A Mini Project Report on

Billing and Inventory Management System

Submitted in partial fulfillment of the requirements for
the award of the degree of

Bachelor of Engineering

in

Computer Engineering

by

Megha Soni(20102164)
Vandan Savla(20102137)
Himali Suroshi(20102118)
Niraj Patil(20102114)

Under the Guidance of

Prof. S. S. Aloni

Department of Computer Engineering
A.P. Shah Institute of Technology
G.B.Road, Kasarvadavali, Thane(W),
Mumbai-400615
UNIVERSITY OF MUMBAI

Academic Year 2021-2022

Approval Sheet

This Mini Project Report entitled ***"Billing and Inventory Management System"*** Submitted by ***"Megha Soni"(20102164), "Vandan Savla"(20102137), "Himali Suroshi"(20102118), "Niraj Patil"(20102114)*** is approved for the partial fulfillment of the requirement for the award of the degree of ***Bachelor of Engineering*** in ***Computer Engineering*** from ***University of Mumbai***.

Prof. S. S. Aloni

Guide

Prof. Sachin H Malave
Head Department of Computer Engineering

Place: A.P.Shah Institute of Technology, Thane

Date:

CERTIFICATE

This is to certify that the mini project entitled ***"Billing and Inventory Management System"*** submitted by ***"Megha Soni" (20102164), "Vandan Savla" (20102137), "Himali Suroshi" (20102118), "Niraj Patil" (20102114)*** for the partial fulfillment of the requirement for the award of a degree ***Bachelor of Engineering*** in **Computer Engineering.**, to the University of Mumbai, is a bonafide work carried out during the academic year 2021-2022.

Prof. S.S. Aloni
Guide

Prof. Sachin H Malave
Head Department of Computer Engineering

Dr. Uttam D.Kolekar
Principal

External Examiner(s)

1.

2.

Place: A.P.Shah Institute of Technology, Thane
Date:

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, We have adequately cited and referenced the original sources. We also declare that We have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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(Signature)

_____

(Megha Soni 20102164)
(Vandan Savla 20102137)
(Himali Suroshi 20102118)
(Niraj Patil 20102114)

Date:

Abstract

People nowadays prefer to shop at standardized stores that issue accurate computer-generated bills. Small, local businesses are losing customers as a result of this. Local firms with limited inventory do not keep track of their stock levels. This leads to confusion and a high risk of inconsistencies in the records. This may also limit the company's ability to expand. Because of the expense, space, and intricacy, the business owner cannot afford to put up a High Tech POS to meet this requirement.

The key objective of this billing system is to meet the needs of small and local businesses by providing a more economical and user-friendly billing and inventory system. This system keeps track of all stock information and generates client bills in PDF format, which can be printed and given to customers. On a weekly/monthly basis, the owner will receive a sales report. Pictorial representations of the various figures created will be available for data analysis.

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List Of Figure

Chapter 1: Introduction

1.1 Problem Statement:

In smaller businesses, books are utilized to keep track of records, and customers are given handwritten bills. High Tech POS is expensive and not feasible for them. There is a need for a product that is affordable and organizes the business.

1.2 Objective:

This project will bridge the gap between the two existing systems. The goal of the project is to give small businesses a more cheap and user-friendly billing and inventory system. This will simplify record-keeping and assist the organization in becoming more standardized. This application might help small businesses thrive in this competitive industry by providing them with a better experience in running their firm. Redundancy and inconsistency in data are reduced through a simpler Inventory system that works in sync with the billing system. The owner can easily calculate and create bills with the help of the computerized billing system. A digitized bill from a small firm will also provide a better experience for the customer than handwritten ones. Overall, this initiative will aid the company's efficiency and growth and invite more customers to shop from local businesses.

1.3 Scope:

There are mainly 4 aspects of the project:

1) **Easy to Use Billing System:** The application would make it simple to generate a bill that includes product and buyer information. All calculations, including taxes, are done correctly. Finally, a pdf file is created that can be printed easily.
2) **Inventory System Based on Database:** A simple, user-friendly inventory management system allows the user to add product details and change them as needed. After the bill is generated, the products are also deducted from the inventory.
3) **Generation of Stock Report and Sales Report:** Weekly and monthly reports can be generated based on the sales made, providing a greater perspective of the firm. A stock report containing product data and availability can also be prepared.
4) **Data Analysis:** A visual representation of sales and inventory can be provided to the user, making it easier to analyze the business and make appropriate decisions.

Chapter 2: Literature Review

[1]This paper presents the idea of inventory and bill generation. A stock level needs to be maintained by every shop their products, In the current system, shopkeepers remove the tag of all the products for later to be recorded and update the inventory. A report generator is required to keep a record of what is coming in, what is selling off, and what requires more promotions. The key role of inventory management is the renewal of data. Associations have multiple levels, and recharging the stocks is crucial. An application is needed to fulfill these requirements of the retailers. Basic features of bill generation, bill printing, and inventory.

This application will help in overcoming the shortage of products as they have a clear view of what is required and the order is placed on time. Tracking the inventory levels in real-time helps to make better decisions about the products. For good customer service speed matters, which means having the right product in time and delivering it in time is important. This paper presents a straightforward application for the retailers to store real-time information about the stock and the report about what is sold on a daily, weekly, and monthly basis.

[2] This paper discusses the design of an Internet billing system that allows invoices to be paid electronically. This procedure is carried out using digital banks, where the cash transfer process can take place. Paper bills are becoming the most common form of communication between businesses and their clients. However, their customizing capabilities are restricted, and they are not interactive. If a consumer wishes to respond to something on his paper bill, such as make a customer service query or place an order for a new service, he must call. Internet Billing promises far more than a new way to deliver billing information. Customers and businesses will be able to communicate electronically one-on-one through the Internet Bill. Consumers will not be tied to one particular bank and its software, nor a single terminal. Deep penetration and spread of the Internet, lead to more electronic applications becoming available.
[3] Internet banking will provide the vast array of services currently offered by banks in a form that is very convenient to consumers. Consumers will be able to write electronic checks to online merchants that draw value directly from their bank accounts rather than using a line of credit.
[2] We created an Internet billing system in this research by constructing virtual banks that perform bank procedures. Some security ideas have been implemented in this system to safeguard it from unauthorized access. it's far feasible to pay invoices electronically. This method is carried out through digital banks, wherein the process of cash switch may be carried out.
[3] On the different hand, many packages may be recognized such as; deposit e-cash, withdrawal e-cash, and decide account balance. A Gate manner translator is used to use authentication rules, protection, and privacy. Users can make payments using E-bank at any time and from anywhere, with the shortest possible access time.

[4]In this paper, the authors have proposed a system that sent alert messages to the stock manager when stock is low using RFID chips.
Store administration framework diminishes the code and works bourdon on the retailers, it furnishes coordinate stockpiling gadget with the assistance of the raspberry pie 3.
Their system enables business owners to make more informed decisions. By keeping a real-time tracking on what products are being taken from the store shelves and what is remaining.

[5]In this paper, they have proposed a billing system software to fulfill the requirements of small or local businesses or industries and to provide an efficient billing system.

The main goal of the software is to maintain stock and by this software, it is very easy to generate bills for the customers. Also, we can create various reports with one click. This software mainly helps in maintaining records and products. With the help of this software, the owner can get the weekly, monthly, and yearly financial\economic reports. In this software, users can use USB barcode readers to save the stock and generate invoices. With the help of this owner will have the proper data on the customer entry, sales made, and the data about inventory. By this owner can analyze all the data entered into the system and can measure the performance of the business. In this, they are implementing an android app to this software. This user can get all the information about the availability of products without manually visiting the shop and with the help of this user can make a list of required items also user will get an average of all the listed products. As we know GST has replaced the state and central tax system and GST is applied to everything which is under domestic consumption. so here they have proposed a GST tax system in this software.

Chapter 3: Technology

The technology used in this project will be:

3.1 Language

Java is a programming language and a platform. It is a high-level, robust, object-oriented, and secure programming language. It is used to develop mobile apps, desktop apps, database connections, etc. The application will be coded in this language taking advantage of all of its features. We are using String, 2D Arrays, and many other features of Java language in our execution.

3.2. Frontend

Swing by Java and AWT by Java is a set of program components for Java programmers that provide the ability to create graphical user interface (GUI) components, such as buttons and scroll bars, that are independent of the windowing system for specific operating systems. These features provided by swing are going to be used in our application for user convenience. We have used JFrame, JPanels, JTextFields, JButtons, and JTables.

3.3 Backend

Database: MySql by Oracle. MySQL is a relational database management system based on the Structured Query Language, which is the popular language for accessing and managing the records in the database. The Database used in this application is named “billing_system”. It has 2 Relations: “products” and “sales”.

Chapter 4: Existing System

Small businesses like grocery stores, small marts, dairy shops, etc still use paper registers for bills and stock reports. The manual preparation of registers is hectic and error-prone. Inconsistency is obvious in the case of registers. If the user wants to make any changes in previous records or update anything he has to again make the records with updated values. This process we all know is time-consuming and can lead to errors which eventually is not feasible for the owner. Sales reports can't be generated in the existing traditional system.

Due to high price and space constraints POS can't be used in local small businesses, also every product doesn't have a barcode that can be scanned so POS is not feasible solution

Problems faced in Existing System:

- Registers require space
- There is no proper management of inventory
- Retrieving information is difficult
- Difficult to modify existing records
- Inconsistency of data is obvious
- There is no type of security.

Chapter 5: Project Design:

5.1 Block Diagram

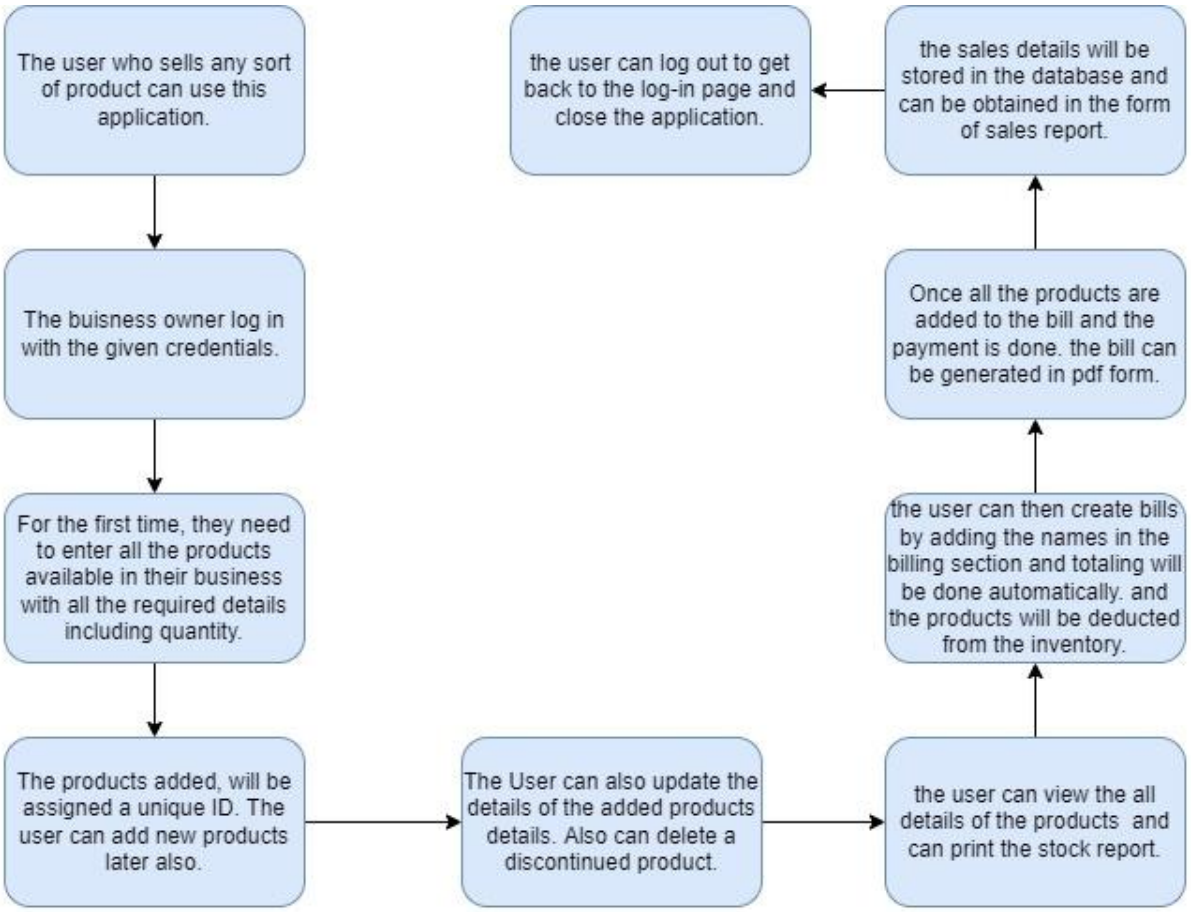


Fig 5.1 Block Diagram

The above diagram shows the flow of the application. Firstly the user, that is the owner of the business who wants to sell products can use this application to maintain an inventory and generate computerized bills.

To use the application, the user has to log in with the given credentials which are hardcoded for now. With the correct credentials which protect the user details, the user logs in and views the home page.

Home page has options to open any of the modules. Initially, the user has to input all the products with their current status into the system. Even later when the user has got in new products he/she can feed in the details.

The Product id is allotted by the system, which uniquely identifies the product when the product with all the details is added and is saved in the system permanently.

If the user wants to make any changes to the details entered he/she can do that too in the update. For any discontinued product the user can permanently delete it from the database. But if the product is not available but will be restocked in the future he can deactivate the product by updating it and later can reactivate it, once restocked.

The user can also see all the details of his product including the quantity. He can print this detail in the form of a table for further assistance.

Besides the inventory, this application can be used for billing. In The billing module, the user inputs the details of the buyer that is printed in the bill for further reference. Then the user can add the products that are bought by the customer with the quantity bought. All the validations are checked, if the product is available, activated, and enough. And added to the billing table with all the calculations made along with the tax calculations. The total quantity is calculated, the Total price is added as the products are added and inventory is updated by deducting the products. The user can also delete the product from the bill table if needed and all the values are altered accordingly.

Once the payment is done the user, that is the seller can generate the bill in a pdf form that can be printed and handed over to the customer.

Once the bill is generated the sales made are updated to the sales table which can be viewed by the user. This can also be printed on a monthly basis or on the whole.
To end the user can log out and close the application.

5.2 Flow Module

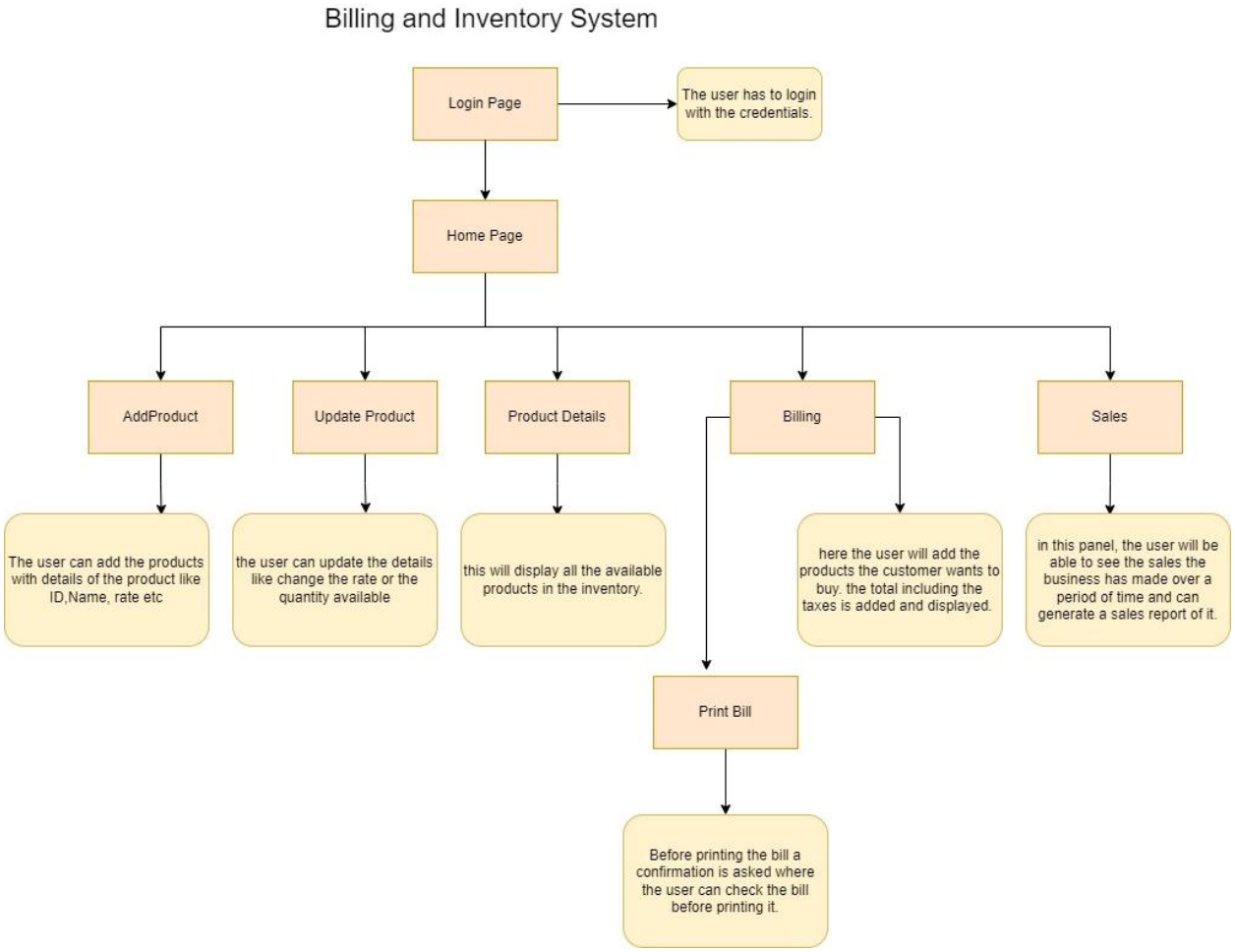


Fig 5.2 Flow Module

The above diagram displays the flow module of the application. The flow module describes how the user flows through the different modules while running the application.

Initially, the user is on the Login module. With correct credentials, the user enters the Home Page module.

From the Home Page, the user has various options where he can select any one of the modules to visit.

The New Product module is for adding a new product introduced in the business initially when he wants to add the products to the application. All the products entered in this module are added to the database.

The update product module is created so that the user can make any changes he/she wants to in the details of the products present in the database, by first searching the name. They can also permanently delete a product from this module.

Product Details module displays all the products of the business and all the necessary details like name, quantity, rate, GST category, activated or not. All these details can also be printed from this module.

Billing Module is a vital module of the application where the user enters the details to generate the bill. It takes all the details such as the buyer's name, address, and phone number. And then the products and the quantity bought. No need for calculations to be made by the user as it is auto-generated by the system. Also, the user can delete the product from the bill table if needed and the changes are made appropriately.

Once the payment is made the user can print the bill, before which he gets the preview of the bill and confirm it.

All the sales made by the business and entered into the system, the user can use the Sales module to view those details that can be sorted on the monthly basis.

5.3 Data Flow Diagram

5.3.1 Level 0 Data Flow Diagram

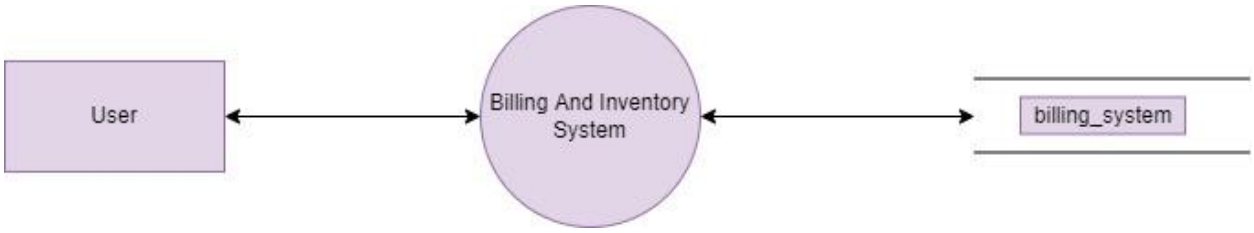


Fig 5.3 Level 0 Data Flow Diagram

The above diagram is a 0-Level Flow Diagram of the application. It's a high-level overview of the entire system being modeled. It's meant to be a quick peek into the system, displaying it as a single high-level process with its connections to external entities. Here the external entity is the User who inputs the data, that is taken by the Billing and inventory management system and processed. Then it is stored in the billing_system database. The data is retrieved from the database by the Billing and inventory management system and given back to the user.

5.3.2 Level 1 Data Flow Diagram

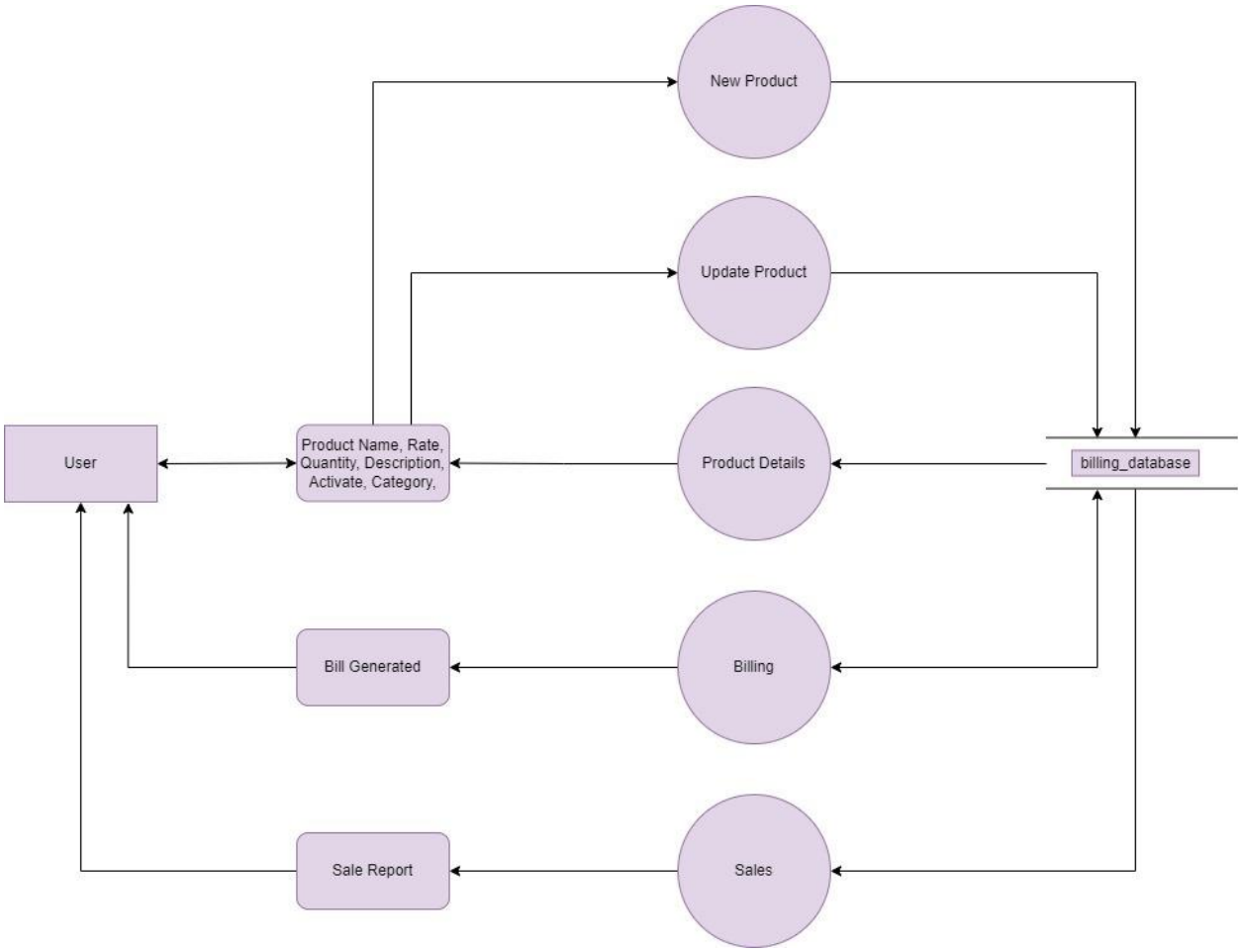


Fig 5.4 Level 1 Data flow Diagram

This is the Level 1 Data flow Diagram of the application. A level 1 DFD notates each of the main sub-processes that together form the complete system. The different module takes in data and processes it differently from the user.

“New Product” and ”Update Product” processes take in the details like Product name, Description, Rate, Category, Activate, and Quantity.

New Product takes that data and inputs it into the billing_system Database.

Update Product takes the data from the database on the basis of the Product Id the user has entered and displays it to the user. The user can make changes and the changes in the data are then stored by the system in the database.

“Product Details” brings the data from the database and displays it to the user.

The “Billing” module takes the data from the user of the products and quantity bought that is processed by the Billing module and calculations are made. Validations are done on the basis of the data in the database. The processed data, in the form of bills, is displayed to the user.

The Sales module takes the data from the database of the sales made processes it on the monthly basis, is asked, and displayed to the user in the form of a sales report.

5.4 Modules

5.4.1 Login module

The user must log in with credentials in this login module. If the user tries to log in without entering any of the details it will not allow login. A pop-up alert appears if the user inputs incorrect credentials. There is a ‘show password’ checkbox that converts the password field to a normal Text field to view the password. As a result, the user must use the appropriate credentials to log in. The user will be taken to the home module after logging in.

5.4.2 Home page module

We go to the main page after login in with the correct credentials. There are buttons on this home page to open the other modules. The showing of different modules is done by a button. We have made the animation showing modules which gives a better look. This is the core module from which we may select and open additional modules. From this home module, the user can access additional modules such as new products, updated products, product details, and so on. Users can also log out from the application which redirects users to log in to the page again.

5.4.3 New Product module

Users can add new items to the system using the new product module, which includes information such as the product id, name, quantity, and price. The product id is auto-generated from the database so the user need not worry about remembering the last entered product id. Users must preserve information after adding a new product. GST is also added to each product in this module which is selected by the user using dropbox. The User can also make the product active or not i.e to make it available or not which is used when billing is done. When a user saves all of the data about a product, the data is saved in a database table named “products”. Also, users can reset the information in this module.

5.4.4 Update Product module

In this module, the user can edit product details such as the name, rate, quantity, availability, GST category, and description offered. The product can be searched by its name. All updates are made possible by this update module, and these updates are visible in the details table. After making changes, the user must save the update, which is then appended to the table. If the

product is discontinued or will not be available in the future the user can delete the product. After deletion, the product along with its id is deleted from the database table. Basics validation like wrong product name or datatype associated with text fields is also made to make the application more consistent and reliable.
Note: “Quantity zero or Activate to No” is not the same as Deletion. The former doesn't delete its id from the database but the latter does.

5.4.5 Product Details module

This module will show all of the inventory's available products. The product details module contains all of the product's information such as id, name, description, rate, availability, category, and total price after GST inclusion. The user can also print a table receipt with all the necessary information.

5.4.6 Billing module

The buyer must provide information such as his or her name, address, phone number, and so on in the billing module. The products that are currently available are the only ones that are shown. Validation is made if you don’t enter a quantity and click add button. The amount is automatically calculated based on GST and total price with its quantity and shown in the text fields below. The buyer must pay the total amount generated after combining all of the products. If after entering products the user wants to delete a product just select it from the table and click the delete button, the total amount is automatically changed. The owner can also reset the values in this module. A bill with the GST amount is generated after the transaction is completed. The owner can then print a bill. This module is made in such a way that after completing the transaction the sold products with quantities are deducted from the “products” table and the same is added to the “sales” table.

5.4.7 Sales module

The user can view a report of product sales, including total quantity and total price, through the sales module. The user can also view the sales made according to months where the total price and total quantity of a particular product are shown in the table whereas the overall total price and quantity are displayed below the quantity and price column. For more reference(see fig 6.7). This document can be printed or saved as a pdf file.

Chapter 6: Implementation

Fig 6.1 Login Page

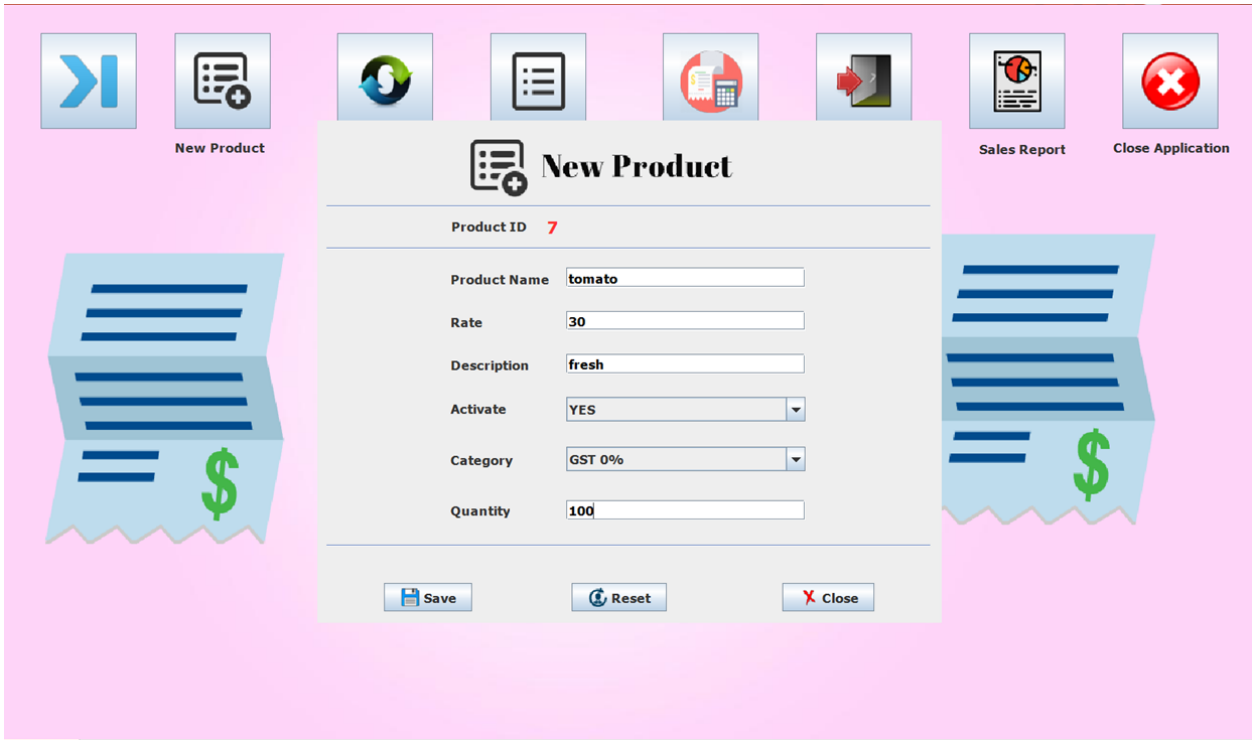


Fig 6.2 New Product Page

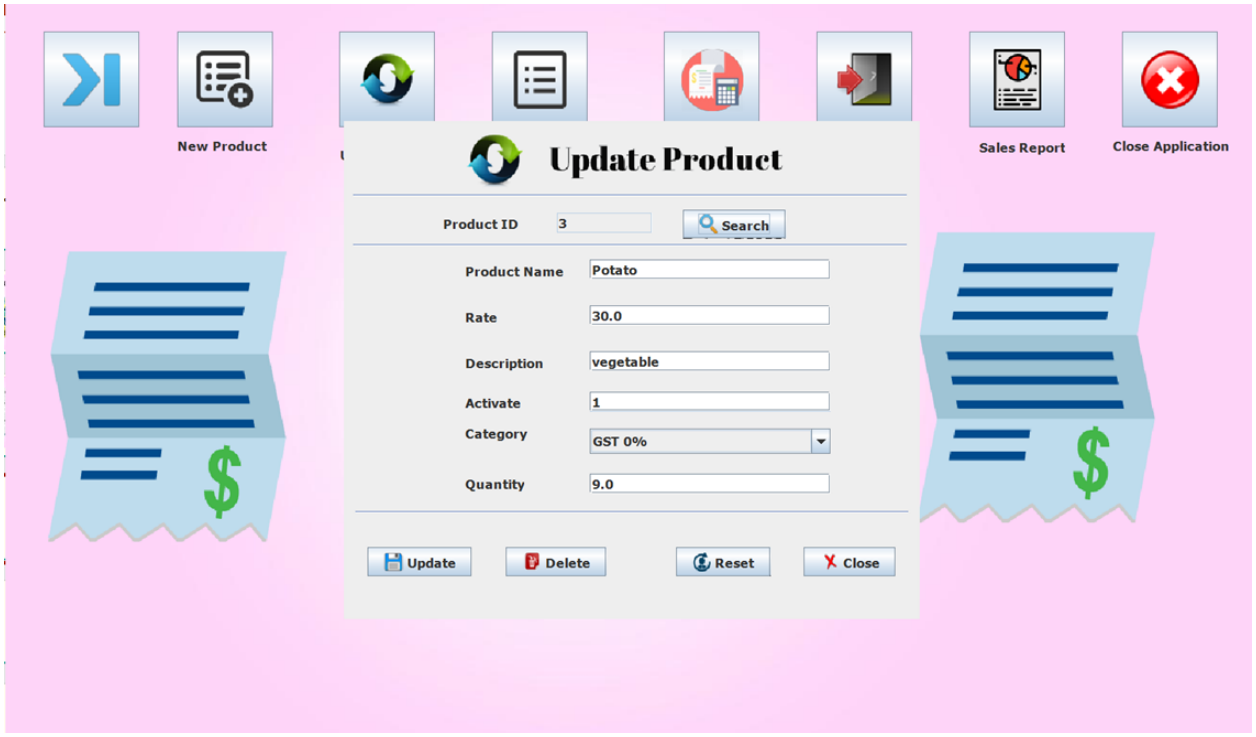


Fig 6.3 Update Product Page

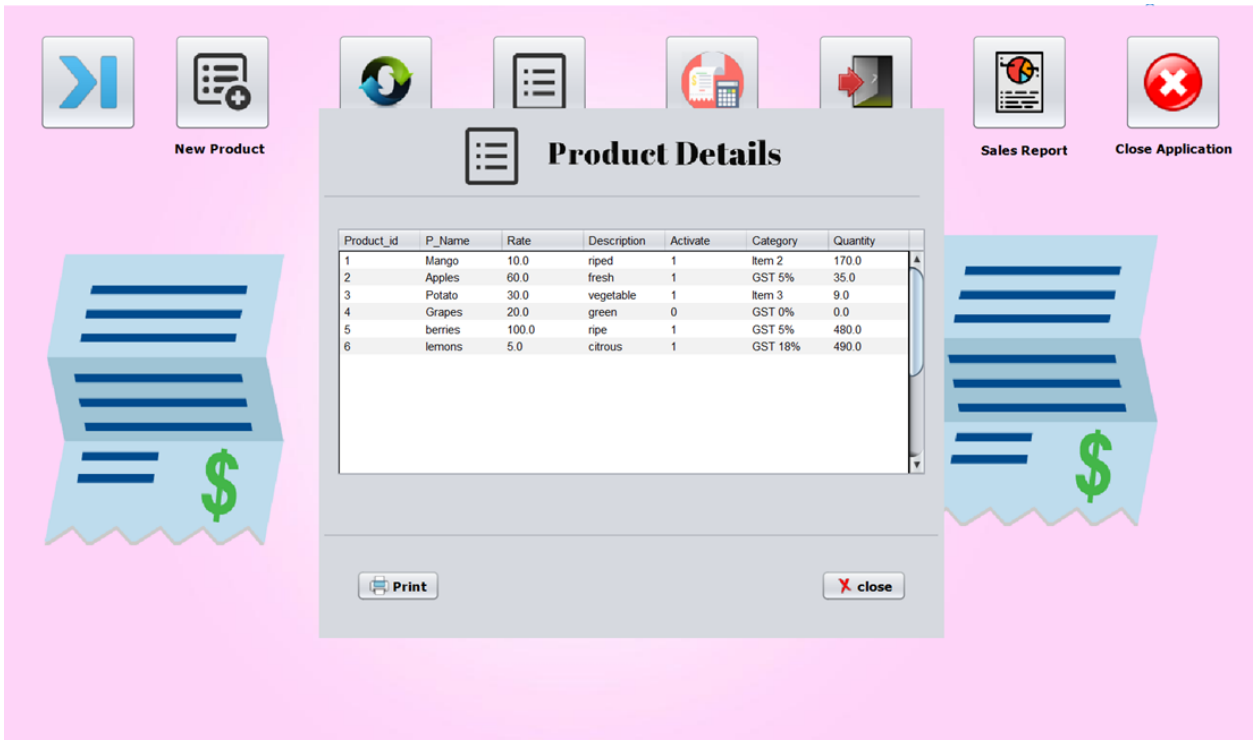


Fig 6.4 Product Details Page

Fig 6.5 Billing Page

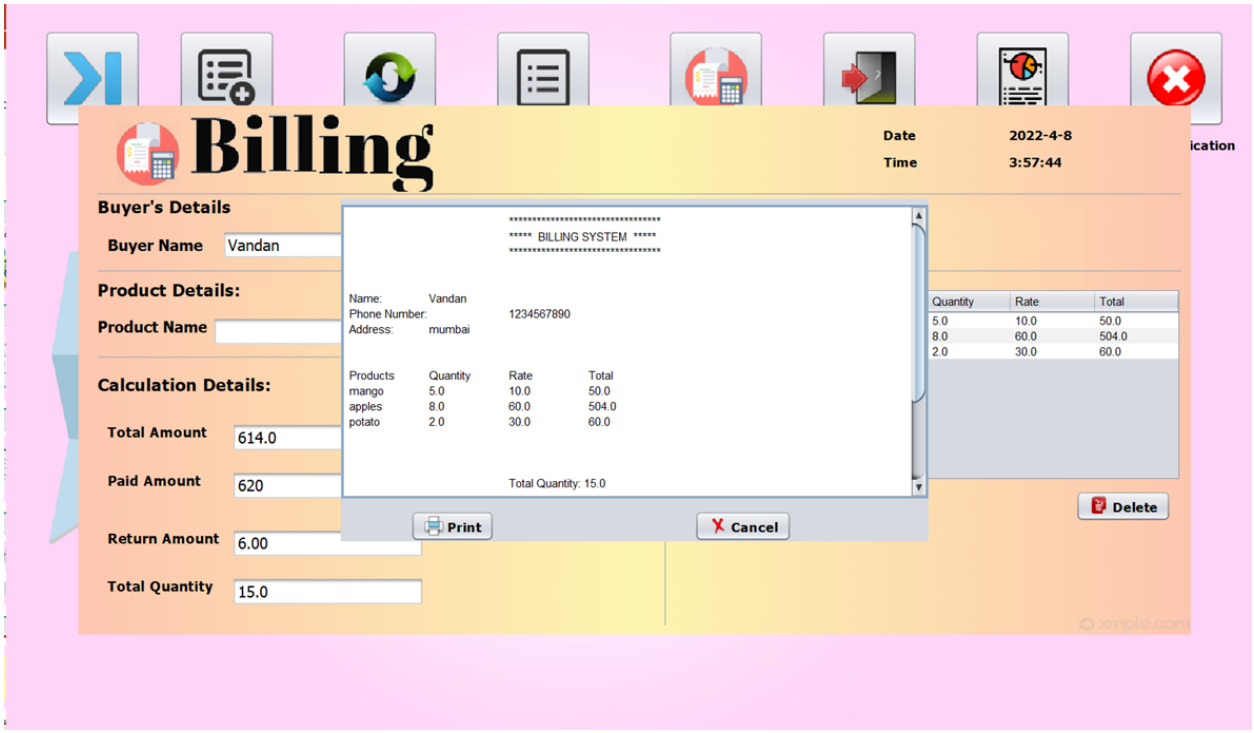


Fig 6.6 Print bill

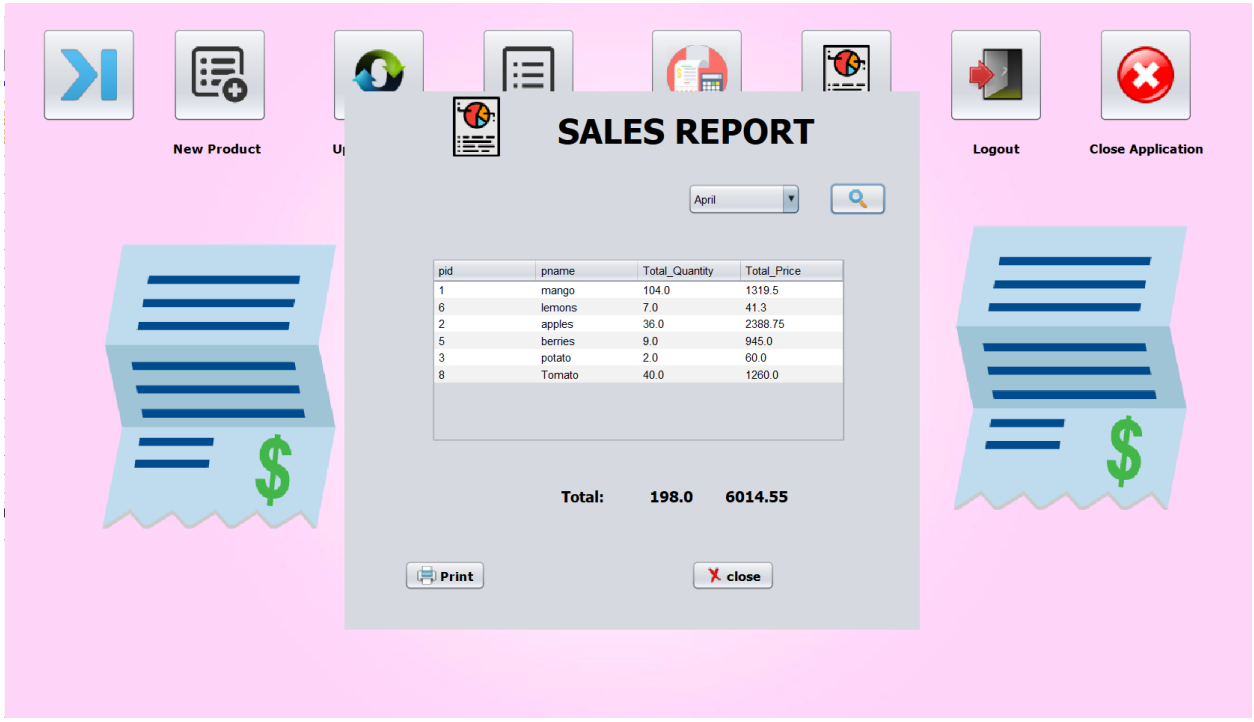


Fig 6.7 Sales Report

Chapter 7: Applications and Benefits

7.1 Applications

This project is a general-purpose program that may be used by a variety of companies. We can use this application:

- Dairy
- Canteen
- Grocery Store
- Medical Store
- Stationery
- Garment Store

This system has unrestricted use as the owner can add, edit and delete the products of his business. For example, a dairy owner can input the products like milk and milk products he owns. A canteen owner can input his menu in the program and a grocery shop owner can add all the products like food items, cleaning products, etc.

7.2 Benefits to the Society

This application not only makes it easier for the business owner to run the business but also benefits society by promoting more local businesses. Local businesses are a vital element of the economy, and their survival in this market is critical.
Customers would always prefer a computer-generated bill with all of the information clearly expressed over a handwritten one that is difficult to read. People will be truly interested in a local business if they receive bills with detailed information. As a result, local businesses will benefit from this, and they will be better able to compete in the high-tech market. Customers will feel satisfied and confident as a result of this.

This system will also provide a clear transaction between the vendor and the buyer. There will be fewer opportunities for any form of fraud to occur. This is advantageous because the transaction is transparent.

Additionally, because the bills are printed with the business information, there is additional advertising for the firm among the locals. This will assist in attracting new clients as well as returning customers.

Chapter 8: Result and Discussion

8.1 Result

Thus we have successfully implemented this project with the previously discussed and planned objectives. This application has a simplified and easy-to-use GUI which makes it user-friendly and easily understandable. It has a log-in page in order to have a security of the data. The user will be able to establish an effective inventory system with the ability to add new products and update details as needed using the billing and inventory management system. Every time a purchase is made, the inventory is updated. Using such technology allows the company to save time on inventory management by eliminating the need for registers. The billing system is simple to use because all calculations are done automatically when the user enters the product name and quantity purchased by the client. The bill's details are then uploaded to a pdf or printed.

8.2 Discussion

There are certain things for future enhancements in this project such as

- It is possible to create a mobile application that will be more useful in terms of space, maintenance, and billing. It is also incredibly convenient for the user because they do not need to set up a computer.
- Users can see detailed graphs for sales statistics, making it easier for them to comprehend their sales on a monthly or weekly basis. The use of visual representations of various figures makes it easier to comprehend the business.

Chapter 9: Conclusion

Our project solves the basic problem that the local businesses experiences. This system is simple to use and has a user-friendly interface that even a novice can understand. The user can then use this application to input data, retrieve data and process the information and use it in order to run the business. The logic is applied in such a way the user does not have to do much work to get his/her job done in minutes. With this application, the user saves a lot of time and decreases the chances of human errors. All the calculations are made automatically, inventory is updated, and the bills and reports are generated in a few clicks. This application blends the inventory and billing system in such a way that the user gets everything in one place.

Chapter 10: Annexure

9.1 Gantt chart

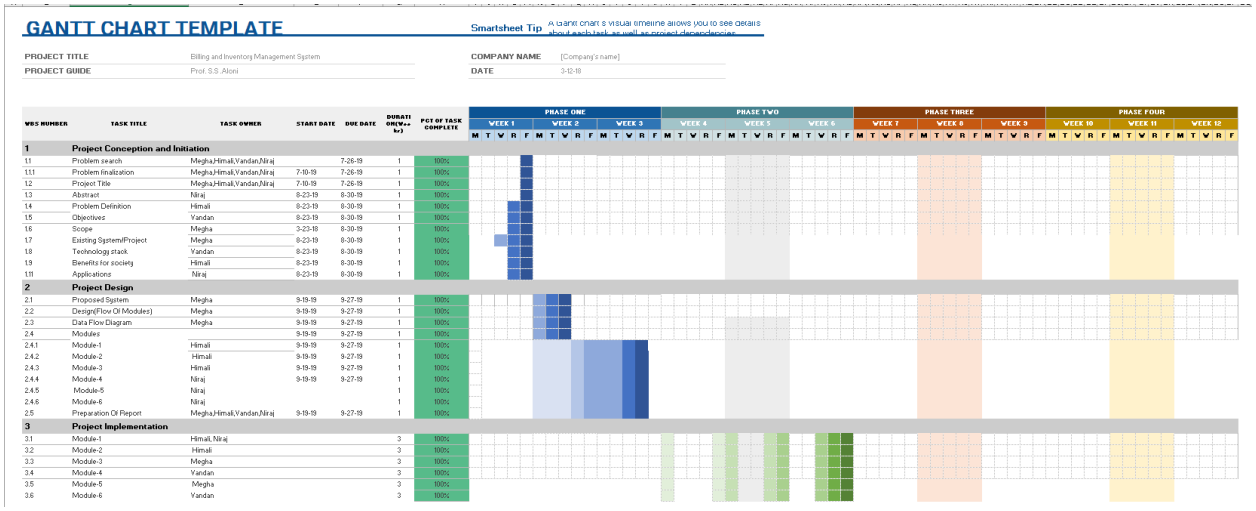
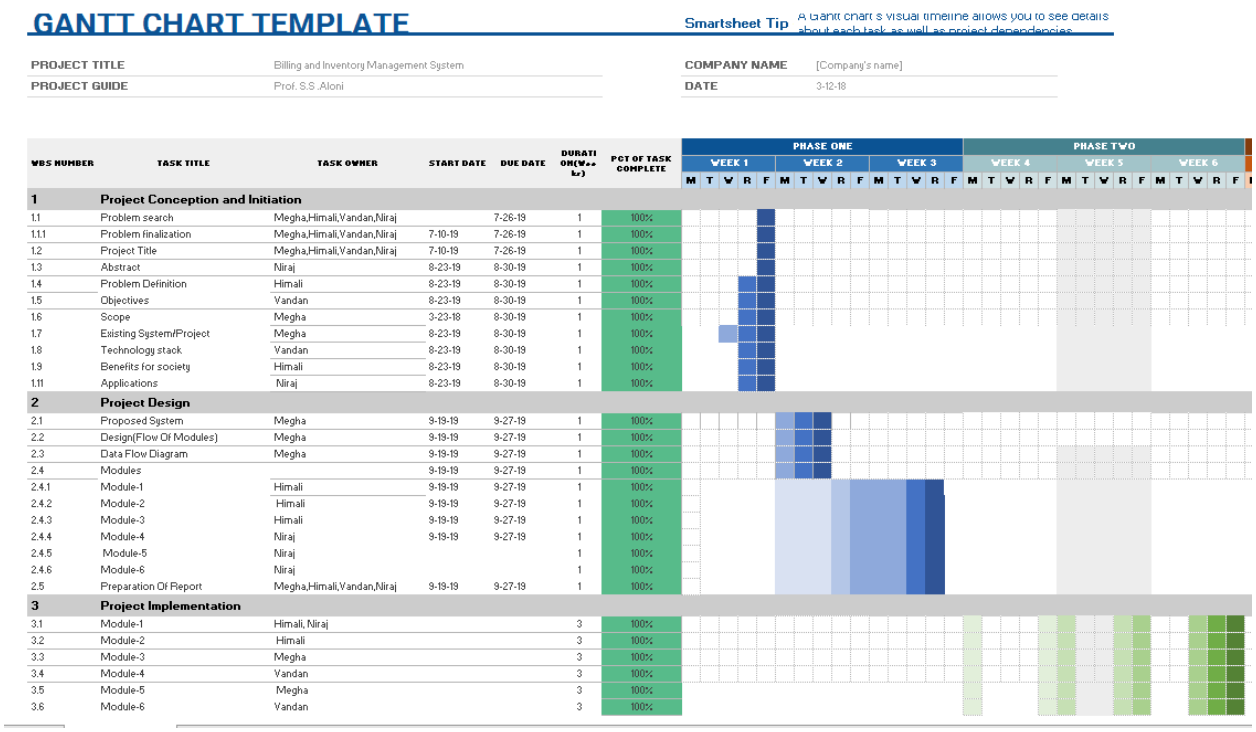


Fig 9.1



WBS NUMBER	TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION(Week)	PCT OF TASK COMPLETE
1	**Project Conception and Initiation**					
1.1	Problem search	Megha,Himali,Vandan,Niraj		7-26-19	1	100%
1.1.1	Problem finalization	Megha,Himali,Vandan,Niraj	7-10-19	7-26-19	1	100%
1.2	Project Title	Megha,Himali,Vandan,Niraj	7-10-19	7-26-19	1	100%
1.3	Abstract	Niraj	8-23-19	8-30-19	1	100%
1.4	Problem Definition	Himali	8-23-19	8-30-19	1	100%
1.5	Objectives	Vandan	8-23-19	8-30-19	1	100%
1.6	Scope	Megha	3-23-18	8-30-19	1	100%
1.7	Existing System/Project	Megha	8-23-19	8-30-19	1	100%
1.8	Technology stack	Vandan	8-23-19	8-30-19	1	100%
1.9	Benefits for society	Himali	8-23-19	8-30-19	1	100%
1.11	Applications	Niraj	8-23-19	8-30-19	1	100%
2	**Project Design**					
2.1	Proposed System	Megha	9-19-19	9-27-19	1	100%
2.2	Design(Flow Of Modules)	Megha	9-19-19	9-27-19	1	100%
2.3	Data Flow Diagram	Megha	9-19-19	9-27-19	1	100%
2.4	Modules		9-19-19	9-27-19	1	100%
2.4.1	Module-1	Himali	9-19-19	9-27-19	1	100%
2.4.2	Module-2	Himali	9-19-19	9-27-19	1	100%
2.4.3	Module-3	Himali	9-19-19	9-27-19	1	100%
2.4.4	Module-4	Niraj	9-19-19	9-27-19	1	100%
2.4.5	Module-5	Niraj			1	100%
2.4.6	Module-6	Niraj			1	100%
2.5	Preparation Of Report	Megha,Himali,Vandan,Niraj	9-19-19	9-27-19	1	100%
3	**Project Implementation**					
3.1	Module-1	Himali, Niraj			3	100%
3.2	Module-2	Himali			3	100%
3.3	Module-3	Megha			3	100%
3.4	Module-4	Vandan			3	100%
3.5	Module-5	Megha			3	100%
3.6	Module-6	Vandan			3	100%

Fig 9.2

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Student Name 1: **Megha Soni**

Student ID 1: **20102164**

Student Name 2: **Vandan Savla**
Student ID 2: **20102137**

Student Name 3: **Himali Suroshi**
Student ID 3: **20102118**

Student Name 4: **Niraj Patil**
Student ID 4: **20102114**