Software Requirements and Design Document

for

Retail Management System

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# Introduction

## Purpose

The **Retail Management System (RMS)** is a software solution specifically designed for small and medium-sized retail shops. This SRS document defines the requirements for RMS version 1.0, encompassing the system's full functionality, including inventory management, sales processing, and customer relationship management (CRM). The purpose of the RMS is to automate retail operations, reduce manual errors, and provide ease to customers by integrating takeaway service.

## Product Scope

The **Retail Management System (RMS)** is intended to support small and medium-sized retail businesses in optimizing their day-to-day operations. Its features include inventory tracking, sales automation, user management, customer relationship management, and takeaway service. By consolidating multiple retail management tasks into a single system, the RMS aims to improve accuracy, save time, and provide real-time data insights. It aligns with the goal of creating an affordable and user-friendly solution for businesses with limited financial resources.

## Title

*Retail Management System (RMS): Enhancing Retail Efficiency Through Automation and Real-time Insights*

## Objectives

*The project aims to:*

* *Provide a unified platform for inventory, sales, and customer management.*
* *Automate routine retail operations, reducing manual errors.*
* *Generate detailed reports, including graphical sales analysis.*
* *Improve inventory tracking and low Stock notification to minimize stock-outs and overstocking.*
* *Enable takeaway service for better customer convenience.*
* *Offer a cost-effective solution tailored to small and medium businesses.*

## Problem Statement

*Traditional retail management practices are plagued by inefficiency, lack of real-time insights, and human error. Small and medium businesses often rely on outdated POS systems or manual spreadsheets, which lead to poor inventory control, delayed reporting, and ineffective customer management. Moreover, existing POS are way too complex to use and not user friendly. These POS systems have very simple and traditional interface.*

*The Retail Management System addresses these challenges by providing an affordable, easy-to-use, and comprehensive solution. The system automates key processes, enhances accuracy, and offers actionable insights through reports. It is designed to be scalable and adaptable to meet the unique needs of smaller retail setups, ensuring improved profitability and operational efficiency. Moreover, it saves customer’s time through takeaway service.*

# Overall Description

## Product Perspective

*The Retail Management System (RMS) is a newly developed, self-contained software product tailored to address the operational challenges of small and medium-sized retail businesses. Unlike existing retail or Point-of-Sale (POS) systems, which may be outdated, overly complex, or too costly for smaller enterprises, this RMS is designed to be intuitive, cost-effective, and robust.*

*It is not an extension of an existing product family but rather a standalone solution built from the ground up. The system aims to replace manual methods and other legacy systems currently in use, which are prone to inefficiency and error. This software integrates essential retail functions such as inventory management, sales operations, user management, and real-time reporting into a cohesive platform.*

*The RMS interfaces integrates with standard hardware components such as barcode scanners and receipt printers. A high-level system architecture diagram showcasing components like the database, user interface modules, and integration with external devices is included to illustrate subsystem interconnections.*

## Product Functions

The Retail Management System (RMS) is designed to streamline key retail operations. The major functionalities include:

* **User Management**: Role-based access for three types of users—Admin, Cashier, and Customer.
* **Sales Processing**: Enabling sale transactions with item scanning and payment processing.
* **Inventory Management**: Automated tracking of product stock levels and management of restocking activities. Moreover, it maintains sales and purchases records or invoices.
* **Return Handling**: Simplified processes for managing product returns and issuing refunds.
* **Reporting and Analytics**:
  + **Sales Reports**: Detailed reports with graphical insights for overall sales performance.
  + **Daily Sales Reports**: Day-specific performance summaries, also with graphical representation.
* **Takeaway Service**: A module for managing takeaway orders efficiently.

## List of Use Cases

***USE CASE #1***

***a) Name***

*Manage Products*

***b) Scope***

*Retail Management System*

***c) Level***

*Subfunction*

***d) Primary Actor***

*Admin*

***e) Stakeholders and Interests***

*Admin: Ensures product information is accurate and up to date.*

*Customer: Expects correct product availability and details.*

***f) Preconditions***

*Admin is logged into the system with valid credentials.*

***g) Postconditions***

*Products are successfully added, updated, or deleted, and inventory is updated.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Admin logs into the system.* | *System validates credentials and grants access.* |
| *Admin selects 'Manage Products.'* | *System displays the product management interface.* |
| *Admin adds/updates/deletes a product.* | *System validates product details.* |
| *Admin submits the changes.* | *System updates the product in inventory.* |
| *Admin receives confirmation.* | *System confirms successful changes.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Invalid login credentials.* | *The system denies access and prompts the admin to re-enter valid credentials.* |
| *Product data is incomplete.* | *System alerts admin of missing/invalid information and prevents submission.* |
| *Database error during update.* | *The system displays an error message, logs the error, and rolls back changes.* |

***USE CASE #2***

***a) Name***

*Process Return*

***b) Scope***

*Retail Management System*

***c) Level***

*User Goal*

***d) Primary Actor***

*Cashier*

***e) Stakeholders and Interests***

*Customer: Expects a quick and smooth return process.*

*Retail Store: Wants efficient inventory updates when returns are processed.*

***f) Preconditions***

*Product is eligible for return, and cashier is logged in.*

***g) Postconditions***

*Return is processed, refund is issued, and inventory is updated.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Cashier logs into the system.* | *System validates credentials.* |
| *Cashier selects 'Process Return.'* | *System displays the return interface.* |
| *Cashier scans the product for return.* | *System checks return eligibility and updates inventory.* |
| *Cashier processes refund.* | *System processes refund and updates transaction logs.* |
| *Cashier provides return receipt.* | *System prints or emails receipt to the customer.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Return period expired.* | *System alerts cashier that the product is no longer eligible for return.* |
| *Product is damaged.* | *System requires manager approval before processing return.* |
| *Refund transaction fails.* | *System displays error and suggests retrying or selecting an alternate method of refund.* |

***USE CASE #3***

***a) Name***

*Sell Product*

***b) Scope***

*Retail Management System*

***c) Level***

*User Goal*

***d) Primary Actor***

*Cashier*

***e) Stakeholders and Interests***

*Customer: Expects a smooth and quick transaction process.*

*Retail Store: Wants accurate sales tracking and inventory updates.*

***f) Preconditions***

*Cashier is logged into the system, and the customer has selected products for purchase.*

***g) Postconditions***

*Sale is completed, inventory is updated, and receipt is generated.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Cashier scans items for sale.* | *System records the items and calculates the total price.* |
| *Customer confirms the purchase.* | *System updates the inventory and logs the sale.* |
| *Cashier processes payment.* | *System processes payment and updates sales records.* |
| *Cashier provides the receipt.* | *System prints or emails the receipt to the customer.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Product is out of stock.* | *System alerts cashier of the stock issue and prevents the sale from completing.* |
| *Payment method rejected.* | *System alerts cashier and requests an alternative payment method.* |
| *System crash during sale.* | *Sale is recorded for manual processing later and a receipt is generated when the system comes back online.* |

***USE CASE #4***

***a) Name***

*View Sales Reports*

***b) Scope***

*Retail Management System*

***c) Level***

*User Goal*

***d) Primary Actor***

*Cashier, Admin*

***e) Stakeholders and Interests***

*Admin: Monitors sales performance.*

*Cashier: Uses sales reports to inform business decisions.*

***f) Preconditions***

*User must be logged in with appropriate access.*

***g) Postconditions***

*Sales report is generated and displayed successfully.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *User logs into the system.* | *System validates credentials and access rights.* |
| *User selects ‘View Sales Reports’.* | *System displays the report generation interface.* |
| *User inputs the desired criteria (date range, etc.).* | *System retrieves sales data and processes the report.* |
| *User views or exports the report.* | *System displays the report and provides export/print options.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *No sales data found for criteria.* | *System displays a 'no data available' message.* |
| *Invalid date range entered.* | *System alerts user of invalid input and requests corrections.* |
| *System fails to generate the report.* | *System logs the error and informs the user to retry later.* |

***USE CASE #5***

***a) Name***

*Manage Users*

***b) Scope***

*Retail Management System*

***c) Level***

*Sub Function*

***d) Primary Actor***

*Admin*

***e) Stakeholders and Interests***

*Admin: Ensures only authorized personnel have access to specific system functions.*

***f) Preconditions***

*Admin must be logged in with appropriate access.*

***g) Postconditions***

*Users are successfully added, updated, or removed from the system.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Admin logs into the system.* | *System validates admin credentials and grants access.* |
| *Admin selects 'Manage Users.'* | *System displays the user management interface.* |
| *Admin adds, updates, or deletes a user.* | *System validates the user information and applies changes.* |
| *Admin submits changes.* | *System updates the user database and roles.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Invalid admin credentials.* | *System denies access and prompts re-entry of credentials.* |
| *User information is incomplete.* | *System prompts the admin to complete the missing fields.* |
| *System fails to update the user.* | *System logs the error and alerts admin of the failure to update the user.* |

***USE CASE #6***

***a) Name***

*Track Customer Loyalty Points*

***b) Scope***

*Retail Management System*

***c) Level***

*Sub Function*

***d) Primary Actor***

*System*

***e) Stakeholders and Interests***

*Customer: Wants to accumulate points based on purchases and redeem them for rewards.*

*Retail Store: Uses loyalty points to encourage repeat customers.*

***f) Preconditions***

*The customer is registered in the loyalty program, and purchase data is available.*

***g) Postconditions***

*Customer's loyalty points are updated based on their purchase.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Customer completes a purchase.* | *System identifies the customer through their loyalty account.* |
| *System calculates loyalty points.* | *System updates the customer's loyalty points balance.* |
| *System notifies the customer of updated points.* | *System logs the transaction in the customer purchase history.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Customer not in loyalty program.* | *System prompts cashier to register the customer in the program or proceed without points.* |
| *System error in calculating points.* | *System logs the error and notifies the cashier to retry or manually update the points later.* |

***USE CASE #7***

***a) Name***

*Handle Stock Alerts*

***b) Scope***

*Retail Management System*

***c) Level***

*Sub Function*

***d) Primary Actor***

*Admin*

***e) Stakeholders and Interests***

*Admin: Wants to be notified when stock levels are low to prevent stockouts.*

*Retail Store: Needs efficient stock management to ensure product availability.*

***f) Preconditions***

*The system is tracking stock levels for all products.*

***g) Postconditions***

*Admin is notified of low stock, and stock data is updated.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Stock levels fall below a defined threshold.* | *System detects the low stock level.* |
| *System generates a stock alert.* | *System sends the alert to the admin via email or notification.* |
| *Admin reviews the alert and takes action.* | *System logs the alert for future reference.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Admin does not receive the notification.* | *System logs the error and allows admin to manually check stock levels in the system.* |

***USE CASE #8***

***a) Name***

*Monitor Daily Sales Performance*

***b) Scope***

*Retail Management System*

***c) Level***

*User Goal*

***d) Primary Actor***

*Admin, Cashier*

***e) Stakeholders and Interests***

*Admin: Wants to track store performance to make informed business decisions.*

*Cashier: May need to check daily sales to manage cash register balances.*

***f) Preconditions***

*Sales data is being recorded throughout the day.*

***g) Postconditions***

*The system generates and displays the daily sales performance report.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Admin or Cashier logs into the system.* | *System validates credentials and access rights.* |
| *User selects 'Monitor Daily Sales.'* | *System retrieves and processes the sales data.* |
| *User views the daily sales report.* | *System displays the report with options to print or export.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *No sales data available for the day.* | *System notifies user that no sales data exists for the selected day.* |
| *System fails to generate the report.* | *System logs the error and prompts user to retry later.* |

***USE CASE #9***

***a) Name***

*Enable Takeaway Service*

***b) Scope***

*Retail Management System*

***c) Level***

*User Goal*

***d) Primary Actor***

*Cashier*

***e) Stakeholders and Interests***

*Customer: Wants a quick pickup experience for in-store orders placed online or via phone.*

*Retail Store: Needs to ensure inventory accuracy and timely pickup processing.*

***f) Preconditions***

*The customer has placed an order online or via phone for pickup.*

***g) Postconditions***

*The order is successfully retrieved from inventory and processed for pickup.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Customer arrives for pickup.* | *System alerts cashier of pending order for pickup.* |
| *Cashier retrieves the order.* | *System marks the order as ready for pickup.* |
| *Cashier processes the payment (if needed).* | *System updates inventory and logs the transaction.* |
| *Cashier hands the order to the customer.* | *System confirms the order is complete.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Order is not found in inventory.* | *System alerts cashier of inventory discrepancy, and customer is informed of the delay.* |
| *Payment fails (if not prepaid).* | *System prompts cashier to retry payment or ask for an alternate method.* |

***USE CASE #10***

***a) Name***

*Generate Invoice*

***b) Scope***

*Retail Management System*

***c) Level***

*Subfunction*

***d) Primary Actor***

*Cashier*

***e) Stakeholders and Interests***

*Customer: Expects a clear, itemized invoice for purchases.*

*Retail Store: Needs accurate invoicing for sales tracking.*

***f) Preconditions***

*The sale must be successfully processed, and the customer requests an invoice.*

***g) Postconditions***

*A clear and accurate invoice is generated and provided to the customer.*

***h) Main Success Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *Cashier completes the sale.* | *System calculates total amount, taxes, and applicable discounts.* |
| *Cashier selects "Generate Invoice."* | *System generates an itemized invoice.* |
| *Cashier reviews the invoice.* | *System provides options to print or email the invoice to the customer.* |
| *Cashier gives the invoice to the customer.* | *System logs the invoice in the sales database.* |

***i) Extensions/Alternate Scenario***

|  |  |
| --- | --- |
| ***Actor Action*** | ***System Responsibility*** |
| *System fails to generate the invoice.* | *System logs the error and informs the cashier.* |
| *Printer malfunction or email failure.* | *System prompts cashier to retry or select an alternative delivery method.* |

## Extended Use Cases

## Use Case Diagram

# Other Nonfunctional Requirements

## Performance Requirements

The Retail Management System (RMS) must ensure:

* **Response Time**: Transaction processing and page loading times should not exceed 2 seconds under normal operating conditions.
* **Scalability**: Support up to 500 concurrent users without degradation in performance.
* **Data Handling**: Efficient processing of large inventories (up to 10,000 products) and generation of reports within 5 seconds.

## Safety Requirements

* *Safeguards must prevent data loss during power outages, such as implementing regular auto-saving and backups.*
* *Preventive measures to ensure system integrity, such as error-checking during data input.*
* *Adherence to workplace safety standards for devices interacting with hardware (e.g., avoiding overheating of POS devices).*

## Security Requirements

* **Authentication**: Role-based access control with secure login for Admin, Cashier, and Customer users.
* **Data Protection**: All sensitive information, including customer data and financial records, must be encrypted (e.g., AES-256).
* **Regulatory Compliance**: Follow data privacy regulations such as GDPR or local equivalents.
* Implement logging to monitor unauthorized access attempts.

## Software Quality Attributes

* ***Usability****: The system must be easy to learn with an intuitive interface and tooltips for guidance.*
* ***Reliability****: Ensure 99.9% uptime with robust error-handling mechanisms.*
* ***Maintainability****: Modular design to facilitate updates and bug fixes.*
* ***Portability****: Compatibility with Windows, macOS, and Linux operating systems.*
* **Interoperability**: Integration with standard retail hardware like barcode scanners and printers.

## Business Rules

* *Only Admin users can add, update, or delete products and manage users.*
* *Cashiers can perform sales transactions, handle returns, and view sales reports but cannot make structural changes to the database.*
* *Customers can only interact with the takeaway module to place orders.*
* Discounts and promotions must be applied only as per predefined configurations by the Admin.

## Operating Environment

* **Hardware Requirements**:
* Minimum of 4GB RAM and 2GHz processor for client devices.
* Barcode scanners, receipt printers must be supported.
* **Operating System**: Windows 10+, macOS 10.14+, or Linux (Ubuntu 18.04+).
* **Database**: Compatible with MySQL or PostgreSQL.

## User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

# Domain Model

# System Sequence Diagram

# Sequence Diagram

# Class Diagram

# Component Diagram

# 

# Package Diagram

# 

# Deployment Diagram

# 