Software Requirements Specification

for

Smart Shop Management System

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Chapter 1

Introduction

1.1 Purpose

The purpose of this SRS document is to provide a detailed description of the software system designed for a super shop. The system aims to manage various aspects of supermarket operations, including purchasing, stock management, payment processing, customer tier management, return and reimbursement processes, loyalty points. This document will guide the development and ensure all stakeholder requirements are met effectively.

1.2 Intended Audience

The intended audience for this SRS includes:

1.2.1 Project Managers

1. **Role**: They are responsible for overseeing the entire project lifecycle.
2. **Responsibilities**:
   (a) Understanding and defining the project scope and requirements by engaging with stakeholders.
   (b) Creating detailed project plans, timelines, and budgets.
   (c) Coordinating with different teams to ensure the project stays on track.
   (d) Managing risks and resolving any issues that arise during the project.
   (e) Ensuring that the project meets its goals and delivers value to the stakeholders.

1.2.2 Developers

1. **Role**: They are tasked with designing and implementing the system according to the specifications.
2. **Responsibilities**:
   (a) Writing clean, efficient, and maintainable code.
   (b) Developing the system architecture and integrating various components.
   (c) Collaborating with project managers to understand requirements and with testers to ensure quality.
   (d) Conducting unit tests and debugging to ensure the system functions correctly.
   (e) Continuously improving the system based on feedback and new requirements.

1.2.3 Testers

1. **Role**: They ensure that the system meets the specified requirements and is free of defects.
2. **Responsibilities**:
   (a) Creating comprehensive test plans and test cases.
   (b) Executing various types of testing, including functional, performance, and security testing.
   (c) Identifying, documenting, and tracking bugs and issues.
   (d) Working closely with developers to resolve any defects.
   (e) Verifying that the system meets quality standards and user expectations.

1.2.4 End Users

1. **Role**: These are the individuals who will use the system in their daily operations.
2. **Responsibilities**:
   (a) **Super Shop Employees**: Using the system for tasks such as inventory management, sales processing, and customer service.
   (b) **Branch Managers**: Overseeing branch operations, generating reports, and making strategic decisions based on system data.

1.3 Product Scope

1.3.1 Inventory Management

1. Track and manage stock levels in real-time, ensuring that inventory data is always up-to-date.
2. Facilitate the addition of new supplies and removal of outdated or sold items.
3. Generate alerts for low stock levels to prevent stockouts and ensure timely replenishment.
4. Provide detailed reports on inventory turnover, helping to identify fast-moving and slow-moving items.
5. Support barcode scanning for efficient inventory tracking and management.

1.3.2 Customer Management

1. Tier customers into categories such as Platinum and Diamond based on their purchase history and loyalty points.
2. Manage customer profiles, including contact information, purchase history, and preferences.
3. Track and update loyalty points based on customer purchases and interactions.
4. Provide personalized offers and discounts to loyal customers based on their tier.
5. Generate reports on customer behavior and trends to help tailor marketing strategies.

1.3.3 Returns and Reimbursements

1. Process product returns efficiently, ensuring that returned items are logged and tracked.
2. Manage reimbursement policies based on customer tier and product condition, offering partial or full refunds as appropriate.
3. Generate return authorization numbers (RAN) to streamline the return process.
4. Track the status of returns and reimbursements, providing updates to customers.
5. Analyze return data to identify common issues and improve product quality and customer satisfaction.

1.3.4 Daily Deals and Discounts

1. Offer special deals and discounts that can be configured by branch managers to attract more customers.
2. Schedule deals and discounts in advance, allowing for automated activation and deactivation.
3. Customize deals based on customer segments, product categories, or specific items.
4. Track the performance of deals and discounts, analyzing their impact on sales and customer engagement.
5. Provide customers with notifications about ongoing and upcoming deals through various channels such as email, SMS, and in-app notifications.

1.4 Risk Definition

The development and implementation of the Smart Shop Management System involve several risks that need to be identified and managed to ensure the project's success. The following are the key risks associated with this project:

1.4.1 Technical Risks

1. **System Integration**: Challenges in integrating various components and technologies could lead to delays and increased costs.
2. **Data Security**: Ensuring the security of sensitive customer and inventory data is critical. Any breach could result in significant financial and reputational damage.
3. **Scalability**: The system must be able to handle increasing amounts of data and users as the business grows. Failure to scale effectively could impact performance and user satisfaction.
4. **Technology Obsolescence**: Rapid changes in technology could render parts of the system obsolete, requiring additional time and resources for updates.

1.4.2 Operational Risks

1. **User Adoption**: Ensuring that all users, including managers, employees, and customers, are adequately trained and comfortable using the system is essential. Resistance to change could hinder the system's effectiveness.
2. **Maintenance and Support**: Ongoing maintenance and support are necessary to address any issues that arise post-deployment. Inadequate support could lead to prolonged downtimes and user dissatisfaction.
3. **Vendor Dependence**: Relying on third-party vendors for certain components or services could pose risks if the vendor fails to deliver as expected or goes out of business.

1.4.3 Project Management Risks

1. **Scope Creep**: Uncontrolled changes or additions to the project scope can lead to delays, increased costs, and resource strain.
2. **Resource Allocation**: Ensuring that the project has sufficient resources, including skilled personnel and budget, is crucial. Misallocation or shortages could impact project timelines and quality.
3. **Timeline Adherence**: Meeting project deadlines is essential for timely delivery. Any delays in the project schedule could affect the overall success of the system.

1.4.4 External Risks

1. **Regulatory Compliance**: The system must comply with relevant laws and regulations. Non-compliance could result in legal penalties and operational disruptions.
2. **Market Changes**: Changes in the market environment, such as new competitors or shifts in customer preferences, could impact the system's relevance and effectiveness.
3. **Economic Factors**: Economic downturns or fluctuations could affect the project's budget and the overall business environment.

Chapter 2

Overall Description

2.1 User Classes and Characteristics

- **Branch Managers**: Responsible for configuring deals and discounts, overseeing store operations, and ensuring smooth functioning of the store. They also monitor sales performance and manage staff schedules.
- **Sales Staff**: Handle customer transactions, manage returns, and provide customer service. They assist customers with their purchases, answer queries, and ensure a pleasant shopping experience.
- **Warehouse Staff**: Manage inventory and stock levels, including adding new supplies and removing outdated or damaged items. They ensure that the inventory is well-organized and up-to-date.
- **Customers**: Purchase goods from the store, accumulate loyalty points, and request returns or deliveries. They interact with the system to browse products, place orders, and track their purchases.
- **System Administrators**: Maintain the system, manage user permissions, and handle technical issues. They ensure that the system is secure, up-to-date, and running smoothly.
- **Data Entry Operators**: Add products to the inventory, update product information, and ensure that the inventory data is accurate and current. They play a crucial role in maintaining the integrity of the inventory database.

2.2 User Needs

The Smart Shop Management System is designed to meet the needs of various users, including managers, employees, and customers. The following are the key user needs identified for this system:

2.2.1 Managers

1. **Inventory Control**: Managers need the ability to track and manage inventory levels in real-time, ensuring that stock is always up-to-date and preventing stockouts.
2. **Sales Monitoring**: Managers require tools to monitor sales performance, generate sales reports, and analyze sales data to make informed business decisions.
3. **Customer Insights**: Access to detailed customer profiles and purchase histories to tailor marketing strategies and improve customer satisfaction.
4. **Operational Efficiency**: Tools to streamline daily operations, including managing employee schedules, processing returns, and handling vendor relationships.

5. **Security and Compliance**: Ensuring that the system complies with relevant regulations and that sensitive data is protected.

2.2.2 Employees

1. **Ease of Use**: A user-friendly interface that allows employees to quickly learn and efficiently use the system for tasks such as sales processing and inventory management.
2. **Task Management**: Tools to manage daily tasks, including restocking shelves, processing transactions, and handling customer inquiries.
3. **Support and Training**: Access to training materials and support resources to help employees effectively use the system and resolve any issues that arise.

2.2.3 Customers

1. **Seamless Shopping Experience**: A smooth and efficient shopping experience, both in-store and online, with easy access to product information and availability.
2. **Personalized Offers**: Receiving personalized offers and discounts based on their purchase history and loyalty tier.
3. **Loyalty Program**: A robust loyalty program that rewards customers for their purchases and encourages repeat business.
4. **Customer Support**: Access to responsive customer support for any issues or inquiries related to their shopping experience.
5. **Notifications and Alerts**: Receiving timely notifications about new products, special deals, and important updates.

2.3 Operating Environment

Hardware Requirements

- **Android Devices:** The system should be compatible with a range of Android devices, including smartphones and tablets.
- **Peripheral Devices:** The system should support integration with peripheral devices such as:
  - Barcode scanners (via Bluetooth or USB)
  - Receipt printers (via Bluetooth or USB)

Software Requirements

- **Android Version:** The app should be compatible with Android version 8.0 (Oreo) and above.
- **Web-Based Access:** If applicable, the system should provide web-based access for branch managers and administrators to manage operations remotely.

Network Requirements

- **Internet Connectivity:** The system should operate over a secure and reliable internet connection to ensure data integrity and availability.

2.4 Constraints

2.4.1 Security Constraints

- The system must ensure that all sensitive data, including customer information and payment details, are encrypted during transmission and storage using industry-standard encryption protocols.
- Authentication processes must support multi-factor authentication (MFA) for administrators and managers to enhance security.
- All user sessions must automatically expire after a period of inactivity to prevent unauthorized access.
- Access to customer data and financial information is restricted based on user roles (e.g., managers can view revenue, but employees cannot).

2.4.2 Performance Constraints

- The system must be able to handle at least 1,000 concurrent users without significant degradation in performance.
- Response times for key user actions (e.g., adding items to the cart, checking out, and viewing product details) should not exceed 3 seconds under normal operating conditions.
- Inventory updates must be processed in real time to prevent discrepancies between available stock and customer purchases.

2.4.3 Usability Constraints

- The system must be accessible via desktop, tablet, and mobile devices, ensuring responsive design for various screen sizes.
- User interface elements must comply with accessibility standards (e.g., WCAG 2.1) to ensure that customers with disabilities can use the platform without barriers.
- The system must offer a multilingual interface to cater to a diverse user base.

2.4.4 Data Storage and Integrity Constraints

- All customer transaction data, including order history, must be stored for at least five years for auditing and legal compliance.
- Inventory data must be stored with high accuracy, and any system failure must not result in data loss. Regular backups must be maintained to recover from potential data corruption or loss.
- The system should prevent the duplication of records for customer accounts, orders, or product inventory.

2.4.5 Legal and Compliance Constraints

- All financial transactions must follow relevant tax laws and generate appropriate reports for taxation and auditing purposes.
- Return and refund policies implemented in the system must adhere to the store's legal obligations and local consumer protection laws.

2.4.6 Operational Constraints

- The system must be available 24/7, with planned maintenance occurring during non-peak hours and users being notified in advance of any downtime.
- The system must integrate with existing payment gateways, ensuring compatibility with major credit cards, digital wallets, and other payment options.

2.4.7 Third-Party Integration Constraints

- The system must be able to integrate seamlessly with third-party vendor systems to manage product returns and inventory replenishment.
- Integration with loyalty program services and gift card providers must follow external system specifications and ensure compatibility.

2.4.8 Scalability Constraints

- The system must be scalable to accommodate an expanding customer base and increasing sales volume without requiring significant modifications.
- The architecture must support the addition of new features (e.g., new loyalty programs, discounts) without major rework.

2.4.9 Time Constraints

- The system must process returns and refund requests within 24 hours of customer submission.
- Any offers, promotions, or loyalty points must be updated in real time across the platform.

2.5 Assumptions

The Software Requirement Specification (SRS) is based on the following assumptions:

2.5.1 User Participation

Assumes that users, including managers and customers, will actively participate in platform activities, such as managing accounts and performing transactions. This assumption forms the basis for the seamless borrowing and lending processes envisioned for the smart shop management system. Managers will handle regular stocking of inventory, allow transactions to happen, offer daily deals, and return damaged/expired goods to vendors. Customers will buy products, receive notifications, and enjoy other privileges.

2.5.2 User Proficiency

Assumes that managers, employees, and customers have a basic understanding of the system developed for them, allowing them to navigate and utilize the system effectively.

2.5.3 Administrator Authority

Assumes that administrators have the necessary skills and authority to manage and monitor all aspects of the shop management system, ensuring a compliant user base.

2.5.4 Document Accessibility

Assumes that all intended users have access to the SRS and can comprehend its content effectively, fostering a unified understanding of the project.

2.5.5 Document Relevance

Assumes that the tailored information in the SRS accurately addresses the specific needs and concerns of each stakeholder group.

2.5.6 Aligned Objectives

Assumes that the information provided in the SRS accurately aligns with the objectives and expectations of developers, testers, and project managers.

Chapter 3

Requirements

3.1 Functional Requirements

3.1.1 Providing Customer Notifications

As a **Customer**, I want to get notified if the products that I bought earlier have a discount on them on a particular day so that I can decide if I want to purchase them again.

Success:

1. Notifications are sent to customers when products they previously bought go on discount.
2. Customers can decide to repurchase discounted products based on the notifications.
3. After a purchase, if the customer's tier changes, they will be notified and receive discounts accordingly.

Failure:

1. If the notification system fails, customers do not receive alerts about discounts on previously purchased products.
2. Customers miss out on potential savings due to lack of timely notifications.
3. If the system fails to notify customers about tier changes, they may not receive the appropriate discounts.

3.1.2 Transaction Notifications and Text Receipts

As a **Customer**, I want to receive a text receipt on my phone every time I complete a transaction with the shop, so that I can have a complete and accessible record of my transaction for my records.

Success:

1. Both the customer and the store manager receive accurate and timely notifications for each completed transaction. Notifications contain all relevant transaction details, including item descriptions, amounts, and transaction times.
2. Customers receive text receipts promptly after the transaction is completed. Text receipts include comprehensive information, such as the transaction date, itemized list of purchases, total amount spent, and any applicable taxes or discounts.

3. Notifications and text receipts are sent reliably and without significant delays, ensuring customers and managers have immediate access to transaction details.

Failure:

1. Notifications are not sent to either the customer or the store manager, or the notifications contain incomplete or incorrect information. Notifications are delayed or fail to reach the intended recipients.
2. Customers do not receive text receipts after transactions, or the text receipts contain incorrect or incomplete information. Text receipts are delayed or not delivered to the customer's phone.
3. The information in the notifications or text receipts does not match the actual transaction details, leading to discrepancies and confusion.
4. There are frequent issues with the delivery of notifications or text receipts due to technical failures, network issues, or incorrect contact details.

3.1.3 Customer Profile Access and Information Management

As a **Customer**, I want to view my profile so that I have access to my basic information related to the shop.

Success:

1. Customers can view their profile and access their basic information related to the shop.
2. Customers can see all their purchase history, total purchases, and tier level.
3. Customers can update their personal information such as name, email, and contact number.
4. Customers can view their loyalty points and rewards.
5. Customers can see their saved payment methods for quicker checkouts.
6. Customers can access their order tracking information for recent purchases.

Failure:

1. If the profile view fails to load, customers are unable to access their basic information, purchase history, total purchases, and tier level.
2. If the system fails to update personal information, customers may not have the latest details reflected in their profile.
3. If loyalty points and rewards are not displayed correctly, customers may not be aware of their benefits.
4. If saved payment methods are not accessible, customers may face delays during checkout.
5. If order tracking information is not available, customers may not be able to track their recent purchases.
6. If the wishlist management fails, customers may not be able to view or update their wishlist items.

3.1.4 Payment Processing

As a **Customer**, I want to make payments using various methods so that I can complete my purchase conveniently.

Success:

1. Payments are successfully processed, and receipts are issued.

2. Users can view and manage their payment history accurately.
3. After a successful payment, a loyalty point will be added to the customer's profile.
4. An SMS notification will be sent to the customer confirming the payment.
5. A summary of the transaction will be sent to the manager.
6. The stock of each product will be updated on the system.

Failure:

1. Payment failures (e.g., declined card) prompt error messages and offer alternative payment options.
2. If the total payable amount is not paid, the decision will be based on the customer's tier.
3. Refunds and adjustments are handled according to store policies.

3.1.5 Receiving Return/Refund Request from Customer for Damaged Items

As a **Customer**, I want to return products and receive refunds or exchanges according to store policies so that I can resolve issues with my purchases.

Success:

1. Returns are accepted and processed within the allowed timeframes, with appropriate refunds or exchanges issued.
2. Communication regarding the status of returns is clear and timely.
3. If the customer is a diamond tier member, they are entitled to receive a refund instead of an exchange if they wish so.
4. The refund amount will be variable according to the product type and customer tier and how long the refund request is imposed after the purchase. (These terms will be set and may be subject to change as the manager sees fit).

Failure:

1. Returns outside the allowed timeframes or for items not meeting the return criteria are rejected with explanations.
2. Return requests are handled based on the condition of the product and customer tier.
3. Low tier customers do not receive a refund but need to buy alternative products.

3.1.6 Provisioning the Store with Supplies

As a **Data Entry Operator**, I want to assign an ID number to each new supply when restocking so that the product details can be easily tracked and managed in the store's inventory system.

Success:

1. The system allows the sales representative to input a unique ID number for each new supply.
2. The ID number is associated with the product details in the inventory system.
3. The product details are accurately updated in the system with the new ID.

Failure:

1. If the system fails to accept or properly store the unique ID number, the supply details are not recorded correctly.
2. If the product details are not updated or associated with the ID number, it leads to inaccuracies in inventory tracking.
3. In case of duplicate ID numbers or system errors, the sales representative receives an appropriate error message to address the issue.

3.1.7 Returning Defective Products to the Vendor

As a **Store Manager**, I want to return damaged goods to the vendor before they are shelved, so that the store is not burdened with unsellable items.

Success:

1. The system allows managers to successfully initiate returns and specify reasons for the return.
2. Inventory is updated in real-time when the return is processed.
3. Notifications are sent to both the vendor and the store manager once the return is initiated and completed.
4. The system provides clear tracking of return status (e.g., initiated, shipped, completed) at each stage.
5. The system correctly processes compliant return requests based on store policies.
6. Accurate records of the returns are generated for future audits.

Failure:

1. The system fails to initiate a return request, preventing the return of damaged goods.
2. Inventory is not updated correctly, resulting in inaccurate stock levels.
3. Notifications to the vendor or manager fail, causing a lack of communication and delays in the return process.
4. The system approves returns that do not comply with store policies, leading to unnecessary or invalid returns.
5. Incorrect or partial returns are not flagged or addressed, leading to discrepancies in the return process.
6. The system does not provide return status tracking, leaving the return's progress unknown to both the vendor and manager.

3.1.8 Administration of Loyalty Points and Discount Programs

As a **Customer**, I want to earn loyalty points for every dollar spent and use them for discounts on future purchases so that I can benefit from discounts based on my accumulated points and membership level.

Success:

1. The system automatically adds 1 loyalty point for every taka spent during a purchase.
2. The total loyalty points are updated in the customer's profile immediately after the purchase.
3. Customers can use loyalty points when their balance is 100 or more.

4. For 100 loyalty points, a $100 discount is applied to the purchase.
5. For platinum members, 105 loyalty points earn a $105 discount.
6. For crown members, 110 loyalty points earn a $110 discount.
7. The discount is applied based on the customer's membership level (standard, platinum, or crown) and the points they have available.
8. The system correctly identifies the membership level and applies the appropriate discount amount.

Failure:

1. If the system fails to add loyalty points accurately for each dollar spent, the customer's profile does not reflect the correct points balance.
2. If the system does not allow redemption of points below the 100-point threshold or fails to apply the discount correctly based on membership level, customers will not receive the intended benefits.
3. Errors occur if the discount amounts for platinum or crown members are not applied correctly, leading to incorrect discount application.
4. In case of a system malfunction or miscalculation, the discount applied might not match the customer's available points or membership benefits, leading to dissatisfaction and potential disputes.

3.1.9 Purchasing and Redeeming Gift Cards

As a **Customer**, I want to buy a gift card for someone and provide their contact number so that the gift card value is added to their profile, and both the giver and receiver earn loyalty points, so that both I and the recipient benefit from additional loyalty points, and the recipient can use the gift card value for discounts on their purchases.

Success:

1. The system allows the customer to purchase a gift card and enter the recipient's contact number.
2. The gift card value is added to the recipient's profile upon purchase.
3. Both the buyer and the recipient receive 20 loyalty points each as a reward for the gift card transaction.
4. The recipient's profile is updated with the gift card value, which can be used for discounts on future purchases.
5. The recipient can redeem the gift card for discounts according to its value, as with any other store credit.
6. The system correctly awards 20 loyalty points to both the customer who purchases the gift card and the recipient.
7. The points are added to their respective profiles immediately upon the completion of the gift card purchase.

Failure:

1. If the system fails to record the recipient's contact number or add the gift card value to their profile, the recipient will not receive the intended benefits.
2. If the loyalty points are not correctly awarded to both the buyer and recipient, the intended reward for the transaction is lost.
3. If the gift card value is not properly applied to the recipient's profile or is not redeemable, the recipient cannot use it for discounts.

4. Errors in applying the gift card value can result in incorrect discount amounts or failed transactions.
5. If the system does not credit the 20 loyalty points to both the giver and the receiver, the loyalty reward for purchasing and receiving the gift card will not be realized, leading to dissatisfaction.

3.1.10 Tier-Based Customer Privileges

As a **Customer**, I want to receive special deals and privileges based on my customer tier, so that I can benefit from tailored offers and discounts.

Success:

1. Accurate Tier Benefits: Customers are correctly assigned to their respective tiers, and discounts and privileges are applied accurately.
2. Immediate Updates: Changes in a customer's tier status are immediately reflected in the system, ensuring they receive appropriate benefits without delay.
3. Customer Awareness: Notifications about tier changes, upcoming deals, and exclusive privileges are effectively communicated to customers.
4. Visible and Accessible Deals: All tier-based deals and benefits are visible during the shopping and checkout process, enhancing customer satisfaction.

Failure:

1. Incorrect Tier Assignment: Customers are incorrectly placed in the wrong tier, leading to misapplied discounts or missed benefits.
2. Delayed Tier Updates: Changes in tier status are not reflected immediately, causing delays in providing benefits to eligible customers.
3. Lack of Communication: Customers do not receive notifications about their tier status or upcoming tier-based promotions, causing confusion or dissatisfaction.
4. Inaccessible Tier-Based Deals: Tier-based discounts or offers are not visible or applied during checkout, leading to customer frustration.

3.1.11 Manager's Observation and Authority

As a **Manager**, I want to view customer profiles and purchase records, add daily deals, receive product restocking suggestions based on weather forecasts and sales trends, and see all customer requests and complaints so that I can effectively manage the store's operations, make informed restocking decisions, enhance customer satisfaction, and optimize sales strategies.

Success:

1. The system allows the manager to access and view the profile information of all registered customers.
2. The manager can view detailed purchase records for any customer, including transaction dates, items bought, amounts spent, and any discounts or loyalty points used.
3. The manager can create and add daily deals to the system, specifying the products on offer and the discount rates.
4. Daily deals are updated in real-time and visible to all customers through the store's sales channels.
5. The system also highlights high-demand products ("hot cakes") that are selling quickly and need to be replenished.

6. All customer requests and complaints are displayed to the manager.
7. The manager can view details of each request or complaint and track their resolution status.

Failure:

1. If the system fails to display accurate or complete profile information and purchase records, the manager cannot effectively manage customer data and track transactions.
2. If the system encounters issues while adding or updating daily deals, the promotions may not be visible to customers, affecting sales and customer engagement.
3. If the system's recommendations for restocking are incorrect or not provided in a timely manner, it may lead to stock shortages or overstocking of products, impacting sales and customer satisfaction.
4. If high-demand products are not correctly identified, the store might miss opportunities for increased sales.
5. If customer requests and complaints are not properly displayed or tracked, the manager cannot address issues promptly, leading to potential customer dissatisfaction and unresolved problems.

3.1.12 Review and Feedback

As a **Customer or Employee**, I want to leave reviews and feedback and make requests, so that I can provide input on my experiences and receive support as needed.

Success:

1. Customers and employees can submit their reviews, feedback, and requests without errors, and the system successfully stores and categorizes them.
2. Reviews and requests are acknowledged within 24 hours of submission, with an initial status update provided.
3. Requests are resolved within the specified time frame (e.g., within 3 business days), and users receive clear resolutions or feedback.
4. Users receive timely notifications about the status and outcome of their submissions, including any required actions or resolutions.
5. Users can access a complete history of their reviews, feedback, and requests, including status updates and resolution details.

Failure:

1. Errors occur during the submission of reviews, feedback, or requests, preventing users from providing their input.
2. Feedback or requests are not acknowledged or addressed in a timely manner, leading to user dissatisfaction.
3. Users do not receive updates or notifications about the status of their submissions, causing confusion and frustration.
4. The system fails to track or display the history of feedback and requests, hindering accountability and opportunities for improvement.

3.2 Non Functional Requirements

3.2.1 Performance

Response Time

The system should respond to user actions, such as updating inventory or processing transactions, within 2 seconds to ensure a smooth user experience.

Transaction Processing

Payment and transaction processes, including product purchases and returns, should be completed efficiently. While actual processing may not be instantaneous due to offline constraints, the system should provide immediate feedback to users on the status of their transactions.

System Load Handling

The system should handle up to 10,000 transactions per day, ensuring smooth operations and minimizing delays during high usage periods.

3.2.2 Security

Data Encryption

All sensitive data, including user credentials and payment information, should be encrypted using AES-256 encryption to protect against unauthorized access.

Authentication

The system must implement secure authentication mechanisms, including support for multi-factor authentication (MFA), to enhance account security.

Access Control

Role-based access control (RBAC) should be enforced to ensure users have access only to the features and data appropriate to their roles, preventing unauthorized access.

3.2.3 Usability

User Interface

The user interface should be intuitive and easy to navigate, with a consistent design and user experience across all pages and functionalities.

Accessibility

The system should comply with WCAG 2.1 standards to ensure accessibility for users with disabilities, providing an inclusive experience for all users.

Help and Support

Users should have access to comprehensive help documentation and support options, including live chat and email support, to assist with any issues or questions.

3.2.4 Reliability

System Uptime

The system should achieve 99.9% uptime, ensuring high availability and minimal disruption for users.

Backup and Recovery

Regular backups of critical data should be performed, and a robust recovery plan should be in place to restore data in the event of a system failure.

Error Handling

The system should log errors and provide meaningful, user-friendly error messages, while ensuring that sensitive information is not exposed to users.

3.2.5 Compatibility

Browser Support

The system should be compatible with the latest versions of major web browsers, including Chrome, Firefox, Safari, and Edge, to ensure broad accessibility.

Mobile Compatibility

The system should be responsive and fully functional on mobile devices, including smartphones and tablets, to accommodate users accessing the system on various devices.

3.2.6 Maintainability

Code Quality

The system should adhere to established coding standards and best practices to ensure code readability, maintainability, and ease of future development.

Documentation

Comprehensive documentation should be provided for both end-users and developers, including user guides and API documentation, to facilitate understanding and system maintenance.

Modularity

The system should be designed in a modular fashion, allowing for easy updates and integration of new features without disrupting existing functionalities.

3.2.7 Performance Monitoring

Monitoring Tools

The system should integrate with performance monitoring tools to track key metrics and system health, enabling proactive management.

Alerts

Automated alerts should be configured to notify administrators of critical issues, such as server downtime or performance bottlenecks, to enable prompt resolution.

3.2.8 Data Integrity

Consistency

The system should ensure data consistency across all components, including inventory, user profiles, and transaction records, to maintain accuracy and reliability.

Validation

Input validation should be enforced to prevent incorrect or malicious data from being entered into the system, ensuring data integrity and security.