Apna Karobar

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Declaration

We have read the project guidelines and we understand the meaning of academic dishonesty, in particular plagiarism and collusion. We hereby declare that the work we submitted for our final year project, entitled **Apna Karobar** is original work and has not been printed, published or submitted before as final year project, research work, publication or any other documentation.

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Statement of Submission

This is to certify that **Maham Babar** Roll No. **70113035, Raja Muhammad Huzaifa** Roll No. **70109946 Roll no of Student** have successfully submitted the final project named as: **Apna Karobar**, at Computer Science & IT Department, The University of Lahore, Lahore Pakistan, to fulfill the partial requirement of the degree of **BS in Computer Science**.

Supervisor Name: ……

Signature: ……

Date: ……

Dedication

This project is a heartfelt tribute to the esteemed members of our FYP group. It stands as a testament to the unwavering dedication and boundless support our parents have bestowed upon us, both financially and morally. Their commitment to providing for our every need during the development of this system has been a beacon of inspiration, reminding us that even the most formidable tasks can be conquered when approached one step at a time.

In the spirit of gratitude, we extend this dedication to all those who labored diligently to assist us in bringing this project to fruition. Our dissertation is a labor of love dedicated to our beloved parents, who instilled in us the profound belief that great undertakings can be achieved through sincerity and unwavering devotion, generously sharing their invaluable resources to fuel our academic journey.

Our profound appreciation also extends to our teachers, whose illuminating guidance has enriched us with knowledge and wisdom, paving the path to our scholarly accomplishments. In this endeavor, we recognize the instrumental role they have played in shaping our academic journey, and we extend our heartfelt thanks.

In honor of the remarkable individuals who have contributed to our journey, we dedicate this project with deep gratitude and reverence.

Acknowledgement

We begin our gratitude with a profound acknowledgment of the unwavering strength and divine guidance provided by Almighty Allah, which has empowered us to undertake this FYP.

It is with immense joy and gratitude that we extend our sincerest appreciation to Mr. Muhammad Abdullah, our esteemed project supervisor at The University of Lahore, for bestowing upon us the invaluable opportunity to embark on this challenging project. His guidance and support have been instrumental in our journey.

In this moment of reflection, we are deeply indebted to our beloved parents for their blessings, which have been a source of inspiration and encouragement throughout our research endeavors. Their unwavering support and love have been a beacon of motivation.

Date:26/06/2024

Abstract

Managing financial records, especially for small businesses, can be cumbersome and prone to errors. Existing solutions often lack user-friendly interfaces and the ability to seamlessly integrate various financial tasks. Apna Karobar seeks to bridge this gap by providing a user- friendly, all-in-one solution for bookkeeping, and credit risk assessment. The Apna Karobar project addresses the critical need for efficient financial management tools tailored for small businesses and supplier individuals. With a focus on simplicity and accessibility, Apna Karobar aims to streamline financial record-keeping, support international transactions, assist with offline financial calculations, and enhance credit risk assessment. The multilingual support ensures accessibility for a diverse range of users, while real-time collaboration features enable seamless teamwork on financial tasks. Apna Karobar represents a significant advancement in digital ledger and financial management applications. By combining essential features, user-friendly interfaces, and innovative functionalities, the application provides a comprehensive solution for small businesses and individuals. The project's success lies in its ability to enhance efficiency, reduce manual effort, and empower users to make informed financial decisions. Apna Karobar stands as a testament to the potential of technology in simplifying financial processes for businesses of all sizes.

Area of the Project

Mobile Application Development

Technologies used

- Language: Java
- Software: Android Studio

Android version:

Android Studio Giraffe | 2022.3.1 Patch 4
Build #AI-223.8836.35.2231.11090377, built on November 14, 2023
Runtime version: 17.0.6+0-b2043.56-10027231 amd64
VM: OpenJDK 64-Bit Server VM by JetBrains s.r.o.

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Chapter 1

Introduction

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1.1 Introduction

"Apna Karobar" is an exceptional and cutting-edge bookkeeping and accounting software and app that simplifies the management of your business accounts and ledger, eliminating the need for manual labor. This versatile tool is available both offline and online, providing seamless control over your personal and business financial matters. As an efficient cash management system and accounting application, Apna Karobar is tailored to suit the needs of small businesses.

With Apna Karobar, you can effortlessly consolidate your cash flow records into a single, easily accessible platform. Bid farewell to the inconvenience of juggling financial records across various locations. It's high time to eliminate these struggles by embracing the Apna Karobar app on your smartphone. With this app, you can manage your small business ledgers while on the move, granting you the flexibility to stay in control wherever you are.

Apna Karobar is an indispensable asset for start-ups, and countless small businesses rely on its capabilities to streamline their daily operations. This ingenious application is designed to be your constant companion, accessible from anywhere in the world. For instance, while waiting in a grocery store aisle for your busy dad to finish shopping, you can efficiently handle your transactions and ledger on your smartphone, making the most of your time.

The Apna Karobar app extends its digital ledger services to small business owners across Pakistan. Embrace Apna Karobar and experience a smarter, more efficient way to manage your business finances.

1.2 Purpose

The purpose of "Apna Karobar" or a similar accounting and financial management app is to provide small business owners with a convenient and efficient way to manage their finances. Here are the primary purposes of such an app:

1. **Simplified Financial Management:** The app simplifies the often-complex task of managing financial transactions, income, and expenses for small businesses. It provides an organized and user-friendly platform to keep track of financial data.
2. **Billing and Invoicing**: It helps create and send invoices to customers, making it easier to get paid for products or services. The app may also track unpaid invoices and send reminders to ensure timely payments.
3. **Time-Saving:** By automating many financial tasks and providing a centralized platform, Apna Karobar saves time for small business owners. They can focus on growing their business rather than getting bogged down in financial paperwork.
4. **Reducing Errors**: Automation and structured data entry reduce the likelihood of errors in financial records, ensuring accuracy in financial reporting.

1.3 Objective

The primary goals and objectives of the "Apna Karobar" project are geared towards enhancing the efficiency, reliability, ease, and overall comfort of using ledger books for businesses. This innovative project goes beyond just ledger management; it also offers users a seamless way to maintain and control their inventory. With the Apna Karobar app, adding, deleting, updating, and tracking inventory details becomes a breeze.
It's designed to be exceptionally easy to navigate and operate, ensuring that even those who aren't tech- savvy can harness its power. As you develop into this project, you'll uncover how technology can be harnessed to simplify and solve real-world business challenges.

The central aim of this endeavor is to provide a platform for businesses to transition into the digital age. It's all about leaving behind traditional, manual ledger books and embracing a more efficient, error-reducing, and time-saving approach to financial management.

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features are:

1. Efficiency Enhancement: The project strives to boost the efficiency of financial operations. By digitizing the ledger process, it streamlines tasks, making them quicker and more accurate.

2. Accelerated Receivables: Apna Karobar facilitates quicker receipt of payments. This means businesses can get paid three times faster, ensuring a healthier cash flow.

3. Secure Digital Ledger: The app offers a safe and reliable way to maintain digital financial records, ensuring the security of your financial data.

4. Online Payments: With free online payment support, businesses can easily manage financial transactions.

5. Inventory Management: Apna Karobar provides a comprehensive solution for maintaining inventory records and keeping them up to date.

1.4 Existing Work

In the realm of financial management, numerous websites and mobile applications have made significant strides in providing a streamlined approach to khata management. With a keen understanding of the existing landscape, we have embarked on a mission to simplify and modernize this process. We've studied and delved into projects like

- **Digi-khata:** Digi-Khata is a safe and user-friendly bookkeeping app. With Digi-Khata, you can effortlessly track and handle your business transactions. The app makes it easy for you to record your financial activities and ensures that you get paid three times faster. It's a secure and straightforward solution for managing your business finances.
- **Udhar Book:** Udhaar Khatabook is the top-rated business app, and it's completely free and secure. This app is designed for both business owners and individuals, helping them effortlessly recover dues, handle business transactions, and even earn money through features like easy load, bill payment, and vouchers. It's a user-friendly and cost-effective solution for managing your business finances.

- **Credit book**: In Credit Book, the convenient cashbook feature lets you easily keep track of cash coming in and going out in your business! And now, in the Credit Book app, you can also manage your business stock with our Stock book feature! Simply add items to your stock, create bills as you buy and sell, and adjust the stock quantity accordingly. with the Credit Book Wallet, you can earn commissions by selling mobile load directly from your phone! It's simple – sell mobile load to friends and customers, and also save money in your Wallet. [3]
- **Easy Khata:** Easy Khata, Pakistan's top digital financial app, effortlessly tracks your credits and cash transactions. No more paper hassles—open accounts with a click, manage records on your phone, and earn profits through Mobile Load and bill payments. Simplifying financial management for businesses and individuals in Pakistan. All of which aim to empower individuals in managing their khata and customer records efficiently, catering to the specific needs of shopkeepers. Our mobile application takes this a step further by facilitating seamless payment transactions.

Current State:

- Shopkeepers predominantly rely on manual registers to maintain their records, a time-consuming and error-prone process.
- The absence of a backup system puts these critical records at risk in the event of data loss.
- Security is a concern; as physical records can be vulnerable to damage or unauthorized access.

Future State:

- Through our innovative application, shopkeepers will transition from manual record-keeping to a digital system.
- We provide a robust backup system to ensure the safety of valuable data.
- Our mobile application prioritizes security, safeguarding financial records.

Proposed Solution:

Our application is a comprehensive tool that effortlessly manages business accounts and ledgers, eliminating the need for manual record-keeping. It's a game-changer, eradicating the need for paper registers, an internet connection, or a computer to manage inventory.

1. **User Accessibility:** Users can access the application both online and offline, ensuring flexibility in managing their khata.
2. **Enhanced Data Security:** We prioritize data security to protect sensitive financial information.
3. **Improved Efficiency:** Our application streamlines the process, saving time and reducing errors.
4. **Enhanced Services:** We strive to provide a superior experience, catering to the specific needs of shopkeepers.
5. **User-Friendly Interface:** The application is intuitive and easy to navigate, ensuring that users can operate it with ease.
6. **Data Integrity Assurance:** We certify the validity and accuracy of your data, ensuring that you can rely on it with confidence.
7. **Efficiency enhancement:** The digitization of the ledger process enhances the efficiency of financial operations. By streamlining tasks, Apna Karobar ensures quicker and more accurate management of financial records.
8. **Accelerated receivables:** Businesses can experience faster receipt of payments, ensuring a healthier cash flow. Apna Karobar accelerates receivables, contributing to the financial stability of small businesses.
9. **Secure digital ledger:** Apna Karobar provides a secure and reliable platform for maintaining digital financial records. The app prioritizes the security of user data, instilling confidence in the safety of financial information.

Chapter 2
Software Requirement Specification

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2.1 Introduction:

'Apna Karobar,' an exceptional and cutting-edge financial management solution that is set to revolutionize the way you handle your business accounts and personal finances. This versatile software and app are meticulously designed to eliminate the manual labour associated with bookkeeping and accounting. Whether you're online or offline, 'Apna Karobar' provides you with seamless control over your financial matters, tailored to meet the unique needs of small businesses.

With 'Apna Karobar,' you can effortlessly consolidate your cash flow records into a single, easily accessible platform, bidding farewell to the hassles of managing financial records across various locations. The 'Apna Karobar' app is your constant companion, accessible from anywhere in the world, allowing you to manage your small business's ledgers even while on the move.

This indispensable tool is the go-to choose for start-ups and numerous small businesses, all relying on its capabilities to streamline their daily operations.

In addition to these core features, 'Apna Karobar' also brings you the incredible benefits of Automated Expense Tracking (AETS), Real-Time Currency Conversion (RTC), Offline Financial Calculator (OFC), and Credit Risk Assessment (CRA), all designed to simplify various financial tasks and decisions.

Embrace 'Apna Karobar' and embark on a journey towards a smarter, more efficient way to manage your business finances, putting you firmly in control of your financial future

2.1.1 Purpose

"Apna arobar" is an exceptional bookkeeping and accounting software and app designed to streamline your business financial management effortlessly, eliminating the need for manual record-keeping. This versatile tool is available both online and offline, offering a comprehensive ledger book solution to oversee your personal and business accounts with utmost convenience. It is not just a ledger book; it's your key to efficient cash management and a robust accounting platform for your small business operations.

its standout features and capabilities:

- **Seamless Cash Flow Management:**
  Apna Karobar simplifies the intricate task of managing your financial transactions, helping you maintain an uninterrupted, real-time view of your cash flow. With all your financial records consolidated in one place, you can bid farewell to the hassles of scattered paperwork.
- **On-the-Go Ledger Management:**
  With Apna Karobar, you can effortlessly manage your small business ledgers from anywhere. Whether you're at your store, on a business trip, or even in a grocery store aisle, the app empowers you to update and track your transactions with ease. This flexibility allows you to stay productive and make the most of your time.
- **Global Accessibility:**
  Apna Karobar is an ingenious application that accompanies you wherever you go. Regardless of your location, you can effortlessly manage your cash flow transactions. This global accessibility is particularly beneficial for individuals with busy schedules or those who need to travel frequently for business purposes.

2.1.2 Scope

2.1.2.1 Software Product

The software product to be produced is the "Apna Karobar" financial management application.

2.1.2.2 Purpose and Functionality

What the Software Will Do:

- **Efficiency Enhancement**: Apna Karobar is designed to significantly enhance the efficiency of financial operations. By digitizing the ledger process, it streamlines various financial tasks, making them quicker and more accurate. For instance, users can swiftly update their financial records, reducing the time and effort required for manual bookkeeping.

- **Accelerated Receivables:** One of the key advantages of Apna Karobar is its ability to expedite the receipt of payments. Businesses using this software can expect to receive payments up to three times faster, ensuring a healthier cash flow. This feature is especially beneficial for small businesses seeking to improve liquidity.

- **Secure Digital Ledger:** Apna Karobar offers a secure and reliable platform for maintaining digital financial records. Users can trust the app to safeguard their financial data, reducing the risk of unauthorized access or data loss. This security feature ensures the confidentiality and integrity of financial information.

- **Credit Management:** The project includes a dedicated "Digi Khata App" to efficiently manage credit accounts. This feature enables businesses to keep a close eye on credit transactions, ensuring that credit terms are adhered to and debts are managed effectively.

- **Online Payments:** The software offers free online payment support, simplifying the management of financial transactions. Businesses can easily accept and process payments online, providing added convenience to both vendors and customers.

- **Inventory Management:** Apna Karobar provides a comprehensive solution for maintaining and updating inventory records. Users can efficiently manage their stock levels, track inventory movements, and ensure their records remain accurate and up to date.

What the Software Will Not Do:

- **Provide Legal Advice:** Apna Karobar is not a substitute for professional legal counsel. It cannot offer legal advice on matters such as contract negotiations, business structure, or compliance with local regulations. For legal matters, it is essential to consult with qualified legal professionals.
- **Offer Tax Consultation:** The software does not provide personalized tax advice or tax planning services. It cannot assist with complex tax strategies, tax optimization, or offer guidance on tax deductions. For comprehensive tax guidance, individuals and businesses should seek the expertise of certified tax professionals.
- **Replace Financial Professionals:** While Apna Karobar empowers users with efficient financial management tools, it cannot replace the expertise of financial advisors or accountants. It does not offer personalized investment advice or retirement planning services. When dealing with complex financial strategies, it is advisable to engage with financial professionals who can provide tailored advice.
- **Ensure Business Success:** While Apna Karobar plays a pivotal role in financial management, it cannot guarantee the success of a business. Success depends on various factors, including market conditions, competitive strategies, and external economic variables. The software supports financial aspects but does not encompass the full spectrum of factors influencing business outcomes.
- **Make Investment Decisions:** Apna Karobar does not make investment decisions on behalf of users. It can provide data and analysis related to financial transactions, but the software does not engage in buying, selling, or managing investments. Investment decisions require careful consideration and should be made based on individual financial goals and risk tolerance.
- **Replace Regulatory Compliance:** Businesses must comply with various legal and regulatory requirements. Apna Karobar cannot replace the need for businesses to adhere to these regulations. It does not provide legal guidance on regulatory compliance and reporting obligations

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2.1.2.3 Applications and objectives

Apna Karobar is designed to be a versatile financial management tool for businesses of all sizes and individuals, with a focus on:

- **Streamlining Financial Record-Keeping**: The software simplifies the process of managing financial records, reducing the complexity of record-keeping and minimizing the room for errors. Whether you are a small business owner or an individual managing personal finances, Apna Karobar streamlines the task of maintaining accurate financial records.

- **Supporting International Financial Transactions**: Apna Karobar facilitates seamless international financial transactions through real-time currency conversion. It ensures that users can engage in global business or manage international investments with clarity and ease.

- **Assisting with Offline Financial Calculations**: The software provides the ability to perform essential financial calculations even when offline. This feature ensures that users can make critical financial decisions no matter where they are, without the constraint of needing an internet connection.

- **Enhancing Credit Risk Assessment:** Apna Karobar integrates machine learning-based credit risk assessment to empower users with informed credit decisions. By evaluating the creditworthiness of individuals and businesses, it reduces the risk of bad debts, benefiting both creditors and borrowers.

Benefits:

The software's key benefits include:

- **Simplifying Expense Tracking:** Apna Karobar simplifies expense tracking by automating the process and reducing manual data entry. This not only saves time but also enhances the accuracy of financial records, leading to better financial decision-making.

- **Enabling Real-Time Currency Conversion**: Users can benefit from real-time currency conversion, ensuring that international transactions are conducted with complete financial clarity. This feature is invaluable for businesses and individuals engaged in global commerce.

- **Providing Offline Financial Calculation Capabilities:** The software's offline financial calculation feature empowers users to make critical financial decisions from any location, whether it's evaluating loan repayments or assessing interest rates. It eliminates the reliance on an internet connection for financial analysis.

- **Empowering Users with Machine Learning-Based Credit Risk Assessment**: Apna Karobar's credit risk assessment feature is driven by machine learning, offering a data-driven approach to

evaluating creditworthiness. This empowers users to make informed credit decisions, reducing the risk of encountering financial losses due to unpaid debts.

Objectives:

The primary objectives of Apna Karobar are:

- **Streamline Financial Management:** Apna Karobar's foremost objective is to streamline financial management for both businesses and individuals. It achieves this by automating and simplifying various financial tasks, allowing users to focus on strategic financial decision-making.

- **Enhance Financial Decision-Making:** The software is designed to enhance financial decision-making capabilities. Through features like real-time currency conversion and credit risk assessment, it equips users with the tools and insights needed to make informed financial choices.

- **Improve Overall Financial Stability:** The overarching goal is to improve the overall financial stability and health of businesses. By offering tools for accelerated payment collection, secure financial record-keeping, and informed credit decisions, Apna Karobar contributes to maintaining strong financial foundations and reducing the risk of bad debts.

2.1.2.4 Consistency with Higher-Level Specifications:

This Scope subsection is fully consistent with the higher-level specifications, which collectively aim to create a comprehensive financial management tool with a strong focus on efficiency, international financial support, offline functionality, and credit risk assessment. It encapsulates the core objectives and functionalities that Apna Karobar aims to provide, ensuring alignment with the broader vision for the software.
The higher-level specifications of Apna Karobar are carefully designed to create a comprehensive financial management tool that addresses the diverse needs of businesses and individuals. These specifications underscore the following key areas of focus:

- **Efficiency Enhancement:**
  The project strives to boost the efficiency of financial operations. By digitizing the ledger process, it streamlines tasks, making them quicker and more accurate. This objective aligns with the higher- level focus on enhancing the efficiency of financial operations.
- **Accelerated Receivables:**
  Apna Karobar aims to facilitate quicker receipt of payments, ensuring a healthier cash flow. This commitment to accelerating receivables is in line with the higher-level specifications that emphasize improving cash flow and financial liquidity.
- **Secure Digital Ledger**:

The higher-level specifications stress the importance of offering a secure and reliable way to maintain digital financial records, ensuring the security of users' financial data. This aligns with the commitment to secure digital ledger maintenance.

- **Credit Management:**
  The project includes a dedicated "Digi Khata App" for managing credit accounts efficiently, which is a direct response to the higher-level specifications that prioritize efficient credit management.
- **Multilingual Support:**
  Apna Karobar's provision of multilingual support in four different scripts reflects the commitment to accessibility and adaptability as outlined in the higher-level specifications.
- **Online Payments:**
  The software's support for online payments is in line with the higher-level specifications that emphasize the importance of managing financial transactions effectively.

- **Inventory Management:**
  Apna Karobar's comprehensive solution for maintaining inventory records aligns with the higher-level specifications that stress the need for effective inventory management for businesses.

2.1.3 Definitions, acronyms, and abbreviations

2.1.3.1 Definitions:

1. **Apna Karobar:** The comprehensive financial management software described in this document, designed for businesses and individuals.
2. **Digital Ledger:** A digital record-keeping system used for tracking financial transactions and maintaining financial records.
3. **Multilingual Support:** The capability of the software to be used in multiple languages and scripts, ensuring accessibility for a diverse user base.
4. **Secure Digital Ledger:** A digital ledger that ensures the confidentiality and security of financial data.

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2.1.3.2 Acronyms:

1. UOL: The University of Lahore.

2.1.3.3 Abbreviations:

1. UOL: Abbreviation for The University of Lahore.

2.2 Overall description

2.2.1 Product perspective

1. In order to prioritize user engagement and security, Apna Karobar places user registration as its primary focus. The registration process is a crucial step to access the application's full functionality. Here's an overview of the user registration perspective:
2. **User Registration Priority:**
   The initial priority is on user-side registration, ensuring that users create an account to unlock the comprehensive functionality of the application.
3. **Information Input:**
   Users are prompted to input various personal details, including but not limited to name, cell number, email, age, CNIC number, and a secure password. This comprehensive set of information contributes to the security and personalization of user accounts.
4. **Security Measures:**
   The collection of user information is implemented with a strong focus on security. This ensures that user data is safeguarded, contributing to a secure and trustworthy environment.
5. **Login Process:**
   After the registration process, users can log in securely using the provided credentials. This login functionality is essential for accessing personalized features and maintaining the privacy of user data.
6. **Interface Guidance:**
   The application's interface guides users to register through a user-friendly sign-up process. This intuitive approach is designed to encourage users to explore and utilize the maximum functions available, creating a seamless on boarding experience.
7. **Interaction Gateway:**
   Registering through the sign-up process becomes the primary gateway for users to interact with the application. It not only establishes a secure connection but also opens the door to a multitude of features and functionalities tailored to serve the user.
8. **User Exploration:**
   Users, upon registration, gain access to a comprehensive set of features, allowing them to explore and utilize the application to its fullest potential. This approach ensures that users receive value and functionality from the moment they register.
9. **Information and Features Showcase:**

In addition to the registration process, users are presented with an overview of the application's features, functions, and other relevant information. This allows users to familiarize themselves with the app's capabilities and benefits.

This user-centric approach, prioritizing secure registration and intuitive interaction, sets the tone for a positive user experience within the Apna Karobar application. The combination of robust security measures, an inviting user interface, and feature showcases contributes to a holistic and engaging user onboarding process.

2.2.1.1 System Interfaces:

Functionality of the Software to the System Requirement: Apna Karobar interfaces with the underlying system to ensure seamless functionality. This includes interactions with the operating system, file management, and other system-level processes required for the software's proper operation.

2.2.1.2 User interface:

The user interface serves as the captivating gateway to the application, offering an engaging and intuitive screen that not only attracts but also guides users effortlessly. It provides a seamless experience, allowing users to register themselves with ease by following clear instructions.

The design of the user interface is intentionally user-friendly, fostering a connection that enables users to interact effortlessly with the system. By ensuring simplicity in operation, users can easily grasp the functionalities of the application and register themselves with confidence.

The interface has been meticulously crafted to be visually appealing and operationally efficient. Its user-friendly nature ensures that users can navigate through the system effortlessly, understanding each operation with clarity. The arrangement of components follows a logical sequence, enabling users to discern and execute various operations with ease.

2.2.1.3 Hardware Interfaces:

Apna Karobar is designed to be compatible with standard hardware configurations commonly used in business and personal computing environments.

- Mobile Phone
- Firebase

2.2.1.4 Software interfaces:

- Language: Java
- Software: Android Studio

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2.2.1.5 Communication interfaces:

Communication interface are the interfaces through which user and product are connected with each other. Apna Karobar may utilize local network protocols for communication, facilitating data exchange between users and ensuring that the software can operate effectively in networked environments.

- Mobile phone

2.2.1.6 Memory:

Apna Karobar is optimized to efficiently use both primary and secondary memory.
49.38 MB used in internal storage.

2.2.1.7 Operations:

Apna Karobar supports normal operations such as financial record-keeping and real-time collaboration. Special operations, including backup and recovery procedures.

2.2.2 Product functions

The application seamlessly performs a range of essential functionalities, enhancing user experience and operational efficiency. Here is an overview of the core features:
Application:

1. **Register:** Users initiate their journey by creating an account, providing a gateway into the application.
2. **Login:** Users can securely access the system through a login process, ensuring a personalized and protected experience.
3. **View Profile**: Users have the ability to view and update their profiles, allowing for personalized interaction within the application.
4. **Search Items:** Shopkeepers benefit from a streamlined item search functionality, enhancing efficiency in managing inventory.
5. **Inventory:** Shopkeepers can add, track sales, and purchase products, providing comprehensive control over their inventory.
6. **Supplier Details:** Shopkeepers gain insights into supplier details and have the capability to add new suppliers, fostering effective supplier management.
7. **Customer Details:** Shopkeeper's access and manage customer details, with the option to add new customers, facilitating personalized customer relationships.
8. **Billing:** The application empowers users to create detailed bills for products, ensuring accuracy and transparency in transactions.
9. **Balance Sheet:** The application diligently maintains financial records in a balance sheet format, providing a comprehensive overview of financial standings.

2.2.2.1 System features:

Registration:

ID:	**FR_01**			
Name:	Registration			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Registering to the system to provide security to personal information.	Username, Email, Password, Phone Number	Account created successfully.	Internet Connectivity required. Username, Email, Password, Phone Number.	• User navigates to the registration page. • User enters the required details: Username, Email, Password, Phone Number. • User clicks the submit button. • The system verifies the information and, with internet connectivity, saves the record in the database. • Account created successfully.

Table 2.1 Functional Requirement for Registration

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User Login:

ID:	FR_02			
Name:	User login			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Logging into the application to secure personal information.	Username, Password	Successful login to the application	username, password and Mobile connectivity to Firebase.	• User opens the application. • User inputs the correct Username and Password. • User clicks the login button. • The system verifies the credentials with the connected Firebase database. • If the credentials are correct, the user successfully logs into the application. Otherwise, access is denied.

Table 2.2 Functional Requirement login access

View Items:

ID:	FR_03			
Name:	View Items			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Enabling users to search and view data and profiles within the application.	None	User can search and view items, data, and profiles.	Mobile connectivity to Firebase	• User opens the application. • User navigates to the search feature. • User enters the desired search criteria. • The system queries the Firebase database. • Results are displayed, allowing the user to view items, data, and profiles

Table 2.3 Function requirements View Items

Edit And View:

ID:	FR_04			
Name:	Edit and View Profile			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Empowering users to update and view their profiles within the application	Username, Password, Email, etc.	User can successfully update and view their profile data.	Mobile connectivity to Firebase.	• User opens the application. • User navigates to the profile editing feature. • User inputs the required credentials: Username, Password, Email, etc. • User makes the necessary updates. • The system verifies the username and password with the connected Firebase database. • If credentials are correct, the user's profile is successfully updated, and they can view the changes. Otherwise, the update is denied.

Table 2.4 Function requirements Edit and view

Inventory:

ID:	FR_05			
Name:	Inventory			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Facilitates shopkeepers in adding items to the inventory	Product Name, Price, Product Type, Date	Item is successfully added to the user's inventory.	Valid information Product name, Price, product type, date	• Shopkeeper logs into the application. • Shopkeeper navigates to the inventory management section. • Shopkeeper inputs the necessary details: Product Name, Price, Product Type, Date. • Shopkeeper submits the information. • The system validates the data for accuracy. • If the data is valid, the item is successfully added to the user's inventory. Otherwise, the addition is denied.

Table 2.5 Function requirements Inventory

Supplier Details:

ID:	FR_06			
Name:	Supplier details			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Enables shopkeepers to log in and view details of a supplier within the application.	User login	Shopkeeper can successfully view supplier details	User login and then view detail of item. Mobile connectivity to Firebase	• Shopkeeper logs into the application. • Shopkeeper navigates to the supplier details section. • Shopkeeper views the details of the selected supplier. • The system fetches and displays the supplier details from the connected Firebase database.

Table 2.6 Function requirements Supplier details

Billing:

ID:	FR_07			
Name:	Billing			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Empowers shopkeepers to log in and create bills within the application.	User login	Shopkeeper successfully generates bills.	User login and then view detail of item. Mobile connectivity to Firebase	• Shopkeeper logs into the application. • Shopkeeper navigates to the billing section. • Shopkeeper selects items for the bill and enters relevant details. • Shopkeeper submits the billing information. • The system processes the billing details and stores them in the connected Firebase database

View Balance Sheet:

ID:	FR_08			
Name:	View balance sheet			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Allows users to log in and check finance details through a balance sheet within the application.	User login	User successfully views the balance sheet with finance details.	User login and check the finance details. Mobile connectivity to firebase	• User logs into the application. • User navigates to the balance sheet section. • User views the finance details presented in the balance sheet. • The system fetches and displays the finance details from the connected Firebase database.

Table 2.8 Function requirements View balance sheet

Customer Details:

ID:	FR_9			
Name:	Customer details			
Description	**Input**	**Output**	**Requirements**	**Basic Work Flow**
Permits users to log in and view details of customers.	User login	User successfully views customer details.	User login and then view detail of customers. mobile connectivity to firebase	• User logs into the application. • User navigates to the customer details section. • User views the details of the selected customer. • The system fetches and displays customer details from the connected Firebase database.

Table 2.9 Function requirements Costumer details

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2.2.3 User characteristics

In the realm of Apna Karobar, understanding the distinctive traits of the intended users is fundamental for crafting a tailored and user-friendly experience. This involves delving into key user characteristics such as educational background, experience, and technical expertise.

- **Educational Level in Apna Karobar:**

User Classes Interaction: Apna Karobar may define user classes based on varying educational levels, ensuring that the software accommodates users with different academic backgrounds.
How it Works: User classes related to educational levels can influence the presentation of interfaces, tutorials, and educational content within Apna Karobar.

Experience with Apna Karobar:

- **User Classes Interaction:**

Apna Karobar can categorize users into classes based on their experience levels, tailoring features to match the proficiency of both novices and seasoned users.
How it Works: User classes associated with experience guide the system in providing a seamless experience, offering functionalities that align with the diverse user journey.

- **Technical Expertise in Apna Karobar:**

User Classes Interaction: Apna Karobar may create user classes to address varying levels of technical expertise, ensuring the platform is accessible and valuable to users with different technological backgrounds.
How it Works: User classes linked to technical expertise influence the sophistication of features, striking a balance that suits users regardless of their familiarity with advanced technologies.
In essence, the interaction between user characteristics and classes within Apna Karobar is a dynamic process. User classes act as a conduit, allowing the system to adapt and cater to the diverse attributes and needs of its users. By considering educational level, experience, and technical expertise, Apna Karobar aims to create a versatile and inclusive platform that resonates effectively with its user base

2.2.4 Constraints

- Apna Karobar is designed to operate on smartphones running Android version 6.0.1 or higher and IOS version 7.0 or higher, imposing limitations based on the capabilities of these platforms.
- The application imposes constraints related to reliability, defining expectations for system uptime, data accuracy, and overall performance
- Limitations on control functions are established to manage user access, permissions, and system configurations, fostering a secure and controlled operational environment
- Protection of user data and prevention of unauthorized access.
- Ensuring system stability and uninterrupted financial services

2.2.5 Assumptions and dependencies

Assumptions:

- The project operates under the assumption that the requirements are in a finalized and comprehensive state, minimizing the need for significant changes during the development process.
- It is assumed that users engaging with the system are well-versed in utilizing the internet, allowing for a seamless and intuitive online experience.
- The assumption is made that users possess a familiarity with mobile phone usage, contributing to the accessibility and user-friendliness of the application.
- It is assumed that users have access to a stable and reliable internet connection, ensuring consistent and uninterrupted use of the application.

Dependencies:

- The security of personal details is considered a paramount dependency, with stringent measures in place to safeguard user accounts and sensitive information.

2.2.6 Apportioning of requirements

- The apportioning of requirements involves a strategic approach to system development, considering the prioritization of core functionalities while allowing for the delayed implementation of certain features until future versions. This enables the development team to deliver a robust and functional system initially while maintaining the flexibility to enhance and expand the application in subsequent releases.
- The identification of requirements for potential delay in Apna Karobar is driven by a forward- looking perspective, considering factors such as evolving user needs, technological advancements, and the dynamic landscape of financial management. By apportioning requirements, Apna Karobar can ensure a timely and efficient deployment of essential features, setting the stage for a phased and iterative evolution of the system.

- This strategic approach to development aligns with the philosophy of delivering value to users promptly while keeping the door open for continuous improvement and innovation in future versions of Apna Karobar.

2.1.1. Functional Requirement

Apna Karobar, as a comprehensive financial management solution, encompasses various functional requirements that contribute to its effectiveness and user-centric design. The functional modules of Apna Karobar are tailored to streamline financial operations, enhance decision-making capabilities, and provide users with a seamless and efficient experience.

1. **User Registration and Authentication:**
   Allow users to create accounts securely, providing necessary information for authentication.
2. **Dashboard and Overview:**
   Provide users with an intuitive dashboard displaying a summarized overview of their financial activities
3. **Multilingual Support:**
   Ensure the application is accessible in multiple languages, catering to a diverse user base.
4. **Online Payments:**
   Support free online payments, allowing businesses to manage financial transactions seamlessly.
5. **Inventory Management:**
   Provide a comprehensive solution for maintaining and updating inventory records.

These functional modules collectively define the rich feature set of Apna Karobar, offering users a versatile and user-friendly platform for effective financial management

2.1.2. Non-functional Requirements

1. Apna Karobar's non-functional requirements encompass various aspects that contribute to its usability, reliability, performance, and overall quality.
2. **Usability:** Apna Karobar prioritizes an intuitive and user-friendly interface, ensuring users can efficiently navigate and utilize the application.
3. **Reliability:** The application is designed for reliability, offering consistent and dependable performance to meet users' financial management needs.
4. **Performance:** Performance of this application is very efficient and responsive immediately. All functions are responsive and take less time in when user create their account on our application.
5. **Scalability:** Apna Karobar is designed to scale efficiently, accommodating a growing user base without compromising performance.
6. **Capacity:** The application ensures robust capacity, allowing for efficient handling of concurrent user activities.
7. **Responsiveness:** All functions within Apna Karobar are highly responsive, delivering immediate results for users.
8. **Design Constraints:** The application adheres to design constraints, considering factors that influence the visual and functional aspects of the user interface.
9. **Portability:** Apna Karobar is built with portability in mind, ensuring users can access the application seamlessly across various devices.
10. **Maintainability:** The application is designed for ease of maintenance, allowing for updates and enhancements to be implemented smoothly.
11. **License Agreement:** Users engaging with Apna Karobar are subject to the terms outlined in the license agreement, ensuring responsible and lawful usage.

2.1.3 Other Nonfunctional Requirements

- **Safety Requirements:**

Apna Karobar prioritizes security by requiring each user to identify themselves through a valid email and verification process.

- **Security Requirements:**

Security measures include fool proof identification, login credentials, encrypted passwords, integrated accounts, and strict prevention of personal information leaks.

- **Software Quality Attributes:**

Apna Karobar emphasizes quality attributes like performance, security, modifiability, reliability, and usability, influencing the software architecture for optimal functionality.

- **Business Rules:**

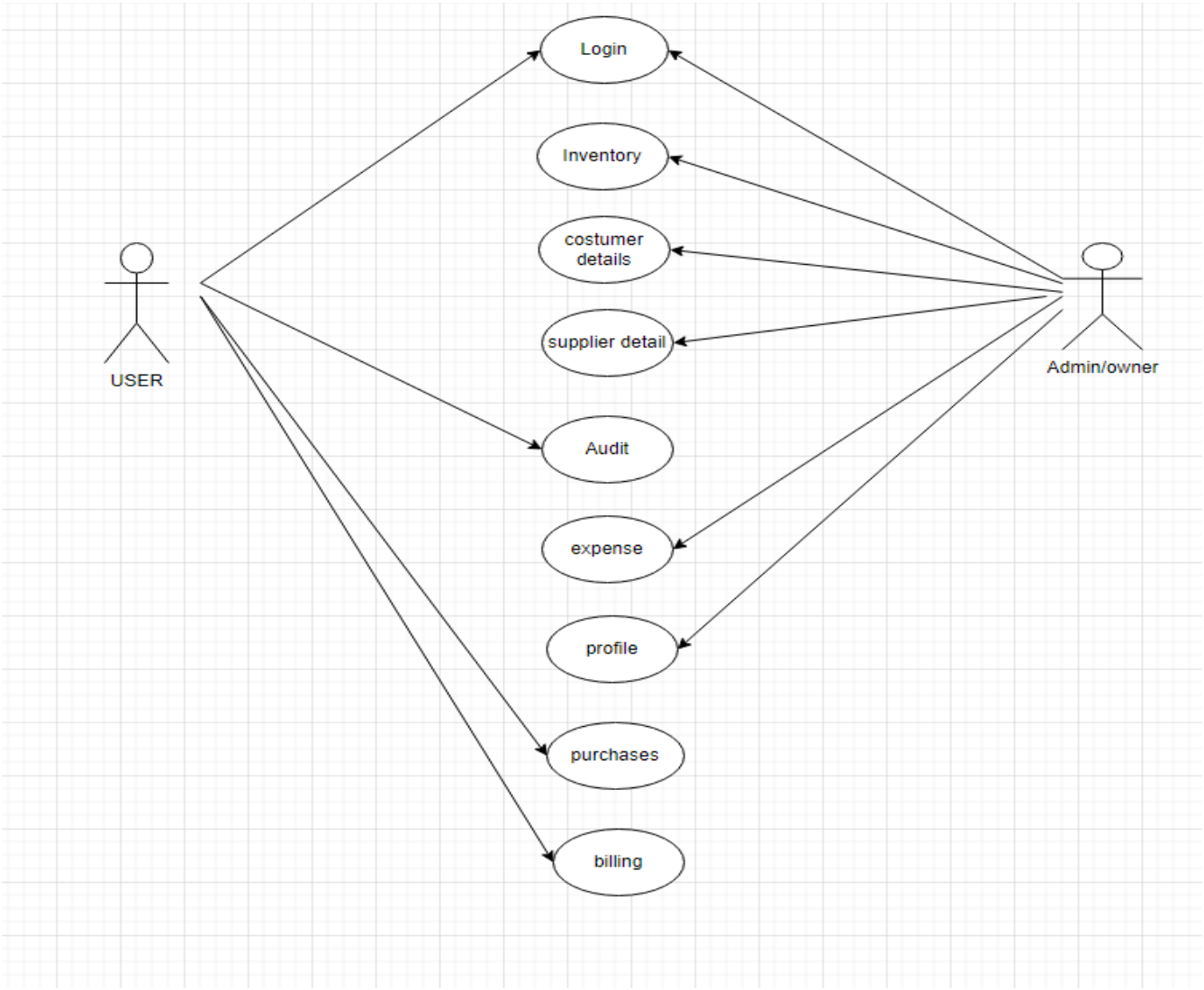
Currently a semester project, Apna Karobar doesn't incorporate specific business rules, leaving room for future development in this aspect.

- **Other Requirements:**

These non-functional requirements collectively define the holistic framework of Apna Karobar, encompassing aspects of performance, security, and user experience

Chapter 3:
Use case Diagrams

40



Use case 1 Use case Diagram of Apna Karobar

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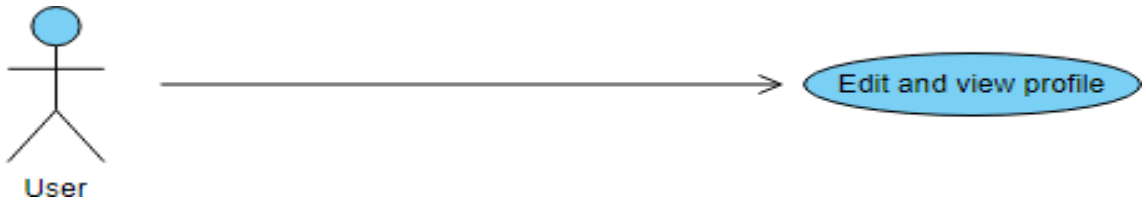
Use Case_01: Search and View Items

Use case for user

Use Case ID	UC_01	
Use Case Name	Login access (Name of use case here is User Login)	
Description	User can login with his/her verified account	
Primary Actor	User/costumer/owner	
Secondary Actor	Database	
Pre-Condition	User can enter its credentials and access main page	
Post-Condition	After login user can access app features	
Basic Flow	Actor Action	System Action
	Enters credentials	Authorizes email and account info
Alternate Flow	User can use Forget option feature to recover their account.	

42

Use Case _02: Edit and View Profile



Use case for edit and view profile

Use Case ID	UC_02	
Use Case Name	Allows user to edit and view profile	
Description	User can add and view features of the app	
Primary Actor	User/owner	
Secondary Actor	Database	
Pre-Condition	User needs to enter required information for verification	
Post-Condition	Can access and make changes in its profile	
Basic Flow	Actor Action	System Action
	Can manage and view profile status	Stores info in its firebase and database
Alternate Flow	Provides options to edit your profile for new costumers	

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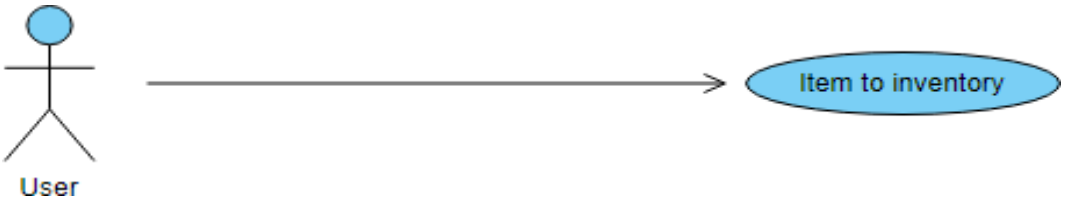
Use Case_03: Item to Inventory



Use case for inventory

Use Case ID	UC_03	
Use Case Name	Adds products to Inventory	
Description	User can add, update, delete and view all products	
Primary Actor	Shopkeeper	
Secondary Actor	Database	
Pre-Condition	User open application.	
Post-Condition	User can see the record of products.	
Basic Flow	Actor Action	System Action
	• Can manage inventory • Enter products • Update products • Delete products • View products	Stores info in database and makes its secure.
Alternate Flow	No other way	

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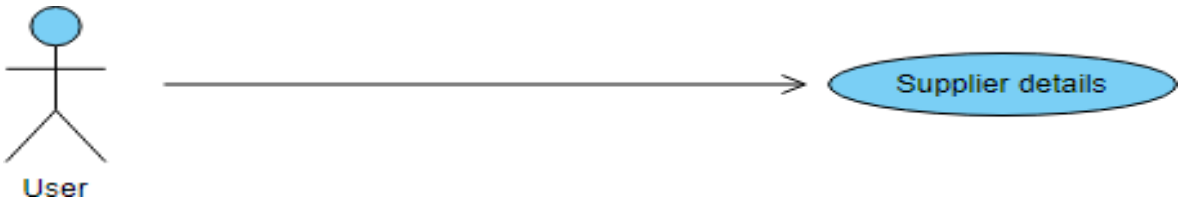
Use Case_04: View Details of Supplier



Use case for supplier details

Use Case ID	UC_04	
Use Case Name	Allows shopkeeper to view details of supplier	
Description	Shopkeeper can view transaction, records and stock with supplier details	
Primary Actor	Shopkeeper	
Secondary Actor	Database	
Pre-Condition	Shopkeeper can track record and payment with supplier	
Post-Condition	Will have 24/7 track with suppliers' dealings	
Basic Flow	Actor Action	System Action
	• Can view transaction • Manage stock • Track suppliers' payment bills • Record payment and transaction	Stores info in database and makes its secure.
Alternate Flow	No other way	

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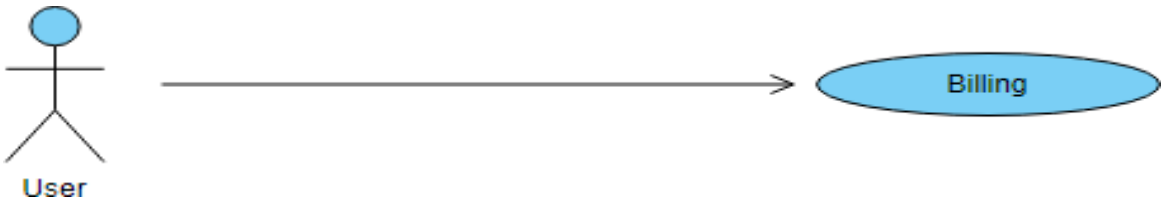
Use Case_05: Billing



Use case for billing

Use Case ID	UC_05	
Use Case Name	Allows shopkeeper to make payments and manage bills	
Description	Empowers shopkeepers to login and create bills within the application	
Primary Actor	Shopkeeper	
Secondary Actor	Database	
Pre-Condition	Shopkeeper can track, edit bills and payment	
Post-Condition	Will have access to view payment bills	
Basic Flow	Actor Action	System Action
	• Can view transaction • Can view details of transactions • Track payment bills • Keeps Record of payment bills	Stores info in database and makes its secure. Mobile connectivity to firebase database.
Alternate Flow	No other way	

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Use Case_06: Balance Sheet

Use case for Balance sheet

Use Case ID	UC_06	
Use Case Name	Creates balance sheet	
Description	User can create balance sheet and can customize it	
Primary Actor	Shopkeeper/User	
Secondary Actor	Database	
Pre-Condition	User access balance sheet feature	
Post-Condition	Generates a balance sheet for tracking payments	
Basic Flow	Actor Action	System Action
	• Access balance sheet feature • Organize your payments	Generates a well-defined and organized balance sheet Can be edit anytime
Alternate Flow	No other feature	

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Use Case_07: Customer Details

Use case for Customer details

Use Case ID	UC_07	
Use Case Name	Allows customers details	
Description	User can check and verify customer details	
Primary Actor	User/shopkeeper	
Secondary Actor	Database	
Pre-Condition	View customer details	
Post-Condition	A detailed information of customer	
Basic Flow	Actor Action	System Action
	• Can view customer profile and details	Checks and verifies customers authenticity
Alternate Flow	No other feature	

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Chapter 4

Design

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In this section, we provide the design analysis of our modules including the following designs

1. Architecture Diagram
2. ERD with data dictionary
3. Data Flow diagram
4. Class Diagram
5. Activity Diagram
6. Sequence Diagram
7. Collaboration Diagram
8. State Transition Diagram
9. Component Diagram
10. Deployment Diagram

4.1 Architecture Diagram

Define the graphical representation of the concepts, their principles, elements and components that are part of your project.

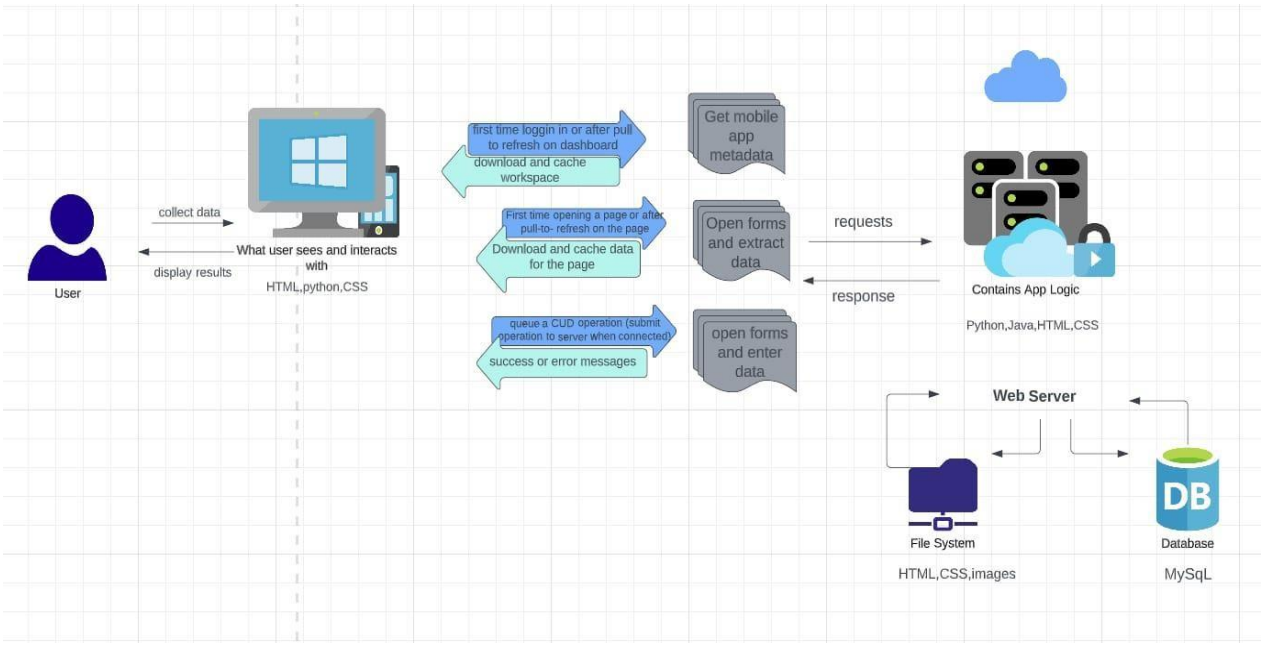


Figure 4 0-1 Architecture Diagram

50

4.1 ERD with data dictionary

Entity Relationship Diagram with complete relations with dependencies of your project

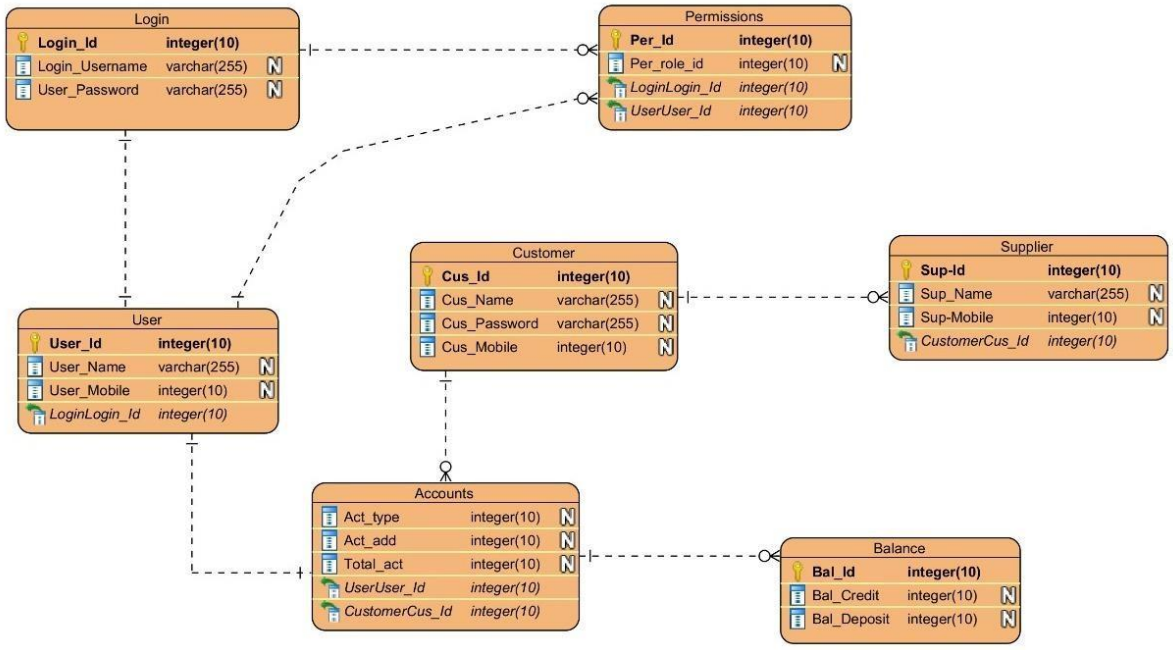


Figure 4 0-2 ERD

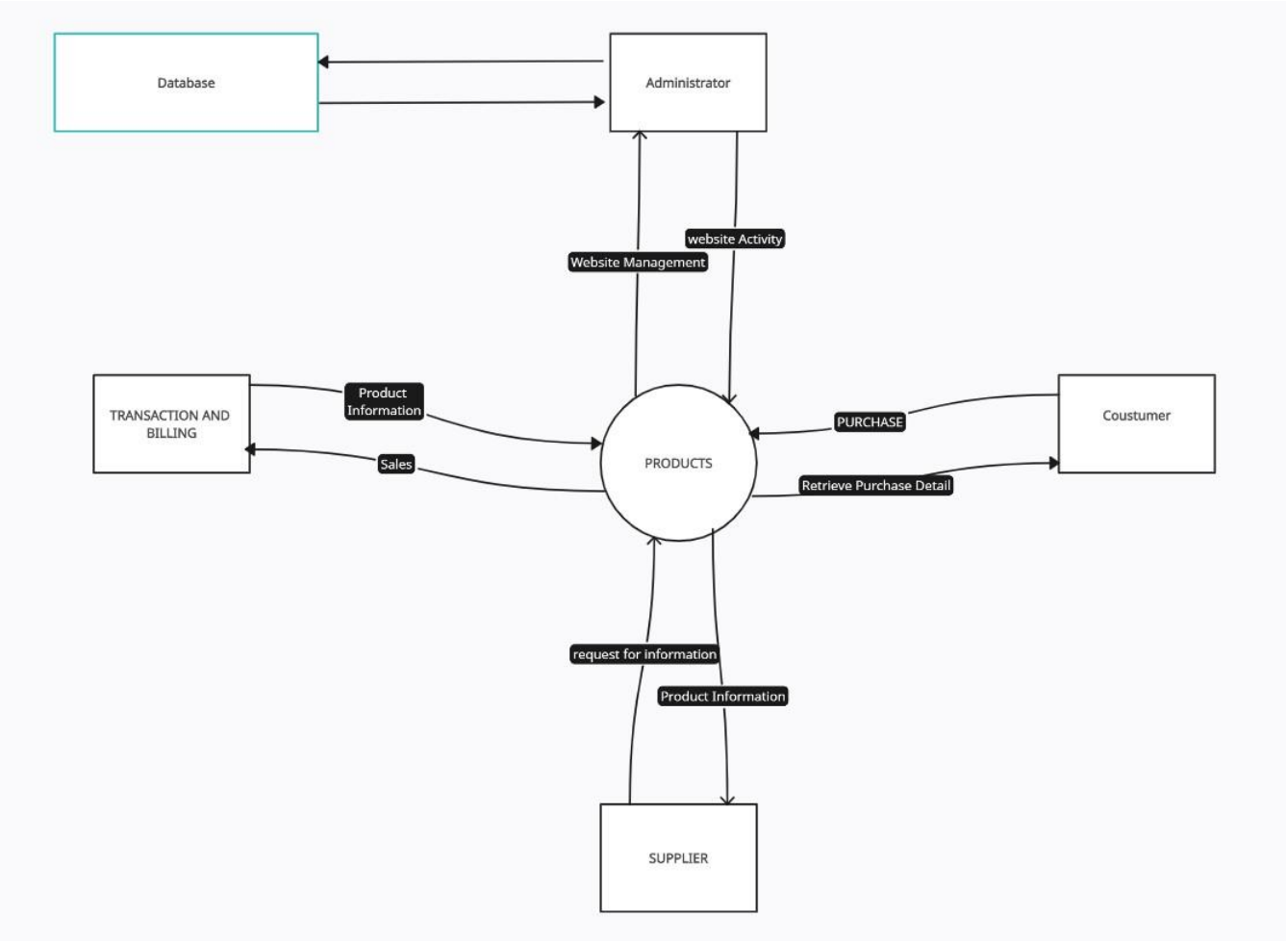
4.1 Data Flow diagram

Data flow diagram includes two levels

4.1.1 The level 0

The flow of information inside the system is defined in this level

Figure 4 0-3 Level 0 DFD



52

4.1.1 The level 1

The flow of information outside the system is defined in this level

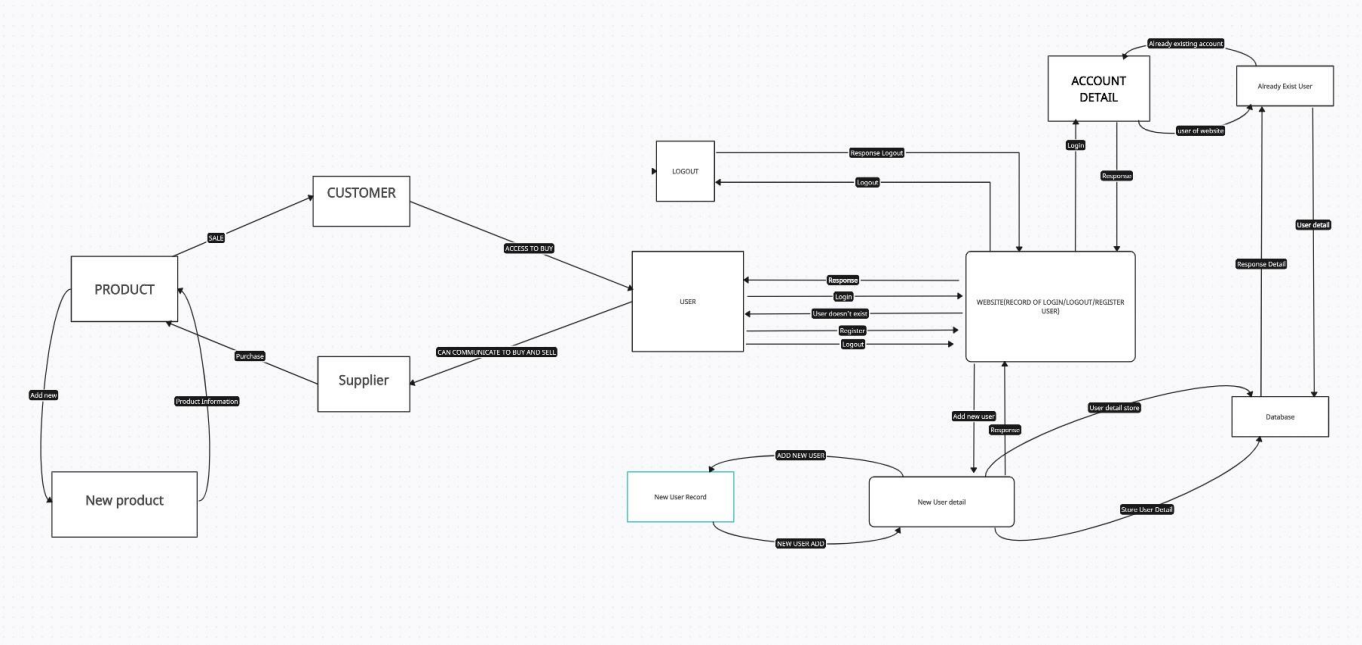


Figure 4 0-4 Level 1 DFD

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4.1 Class Diagram

Describe the structure of a project by showing the systems classes, their attributes, operations (or methods), and the relationships among objects.

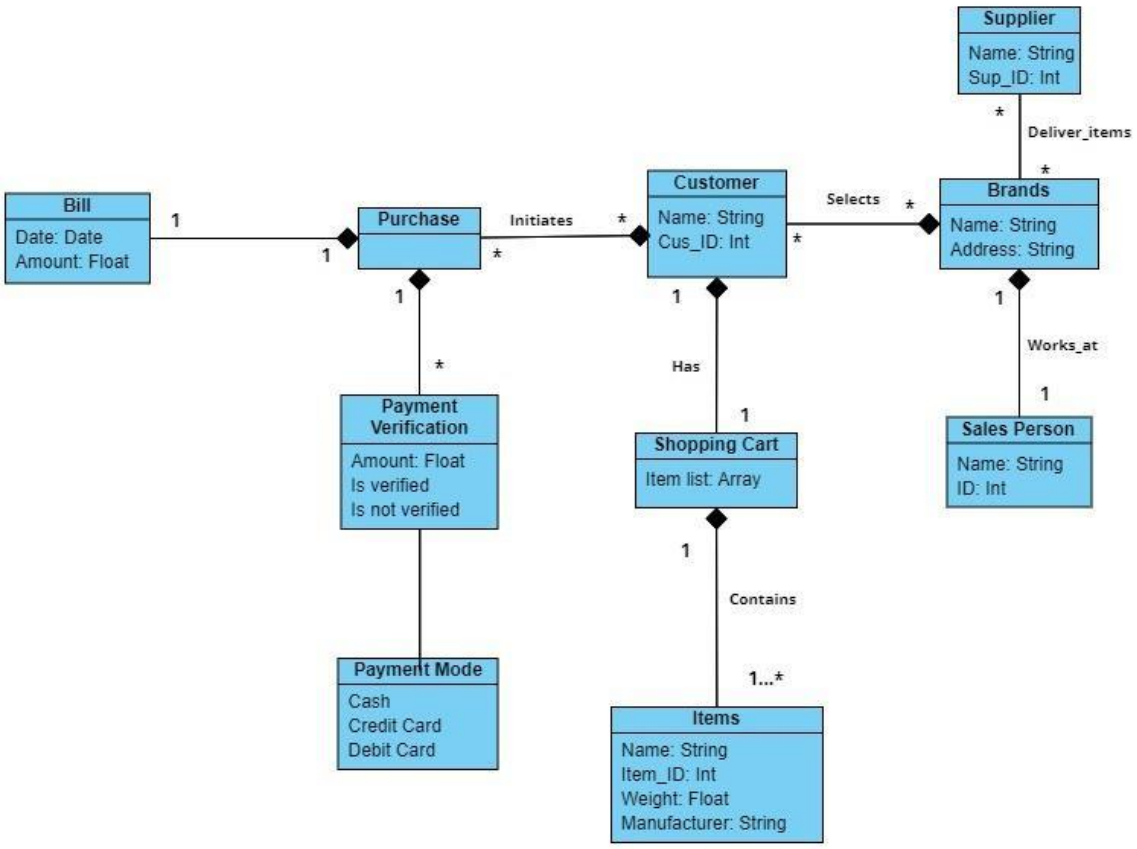

Figure 4 0-5 Class Diagram

4.1 Activity Diagram

Feature 1: Register

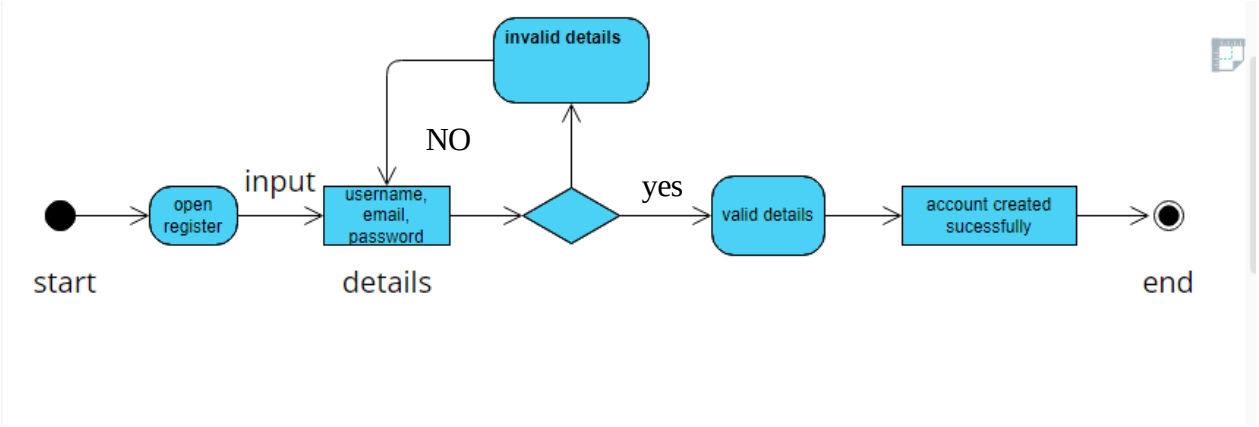

Figure 4 0-6 Activity Diagram register Account

Feature 2: Login

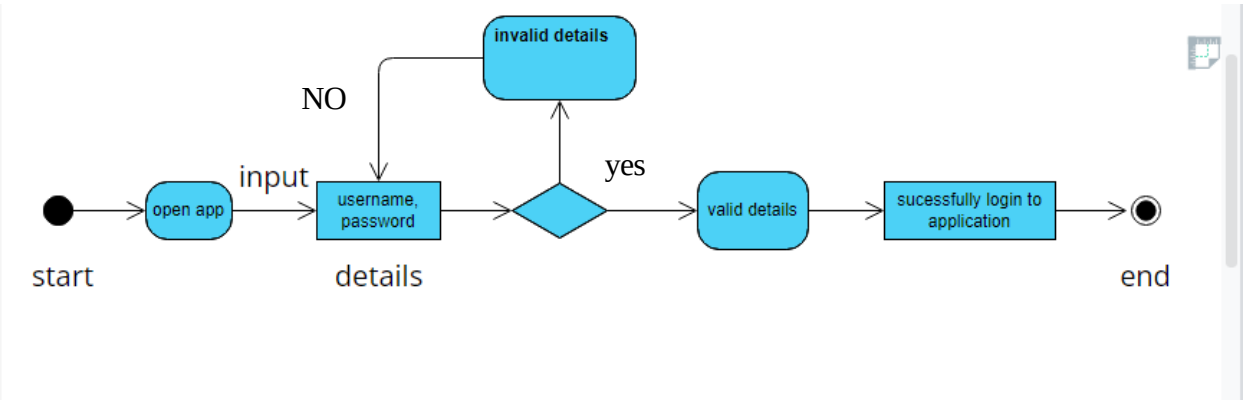

Figure 4 0-7 Activity Diagram Login

Feature 3: Search and View

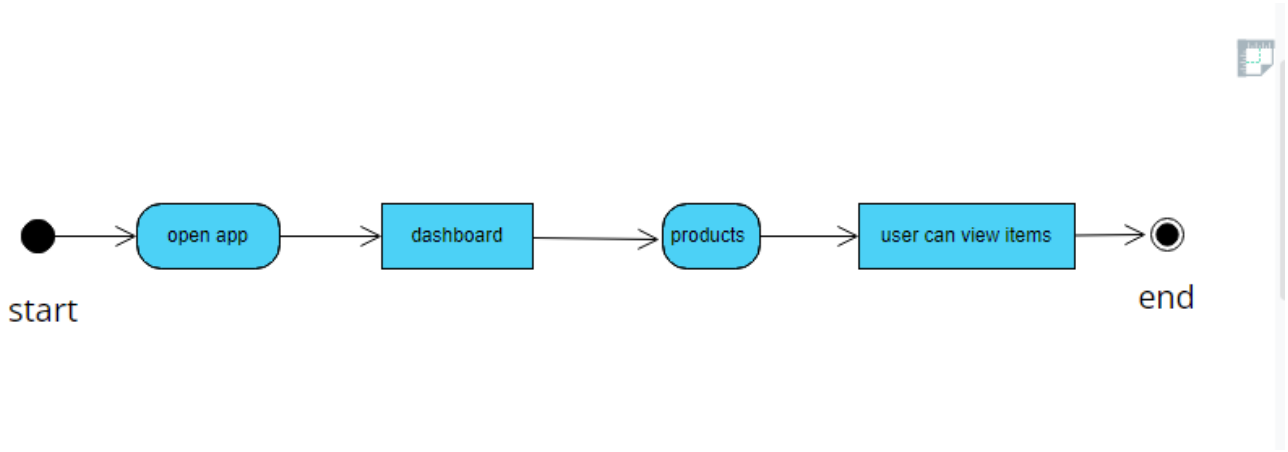

Figure 40-8 Activity diagram Search and View

Feature 4: Edit and view profile

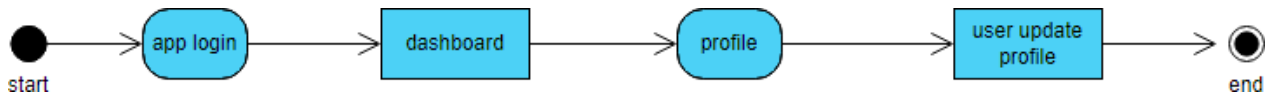

Figure 40-9 Activity diagram Edit and view profile

Feature 5: Inventory

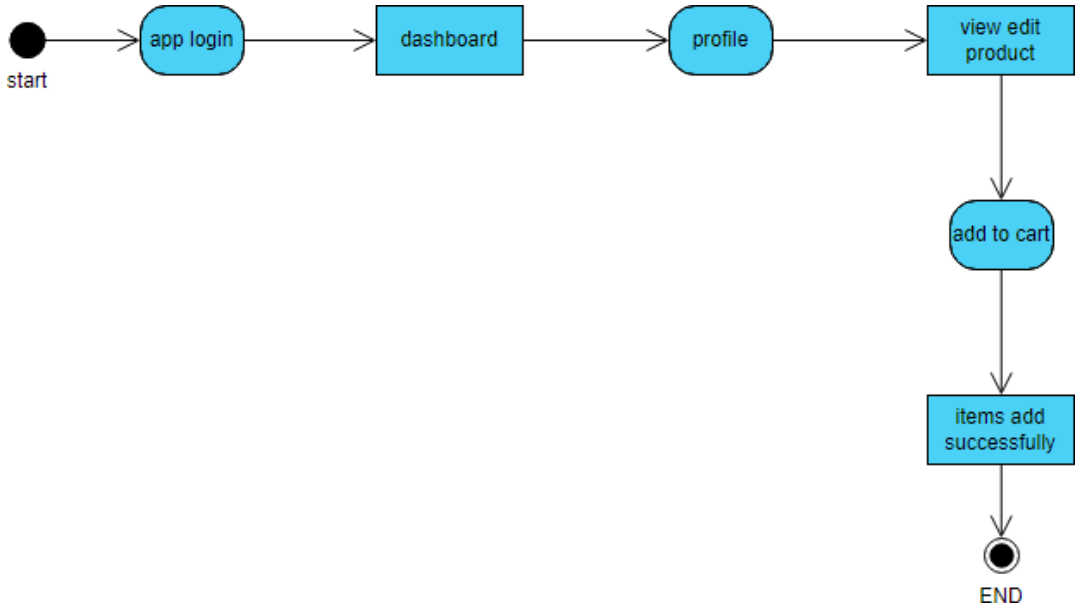

Figure 40-10 Activity diagram Inventory

Feature 6: Supplier details

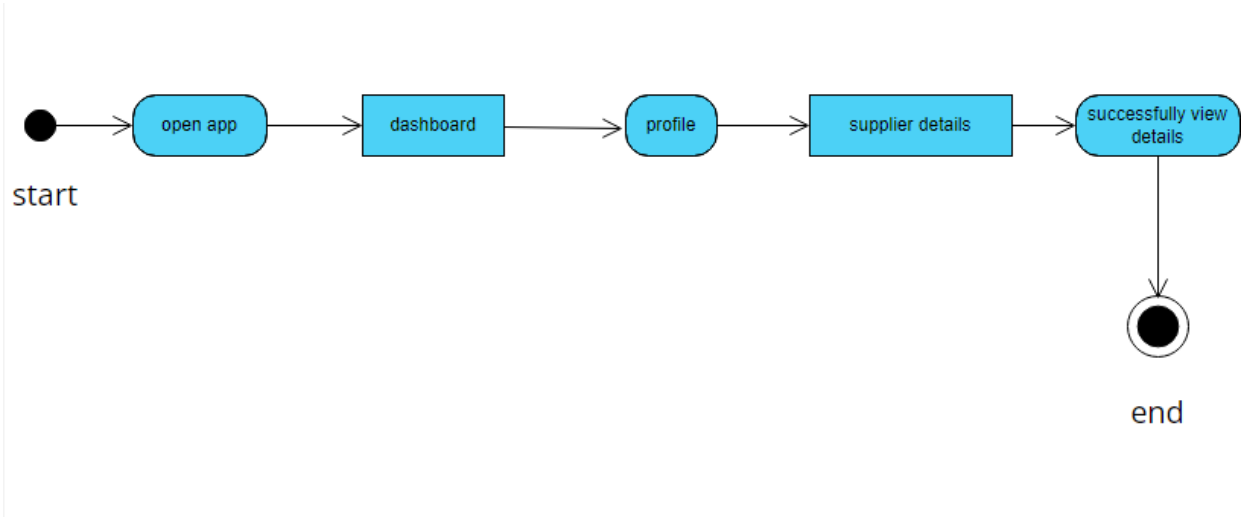

Figure 40-11 Activity diagram Supplier details

57

Feature 7: Billing

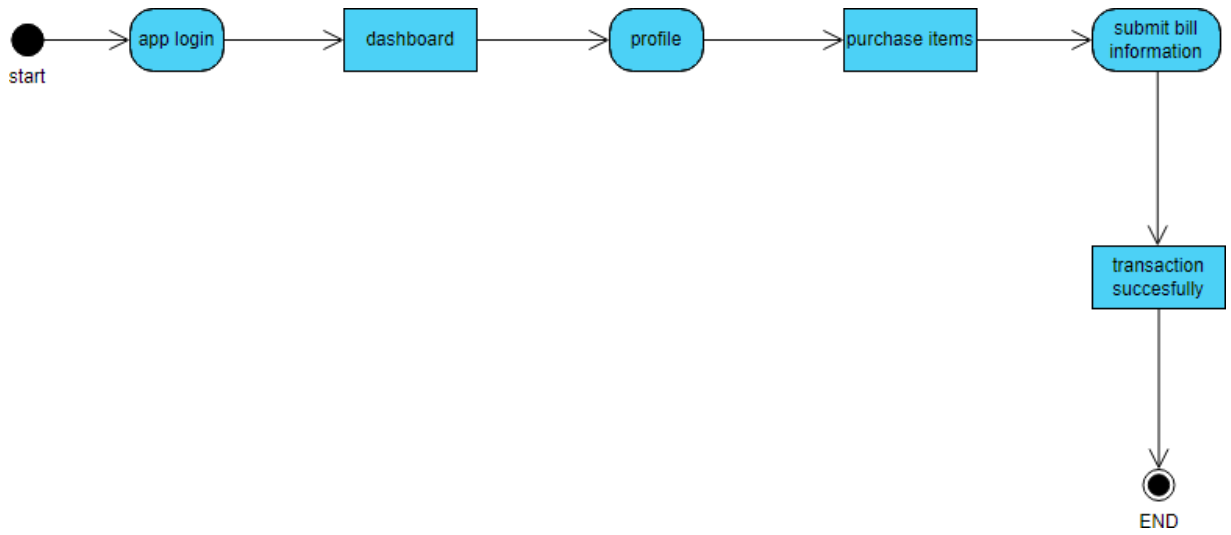

Figure 40-12 Activity diagram Billing

58

Feature 8: Balance sheet

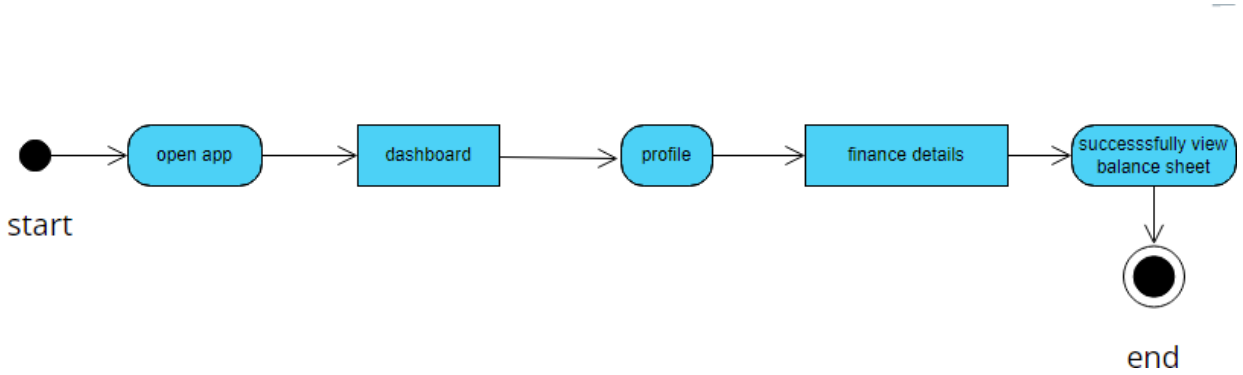

Figure 40-13 Activity diagram Balance sheet

Feature 9: Customer details

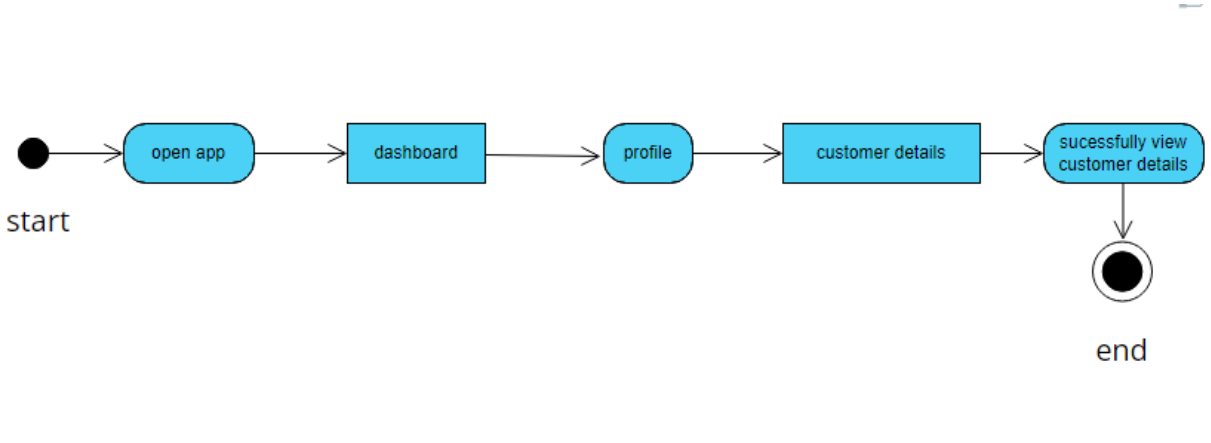

Figure 40-14 Activity diagram Customer details

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4.2 Sequence Diagram

This diagram includes all the Sequence diagrams of the functional requirements of your project along with the aggregated Sequence diagram

Feature 1: Login

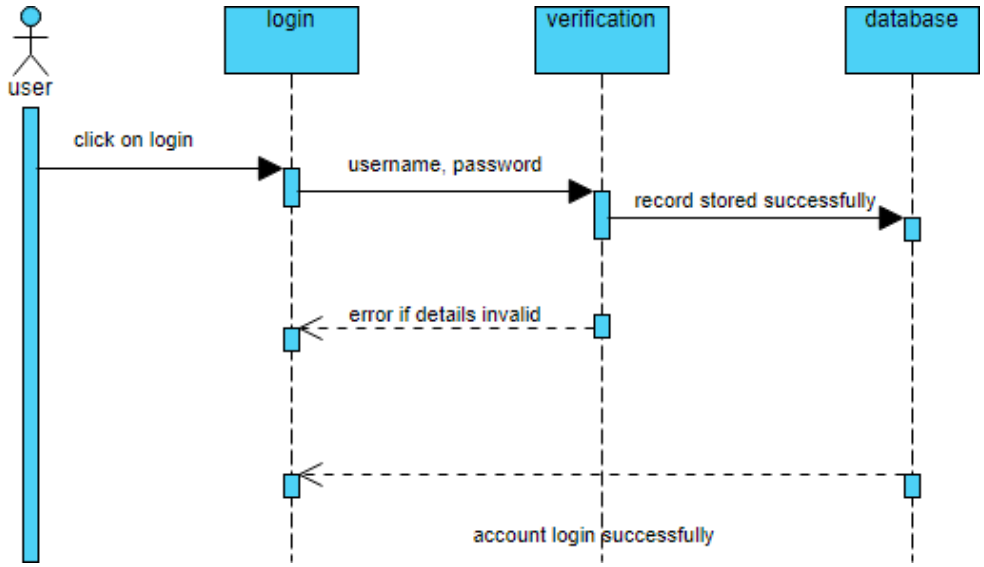

Figure 4.6 2 Login

Feature 3: Search and view

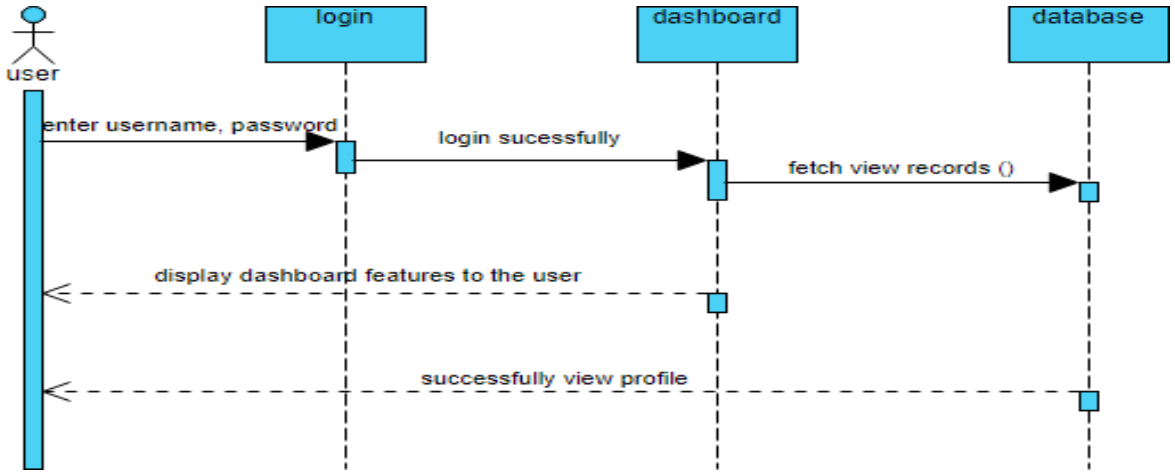

Figure 4.6 3 Search and View

60

Feature 3: Search and view

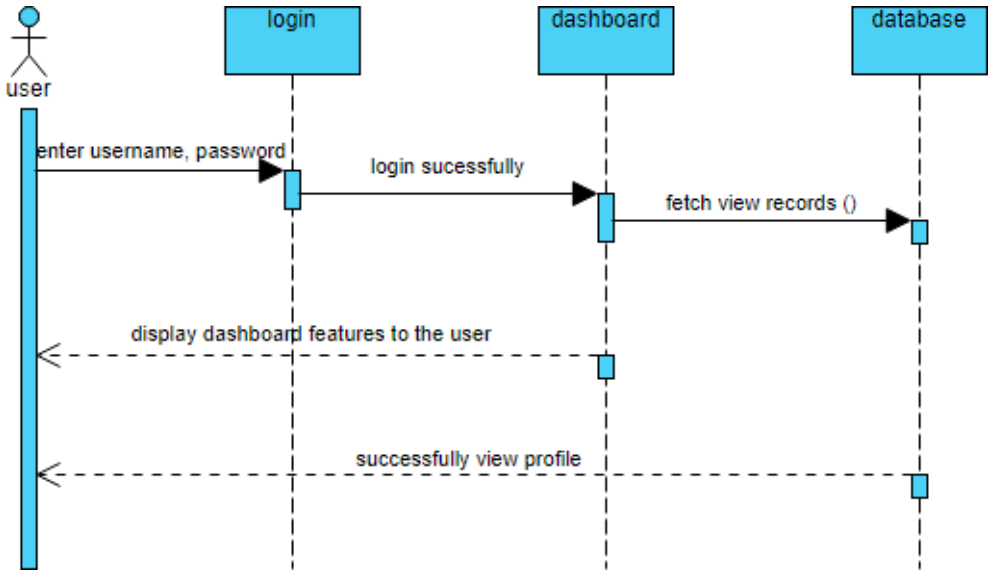

Figure 4.6 3 Search and View

Feature 4: Edit and view profile

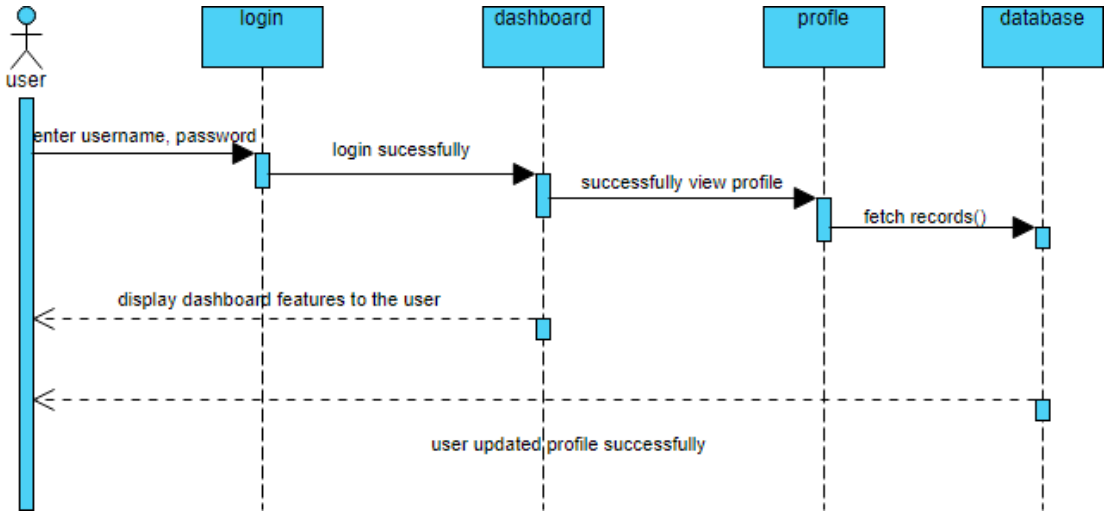

Figure 4.6 4 Edit and View Profile

61

Feature 4: Edit and view profile

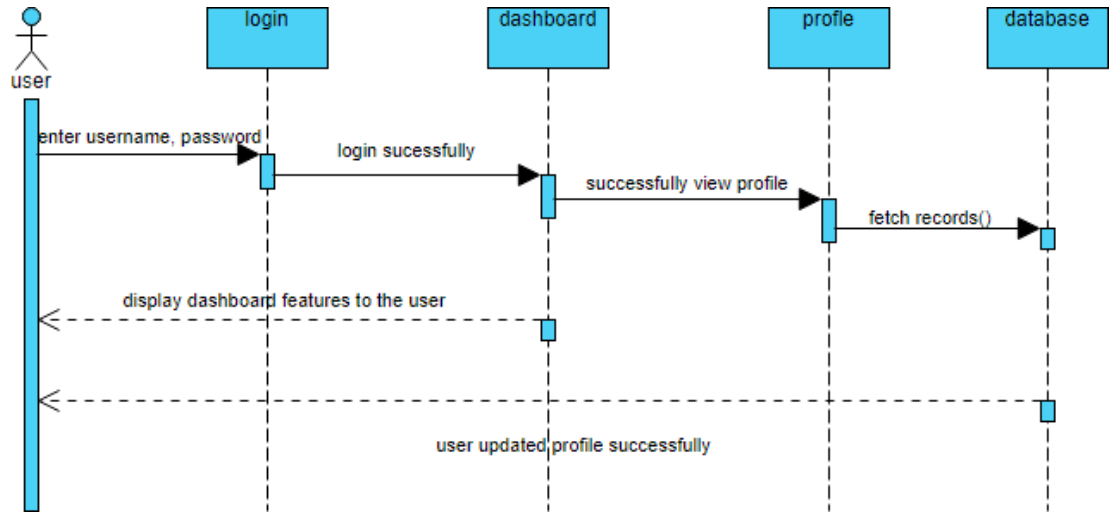

Figure 4.6 4 Edit and View Profile

Feature 5: Inventory

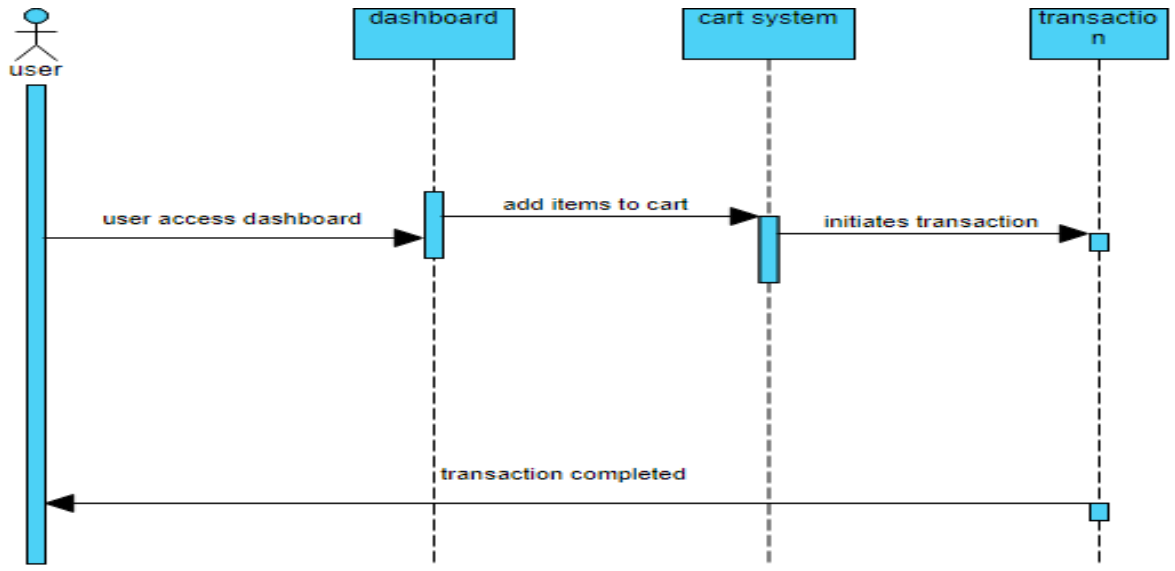

Figure 4.6 5 Inventory

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Feature 6: Supplier details

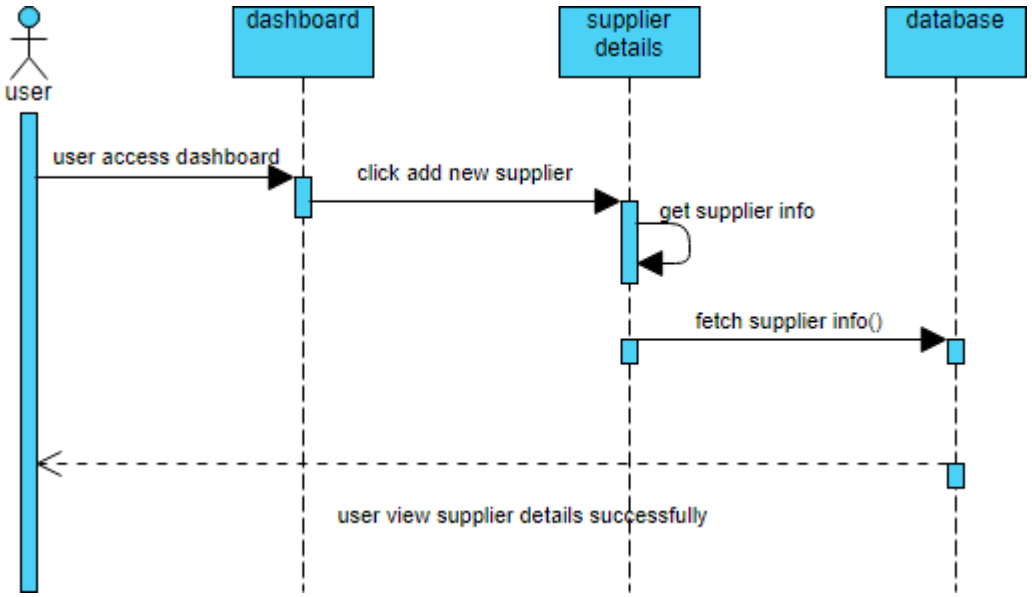

Figure 4.6 6 Supplier details

Feature 7: Billing

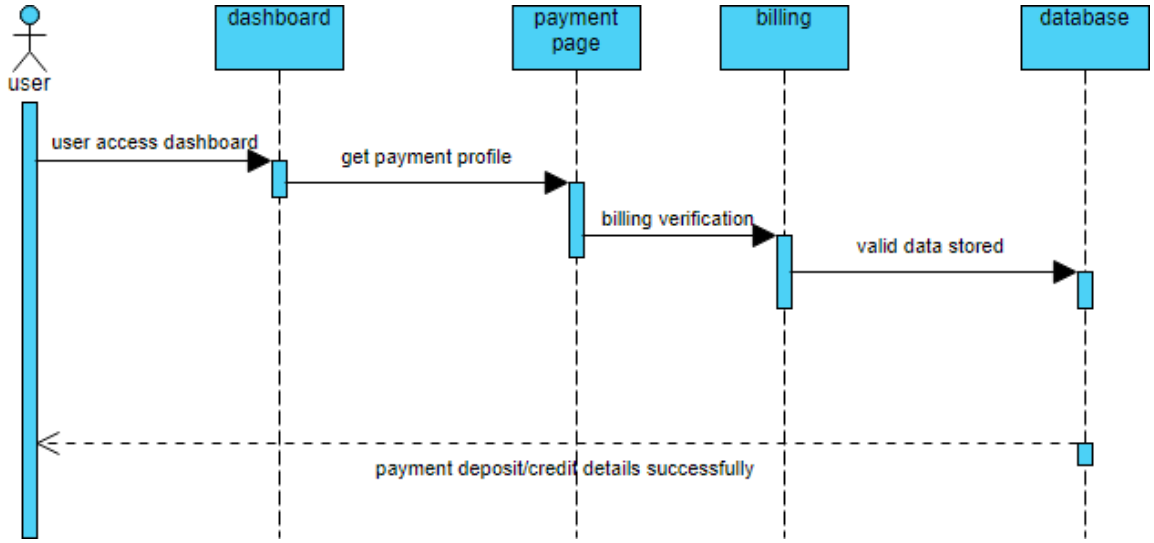

Figure 4.6 7 Billing

Feature 8: Balance sheet

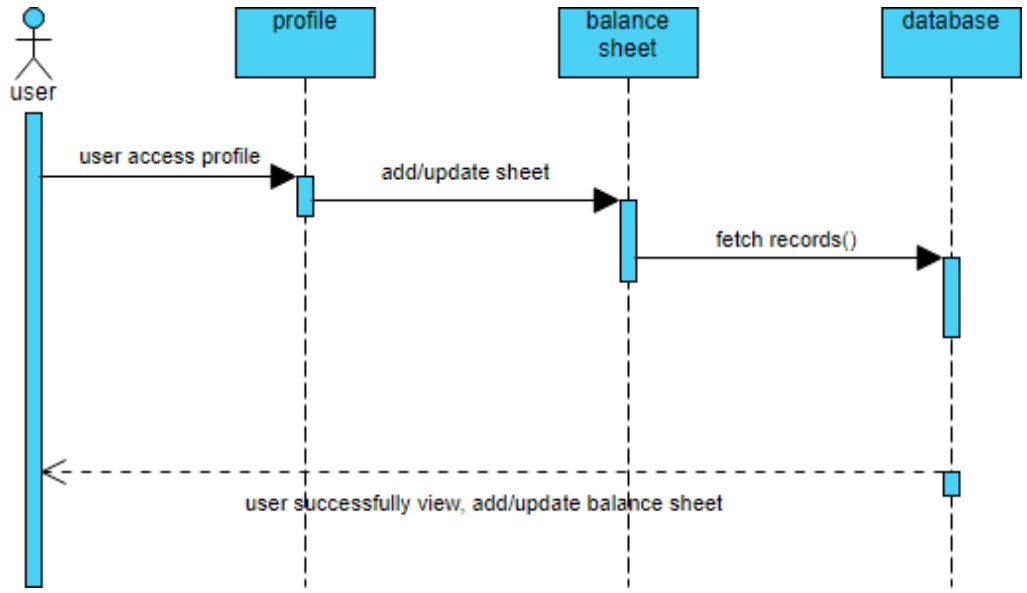

Figure 4.6 8 Balance sheet

Feature 9: Customer details

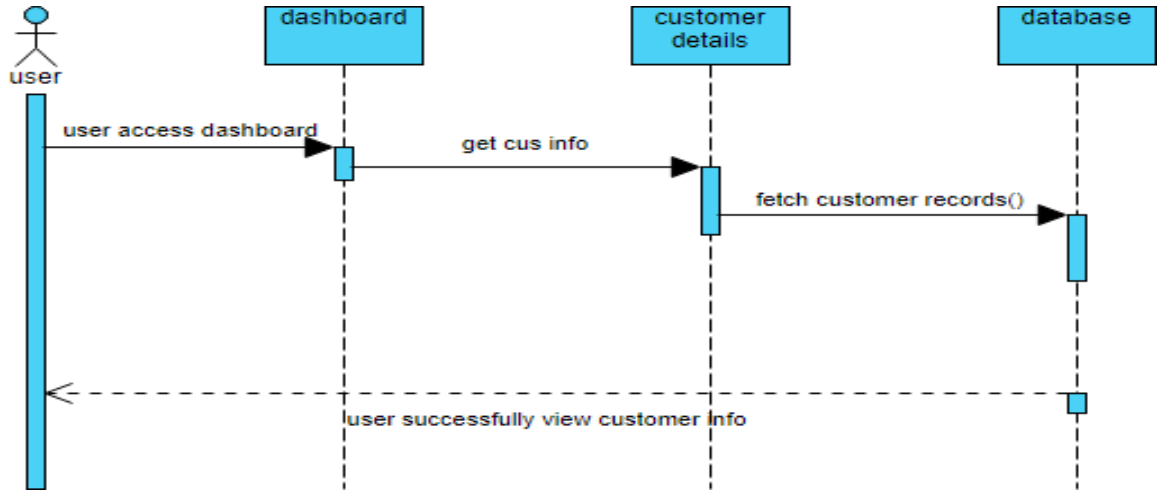

Figure 4.6 9 Customer detail

Aggregated sequence diagram:

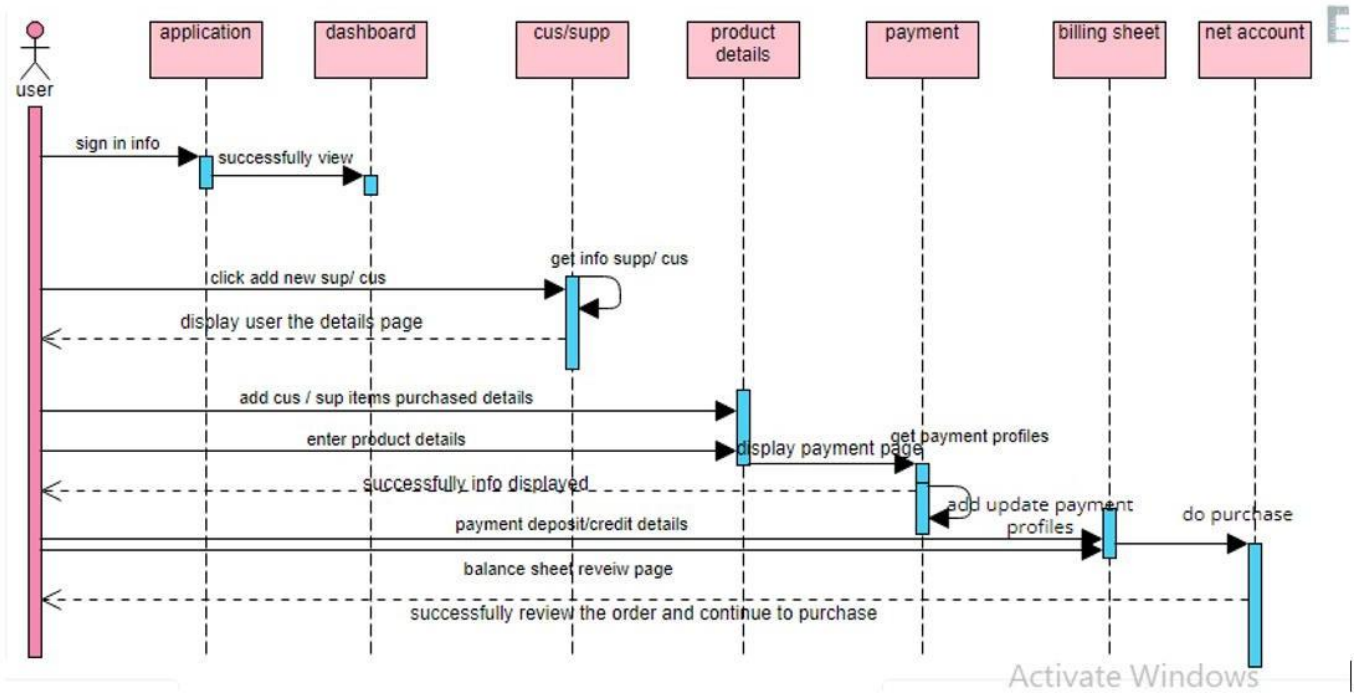

Figure Aggregated Sequence Diagram 1

65

4.4 Collaboration Diagram

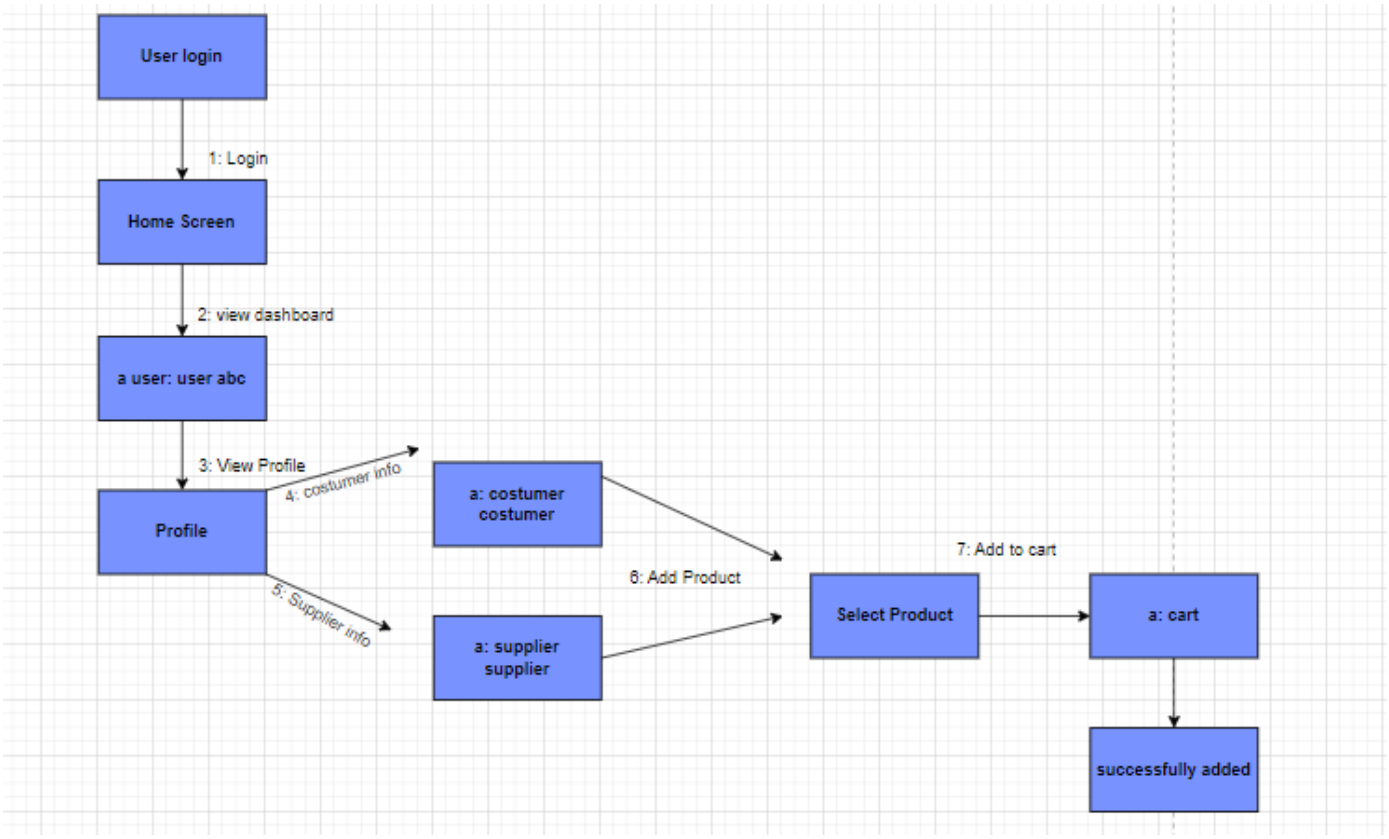

Figure 4.7 1 Collaboration Diagram

66

4.5 State Transition Diagram

State Transition diagram is used to describe the states of different objects in its life cycle. So, the emphasis is given on the state changes upon some internal or external events. These states of objects are important to analyze and implement them accurately

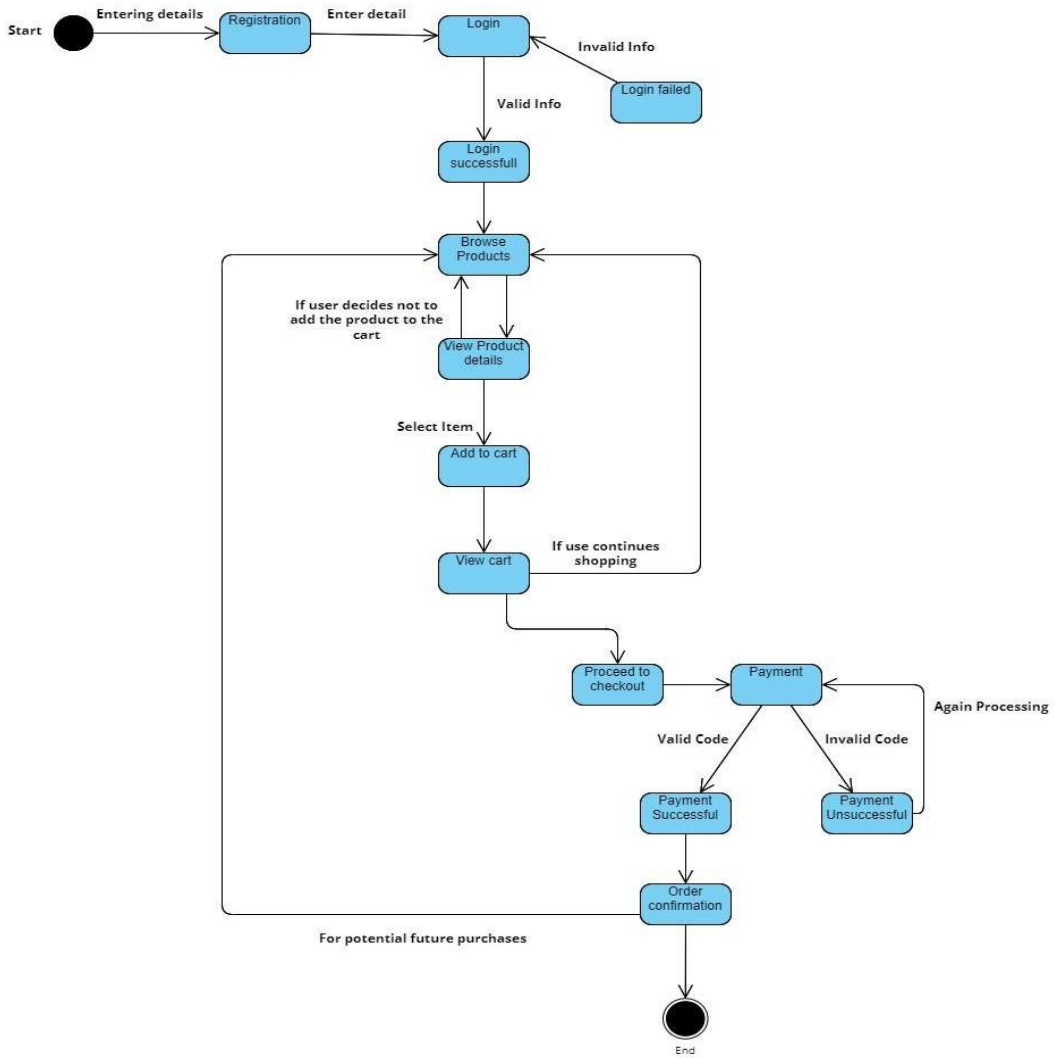

Figure 4.8 1 State Transition Diagram

67

4.6 Component Diagram

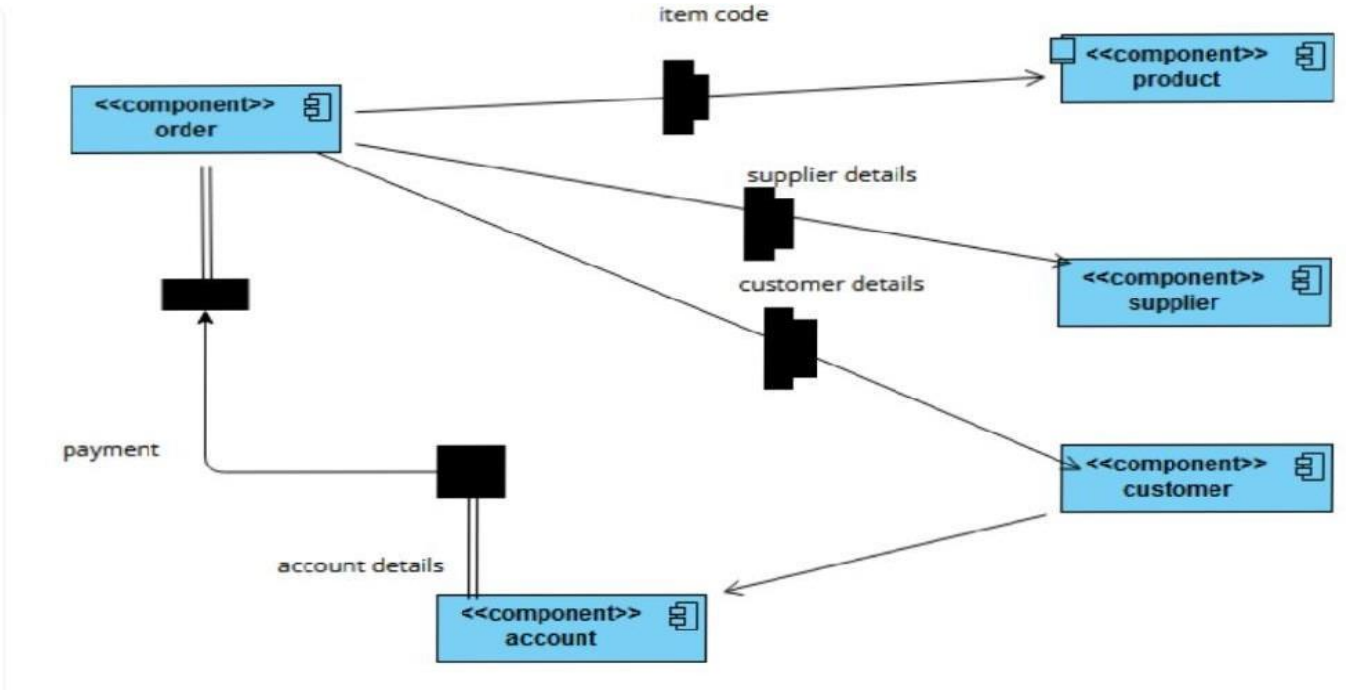

Figure 4.9 1 Component Diagram

68

4.6 Deployment

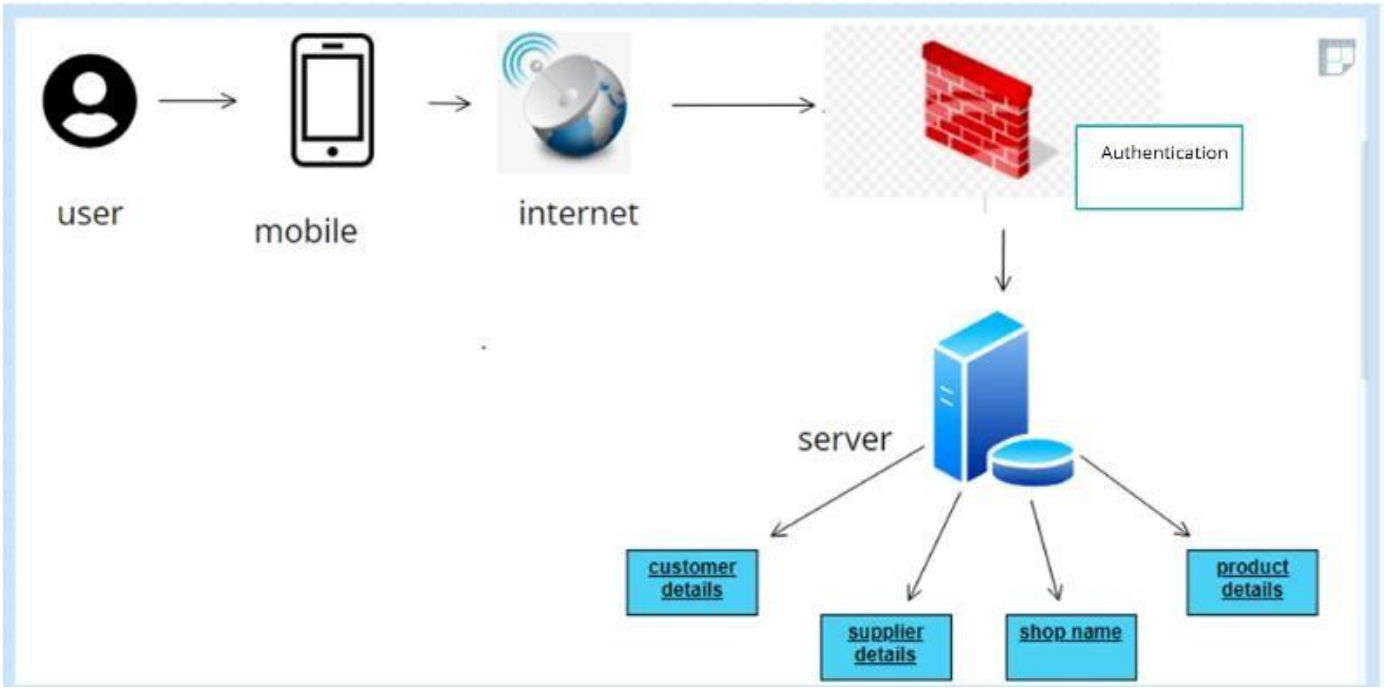

Figure 4.9 2 Deployment Diagram

69

Chapter 5
Testing

70

5.1 Test Case Specifications

5.1.1 Test Case for registration

Positive Test Case	
ID	TC_REGISTRATION_SUCESSFUL
Priority	High
Description	User can register through it
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) System must be online d) User register themselves
Steps	a) Click on registration option b) Enter user email c) Set their password
Input	User id, password
Expected result	Successfully registered themselves
Status	Tested, passed.

Table 5.1 1 Positive Test Case

71

Negative Test Case	
ID	TC_REGISTRATION_FAILURE
Priority	High
Description	To verify user authentication to system.
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) Must have internet connection c) System must be online d) User register themselves
Steps	a) Click on register option b) Enter email c) Password(length should be minimum 10 length characters)
Input	Incorrect email id or missing syntax or putting password length exceeds 10 length
Expected result	Does not allows access to system features and notifies the error.
Status	Tested, passed.

Table 5.1 2 Negative Test Case

72

5.1.2 Test case for login

Positive Test Case	
ID	TC_LOGIN_SUCESSFUL
Priority	High
Description	User can login through email and password
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) Click on login
Steps	a) Click on login b) Enter user email c) Enter their password
Input	User id , password
Expected result	Successfully login themselves
Status	Tested, passed.

Table 5.2 1 Positive test cases for login

Negative Test Case	
ID	TC_LOGIN_FAILURE
Priority	High
Description	User can login through email
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) Click on login
Steps	a) Click on login b) Enter user email c) Enter password
Input	put incorrect password or incorrect email
Expected result	User cannot open the application and shows invalid password or email
Status	Tested, passed.

Table 5.2 2 Negative test cases for login

74

5.1.3 Test case for add product

Positive Test Case	
ID	TC_ADD PRODUCT_SUCESSFUL
Priority	High
Description	User can add product into the cart
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) System must be online d) User select the product and add to cart
Steps	a) Open application b) Enter user email c) Enter password d) Click on product add to the cart
Input	User id , password and select product add to cart
Expected result	Successfully added product in to the cart
Status	Tested, passed.

Negative Test Case	
ID	TC_ADD PRODUCT_FAILURE
Priority	High
Description	User can add product into the cart
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	e) User open application f) User must have internet connection g) System must be online h) User select the product and add to cart
Steps	e) Open application f) Enter user email g) Enter password h) Click on product add to the cart
Input	Select the product which is out of stock or stock 0
Expected result	Product cannot be added to the cart
Status	Tested, passed.

Table 5.3 1 Positive test case for Add product

76

5.1.4 Test case for inventory

Positive Test Case	
ID	TC_INVENTORY_SUCESSFUL
Priority	High
Description	User can add , delete, update and view all products
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) System must be online
Steps	a) Click on inventory b) Enter products c) Update products d) Delete products e) View products
Input	User id , password
Expected result	Successfully user view the inventory
Status	Tested, passed.

Table 5.4 1 Positive test cases for Inventory

77

Negative Test Case	
ID	TC_INVENTORY_FAILURE
Priority	High
Description	User can add , delete, update and view all products
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) System must be online
Steps	a) Input: b) User ID: [Provide a valid user ID] c) Password: [Provide the correct password for the user] d) Action: e) Log in to the application using the provided credentials. f) Action: g) Locate and click on the "Audit" feature or button within the application. h) Expected Result: i) The user is able to initiate and complete the audit process successfully without encountering errors or issues.
Input	User id , password
Expected result	The application should prevent the creation of invalid data and provide clear feedback to the user about the issue encountered.
Status	Tested, passed.

Table 5.4 2 Negative test case for inventory

5.1.5 Test case for audit

Negative Test Case	
ID	TC_AUDIT_SUCESSFUL
Priority	High
Description	User can audit
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) System must be online d) Press trigger audit
Steps	a) Click on audit b) Records display on screen c) Check all records
Input	User id , password , click on audit
Expected result	Successfully user view all the records
Status	Tested, passed.

Table 5.5 1 Positive test case for Audit

79

Negative Test Case	
ID	TC_AUDIT_FAILURE
Priority	High
Description	User can audit
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) The application is installed and operational on the user's device. b) User has a valid account with appropriate permissions (Admin or User). c) User is logged in with correct credentials. d) The device has a stable internet connection.
Steps	a) Input: b) User ID: [Provide a valid user ID] c) Password: [Provide the correct password for the user] d) Action: e) Log in to the application using the provided credentials. f) Action: g) Locate and click on the "Audit" feature or button within the application. h) Expected Result: i) The user is able to initiate and complete the audit process successfully without encountering errors or issues.
Input	User id , password , click on audit
Expected result	The audit feature should work correctly, letting the user review and manage important data as needed for auditing purposes.
Status	Tested, passed.

Table 5.5 2 Negative test case for Audit

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5.1.4 Test case for profile

Positive Test Case	
ID	TC_PROFILE_SUCESSFUL
Priority	High
Description	User can check their profile
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) User enter correct email and password to check their profile
Steps	a) Click on profile b) User profile show on screen
Input	User id , password
Expected result	User successfully view the profile
Status	Tested, passed.

Table 5.7 1 Positive test case for Profile

81

Negative Test Case	
ID	TC_PROFILE_FAILURE
Priority	High
Description	User can check their profile
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	d) User open application e) User must have internet connection f) User enter correct email and password to check their profile
Steps	c) Click on profile d) User profile show on screen
Input	Incorrect user email or password
Expected result	User cannot view the profile
Status	Tested, passed.

Table 5.7 2 Negative test case for Profile

5.1.5 Test case for billing

Positive Test Case	
ID	TC_BILLING SYSTEM_SUCESSFUL
Priority	High
Description	User can generate the bill and print it
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) User enter recusation. d) User can generate the bill
Steps	a) Click on bill b) Enter product and its price c) Save bill
Input	User id , password
Expected result	User successfully generate the bill
Status	Tested, passed.

Table 5.8 1 Positive test case for Billing

83

Negative Test Case	
ID	TC_BILLING SYSTEM_FAILURE
Priority	High
Description	User can generate the bill and print it
Reference	Functional Requirement reference
Users	Admin, user
Pre-requisites	a) User open application b) User must have internet connection c) User enter recusation. d) User can generate the bill
Steps	a) Click on bill b) Enter product and its price c) Save bill
Input	do not save the bill
Expected result	User cannot generate the bill
Status	Tested, passed.

Table 5.8 2 Negative test case for Billing

84

5.1 Black Box Test Cases

Black box testing also known as Behavioral Testing, is a in which the internal structure/ design/ implementation of the item being tested is not known to the tester. These tests can be functional or non-functional, though usually functional.

This method is named so because the software program, in the eyes of the tester, is like a black box; inside which one cannot see. This method attempts to find errors in the following categories:

- Incorrect or missing functions
- Interface errors
- Errors in data structures or external database access
- Behavior or performance errors
- Initialization and termination errors

5.1.1 Equivalence Partitions (EP)

Equivalence class partitioning (EP) is a very widely used method to decrease the number of possible test cases that are required to test a system.

5.1.1.1 Log in

Variable	Valid Classes	Invalid Classes
Email	Valid and verified google Account.	Invalid/incorrect google Account. / Empty field.
Password	Verify correct password.	Empty field

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5.1.1.2 Registration

Variable	Valid Classes	Invalid Classes
Email	user@gmail.com	Missing of email syntax
Password	Should be maximum 10 length	Empty field or exceeds the limit of 10 length

5.1.1.3 Edit profile

Variable	Valid Classes	Invalid Classes
Name	• Must not contain a special character. • Field cannot be left empty.	• Using special characters. • Empty field
DOB	• Choosing dates previous to current date.	• Choosing dates ahead of current date.

5.1.1.4 Add product

Variable	Valid class	Invalid class
Product name	Enter correct product name	Empty field
stock	Select the available stock product	Selecting 0 stock product
category	Choose the correct category of product	Not selecting the category, making it difficult to classify the product

5.1.1.5 Inventory

Variable	Valid Classes	Invalid Classes
Product ID	• Must enter correct id, which identifies the product	• ID is missing or incorrect contains non numeric values
Product stock	• Check the available stock and add stock	• Choosing stock 0 or empty field

5.1.2 Negative test cases for login Boundary Value Analysis

A boundary value is an input or output value on the border of an equivalence partition, includes minimum and maximum values at inside and outside boundaries. Normally Boundary value analysis is part of stress and negative testing.

5.1.2.1 Login

E-mail		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
At least no character before @.	At least one character before @.	At least no special character after @ expect '.'
Password		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
Length < 10 character	Length >= 10 character	Length > 50 character

5.1.2.2 Registration

E-mail		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
Invalid user information. Entering wrong email address	Enter username@gmail.com	At least no special character after @ expect '.'
Password		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
Length < 8 character	Length >= 8 character	Length > 50 character

5.1.2.3 Add product

Product		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
Empty field in product description	Product name, price etc	Cannot add two product information
stock		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
Stock 0	Stock available	Exceeding the maximum limit of product

5.1.2.4 Edit profile

Name		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
Empty field	Enter name of user	At least 10 characters is allowed.
DOB		
Invalid [min-1]	**Valid [min to max]**	**Invalid [max+1]**
Not filling the year	Must fill whole info or enter date , year, day	Choosing year which does not allowed

5.1.3 Decision Table Testing

Decision Table is a testing method, which aims to ensure that each one of the possible branch from each decision point is executed at least once and thereby ensuring that all reachable code is executed.

5.1.3.1 Login

Conditions	**R1**	**R2**	**R3**	**R4**
Email	F	F	T	T
Password	F	T	F	T
Action/Effect				
Account Created	F	F	F	T

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5.1.3.2 **Registration**

Conditions	**R1**	**R2**	**R3**	**R4**
Email	F	F	T	T
Password	F	T	F	T
Action/Effect				
Account Created	F	F	F	T

5.1.3.3 Add product

conditions	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**
Product name	**T**	**F**	**T**	**T**	**T**	**F**	**F**	**F**
stock	**T**	**T**	**F**	**T**	**F**	**F**	**T**	**F**
category	**T**	**T**	**T**	**F**	**F**	**T**	**F**	**F**
Action								
added	**T**	**F**	**F**	**F**	**F**	**F**	**F**	**F**

5.1.3.4 Inventory

Conditions	**R1**	**R2**	**R3**	**R4**
Product id	T	T	F	F
Product stock	T	F	T	F
Action/Effects				
viewed	T	F	F	F

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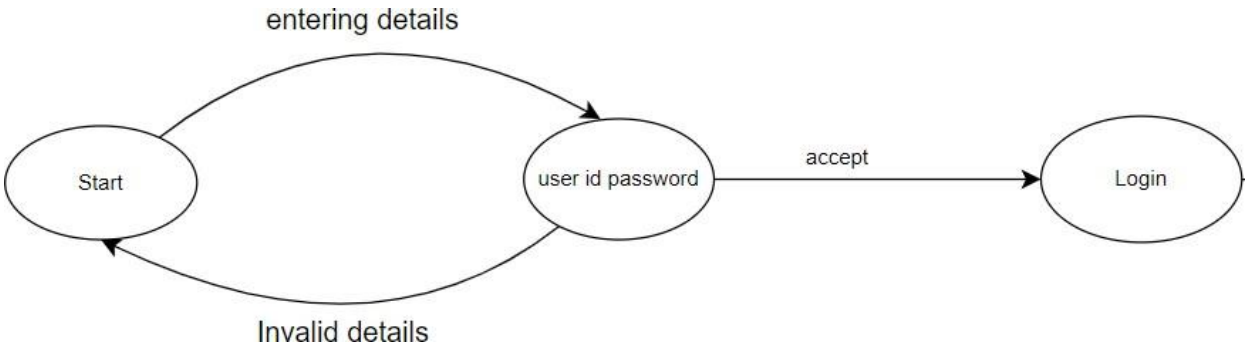
5.1.4 State transition Testing

State Transition testing, a black box testing technique, in which outputs are triggered by changes to the input conditions or changes to 'state' of the system. In other words, tests are designed to execute valid and invalid state transitions.

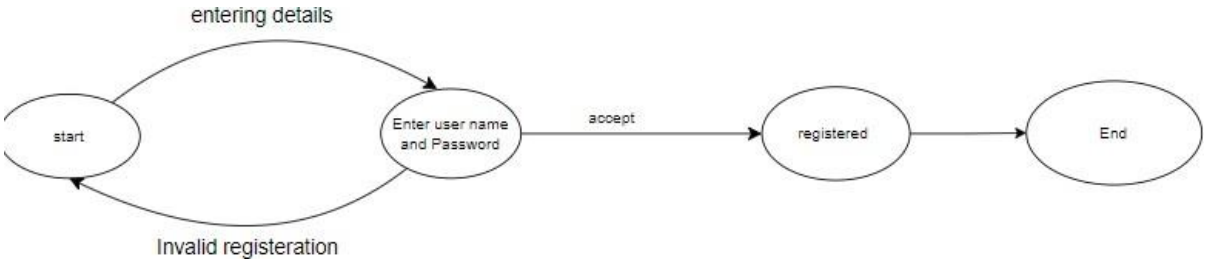
State Transition for login:

State	Sign In	Correct details	Incorrect details
Start S1	S2	-	-
User id pass S2	-	S3	S1
Login S3	-	-	-



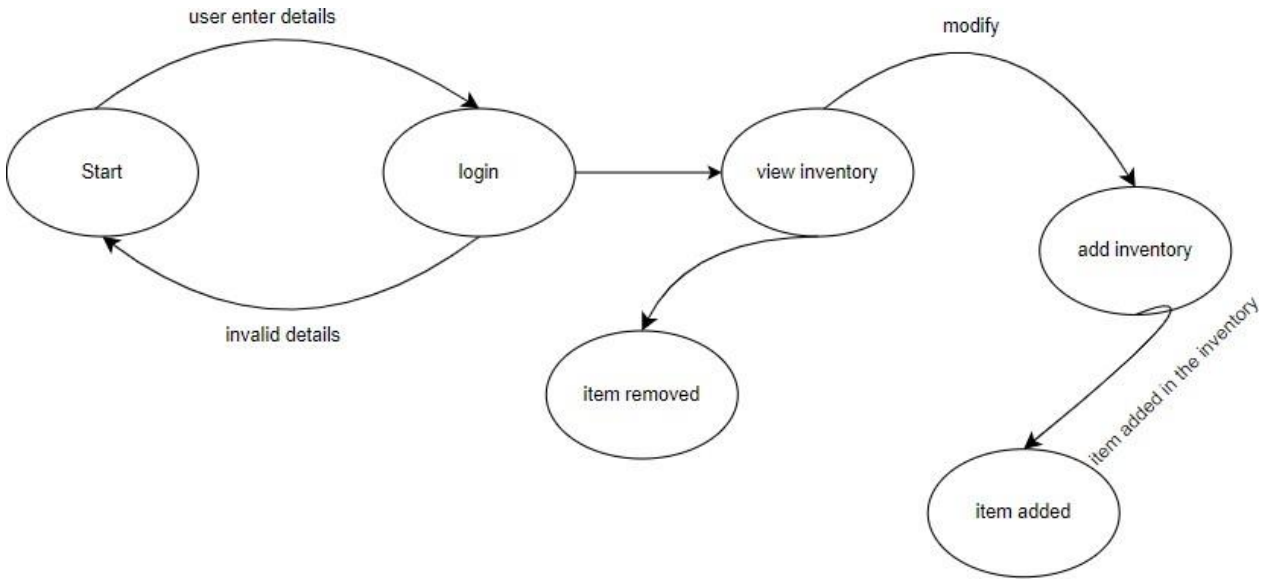
State Transition for Registration:

State	Enter details	Invalid registration	Accept	End
Start S1	S2	-	-	-
Enter User Name S2	-	S1	S3	-
Registered S3	-	-	-	S4
End S4	-	-	-	-



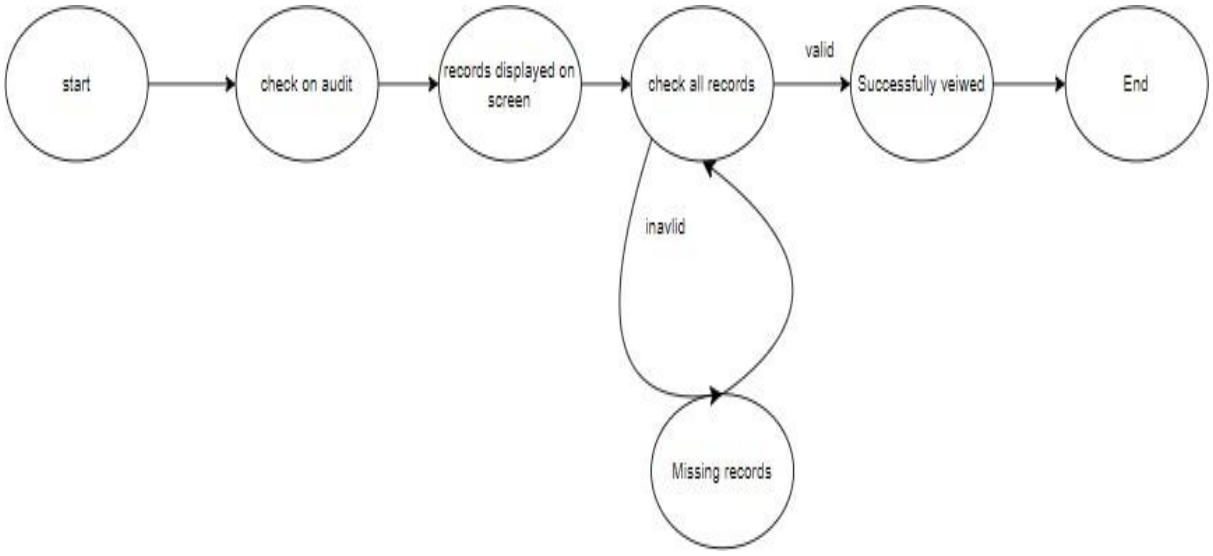
State Transition for Inventory:

State	Enter Details	Invalid details	Access Inventory	Modify	Added item	Item removed
Start S1	S2	-	-	-	-	-
Login S2	-	S1	S3	-	-	-
View inventory S3	-	-	-	S5	-	S4
Item Removed S4	-	-	-	-	-	-
Add item to inventory S5	-	-	-	-	S6	-
Item added S6	-	-	-	-	-	-



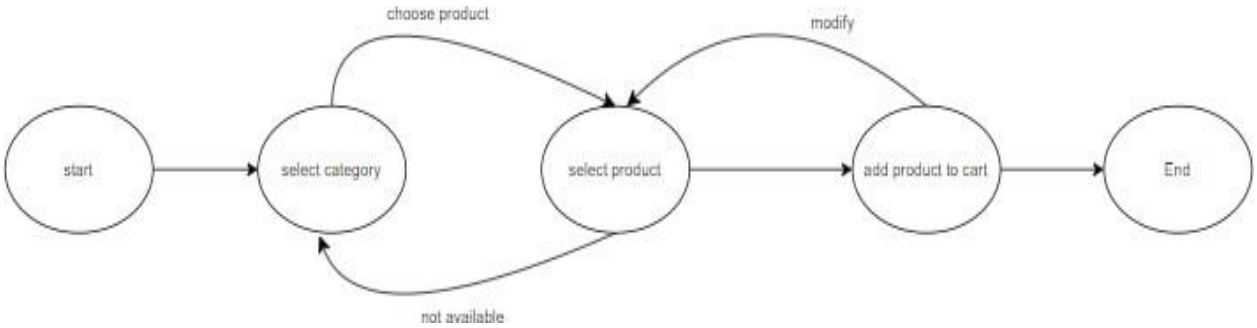
State Transition for Audit:

State	Audit	Display records	All records	Invalid	valid	End
Start S1	S2	-	-	-	-	-
Audit Check S2	-	S3	-	-	-	-
Records Displayed S3	-	-	S4	-	-	-
All records S4	-	-	-	S5	S6	-
Missing records S5	-	-	-	S4	-	-
Viewed S6	-	-	-	-	-	S7
End S7	-	-	-	-	-	-



State Transition for Add Product:

State	Choose category	Choose valid product	Not available	Modify	Item added to cart	End
Start S1	S2	-	-	-	-	-
Select Category S2	-	S3	-	-	-	-
Select Product S3	-	-	S2	-	S4	-
Add product to cart S4	-	-	-	S3	-	S5
End S5	-	-	-	-	-	-



5.1.5 Use Case Testing

Use Case Testing is a functional black box testing technique that helps testers to identify test scenarios that exercise the whole system on each transaction basis from start to finish. Here are the use cases of our Apna Karobar.

5.1.5.1 Login

	Steps	Description
A: Actor (user/shopkeeper) **S: System**	1	click on login
	2	Enter authorize email
	3	Enter password
Extensions	4	User logged in or enter wrong email or password.
		S: Display error message

5.1.5.2 Registration

	Steps	Description
A: Actor (shopkeeper/owner/user) **S: System**	1	Click on registration option
	2	Enter email
	3	User set their password
Extensions	4	Internet connection lose, empty field of password
		S: Display error message

5.1.5.3 Edit profile

	Steps	Description
A: Actor (customer) **S: System**	1	A: Enter email
	2	A: Enter password
	3	A: Go to settings and Click Edit account button
Extensions	4a	Edit User name or Edit password not valid. S: Display error message
	4b	Empty field S: Display error message

5.1.5.4 View profile

	Steps	Description
A: Actor (user) **S: System**	1	A: click on Profile icon option
	2	S: Profile Icon will show
	3	A: select the Profile Icon.
Extensions	4	Internet connection lose
		S: Display error message

5.1.5.5 Add product

	Steps	Description
A: Actor (user/customer) **S: System**	1	Open App , enter email , password
	2	Click on products
	3	Add product to the cart
Extensions	4	Internet connection lose, choose product of stock 0
		S: Display error message : not available

5.1.5.6 Inventory

	Steps	Description
A: Actor (shopkeeper) **S: System**	1	Click on inventory
	2	Enter products
	3	Update products, delete, view products
Extensions	4	Internet connection lose
		S: Display error message

5.1.5.7 Audit

	Steps	Description
A: Actor (admin, shopkeeper) **S: System**	1	Click on audit
	2	Record display on screen
	3	Check all records
Extensions	4	Cannot view by loss of internet connection
		S: Display error message

5.1.5.9 Billing system

	Steps	Description
A: Actor (customer) **S: System**	1	Click on bill
	2	Enter products and its price
	3	Save bill
Extensions	4	User can generate bill or Internet connection lose
		S: Display error message

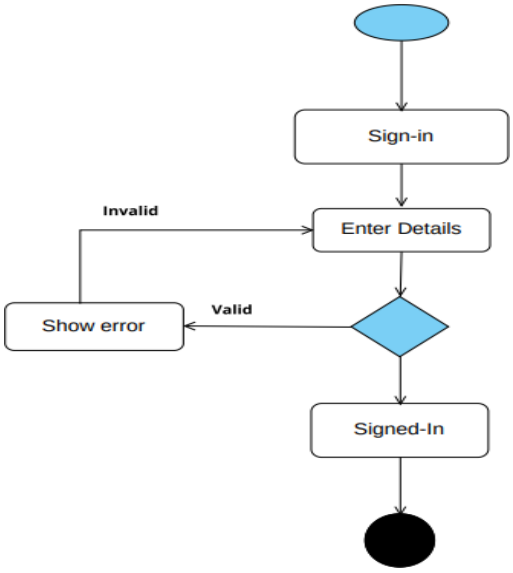
5.2 White Box Test Cases

White box testing is a testing technique that examines the program structure and derives test data from the program logic/code. The other names of glass box testing are clear box testing, open box testing, logic driven testing or path driven testing or structural testing.

5.2.1 Cyclometric complexity

Cyclometric complexity is a source code complexity measurement that is being correlated to a number of coding errors. It is calculated by developing a Control Flow Graph of the code that measures the number of linearly-independent paths through a program module. Lower the Program's cyclometric complexity, lower the risk to modify and easier to understand.

5.2.1.1 Login



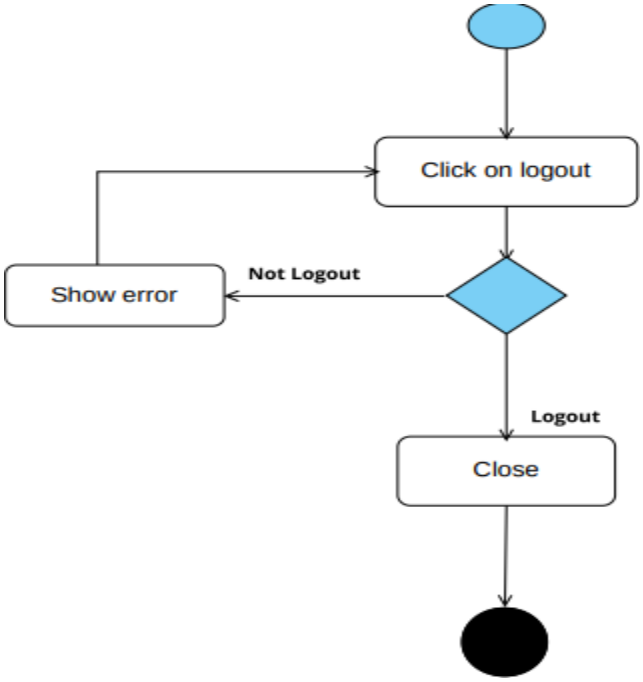
CYCLOMETRIC COMPLEXITY OF LOGIN:

CC = E-N+2*P

CC= 7-7+2*1

CC= 2

5.2.1.2 Log out



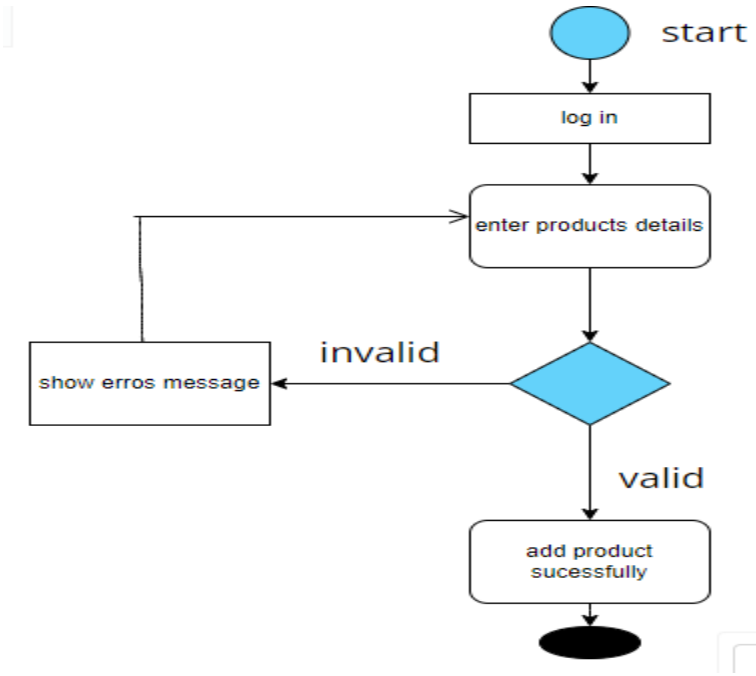
CYCLOMETRIC COMPLEXITY OF LOGOUT:

CC= E-N+2*P

CC= 6-6+2*1

CC= 2

5.2.1.3 Add product



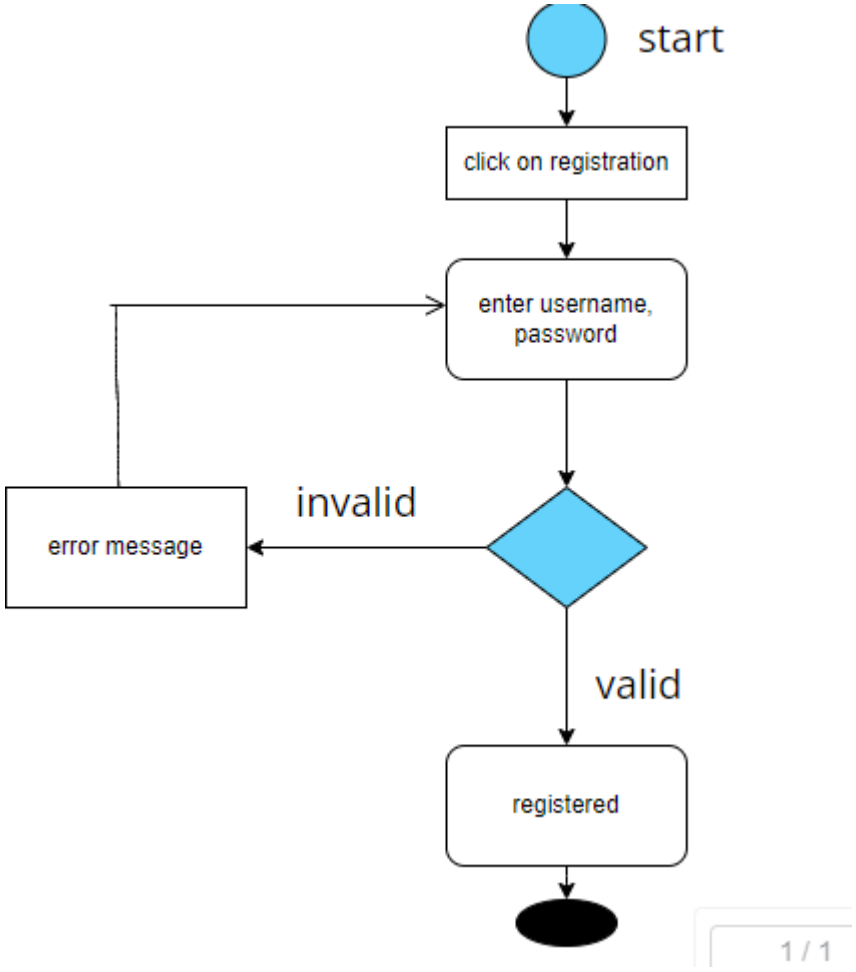
CYCLOMETRIC COMPLEXITY OF ADD PRODUCT:

CC= E-N+2*P

CC= 7-7+2*1

CC=2

5.2.1.4 Registration



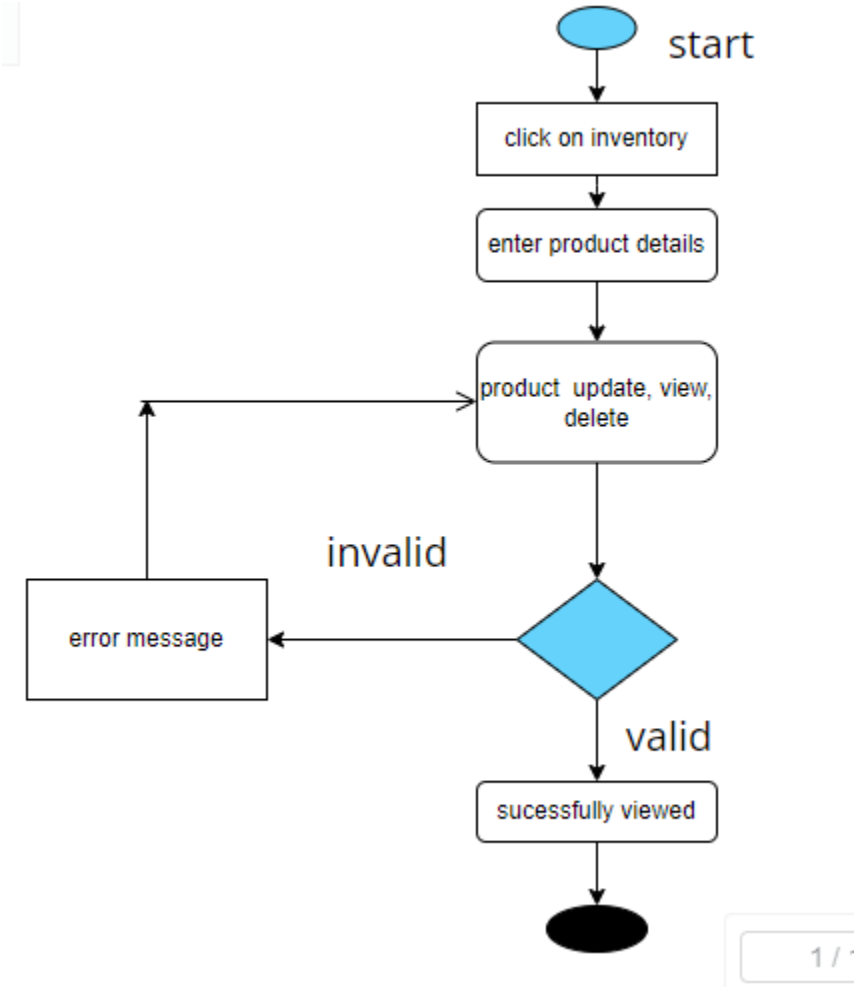
CYCLOMETRIC COMPLEXITY OF REGISTRATION:

CC= E-N+2*P

CC= 7-7+2*1

CC= 2

5.2.1.5 Inventory



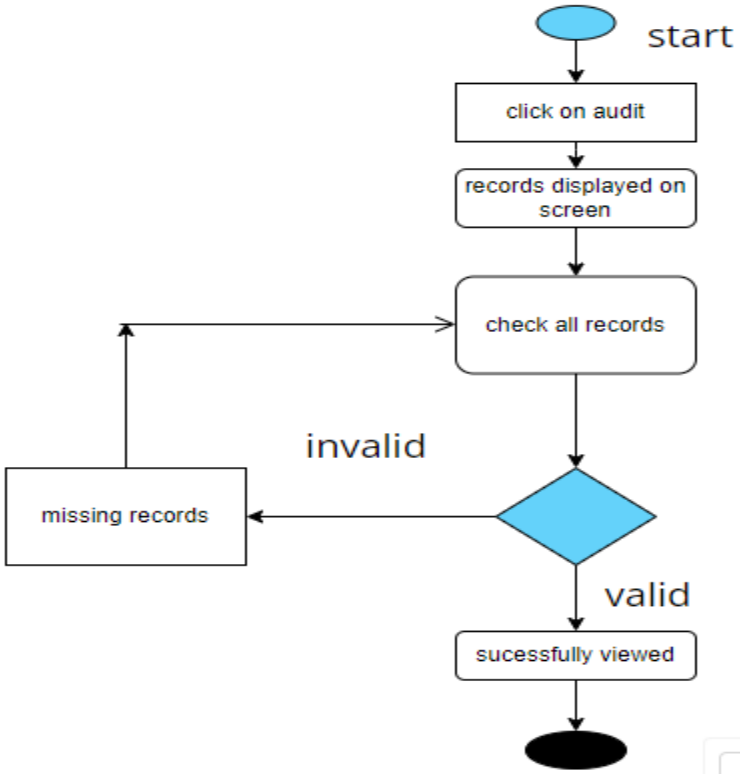
CYCLOMETRIC COMPLEXITY OF INVENTORY:

CC= E-N+2*P

CC= 8-8+2*1

CC = 2

5.2.1.6 Audit



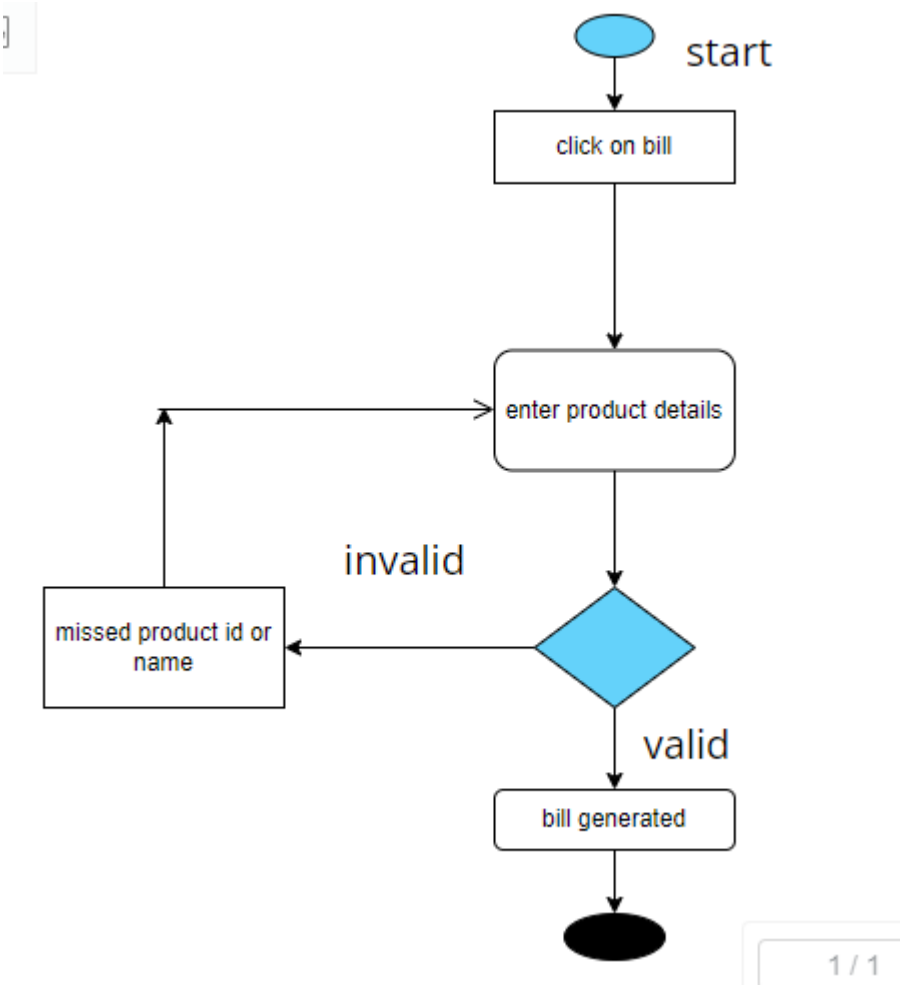
CYCLOMETRIC COMPLEXITY OF ADUIT:

CC= E-N+2*P

CC= 8 – 8+2*1

CC= 2

5.2.1.7 Billing system



CYCLOMETRIC COMPLEXITY OF BILLING:

CC= E-N+2*P

CC = 7-7+2*1

CC = 2

5.3 Performance testing

Performance testing, a non-functional testing technique performed to determine the system parameters in terms of responsiveness and stability under various workload. Performance testing measures the quality attributes of the system, such as scalability, reliability and resource usage.

1. Select the ledger book that you want to test.
2. Set up the testing environment by creating a testing ledger and adding some transactions to it.
3. Load the testing ledger into the ledger book.
4. Run the performance tests.
5. Analyze the results of the tests

5.4 Stress Testing

A stress test is an examination of the ledger book under conditions of stress, typically involving the application of additional loads or forces beyond those expected during normal operation.

The purpose of a stress test is to determine the strength and stability of the ledger book under conditions of stress, and to identify any potential weaknesses that could lead to failure.

Stress testing may be performed on individual components or on the ledger book as a whole.

There are several methods that can be used to apply stress to a ledger book, including physical loading, thermal cycling, and chemical exposure.

Once the stress test is complete, the ledger book is typically inspected for signs of damage, deformation, or other failure.

In some cases, the stress test may be repeated multiple times, with different levels of stress applied, in order to identify the point at which the ledger book fails.

5.5 System Testing

System Testing was conducted to verify the overall functionality and performance of our Apna Karobar application. A comprehensive set of test cases was executed to ensure seamless integration and interaction among different modules to test its working functionality. The system process validated the fulfillment of all the requirements and aimed to identify and resolve any defects. End to end scenarios were tested to verify the proper flow of operation of data and functionality across the application, ensuring its reliability and effectiveness.

Chapter 6

Tools and Techniques

Languages used:

1. Java
2. XML files for user interface

Application used for development:

- Android Studio

Chapter 7

Summary and Conclusion

Summary:

The primary goals and objectives of the "Apna Karobar" project are geared towards enhancing the efficiency, reliability, ease, and overall comfort of using ledger books for businesses. This innovative project goes beyond just ledger management; it also offers users a seamless way to maintain and control their inventory. With the Apna Karobar app, adding, deleting, updating, and tracking inventory details becomes a breeze.
It's designed to be exceptionally easy to navigate and operate, ensuring that even those who aren't tech-savvy can harness its power. As you delve into this project, you'll uncover how technology can be harnessed to simplify and solve real-world business challenges.

The central aim of this endeavor is to provide a platform for businesses to transition into the digital age. It's all about leaving behind traditional, manual ledger books and embracing a more efficient, error-reducing, and time-saving approach to financial management.

Achievements:

Apna Karobar has facilitated efficient financial management and has been crucial in delivering accurate financial information. This tool is essential for both businesses and individuals, aiding in the effective management of finances. However, there is still much to improve as this is just the beginning of the project, and further enhancements are planned for the future.

Future Enhancements/Recommendations:

The Apna Karobar team is continuously working on new features and enhancements to make the app even more useful for users.

Some of the upcoming features include:

- support for multiple currencies
- ability to attach receipts and invoices to transactions
- enhanced reports and analytics
- integration with popular accounting software

Future Work:

- **Automated Expense Tracking (AETS):**
  AETS automatically keeps track of your expenses without you having to manually enter each expense.

- **Real Time Currency Conversion (RTC):**
  RTC helps you convert one currency to another in real time. This is handy for international travellers or businesses dealing with foreign currencies.

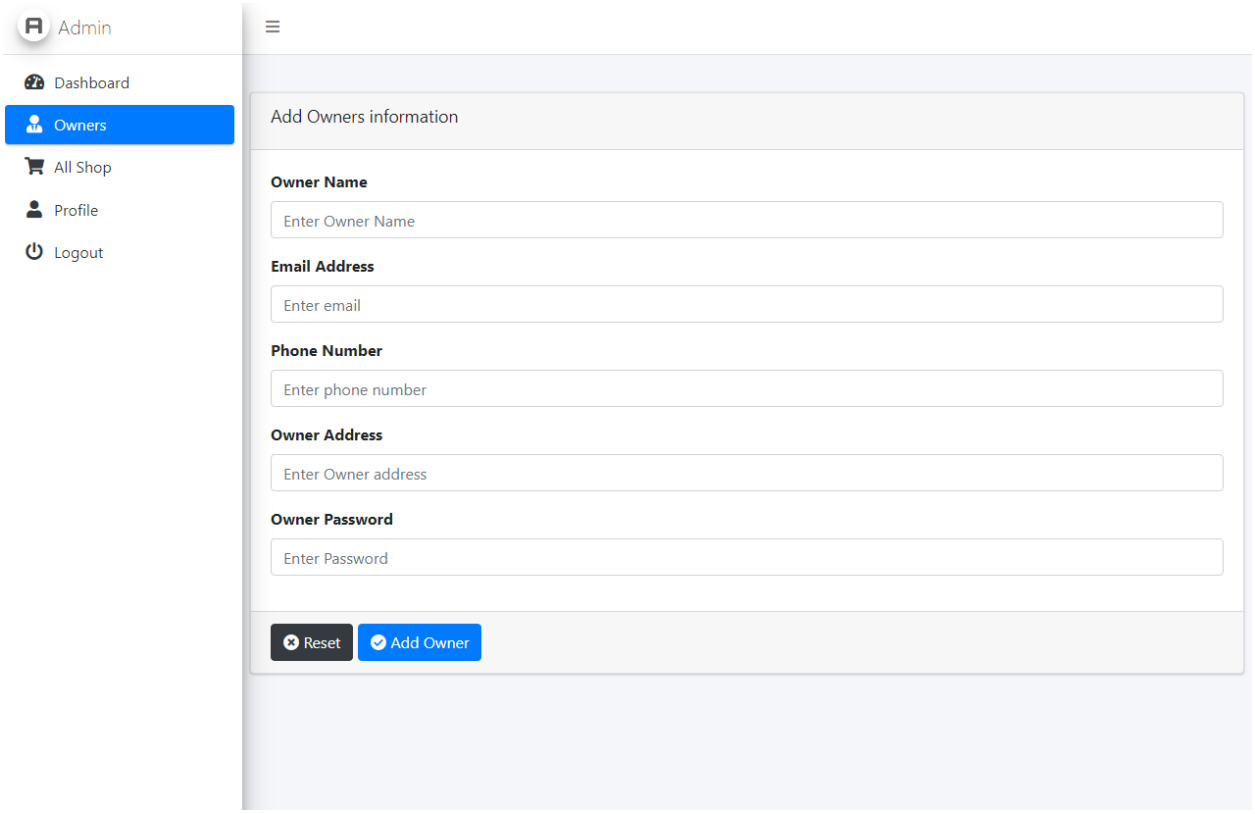
- **Offline Financial Calculator (OFC):**
  OFC allows you to perform financial calculations like loan repayments or interest calculations even when you don't have an internet connection.

- **Credit Risk Assessment (CRA):**
  CRA uses Machine Learning to assess the credit risk of customers or clients. It helps make better credit decisions and reduces the risk of lending money to people who may not be able to repay
  "Apna Karobar" project is all about making business financial management smoother, more efficient, and accessible to all. It paves the way for a seamless transition to digital solutions while addressing practical business needs. It's a significant leap forward for businesses, bringing convenience, security, and efficiency to their financial operations.

Chapter 8

User Manual

Register Account:



Login:

Dashboard:


APNA KAROOBAR
APNA KAROBAR
SHOP
Hi Admin
Customers
Suppliers
Products
POS
All Orders
Expense
Report
Settings
Logout

References:

[1] "The challenges of traditional bookkeeping for small businesses." Small Business Trends. [Online]. Available: https://smallbiztrends.com/2019/06/challenges-of-traditional-bookkeeping.html

[2] "Tally ERP 9 - Apps on Google Play." Google Play Store. [Online]. Available: https://play.google.com/store/apps/details?id=com.tspl.tallyerp9&hl=en&gl=US

[3] "QuickBooks Accounting: Invoicing & Expenses - Apps on Google Play." Google Play Store. [Online]. Available: https://play.google.com/store/apps/details?id=com.intuit.quickbooks&hl=en&gl=US

[4] "Wave Invoicing - Billing & Finance - Apps on Google Play." Google Play Store. [Online]. Available: https://play.google.com/store/apps/details?id=com.waveinvoicing&hl=en&gl=US