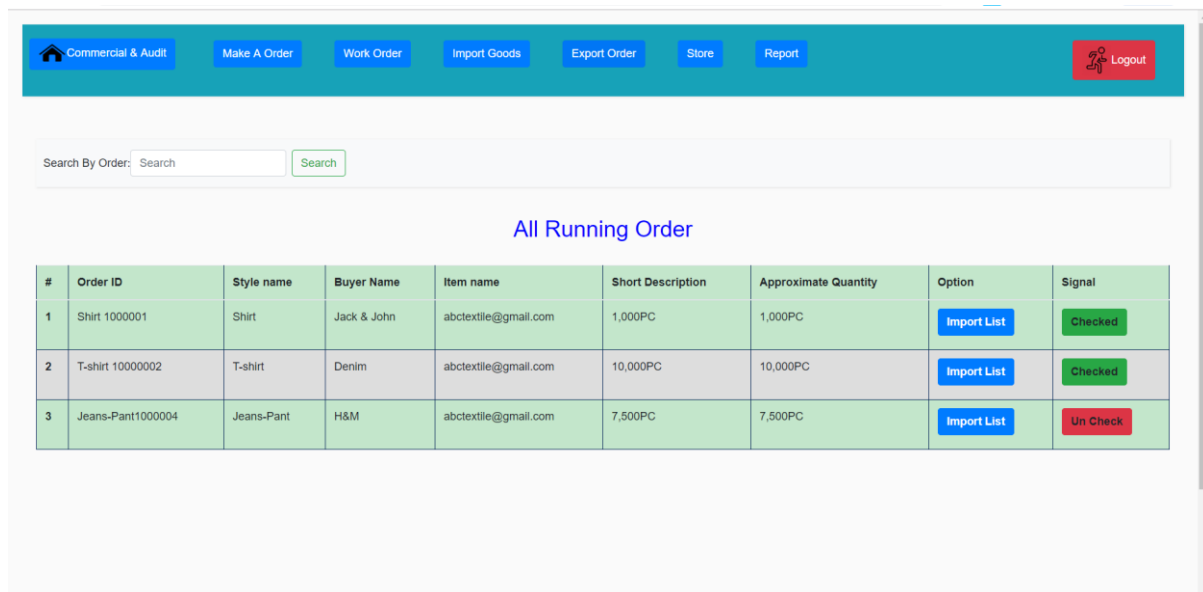
[Print This Page](#) [Checked](#)

localhost/CommercialERP/export.php

Figure 6.8: Order Proforma Invoice

6.1.9 Import Order

After preparing order manager need to check import order list. This is the import order list for individual order that can give manager.



#	Order ID	Style name	Buyer Name	Item name	Short Description	Approximate Quantity	Option	Signal
1	Shirt 1000001	Shirt	Jack & John	abctextile@gmail.com	1,000PC	1,000PC	Import List	Checked
2	T-shirt 10000002	T-shirt	Denim	abctextile@gmail.com	10,000PC	10,000PC	Import List	Checked
3	Jeans-Pant1000004	Jeans-Pant	H&M	abctextile@gmail.com	7,500PC	7,500PC	Import List	Un Check

Figure 6.9: Import Order

6.1.10 Import Order Proforma Invoice

After checking import order then manager need to check import proforma invoice for investigation. Then manager give the clearance for the import order and give the permission for give money to the supplier.

Import Goods Proforma Invoice	
Import Order Id:	ABC Textile LTD
Supplier Name:	ABC Textile LTD
Fabric Name:	
Consumption:	
Unit:	
Price:	
Basic accessories:	
Decorative accessories:	
Finishing accessories:	
Supplier Bank Info:	
Order Send Date:	
Order Receiving Date:	
Total Price For This Order:	

[Print This Page](#) [Checked](#)

localhost/CommercialERP/import.php

Figure 6.10: Import Order Proforma Invoice

6.1.11 Export Order List

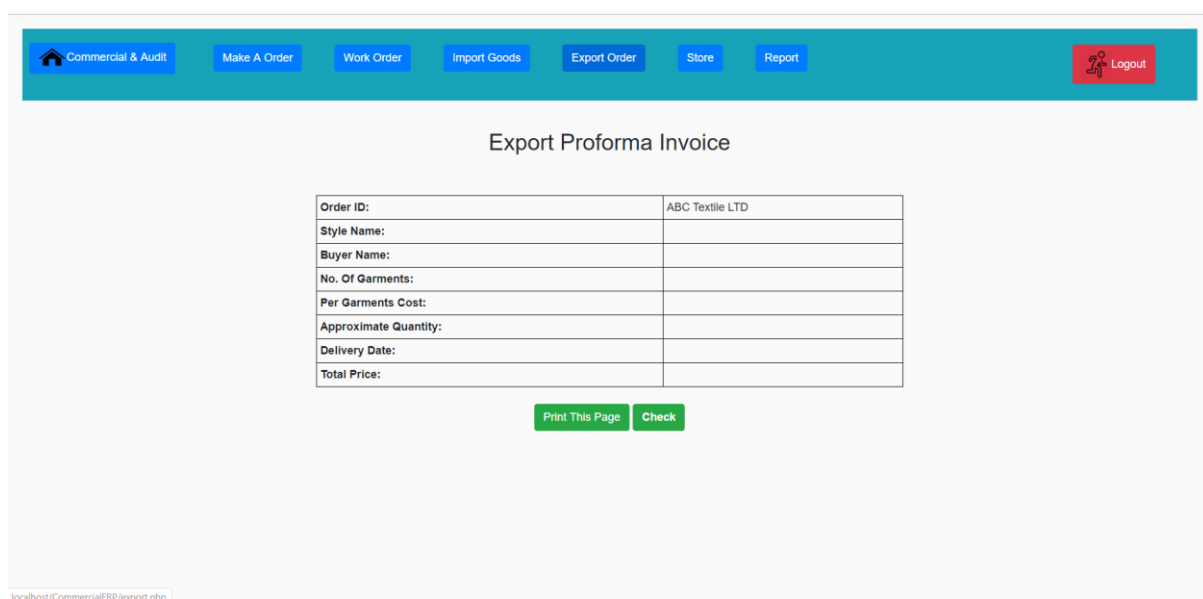
After preparing order manager need to check export order list. This is the export order list for individual order that can give manager.

#	Order ID	Style Name	Buyer Name	No. Of Garments	Per Garments Cost	Approximate Quantity	Delivery Date	Total Price	Proforma Invoice	Option
1	Shirt 1000001	Shirt	Jack & John	USA	Washington, DC, USA	1,000PC	10/10/2019	293849 \$	Proforma Invoice	Un Check
2	T-shirt 1000002	T-shirt	Denim	India	2098 New Delhi ,India	10,000PC	10/10/2019	23222 \$	Proforma Invoice	Checked
3	Jeans-Pant1000004	Jeans-Pant	H&M	Australia	NORTH SYDNEY, NSW ,Australia	7,500PC	10/10/2019	2435 \$	Proforma Invoice	Un Check

Figure 6.11: Export Order List

6.1.12 Export Order Proforma Invoice

After checking export order then manager need to check export proforma invoice for investigation. Then manager give the clearance for the export order and give the permission for shipment the order product.



The screenshot shows a web application interface for generating an Export Proforma Invoice. At the top, there is a teal navigation bar with buttons for 'Commercial & Audit', 'Make A Order', 'Work Order', 'Import Goods', 'Export Order' (which is highlighted), 'Store', 'Report', and a 'Logout' button with a user icon. Below the navigation bar, the title 'Export Proforma Invoice' is centered. The main content area contains a form with two columns. The first column lists various fields: 'Order ID:', 'Style Name:', 'Buyer Name:', 'No. Of Garments:', 'Per Garments Cost:', 'Approximate Quantity:', 'Delivery Date:', and 'Total Price:'. The second column contains the value 'ABC Textile LTD' for the 'Order ID' field, while the other fields are empty. Below the form, there are two green buttons: 'Print This Page' and 'Check'. At the bottom left of the page, the URL 'localhost/CommercialERP/export.php' is visible.

Order ID:	ABC Textile LTD
Style Name:	
Buyer Name:	
No. Of Garments:	
Per Garments Cost:	
Approximate Quantity:	
Delivery Date:	
Total Price:	

[Print This Page](#) [Check](#)

localhost/CommercialERP/export.php

Figure 6.12: Export Order Proforma Invoice

6.1.13 Add Fabrication

Manager can add fabrication to the system for reserve product. And manager also can edit fabrication.

Commercial & Audit Make A Order Work Order Import Goods Export Order Store Report Logout

Fabrication Accessories

Fabric Name Consumption

Unit Price

Add New

Febrication

Fabric Name	Consumption	Unit	Price	Option
Casement	15kg	1kg	\$3	Edit
New Linen Type Sofa Fabric	50kg	1kg	\$2.5	Edit
PP Spunbonded Nonwoven Home Textile	25kg	1kg	\$4.75	Edit
Cotton 2.2	175 Kg	1 Kg	\$.85	Edit

localhost/CommercialERP/export.php

Figure 6.13: Add Fabrication

6.1.14 Add Basic Accessories

Manager can add basic accessories to the system for reserve product. And manager also can edit individual basic accessories.

Commercial & Audit Make A Order Work Order Import Goods Export Order Store Report Logout

Febrication Accessories

company name yarn

mesin colour zipper cotton wool silk other materials

Add New

Basic Accessories

Company Name	Yarn	Mesin	Colour	Zipper	Cotton	Wool	Silk	Other Materials	Option
ABC Textile PVT. LTD	11100KG	Swim Mesin	VIBGORM	200 Black	200	3kg	30kh	N/A	Edit
Square Pvt Ltd.	N/A	Cutting	White 20Kg	Red 200 Pc	N/A	N/A	N/A	N/A	Edit

Figure 6.14: Add Basic Accessories

6.1.15 Report

After preparing all order and proforma invoice manager need to check final report. This is the final report order list for individual order that can investigate manager.

#	Order ID	Buyer Name	Style Name	Item Name	Approximate Quantity	Proforma Invoice	Signal
01	Maria Anders	Germany	Germany	Alfreds Futterkiste	Maria Anders	Proforma Invoice	Checked
02	Francisco Chang	Mexico	Alfreds Futterkiste	Maria Anders	Germany	Proforma Invoice	Not Check
03	Roland Mendel	Austria	Alfreds Futterkiste	Maria Anders	Germany	Proforma Invoice	Not Check

Figure 6.15: Report

6.16 Report Proforma Invoice

After checking report order then manager need to check report proforma invoice for investigation. Then manager give the clearance for the order and give the permission for shipment the order product.

[Commercial & Audit](#) [Make A Order](#) [Work Order](#) [Import Goods](#) [Export Order](#) [Store](#) [Report](#) [Logout](#)

Total Costing Per Order Proforma Invoice

Order Id:	ABC Textile LTD
Style Name:	
Item Name:	
Approximate Quantity:	
Working Costing:	
Import Goods Costing:	
Export Costing:	
Dyning Costing:	
Worker Bill:	
Electricity Bill:	
Others Cost:	
Total Cost For This Order:	

[Print This Page](#) [Checked](#)

localhost/CommercialERP/export.php

Figure 6.16: Report Proforma Invoice

Chapter 7

Project Summary

7.1 GitHub Link

<https://github.com/laptopworldbd/GarmentsERP-System->

7.2 Project Outline

I have begun to develop this project from August. From the very terribly beginning of development of this project, it demands hard exhausting operating, patients, perseverance to satisfy the wants of stakeholders. After that I actually have projected the planning and so begun to work.

Database plays a significant role for any system software code. Then this is why, I actually have designed the database diagram having tables with correct relationship. After that, I actually have ready the user interface and take their approval to still consecutive half. It's to be said that, the interface of my system is extremely easy and simple to know. When finishing that, I actually have started to write the core practically of the project.

7.3 Limitations

For developing this project, I actually have visage some limitations. Now I will describe those in brief.

- **Payment Method:** In our system, there is not having any payment method directly by which one can make their transaction through our application. End user need to pay and after that they will enter those data to our application. At last recipient will confirm the transaction.

7.4 Obstacles and Achievements

I believe that if there are not any obstacles to develop a project, then there doesn't have any challenges. Obstacles, challenges and achievements are like a path to the success.

Before starting this project, I didn't know the actual flow of software development life cycle. My supervisor helps me a lot from the very beginning of the development of this project.

- **Lack of Stakeholder's Engagement:** There are only one stakeholder in our system.
- **Scope Change:** Sometimes, some features need to be changed or modified. Then I need to follow reverse engineering process. And again, designed to meet the new requirements. It also made me frustrated sometimes.

7.5 Future Scope

I have learnt a lot throughout the complete development stage of this project. For creating this project developed, I actually have additionally met some young entrepreneurs and additionally. I'm greatly thankful to any or all of them as their plan and discussion gave me some opportunities to create me to figure project in future additionally. It will help me to work with similar type project in future also.

7.6 References

I have gained some knowledge from some platforms. Obviously, I will mention those references. For making my project successful those resources help me a lot. Not I will mention the names below.

- ? www.google.com
- ? www.youtube.com
- ? www.github.com
- ? www.wikipedia.com
- ? www.php.net
- ? www.mysql.com
- ? www.mysql.com/products/workbench
- ? www.themeforest.net
- ? www.getbootstrap.com
- ? www.w3schools.com
- ? www.jquery.com
- ? www.sublimetext.com/3
- ? www.apachefriends.org
- ? www.stakeoverflow.com