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Project Name:
GROCERYSHOP MANAGEMENT SYSTEM
Tushi Groceries

Chapter 1 (INTRODUCTION)

Purpose:
The purpose of this document is to define the scope, objectives, and requirements of the Grocery Shop Management System. This system aims to streamline daily operations of grocery stores, improve inventory management, enhance customer experience, and ensure efficient transaction handling.

Scope:
The Grocery Shop Management System is designed to handle inventory management, billing, order tracking, customer management, and supplier interactions. It is intended for small to medium-sized grocery stores aiming to digitize their processes and reduce operational inefficiencies.

Objective:
. Automate billing and checkout processes.
• Maintain real-time inventory updates.
• Facilitate online ordering and delivery services.
•Generate reports for sales, inventory, and profitability analysis.
•Improve customer satisfaction through loyalty programs and quick services.

System Overview:
- **Inventory Management:** Tracks stock levels, expiration dates, and supplier details.
- **Sales and Billing**: Provides a fast, user-friendly interface for generating invoices.
- **Customer Management:** Maintains customer profiles and purchase histories.
- **Supplier Management**: Records supplier details and manages orders and payments.
- **Reporting:** Generates analytical reports for sales trends and stock levels.

Why we need to develop this system?
1.Overcoming manual limitation
2.Improve inventory management
3.Enhance customer experience
4.Cost & Time efficiency
5.Scalability & future growth

Chapter 2 (STAKEHOLDERS)

What is stakeholders?

Stakeholders in a software system are individuals, groups, or organizations that are impacted by the system's development, use, or existence. They have a vested interest in the system's success and can influence its requirements, design, and functionality.

Who are the stakeholders for this system?

A list of three stakeholders for this system:

Shop Owner: Oversees the system's implementation and operation.

Store Manager: Uses the system for daily operational tasks, including inventory management and reporting.

Chapter 3 (Requirement Analysis)

What is requirement analysis?

Requirements Analysis is a fundamental stage in software development that focuses on determining the needs, expectations, and conditions that a new or modified product or system should fulfill. This process considers the often conflicting requirements of various stakeholders involved in the project.

Functional requirement table:

FR 1	**Registration**
Description	Users should be able to input their full name, email, phone number, and password to register.
Stakeholder	Store manager, Shop owner
FR 2	**Login**
Description	Registered users should enter their email and password to access their accounts. The system should validate the credentials and allow access only if they match stored data.
Stakeholder	Store manager, shop owner
FR 3	**Email and password storage**
Description	The system should hash user password and email before storing them to protect against unauthorized access and breaches.

Stakeholders	Shop owner
FR 4	**Load products from file**
Description	The system should be able to load product data from an external file during initialization or on demand to ensure all operations work on the latest dataset.
Stakeholders	Store manager, Shop owner
FR 5	**Add products**
Description	The system should allow users to add new products to the inventory, including product details like name, price, and stock quantity.
Stakeholders	Store manager, Shop owner
FR 6	**Search products**
Description	Users should be able to search for a specific product using criteria such as product variety or name.
Stakeholders	Store manager
FR 7	**Display products**
Description	The system should provide a feature to display a list of all available products along with their details, such as price, stock quantity, and description.
Stakeholders	Store manager
FR 8	**Sell product**
Description	The system should handle sales transactions, allowing products to be sold and updating the inventory accordingly.
Stakeholders	Store manager, Shop owner
FR 9	**Update stock**
Description	Users should be able to update the stock levels of existing products to reflect new inventory arrivals or adjustments
Stakeholders	Store manager, Shop owner
FR 10	**Select product**
Description	After searching product customer can select the products what they wants to buy
Stakeholders	Store manager
FR 11	**Delete product**
Description	The system should allow users to delete products that are no longer in inventory or being sold.
Stakeholders	Store manager
FR 12	**Return product**
Description	The system should handle product returns, ensuring stock is updated and any necessary refunds or exchanges are recorded.

Stakeholders	Store manager
FR 13	**Payment process**
Description	Allow users to view their order summary, enter payment information, and complete purchases securely. The system should confirm successful payment and provide order details.
Stakeholders	Store manager, shop owner
FR 14	**Exit system**
Description	Provide an option to exit the application gracefully, ensuring any unsaved data is preserved or the user is prompted to save before exiting.
Stakeholders	**All users**

Chapter 4

Use case diagram:
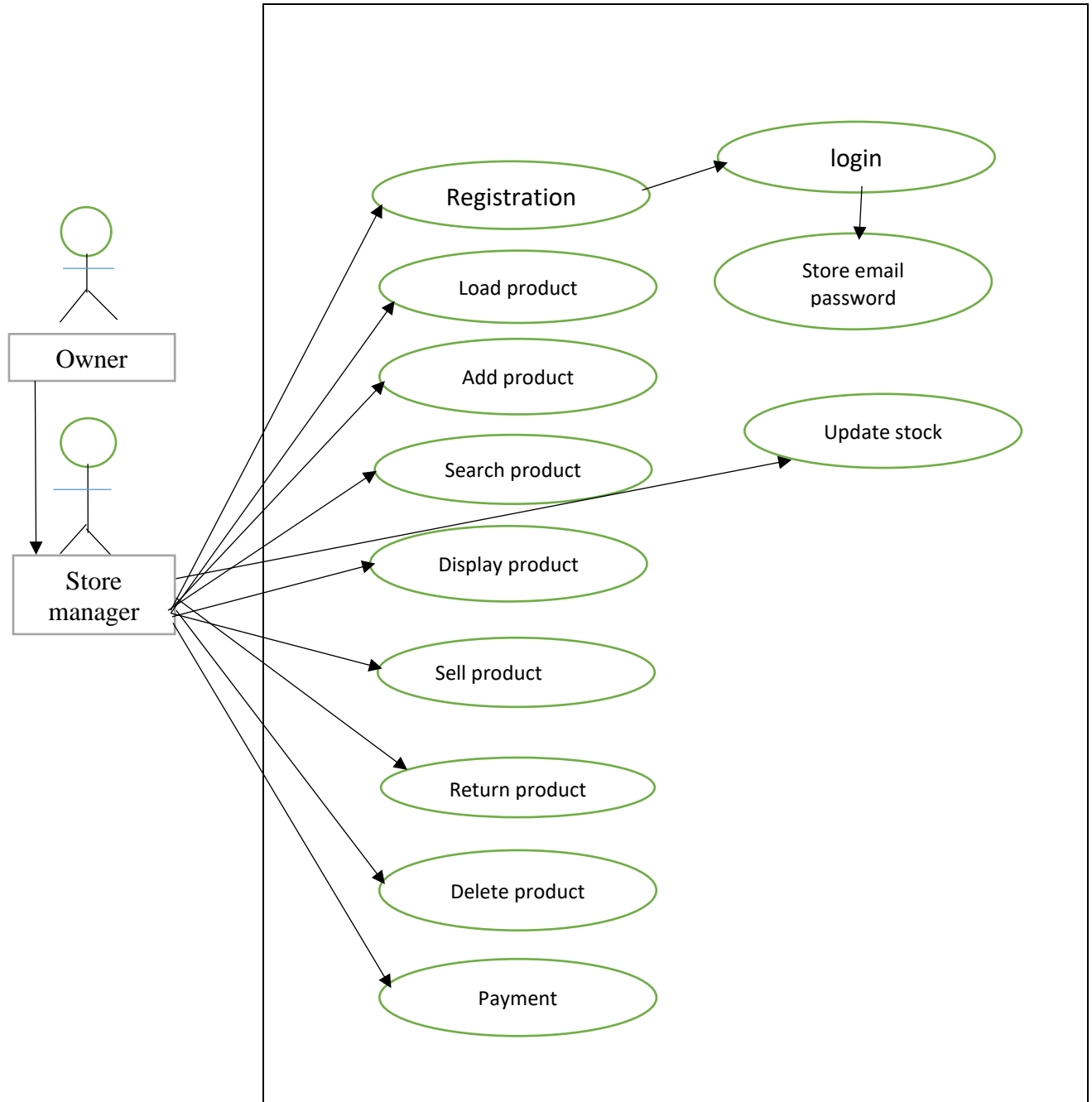
Chapter 5

Features Description

Below is a detailed description of key features for a **Grocery Shop Management System**, designed to streamline inventory, sales, and customer service operations.

1. **User Management**
- **Feature Description**:
    - Manage different user roles, such as administrators, store staff, and customers.
    - Features include registration, login, password management, and role-based access control.
- **Purpose**: Ensures secure access and tailored system functionality for various user types.

2. **Inventory Management**
- **Feature Description**:
    - Add, update, delete, and track products in the inventory.
    - Categorize items
    - Monitor stock levels and receive alerts for low inventory.
- **Purpose**: Maintain accurate inventory records and prevent stockouts or overstocking.

3. **Product Management**
- **Feature Description**:
    - Add new products with details like name, category, price, stock quantity, and supplier information.
    - Edit product information or remove discontinued items.
    - Search products by name, category, or ID.
- **Purpose**: Simplifies the process of organizing and retrieving product information.

4. **Sales Management**
- **Feature Description**:
    - Process transactions for selling products.
    - Generate invoices with details such as product name, quantity, price, and total amount.
    - Apply discounts or promotional offers.
- **Purpose**: Ensures smooth and accurate sales transactions.

5. **Purchase Management**
- **Feature Description**:

- Manage the purchase of stock from suppliers.
  - Record purchase orders, payment details, and delivery status.
- **Purpose**: Tracks supplier relationships and ensures timely restocking.

6. Billing and Invoice Generation
- **Feature Description**:
  - Automatically generate bills and invoices for purchases.
  - Provide options for digital or printed receipts.
- **Purpose**: Simplifies the checkout process and provides accurate documentation.

7. Reporting and Analytics
- **Feature Description**:
  - Generate reports on sales, inventory levels, profit margins, and customer trends.
  - Visualize data with charts and graphs for decision-making.
- **Purpose**: Helps managers analyze performance and plan future strategies.

8. Sales Tracking
- **Feature Description**:
  - Track daily, weekly, or monthly sales.
  - Identify top-selling products and peak sales times.
- **Purpose**: Improves inventory planning and identifies opportunities for growth.

9. Return Management
- **Feature Description**:
  - Process product returns and issue refunds or replacements.
  - Update inventory accordingly.
- **Purpose**: Ensures customer satisfaction and maintains accurate records.

Chapter 6 (Feature Showcase)

Welcome page:

```
WELCOME TO
..........
Tushi Groceries
.................
HERE YOU FIND BEST PRODUCT IN REASONABLE PRICE!!
.........................................

Current Time : Tue Dec  3 03:09:38 2024
.....................................

****** Welcome to Tushi Groceries System ******

Choose an option:
[1] Register
[2] Login
[3] Exit

Your choice:
```

Registration :

```
*********  REGISTER  *********

Full Name: Chingchon Yung

Email Address: chionchon@gmail.com
Enter Phone Number: 0170000001111

The password must contain at least 8 characters, including uppercase, lowercase, digit, and special character.
Enter password: *********
Registration Successful!
```

Login:

```
**********   LOG IN  **********

Email Address: chionchon@gmail.com
Enter password: *********
```

Menu:

```
****** Welcome to Tushi Groceries System ******

              Enter [1] To Add Product

              Enter [2] To Search Product

              Enter [3] To Display Product

              Enter [4] To Sell Product

              Enter [5] To Update Stock

              Enter [6] To Track Sales

              Enter [7] To Delete Product

              Enter [8] To Return Product

              Enter [9] To Exit


              Enter your choice [1-9]:
```

Add product:

```
Enter product name: Apple
Enter category: Fruit
Enter buy price: 160
Enter sell price: 195
Enter stock quantity: 112
Product added successfully!

Press Enter to return to the main menu, or any other key to add another product...
```

Search product:

```
Enter product name or category to search: Apple
Search Results:
Name: Apple
Category: Fruit
Sell Price: 195.00
Stock: 112

Press any key to return to the main menu...
```

Display product:

```
        Product Inventory:
        1. Name: Apple
        Category: Fruit
        Buy Price: 160.00
        Sell Price: 195.00
        Stock: 112
        2. Name: Orange
        Category: Fruit
        Buy Price: 130.00
        Sell Price: 150.00
        Stock: 68
        3. Name: Biscuit
        Category: Dry Food
        Buy Price: 20.00
        Sell Price: 30.00
        Stock: 45

        Press any key to go back to the main menu...
```

Sell product:

```
        Enter product name to sell: Apple
        Enter quantity to sell: 8
        Enter customer phone number: 01900011122
        Select payment method:
        1. Cash
        2. Card
        3. Mobile Payment
        Enter your choice: 1

        ------- RECEIPT -------
        Product Name      : Apple
        Quantity Sold     : 8
        Price per Unit    : 195.00
        Total Price       : 1560.00
        Payment Method    : Cash
        Customer Contact : 01900011122
        -----------------------
        Press any key to return to the menu...
```

Track sells:

```
**********  SALES REPORT  **********
Total Profit: 406.00

------ Sales Breakdown ------
Product: Apple        | Sold: 8      | Profit: 280.00
Product: Orange       | Sold: 4      | Profit: 80.00
Product: Biscuit      | Sold: 2      | Profit: 20.00

------ Payment Method Breakdown ------
Cash Payments: 1578
Cash Payments Count: 1

Card Payments: 635
Card Payments Count: 1

Mobile Payments: 60
Mobile Payments Count: 1

Total Sales Count: 5
Total Sales Transactions: 2273

Press any key to go back to the main menu...
```

Update stock:

```
Enter product name to update: Apple
Enter quantity to add: 3

Updated stock quantity for Apple = 107

Press any key to return to the menu...
```

Delete product:

```
Enter product name to delete: Orange
Product 'Orange' deleted successfully!

Press any key to go back to the main menu...█


  Product Inventory:
  1. Name: Apple
  Category: Fruit
  Buy Price: 160.00
  Sell Price: 195.00
  Stock: 107
  2. Name: Biscuit
  Category: Dry Food
  Buy Price: 20.00
  Sell Price: 30.00
  Stock: 43

  Press any key to go back to the main menu...█
```
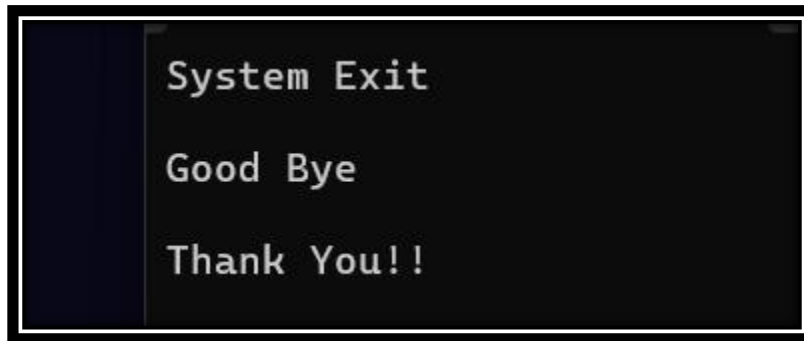
Return product:

```
Enter product name to return: Apple
Enter quantity to return: 5

Returned 5 units of 'Apple'.
Updated stock: 112

Press any key to return to the menu...█
```

Exit:

```
System Exit

Good Bye

Thank You!!
```

Chapter 7
(System Testing)

System testing is a critical phase in the software development lifecycle where a complete, integrated system is tested to verify that it meets the specified requirements. This level of testing is performed after integration testing and before acceptance testing. The main goal of system testing is to evaluate the system's compliance with the specified requirements. It involves testing the system as a whole in a fully integrated environment to ensure that it functions correctly and reliably.

Testing analysis for whole system:

1.Functional Testing

Objective: Verify that all features work according to the requirements.
- **Test Cases:**
    1. **User Login/Registration**:
        - Verify user can register with valid data.
        - Verify login with valid credentials and rejection with invalid credentials.
    2. **Product Management**:
        - Add, edit, delete, and search for products.
        - Check product details, including name, price, and quantity.
    3. **Sales Process**:
        - Verify product selection and billing processes.
        - Ensure stock levels decrease after a sale.

1. Integration Testing
Objective: Test interactions between different modules.
Test Cases:
1. Ensure seamless integration between inventory management and sales modules.
2. Verify updates in the database after product addition or deletion.

2. Security Testing
Objective: Ensure the system is secure and protects sensitive data.
Test Cases:
1. Test for SQL injection vulnerabilities in input fields.
2. Verify secure password storage using hashing.

3. Ensure access control mechanisms work (e.g., only admins can delete products).
4. Test session management, including timeout for inactive sessions.

4.Database Testing:
Objective: Validate database integrity, structure and operation.
Test case:
1.Verify data consistency after adding, editing or deleting records.
2.Ensure database constraints (emails for users, non-null product fields)   are enforced.
3.Test database performance for complex queries.

5.End-to-End Testing
Objective: Simulate real-world scenarios to test the complete workflow.
- **Test Scenarios**:
    1. User logs in, adds products, sells items, and generates reports.
    2. Admin updates stock and tracks sales while monitoring notifications.
    3. Customer returns a product, and inventory is updated accordingly.

Chapter 8
(Conclusion)

The Grocery Shop Management System is a comprehensive solution tailored to meet the unique demands of grocery store operations. By automating critical processes such as inventory management, sales tracking, and customer interactions, the system reduces manual workload, enhances accuracy, and improves overall efficiency. Its user-friendly interface and modular design make it accessible to staff with varying levels of technical expertise, ensuring seamless adoption and use.

Conclusion for Grocery Shop Management System
Comprehensive Automation:
The system automates critical processes like inventory management, sales tracking, and customer interactions, significantly reducing manual workload and errors.

User-Friendly Design:
Its intuitive interface and modular design ensure accessibility for users with diverse technical expertise, enabling easy adoption and use.

Actionable Insights:

Features like real-time sales updates, low-stock alerts, and detailed reporting empower store managers to make informed, data-driven decisions and optimize operations.

Enhanced Security:
With role-based access control, secure login, and encrypted data storage, the system ensures the safety of sensitive business and customer information.

Scalability for Growth:
The system's scalability supports growing inventories, expanding customer bases, and multi-store management, making it a sustainable solution for future business growth.

Operational Optimization:
By streamlining billing, returns, and stock updates, the system improves overall efficiency, freeing up time for store managers to focus on strategic priorities.

Customer Satisfaction:
Efficient billing, accurate stock availability, and a seamless shopping experience enhance customer service and foster loyalty.

Profitability and Competitiveness:
Through performance monitoring and analytics, the system aids in identifying opportunities to increase profitability and stay competitive in the retail market.

By adopting this system, grocery store owners can achieve higher operational efficiency, provide better customer service, and make informed decisions using data-driven insights. Ultimately, the Grocery Shop Management System serves as a valuable tool for driving growth, improving productivity, and staying competitive in the evolving retail landscape.