

Kathmandu University
Department of Computer Science and Engineering
Dhulikhel, Kavre



A Project Report
on
“BillX: Billing System”

[Code No: ENGG 102]

(For partial fulfillment of I Year/ II Semester in Computer Science)

Submitted by

Shashwat Khadka (27)
Shubin Pokhrel (37)
Siddhartha Lal Pradhan (40)
Binaya Raj Thapa (54)

Submitted to

Praynita Karki
Department of Computer Science and Engineering

Submission Date: 4th May 2022

Bona fide Certificate

This project work on

“BillX: Billing System”

is the bonafide work of

“SHASHWAT KHADKA, SHUBIN POKHREL,

SIDDHARTHA LAL PRADHAN, BINAYA RAJ THAPA”

who carried out the project work under my supervision.

Project Supervisor

Bipesh Raj Subedi

Teaching Assistant

Department of Computer Science and Engineering

Date:

Abstract

Our project titled “**BillX**” is a billing system that can be used by supermarkets, retail stores, and convenience stores all alike. It is a desktop application and we intend to help small businesses as well as larger stores and supermarkets by providing them with a billing system so that they can create bills, manage inventory and provide membership services to the customers. Since many traditional billing systems only help businesses by helping them make a bill, our application tends to provide other features as well. The main objective of this project is to create a desktop application via which small businesses and supermarkets can create a bill, get an insight into the items in their inventory, provide membership services to their customers and track their growth. We have used *C++* as the programming language, *Qt* as the framework, and *SQLite* as the Database Management System. Through this project, we aim to increase the use of digital billing systems in many convenience and retail stores around the country.

Keywords: *C++*, *Qt*, *SQLite*

Table of Contents

Abstract	i
List of Figures	iv
Acronyms/Abbreviations	v
Chapter 1 Introduction	1
1.1 Background	1
1.2 Objectives	2
1.3 Motivation and Significance	2
Chapter 2 Related Works	3
2.1 Vyapar - Accounting & Invoicing:	3
2.2 Horizon ERP:	4
2.3 NetSuite ERP:	5
Chapter 3 Design and Implementation	7
3.1 System Requirement Specifications	9
3.1.1 Software Specifications	9
3.1.1.1 Front End Tools:	9
3.1.1.2 Back End Tools:	9
3.....	9
3.1.2 Hardware Specifications	9
Chapter 4 Discussion of the achievements	10
4.1 Features:	10
4.1.1 Registration and Login	10
4.1.2 Admin Access & Employee Access	11

4.1.3	Create Bill	13
4.1.4	Inventory Management	14
4.1.5	View Account	15
Chapter 5	Conclusion and Recommendation	16
5.1	Limitations	16
5.2	Future Enhancement.....	16
References	17
APPENDIX	18

List of Figures

Figure 2.1.1: Vyapar-Accounting & Invoicing	3
Figure 2.2.1: Horizon ERP.....	4
Figure 2.3.1: NetSuite ERP.....	6
Figure 3.0.1: Program Flow	8
Figure 4.1.1: BillX Login.....	10
Figure 4.1.2: Employee and Member Register	11
Figure 4.1.3: Employee Dashboard	12
Figure 4.1.4: Admin Dashboard and Admin Change Password	12
Figure 4.1.5: Create Bill Window.....	13
Figure 4.1.6: Inventory Window.....	14
Figure 4.1.7: Editing and Adding Products	14
Figure 4.1.8: View Account Window	15
Figure A: Gantt Chart.....	18

Acronyms/Abbreviations

GST	Goods and Services Tax
ERP	Enterprise Resource Planning
OOP	Object-Oriented Programming

Chapter 1 Introduction

1.1 Background

Supermarkets and departmental stores have been taking over a bigger and bigger share of the retail and grocery market. As we emerge from the global pandemic, the retail market is growing faster than ever. Technology is one of the most important factors responsible for this growth in organized retailing and will continue to do so for a long time. Ever since the pandemic, the retail sector has seen newer consumer behavior and business practices. Despite incomes shrinking significantly, shopping volumes have increased. Many have used their spare time due to the pandemic-induced lockdown to renovate and redecorate homes, embrace new hobbies and change their shopping habits. Retail stores that catered to these needs thrived, especially those with a strong digital system.

In the current context of Nepal, most retail stores have little to no integration of digital systems, the ones that have integrated technology in their businesses lack a robust system in place and have many drawbacks. Most transactions are still done via a physical ledger, which is prone to human error and is not the most effective way to carry out transactions. With this project, we aim to solve this problem with a robust digital system in place to help carry out transactions smoothly. This application aims to give the person behind the counter or the administrator more control over the system, with this the administrator and the employee can create a bill, check the inventory and provide membership services to the customers.

1.2 Objectives

- Allow people to take membership.
- To reduce the time for the organization and large amounts of paperwork.
- To reduce pressure on the labor and relieve manpower from repetitive and dull jobs.

1.3 Motivation and Significance

We came up with the idea of creating a billing application for stores and supermarkets because from first-hand experience, most of the time when we shop for products in local departmental and retail stores, customers do not get a bill for their products, also we felt that the store operators could use their time more efficiently and apply digital technology to expand and grow their business. Considering this, we felt that a solid digital billing system must be in place for the store owners and operators to grow their business and also for the customers to have a better shopping experience. Apart from doing the same work as other billing systems, i.e., calculating the bill, giving it to the customer, and maintaining a proper database, our application has a membership feature via which customers get discounts on purchases and with this application, the business can also maintain their inventory. The membership feature is beneficial for both the seller and the buyer. Since the billing system has a membership feature the buyer gets to retain his/her customers and the customers too can get a discount depending on the amount they shop. Apart from that, the shop operators can check their inventory straight from the application, track and maintain the products, add or remove according to their requirement. This can be very beneficial for small business owners since they can operate their business and grow in a very time-effective way compared to the traditional way of maintaining a physical ledger.

Chapter 2 Related Works

There are a lot of applications related to our project. Even though these applications include almost everything a billing system may need, they are usually complex to use and require a trained person to operate. We want to create simple software that can be used by anyone who knows how to use a computer. Some of the key billing and inventory management software are listed below.

2.1 Vyapar - Accounting & Invoicing:

Vyapar [1] is a desktop and android application that claims to be India's No.1 Billing Software. It is a GST-compatible invoicing and accounting solution for small businesses. You can use it to create GST bills, fulfill orders, generate GSTR reports, track payments/expenses, and manage your inventory. Besides, you can use it to customize invoices and collect payments online. It aims to digitally upgrade small business accounting by eliminating paper bills.



Figure 2.1.1: Vyapar-Accounting & Invoicing

Features:

- Become GST compatible.
- Manage all parties in one single place and market business much easier.
- View how business is performing instantly.
- Create, print/and share customized invoices.
- Set up “Auto Backup” and secure business accounting data against accidental data loss.
- Track and control individual units of an item by their expiry dates, and batch no to pick the right ones for an upcoming sale.
- Set automatic payment reminders.
- Do business accounting offline without the internet.

2.2 Horizon ERP:

Horizon ERP [3] is a ready-to-use GST billing and accounting software for small businesses. It is simple and easy to use. The simple user interface enables easy execution of tasks. It is easier for the user to adapt.

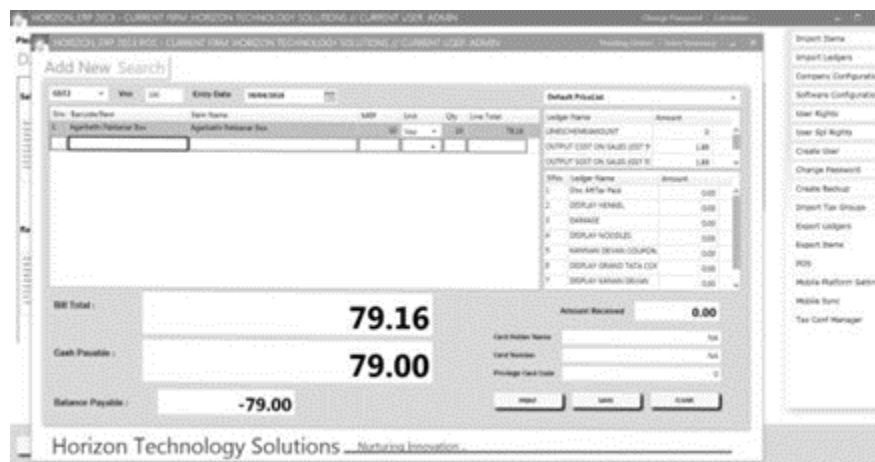


Figure 2.2.1: Horizon ERP

Features:

- Receivables and Payables
- Multilevel classification of items
- Sales & Purchase invoicing
- Multiple prices list
- Discount & Scheme management
- Credit note & Debit note management
- Auto Backup
- User wise access control
- Exporting & Importing data (in Excel & PDF)
- MRP wise stock display
- View item Purchase & Billing history

2.3 NetSuite ERP:

NetSuite ERP [2] is an all-in-one cloud business management solution that helps organizations operate more effectively by automating core processes and providing real-time operational and financial performance visibility. With a single, integrated suite of applications for managing accounting, order processing, inventory management, production, supply chain, and warehouse operations, NetSuite ERP gives companies clear visibility into their data and tighter control over their businesses.

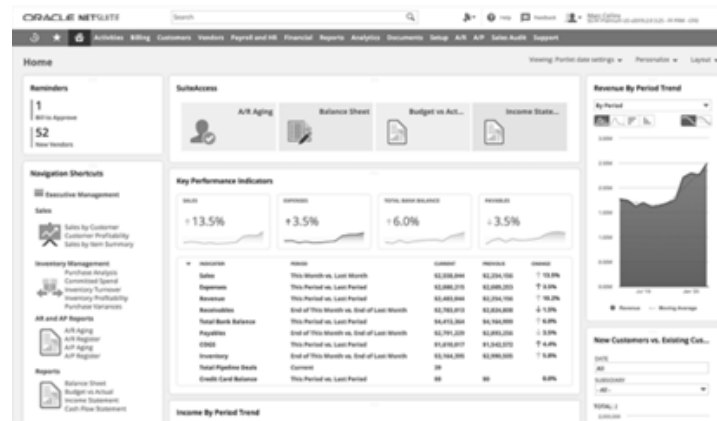


Figure 2.3.1: NetSuite ERP

Features:

- Get a complete view of cash flow and financial performance.
- Get a complete, real-time view of your business's financial performance, from a consolidated level down to individual transactions.
- Manage global operations, including multiple currencies, taxation rules, and reporting requirements, across geographies and subsidiaries, all while providing real-time financial consolidation and visibility.
- Delivers tools for tracking inventory in multiple locations, determining to reorder points, managing replenishment, and optimizing safety stock.
- Streamline order processing by eliminating manual bottlenecks, preventing errors, and establishing a smooth flow from sales quote to order fulfillment resulting in timely invoicing and payment.
- Eases the process of moving goods or materials through an extended supply chain.
- Optimize warehouse operations with RF-device-directed put away and picking tasks, driven by customized, user-defined strategies and advanced capabilities like wave management, cartonization, cycle count planning, real-time inventory updates, and shipping system integrations.

Chapter 3 Design and Implementation

BillX is a supermarket billing system where users of the application can do everything starting from creating bills, maintaining inventory, registering new employees, and new members, and viewing their details. The application starts from a login screen where users have to provide their details (phone number and password) and also mention the type of login (admin or employee). In this case, the admin is provided with a default ten-digit number and a password, which they can change accordingly. On the other hand, the employees who have been registered by the admin can also access this application but only in the employee mode. After going past the login screen, we can view a dashboard, dashboards are different for different kinds of users, the employee user can create bills, maintain inventory, view accounts and register new members. The admin user on the other hand can do everything an employee user can do, they can also register new employees which employee users cannot. The admin can also change the default password from their dashboard.

Here, is a flowchart that describes the flow of the program:

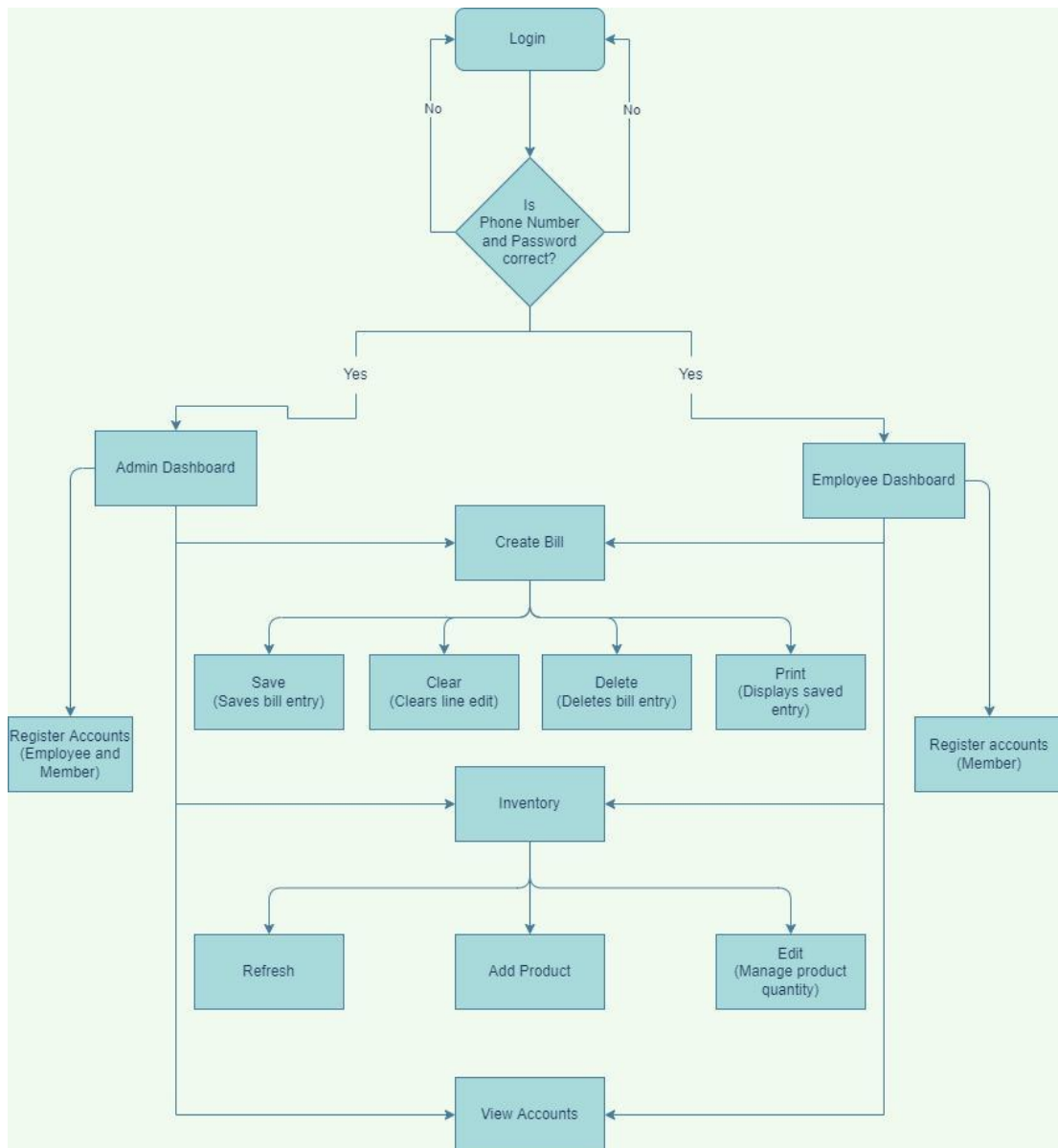


Figure 3.0.1: Program Flow

3.1 System Requirement Specifications

3.1.1 Software Specifications

3.1.1.1 Front End Tools: Qt

3.1.1.2 Back End Tools: SQLite

3.1.1.3 Operating System: Windows 10 1809 64bit

3.1.2 Hardware Specifications

3.1.2.1 RAM: 2GB minimum

3.1.2.2 Storage: 60MB minimum

Chapter 4 Discussion of the achievements

This project was our first real experience of working in a group to carry out a project. Since C++ programming language and on top of that the Qt [4] framework was fairly new for us, it took some time for us to adjust. We took help from online video tutorials, documentation, and developer forums. We went through a lot of discussions and brainstorming to finalize the different features and program flow of this project. Even though this was our first time carrying out a project of this kind, it became easier with teamwork and the supervision of our supervisor, this could not have been possible without the different kinds of video tutorials, books, forum discussions, and online documentation.

4.1 Features:

4.1.1 Registration and Login

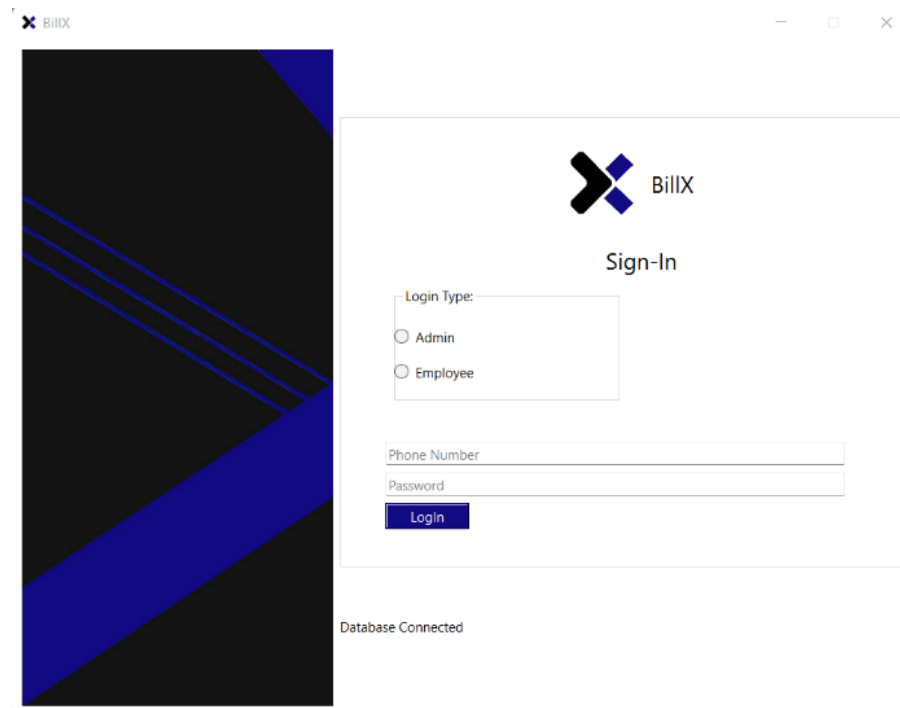


Figure 4.1.1: BillX Login

A login and registration system is the most basic feature that needs to be included in any application. BillX provides access to two different types of users: admin and employee.

Above is a Login screen where the users need to provide the credentials and choose the login type to get access to the application dashboard.

Figure 4.1.2: Employee and Member Register

For Registration, the users can register two kinds- employee and member. The admin can register both employees and members whereas, the employee in the employee mode can only register new members.

4.1.2 Admin Access & Employee Access

The “BillX” Desktop application can be accessed in two different modes:

4.1.2.1 Employee Mode:

The employee mode of this application is supposed to be accessed by only employees of the organization. Here, the employees can create the bill, check and maintain the products in the inventory, view accounts, and register new members.

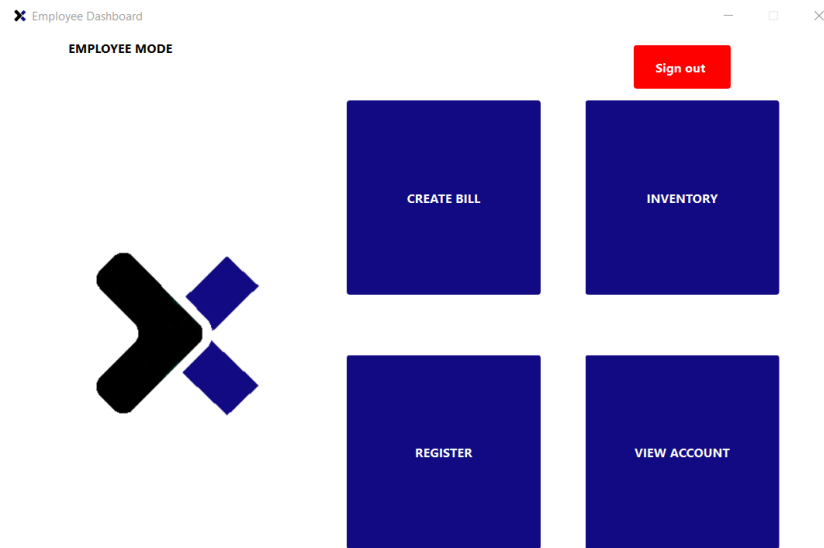


Figure 4.1.3: Employee Dashboard

4.1.2.2 Admin Mode:

There is only a single admin user for this application. The admin is provided with a default 10digit number and a password, but they can change the password according to their need and requirement. The admin can do everything an employee can and more. The admin can create bills, check and maintain inventory, view accounts, and register employees and new members.

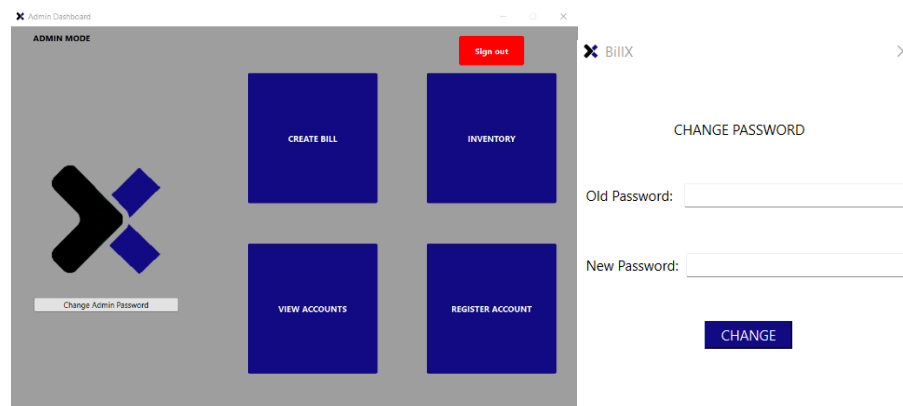


Figure 4.1.4: Admin Dashboard and Admin Change Password

4.1.3 Create Bill

Bill Number :

14 20 54
Sat Apr 30 2022

SAVE CLEAR DELETE PRINT

Mobile Number : Product Code :

Address : Quantity :

Price :

Figure 4.1.5: Create Bill Window

The Create Bill window is the most fundamental aspect of this application. It helps businesses and small organizations create bills of purchase. The users can create bills of items according to their respective product numbers. Also, with creating a bill, this application is equipped with a membership feature. The membership feature of this application enables registered members to receive discounts on every purchase. Members register themselves by giving their phone number and full name. We can save the purchase details in the database, create bills and provide discounts to registered members of the organization through this window.

4.1.4 Inventory Management

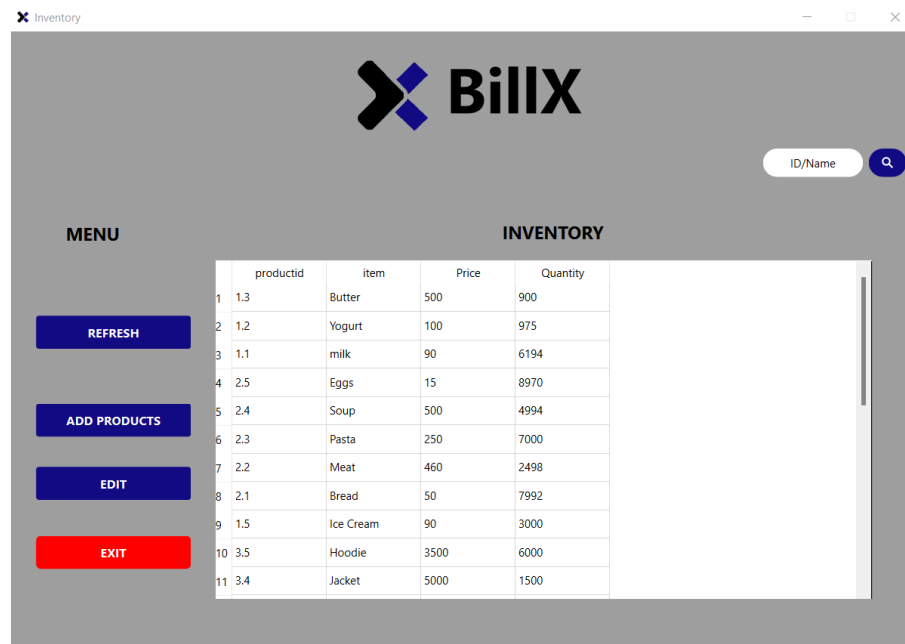


Figure 4.1.6: Inventory Window



Figure 4.1.7: Editing and Adding Products

The inventory window of this application is equipped with 3 major functions- search, edit and add. We can search for products and their quantities in the store, which helps keep track of items and ensure that they do not run out of stock. We can also add the required number of items every time a new shipment arrives, remove the required number of items and also completely remove a product that the store has decided

to stop selling. The add button also enables the employees and the administrator to add a completely new item to the store inventory.

4.1.5 View Account

✕ View Accounts

— □ ✕

EXIT

EMPLOYEE

	FirstName	LastName	PhoneNumber
1	Binay	Thapa	9869422441
2	Shashwat	Khadka	9869422471

MEMBER

	FirstName	LastName	PhoneNumber
1	Shubin	Pokhrel	9869422437
2	Siddhartha	Pradhan	9869422400

Figure 4.1.8: View Account Window

The users of the application can also view basic details of the people that are associated with the business or organization. They can view 3 basic details- first name, last name, and phone number of employees in the organization and members registered in the organization.

Chapter 5 Conclusion and Recommendation

Working on this project has been very beneficial for us. This project helped us to learn about Qt, SQLite, and C++ programming language by creating a supermarket billing system. We have successfully built a desktop application that helps small business owners to create a bill, check their inventory, add items to the inventory and provide membership services to their customers. BillX is a desktop application developed using Qt with C++ and SQLite. This project like anything has its limitations and can be improved with future enhancements.

5.1 Limitations

- The bill that is created is not in a physical form, it is only available digitally.
- The current membership feature provides a flat discount to members, this could be improved with a more improved system that maximizes profits and the number of customers for the business.
- Customers can only register themselves as members by physically visiting the store.

5.2 Future Enhancement

- The bill created could be made available both digitally and physically.
- The membership feature that provides discounts to members could be improved to maximize profit and the number of customers for the business.
- A new feature that enables the registration of customers as members online could be added.

References

1. *About the Vyapar app a billing software.* Vyapar App. Retrieved January 3, 2022, from <https://vyaparapp.in/gst-billing-app>
2. NetSuite.com. *What is NetSuite ERP?* Oracle NetSuite. Retrieved January 3, 2022, from <https://www.netsuite.com/portal/products/erp.shtml>
3. Horizon Technology Solutions, I. *Billing software with GST: E-way-bill: Accounting: Inventory.* Horizon Technology Solutions. Retrieved January 3, 2022, from <https://www.horizontechsolutions.co.in/>
4. *The future is written with Qt.* Qt documentation. Retrieved February 12, 2022, from <https://doc.qt.io/>

APPENDIX

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
<i>Planning and Preparation</i>												
<i>Work division</i>												
<i>Coding</i>												
<i>Merging</i>												
<i>Debugging</i>												
<i>Beta testing</i>												

Figure A: Gantt Chart

Tasks

- Planning and Preparation
- Work division
- Coding
- Merging
- Debugging
- Beta testing