SOFTWARE REQUIREMENTS SPECIFICATION

For

Inventory Management System

TEAM: DRASTIC INNOVATORS

Done by: -

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1. Introduction

1.1 Purpose

An Inventory Management System (IMS) serves a pivotal role in optimizing business operations through efficient resource allocation. By preventing overstocking or stockouts, the system ensures that organizations maintain the optimal levels of inventory, minimizing holding costs and enhancing overall supply chain efficiency. Additionally, IMS plays a crucial role in cost control by providing real-time insights, enabling informed decisions on procurement, storage, and order fulfillment. This not only prevents excess inventory costs but also contributes to the efficient allocation of financial resources. Furthermore, the system directly impacts customer satisfaction by maintaining accurate inventory levels, ensuring timely order fulfillment, and reducing the likelihood of backorders. Moreover, IMS aids in forecasting and planning by leveraging data-driven insights, allowing businesses to anticipate demand trends, plan for seasonal fluctuations, and optimize stocking levels for future demand. Lastly, the system contributes to risk mitigation by providing visibility into inventory levels, helping businesses avoid issues such as obsolete stock, theft, or product obsolescence, ultimately enhancing overall business resilience in a dynamic marketplace. This project describes the software interface requirements using ERdiagrams.

1.2 Scope of Development Project

The Smart Inventory Management System functions as an online software application designed to meet the requirements of stock analysis across multiple godowns. It offers a user-friendly graphical interface for efficiently managing both daily transactions and historical data. The system generates management reports, including monthly inwards, deliveries, and returns, providing valuable insights. Operating with a centralized database ensures immediate reflection of any changes made at a specific location.

As an online tool, it allows concurrent logins for multiple users, promoting collaborative use. The primary objective of this application is to streamline and automate the management of transactions and historical data in diverse godowns, thereby reducing manual efforts. Additionally, it furnishes users with a convenient interface to access details such as daily stock statements for all godowns.

1.3 Definitions, Acronyms and Abbreviations

JAVA -> platform independence
SQL-> Structured query Language
ER-> Entity Relationship
UML -> Unified Modeling Language
IDE-> Integrated Development Environment
SRS-> Software Requirement Specification

1.4 References

- **Books**

1. Essentials of Inventory Management

   Author: Max Muller

2. Inventory Management Explained

   Author: David J

- **Websites**

- **https://www.ibm.com/topics/inventory-management**
- **https://www.selecthub.com/inventory-management/types-of-inventory-management-systems/**
- **https://dynamics.microsoft.com/en-in/field-service/inventory-management-system/**

2. Overall Descriptions

2.1 Product Perspective

Use Case Diagram of Inventory Management System

2.2 Product Function

Entity Relationship Diagram of Inventory Management System

2.3 User Classes and Characteristics

2.3.1 Users:

The major functionality of this product is divided into two categories.

1. Administrative User Functions.
2. Normal User Functions.

2.3.2 Administrative User Functions:

Administrators can perform the following task

- Create new users • Change the password
- Add/Update the details of Employees of the Company
- Add the information about the Godowns
- Can view the information about the Inwards

- Can view the information about the Deliveries
- Can view the information about the Returns
- Can view/generate management reports

2.3.3 Normal User Functions:

Normal users can perform the following task

- Change the password
- View the details of Employees of the Company
- View information of different Godowns
- Can add the information about the Inwards
- Can add the information about the Deliveries
- Can add the information about the Returns
- Can view management reports

2.4 Operating Environment

The product will be operating in windows environment. The Inventory Management System is a website and shall operate in all famous browsers, for a model we are taking Microsoft Internet Explorer, Google Chrome, and Mozilla Firefox. Also it will be compatible with the IE 6.0. Most of the features will be compatible with the Mozilla Firefox & Opera 7.0 or higher version. The only requirement to use this online product would be the internet connection.

The hardware configuration includes Hard Disk: 40 GB, Monitor: 15" Color monitor, Keyboard: 122 keys. The basic input devices required are keyboard, mouse and output devices are monitor, printer etc.

2.5 Assumptions and Dependencies

The assumptions are: -

- The coding should be error free.
- The system should be user-friendly so that it is easy to use for the users.
- The information of all users, books and libraries must be stored in a database that is accessible by the website.
- The system should have more storage capacity and provide fast access to the database.
- The system should provide search facility and support quick transactions.
- The Inventory Management System is running 24 hours a day.
- Users may access from any computer that has Internet browsing capabilities and an Internet connection.
- Users must have their correct usernames and passwords to enter into their online accounts and do actions.

The dependencies are:-

- The specific hardware and software due to which the product will be run.
- On the basis of listing requirements and specification the project will be developed and run.
- The end users (admin) should have proper understanding of the product.
- The system should have the general report stored.
- The information of all the users must be stored in a database that is accessible by the Stock Administrator system.
- Any update regarding the product from the stock is to be recorded to the database and the data entered should be correct.

2.6 Requirement

Software Configuration: -

This software package is developed using java as front end. My SQL Server as the back end to store the database.
Operating System: Windows
Language: Java Runtime Environment, Eclipse IDE (front end)
Database: My SQL Server (back end)

Hardware Configuration: -

Processor: Pentium(R)Dual-core CPU
Hard Disk: 40GB
ROM: 256 MB or more

2.7 Data Requirement

The Inventory Management System necessitates robust data management, encompassing product details like ID, cost, and quantity, along with transaction records capturing date, type, and quantities transacted. Supplier information, user accounts with role-based permissions, and location data are vital components. Comprehensive reporting and analytics, such as monthly stock reports and inventory valuation, contribute to informed decision-making. An audit trail logs system activities, ensuring accountability, while security and authentication data fortify the system against unauthorized access. Backup and recovery procedures, integration points, and user preferences further shape the data requirements for a resilient and user-friendly inventory management solution.

3. External Interface Requirement

3.1 GUI

The software provides good graphical interface for the user and the administrator can operate on the system, performing the required task such as create, update, viewing the details of the stocks.

- It allows user to view quick reports like Stocks Provide/Returned in between particular time.
- It provides stock verification and search facility based on different criteria.
- The user interface must be customizable by the administrator.
- All the modules provided with the software must fit into this graphical user interface and accomplish to the standard defined.
- The design should be simple and all the different interfaces should follow a standard template.
- The user interface should be able to interact with the user management module and a part of the interface must be dedicated to the login/logout module.

Login Interface: -

In case the user is not yet registered, he can enter the details and register to create his account. Once his account is created, he can ‘Login’ which asks the user to type his username and password. If the user entered either his username or password incorrectly then an error message appears.

Search: -

Users can search for products based on parameters like product name, ID, or category. Advanced filtering options to refine search results (e.g., by price range, quantity in stock). Instant display of search results with relevant product details. Support for barcode scanning to quickly locate products.

Categories View: -

Products organized into categories for a structured view. Expandable/collapsible category menus for ease of navigation. Display of the number of products within each category. Option to view and filter products based on selected categories. Visual cues or icons for different categories.

Administrator Control Panel: -

Create, modify, and delete user accounts with different roles (Admin, Manager, Clerk). Password management and user authentication controls. Configuration of system settings (e.g., currency, date format). Definition of reorder thresholds and alert settings. Add, edit, or remove products with details such as cost, selling price, and supplier information. Bulk import/export functionality for product data. Real-time monitoring of transactions with details like transaction type, date, and quantity. Historical transaction logs for audit purposes. Access to comprehensive reports (e.g., monthly inwards, outwards, returns). Analytics tools for data-driven decision-making. Access control settings to manage permissions for different user roles. Security logs to track login attempts and system activities. Configurable backup schedules and recovery procedures. Monitoring of backup status and logs.

4. System Features

The users of the system should be provided the surety that their account is secure. This is possible by providing: -

- User authentication and validation of user using their unique user ID.
- Add, edit, and delete product details such as name, ID, description, cost, selling price, and supplier information. Categorize products for organized inventory management. Bulk import/export functionality for efficient data handling.
- Proper accountability which includes not allowing a user to see other user's account. Only administrator will see and manage all users accounts.
- Real-time monitoring of inventory levels. Automatic update of stock quantities with each transaction. Reorder point alerts to prevent stockouts.
- Record and track all incoming and outgoing transactions. Differentiate between purchase transactions, sales transactions, and product returns. Capture transaction details such as date, time, product ID, and quantity.
- Scheduled backups to prevent data loss. Efficient recovery procedures in case of system failures.

5. Other Non-functional Requirements

5.1 Performance Requirement

- Define acceptable response times for various system operations, such as retrieving product information, updating stock levels, or generating reports.
- Fast response times contribute to user satisfaction and productivity. Specify the number of transactions or operations the system should be able to handle per unit of time.
- This metric is essential for determining the system's capacity to manage simultaneous user requests without degradation in performance.
- Address the system's ability to handle multiple users or transactions concurrently. It's important to establish the maximum number of users who can access the system simultaneously without a significant decrease in performance.
- Define the speed at which the system should retrieve and display data, especially critical for large datasets.
- Efficient data retrieval ensures that users can access the information they need promptly. Describe how the system should scale in response to increased load or

growing data volumes.

- Scalability ensures that the system can handle future growth without a substantial decline in performance.
- Implement load balancing mechanisms to distribute incoming requests evenly across multiple servers or resources. This helps prevent bottlenecks and ensures optimal resource utilization. Utilize caching strategies to store frequently accessed data temporarily. This reduces the need to fetch data from the database repeatedly, improving response times and overall system performance.
- Consider network latency and bandwidth requirements, especially for distributed inventory management systems. A well-optimized network is essential for seamless communication between different system components.
- Specify the time frame and performance expectations for batch processing tasks, such as inventory updates, data imports, or system backups. Efficient batch processing minimizes disruptions to real-time operations.
- This contributes to both performance and reliability. Monitor and optimize the utilization of system resources, including CPU, memory, and storage. Efficient resource management prevents system slowdowns and ensures a consistent level of performance.
- Define the time it takes to generate and deliver various reports. Reporting performance is critical for timely decision-making and analysis of inventory-related data.

5.2 Security Requirement

- System will use secured database.
- Normal users can just read information but they cannot edit or modify anything except their personal and some other information.
- System will have different types of users and every user has access constraints.
- Proper user authentication should be provided.
- No one should be able to hack user's password.
- There should be separate accounts for admin and members such that no member can access the database and only admin has the rights to update the database.

5.3 Requirement attributes

- There may be multiple admins creating the project, all of them will have the right to create changes to the system. But the users cannot do changes.
- The project should be open source.
- The Quality of the database is maintained in such a way so that it can be very user friendly to all the users of the database.

5.4 Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, make a decision, or infer new data from existing data. This includes the rules and regulations that the System users should abide by. This includes the cost of the project and the discount offers provided. The users should avoid illegal rules and protocols. Neither admin nor user should cross the rules and regulations.

5.5 User Requirement

The users of the system are members and Librarian of the university who act as administrator to maintain the system. The members are assumed to have basic knowledge of the computers and internet browsing. The administrators of the system should have more knowledge of the internalsof the system and is able to rectify the small problems that may arise due to disk crashes, power failures and other catastrophes to maintain the system. The proper user interface,

user manual, online help and the guide to install and maintain the system must be sufficient to educate the users on how to use the system without any problems.
The admin provides certain facilities to the users in the form of: -

- Backup and Recovery, Forgot Password.
- Data migration i.e., whenever user registers for the first time then the data is stored in the server.
- Data replication i.e., if the data is lost in one branch, it is still stored with the server.
- Auto Recovery i.e., frequently auto saving the information.
- Maintaining files i.e., File Organization.
- The server must be maintained regularly and it has to be updated from time to time.

6. Other Requirements

6.1 Data and Category Requirement

An effective inventory management system requires comprehensive data on product details, including item names, descriptions, quantities, and suppliers. Additionally, it necessitates real-time tracking of stock levels, reorder points, and sales transactions to optimize restocking processes. Categories such as product types, brands, and storage locations are essential for efficient organization and retrieval of inventory items. Integrating a user-friendly interface and reporting functionalities further enhances the system's ability to facilitate informed decision-making and streamline inventory control.

6.2 Appendix

A: Admin, Abbreviation, Acronym, Assumptions; B: Books, Business rules; C: Class, Client, Conventions; D: Data requirement, Dependencies; G: GUI; K: Key; L: Library, Librarian; M: Member; N: Non-functional Requirement; O: Operating environment; P: Performance, Perspective, Purpose; R: Requirement, Requirement attributes; S: Safety, Scope, Security, System features; U: User, User class and characteristics, User requirement;

6.3 Glossary

The following are the list of conventions and acronyms used in this document and the project as well:

- Administrator: A login id representing a user with user administration privileges to the software
- User: A general login id assigned to most users
- Client: Intended users for the software
- SQL: Structured Query Language; used to retrieve information from a database
- SQL Server: A server used to store data in an organized format
- Layer: Represents a section of the project
- User Interface Layer: The section of the assignment referring to what the user interacts with directly
- Application Logic Layer: The section of the assignment referring to the Web Server. This is where all computations are completed
- Data Storage Layer: The section of the assignment referring to where all data is recorded
- Use Case: A broad level diagram of the project showing a basic overview
- Class diagram: It is a type of static structure diagram that describes the structure of a system by showing the system’s cases, their attributes, and the relationships between the classes
- Interface: Something used to communicate across different mediums
- Unique Key: Used to differentiate entries in a database

6.4 Class Diagram