INVENTORY MANAGEMENT SYSTEM

DBMS MINI PROJECT REPORT

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RAJALAKSHMI
ENGINEERING COLLEGE

BONAFIDE CERTIFICATE

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UNIVERSITY REGISTER No.

Certified that this is the bonafide record of work done by the above students in the Mini Project titled "**INVENTORY MANAGEMENT SYSTEM**" in the subject **CS19443 "DATABASE MANAGEMENT SYSTEM"** during the year 2023 - 2024.

Signature of Faculty – in – Charge

Submitted for the Practical Examination held on ______________________

Internal Examiner **External Examiner**

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ABSTRACT

An inventory management system is an essential tool for businesses to efficiently track, manage, and control inventory levels across various stages of the supply chain. This system aims to optimize inventory handling processes, reduce costs, prevent overstocking and stockouts, and improve overall operational efficiency. By leveraging advanced technologies such as barcode scanning, RFID, and integrated software solutions, the system ensures real-time visibility and accuracy of inventory data. Key features include automated replenishment, order tracking, demand forecasting, and detailed reporting capabilities. Implementing an effective inventory management system enhances decision-making, boosts customer satisfaction by ensuring product availability, and supports scalability for future growth. This abstract explores the functionalities, benefits, and implementation considerations of a modern inventory management system, highlighting its impact on business performance and competitiveness.The project showcases the application of SQL in creating a reliable, efficient, and scalable inventory management solution.

CHAPTER 1

INTRODUCTION

1.1 OUTLINE OF THE PROJECT

In the contemporary business environment, effective inventory management is crucial for ensuring operational efficiency and customer satisfaction. An inventory management system (IMS) is a fundamental tool for organizations that need to manage their stock levels, track orders, sales, and deliveries. This project presents the design and implementation of a comprehensive Inventory Management System using Python with Tkinter for the frontend and MySQL for the backend.The Inventory Management System developed in this project aims to automate and streamline the process of managing inventory, ensuring that businesses can keep track of their stock in real-time. This system is designed to cater to small and medium-sized enterprises (SMEs) that require a robust yet simple solution to manage their inventory efficiently.

The frontend of the application is developed using Tkinter, Python's standard GUI (Graphical User Interface) toolkit, which provides a straightforward and efficient way to create desktop applications. Tkinter is chosen for its simplicity and ease of use, making it suitable for rapid development and deployment. The user interface is designed to be intuitive, allowing users to perform tasks such as adding new products, viewing current stock levels, processing sales, and generating reports with minimal training.

The backend of the application is powered by MySQL, a reliable and widely-used relational database management system. MySQL provides the necessary functionalities to store, retrieve, and manage data efficiently. The database schema is carefully designed to normalize data and eliminate redundancy, ensuring data integrity and consistency.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The existing body of literature on inventory management systems underscores the transformative impact of automated systems on business operations. Historically, manual inventory tracking methods have been fraught with inaccuracies and inefficiencies, leading to substantial operational challenges such as stock discrepancies, overstock, and stockouts. Automated inventory management systems have emerged as a solution to these problems, offering real-time tracking, precise demand forecasting, and improved supply chain coordination. Studies reveal that businesses implementing these systems experience significant enhancements in operational efficiency, cost reductions, and customer satisfaction. For instance, real-time data access and integration across various business functions allow for better decision-making and streamlined operations. However, many small and medium-sized enterprises (SMEs) find existing systems too complex and expensive, highlighting a gap in the market for accessible, cost-effective solutions tailored to their specific needs. This project aims to bridge this gap by providing an intuitive and affordable inventory management system that leverages the strengths of relational databases and user-friendly interfaces.

2.2 Problem Definition

Small and medium-sized enterprises (SMEs) often grapple with the complexities of inventory management due to their reliance on manual processes, which are prone to errors and inefficiencies. These challenges result in frequent stock discrepancies, stockouts, overstock situations, and inaccurate inventory records, all of which can negatively impact business operations and profitability. Despite the availability of sophisticated automated inventory management systems, many SMEs find these solutions prohibitively expensive and overly complex for their needs. This project seeks to address these issues by developing a user-friendly, cost-effective Inventory Management System that automates key inventory functions. By leveraging Python and Tkinter for the frontend and MySQL for the backend, the system will provide a streamlined solution for managing products, suppliers, orders, customers, and sales. The goal is to reduce the manual effort required for inventory management, minimize errors, and enhance overall efficiency, thereby helping SMEs to operate more effectively and compete more robustly in the marketplace.

2.3 Summary of Limitations

While the proposed Inventory Management System is designed to be robust and user-friendly, it does have certain limitations. Primarily, the system is tailored for small to medium-sized enterprises and may not scale well for large organizations with more complex inventory needs and higher transaction volumes. The reliance on manual data entry for product addition and sales processing presents a potential risk for human errors, which could affect inventory accuracy. Furthermore, the system's reporting and analytics capabilities, while sufficient for basic needs, do not include advanced features such as predictive analytics, which could provide deeper insights and more strategic advantages. Another limitation is the local database setup, which may restrict real-time collaboration and data sharing across multiple business locations without additional infrastructure or cloud integration. These limitations highlight areas for future enhancement, such as incorporating automated data capture technologies and expanding the system's scalability and analytical depth.

2.3 Proposed Work

The proposed project involves developing a comprehensive Inventory Management System designed specifically for SMEs. Utilizing Python with Tkinter for the frontend and MySQL for the backend, the system aims to automate and streamline the management of inventory-related activities. The core functionalities will include product management, supplier management, order processing, customer management, sales tracking, and detailed reporting. Each feature is crafted to address common pain points in inventory management. For example, product management will allow users to add, update, and delete product information effortlessly, while supplier management will facilitate seamless tracking of supplier details and order histories. The order processing module will help in maintaining optimal stock levels by managing incoming and outgoing orders. Customer management and sales tracking will enable efficient handling of customer data and transaction records, thus enhancing the overall customer experience. Additionally, the system will provide robust reporting tools, offering insights into sales performance, inventory levels, and other critical metrics. This integration aims to ensure that SMEs can manage their inventory with minimal effort and maximum efficiency, reducing errors and improving operational productivity.

CHAPTER 3

SYSTEM ARCHITECTURE

3.1 Objective

The primary objective of this Inventory Management System (IMS) project is to design and develop a comprehensive, user-friendly, and cost-effective software solution tailored specifically for small and medium-sized enterprises (SMEs). SMEs often face significant challenges in managing their inventory due to limited resources and reliance on manual processes, which can lead to inefficiencies, errors, and ultimately, financial losses. This project aims to automate and streamline inventory management tasks, thereby enhancing operational efficiency, reducing errors, and improving overall productivity. The system is intended to provide functionalities such as product management, supplier management, order processing, customer management, sales tracking, and detailed reporting.

By developing an IMS using Python with Tkinter for the frontend and MySQL for the backend, the project aims to leverage the strengths of these technologies to deliver a robust and scalable solution. The choice of Python and Tkinter ensures that the user interface is intuitive and easy to use, while MySQL provides a reliable and efficient database management system to handle the backend operations. The system will allow users to add, update, and delete product information, manage supplier details, process orders, track sales, and generate various reports. These features are designed to address the common pain points of inventory management in SMEs, such as maintaining accurate stock levels, reducing manual data entry errors, and providing insights through comprehensive reporting.

Additionally, the project aims to enhance decision-making processes within SMEs by providing real-time access to inventory data and analytics. By having accurate and up-to-date information at their fingertips, business owners and managers can make informed decisions regarding stock replenishment, pricing strategies, and overall inventory management. This, in turn, can lead to cost savings, improved customer satisfaction, and increased profitability. The system will also be designed to be scalable, allowing for future expansion and integration with other business systems as needed.

Another critical objective is to ensure the system's security and data integrity. The project will implement appropriate security measures to protect sensitive business data from unauthorized access and breaches. This includes user authentication, data encryption, and regular backups. The system will also be designed to handle data validation and error handling to maintain data accuracy and consistency.

In summary, the primary objectives of this Inventory Management System project are to automate and streamline inventory management tasks for SMEs, enhance operational efficiency, reduce errors, improve decision-making processes, ensure data security and integrity, and provide a scalable solution that can grow with the business. By achieving these objectives, the project aims to deliver a valuable tool that addresses the specific needs of SMEs and helps them to manage their inventory more effectively and efficiently.

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3.2 Diagrams

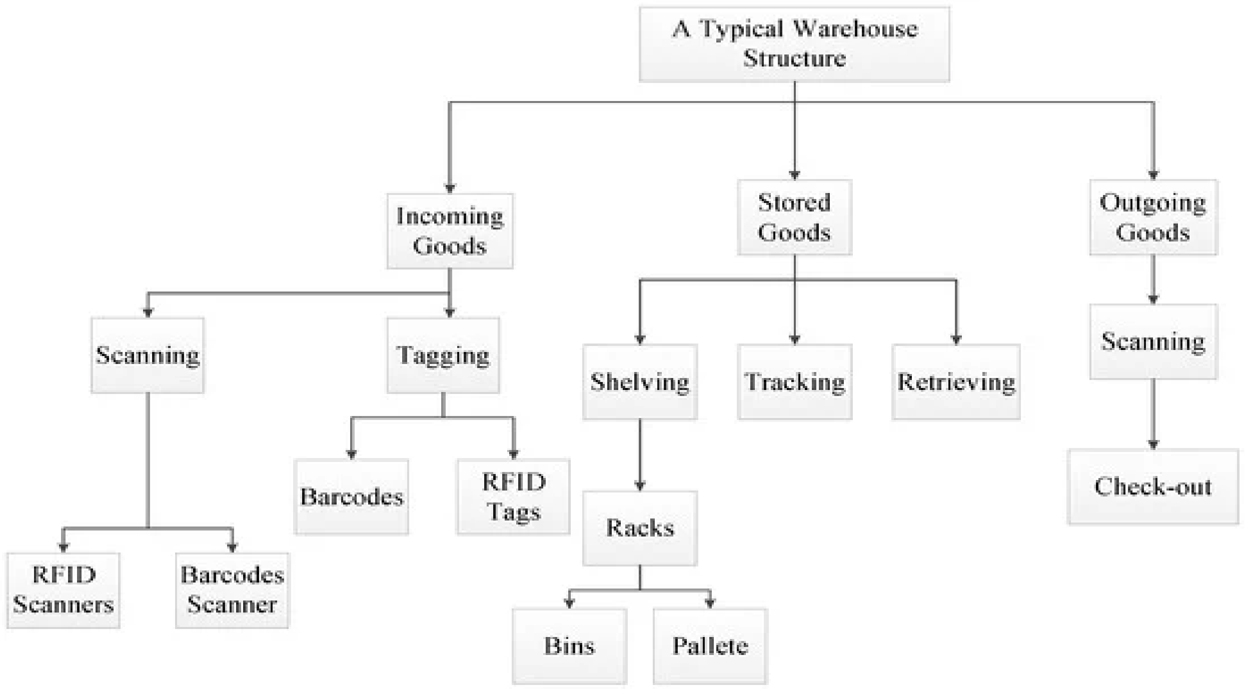


Fig 3.2 ARCHITECTURAL DIAGRAM

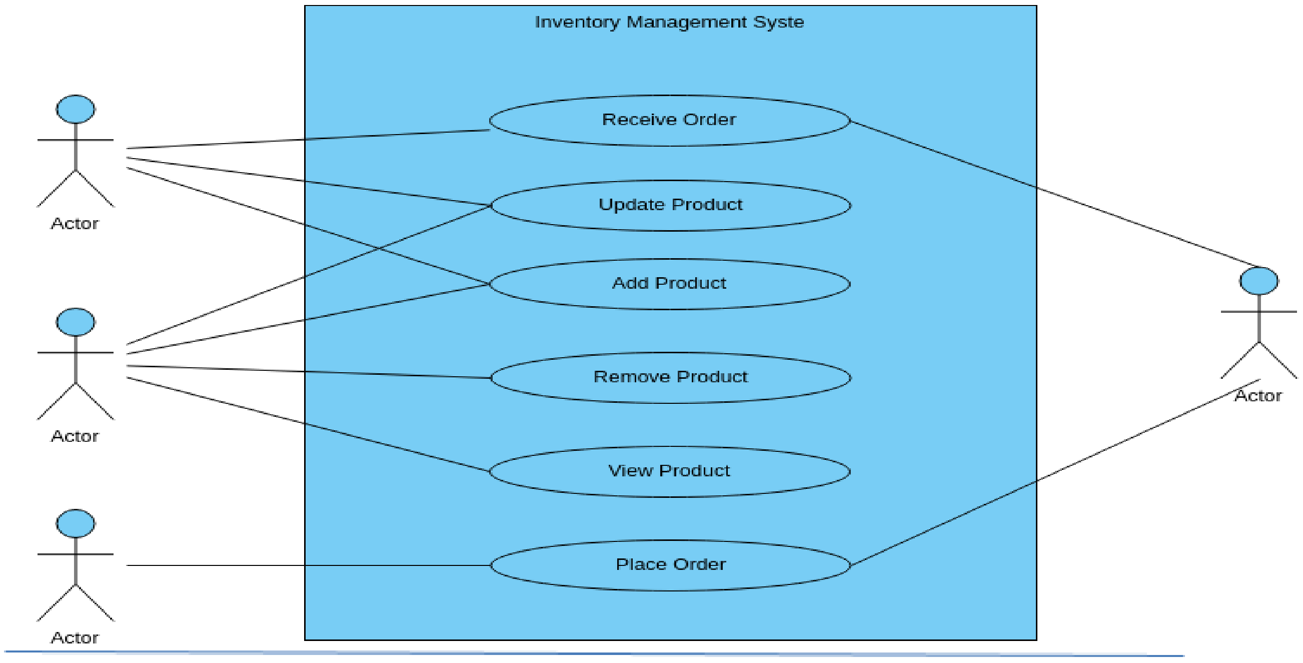


Fig 3.2 USE CASE DIAGRAM

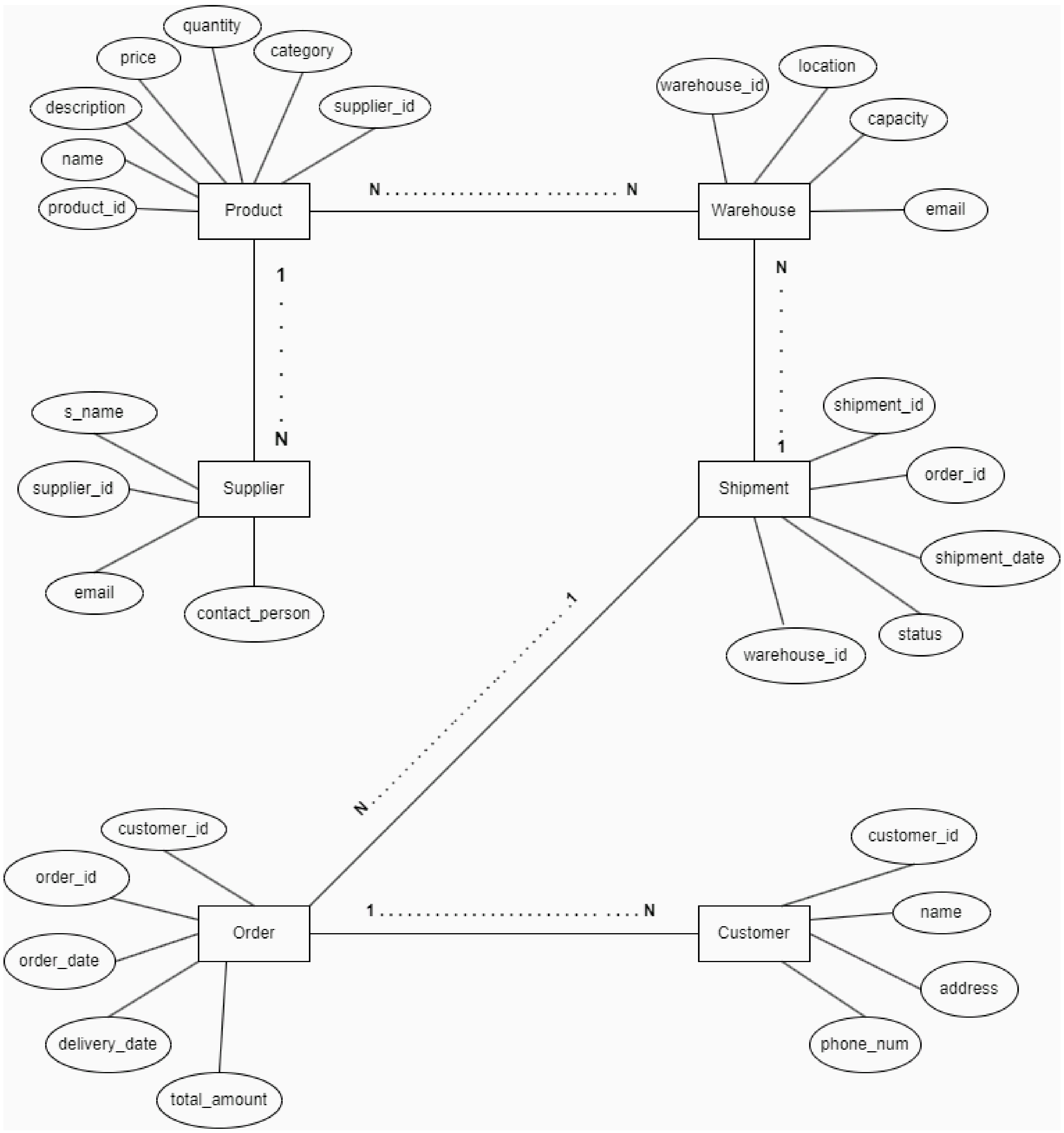


Fig 3.3 E-R DIAGRAM FOR Inventory MANAGEMENT SYSTEM

3.3 Software Requirements

The development of an efficient and user-friendly Inventory Management System (IMS) necessitates a well-defined set of software requirements. These requirements encompass both functional and non-functional aspects to ensure the system meets user expectations and performs reliably under various conditions. The choice of technologies and tools plays a critical role in the overall success of the project, ensuring that the system is robust, scalable, and secure.

Frontend Requirements: The user interface of the IMS will be developed using Python's Tkinter library. Tkinter is a standard GUI toolkit that provides a simple yet powerful way to create desktop applications. Its ease of use and integration with Python makes it an ideal choice for developing the frontend of the IMS. Tkinter's widgets and layout management tools will be utilized to create an intuitive and responsive user interface that allows users to perform tasks such as adding products, viewing inventory, processing sales, and generating reports with minimal effort.

Backend Requirements: The backend of the IMS will be powered by MySQL, a widely-used relational database management system known for its reliability, scalability, and performance. MySQL will handle the storage, retrieval, and management of all inventory-related data. The database schema will be designed to ensure data normalization and integrity, with tables for products, suppliers, orders, customers, and sales. Stored procedures.

Programming Language: Python will be the primary programming language used for developing the IMS. Python's simplicity and readability, combined with its extensive libraries and frameworks, make it an excellent choice for rapid application development. The use of Python ensures that the codebase is maintainable and easy to extend in the future.

Additional Libraries and Tools: Several additional Python libraries will be used to enhance the functionality and performance of the IMS. `mysql-connector-python` will be used to facilitate communication between the Python application and the MySQL database. The `datetime` module will handle date and time operations, while the `tkinter.messagebox` module will provide user feedback and error messages.

Development Environment: The development of the IMS will take place in a Python integrated development environment (IDE) such as PyCharm or Visual Studio Code. These IDEs offer features like code completion, debugging tools, and version control integration, which enhance the development process and improve code quality.

Security Requirements: Ensuring the security of the IMS is paramount. The system will implement user authentication to restrict access to authorized users only. Sensitive data, such as user credentials, will be encrypted to prevent unauthorized access. Regular backups of the database will be performed to safeguard data against loss or corruption.

Performance Requirements: The IMS will be designed to handle a moderate volume of transactions and data queries efficiently. The system should be responsive, with minimal latency in data retrieval and processing. Optimization techniques, such as indexing and query optimization, will be employed to enhance performance.

Compatibility Requirements: The IMS should be compatible with major operating systems, including Windows, macOS, and Linux. The use of cross-platform libraries and tools ensures that the system can be deployed and used on different platforms without modification.

CHAPTER 4
MODULE DESCRIPTION AND METHODOLOGY

4.1 Introduction

The Inventory Management System (IMS) is comprised of several key modules, each designed to handle specific aspects of inventory management. These modules work together to provide a comprehensive solution for managing inventory, suppliers, orders, customers, and sales. By modularizing the system, we ensure that each component is focused on a particular functionality, which enhances maintainability, scalability, and ease of development. This modular approach also allows for future enhancements and the addition of new features with minimal impact on existing functionality.

Product Management Module: This module is responsible for handling all tasks related to the products in the inventory. It includes functionalities for adding new products, updating existing product details, and deleting products that are no longer needed. The module also allows users to view a list of all products, along with their quantities and prices. This ensures that the inventory data is always up-to-date and easily accessible. The Product Management Module is crucial for maintaining accurate stock levels and providing a clear overview of the inventory status.

Supplier Management Module: This module manages information related to suppliers. It allows users to add, update, and delete supplier details, including contact information and order histories. By keeping track of supplier information, the system facilitates better supplier relationships and more efficient order management. The Supplier Management Module is essential for ensuring that the business has a reliable source of products and can quickly reorder items when stock levels are low.

Order Processing Module: This module handles the process of placing orders with suppliers and tracking their status. It includes functionalities for creating new orders, updating existing orders, and viewing the status of all orders. The Order Processing Module helps maintain optimal stock levels by ensuring that products are reordered in a timely manner. It also provides a clear record of all transactions with suppliers, which is useful for accounting and auditing purposes.

Customer Management Module: This module manages information related to customers. It includes functionalities for adding, updating, and deleting customer details, such as contact information and purchase histories. The Customer Management Module is crucial for maintaining accurate customer records and providing personalized service. By keeping track of customer information, the system can improve customer satisfaction and loyalty.

Sales Management Module: This module handles the process of recording sales transactions. It includes functionalities for processing sales, updating stock levels, and calculating total sales revenue. The Sales Management Module also allows users to generate sales reports, providing valuable insights into sales performance. This module is essential for tracking the flow of products out of the inventory and ensuring that stock levels are adjusted accordingly.

Reporting Module: The Reporting Module provides tools for generating various reports related to inventory, orders, suppliers, customers, and sales. These reports help business owners and managers make informed decisions by providing detailed insights into inventory status, sales performance, and supplier reliability. The module includes pre-defined report templates as well as options for custom report generation. The Reporting Module is crucial for strategic planning and decision-making.

User Management and Security Module: This module handles user authentication and authorization. It ensures that only authorized users have access to the system and its various functionalities. The module includes functionalities for creating user accounts, managing user roles and permissions, and implementing security measures such as password encryption. The User Management and Security Module is essential for protecting sensitive business data and maintaining the integrity of the system.

In summary, the Inventory Management System consists of several interrelated modules, each designed to handle specific aspects of inventory management. These modules work together to provide a comprehensive and efficient solution for managing inventory, suppliers, orders, customers, and sales. By modularizing the system, we ensure that it is maintainable, scalable, and easy to develop, while also providing the flexibility to add new features and enhancements in the future.

4.2 Module Description

Product Management Module: The Product Management Module is the cornerstone of the Inventory Management System (IMS), responsible for maintaining accurate and up-to-date information about the products within the inventory. This module provides functionalities for adding new products, updating existing product details, and removing products that are no longer available. The module also allows users to view a comprehensive list of all products, complete with details such as product ID, name, quantity, and price. These functionalities ensure that the inventory data is always current, which is critical for effective stock management. Additionally, the module includes validation mechanisms to prevent errors during data entry, ensuring the integrity of the product information.

Supplier Management Module: The Supplier Management Module is designed to handle all aspects of supplier information management. This module allows users to add new suppliers, update existing supplier details, and delete suppliers that are no longer active. Key supplier information such as contact details, order history, and reliability ratings are maintained within this module. By keeping a detailed record of supplier interactions, the system facilitates better supplier relationships and more efficient procurement processes. The module also includes functionalities for managing supplier contracts and tracking the performance of suppliers, ensuring that the business maintains a reliable supply chain.

Order Processing Module: The Order Processing Module is crucial for managing the flow of products into the inventory. This module provides functionalities for creating new orders, updating order statuses, and tracking the progress of orders from placement to delivery. The module allows users to view detailed information about each order, including order ID, supplier, order date, expected delivery date, and order status. By automating the order processing workflow, this module helps ensure that stock levels are maintained at optimal levels, reducing the risk of stockouts and overstock situations. Additionally, the module includes features for handling returns and cancellations, providing a comprehensive solution for order management.

Customer Management Module: The Customer Management Module focuses on managing customer information and interactions. This module allows users to add new customers, update existing customer details, and delete customers who are no longer active. Key customer information such as contact details, purchase history, and preferences are maintained within this module. By keeping detailed records of customer interactions, the system can provide personalized service and improve customer satisfaction. The module also includes functionalities for managing customer accounts and tracking customer loyalty, helping businesses build and maintain strong customer relationships.

Sales Management Module: The Sales Management Module is responsible for recording and managing sales transactions. This module provides functionalities for processing sales, updating stock levels, and calculating total sales revenue. Users can view detailed information about each sale, including sale ID, customer, product, quantity, and total price. The module also includes features for handling discounts, promotions, and refunds, ensuring that the sales process is flexible and responsive to customer needs.

Reporting Module: The Reporting Module provides comprehensive tools for generating various reports related to inventory, orders, suppliers, customers, and sales. This module includes pre-defined report templates as well as options for custom report generation, allowing users to tailor reports to their specific needs. Reports can be generated in various formats, such as PDF, Excel, or HTML, making it easy to share and analyze the data.

User Management and Security Module: The User Management and Security Module is essential for ensuring that the Inventory Management System is secure and that sensitive business data is protected. This module provides functionalities for creating and managing user accounts, assigning roles and permissions, and implementing security measures such as password encryption and multi-factor authentication.

CHAPTER 5

IMPLEMENTATION AND RESULTS

5.1 WORKING PRINCIPLE

The implementation phase of the Inventory Management System involves translating the design specifications into functional code and integrating the frontend with the backend. Here's an overview of the key steps involved:

1. **Frontend Development**: Using Tkinter, the Python library for creating graphical user interfaces, the frontend of the system is developed. This includes designing the layout, adding widgets such as buttons, labels, and entry fields, and implementing functionality for user interactions.
2. **Backend Development**: The backend of the system is implemented using Python's MySQL connector to interact with the MySQL database. This involves writing Python scripts to handle database operations such as inserting, updating, and querying data.
3. **Database Setup**: The MySQL database is set up to store product, supplier, order, customer, and sales data. Tables are created according to the database schema designed during the planning phase, and necessary constraints and relationships are established to ensure data integrity.
4. **Integration**: The frontend and backend components are integrated to create a cohesive application. User inputs from the frontend are processed by the backend scripts, which interact with the database to perform CRUD (Create, Read, Update, Delete) operations.
5. **Testing**: The implemented system is thoroughly tested to identify and fix any bugs or issues. Unit tests are conducted to verify the functionality of individual components, while integration tests ensure that the frontend and backend work seamlessly

together.

6. **User Acceptance Testing (UAT)**: The system is tested by end-users to validate its usability, functionality, and performance. Feedback from UAT helps in refining the system and addressing any user concerns or suggestions.
7. **Documentation**: Comprehensive documentation is prepared, including user manuals, installation guides, and technical specifications. This documentation serves as a reference for users and developers and facilitates future maintenance and updates.

5.2 RESULT

Upon the culmination of the implementation phase, the Inventory Management System emerges as a pivotal asset for businesses seeking streamlined operations and enhanced efficiency. Through its intuitive user interface, the system empowers users with the ability to seamlessly execute a myriad of inventory-related tasks, ranging from the addition of new products to the meticulous updating of product details. Notably, the system's robust functionalities extend to encompass comprehensive order processing capabilities, facilitating the seamless management of incoming orders from suppliers and enabling users to maintain optimal stock levels with unparalleled ease.

Furthermore, the system's adeptness in customer management and sales tracking stands as a testament to its multifaceted utility. By storing and organizing customer information, the system enables users to record sales transactions effectively, thereby fostering a deeper understanding of customer preferences and behaviors. Such insights, facilitated by the system's reporting and analytics features, prove instrumental in informing strategic decisions and identifying areas ripe for optimization. Through the generation of detailed reports encompassing product sales, inventory status, and supplier performance, the system equips users with the actionable intelligence needed to navigate the intricacies of inventory management with confidence and precision.

APPENDICES

PYTHON CODE:

```
import tkinter as tk
from tkinter import messagebox
import mysql.connector
from datetime import date

# Database connection
conn = mysql.connector.connect(
    host="localhost",
    user="yourusername",
    password="yourpassword",
    database="inventory_db"
)
cursor = conn.cursor()

class InventoryApp:
    def __init__(self, root):
        self.root = root
        self.root.title("Inventory Management System")
        self.root.geometry("600x400")

        # Labels and Entries
        self.product_label = tk.Label(root, text="Product Name")
        self.product_label.grid(row=0, column=0, padx=10, pady=10)
        self.product_entry = tk.Entry(root)
        self.product_entry.grid(row=0, column=1, padx=10, pady=10)

        self.quantity_label = tk.Label(root, text="Quantity")
        self.quantity_label.grid(row=1, column=0, padx=10, pady=10)
        self.quantity_entry = tk.Entry(root)
        self.quantity_entry.grid(row=1, column=1, padx=10, pady=10)

        self.price_label = tk.Label(root, text="Price")
        self.price_label.grid(row=2, column=0, padx=10, pady=10)
        self.price_entry = tk.Entry(root)
        self.price_entry.grid(row=2, column=1, padx=10, pady=10)

        # Buttons
        self.add_button = tk.Button(root, text="Add Product", command=self.add_product)
        self.add_button.grid(row=3, column=0, padx=10, pady=10)

        self.view_button = tk.Button(root, text="View Products", command=self.view_products)
        self.view_button.grid(row=3, column=1, padx=10, pady=10)
        self.sell_button = tk.Button(root, text="Sell Product", command=self.sell_product)
        self.sell_button.grid(row=4, column=0, padx=10, pady=10)

        self.view_sales_button = tk.Button(root, text="View Sales", command=self.view_sales)
        self.view_sales_button.grid(row=4, column=1, padx=10, pady=10)

    def add_product(self):
        name = self.product_entry.get()
        quantity = int(self.quantity_entry.get())
        price = float(self.price_entry.get())

        cursor.execute("INSERT INTO Products (name, quantity, price) VALUES (%s, %s, %s)",
(name, quantity, price))
        conn.commit()

        messagebox.showinfo("Success", "Product added successfully!")

        self.product_entry.delete(0, tk.END)
        self.quantity_entry.delete(0, tk.END)
        self.price_entry.delete(0, tk.END)

    def view_products(self):
        cursor.execute("SELECT * FROM Products")
        products = cursor.fetchall()

        view_window = tk.Toplevel(self.root)
        view_window.title("View Products")

        for index, product in enumerate(products):
            tk.Label(view_window, text=f"ID: {product[0]}, Name: {product[1]}, Quantity:
{product[2]}, Price: {product[3]}").grid(row=index, column=0, padx=10, pady=5)

    def sell_product(self):
        sell_window = tk.Toplevel(self.root)
        sell_window.title("Sell Product")

        tk.Label(sell_window, text="Product ID").grid(row=0, column=0, padx=10, pady=10)
        product_id_entry = tk.Entry(sell_window)
        product_id_entry.grid(row=0, column=1, padx=10, pady=10)

        tk.Label(sell_window, text="Customer Name").grid(row=1, column=0, padx=10, pady=10)
        customer_name_entry = tk.Entry(sell_window)
        customer_name_entry.grid(row=1, column=1, padx=10, pady=10)

        tk.Label(sell_window, text="Quantity").grid(row=2, column=0, padx=10, pady=10)
        sell_quantity_entry = tk.Entry(sell_window)
        sell_quantity_entry.grid(row=2, column=1, padx=10, pady=10)

        def process_sale():
            product_id = int(product_id_entry.get())
            customer_name = customer_name_entry.get()
            quantity = int(sell_quantity_entry.get())

            cursor.execute("SELECT price FROM Products WHERE product_id = %s", (product_id,))
            price = cursor.fetchone()[0]
            total_price = price * quantity

            cursor.execute("INSERT INTO Customers (name) VALUES (%s)", (customer_name,))
            conn.commit()

            customer_id = cursor.lastrowid

            cursor.execute("INSERT INTO Sales (product_id, customer_id, sale_date, quantity,
total_price) VALUES (%s, %s, %s, %s, %s)",
                           (product_id, customer_id, date.today(), quantity, total_price))
            conn.commit()

            cursor.execute("UPDATE Products SET quantity = quantity - %s WHERE product_id =
%s", (quantity, product_id))
            conn.commit()

            messagebox.showinfo("Success", "Product sold successfully!")
            sell_window.destroy()

        tk.Button(sell_window, text="Sell", command=process_sale).grid(row=3, column=0,
columnspan=2, padx=10, pady=10)

    def view_sales(self):
        cursor.execute("SELECT Sales.sale_id, Products.name, Customers.name, Sales.sale_date,
Sales.quantity, Sales.total_price FROM Sales JOIN Products ON Sales.product_id =
Products.product_id JOIN Customers ON Sales.customer_id = Customers.customer_id")
        sales = cursor.fetchall()

        view_sales_window = tk.Toplevel(self.root)
        view_sales_window.title("View Sales")

        for index, sale in enumerate(sales):
            tk.Label(view_sales_window, text=f"ID: {sale[0]}, Product: {sale[1]}, Customer:
{sale[2]}, Date: {sale[3]}, Quantity: {sale[4]}, Total Price: {sale[5]}").grid(row=index,
column=0, padx=10, pady=5)
```

```
if __name__ == "__main__":
    root = tk.Tk()
    app = InventoryApp(root)
    root.mainloop()

# Close the database connection
conn.close()
```

Database Code(MySQL):

```
CREATE DATABASE inventory_db;

USE inventory_db;

CREATE TABLE Products (
    product_id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    quantity INT NOT NULL,
    price DECIMAL(10, 2) NOT NULL
);

CREATE TABLE Suppliers (
    supplier_id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    contact VARCHAR(100)
);

CREATE TABLE Orders (
    order_id INT AUTO_INCREMENT PRIMARY KEY,
    product_id INT,
    supplier_id INT,
    order_date DATE,
    quantity INT,
    FOREIGN KEY (product_id) REFERENCES Products(product_id),
    FOREIGN KEY (supplier_id) REFERENCES Suppliers(supplier_id)
);

CREATE TABLE Customers (
    customer_id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    contact VARCHAR(100)
);

CREATE TABLE Sales (
    sale_id INT AUTO_INCREMENT PRIMARY KEY,
    product_id INT,
    customer_id INT,
    sale_date DATE,
    quantity INT,
    total_price DECIMAL(10, 2),
    FOREIGN KEY (product_id) REFERENCES Products(product_id),
    FOREIGN KEY (customer_id) REFERENCES Customers(customer_id)
);
```

OUTPUT SCREEN SHOTS:

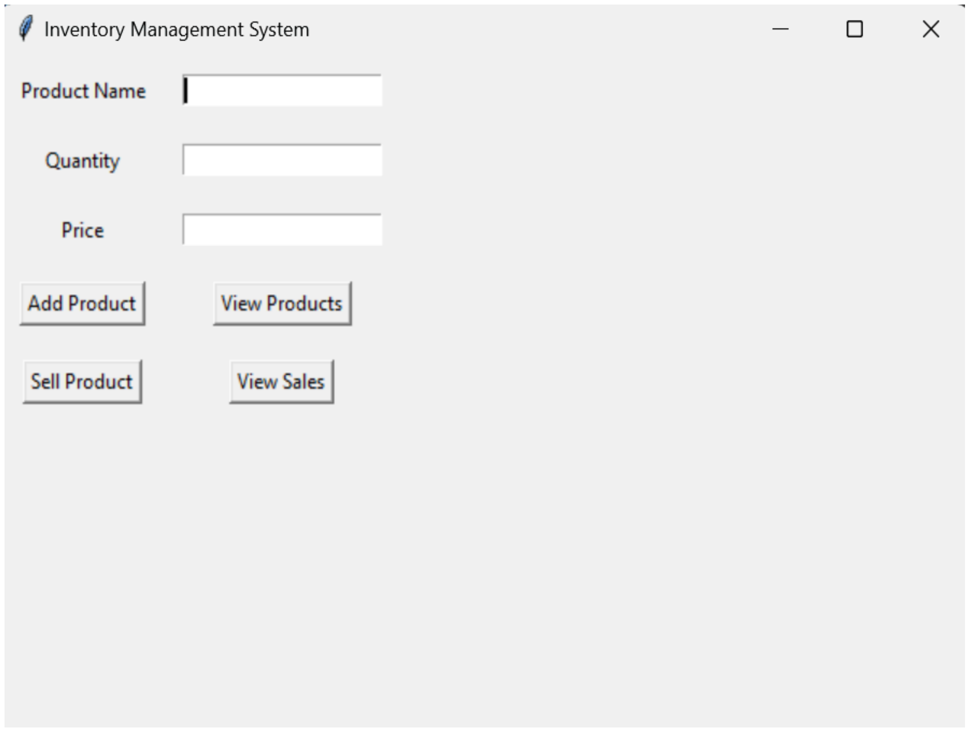
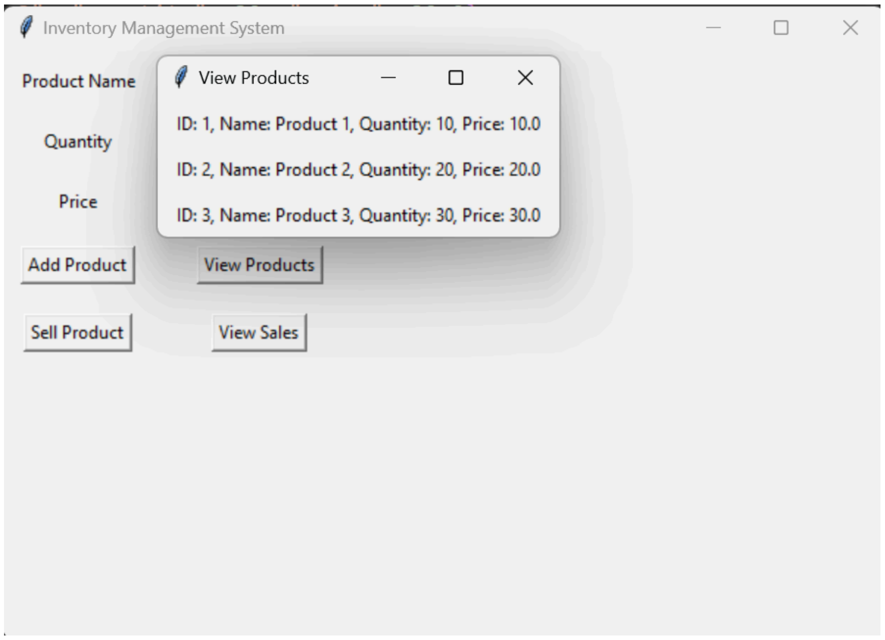


Figure 5.1: Inventory Management System



```
ID: 1, Name: Product 1, Quantity: 10, Price: 10.0
ID: 2, Name: Product 2, Quantity: 20, Price: 20.0
ID: 3, Name: Product 3, Quantity: 30, Price: 30.0
```

Figure 5.2: Inventory Management System

CHAPTER 6
CONCLUSION

The Inventory Management System (IMS) transcends a simple stockroom organizer. It's a digital workhorse that streamlines inventory control and unlocks valuable insights. Users interact with a user-friendly interface, barking commands through buttons and menus. Behind the scenes, the IMS translates their actions into a language the database understands, ensuring data integrity. It adds new items, updates existing ones, and deletes them with precision. Powerful search functionalities help users locate specific stock in a flash. But the IMS doesn't stop there. It acts as a vigilant watchdog, catching errors during data transfers and providing clear error messages for troubleshooting. Furthermore, the system empowers users to export their inventory data to a format compatible with other programs, unlocking the potential for in-depth analysis and strategic decision-making. In essence, the IMS bridges the gap between users and the database, transforming raw stock data into actionable insights. This newfound control empowers businesses to optimize stock levels, minimize waste, and ultimately, achieve a smoother-running, more profitable operations.

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