A Project Report On

DMS

Technology – Python-Django & ML

Submitted in the partial fulfillment for the Semester-V Mini-Project in

MASTER OF COMPUTER APPLICATIONS
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Submitted by

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ACKNOWLEDEGEMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we extremely privileged to have got this all along the completion of our project. All that we have done is only due to such supervision and assistance and we would not forget to thank them.

We learn lots of thing like Analysis, Designing, Deal with Large amount of Datasets, Test-cases, Debugging and lot many.

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1. PROJECT PROFILE

1.1.Project Description

DMS is online stock management application, invoicing by scan QR Code, statistical data and some other features which will help to grow their business, on web-based application responsive design mobile-tablet-desktop supportive, for any small or large scale business/organization, which covers all sports store, supermart, gift and home-decor shop, book store, stationery, hardware, auto-parts store.

1.2.Core Components

In this application/system there are **seven modules** which are describes below

1.2.1. Login Module

Registration of any organization, Registration of any organization, while registration we will take basics details about organization which will take be like business name, username, password, address, city, state, contact details and business logo, GSTIN Number. Once registration completes, authenticate user of organization has to login via their username and password.

1.2.2. Stock Management Module

Stock Management Module is divided into 2 sub-modules, Add Products, Add/Modify Stock Details. While adding products or modifying stock details we will get some details like, product name, quantity, HSNCode, Cost Price, Selling Price, expire date, packing date. User can add product manually or they can insert directly stocks, if there is any new product it will automatically first add product and then it add stocks.

1.2.3. Billing Module

User will scan the products QR Code and each items will be added to list of billing desk, billing was done with some basic calculation related to GST and discount based on product. `Qty*SellingPrice=Amount`, `AmountDiscount=TaxableAmount`, `TaxableAmount+GST=TotalAmount` information we get while billing are Customers Mobile / email, Selling Price(With GST). Quantity, Payment Mode

1.2.4. Print Module

Based on the product inserted into the stock user can also print out the QR code, they can select the product and system will ask how many QR Code must be printed for per product.

1.2.5. Report & Analysis Module

All kind of statistical data will be displayed here which will help owner to boost their business/ entier organization. Report & Analysis details like..

- Maximum Selling Product in the Day
- Maximum Selling Product in the Month
- Unique Customers
- Total Products in their Shop
- Which Products not sale in Day or Month
- Product wise selling count Report of the Day, Month and Year
- Profit of the Day, Month and Year
- Current Stock Report
- Sales Return Products
- And Many More Reports with PDF and Excel files.

1.2.6. Stock Notify Module

If any stock is less than given limit or product is expired then it will notify instantly to owner, to remove that stock from their shop.

1.2.7. Sales Return Module

Whenever any customer return any product, due to any reason like damaged product, Defective Product, Product not as per expected, etc... We will get some details at the time of sales return like, Customer Mobile, Product ID, Quantity, Note (Reason for Return)

Future enhancement modules

- **Transaction Module**
  Currently we are billing and taking Cash. But if we have time then we have to accept online transaction via POS Machine or UPI with any gateway
- **Bot Module**
  Bot will gives some basics answer related to transactional entries or statistical output based on the questions asked by user

1.3.System Requirements

1.3.1. Minimal Hardware Requirements

Operating System	Microsoft Windows 7, 8 or 10, Ubuntu, Mac
CPU Processor	Dual Core 3rd Gen. or above
RAM	2GB
Hard Disk	250GB
Camera	2.0 MP TrueVision

Table 1 Minimal Hardware Requirements

1.3.2. Software Requirements

Python 2.7+	Support some libraries, (if requires)
Adobe Reader or any pdf reader	Used for Label printing and billing
MS Excel	Checking Excel sheet files
Chrome Browser 30+ or any browser	For Running application

Table 2 Software Requirements

1.3.3. Network Requirements

Mobile Data Plan	3G or Above

Table 3 Network Requirements

2. ABOUT THE TOOLS & TECHNOLOGIES

2.1.HTML

- HTML stands for HyperText Markup Language.
- It is the standard markup language used for creating the web pages.
- It describes the structure of a web page.
- It consists of a series of elements.
- HTML elements tell the browser how to display the content.

2.2.CSS

- CSS stands for Cascading Style Sheets.
- CSS describes how HTML elements are to be displayed on screen, paper, or in other media.
- CSS saves a lot of work. It can control the layout of multiple web pages all at once.
- External stylesheets are stored in CSS files.
- CSS is easy to learn and understood but it provides powerful control over the presentation of an HTML document.

2.3.JavaScript

- JavaScript enables interactive web pages and is an essential part of web applications.
- The vast majority of websites use it for client-side page behaviour, and all major web browsers have a dedicated JavaScript engine to execute it.
- As a multi-paradigm language, JavaScript supports event-driven, functional, and imperative programming styles. It has application programming interfaces (APIs) for working with text, dates, regular expressions, standard data structures, and the Document Object Model (DOM).
- However, the language itself does not include any input/output (I/O), such as networking, storage, or graphics facilities, as the host environment (usually a web browser) provides those APIs.

2.4.JQuery

- jQuery is a JavaScript library.
- jQuery greatly simplifies JavaScript programming.
- jQuery is easy to learn.
- Purpose of jQuery is to make it much easier to use JavaScript on mobiles.
- The jQuery team knows all about cross-browser issues, and they have written this knowledge into the jQuery library. jQuery will run exactly the same in all major browsers.

2.5.PostgreSQL

- PostgreSQL, also known as Postgres, is a free and open-source relational database management system emphasizing extensibility and SQL compliance.
- It was originally named POSTGRES, referring to its origins as a successor to the Ingres database.
- PostgreSQL features transactions with Atomicity, Consistency, Isolation, Durability (ACID) properties, automatically updatable views, materialized views, triggers, foreign keys, and stored procedures.
- It is designed to handle a range of workloads, from single machines to data warehouses or Web services with many concurrent users.
- It is the default database for macOS Server, and is also available for Linux, FreeBSD, OpenBSD, and Windows.

2.6.Django

- Django is a Python-based free and open-source web framework that follows the model-template-views (MTV) architectural pattern.
- It is maintained by the Django Software Foundation (DSF), an American independent organization established as a non-profit.
- Django's primary goal is to ease the creation of complex, database-driven websites.
- The framework emphasizes reusability and "pluggability" of components, less code, low coupling, rapid development, and the principle of don't repeat yourself.
- Python is used throughout, even for settings, files, and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models.

2.7.Machine Learning

- The live feed of a camera can be used to identify objects in the physical world.
- Using the “streaming” mode of ML Object Detection, a camera feed can detect objects and use them as input to perform a visual search with our app’s own image classification model and databases.

2.8.Bootstrap

- Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development.
- It contains CSS- and (optionally) JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.

2.9.Visual Studio Code

- Visual Studio Code is a free source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

2.10. Edraw Max

- Edraw Max is a 2D business technical diagramming software which help create flowcharts, organizational charts, mind map, network diagrams, floor plans, workflow diagrams, business charts, and engineering diagrams.

2.11. Microsoft Project

- Microsoft Project is a project management software product, developed and sold by Microsoft. It is designed to assist a project manager in developing a schedule, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads.

2.12. Microsoft Visio

- Microsoft Visio is software for drawing a variety of diagrams. These include flowcharts, org charts, building plans, floor plans, data flow diagrams, process flow diagrams, business process modeling, swimlane diagrams, 3D maps, and many more. It's a Microsoft product, sold as an addition to MS Office.

3. SYSTEM ANALYSIS

3.1.About Existing System

There are many billing system like zoho, vyaparapp, justbilling, retailcore, Anapurna Supermarket, etc. Some of applications works Online or Offline standalone applications. Many system are just for specific purpose, supports only stock management and billings, While some of system also gives statistical information and analysis of stock with profit/loss, and to track customers buying analysis, and many more.

3.2.Feasibility Study

3.2.1. Economical

Economic analysis is the most frequently used method for evaluating the effectiveness of the candidate system. More commonly known as cost/benefit analysis, the procedure is to be determining the benefits and savings that are expected from a candidate and compare them with costs. If benefits outweigh costs, then the decision is made to design and implement the system.

A systems financial benefit must exceed the cost of developing that system. I.e. a new system being developed should be a good investment for the organization. Economic feasibility considers the following

- The cost to conduct a full system investigation.
- The cost of hardware and software for the class of application.
- The benefits in the form of reduced cost or fewer costly errors.
- The cost if nothing changes (i.e. the proposed system is not developed).

The proposed "DMS" is economically feasible because

The system requires very less time factors.

- The system will provide fast and efficient automated environment instead of slow and error prone manual system, thus reducing both time and man power spent in running the system.
- The system will have GUI interface and very less user-training is required to learn it.
- The system will provide service to view various information for proper managerial decision making.

3.2.2. Technical

Technical feasibility centers around the existing computer system (Hardware and Software etc) and to what extend it support the proposed addition. For example, if the current computer is operating at 80 percent capacity - an arbitrary ceiling - then running another application could overload the system or require additional Hardware. This involves financial considerations to accommodate technical enhancements. If the budgets is a serious constraint, then the project is judged not feasible. In this project, all the necessary cautions have been taken care to make it technically feasible. Using a key the display of text/object is very fast. Also, the tools, operating system and programming language used in this localization process is compatible with the existing one.

3.2.3. Operational

People are inherently resistant to change, and computers have been known to facilitate change. An estimate should be made of how strong a reaction the user staff is likely to have toward the development of a computerized system. Therefore it is understandable that the introduction of a candidate system requires special efforts to educate and train the staff. The software that is being developed is user friendly and easy to learn. In this way, the developed software is truly efficient and can work on any circumstances, tradition, locales.

3.3.Limitation of Existing System

There are many billing system like zoho, vyaparapp, justbilling, retailcore, Anapurna Supermarket, etc. Some of applications works Online or Offline standalone applications.

Many system are just for specific purpose, supports only stock management and billings, while some of system also gives statistical information and analysis of stock with profit/loss, and to track customers buying analysis, and many more.

3.4.Scope of Proposed System

Online stock management, invoicing by scan QR Code, statistical data and some other features which will help to grow their business, on the base of statistical data analysis on web-based application, which will be responsive design mobile-tablet-desktop supportive, for any small or large scale business/organization, which covers all sports store, supermart, gift and home-decor shop, book store, stationery, hardware, auto-parts store. Targeted to Small Shops. This system works only in Smart Cities, requires Internet.

3.5.Limitation of Proposed System

This system requires Internet, mobile or laptop and It may works only in smart cities.

Currently it was proposed with one user authentication for organization.

3.6.Targeted Users

Targeted users are any small or large scale business/organization, which covers all sports store, supermart, gift and home-decor shop, book store, stationery, hardware, auto-parts store.

Targeted to Small Shops First.

3.7.Project Module

Login Module

Registration of any organization, Registration of any organization, while registration we will take basics details about organization which will take be like business name, username, password, address, city, state, contact details and business logo, GSTIN Number. Once registration completes, authenticate user of organization has to login via their username and password.

Stock Management Module

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Stock Notify Module

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Future enhancement modules

Transaction Module

Currently we are billing and taking Cash. But if we have time then we have to accept online transaction via POS Machine or UPI with any gateway

Bot Module

Bot will gives some basics answer related to transactional entries or statistical output based on the questions asked by user

4. SYSTEM DESIGN

4.1.Use Case Diagram

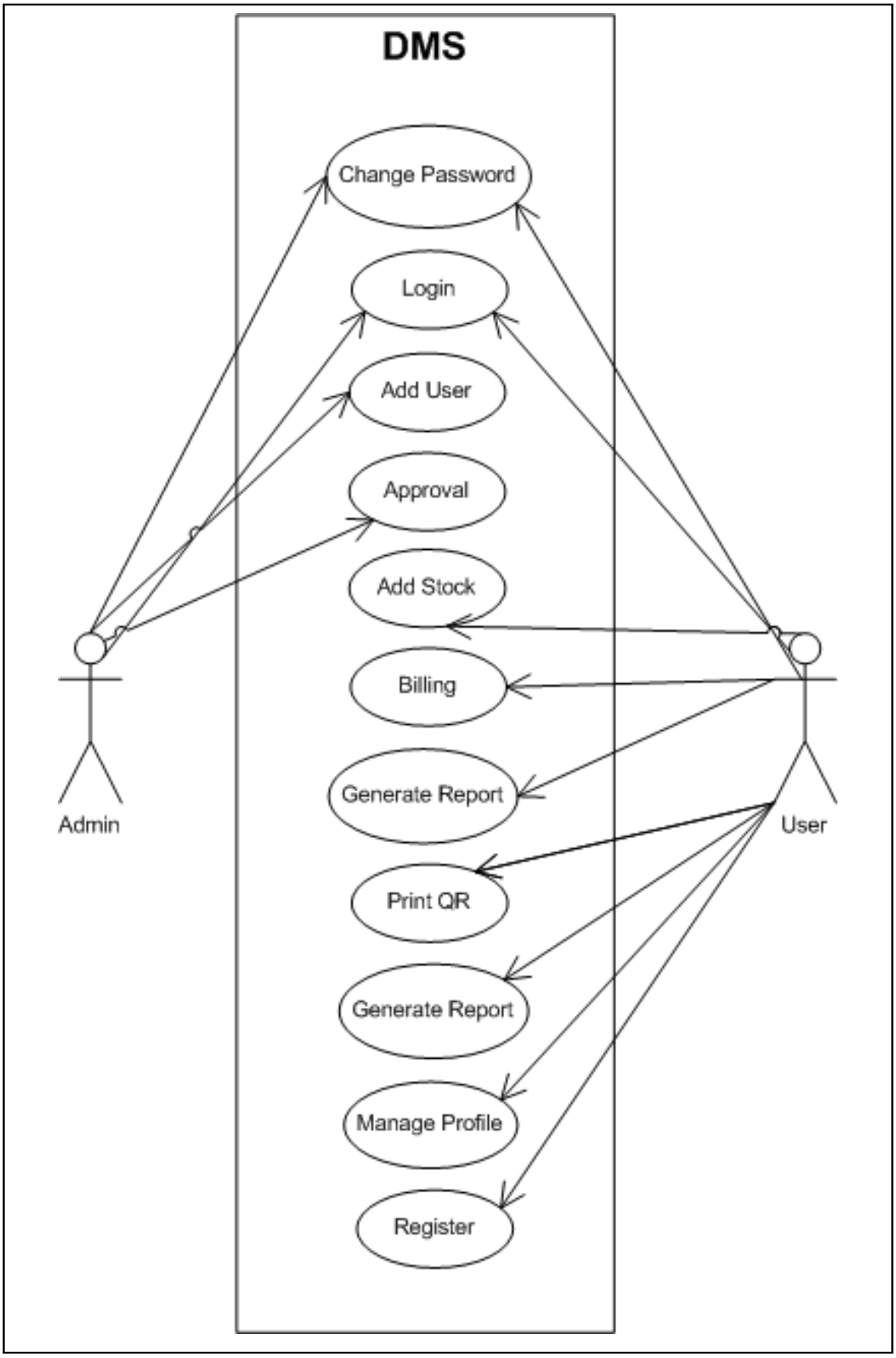

Figure 1 UseCase Diagram

4.2.Activity Diagram

- An Activity Diagram for **Login Page**

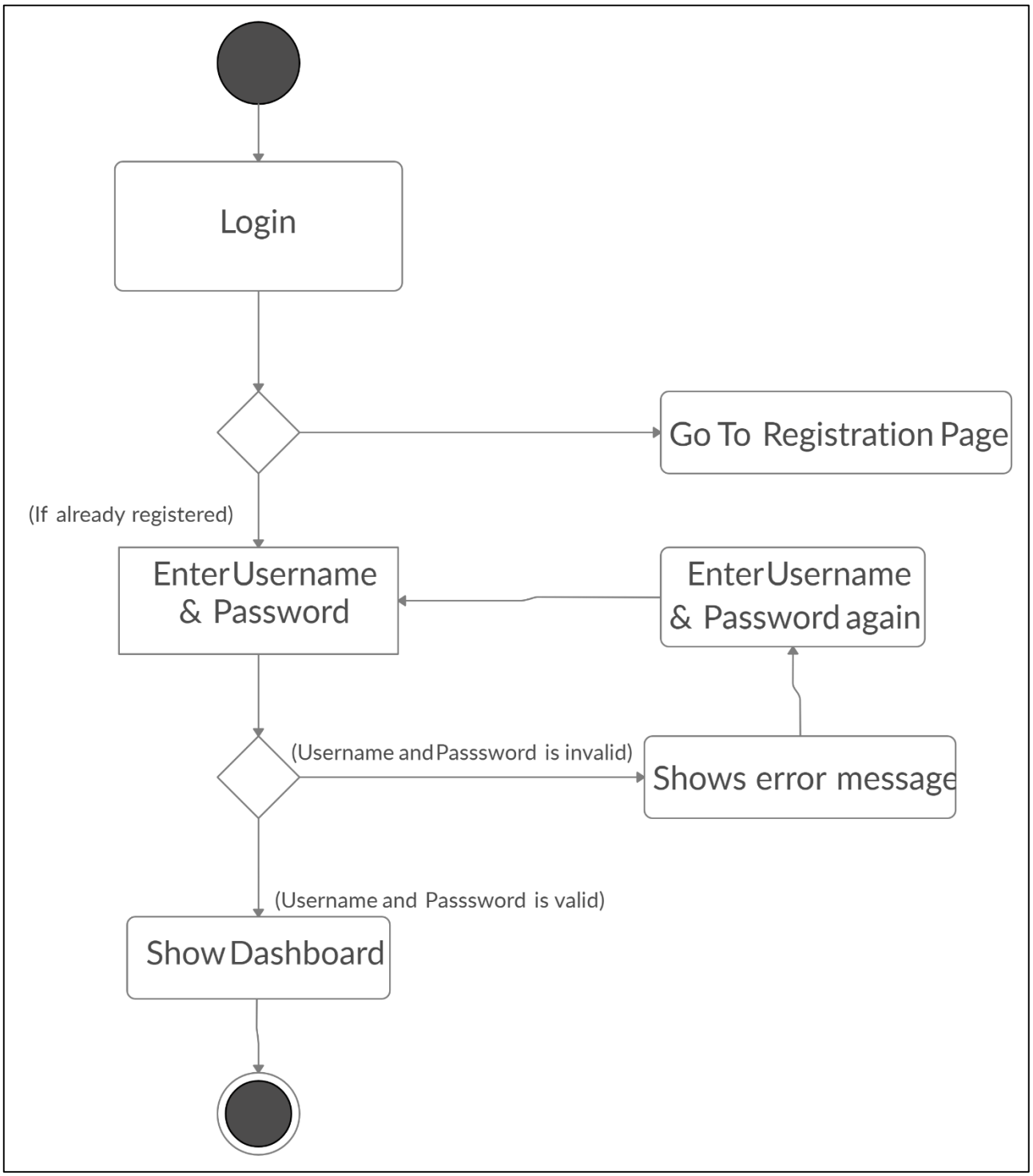

Figure 2 Activity Diagram of Login

- An Activity Diagram for **Add Product**

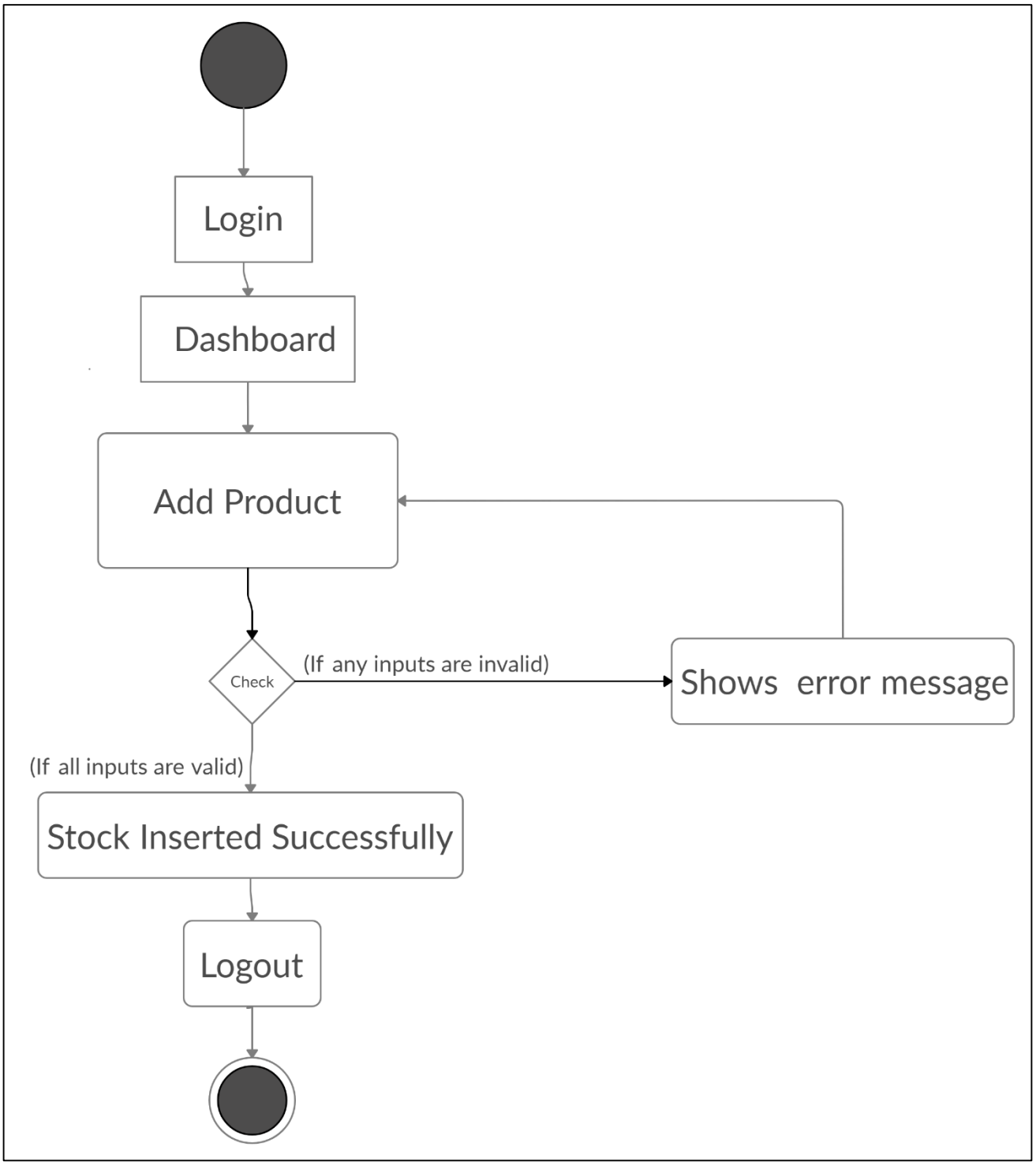

Figure 3 Activity Diagram of add Products

- An Activity Diagram for **Print QR Code PDF**

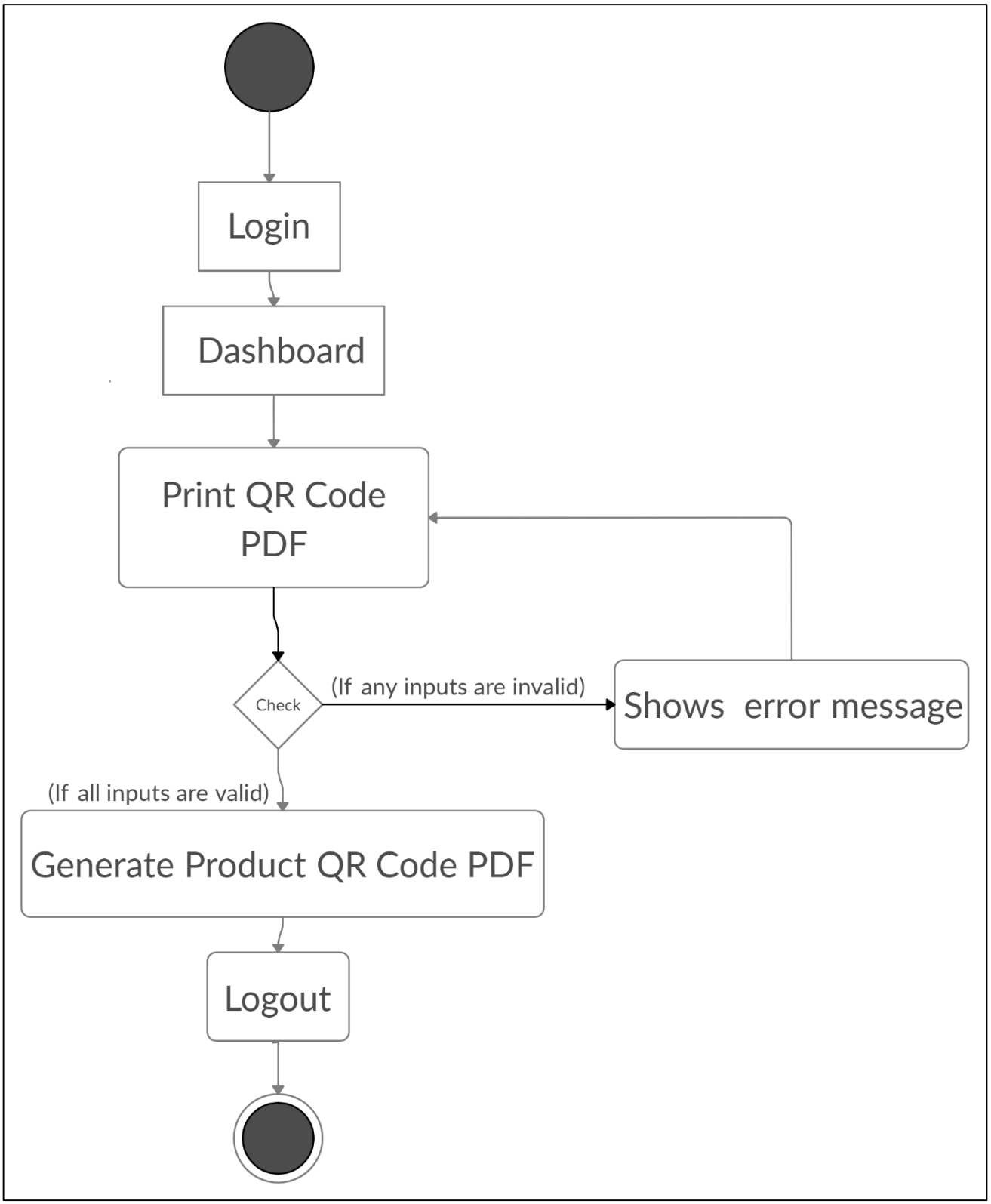

Figure 4 Activity Diagram of Print QR Code PDF

- An Activity Diagram for **Billing**

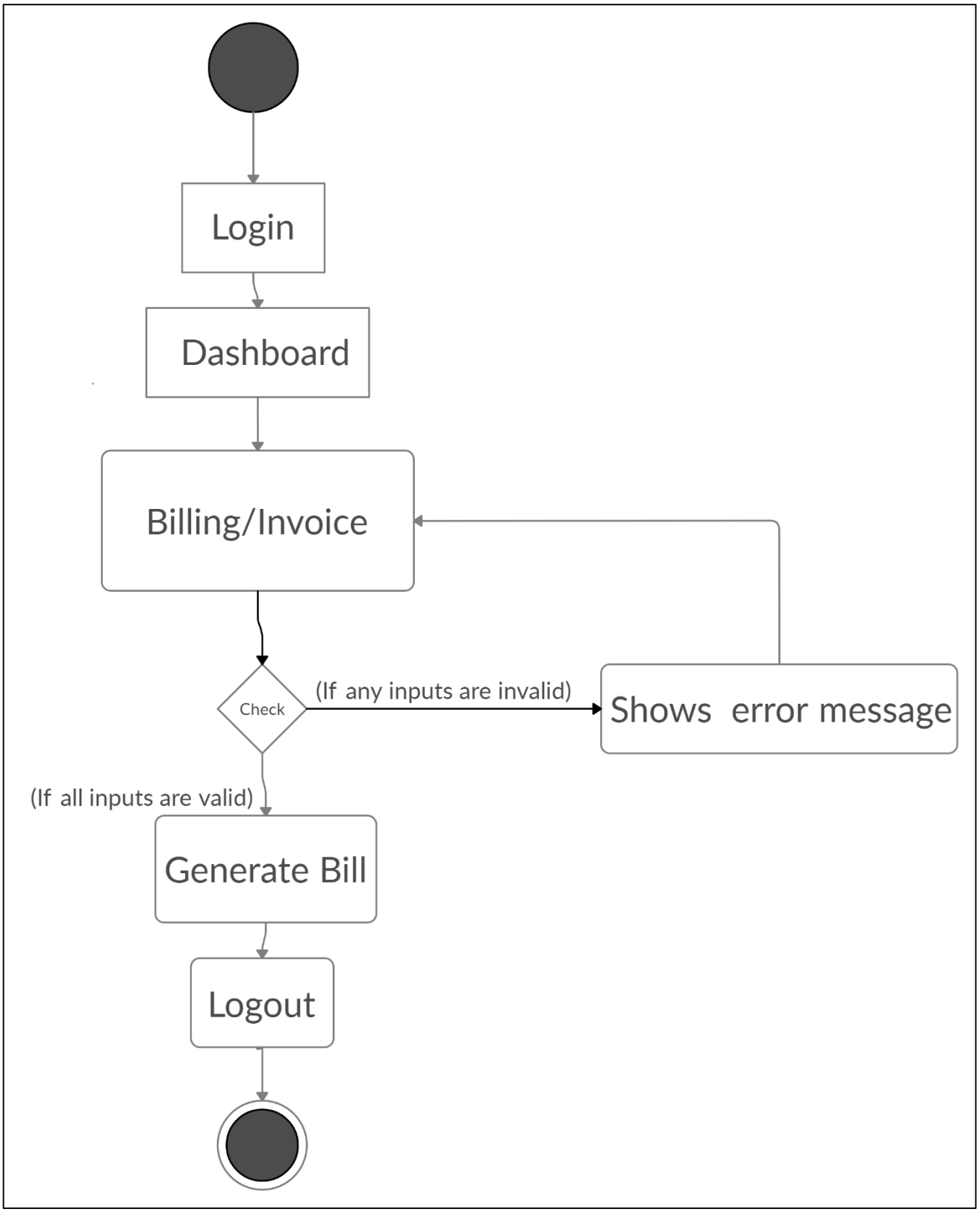

Figure 5 Activity Diagram of Billing

- An Activity Diagram for **Sales Return**

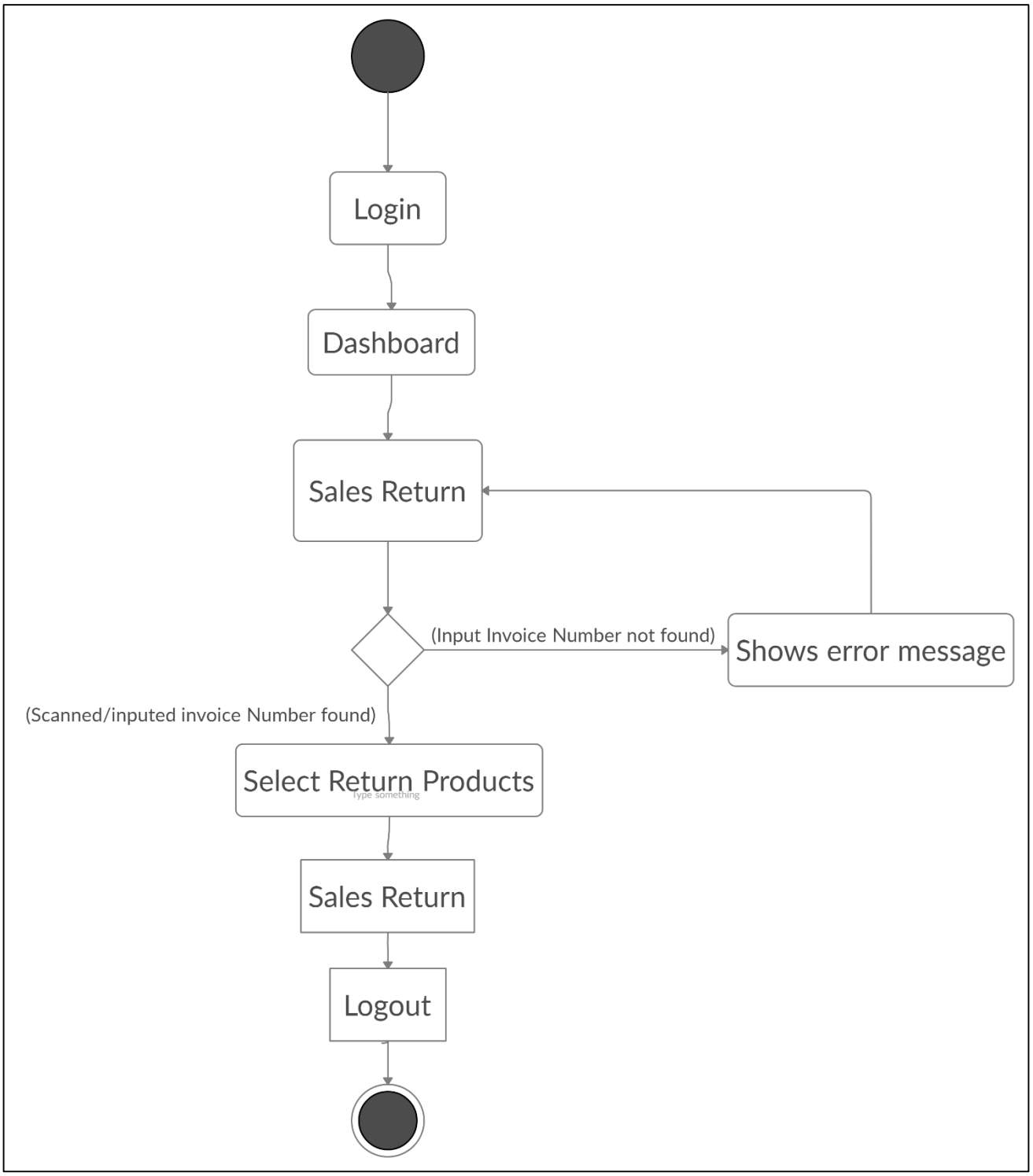

Figure 6 Activity Diagram of Sales Return

4.3.Class Diagram

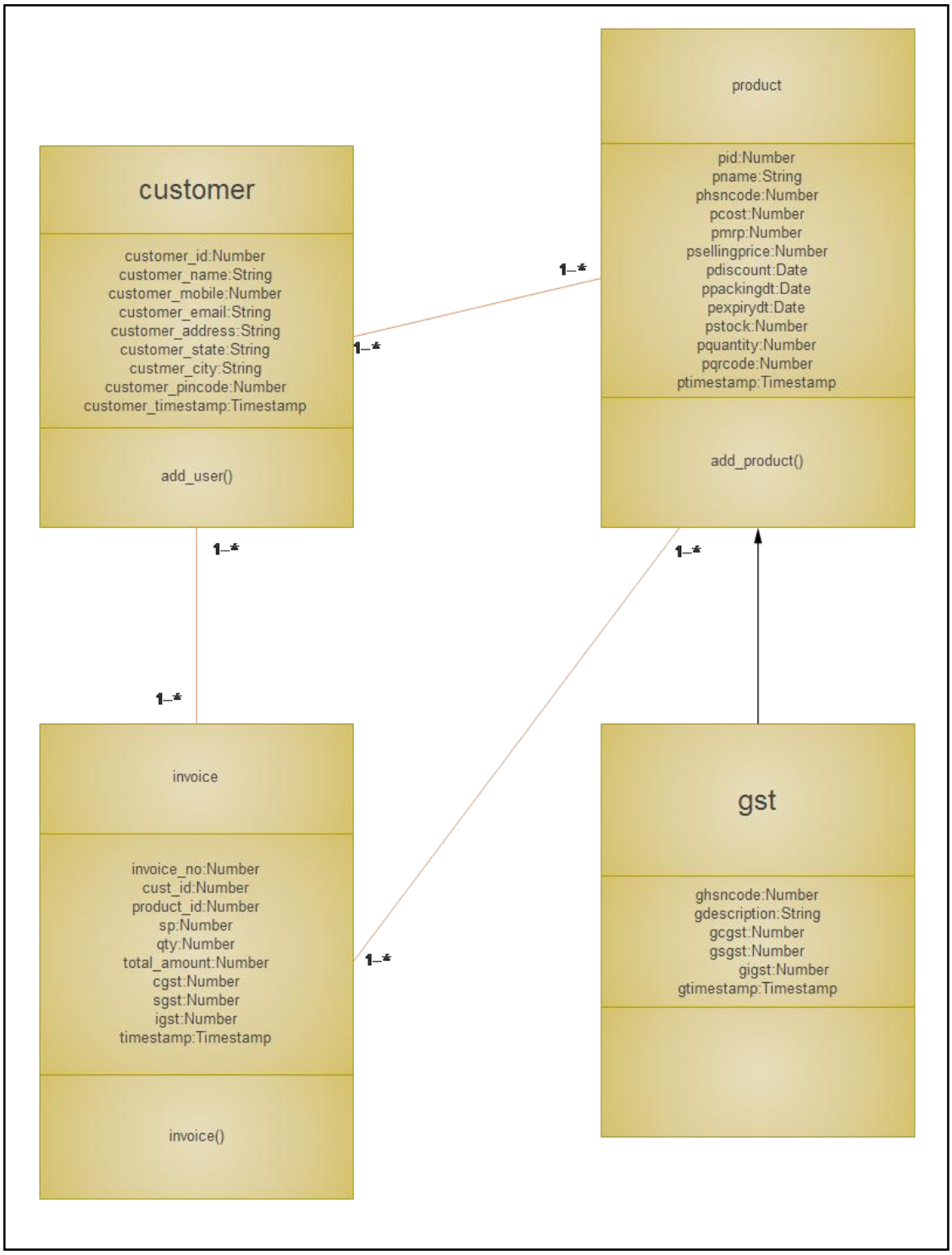

Figure 7 Class Diagram

4.4.Sequence Diagram

- Sequence Diagram for **Login**

Figure 8 Sequence Diagram of Login

- Sequence Diagram for **Add Product**

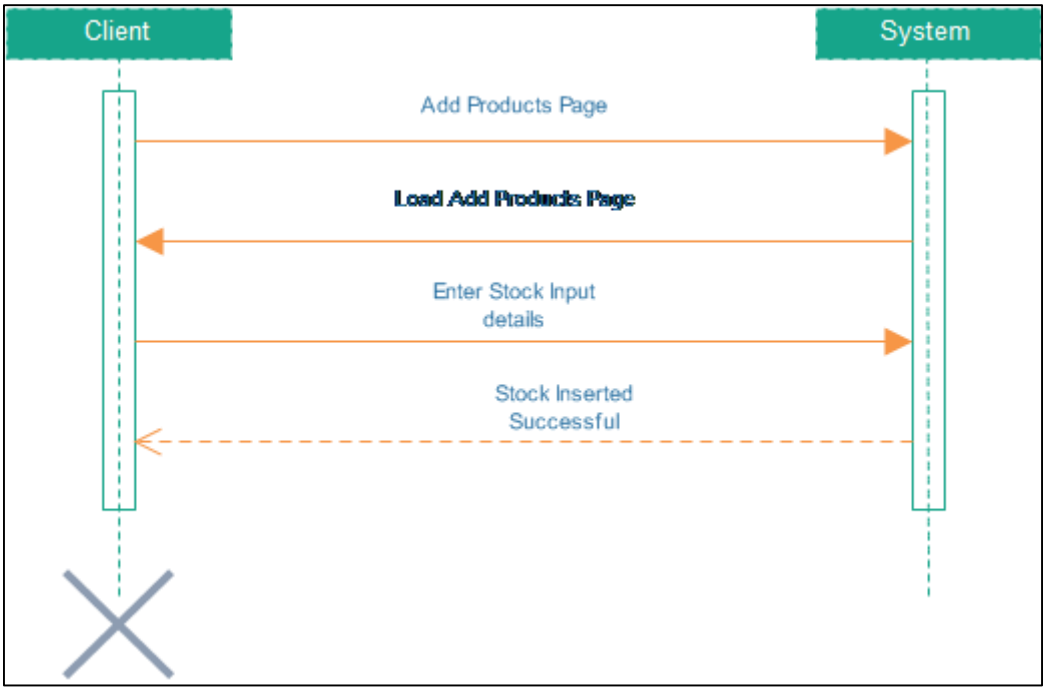

Figure 9 Sequence Diagram of Add Products

- Sequence Diagram for **Print QR codes**

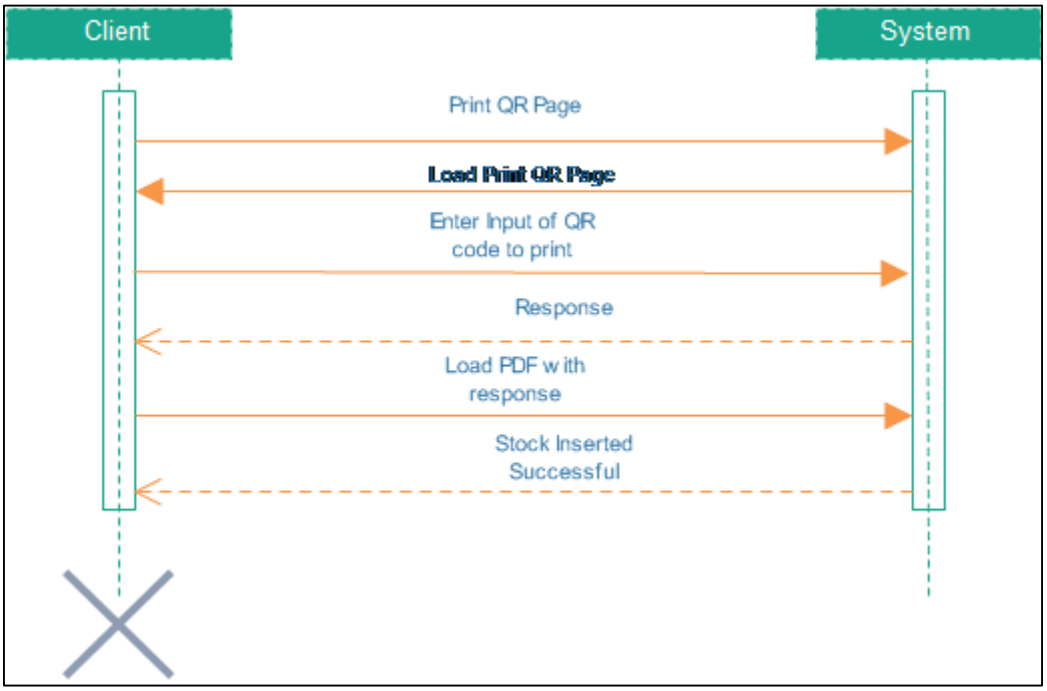

Figure 10 Sequence Diagram of Print QR Codes

- Sequence Diagram for **Billing**

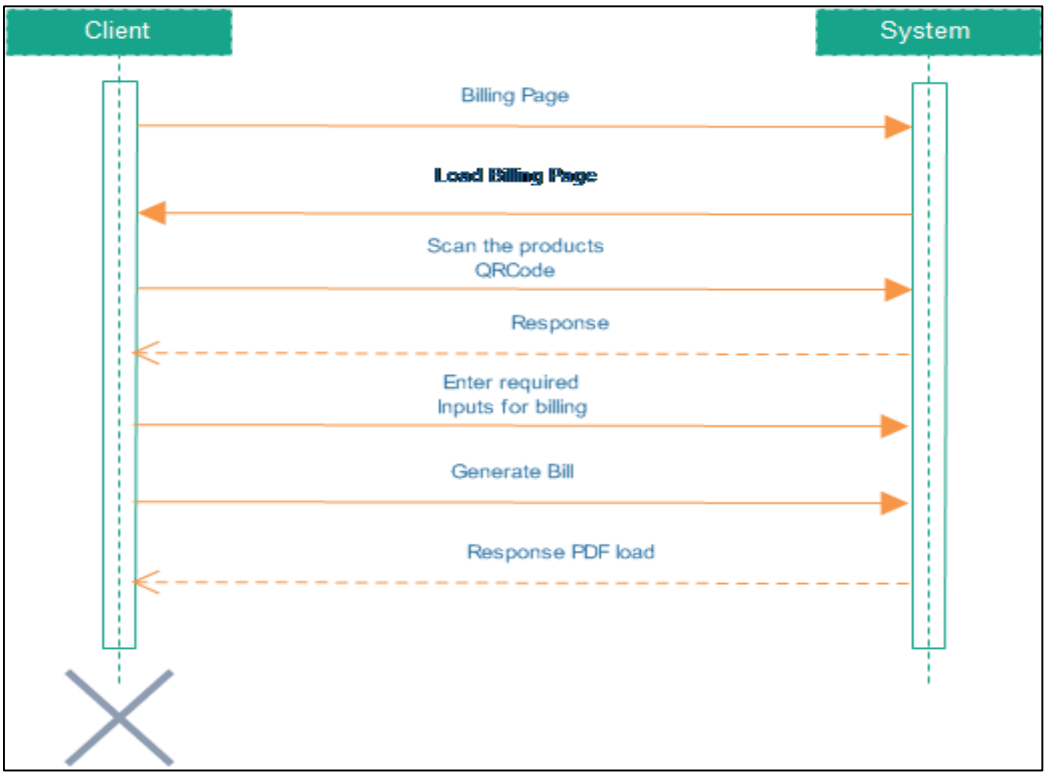

Figure 11 Sequence Diagram of Billing

- Sequence Diagram for **Sales Return**

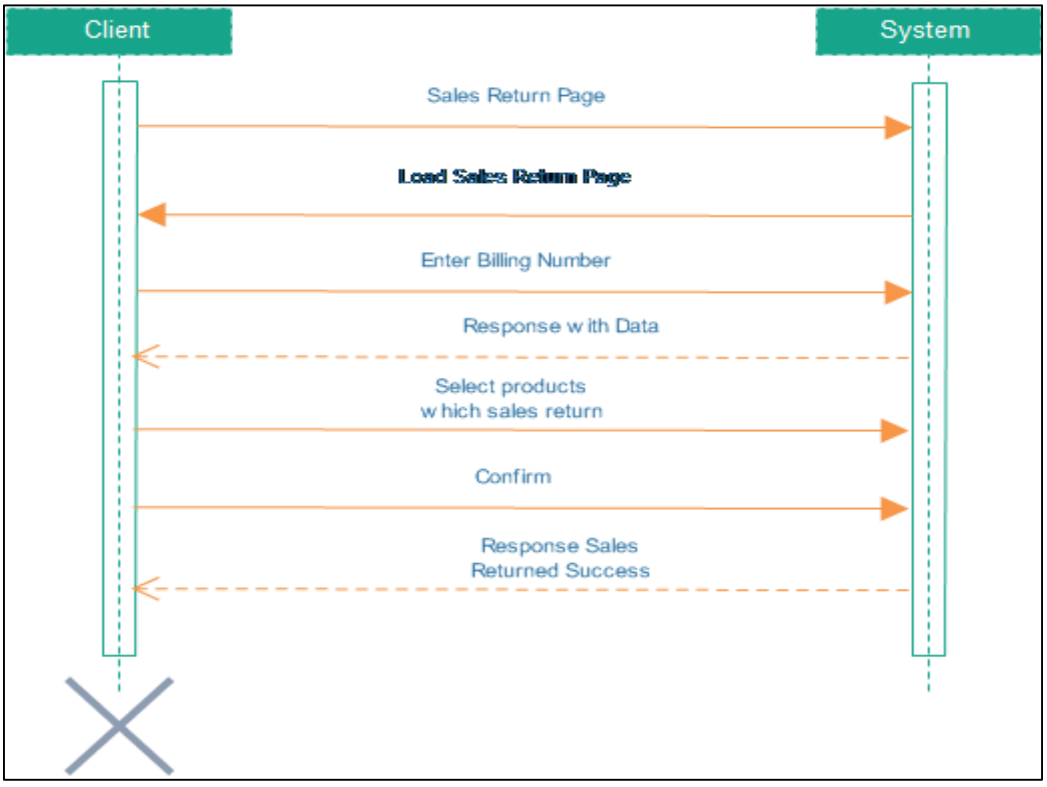

Figure 12 Sequence Diagram of Sales Return

4.5.Screenshots

4.5.1. User Side

Screenshot: Login

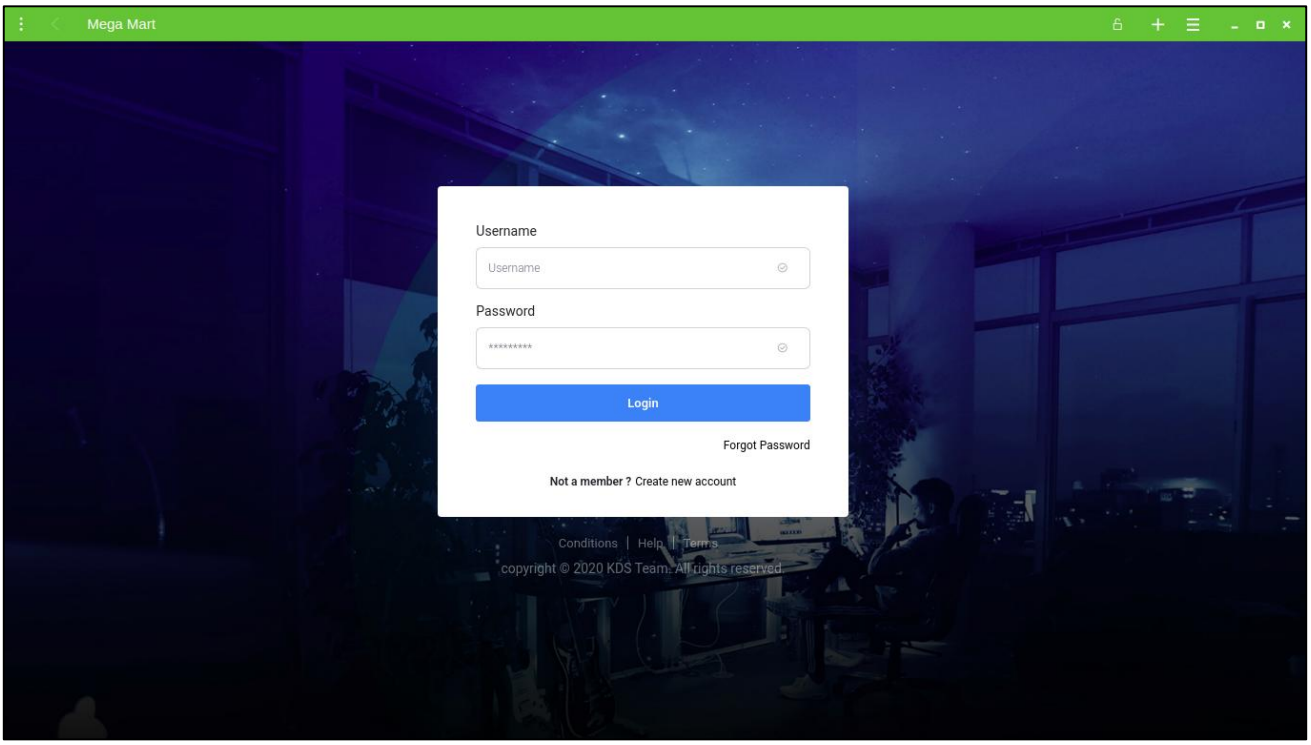

Figure 13 Screenshot of Login Screen

- Login screen
- If user is already registered then login to the application from this screen

Screenshot: Dashboard

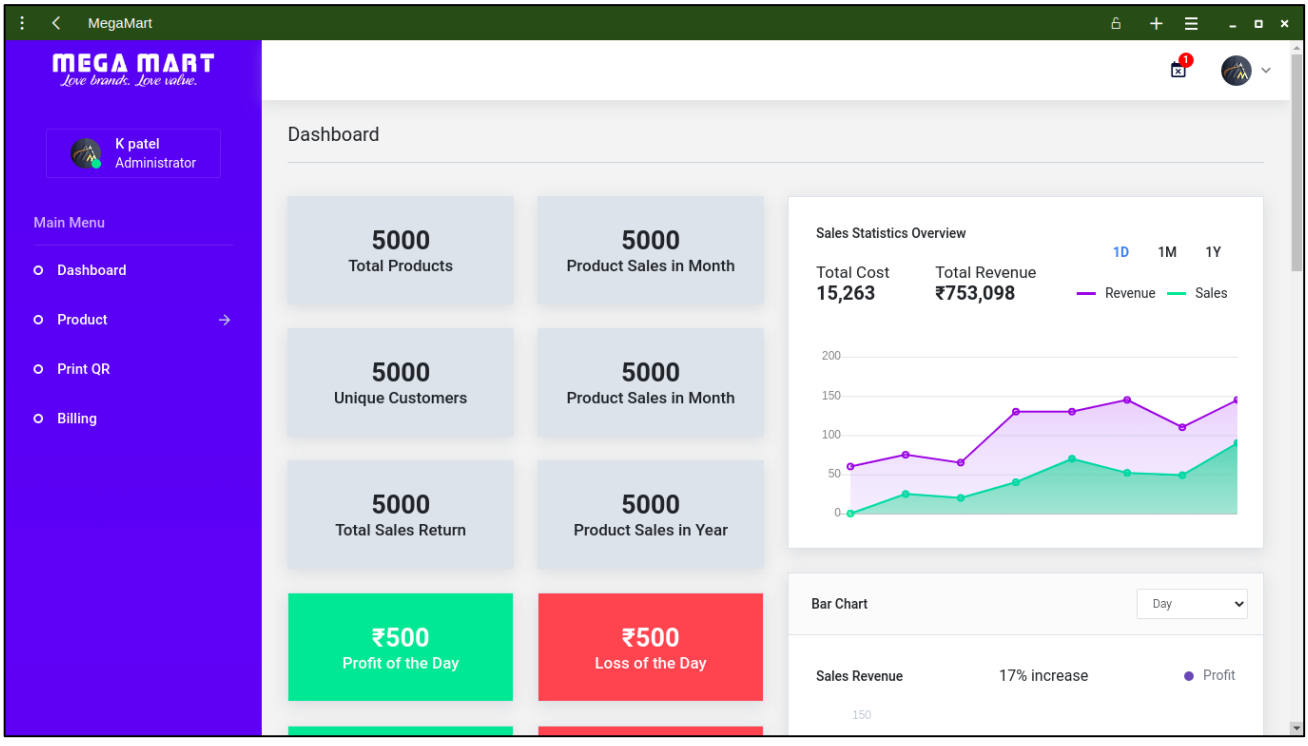

Figure 14 Screenshot of Dashboard

- After user logged in user will see dashboard screen

Screenshot: All Products

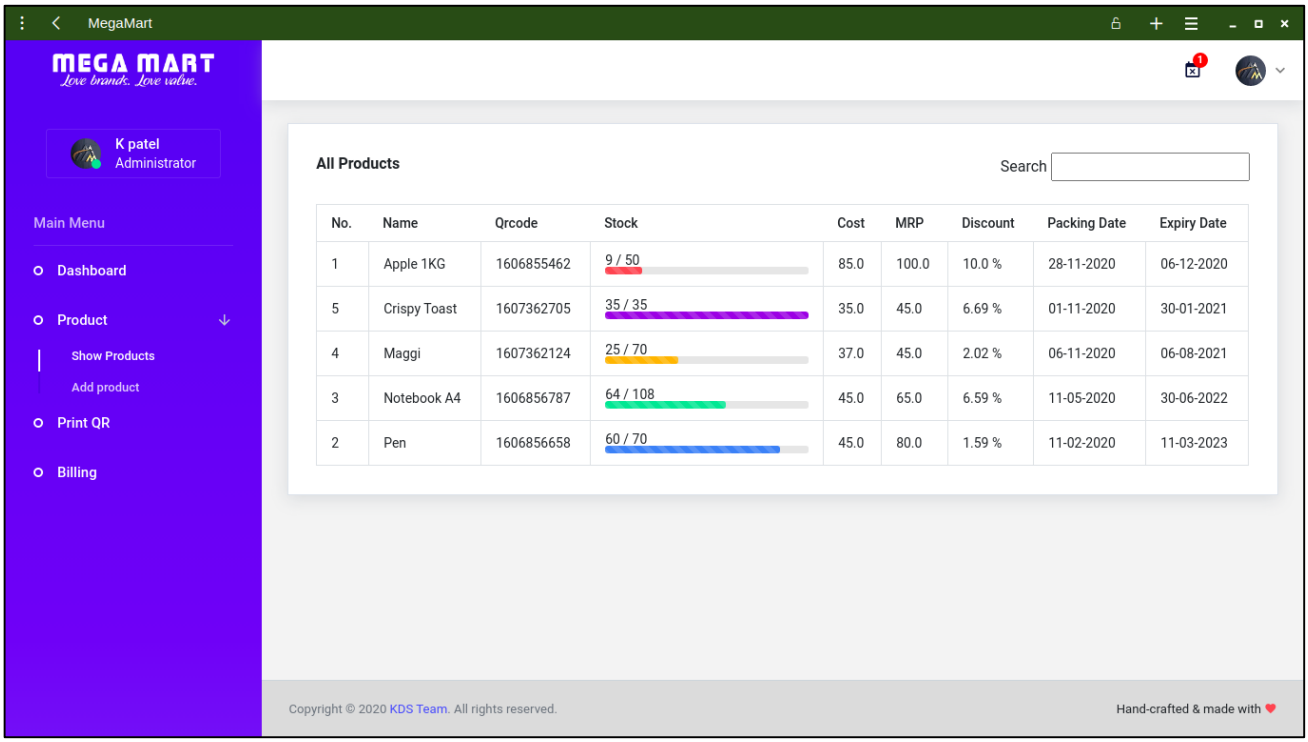

Figure 15 Screenshot of All Products

- To check stock of our organization

Screenshot: Show all products

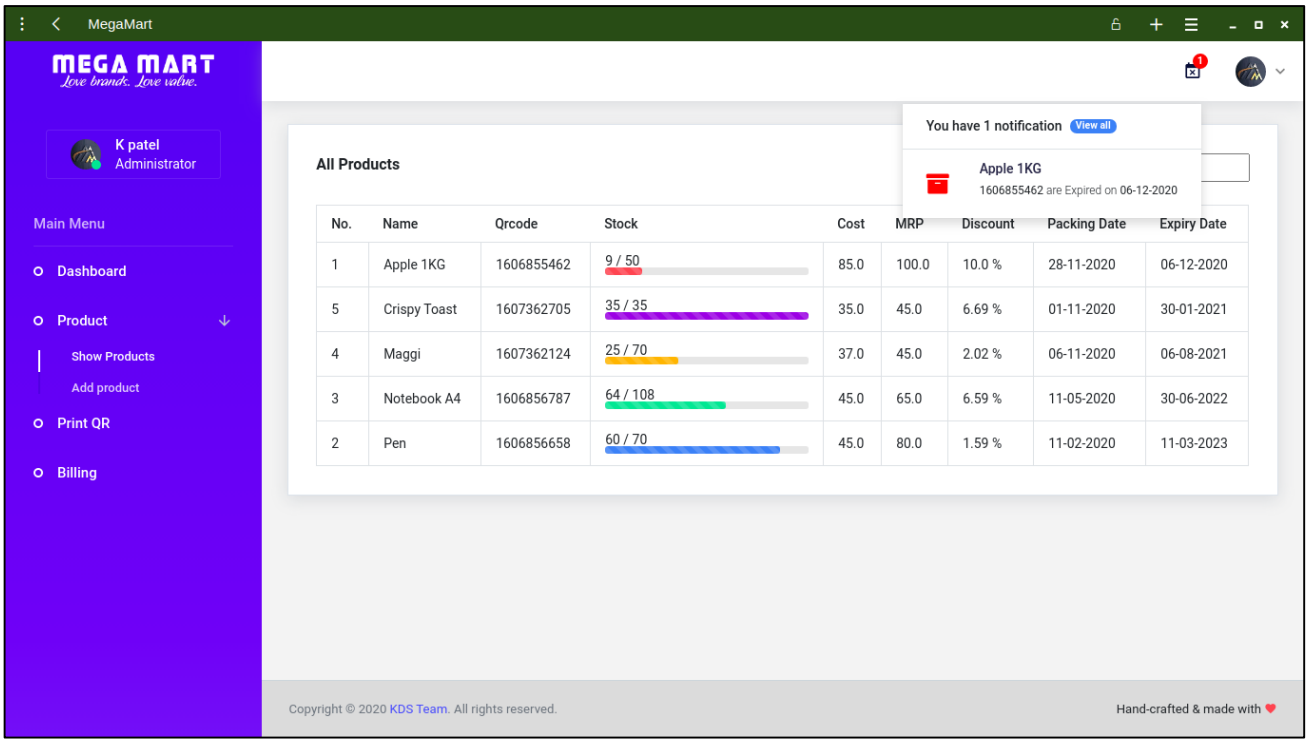

Figure 16 Screenshot of Show all products and Notification of Expired products

- Here you can check “Apple 1KG” the fruits products has been expired, it will notify in top-navbar.When stock change, or if stock is gone under some conditions it will change colors, like on below 10% stock it will show red lines, below 50% it will show yellow lines, above 50% it will show green lines, above 75% it will show blue lines and on 100% it will show purple lines.

Screenshot: Add Product/Stock

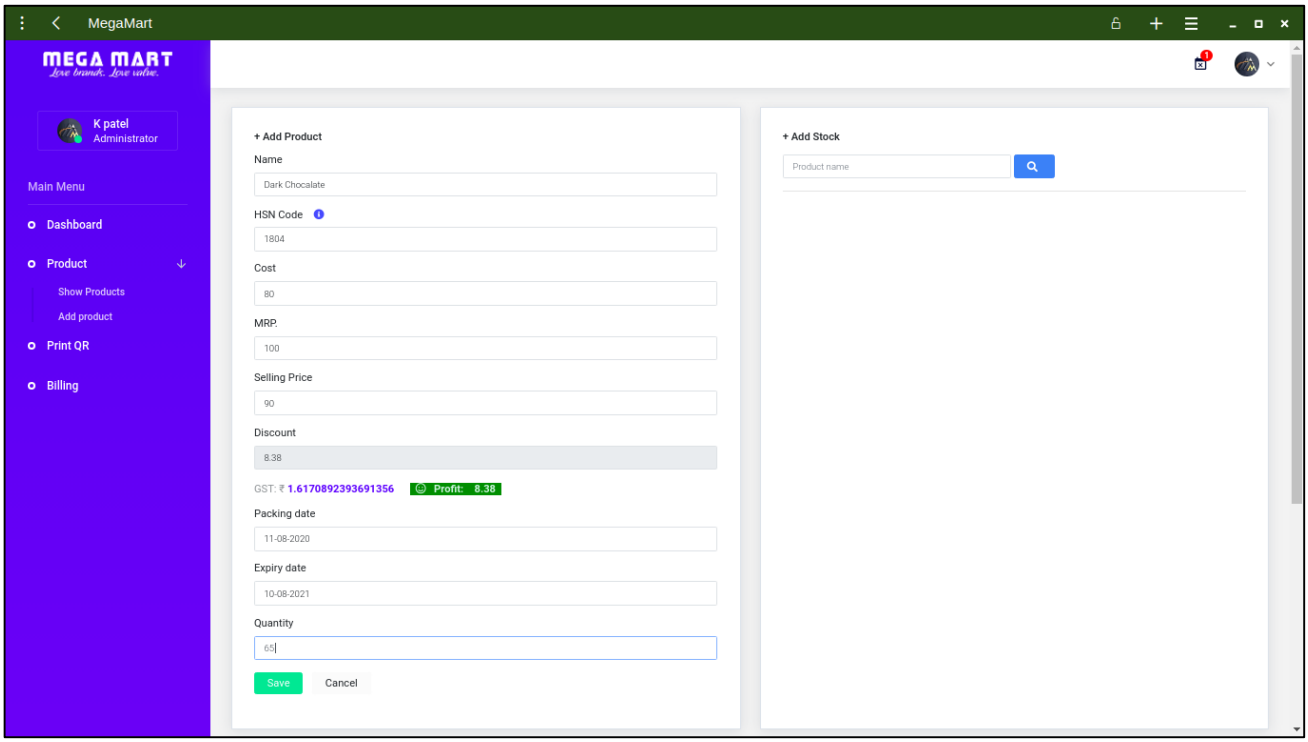

Figure 17 Screenshot of Add Stock

- To add any stock, it will also take care if user try to fill wrong details it will show error like if user enters stock manufacture date of next upcoming days. It will shows error, not only one field, almost all fields having validation.

Screenshot: Add Stock with same details

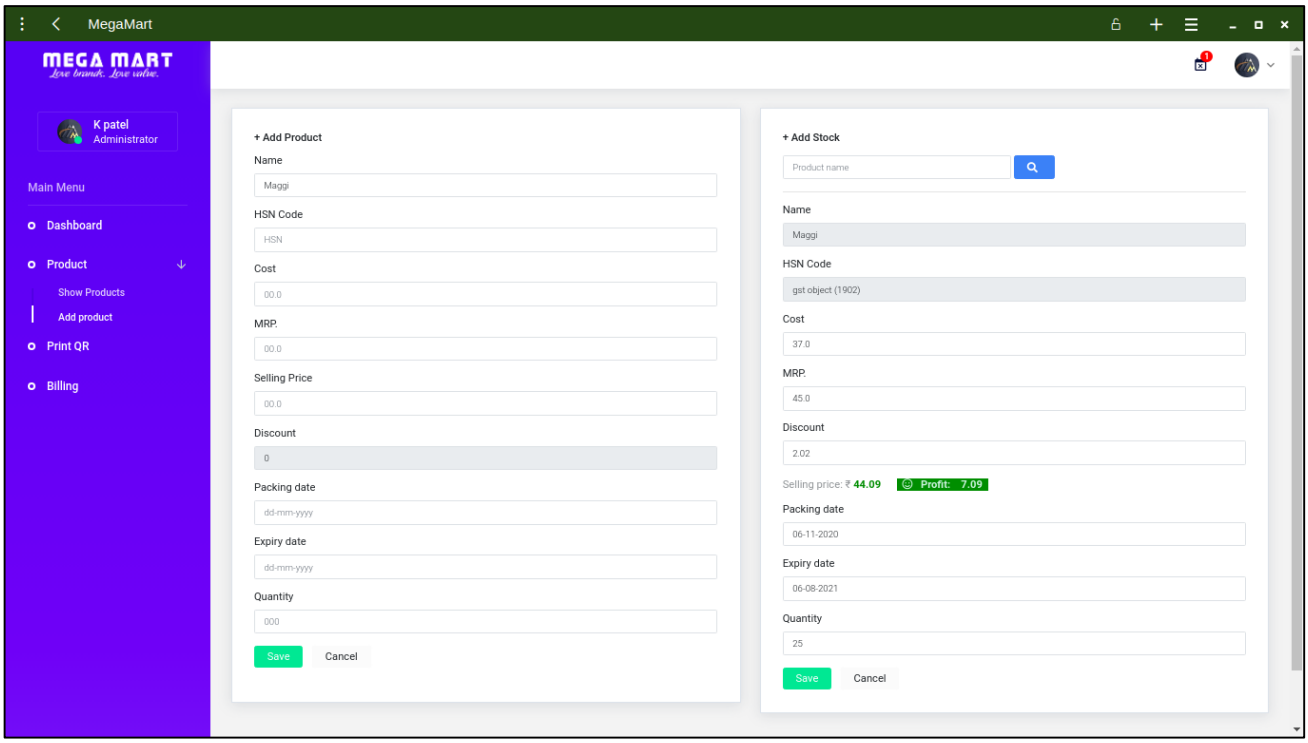

Figure 18 Screenshot of Add Stock if already inserted with same details

- If user was trying same stock with same details it will add that stock with same details, not need to rewrite stock details again on system.

Screenshot: Printing QR Code

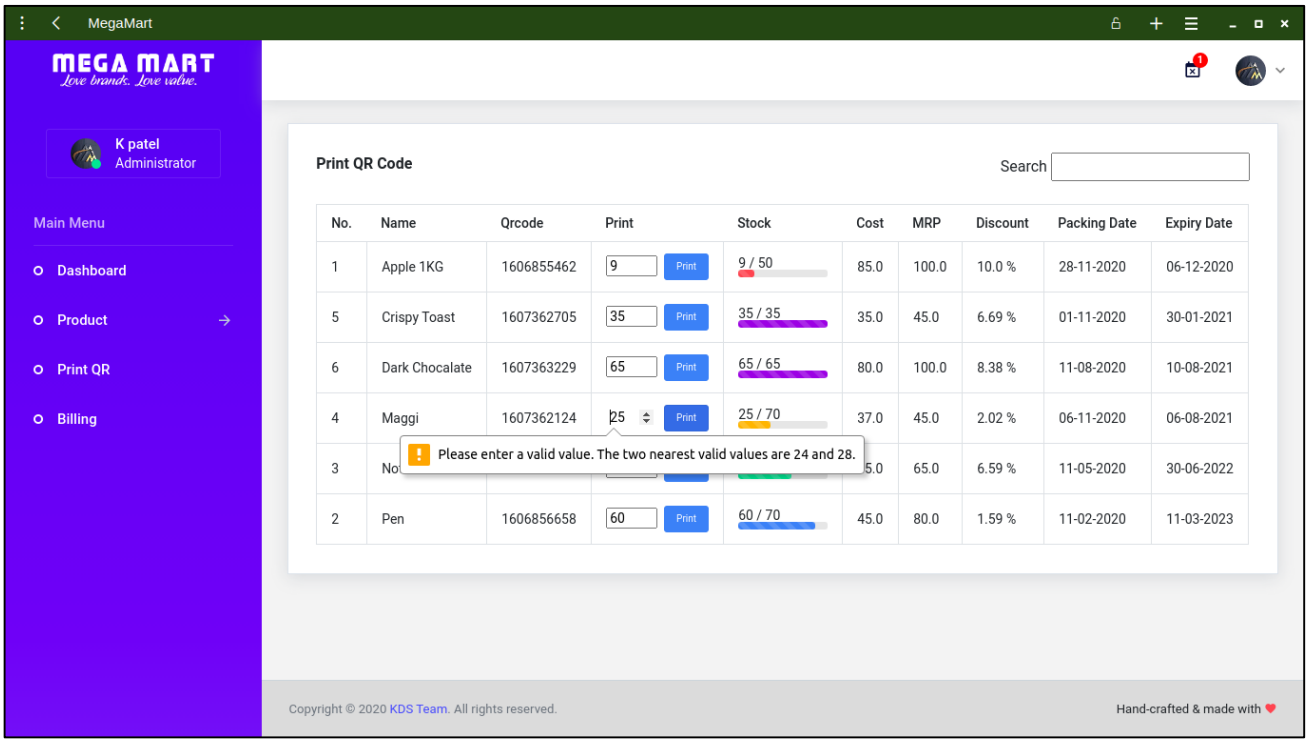

Figure 19 Screenshot of Printing QR Code

- Printing of QR Code, we can create pdf of QR code in multiple of 4. Ex. 4,8,12,16,……

Screenshot: QR Code PDF

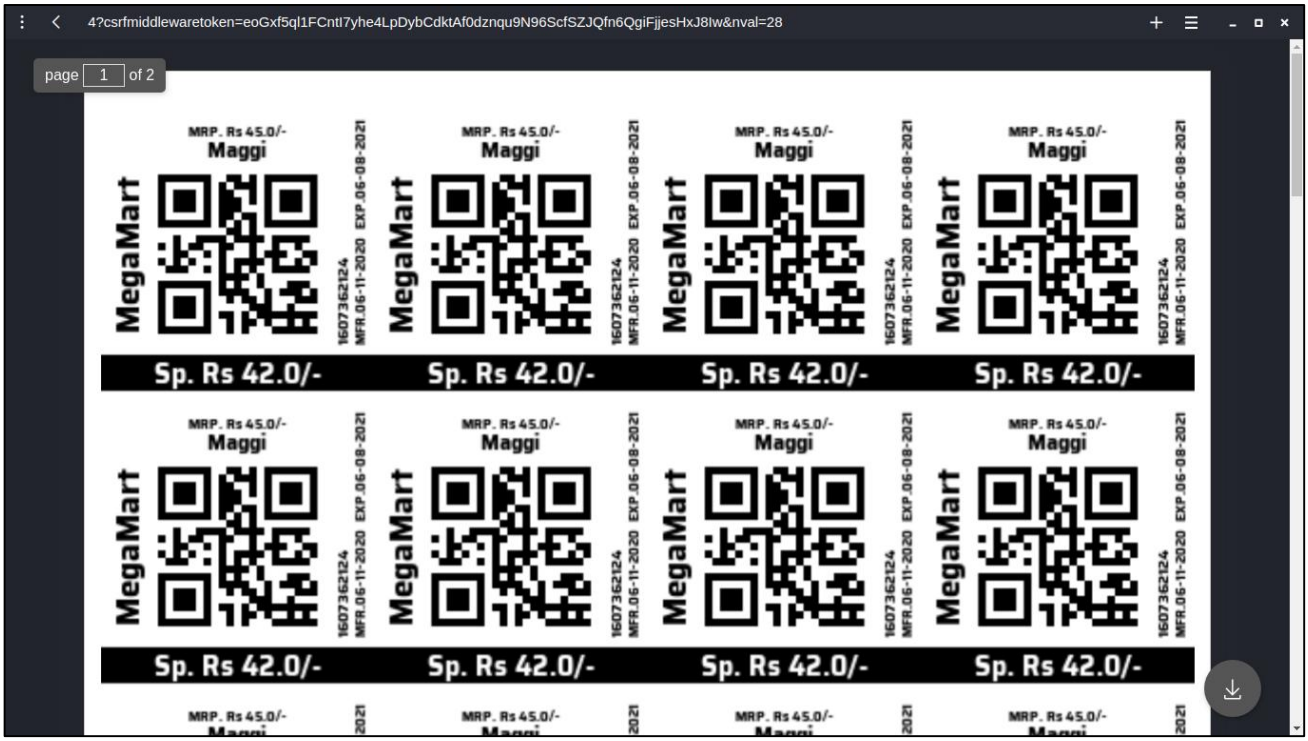

Figure 20 Screenshot of QR Code PDF

- To download PDF we have to select Download button

Screenshot: Billing

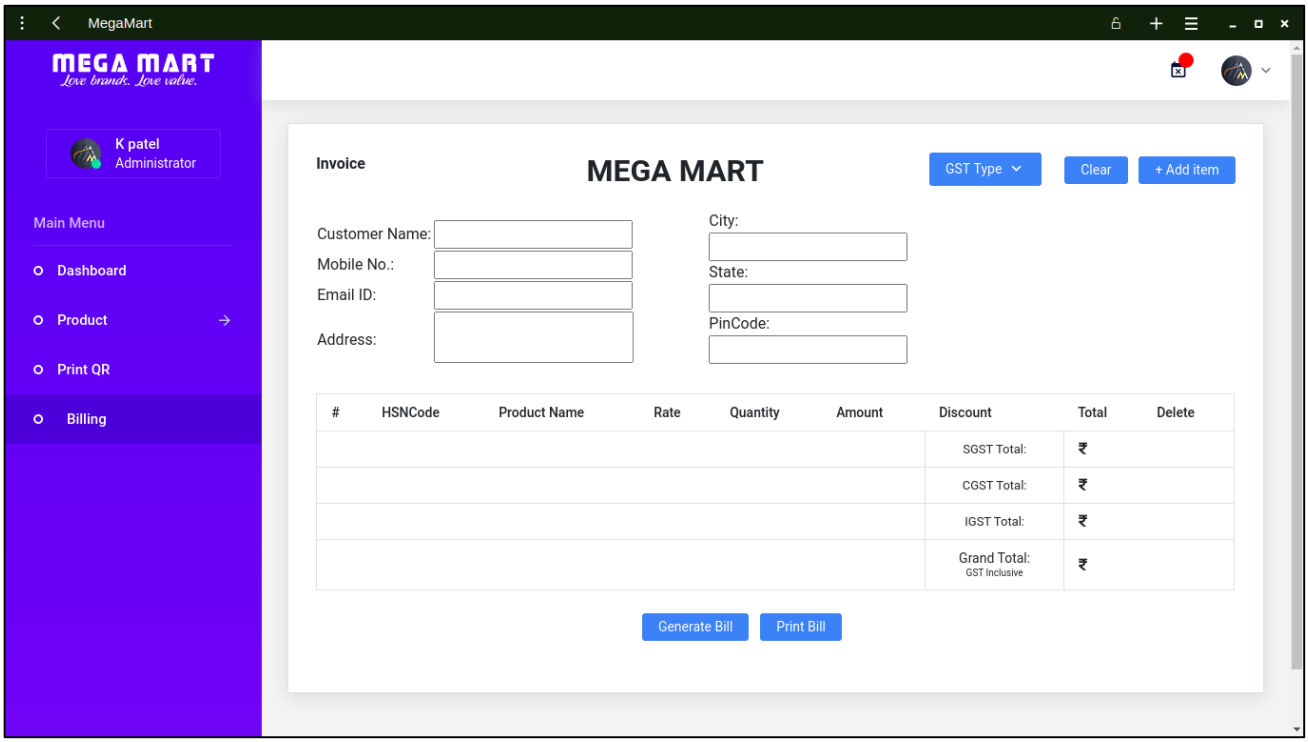

Figure 21 Screenshot of Billing

- Billing module looks like above mentioned Screenshots.
- To add product into billing we have use add item, and to clear all details in billing module clear button.
- billing module makes beep sound, while inserting, deleting, adding products…

Screenshot: Billing, QR Code Dialog

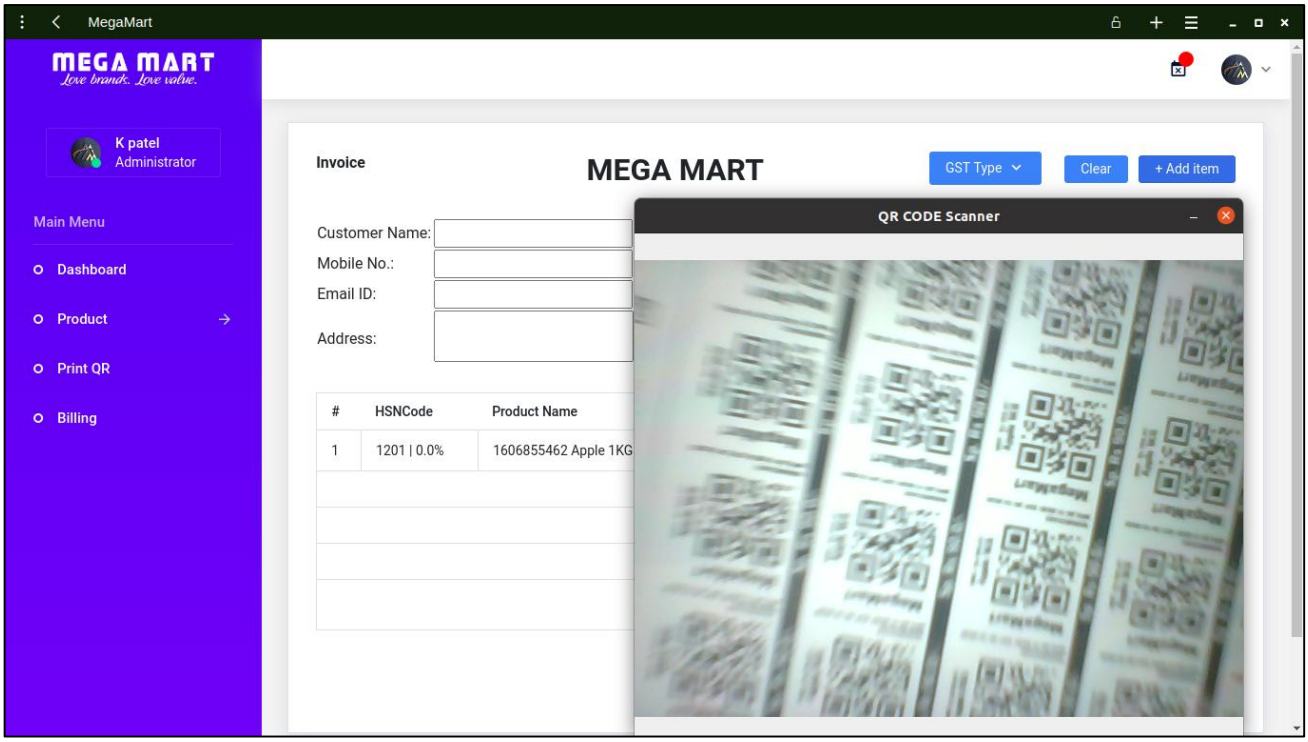

Figure 22 Screenshot of Billing, QR Code Dialog

- On click “add item” QR Code Scanner dialog will open, its just for view where we are scanning, sometimes we require to get close QR Code near to camera.

Screenshot: Billing, default GST type was SGST & CGST

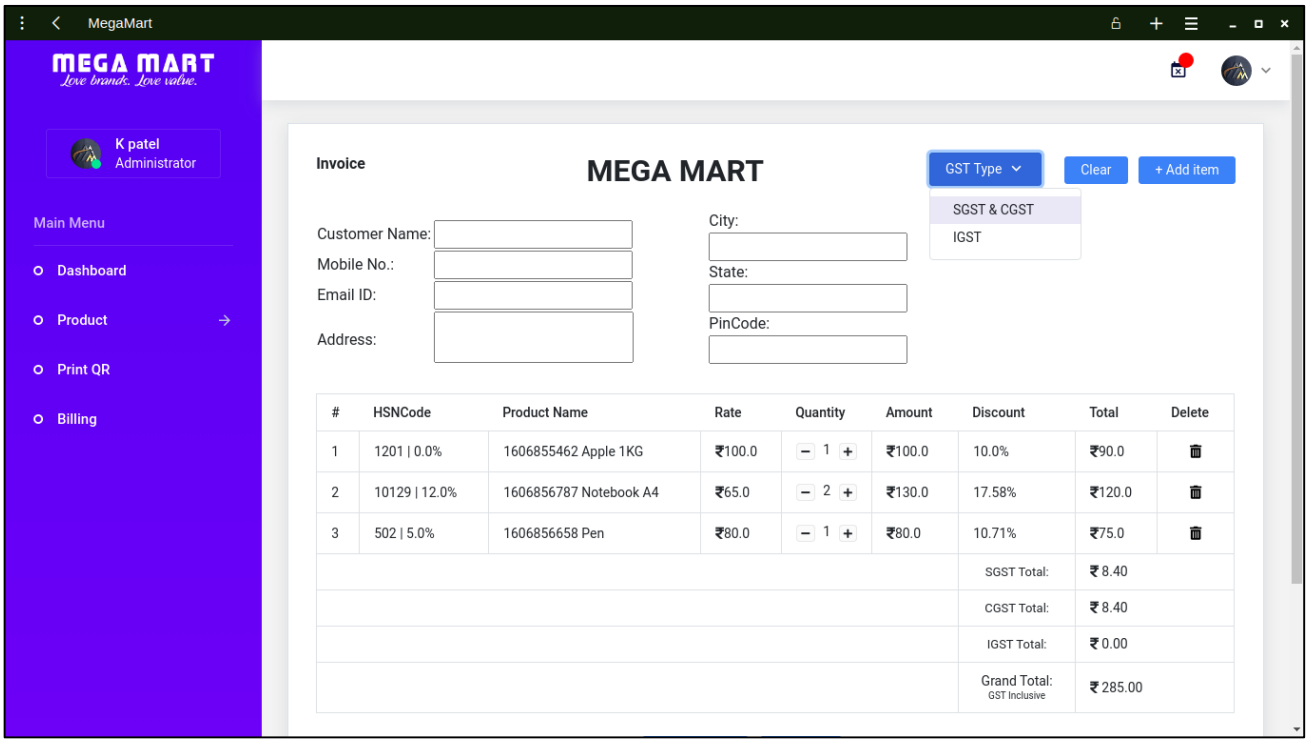

Figure 23 Screenshot of Billing, default GST type was SGST & CGST

- By default in Billing module GST type was SGST & CGST, we can change GST type to IGST by clicking on dropdown menu “GST Type”.

Screenshot: Billing, changing billing type to IGST

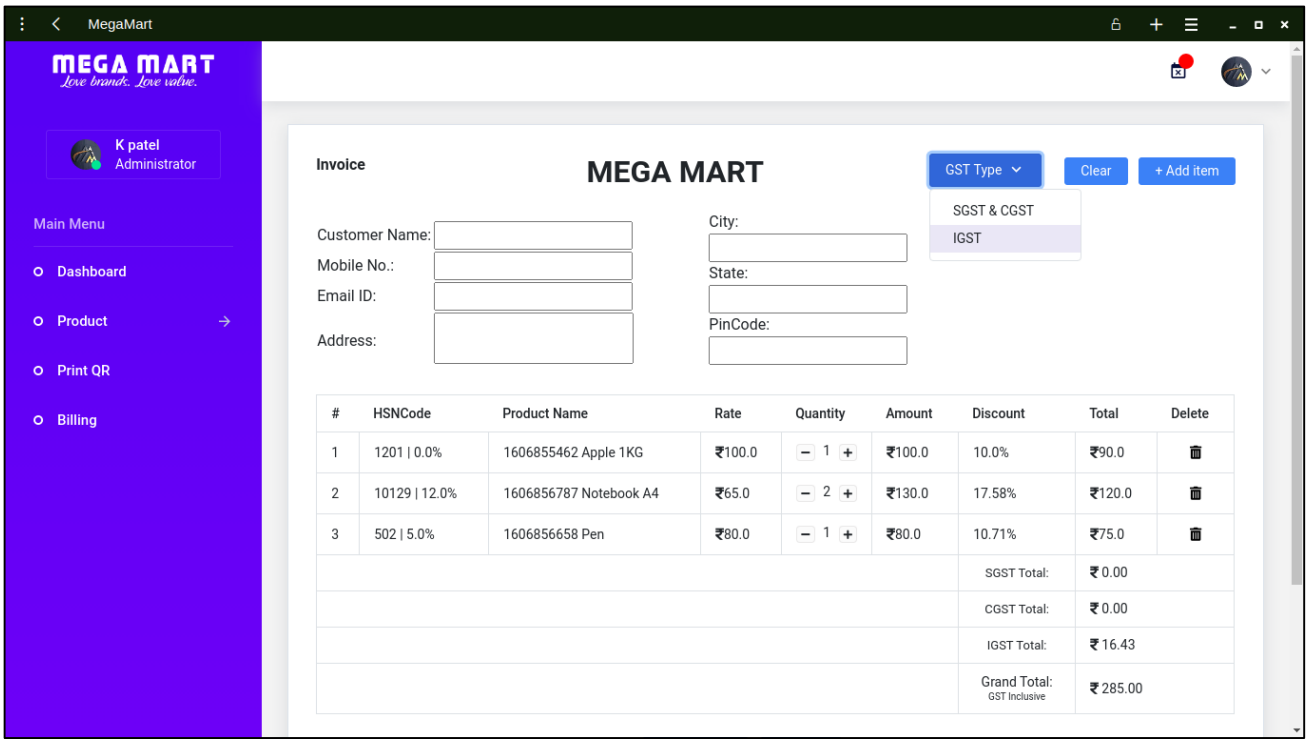

Figure 24 Screenshot of Billing, changing billing type to IGST

- Changing GST Type to IGST, and the Grand Total is GST inclusive.

Screenshot: Billing, Deleting any product in between

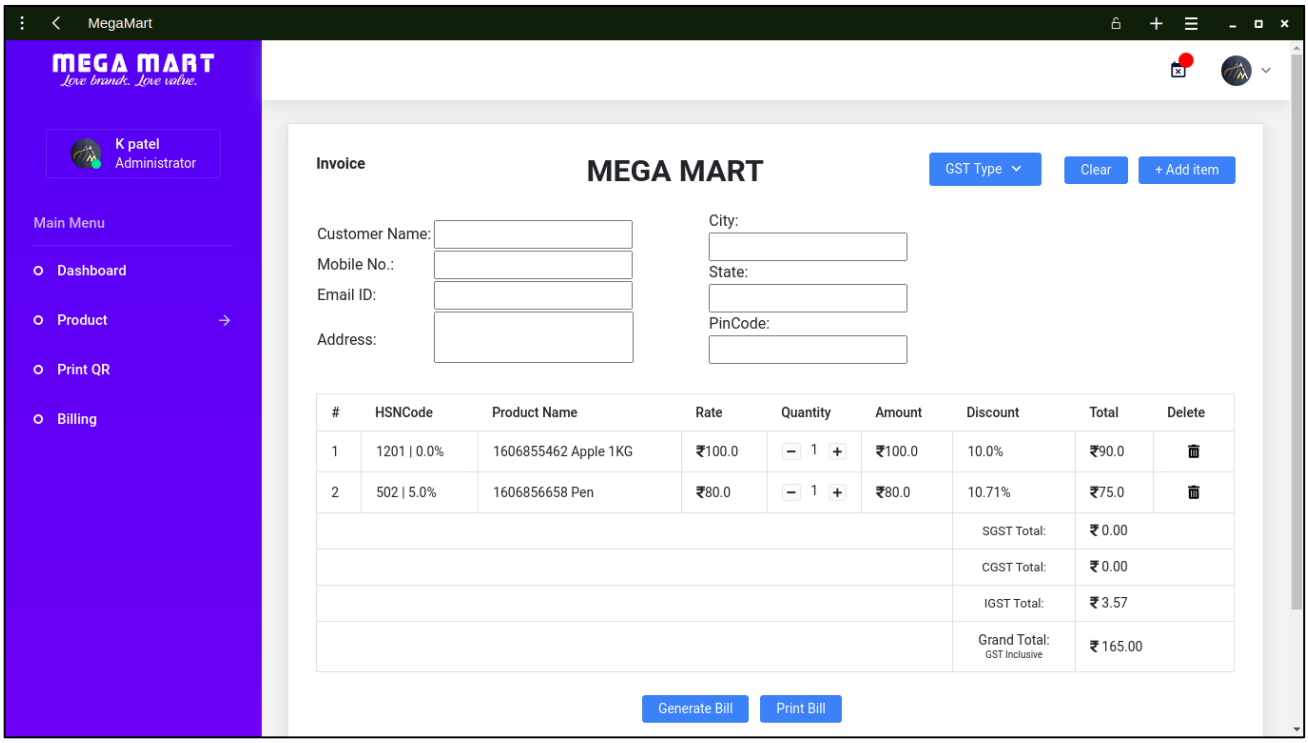

Figure 25 Screenshot of Billing, Deleting any product in between

- Deleting product in between in billing as per above screenshots you can check "Notebook A4" has been deleted and serial no. also maintain order.

Screenshot: User dropdown

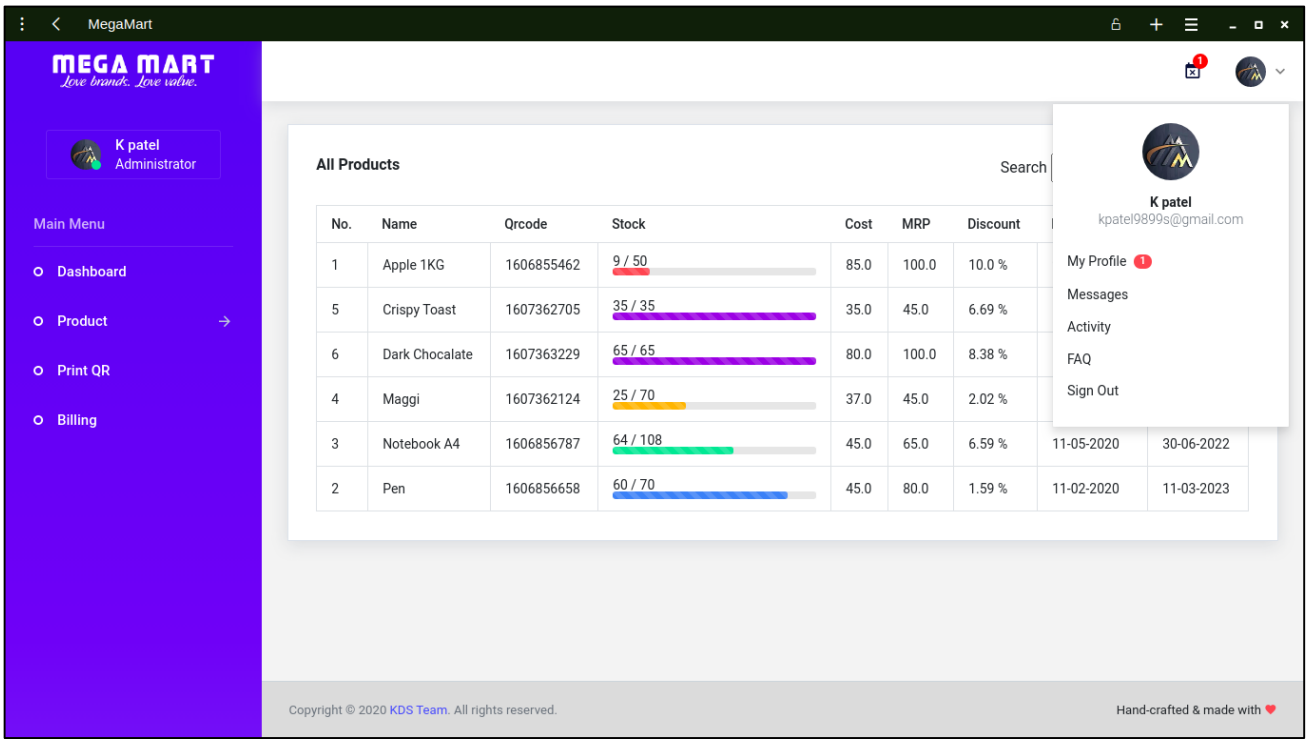

Figure 26 Screenshot of MegaMart System profile logout

- At end we can also logout from MegaMart System

4.5.2. Admin Side

Screenshot: Admin login

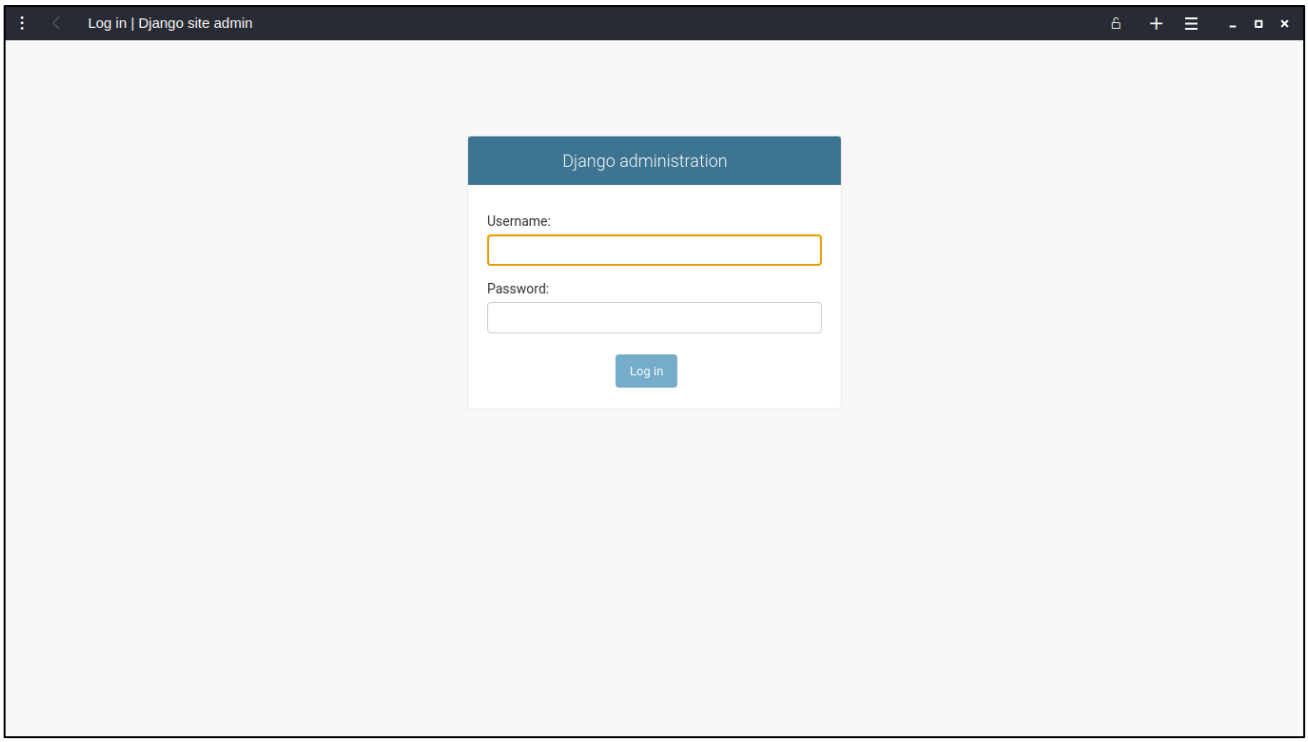

Figure 27 Screenshot of Admin Login

- To login we have enter admin username and password

Screenshot: Shows main tables

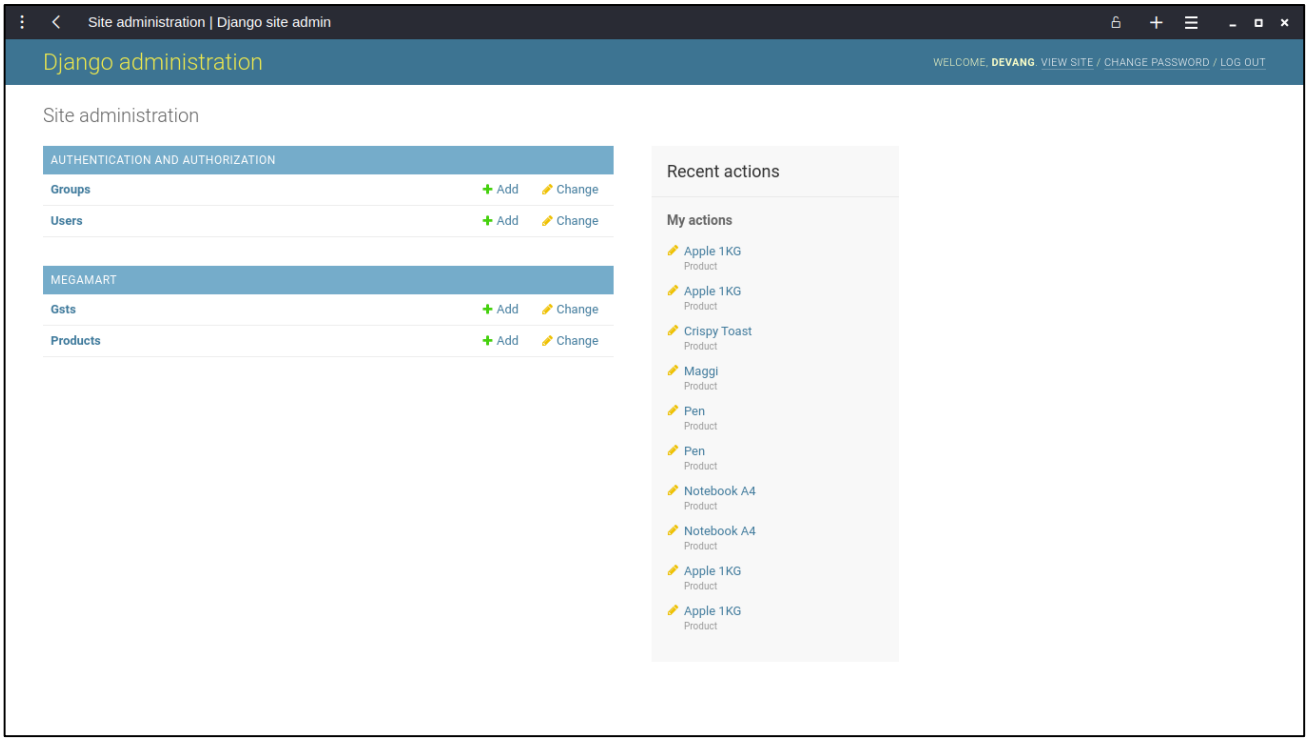

Figure 28 Screenshot of shows main tables in admin

- In admin panel we can check main tables will be display.

Screenshot: Product table in Admin

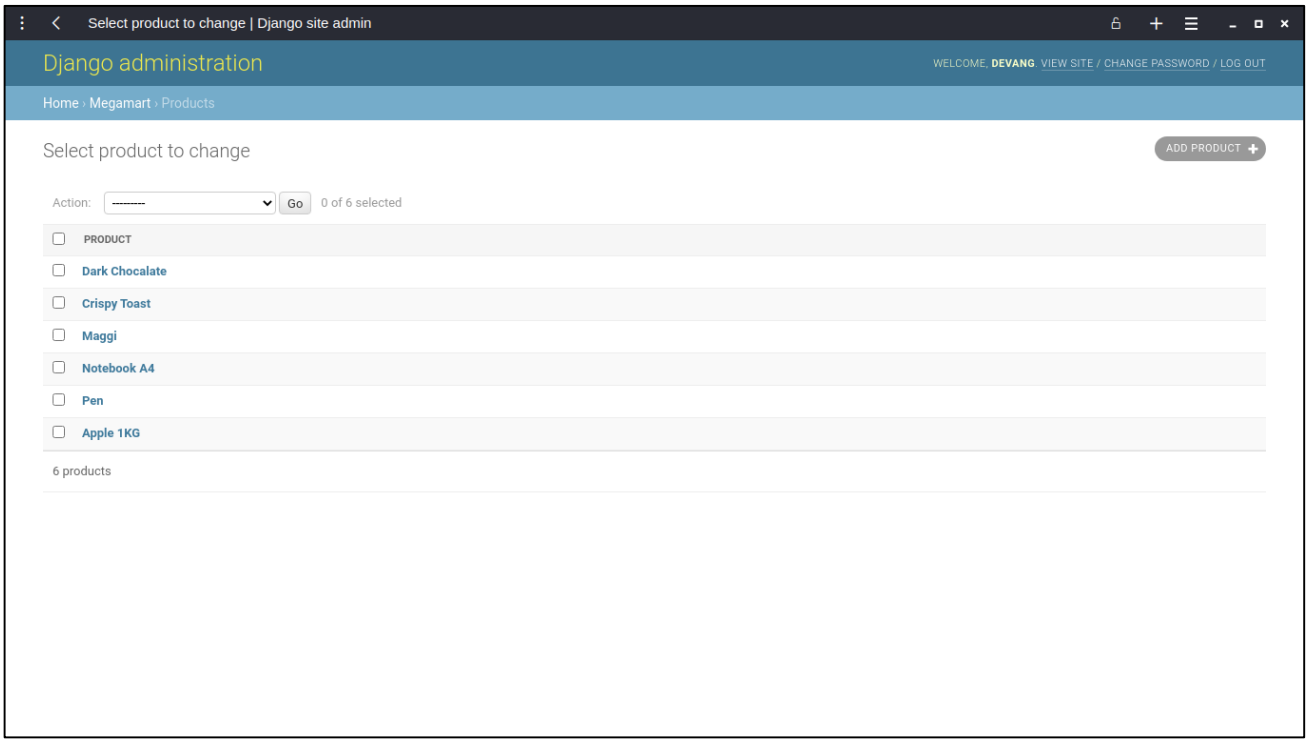

Figure 29 Screenshot of Product table in Admin

- Shows all product list

Screenshot: Deleting products

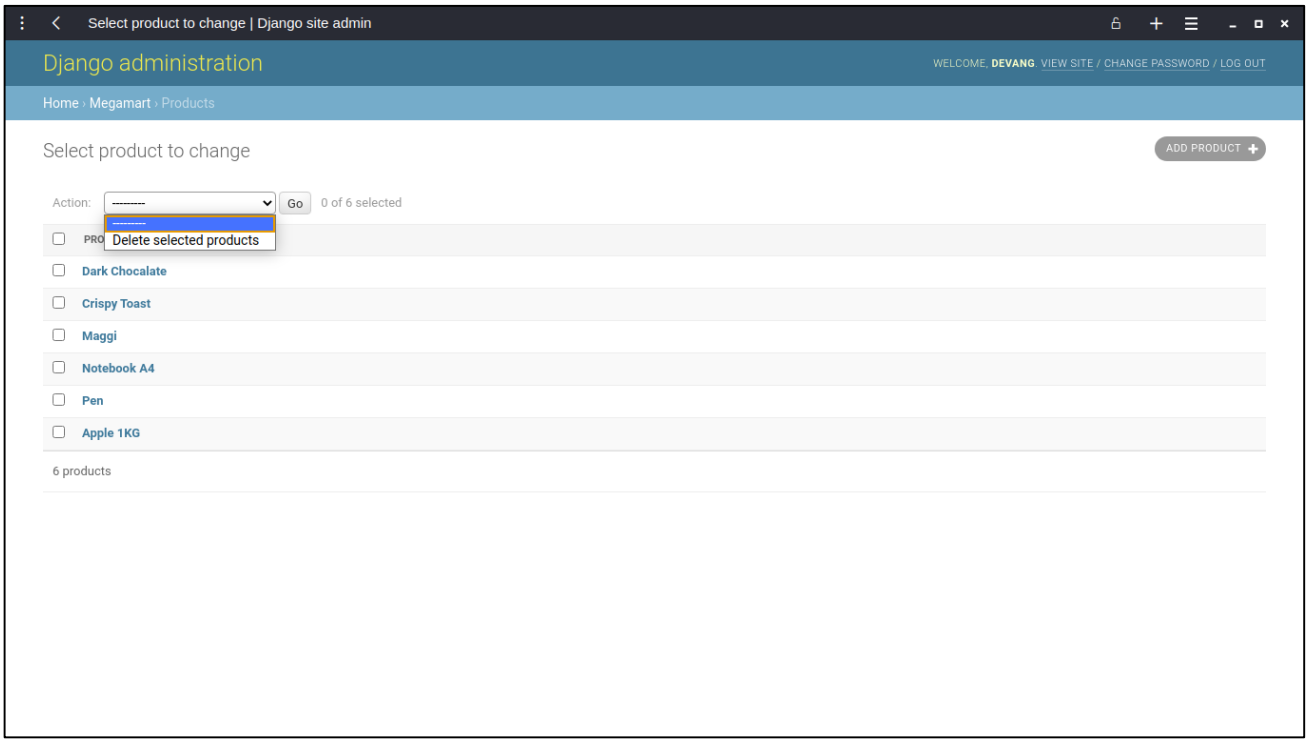

Figure 30 Screenshot of Deleting products

- To delete any product or stock we can manage it in admin panel, to delete multiple we can select checkbox and then we can select “delete selected products” and then GO button.

Screenshot: Editing product details

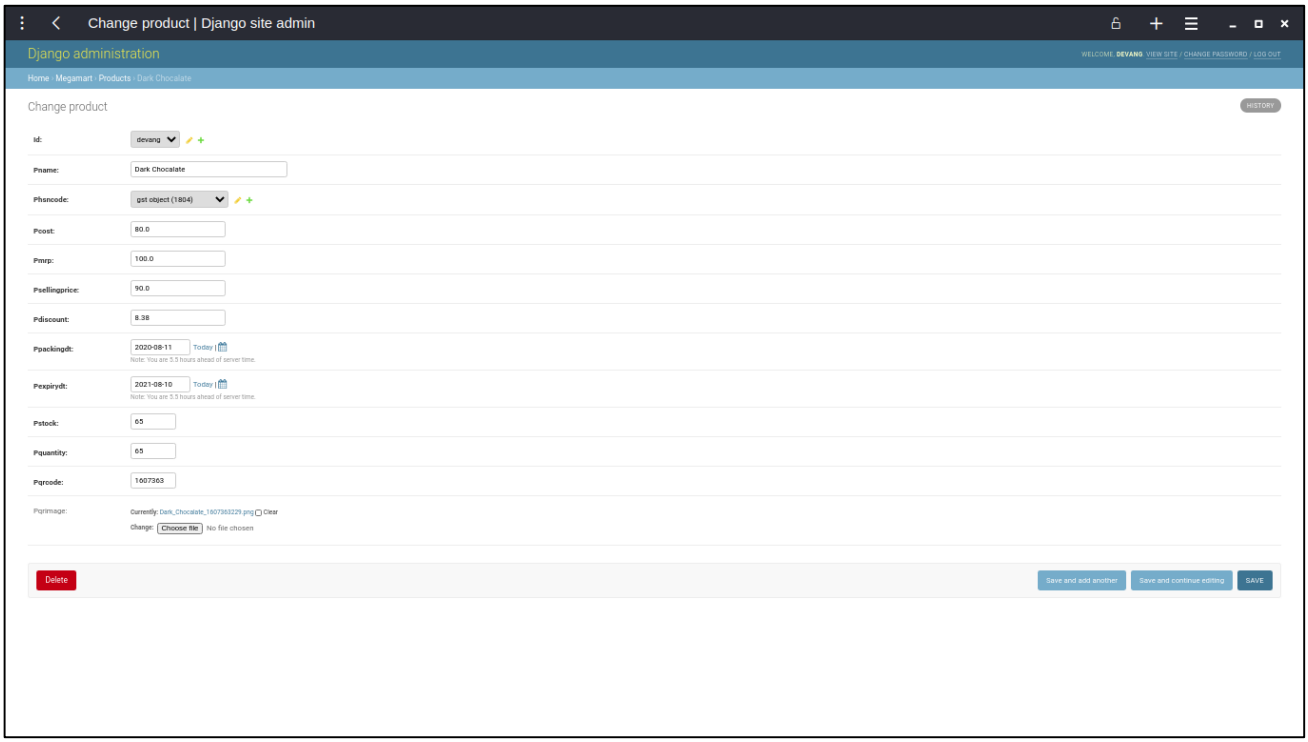

Figure 31 Screenshot of Editing product details

- To edit product details we have to select product and it will shows all fields.

Screenshot: Logout from Admin

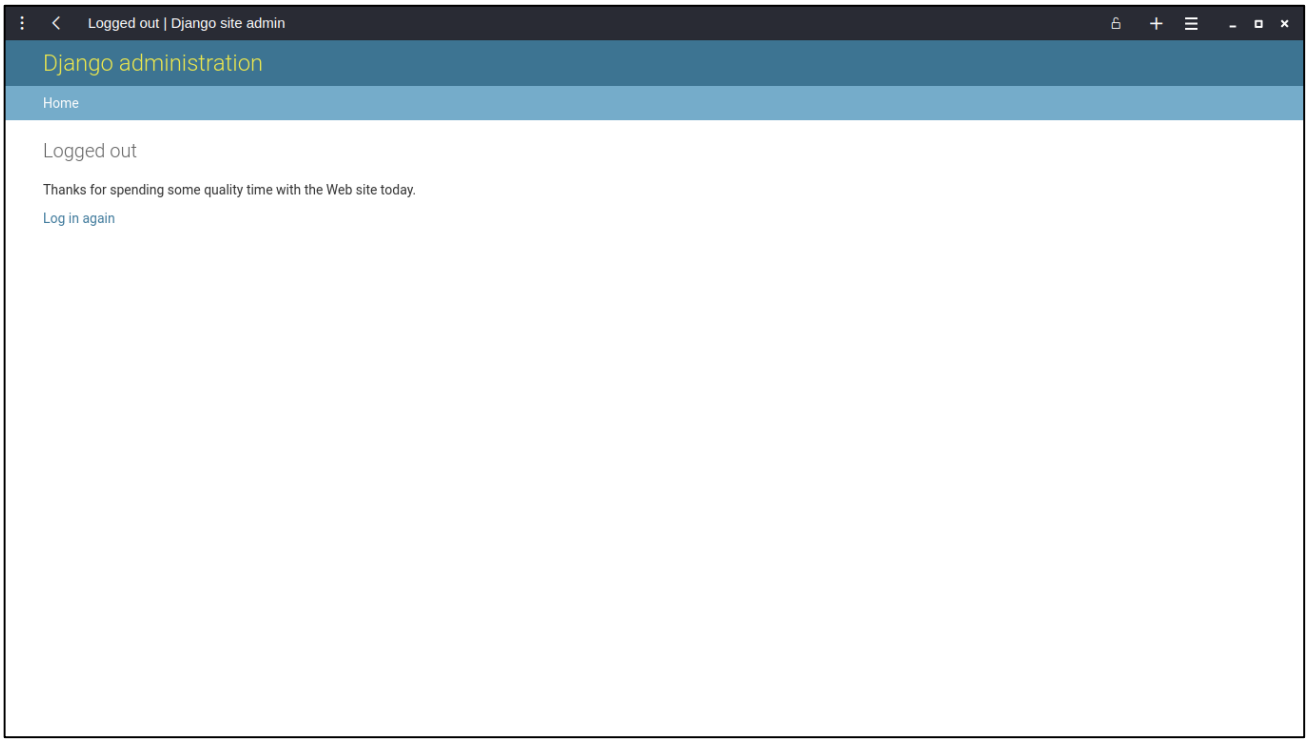

Figure 32 Screenshot of Logout from Admin

- To logout we have to select logout button from top-navbar.
- After logout from admin page it will redirect to logout page.

Screenshot: Postgres Database (Administration)

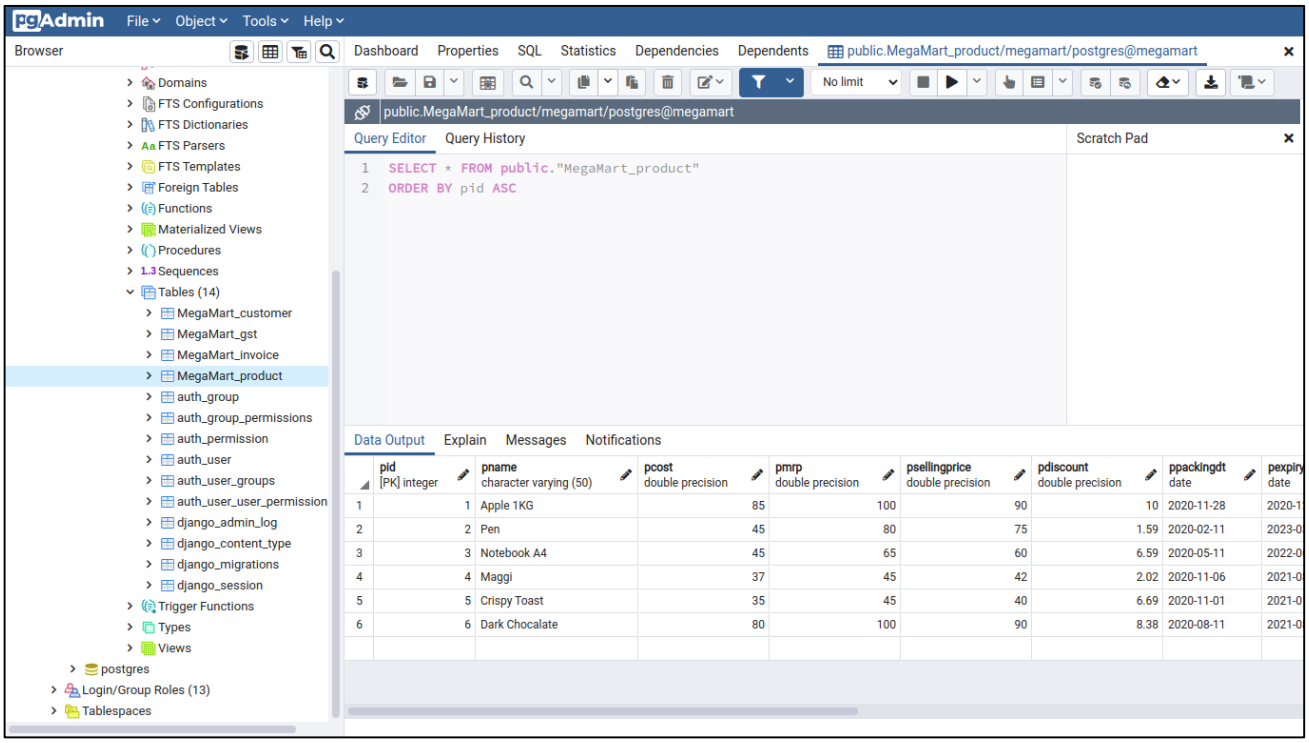

Figure 33 Screenshot of Postgres Database Admin view 1

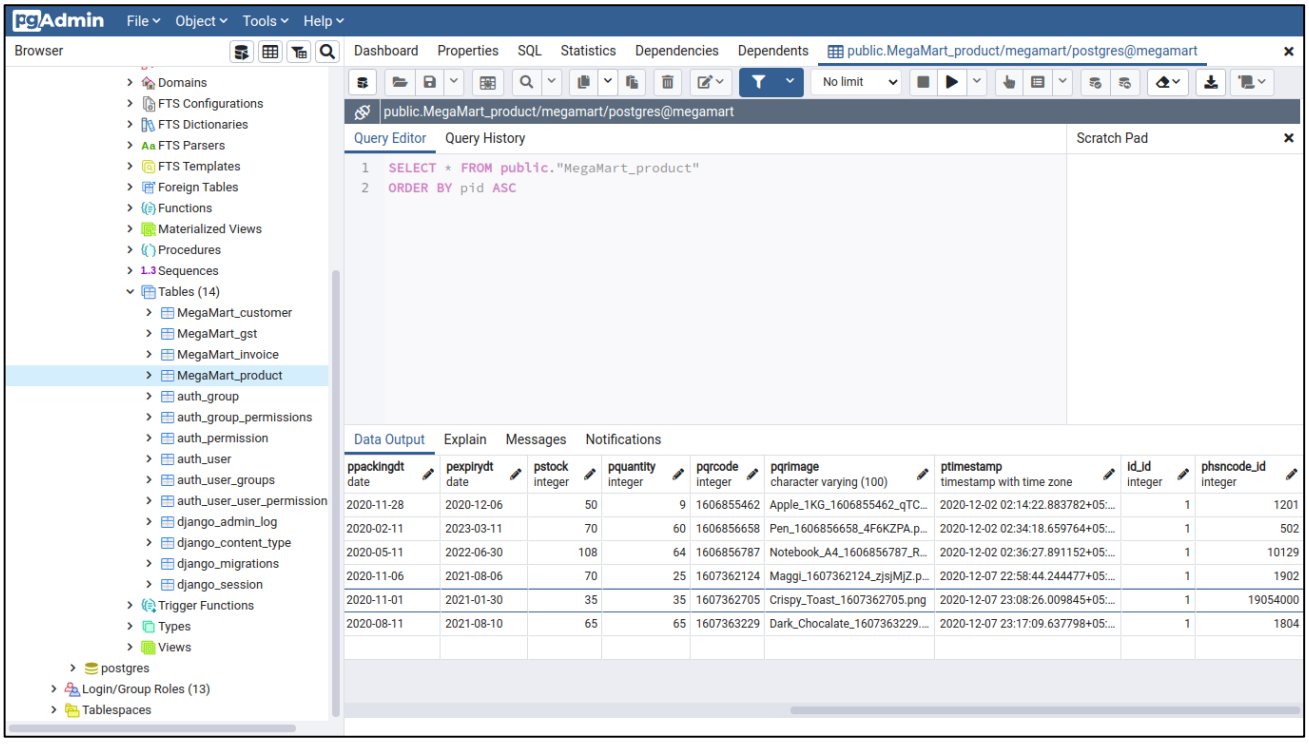

Figure 34 Screenshot of Postgres Database Admin view 2

- postgres database looks admin side, product table screenshot, we can check there are many tables in left Nav.

5. CONCLUSION

5.1 Future Extension

- **Transaction Module**
  Currently we are billing and taking Cash. But if we have time then we have to accept online transaction via POS Machine or UPI with any gateway
- **Bot Module**
  Bot will gives some basics answer related to transactional entries or statistical output based on the questions asked by user

5.2 Timeline Chart

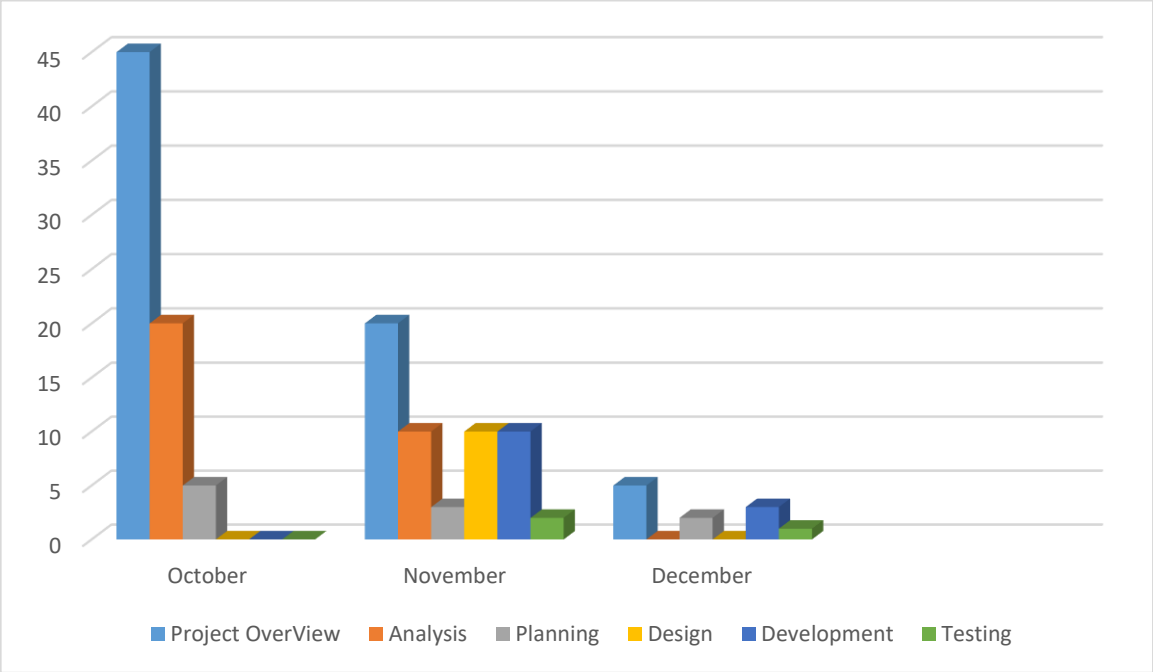

Figure 35 Timeline Chart

BIBLIOGRAPHY

WEB REFERENCES:

For making QRCode

https://pypi.org/project/qrcode/

https://pypi.org/project/PyQRCode/

https://github.com/devanggarach/python-qrcode

Decode QRCode into Text

https://github.com/Edinburgh-Genome-Foundry/blabel

Printing QRCode into PDF

https://pypi.org/project/blabel/

https://github.com/Edinburgh-Genome-Foundry/blabel

Making PDF

https://docs.djangoproject.com/en/3.1/howto/outputting-pdf/

https://stackoverflow.com/questions/17940669/django-python-how-to-convert-text-to-pdf

Generate Excel sheet

https://pypi.org/project/django-excel/

http://django.pyexcel.org/en/latest/

Django specific errors and understanding

https://docs.djangoproject.com/en/3.1/ref/models/constraints/

https://docs.djangoproject.com/en/3.1/topics/forms/

https://stackoverflow.com/questions/50538244/django-how-to-add-constraints-on-the-foreign-key-dashboard

https://docs.djangoproject.com/en/3.1/ref/contrib/postgres/constraints/

https://docs.djangoproject.com/en/3.1/ref/exceptions/

Django Bot integration

https://chatterbot.readthedocs.io/en/stable/django/

https://chatbotslife.com/implementing-a-chatbot-in-django-b2fd3c1bcd2a