A

Mini Project Report

on

GreenThumb: Nursery and Plant Management Solutions

Submitted in partial fulfillment of the requirements for the degree

Second Year Engineering – Computer Science and Engineering-Data Science

by

Agrima Gupte	**24207019**
Muaz Shaikh	**24207016**
Prajakta Bhanushali	**23107057**
Shreya More	**23107135**

Under the guidance of

Ms. Rajashri Chaudhari

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-DATA SCIENCE

A.P. SHAH INSTITUTE OF TECHNOLOGY

G.B. Road, Kasarvadavali, Thane (W)-400615

UNIVERSITY OF MUMBAI

Academic year: 2024-25

CERTIFICATE

This to certify that the Mini Project report on **Nursery Management System** has been submitted by **Agrima Gupte** (24207019), **Muaz Shaikh (**24207016**) Prajakta Bhanushali** (23107057) and **Shreya More** (23107135) who are bonafide students of A. P. Shah Institute of Technology, Thane as a partial fulfillment of the requirement for the degree in **Computer Science and Engineering-Data Science**, during the academic year **2024-2025** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

Ms. Rajashri Chaudhari
Guide

Ms. Anagha Aher
HOD, CSE (Data Science)

Dr. Uttam D. Kolekar
Principal

External Examiner:
1.

Internal Examiner:
1.

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

ACKNOWLEDGEMENT

This project would not have come to fruition without the invaluable help of our guide **Ms. Rajashri Chaudhari** expressing gratitude towards our HoD, **Ms. Anagha Aher**, and the Department of Computer Science Engineering - Data Science for providing us with the opportunity as well as the support required to pursue this project. We would also like to thank our project coordinator **Ms. Richa Singh** who gave us his valuable suggestions and ideas when we were in need of them. We would also like to thank our peers for their helpful suggestions.

TABLE OF CONTENTS

Chapter 1

Introduction

A Nursery Management System is a specialized software solution designed to support the efficient operation of plant nurseries, streamlining various business activities such as inventory management, customer interactions, and operational logistics. Nurseries are essential businesses focused on growing and selling plants, including flowers, trees, shrubs, and other horticultural products. Managing a nursery involves numerous tasks that range from cultivating plants to handling customer orders and managing staff. As the scale of operations` increases, it becomes increasingly challenging to maintain accurate records and ensure smooth workflow processes manually. This is where a nursery management system comes into play, offering a comprehensive solution for optimizing these tasks.

In addition to the customer-facing features, the system also offers an online cart mechanism. Once plants are added to the cart, the system generates a total based on the price, allowing for seamless experience. The system ensures that customers can check out efficiently, which improves customer satisfaction by reducing waiting times.

The system is built using Python- Visual Studio as the integrated development environment (IDE) for the frontend. This makes the interface user-friendly and easy to navigate for both customers and administrators. On the backend, the system uses MySQL, a robust and widely- used relational database management system, ensuring secure and efficient storage of all data related to plants, and customer data. The Nursery Management System is a reliable and effective tool that simplifies the business operations of plant nurseries. It reduces the workload of nursery owners, provides a smooth shopping experience for customers, and ensures accurate and quick operations. Overall, the benefits of a Nursery Management System are extensive.

1.1 Purpose

The purpose of a Nursery and Plant Management System is to streamline and automate the various processes involved in running a plant nursery, enhancing efficiency, accuracy, and overall management. By integrating essential functions such as inventory management, customer relationship management, sales processing, and financial oversight into a unified platform, it aims to optimize operations, reduce manual errors, and provide a scalable solution for business growth. The system aims to simplify nursery operations by automating tasks such as inventory management and customer order processing, while allowing customers to view the total price of plants they add to their cart.

- Efficient Inventory Management

One of the main purposes is to ensure effective tracking and management of plant inventory. Nurseries deal with a wide variety of plant species, seeds, and gardening supplies, all at different stages of growth and readiness for sale.

- Enhanced Customer Service

It facilitates improved customer service by maintaining a comprehensive database of customer information, including preferences, purchase history, and recommendations for seasonal plants.

- Streamlined Sales and Order Management

Managing sales is a critical function of any nursery. A Nursery Management System automates the sales process, from accepting orders to processing payments. The system speeds up checkout times, reducing wait times and improving customer satisfaction.

1.2 Problem Statement

Plant nurseries face several significant challenges that hinder their operations and customer satisfaction. One major issue is data management, as many nurseries lack comprehensive software to integrate sales and customer relations effectively. Many

nurseries also rely on manual inventory management methods, such as paper records or spreadsheets, which can lead to inaccuracies and mismanagement of stock. This inefficiency extends to the sales process, where the lack of automation slows down transactions, resulting in longer wait times and diminished customer experiences. Human error further complicates matters, as manual calculations of prices and inventory can affect billing accuracy and overall customer satisfaction. Without automation, nurseries struggle to scale their operations efficiently, and these issues ultimately contribute to customer dissatisfaction due to delayed transactions and poor management practices.

1.3 Objectives

The system is designed to organize plants into well-defined categories, enabling users to easily browse, filter, and select based on specific requirements. In addition, the platform integrates eco-conscious gardening insights, promoting sustainability and environmentally friendly care techniques. A key focus is placed on personalizing the shopping and gifting experience through customized plant recommendations, streamlined inventory access, and tailored gifting options.

1. **To categorize product selection**: Organization of plants into well-defined categories, making it easier for users to browse, filter, and choose based on specific needs.

2. **To develop a system where Sustainability & Eco-Friendly practices are maintained:** Providing eco-conscious gardening insights into plant sustainability, care tips, and environmentally friendly practices.

3. **To design a system in which Shopping & Gifting Experience is personalized**: Provide a categorized plant selection, personalized gifting options, and inventory access to ensure a smooth and enjoyable buying experience.

4. **To suggest Seasonal Plant Recommendations:** Provide automated plant suggestions based on seasonal availability and user preferences to improve plant selection.

1.4 Scope

A Plant Nursery Management System is designed to automate and streamline the operations of plant nurseries, enhancing operational efficiency and customer satisfaction by covering several key areas. These include inventory management for real-time tracking of stock levels and plant health, sales management, and customer relationship management to maintain detailed customer sales for personalized service. The system also incorporates seasonal recommendations for continuous improvement, robust capabilities for decision-making, and personalized touch. Additionally, it supports e-commerce integration for online sales, ensures scalability to accommodate business growth, and prioritizes data security to protect sensitive information.

- Inventory Management:

  It will monitor stock levels in real time, ensuring that users are aware of current inventory status. This proactive approach to inventory management will enhance operational efficiency, streamline the supply chain, and ensure that the nursery is consistently well- stocked to meet customer demands.

- Sales and Billing:

  This system will streamline the sales process by enabling users to easily select products, calculate totals, and complete with a smooth process. Ensuring effective managing the sales and ongoing processes, this module will enhance customer satisfaction.

- Customer Relationship Management:

This system will enable customers to easily shop with seasonal recommendations, suggestions for improvement, fostering a personalized touch between the nursery and its clientele. The nursery can enhance its services and products, ultimately leading to improved customer satisfaction.

A Plant Nursery Management System is designed to automate and streamline the operations of plant nurseries, enhancing operational efficiency and customer satisfaction by covering several key areas. These include inventory management, which enables real-time tracking of stock levels, monitoring of plant availability, and updates on plant health status to avoid shortages or wastage. Sales management allows for the seamless processing of customer transactions, maintaining accurate records of purchases, and generating invoices. Customer relationship management (CRM) stores detailed profiles, including purchase history and preferences, to offer personalized service and improve retention.

The system incorporates seasonal recommendations based on planting cycles and customer demand, assisting nursery owners in stocking and promoting relevant products. It offers data-driven decision-making tools such as reports and analytics for tracking sales trends, customer behavior, and inventory turnover. A personalized user experience is achieved through tailored product suggestions and targeted promotions. The system supports e-commerce integration, enabling customers to browse, order, and pay online, thus expanding the nursery's reach. It is designed with scalability in mind to handle increased data and users as the business grows, and it includes data security features like access controls, encrypted transactions, and secure login to protect sensitive customer and business information.

Chapter 2

Proposed System

Plant Nursery Management System is designed to streamline operations and enhance customer satisfaction within plant nurseries. By integrating key functionalities such as inventory management, sales processing, and customer relationship management, the system offers a comprehensive solution that automates daily tasks and minimizes errors. Its user- friendly interface ensures ease of use for staff, while robust system and easy mechanisms facilitate continuous improvement. This system not only boosts operational efficiency but also supports the growth and scalability of nurseries, enabling them to meet the evolving needs of their customers effectively.

2.1 Features and Functionality

The features and functionalities of the proposed Plant Nursery Management System are designed to optimize nursery operations and enhance customer engagement. With a user- friendly interface for seamless navigation, the system enables real-time inventory tracking, efficient sales management through a comprehensive user + admin system, and robust customer relationship management. Together, these features create a holistic solution that improves efficiency, reduces errors, and fosters lasting customer relationships.

The system includes these key features:

- Inventory Management: Updates inventory in real-time.

The system features a dynamic inventory management module that automatically updates stock levels in real-time. Every time a transaction is made—whether it's a new stock entry, a customer purchase, or an item return—the inventory is instantly adjusted to reflect the current availability. This eliminates the need for manual stock tracking and reduces the risk of errors such as overstocking or running out of items. Additionally, the system can generate alerts when stock levels fall below a specified threshold, enabling

timely reordering and ensuring that popular or essential items are always in supply. This real-time synchronization supports better decision-making, improves operational efficiency, and ensures that both staff and customers have up-to-date information about product availability.

- Real-Time Order Tracking: Provide live tracking for orders with estimated delivery times.

The system includes a real-time order tracking feature that allows customers to monitor the status of their orders from the moment they are placed until they are delivered. This functionality provides live updates on order processing stages—such as confirmation, packaging, dispatch, and delivery—offering full visibility into the delivery cycle. Customers receive estimated delivery times and are notified of any changes or delays via alerts or messages. This transparency not only enhances customer trust and satisfaction but also reduces the need for manual inquiries regarding order status. For administrators, the feature helps streamline logistics by tracking delivery personnel and optimizing route planning, ultimately improving the overall efficiency of the order fulfillment process.

- User & Admin Dashboard:
    - For Users: View options to shop, track cart and order products.
    - For Admins: Manage inventory, process orders.

The system features a comprehensive User & Admin Dashboard designed to cater to the distinct needs of both customers and administrators. For users, the dashboard offers a seamless interface to browse products, manage their shopping cart, place orders, and track order statuses, providing a convenient and engaging shopping experience. On the other hand, the admin dashboard serves as a centralized control hub, enabling nursery staff to manage inventory, update product listings, process orders, track sales, and access customer data. This dual-dashboard structure ensures efficient operations, enhances user interaction, and maintains clear role-based access for secure and organized system management.

Chapter 3

Project Outcomes

The Plant Nursery Management System is designed with the core objective of significantly enhancing the overall efficiency, accuracy, and effectiveness of nursery operations. By integrating modern technology into day-to-day processes, the system provides a centralized platform that automates and streamlines a wide range of nursery functions, from product cataloging and order management to inventory tracking and customer interactions.

The planned Plant Nursery Management System aims to streamline the day-to-day activities of nursery businesses while significantly enhancing the overall customer experience. It is thoughtfully crafted with an intuitive layout that ensures effortless interaction for all users, whether staff or customers. The platform supports live monitoring of stock, allowing for accurate oversight of plant varieties, gardening tools, and other supplies at all times.

It also features an integrated administrative and customer portal, which simplifies the sales process—from order placement and payment to delivery tracking and after-sales support. This dual-access system empowers administrators to manage operations efficiently, while customers enjoy a smooth and engaging shopping journey.

In addition, the system includes a powerful customer engagement module that stores and utilizes customer preferences, purchase patterns, and feedback. This enables personalized services and targeted promotions, helping businesses build strong, long-term relationships with their clientele.

When combined, these tools form a comprehensive digital solution that enhances productivity, minimizes manual mistakes, and elevates customer satisfaction. It creates a seamless workflow for staff and a more interactive, rewarding experience for plant enthusiasts and buyers.

One of the most critical improvements this system brings is enhanced inventory accuracy. Traditional manual methods often lead to errors, miscounts, and stock discrepancies. With a digital inventory management feature, the system ensures real-time updates on product availability, minimizing the risk of overstocking or stockouts, and enabling better forecasting and resource planning.

In addition, the system streamlines the sales process by providing users with an intuitive interface to view products, place orders, and track delivery statuses. This reduces the administrative burden on staff and speeds up transaction times, leading to more efficient sales operations. Once the system was implemented, it achieved the following outcomes:

- Efficiency: Managing customer and inventory data efficiently reduction in manual processes, leading to time savings and lower error rates.
- Admin Insights: Enabled admins for better understanding of customer activity. Admins can access customer interactions and purchase pattern, admins can identify trends and preferences.
- Improved Services: Implementing a structured seasonal recommendation system allows customers to easily shop with their experiences, suggestions, and concerns in real-time.

The implementation of the Plant Nursery Management System is expected to yield several significant outcomes. Firstly, it will streamline nursery operations, reducing manual workload and ensuring greater accuracy in tasks such as inventory management, sales tracking, and customer data handling. Secondly, by offering a user-centric design and responsive interface, the system will enhance both employee productivity and customer satisfaction, leading to increased sales and repeat business.

Furthermore, the integration of smart features such as real-time tracking, automated updates, and personalized customer interactions will contribute to greater operational transparency and decision-making efficiency. The system also fosters a more professional and engaging customer experience, strengthening brand loyalty and trust.

Ultimately, the project aims to transform traditional nursery management into a modern, tech-driven ecosystem, capable of supporting business growth, adapting to evolving market trends, and delivering sustainable value to both the business and its customers.

Chapter 4

Software Requirements

The proposed Plant Nursery Management System leverages a combination of technologies to ensure a robust and efficient application. The software requirements are detailed as follows:

1. Frontend:

- **Python:** The primary programming language used for developing the user interface. Python is chosen for its platform independence, strong object-oriented features, and extensive libraries that facilitate the development of a responsive and interactive user experience.
- **Visual Studio (VsCode):** VS Code is a powerful, efficient, and versatile IDE that enhances Python development, making it a perfect choice for a smooth workflow. VS Code, being lightweight, cross-platform, and highly extensible, enhances productivity with integrated debugging and Git support. It allows seamless database management, real-time previews, and smooth execution of Python script.

2. Backend:

- **MySQL Database:** The relational database management system used to store critical data for the application. MySQL is selected for its reliability, scalability, and ease of use. This includes inventory data, which encompasses information on plant species, quantities, ensuring accurate stock tracking and management. Additionally, the database will store order information, detailing customer orders with itemized lists, total prices, and transaction history, facilitating efficient processing and record- keeping. This information enables nurseries to provide personalized service and implement targeted strategies.

Python for the frontend and MySQL for the backend establishes a solid foundation for the development of a reliable, efficient, and user-friendly Plant Nursery Management System. Python’s simplicity, flexibility, and strong library support make it ideal for building a responsive user interface that enhances user interaction and navigation. Coupled with the robust development environment provided by Visual Studio Code, the frontend development process is streamlined, ensuring faster implementation and easier maintenance.

On the backend, MySQL provides a powerful and scalable solution for managing large volumes of structured data, including inventory, customer orders, and transaction records. Its stability and efficiency ensure secure data storage and retrieval, enabling real-time processing and consistent performance. Together, these technologies ensure that the system is both technically sound and capable of supporting the nursery's operational needs, ultimately contributing to a seamless and effective digital solution for modern nursery management.

Chapter 5

Project Design

The design of the Plant Nursery Management System encompasses several key components. Database design will utilize MySQL tables to effectively store essential data, including plant inventory, customer orders, cart details, feedback, and user data. The frontend design will feature a user-friendly interface built with Java, providing easy access to inventory, orders, and user both customers and staff. For the backend design, robust logic will be implemented to process orders, update inventory levels, and calculate cart totals, ensuring smooth and accurate operations. Additionally, the system will prioritize security with features such as secure login protocols and data protection measures for both users and administrators, safeguarding sensitive information and maintaining user trust.

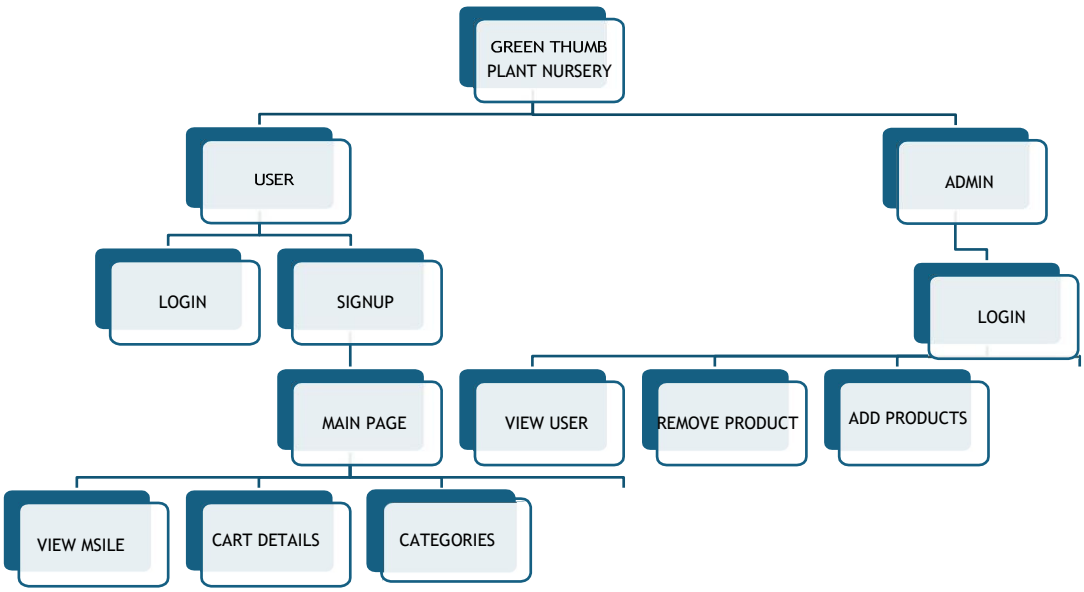


Fig.5.1: Block diagram

Overall figure 5.1 illustrates a clear structure of admin and users, their interactions with the system, as well as the administrative tasks for managing the nursery's offerings.

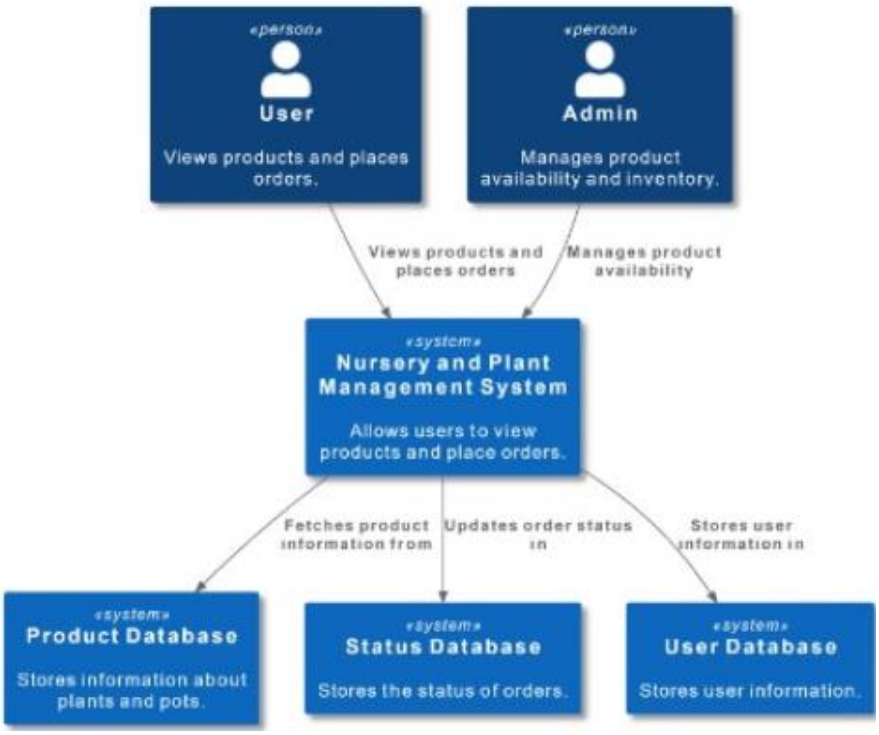


Fig 5.2: System Architecture

The diagram illustrates the architecture and interaction flow within the Nursery and Plant Management System, designed to facilitate efficient plant and product order management. Users interact with the system to view available products and place orders, while Admins are responsible for managing product availability and inventory. These roles interact through the central Nursery and Plant Management System, which serves as the core platform enabling these functionalities.

User Side:

The user interface of the Plant Nursery Management System offers several essential functionalities to enhance the user experience. Users can log in to access their accounts or sign up to create a new account if they are first- time visitors. After a successful login or signup, users are directed to the main page, which serves as the landing area from where they can easily navigate to various features of the system. Users can view their info. Additionally, users can browse through categories to explore different product types, making it easier to find what they need. This comprehensive design ensures a seamless and engaging experience for users while interacting with the nursery system.

Admin Side:

The admin interface of the Plant Nursery Management System includes several key functionalities. First, admins can log in securely to access the system. Once logged in, they have the capability to monitor user activity and manage accordingly. Additionally, admins can access products in demand provided by users, which helps in understanding customer experiences and areas for improvement. Finally, admins can add and/or remove new/existing products to the nursery system, ensuring that the inventory remains up-to-date and aligned with customer demand. This comprehensive set of features empowers admins to manage the nursery effectively and respond to customer needs proactively.

Chapter 6

Project Scheduling

Project scheduling is the process of defining and organizing the tasks, timelines, and resources needed to complete a project. It involves breaking down the project into smaller, manageable tasks, assigning durations and deadlines, and determining dependencies between tasks. A well-structured schedule helps ensure that the project stays on track, meets its deadlines, and allocates resources efficiently. Project scheduling is essential for monitoring progress, identifying potential delays, and ensuring timely project delivery. It is typically visualized using tools like Gantt charts or timelines to provide a clear roadmap for the project's completion.

Conception and Initiation, Project Design and Implementation. Each phase includes various tasks, color coded for distinction, and spans over specific time periods (weeks). Task descriptions, deadlines, and responsibilities are listed, showing a clear project schedule, with progress and dependencies marked visually through bars of different colors. The chart is designed to help track the milestones and deliverables over time, facilitating project management and monitoring.

Figure 6.1: Gantt chart

Chapter 7

Results

The implementation of the Plant Nursery Management System produced several significant results that enhanced overall operations. It led to improved efficiency by making inventory management and order processing faster and more accurate, thereby reducing time and errors associated with manual methods. Additionally, the system provided accurate cart totals, allowing customers to easily view the total price of plants in their cart, which simplified the purchasing process. Admins benefited from enhanced capabilities as well, with the ability to effectively view product sales, facilitating better management and support. These outcomes collectively contributed to a more streamlined and responsive nursery operation.

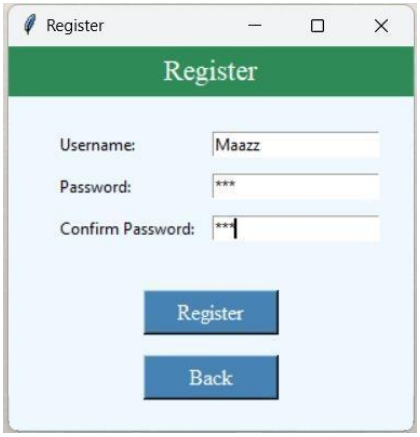


Figure 7.1: Registration page

In above figure 7.1 the registration page for nursery management system. It features 3 input fields Username, Password, Confirm password to create a new account. There is a register button to save the details, back button to go to previous page where user can go to login page if user already have an account.

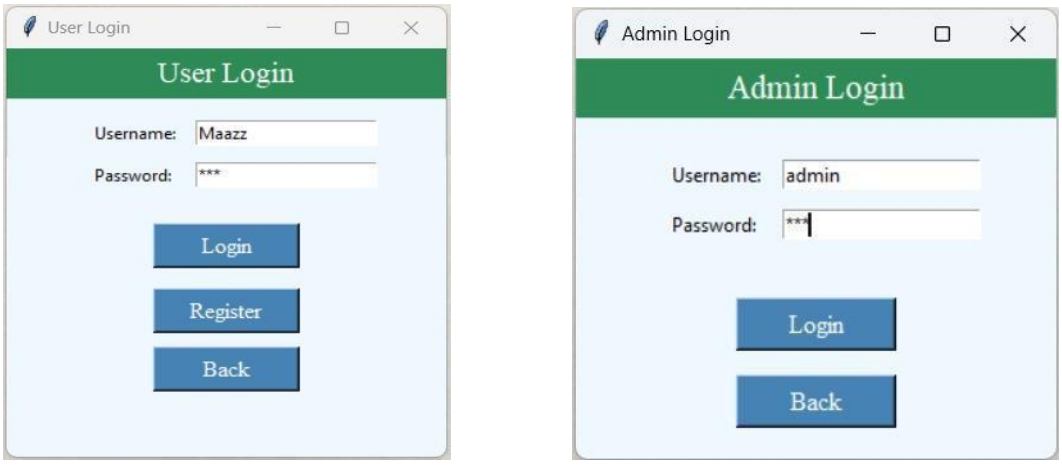


Figure 7.2: Login page for USER AND ADMIN

In above figure 7.2 the login page for nursery management system. It features two input fields Username and Password to login and start with application experience. There is a login button to go to main page and a back button to go to previous page. Both user and admin have these options of login.

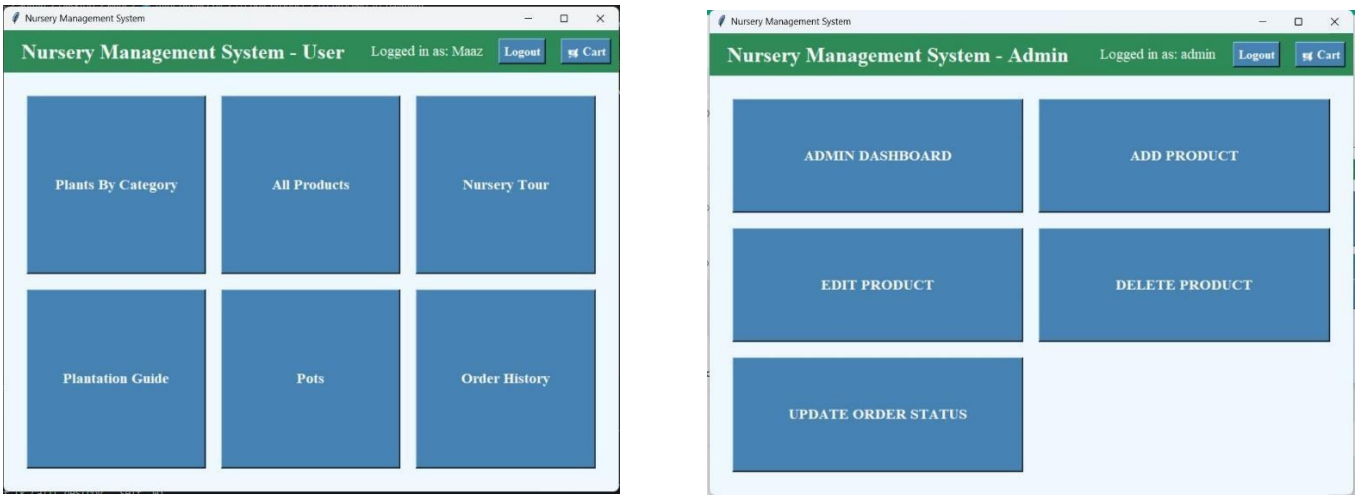


Figure 7.3: Dashboard for USER and ADMIN

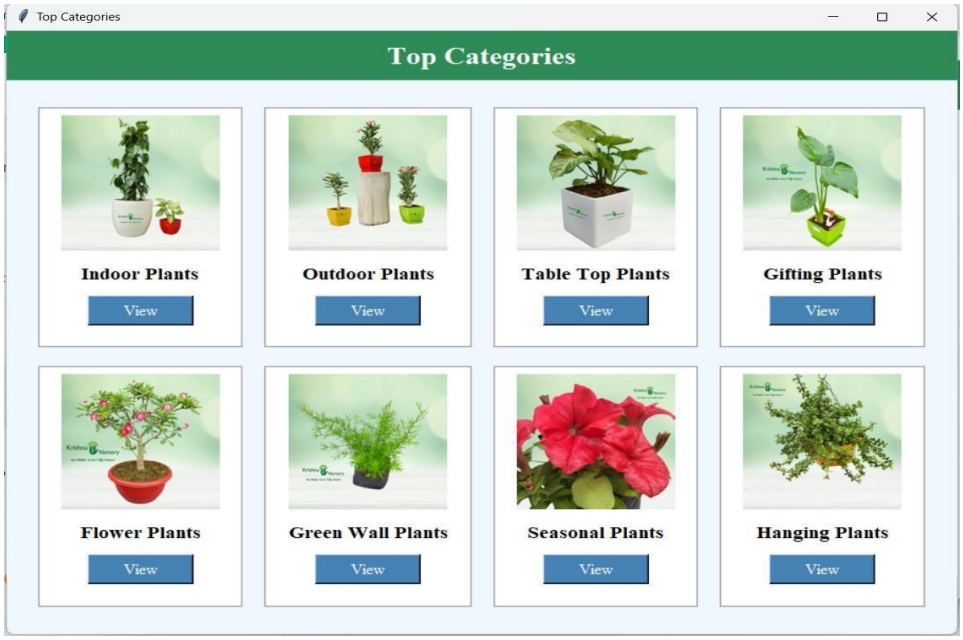


Figure 7.4: Plants Categories

Above Fig 7.4 represents the page of plants which includes a variety of options for categorized plants options. User can also choose from varied options from the listed options. It includes indoor, outdoor, tabletop, gifting options, flower plants, wall, seasonal and hanging plants accordingly.

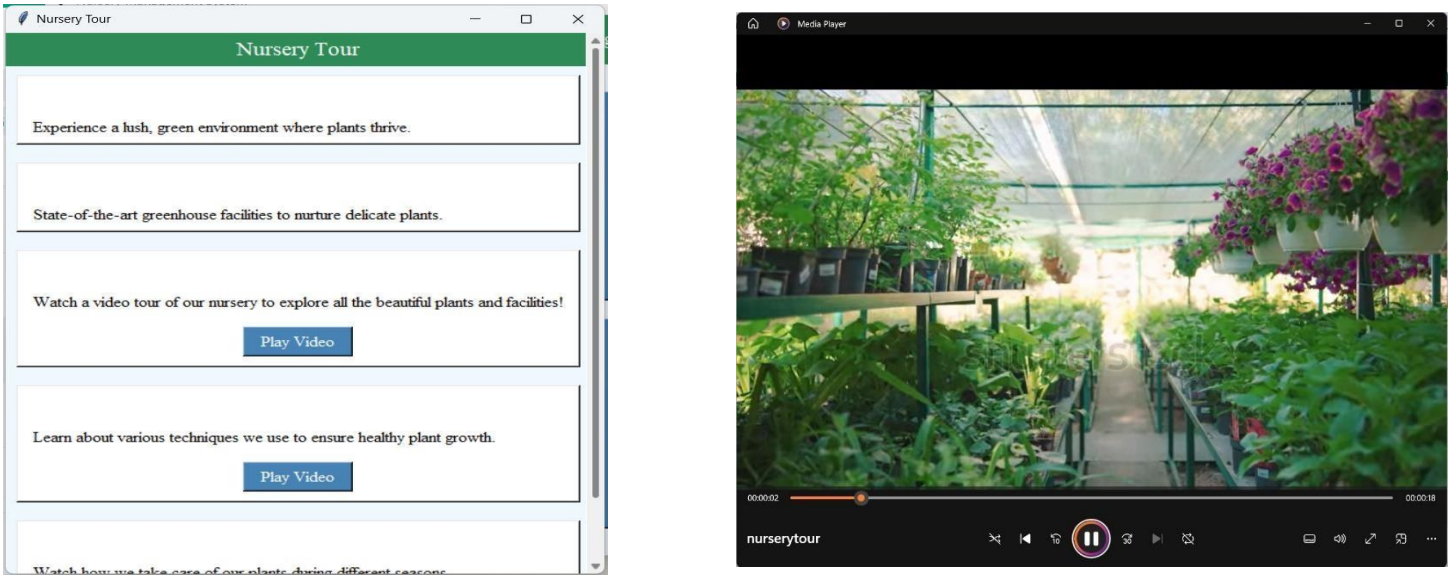


Figure 7.5: Nursery Tour option

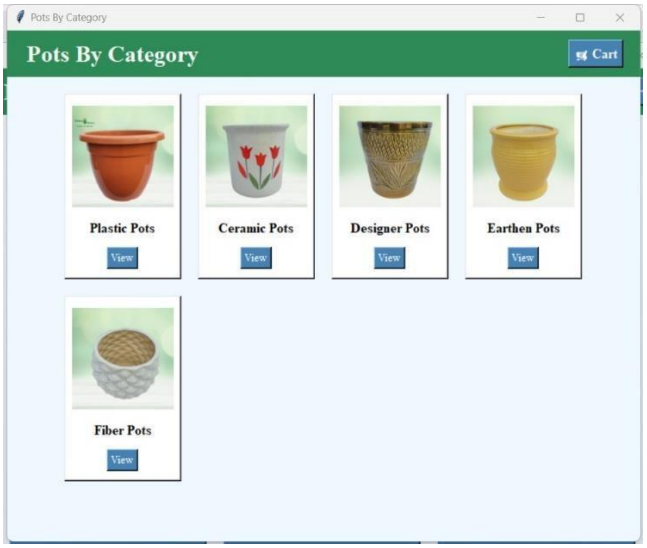


Figure 7.6: Pots Categories

Above Fig 7.6 represents the page of pots which includes a variety of options for categorized plantation pots options to choose from. It includes plastic pots, ceramic pots, designer pots, earthen pots and fiber pots respectively.

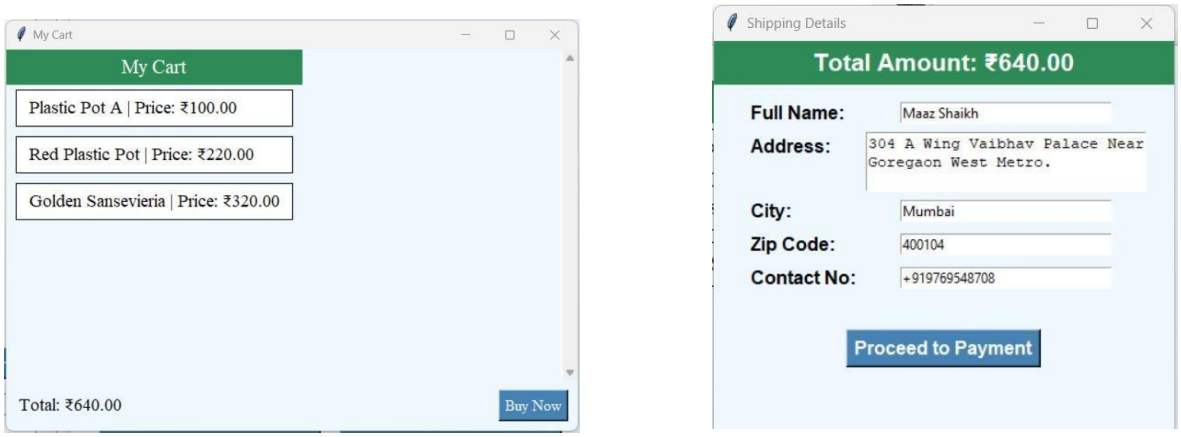


Figure 7.7: Cart page

Above page represents a cart page where all the products that are purchased by the user are appeared in a form of list with its details with a total grand amount of all the products with an option of buy now button. And then it lands to address details page.

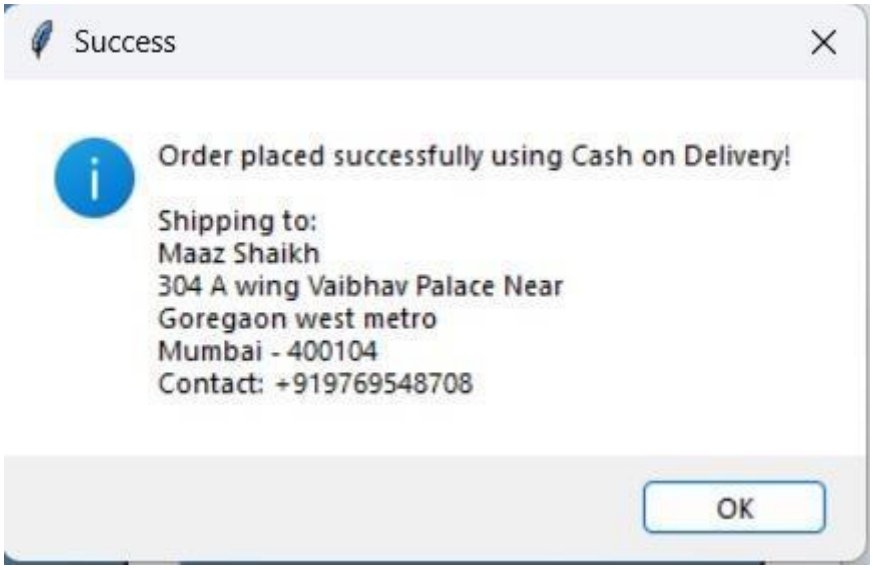
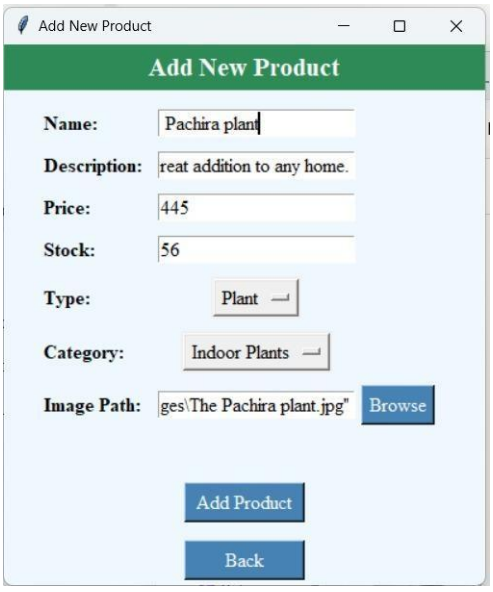
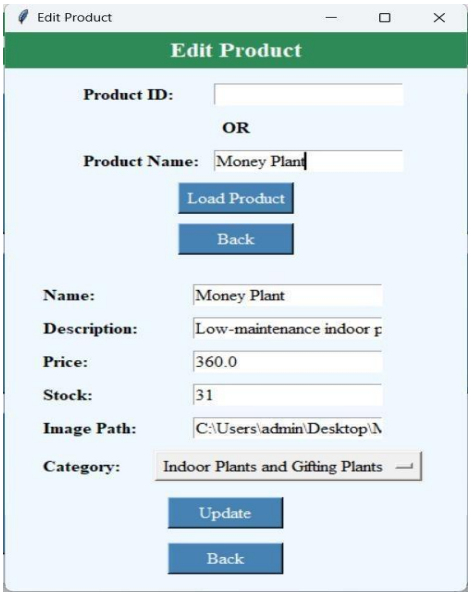


Figure 7.8: Order Placement

The above figure 7.8 represents final successful message prompt of order placement with the all necessary details – name, address, contact no and ok button to exit. It basically reflects the details provided by the user and asks for confirmation.





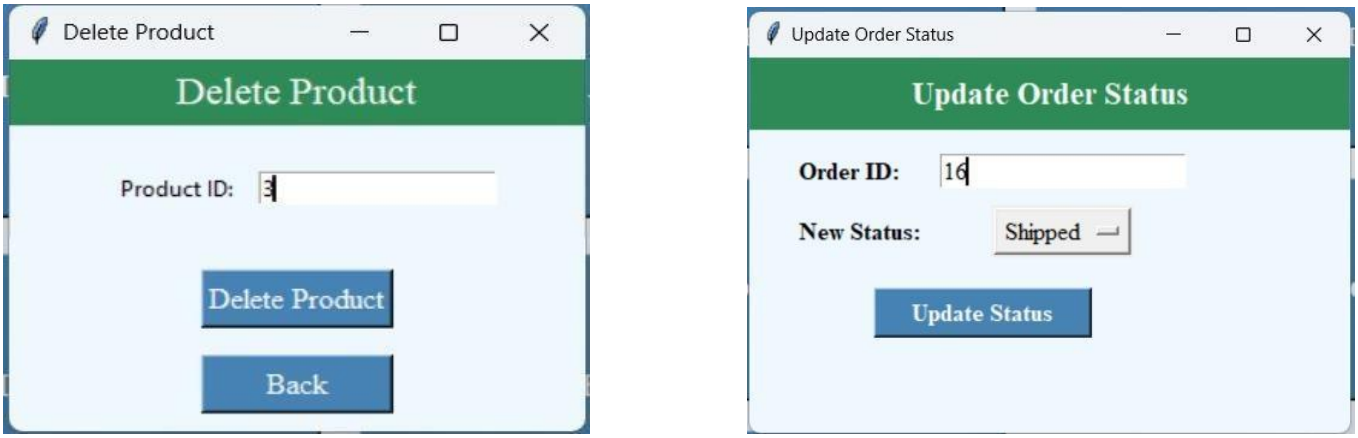


Figure 7.9: Admin options to manage products

The above figure 7.9 represents the product information to be modified by the admin accordingly as ADD NEW PRODUCT, EDIT THE PRODUCT, DELETE AND UPDATE STATUS. First image signifies delete product and second signifies update order status which both basically modifies a product.

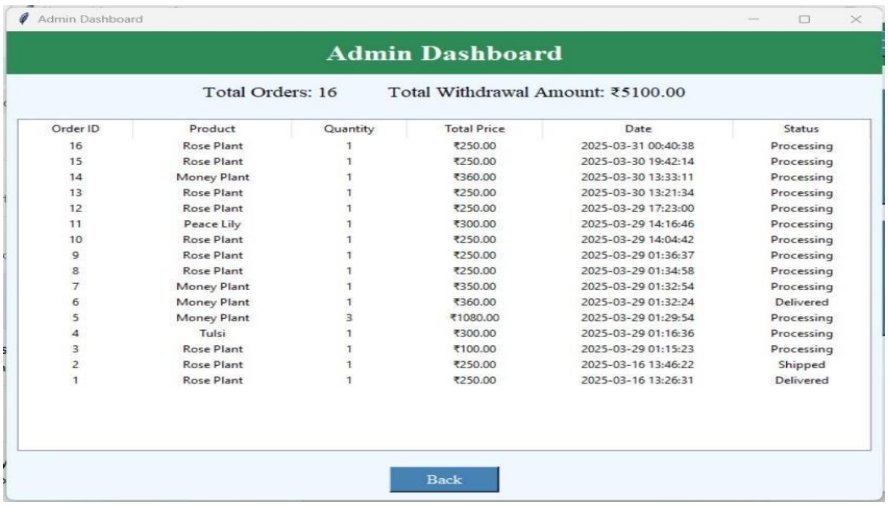


Figure 7.10: Admin Dashboard

This displays TOTAL ORDERS, TOTAL WITHDRAWAL AMOUNT specified beside and a tabular information of product with order id, quantity, total price, date and status accordingly.

Chapter 8

Conclusion

The Plant Nursery Management System successfully automated nursery operations, including inventory management and customer order processing. The “Add to Cart” feature, displaying the total price of selected plants, improved the customer experience. Admins can now view product sales and modify it according to inventory, helping them better understand customer activity. The varied options with seasonal recommendations system also contributed to improving services. Future updates can include more features as the nursery grows. Plant Nursery Management System represents a comprehensive solution designed to address the challenges faced by nurseries in managing operations efficiently and enhancing customer satisfaction. By integrating advanced functionalities such as real-time inventory tracking, streamlined sales processing, and robust customer relationship management, the system not only improves operational efficiency but also fosters stronger connections with customers. Overall, this project successfully demonstrates how technology can transform traditional nursery operations, paving the way for growth, improved customer experiences, and sustained success in a competitive market. With the system in place, nurseries are better equipped to meet the evolving needs of their customers while maintaining high standards of service and product quality.

References

MySQL Reference Manual - Data Types

1.MySQL. Data Types.
https://dev.mysql.com/doc/refman/8.0/en/data-types.html

Image reference extracted from websites:

1. Retrieved from:

   https://krishnanursery/

   https://www.ugaoo.com/

   https://www.greencarpet.in/

Python and Tkinter Documentation

2. Python Official Docs:
   https://docs.python.org/3/
3. Tkinter GUI Documentation:
   https://docs.python.org/3/library/tkinter.html

SQLite and Database Concepts

4. SQLite Official Documentation:
   https://www.sqlite.org/docs.html
5. SQLite3 in Python (W3Schools):
   https://www.w3schools.com/sql/sql_python.asp

6. Stack Overflow:
   https://stackoverflow.com/
7. GeeksforGeeks Python Tkinter:
   https://www.geeksforgeeks.org/python-gui-tkinter/

Library References

8. Twilio SMS API :

   https://www.twilio.com/docs/sms/send-messages

GUI Design Inspiration

9. Tkinter Layouts Examples:
   https://likegeeks.com/python-gui-examples-tkinter-tutorial/

Other Helpful Tutorials

10. Real Python Tutorials:
    https://realpython.com/

11. Programiz Python Tutorials:
    https://www.programiz.com/python-programming