1. Hospital Management System

Hospital management system is a computer system that helps manage the information related to health care and aids in the job completion of health care providers effectively. They manage the data related to all departments of healthcare such as,

- Clinical
- Financial
- Laboratory
- Inpatient
- Outpatient
- OT
- Materials
- Nursing
- Pharmaceutical
- Radiology
- Pathology

Objective

- **Computerization** – All the details regarding hospitals, whether it is small or big, will be computerized.
- **Automated inventory** – If the medicines are provided to the patients, the stock will be reduced in the inventory, and will help in to know the status of the available medicines.
- **No redundancy** – For every test that is conducted of the patients, an automated report will be generated and will be available to the patients and his / her concerned doctor uniformly.
- **Keep the Records** – It will be an easier task for the management to keep the record of the patients for historical purposes.
- **Appointment** – It will be easier for both the doctors and the patients to have the appointments.

Required Features:

- Multi-user account system
- Monitoring the whole hospital system
- Management of all type of users' account
- Notice Board
- Appointment Management
- View Appointments
- Notifications
- Medical History
- Invoice Management
- Medical Report Management
- Internal Communication
- Responsive User Interfaces

Modules Description

There are eight types of users involved in a hospital management system:
- Admin
- Doctor
- Patient
- Nurse
- Receptionist
- Pharmacist
- Accountant
- Laboratories

Admin Module

It is the most powerful user of the system.

- There will be only one admin in the system.
- The admin can create and manage all other 7 user accounts. He/she can delete any account according to need.
- The admin can monitor all the activities of the hospital. Whatever is going on in the hospital, will be available in the admin panel.
- If others violate the codes of the hospital, he can take immediate action and can charge that user.
-

Before discussing the other 7 modules, let us understand some common features, which will be involved in these modules and their functionalities will be the same across all of the seven modules.

Entering Into the System (registration)

Every single type of user except admin will go through the initial phase i.e. registration in order to start with the system. The registration process will not be exactly the same for all types of users.

The following are the common requirement fields:
- **Name** – The user will be asked to enter his/her full name.
- **Password** – It is the key field that will help the user to have a secure account in the system.
- **Contact No.** – The concerned user should also provide his personal mobile number or residence contact number so that he/she can be contacted at the time of need.
- **Email ID** – Now, the email address has become the for the communication purpose, verifying the users involved in the system. It helps in making the authenticated system.

Verification

- When the user enters all the above details in the valid form, he/she should read the terms and conditions, and policy.
- If he/she is satisfied with all the statements stated in those terms and conditions on, policy page, he/she should tick the checkbox.
- When this registration process is completed successfully, a mail will be sent to the email address for verification purposes.

- The user will have to follow simple order of instructions. After completion of these steps, a unique id will be generated and given to the concerned user, which will be mainly used later on as patient ID, doctor ID, accountant ID, nurse ID, etc.

Login

This is also the main common feature of the hospital management system. Every type of user will have to enter his / her unique id as login id, which was given to her/him after completing the email verification, and the password. If both login id and password are matched with the credential stored in the system, the user will be granted access to the system.

For every type of user there will be different view and different privileges of the system.

Forgot Login ID or Password

- **Via Email** – The users just have to enter their respective valid registered email ids into the field. An immediate email will be sent to their respective email ids with some set of instructions to recover the login id and password.

Change Password

Security plays a vital role in any system. Suppose, someone knows the login id and password combination, that would be a threat. That burglar may misuse the system, steal private information, etc. So, if any user suspects his / her login credentials are compromised, that user must change his / her password immediately.

Edit Profile

It is another common feature of this management system. It is not possible to ask for all the important information from the user at the time of registration. This would make the difficult time for the user who is trying to create the account for the first time in the system. So, a user can enter his/her personal information anytime they want.

One of them is the address. It is mandatory for some future communications. It consists of the apartment number, area name, street name, city name, zip code, country name, etc.

The following are some additional information that needs to be updated:
- Date of Birth.
- Age.
- Gender.
- Height and Weight – (For patients).
- Profile Photo – The user must upload his / her profile photo after the first login.
- Designation – (For Hospital staffs).

And, the users can update any of these fields or their contact numbers any time they want.

Other Modules:

Receptionist

The receptionist will be the user that will keep tabs on the appointments. This user will maintain the timetable of each doctor. This timetable of each doctor will be available to the patients. The other task the receptionist can do is, filtering the appointments based on doctors and time periods so that it is easy to access the appointment record.

Accountant

An accountant is a user who deals with the financial transactions of the hospitals. All the payment information and invoices will be managed by the accountant.

Pharmacist

All the medicines and their information in the hospital are managed by the pharmacists. He/she can view which medicines are in the stocks and which are to be needed. He/she can filter the medicines based on date i.e. expired date so that it is easier to know which medicines are going to expire so that those can be arranged at the hour of the need.

When the patient provides the prescription to the pharmacist, the pharmacist can provide the appropriate medications to the concerned patient.

Patient

A patient can make an appointment with the available doctors. The timetable will be shown which is directed by the receptionist. When the doctor approves the appointment, the patient will be notified via SMS/Call

The patient can view the doctor's report about his / her appointment and his / her prescription details. Thus, the patient can clearly know what has happened to him/her and how she or he should take care of herself or himself. If there are some serious health issues and the patient is needed to be admitted into the hospital, the bed would be allotted to him or her.

The patient can view the information about the allotted bed. The patient can also have a private massage session with the doctors.

Nurse

The nurse is an assistant to the doctor. The nurse helps the doctors in performing the operations. Nurse takes the diagnostic report and provides it to the doctor.

Laboratories

Whenever a patient is asked by the doctor to have some tests, so that the doctor can prescribe some medications according to the test result, the patient goes to the lab. Their lab assistant diagnoses some tests and generates the reports. This report further is handed over to the nurse's account.

Doctor
- The doctor is the user who will help the patients with their physical health. The doctor will be able to approve the appointments whether he or she wants to take them or not.
- If the doctor wants, he or she can cancel the appointments. The concerned patient will be notified via SMS.

- The doctor can view the medication history of the patients. The doctor can provide prescriptions to the patients.
- The doctor will be able to have a private conversation with the patients. There might be a chance when the patient needs medical assistance at home or anywhere but a hospital. So, I will provide a private massage room for the doctor and patient.

2. Hotel Management System

Hotel Management System is a web-based application that allows the Hotel Manager & Owner to handle all hotel activities online easily and safely. Using Interactive GUI anyone can easily learn to use the complete system. This Proposed System provides room booking, staff management, and bill generation features. The system will be so simple and attractive which will make the customer comfortable to use and choose their ideal room. The system allows the Owner to check the Progress of the hotel from interactive Graphs and he will be notified of each new change made in System.

The system allows the manager to keep track of available rooms in the system and even maintain staff details like their hours worked and salary. Customers can view and book an available room online and the system will automatically generate the bill according to the number of days the type of room is booked.

Required Modules

Owner Profile:

In the Owner profile, he has full access to the system. The owner can view all the details in a graphical way and he has the authority to change the Cost of Room, Room Availability, Service Details, and much more. He can also check the details of the receptionist and staff member currently working at that Hotel.

He will get the notification of all the changes made by the Manager in the system. He will also have special permission to revert those changes if needed. He can also check the transactions made through the day and thought the month and an algorithm will check the progress the Hotel is making.

Manager Profile:

Manager profile can have partial access to the System. The manager can view the availability and can change the cost of the room and other service details. He will also have a special interface where he can manage the staff of the hotel. He can add new people and he can also remove anyone from the system. And at the same time Owner will receive the notification of these changes.

Customer Profile:

In the Customer profile, people can check the availability of rooms and they can also book a room according to their budget and need. Customer profile contains their name, Contact details, address, and other necessary details, etc. They need to sign-up for booking the hotel, which will make them as well as the manager of the hotel easily interact with each other.

They can pay the amount Online and if they need to do payment Offline, they must give some advance amount to confirm their room.

Receptionist Profile:

In the Receptionist Profile, who so ever is the Receptionist must log in and then he can book the hotel for the customer and this will serve the customer as offline mode. When he will log-in his attendance will be taken and it will be easy for the Manager and Owner to monitor them. Here they will also get a notification of booked room so that they can beforehand maintain the room.

Staff Profile:

In the staff profile, there will be complete details of each staff of the hotel like their personal details and their post at the hotel. They can easily give their attendance to the receptionist and that attendance details will be visible in Real-time to Manager.

Booking:

The customer can easily search their Room from the various option available. This all will be so user-friendly so that Customer will not find any trouble in the booking room. Once the room is searched and the customer finds his choice room then this module helps the customer to book the room by following the rules of the Hotel like Check-in and check-out time of the Hotel, Limit of people per room, etc.

If everything is done properly, he will be asked to pay partial or complete money. And then he will be forwarded to Payment Gateway. Where he can easily pay Online.

Payment Details:

After filling in the booking details clients need to pay the money using different options available like cash/net banking/ATM card. The payment portal would use a payment gateway to clear payment. Once payment will clear receipt of payment will be generated automatically and this receipt will be sent to the manager and the Receptionist will get the notification to make the room ready before they arrive.

Add/Update/Delete Hotel Members/Booking Details:

The owner and Manager can easily add, update, or delete the Staff details. If the customer does not reach the hotel within 3hr of check-in time and if he does not give any prior details of this arrival then the receptionist will have complete authority to remove his booking and allow another customer that room if needed.

User Authentication According to His/her Role:

This portal will take care of every profile in our system. No user will be allowed to use our system without a valid ID. Every profile must authenticate using system procedure. This would ensure the security of our system.

System Design and Flow

This complete System run on the simple Interface was there are only three users i.e. Owner, Manager, and Customers.

Customers

The customer can view the Availability of a Room in the Hotel. If he wishes to book, he has to sign-up by providing his contact details, and then a user ID will be generated using this he can securely enter the System, and then he can book and Pay Online with full security.

He can also change his check-in time and check-out time if possible. He can also cancel the booking if he doesn't wish to visit.

Receptionist

The receptionist will check all the details of Customer check-in and check-out date and time and settles any pending payments. And He will have authority to allow Room number to Customer on their arrival. He will take care of all customer needs and their comfort.

Owner/Manager

The owner, as well as the manager, has almost the same Authority. Both can see all the details of the hotel and can Change. The manager can change details but the Owner will receive the notification of any changes made by him. So that it will be easy for the Owner to keep track of his hotel even if he is far away.

This all will take place securely since both Manager and Owner will have separate IDs and whatever they will do all will be fully secure in this system. The owner, as well as the manager, has almost the same Authority. Both can see all the details of the hotel and can Change. The manager can change details but the Owner will receive the notification of any changes made by him.

So that it will be easy for the Owner to keep track of his hotel even if he is far away. This all will take place securely since both Manager and Owner will have separate IDs and whatever they will do all will be fully secure in this system.

User Interface (UI)

The user interface is a very important part of the system. This helps every member of the system to interact with each detail properly. As we have shown several use cases in this system. We have developed these interfaces to interact with the system.

- **Login Page:**

Owner or Manager need to log in using login id and password.

- **Customer Page:**

Can view their details as well as Booking details.

- **Receptionist Page:**

He can Offline Book the available room at the hotel.

- **Payment Page:**

This interface helps in paying the money via several modes.

EduBridge

- **Design Data Dictionary**

The data dictionary is useful in case of development.

Table Name: Owner Master
Primary Key: Owner ID
Description: To store the details of admin

Serial No.	Fields	Datatype	Description
1.	Owner ID	Integer	Primary key
2.	Name	varchar	
3.	Email ID	varchar	
4.	Contact.	Integer	Multiple contacts can exist for a single admin
5.	Address	varchar	

Table Name: Manager Master
Primary Key: Manager ID
Description: To store the details of General Manager

Serial No.	Fields	Datatype	Description
1.	Manager ID	Integer	Primary key
2.	Name	varchar	
3.	Email	varchar	
4.	Contact.	Integer	Multiple contacts can exist for a single admin
5.	Address	varchar	

Table Name: Employee Master
Primary Key: Employee ID
Description: To store the details of Employee Details

Serial No.	Fields	Datatype	Description
1.	Employee ID	Integer	Primary key

2.	Name	varchar	
3.	Email	varchar	
4.	Contact.	Integer	Multiple contacts can exist for a single admin
5.	Address	varchar	

Table Name: Client Master
Primary Key: Client ID
Description: To store the details of Clients

Serial No.	Fields	Datatype	Description
1.	Client ID	Integer	Primary key
2.	Name	varchar	
3.	Email	varchar	Multiple contacts can exist for single client
4.	Address	varchar	

Table Name: Hotel Master
Primary Key: Hotel ID
Description: To store the details of Property

Serial No.	Fields	Datatype	Description
1.	Hotel ID	Integer	Primary key
2.	Hotel Name	varchar	
3.	Address	varchar	
4.	Number of rooms	Integer	

Table Name: Book Master
Primary Key: Book ID
Description: To store the details of Payment

Serial No.	Fields	Datatype	Description
1.	Book ID	Integer	Primary key

Serial No.	Fields	Datatype	Description
2.	Room No.	Integer	
3.	Date	date	

Table Name: Payment Master
Primary Key: Payment ID
Description: To store the details of Payment

Serial No.	Fields	Datatype	Description
1.	Payment ID	Integer	Primary key
2.	Book ID	Integer	Foreign key to Book Master
3.	Date	date	
4.	Transaction No.	varchar	
5.	Status	varchar	

3. Inventory Management

Inventory management that gives you complete control of your entire inventory – tracking stock accurately. This can be used to track the inventory of a single store or to manage the delivery of stock

between several branches of a larger franchise. However, the system merely records sales and restocking data and provides warning of low stock at any location through email at a specified interval.

The goal is to reduce the stress of tracking rather than to holder all store maintenance. Further features may consist of the ability to create reports of sales, but again the explanation is left to the management. In addition, since theft does occasionally occur, the system provides solutions for confirming the store inventory and for correcting stock quantities.

Production units use an inventory management system to reduce their transport costs. The system is used to track products and parts as they are transported from a seller to a storeroom, between storerooms, and finally to a retail location or directly to a customer.

The inventory management system is used for various purposes, including:
- Maintaining and recording the information between too much and too little inventory in the company.
- Keep track of inventories as it is transported between different locations.
- Recording product information in a warehouse or other location.
- Having a record of Picking, packing, and selling products from a warehouse.
- Reduction of product obsolescence and decay.
- Avoiding out-of-stock situations.

Module Requirement

Admin:
Primarily, the user who will interact with the system will be the administrator of the institution assigned to take care of all data transactions and insertion or update. It will have to go through an authorization process of login and logout. It will have the ability to create storage records, add inventory details, item details, Orders, Shipment details and take care of the development and maintenance of the application.

- **Name**: Name of Admin.
- **Admin ID**: It will be a unique value that will act as the primary key and will be the same as the employee id in the company.
- **Email ID:** For contacting purposes every user must enter their email id.
- **Address:** Employee address is also an attribute that helps to get more about the employee.

Manager:
Second, the user who will interact with the system will be the Manager of the institution assigned to take care of management services. It will have to go through an authorization process of login and logout. It will have the ability to create storage records, add inventory details, item details, Orders, Shipment details and take care of notification, and can see reports and other business-related data.

- **Name**: Name of Manager.
- **Emp ID**: It will be a unique value that will act as the primary key.
- **Email ID:** For contacting purposes every user must enter their email id.
- **Address:** Employee address is also an attribute that helps to get more about the employee.

Storage:

Storage is used to store raw material and product that has been produced but not being order.

- **S-No**: Serial number is assigned to every product or raw material to keep their records. It is the Primary key.
- **Bar-Code/Serial Number:** To make the record update process faster. We have added a bar code system that would help to update the status of the product just after a scan using a bar code reader.
- **Name**: Name of product or raw materials.

Inventory:

Inventory is basically having records of items and their quality.

It has following attributes:
- **Inventory ID**: Inventory Id is the primary key to identify each record.
- **Item ID:** We have already an Items table in our Database. Here Item ID is a foreign key to that table.
- **Quantity:** Quantity describes the number of units available or the amount of product or material available.

Items:

Item is actual product we produce in our company.

It has following Attributes:
- **Item No**: Item number is numeric data assign to every product. This is unique for every product. That means this Primary key.
- **Bar Code/Serial Number:** Item No is converted into bar code and updated in the barcode field. This would increase the process of tracking and getting actual information.
- **Item-description**: This attribute basically keeps the record of every information about the product.

Orders:

Whenever an order is received from the customer. It fetches the item from the item table and tags Order No. to it.

It has the following attributes:
- **Order No**: This is the primary key to the Order table. It uniquely identifies every record of this table.
- **Barcode/Serial Number**: Every order No is converting to bar code and tag to product and barcode is generated and pasted over product. This will help to track the product.
- **Date Required:** This is attribute store the information of deadline of the product.
- **Date Completed:** When a product is delivered to the client. The date should be updated and payment clearance should note.

Shipments:

When product is successfully ordered. Its time ship the product.

It contains following attributes:

- **Shipment No**: This is the primary key for the Shipment table. It uniquely defines every shipment.
- **Address:** Address is a mandatory field without this field data would not be saved in the database.
- **Shipment Date:** When data is successfully shipped date of that day would update to our database.

UI Design

UI plays a major role in the success of any software. Simple, user-friendly, and standard UI makes visitors' experience great and which means the software is going to be successful.

Followings are the interfaces:
- *Login Page:* Basically, for any software security is a major concern. So, we have developed a secure application. Without being authenticated no user is allowed to view any other interfaces. For the login page, we have a User ID, Password, Profile. After being authenticated user is authorized to perform certain work according to his/her profile.
- **Profile Page:** Every user has his own profile. From here they can change their information like the correction in name, email id, address, etc.
- *Storage Page:* On this page, users can add items to be stored using this page and barcode reader. After scanning barcode information stored in the barcode are fetch from the database and desired data are stored in a storage table.
- **Inventory Page:** The inventory page provides flexibility to change quality if any inventory gets damaged. Managing inventory is our main goal so this page is only visible to admin or manager profiles.
- *Items Page:* The user can add new items using this page. While adding the items to the database user provides an item description. This description helps to understand the quality of the product, uses, manufacture date, expiry date, etc.
- *Order Page:* Using the order page one can place an order and the database would add the item to the order list and the quantity has been decreasing from the Inventory table. Admin/Manager has the special privilege to edit order details if the customer requested to edit them. Order is attached to the shipment table which helps the user to get the address of the customer and make an order to dispatch.
- *Shipment page:* Using this page user can update the address if it changes and track the shipped items. Tracking is required to increase the client experience more satisfactory. This page also helps the user to cancel any product if customers demand such things.
-

Workflow & Automation Logic:
Now a day, Automation is demand in any business. As per requirement of era, we come up with some solution.

Reordering of Inventory:

Inventory reaches a specific threshold; our Inventory Management System can be programmed to tell managers to reorder that product. This helps companies avoid running out of products or tying up too much capital in inventory. This is a very good feature and adds extra advantages to our system. Due to less involvement of human chances of error has been reduced exponentially.

Asset Tracking:

Inventory is a current asset for any company so tracking the asset is mandatory. When an item is in a warehouse, it can be tracked via its barcode or some other ways like serial number, lot number, or revision number. This will help the user and company to track his net worth very clearly. This makes the calculation of net profit and loss more quickly than previous.

Email notification:

Whenever customer books any order in our company an email alert has been sent to him/her as confirmation and tracking id and email notification of their order status send to them periodical.

4. Grocery Management System:

Actors:

1. ADMIN

2. CUSTOMERS

CUSTOMER SPECIFIC MODULES:

MY ACCOUNT MODULE:

1.Show my account module to add personal details which should have edit profile, delivery address, email address and necessary information.

2. Show my orders which includes the current and all the past transactions.

3. Display payment option where customer can edit their linked wallets, saved card details

4. Display any gifts, or coupons, notifications to the customers

HOME MODULE:

1. It should have offers sections
2. Display shop by category(Fruits, vegetables, beverages, snacks etc)
3. Display view all items

SUB CATEGORY MODULE:

1. If the user clicks on specific sub category from the home module for eg(Fruits) display all the sub category available in it like fresh fruits, exotic fruits and organic fruits as the deep sub category list
2. Display all available fruits if no filter is applied
3. Add filters with options like price, savings, discounts, relevance etc
4. Display items with pictures, title of the fruit, estimated time to deliver, save the item, quantity, add to cart and price
5. Refer the below image

CART MODULE:

1. Display the total no of items with total price.
2. Add check out button
3. Give options to remove an item from the cart
4. Refer the below image for sample

Items (1 item)	Quantity	Sub-total
Fruits & Vegetables		
Mushrooms - Button ₹45 ~~₹66.25~~ (180g - 200g)	− 1 + Delete | Save for later	₹45 Saved: ₹21.25

ADMIN SPECIFIC MODULES:

ADD ITEM

DELETE ITEM

DISABLE USER

Common functionalities for the actors:

1.HOME PAGE: A proper home page for the above actors should be developed.

2.LOGIN PAGE: A login page should be there with SIGN IN and SIGN UP

SIGN IN:

1. SIGN IN page should have email and password as **required fields.**
2. Include a sign in button
3. Have a link / button for forgot password
4. In Forgot password have the provision to enter the phone number or email to reset the password

SIGN UP:

1. A SIGN-UP page should contain name, phone number, email, password, country, Gender. This page can be considered as a registration page also.

ALTERNATE TO SIGN IN PAGE:

1. Enter the 10-digit mobile and make login through otp.

LOGOUT PAGE:

A thank you and visit us page should be added appropriately.

The below diagram helps to understand the use case for admin and customers
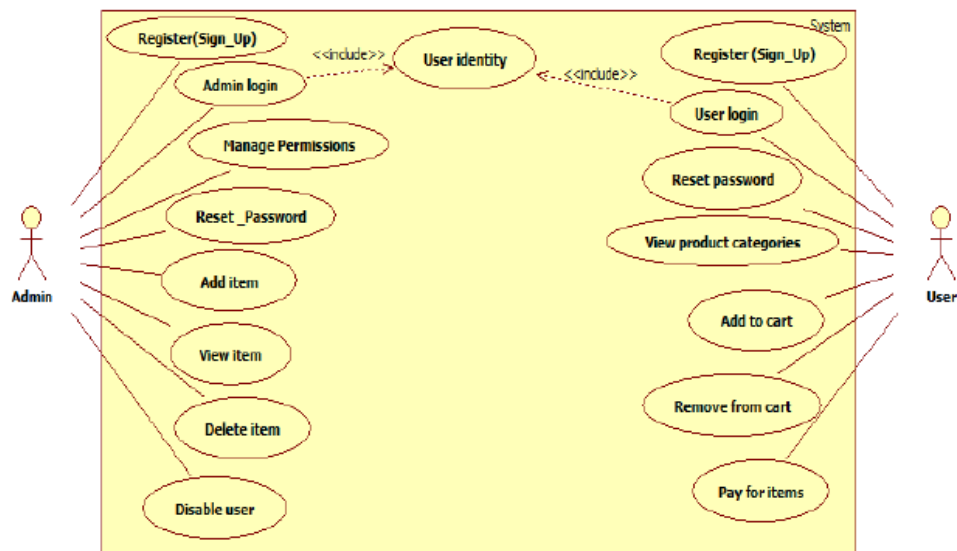
NOTE: This is a draft which learners can use it as a reference, it up to learners' creativity to add or remove the functionalities stated above.

5. **Online shopping system**

ECommerce Website Angular Spring Boot – In this article I have explained how create and develop E-Commerce Shopping web application using Angular Spring Boot. When we build projects with help java programming language, that was very secure. Because Java is very popular language & large community support. Mostly Spring boot used for when implement high level & large scalable application like banking projects etc.

MODULES:

The system has been identified to be presented with the following modules and roles.
The modules involved are:
1. Administrator
2. Moderators
3. Users

1. ADMINISTRATOR:

The administrator will be the super user of this application. Only admin will have access into this admin page. Admin may be the owner of the shop. The administrator has all the information about all the users and about all products.

This module is divided into different sub-modules.
1. Manage Moderators
2. Manage Products
3. Manage Users
4. Manage Orders
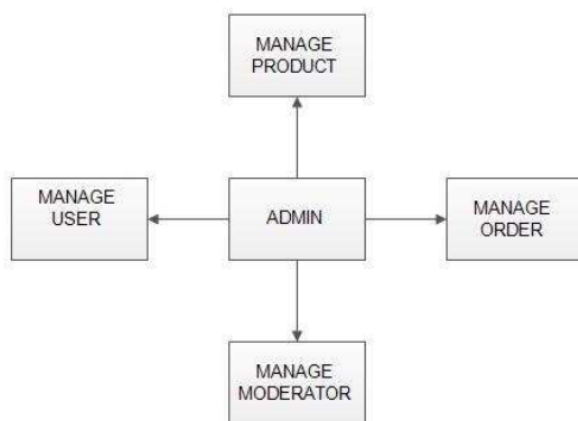
1. MANAGE MODERATOR
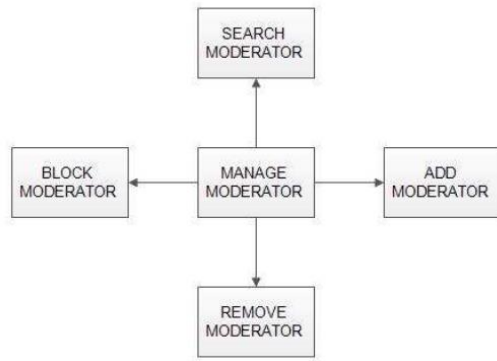
Add Moderator

Only admin will having the privilege to add a moderator. A moderator can be considered as a staff who manages the orders or owner of a group of products.

Block moderator

Admin can restrict a moderator from managing the orders by blocking them. Admin can unblock a blocked user if needed.
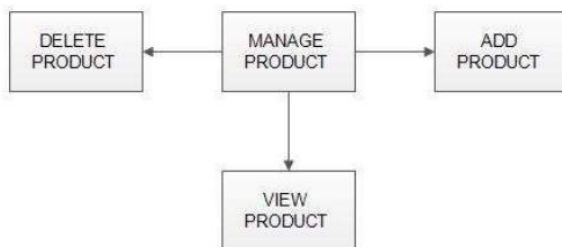
Remove Moderator

Admin has privilege to delete a moderator who was added.

Search moderator:

All existing moderators can be viewed by the administrator as a list. If there is number of moderators and admin need to find one of them, the admin can search for a moderator by name.

MANAGE PRODUCTS

Add Products

    The shopping cart project contains different kind of products. The products can be classified into different categories by name. Admin can add new products into the existing system with all its details including an image.
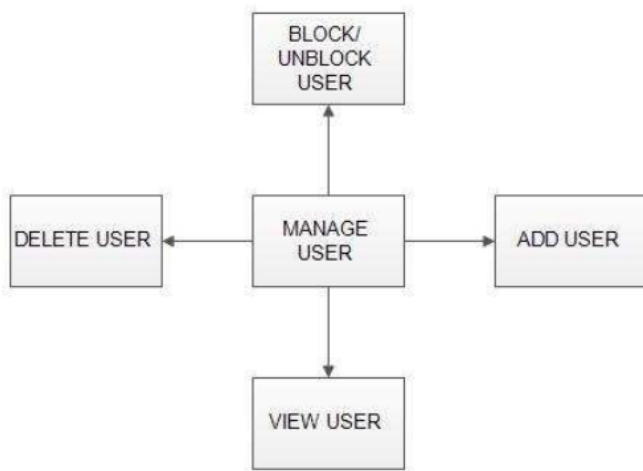
Delete Products

    Administrator can delete the products based on the stock of that particular product.

Search products

    Admin will have a list view of all the existing products. He can also search for a particular product by name.

MANAGE USER

View Users: The admin will have a list view of all the users registered in the system. Admin can view all the details of each user in the list except password.

Add Users: Admin has privileges to add a user directly by providing the details.

Delete &Block Users: Administrator has a right to delete or block a user. The default status of a new user registered is set as blocked. The admin must accept the new user by unblocking him.
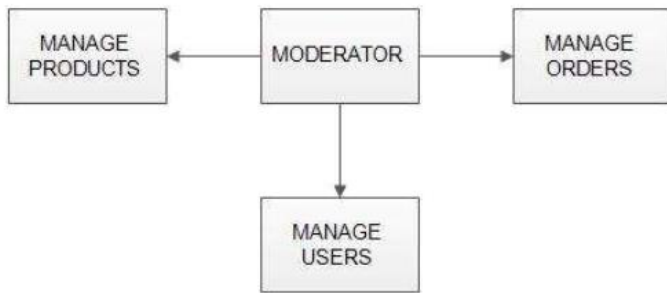
MANAGE ORDERS

View Order
Administrator can view the Orders which will be generate by the users. He can verify the details of the purchase.

Delete order
Admin can delete order from the orders-list when the product is taken for delivery.

2. **MODERATORS**

A moderator is considered as a staff who can manage orders for the time being. As a future update moderator may give facility to add and manage his own products. Moderators can reduce the work load of admin. Now moderator has all the privilege an admin having except managing other moderators. He can add products and users. He can also check the orders and edit his profile.

- Manage products
- Manage users
- Manage orders

3. USERS
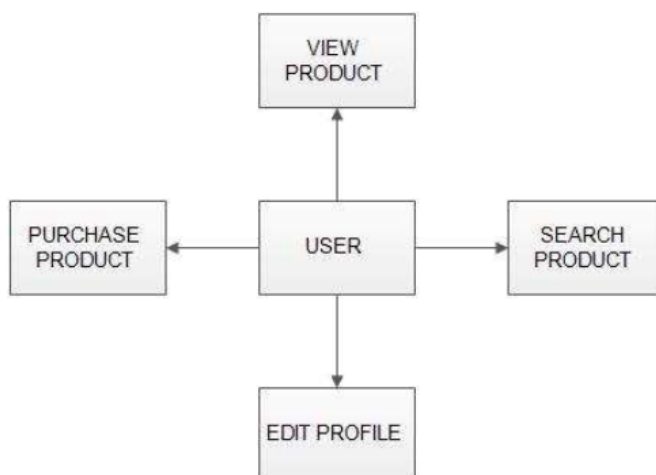
Registration
A new user will have to register in the system by providing essential details in order to view the products in the system. The admin must accept a new user by unblocking him.

Login
A user must login with his user name and password to the system after registration.

View Products
User can view the list of products based on their names after successful login. A detailed description of a particular product with product name, products details, product image and price can be viewed by users.

Search Product
Users can search for a particular product in the list by name.

Add to cart:
The user can add the desired product into his cart by clicking add to cart option on the product. He can view his cart by clicking on the cart button. All products added by cart can be viewed in the cart. User can remove an item from the cart by clicking remove.

Submit Cart:
After confirming the items in the cart the user can submit the cart by providing a delivery address. On successful submitting the cart will become empty.

History
In the history the user will have a view of pending orders.

Edit Profile
The user can view and edit the profile.

SYSTEM DESIGN

System design is the solution for the creation of a new system. This phase focuses on the detailed implementation of the feasible system. It emphasis on translating design. Specifications to performance specification. System design has two phases of development.

- Logical design
- Physical design

During logical design phase the analyst describes inputs (sources), outputs (destinations), databases (data sources) and procedures (data flows) all in a format that meets the user requirements. The analyst also specifies the needs of the user at a level that virtually determines the information flow in and out of the system and the data resources. Here the logical design is to be done through data flow diagrams and database design. The physical design is followed by physical design or coding. Physical design produces the working system by defining the design specifications, which specify exactly what the candidate system must do. The programmers need to write the necessary programs that accept input from the user, perform necessary processing on accepted data and produce the required report on a hard copy or display it on the screen.

INPUT AND OUTPUT DESIGN

INPUT DESIGN:
Input design is the link that ties the information system into the world of its users. The input design will involves determining the inputs, validating the data, minimizing the data entry and provides a multi-user facility.
Inaccurate inputs are the most common cause of errors in data processing. Errors entered by the data entry operators can be controlled by input design. The user-originated inputs are converted to a computer based format in the input design. Input data are collected and organized into groups of similar data. Once identified, the appropriate input media are selected for processing. All the input

data will be validated and if any data violates any conditions, the user will warned by a message. If the data satisfies all the conditions, it transferred to the appropriate tables in the database. The design should be done such that users get appropriate messages when exceptions occur.

OUTPUT DESIGN:

Computer output is the most important and direct source of information to the user. Output design is a very important phase since the output needs to be in an efficient manner. Efficient and intelligible output design improves the system relationship with the user and helps in decision making. Allowing the user to view the sample screen is important because the user is the ultimate judge of the quality of output.

DATABASE

DATABASE DESIGN:

Databases are the storehouses of data used in the software systems. The data is stored in tables inside the database. Several tables are created for the manipulation of the data for the system. Two essential settings for a database are - the field that is unique for all the record occurrences.
-the field used to set relation between tables.

VALIDATION : Validation is required for the various pages like add user, add product etc.

FRONT END:

- HTML, CSS, JAVA SCRIPT are utilized to implement the frontend.
- Using HTML, one can collect input from users through web page.
- CSS (Cascading Style Sheets)
- CSS is a style sheet language used for describing the look and formatting of a document written in a markup language.

BACK END

The back end is implemented using MySQL which is used to design the databases.
MySQL
MySQL is the world's second most widely used open-source relational database management system (RDBMS). The SQL phrase stands for Structured Query Language.

TECHNOLOGIES REQUIRED:

- Spring
- Hibernate
- HTML
- MySQL
- Maven

6. **Employee Management System**

Employee management system is a distributed application, developed to maintain the details of employees working in any organization.

- It maintains the information about the personal details of their employees, also the details about the payroll system which enables to generate the payslip.
- The application is actually a suit of applications developed using java. Its simple to understand even if your not smiler with this application.
- The application is reduced as much as possible to avoid errors while entering the data.
- It also provides error message while entering invalid data.
- No formal knowledge is needed for the user to use this system.
- Thus, by this all it proves it is user-friendly.
- Employee Management System, It can assist the user to concentrate on their other activities rather concentrate on the record-keeping.
- Thus, it will help the organization in better utilization of resources.

Objective
- The purpose of the Employee Management System is to automate the existing manual system with the help of computerized equipment and full-fledged computer software, fulfilling their requirements so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. The required software and hardware are easy to work with.
- Employee Management systems, as described above, can lead to error-free, secure, reliable and fast management systems.
- It can assist the user to concentrate on their activities rather to concentrate on the record keeping.
- Thus, it will help an organization in better utilization of resources.
- The organization can maintain computerized records without redundant entries.
- That means that one need not be distracted by information that is not relevant while being able to reach the information.

Software Requirements

Operating System	Windows 7 or Windows 10
Language	Java
IDE	Spring Boot,PostMan
Backend	Microsoft MySQL server

There are mainly three stages –
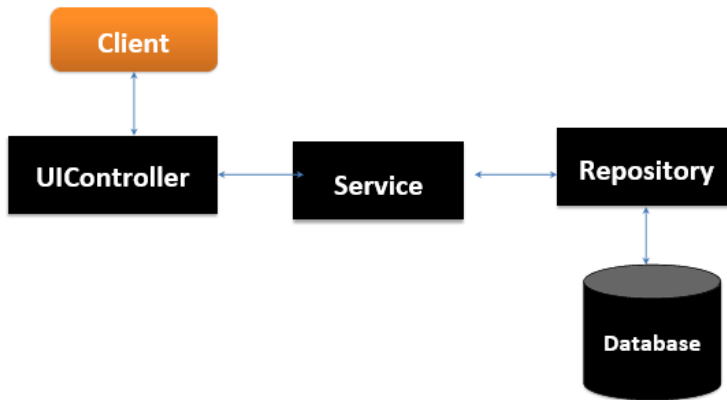
- **UIController** - In Spring Boot, the UIController class is responsible for processing incoming requests, preparing a model, and returning the view to be rendered as a response.

- **Service** - Components are the class file which contains @Service annotation. These class files are used to write business logic in a different layer.

- **Repository** - Repository is a specialization of @Component annotation which is used to indicate that the class provides the mechanism for storage, retrieval, update, delete and search operation on objects.

Proposed System

- First, we have to run the Application on the browser, the index page will be shown after that if the user is registered then he/she can login the page and he/she can entering in the application.
- If the user is not registered then he/she needs to register themselves and then he/she can continuing to login and he/she can access any time.
- After that related pages will be there like if user is admin so he/she can access all the operations like insert, delete, update and search the details.
- If the user is customer, then he/she can view the related record and he/she can update the record.
- after that he/she can logged out by themselves.

About Back-end:

- There are mainly four operations will be performed by the user and admin Ex. Insert, update, retrieve/fetch, delete.
- These operation will be performed using the spring boot framework, core java and spring boot web, spring data Jpa , and hibernate.
- And thymeleaf is the design pattern for the user interface.
- For connectivity purpose we are using MySQL database. It is connected to the java and database.