ASSIGNMENT 6

Course: CS253A
Software Development And Operations

SUPERMARKET INVENTORY MANAGEMENT SYSTEM

Software Requirement Specifications (SRS)

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1. Introduction

1.1 Purpose

The purpose of this SRS is to create, analyze and give an in-depth insight into the IMS for “Wonder Mart”, an on-site supermarket.
In the existing system, the entire process of inventory management has to be done manually. With the increasing number of customers for purchase every year, a maintenance system is essential to meet the demand. Also, manually keeping track of inventory levels, sales, and orders is both time-consuming and prone to error.
Hence, this system uses programming and database techniques to elucidate this process in an automated manner.
This system would help tackle problems that arise when doing this work manually and would prove to be beneficial to clients such as Wonder Mart and similar enterprises.

1.2 Scope

The system would provide an efficient interface to the supermarkets for managing their goods inventory. All the items present and their quantities in the supermarket will be stored in the database of the system. The system will analyze the total sale of each item in the store and will deduct the appropriate amount from the database. Then it will compare the available quantity to the baseline quantity of each item, and if it finds that the available quantity is less than the baseline quantity, a purchase order will be generated for that item(s) which will be sent to the manager(admin) for approval. Once the manager confirms the pending requests, an order will be placed and sent to the vendors. After each process, the system maintains and updates the inventory accordingly.

1.3 The domain

Though this software is designed for a specific client, i.e., Wonder Mart, it is intended to be used across a very wide domain. From a local grocery

store to a general-purpose supermarket, any enterprise in need of an IMS can use this software system to manage its inventory effectively with minor modifications on a need basis.
In the case of a single local store, the software could be used to keep track of the available goods and update its inventory. However, for a general-purpose supermarket chain with multiple branches across the city, the system could be modified to record the resources available in the warehouse, as a whole, for all the branches. For such supermarkets, the system would also keep track of the local inventories which have goods pertaining to that specific branch.

1.4 The client

The client could range from a local grocer to even a corporate organization of supermarkets. Any company can request the customization of the software system according to their needs.
For being able to use the software, the client must apply for a license. When applying for the license, the company must specify the type of store (or stores, in case of a chain of supermarkets) and specific customizations such as database modification, etc. The permissibility of the customizations will be discussed and approved at the time of license approval. The client can renew the license once in ten years.

1.5 The user

The end users are the store's managers and sales staff (in this case, the Wonder Mart staff). The managers would be involved in the approvals of vendor contracts, management of newly arrived goods, removal of goods, etc. This process is predominantly automated. The managers may need to login once or twice a week for order approvals, items management, etc.
The sales staff shall look after the regular inflow and outflow of stock at the customer level, entries of damaged or expired goods in the inventory, etc. They must log in at the start of every working day and log out before leaving the store.

1.6 Objectives and success criteria

The objective of this product is to provide an efficient IMS to the supermarket Wonder Mart to automate the inventory management process which was otherwise tedious and error-prone.
The success of this software depends on the accuracy in maintaining inventory levels, accuracy in notifying the manager regarding the replenishment of the items and placing the order accordingly, and handiness.

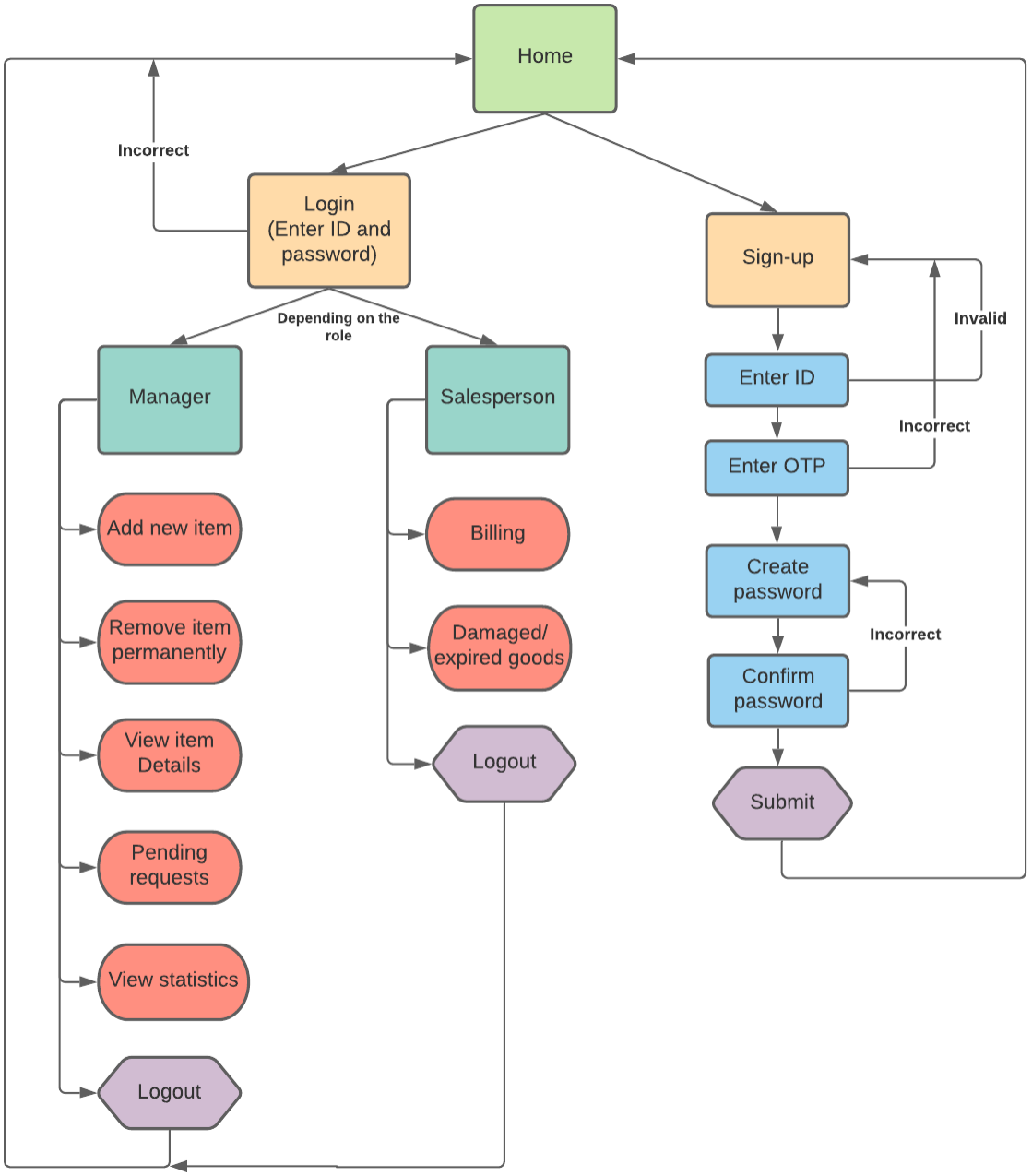
2. Overall Description

2.1 Product perspective

The product is designed to be used by the manager and the sales staff to keep a record of the sales and manage the inventory in an automated way. This product aims to serve Wonder Mart and similar enterprises that want to save time and effort by managing their goods inventory automatically.

2.2 Product functions

The major functions of the product are depicted in the form of a flow chart given below.



2.3 Design constraints

The system should run on any OS (Windows, Linux, Mac, Unix, etc.) that contains a web browser and supports PHP, JavaScript, and SQL database.

2.4 User characteristics

The system provides two roles for accessing and modifying data from the database. One is the manager, and the other is the salesperson.

The functionalities of each of these positions are given below:

- **Manager -** The manager will be able to perform the following functions-
    1. view the details of the items
    2. edit/approve/remove the pending purchase orders
    3. add/remove goods
    4. view statistics of the sales (daily, weekly, monthly, and yearly)
- **Sales staff -** The sales staff will be able to perform the following functions-
    1. update the inventory at the time of billing
    2. update the quantity of removed damaged /expired goods (if any)

2.5 Constraints, assumptions, and dependencies

- A full-time internet connection would be required for the working of our IMS.
- The IMS should be accessible 24x7 and should work in parallel for different users using the system at the same time.
- Details related to the sales staff, managers, items, and vendors should be provided to the system manually.

3. Specific requirements

3.1 External interface requirements

3.1.1 User interfaces

The system must be designed in a user-friendly way, with features that even a layperson can understand. The fonts and styles must be simple, and the web pages must load quickly (under 2 seconds). The web pages must not be overcrowded with information.
The default page is the home page that displays the company's logo/ store (in this case, the logo of Wonder Mart) along with options to

log in or sign up. Other interfaces in the product are the sign-up page, the login page, a screen displaying functions of the manager or sales staff, etc. All the other web pages should follow a similar format.

3.1.2 Hardware interfaces

The software only interacts with the system hardware. The system must have decent RAM and memory enough to run the software.

3.1.3 Software interfaces

Operating Systems - Windows, Linux, Unix, Mac OS, etc.
Development tools - PHP, JavaScript, CSS, SQL
Database - MySQL database server

3.1.4 Communication interfaces

The changes made to the inventory using the software must be communicated to the database as well.

3.2 Performance requirements

1. The system should not lag beyond 3 to 5 seconds.
2. In case the system hangs, there should be provisions to recover the data.
3. The system should update the database as and when the user makes changes to it (within 2 to 3 seconds).
4. The functions specified for the user should be available at all times when the system is on.
5. The values set explicitly by the user should not be changed by the system unless the user asks the system to do so.

3.3 Non-functional requirements

3.3.1 Reliability

- As and when the user confirms, the changes must get updated to the database.
- Multiple users should be able to update the database simultaneously using the system.
- In case the system hangs, on relaunching it must ask for a confirmation before making changes to the database.

3.3.2 Availability

- The system must be available 24x7 as long as it is connected to the power source and internet with sufficient speed although it is used only during the working hours of the store.

3.3.3 Security

- The system must be secure and should only give access to authorized users.
- The system must have a database consisting of the details of all the managers and sales staff, like their names and phone numbers. When the details of the user are updated to the database, the user is assigned a unique login ID by the system. The users must generate their passwords at the time of sign-up via an OTP system linked to their registered mobile numbers.
- The user must log in using his/her login ID and password to access the functions of the software at the start of the day and log out once they finish their work for the day.

3.3.4 Maintainability

The system must be designed in a way that is easy to maintain.

3.3.5 Usability

- The system must be easily navigable and easy to use by both the managers and the sales staff.

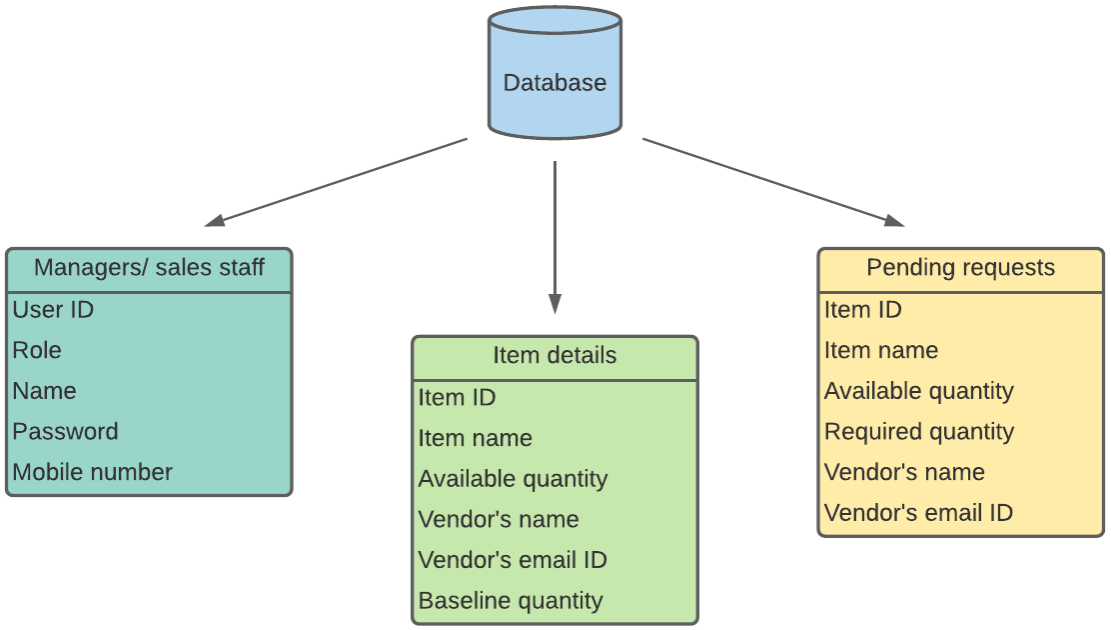
- The system must be simple and intuitive, with buttons that are easy to understand.

3.4 Logical database requirements

All the required data is stored in the database of the system. The following tables must be included in the database.

- Managers/ sales staff- This table of the database stores details of the managers and sales staff members.
- Item details- This table of the database stores details of all the items that are sold in the store.
- Pending requests- This table of the database stores details of all the pending requests of the purchase order.

A schematic of the tables and corresponding attributes the database must have is given below.



3.5 System features

The system must consist of several functions that enable the efficient and user-friendly management of the supermarket's inventory. The quantities

of various goods are monitored and updated to the databases by the system. When the quantity of a certain item falls below the baseline, the system alerts the user (the manager) to place an order to replenish the item.
The main features the system must have are described below.

3.5.1 Sign-up, login, and logout

- The sign-up feature is used to create an account for a new user. To initiate this process, users must click on the 'sign-up' button and then enter the ID provided to them by the store. This will send an OTP to their registered mobile numbers. On entering the correct OTP, the system directs the user to the page where they must create a password. After clicking on the 'submit' button, their account will be created successfully, and the password will get stored in the sales-staff/managers table of the database.
- The login feature enables the user to log in to his/her account and access the various functionalities of the system. On entering the user ID and the corresponding password, the system will go through the sales-staff/manager table of the database and checks if the entered data is valid or not. If yes, it will direct the user to the main screen depending on his/her role.
- The logout feature is for the user to log out of the software. Clicking on the 'logout' button directs the user back to the home page.

Functional requirements:

1. A button for sign up, log in, log out, and submit
2. A table in the database containing information of all the authorized users

3.5.2 Billing

- This feature is accessible only by the sales staff.

- This feature allows the staff member to update the inventory at the time of billing. On clicking the 'billing' button, the system directs the user to a web page that displays a screen asking for the item ID and its quantity. After entering these details, the user must click the 'add' button to add it to the list. This list gets displayed on the screen along with an additional column with a 'delete' option for each row. Once the user enters the details of all the items purchased by the customer, he/she clicks the 'confirm' button.
- On confirmation, the items table of the database gets updated with the new reduced quantities. If the quantity of any of these items falls below the baseline quantity, a request gets generated wherein the pending requests table of the database gets updated with the data corresponding to that item from the item table. The 'required quantity' field of the pending requests table stores the value equal to five times the baseline quantity of that item.

Functional requirements:

1. A button for billing, add, delete and confirm
2. A table in the database containing the details of each item
3. A table in the database containing the details of each pending request

3.5.3 Damaged/expired goods

- This feature is accessible only by the sales staff.
- This feature allows the staff member to update the inventory after the removal of damaged or expired goods from the store. On clicking the 'damaged/expired goods' button, the system directs the user to a web page that displays a screen asking for the item ID and the quantity removed. Once the user enters the details, he/she must click on the 'confirm' button. Once confirmed, the items table of the database gets updated with the new reduced quantity.

- If the quantity of the item falls below the baseline quantity, a request gets generated wherein the pending requests table of the database gets updated with the data corresponding to that item from the items table. The 'required quantity' field of the pending requests table stores the value equal to five times the baseline quantity of that item.

Functional requirement:

1. A button for damaged/expired goods and confirm
2. A table in the database containing the details of each item
3. A table in the database containing the details of each pending request

3.5.4 Add/remove items

- This feature is accessible only by the managers.
- The add item feature is used to update the database by entering the details of an item that has newly arrived at the store. The manager must enter the name, quantity, vendor's name, vendor's email ID, and baseline quantity of the item. After that, the system generates a unique ID for that item. All this information gets stored in the item details table of the database.
- The remove item feature is used to update the database by removing the data of those items which are no longer being sold in the store. The manager must enter the item ID. Then, the system displays the details of that item and asks for confirmation, after which all the information corresponding to that item gets erased from the database permanently.

Functional requirements

1. A button for add item, remove item, confirmation, and cancellation
2. A table in the database containing the details of each item

3.5.5 View item details

- This feature is accessible only by the managers.
- This feature allows the manager to see the details of all the items in the store. On clicking the 'view item details' button, the system directs the user to a web page that displays all the information present in the item table of the database in a tabulated form.
- The web page also has an 'edit baseline' column which has the buttons 'edit baseline' corresponding to each item. The user can click this button to change the baseline quantity of that particular item and can confirm the edit by clicking the same button, now named 'confirm'. Once confirmed, the change gets updated to the database.

Functional requirement:

1. A button for view item details and edit baseline/ confirm
2. A table in the database containing the details of each item

3.5.6 Pending requests

- This feature is accessible only by the managers.
- This feature is used by the manager to edit, approve or delete pending purchase order requests. On clicking the 'pending requests' button, the system directs the user to a web page that displays all the information present in the pending requests table of the database in a tabular form.
- This list consists of the details of all the items whose quantities have reached below their respective baseline quantities.
- The tabular form also consists of three columns with the options 'edit', 'approve' and 'delete' corresponding to each request. The data in the columns 'required quantity', 'vendor's name', and 'vendor's email ID' can be modified using the 'edit' option. By default, the 'required quantity' field is set to five times the baseline quantity of that item, and the 'vendor's name' and 'vendor's email ID' fields are set to those corresponding to that item.

- The ‘approve’ button generates the purchase order and sends an email to the corresponding vendor’s email ID. Once clicked, the ‘approve’ button gets converted into an ‘order received’ button. As and when the order is received from the vendor, the manager clicks the ‘order received’ button, after which the quantity of that particular item gets updated in the item table of the database, and that particular row gets erased from the pending requests table of the database and from the web page. In case the order doesn’t arrive, the manager can press the ‘delete’ button.
- The ‘delete’ button simply deletes the pending request. Once deleted, that particular row gets erased from the pending requests table of the database and the webpage.

Functional requirement:

1. Buttons for pending requests, edit, approve/ order received, and delete
2. A table in the database containing the details of each item
3. A table in the database containing the details of each pending request

3.5.7 View statistics

- This feature is accessible only by the managers.
- The view statistics feature is used to display the statistics of the inventory of the supermarket. On clicking the ‘view statistics’ button, the user can see a list of all the item names along with their IDs. Each of these item names can be clicked to view the statistics of that particular item. On clicking a particular item, the user can see four buttons, namely ‘daily sales’, ‘weekly sales’, ‘monthly sales’, and ‘yearly sales’.
- On clicking the ‘daily sales’ button, the user is asked to enter the number of days, say n, and click enter, after which he/she is presented with a graph showing the quantity of that item sold in the past n days.

- Similarly, on clicking the ‘weekly sales’/ ‘monthly sales’/ ‘yearly sales’ buttons, the user is asked to enter the number of weeks/months/years, say n, and click enter, after which he/she is presented with a graph showing the quantity of that item sold in the past n weeks/months/years.

Functional requirements

1. A button for view statistics, each item name, daily sales, weekly sales, monthly sales, yearly sales, and enter
2. A table in the database containing the details of each item

4. Glossary

- **Inventory**- A detailed list of items that are present in the supermarket.
- **Manager**- The person who handles all the administrative work of the supermarket.
- **Software/product/system** - Refers to the software system being described in the SRS.
- **Sales staff** - The staff members in the supermarket who are in charge of the sales.
- **Vendor**- The company/person that provides the supermarket with the required goods.
- **Goods/items**- The things that are available for sale in the supermarket or to be purchased by the supermarket.
- **Order**- The list of items and the quantities that are to be purchased from the vendor.
- **IMS**- Inventory Management System
- **OS**- Operating system
- **OTP**- One-time password
- **PHP**- Hypertext Pre-processor
- **CSS**- Cascading Style Sheets
- **SQL**- Structured Query Language