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Application Design Document

Online Platform for Local Stores

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Table of Contents

1. Introduction

2. System Architecture

3. ER Diagram

4. Cryptography Implementation

5. Use Case Implementation

6. Session Management

7. Logging and Error Handling

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1. Introduction

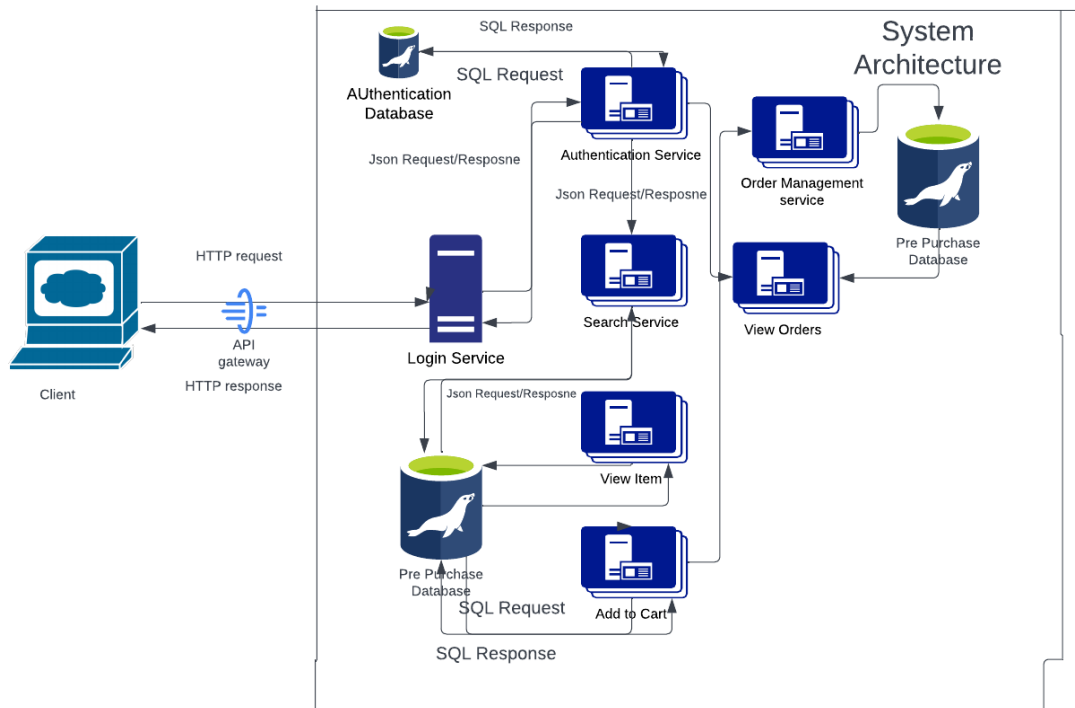
The software design document is a detailed plan for developing software. This document contains a detailed description and graphical representation of all the entities involved in this software. The software design document acts as the base-level system from which the real software is built. It will serve as a proof of concept and a guideline in the upcoming software development lifecycle stages. The software built can be validated against this document.

1.1 Scope of Document

The system has all the basic facilities needed for placing an order online and solves typical issues of going to a shop and searching for products and purchasing them. This Platform helps sellers by increasing their sales and visibility across the city. Customers can purchase items from the comfort of their homes. Our system will act as a bridge between customers and sellers.

2. System Architecture

Below is the figure for the overall system architecture.



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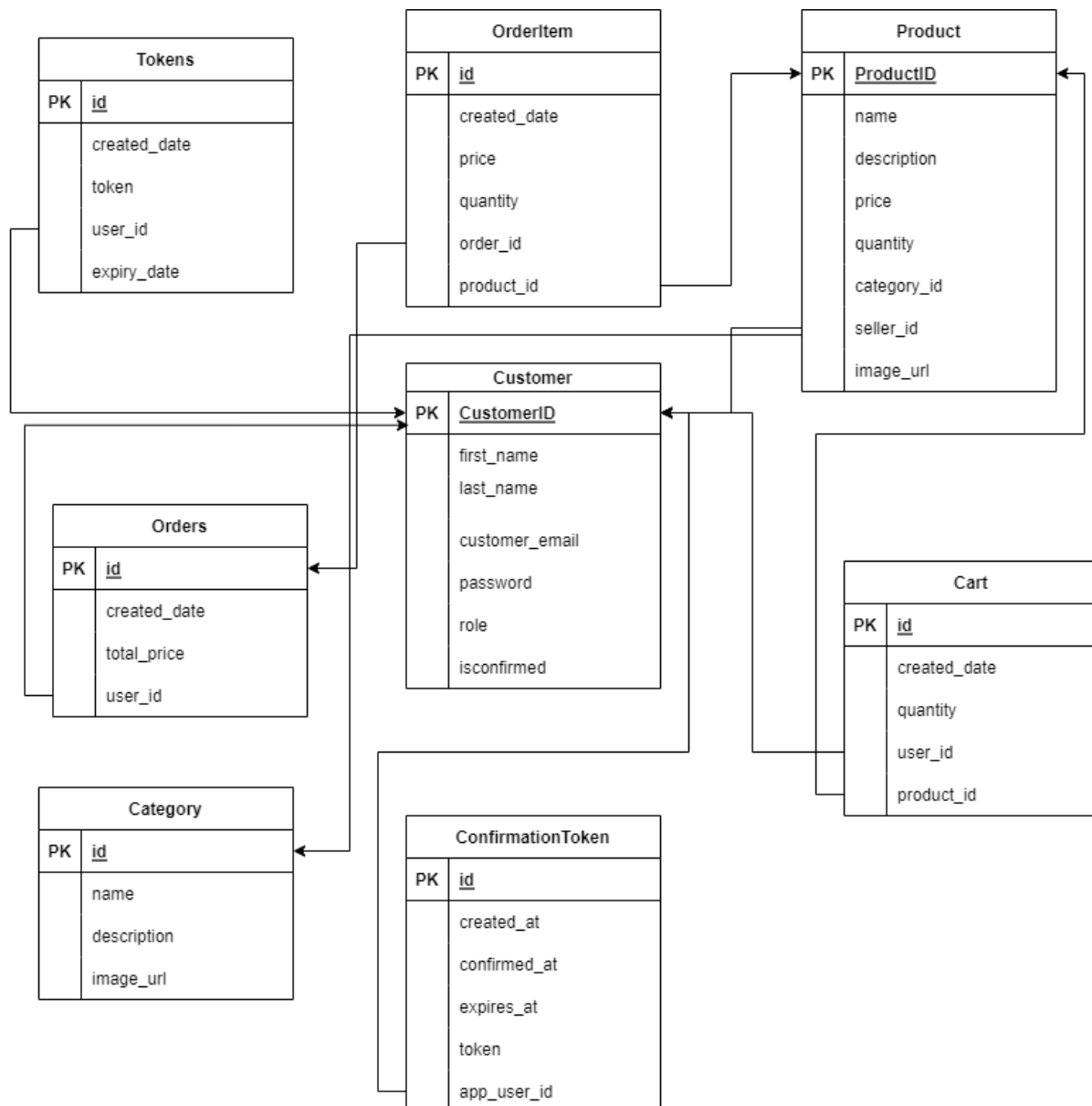
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Figure 1: System Architecture

3. ER Diagram

- Our application is using an RDBMS for the data storing and updating of different entities they are required for our application. The ER diagram is as below



Picture 2: ER Diagram

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The main entities are

- **Customer**

The customer table contains all the details of the customer which include, Customer_name, customer_id, customer_email, cust_pwd, role_id, is_token_eligible

- **Product**

The Item table contains all the information about the item which includes product_id, name, seller_id, price, quantity, description, image_url.

- **Cart**

The cart table contains all the details about the items in the Cart, which include created_date, quantity, user_id, product_id

- **Orders**

The Order table contains all the details about the order that is created which includes created_date, price, user_id

- **Tokens**

The Token table contains all the details about the token that we give to the customer based on certain conditions. The details in the table include created_date, token, user_id, expiru_id

- **Category**

It contains product category. It has name, description, image_url

- **OrderItem**

It includes created_date, quantity, order_id, product_id, price

- **Cart**

It includes created_date, quantity, user_id, product_id

4. Cryptography implementation

Cryptography is one of the most important aspects of our system which include password encryption and safely storing customer confidential information.

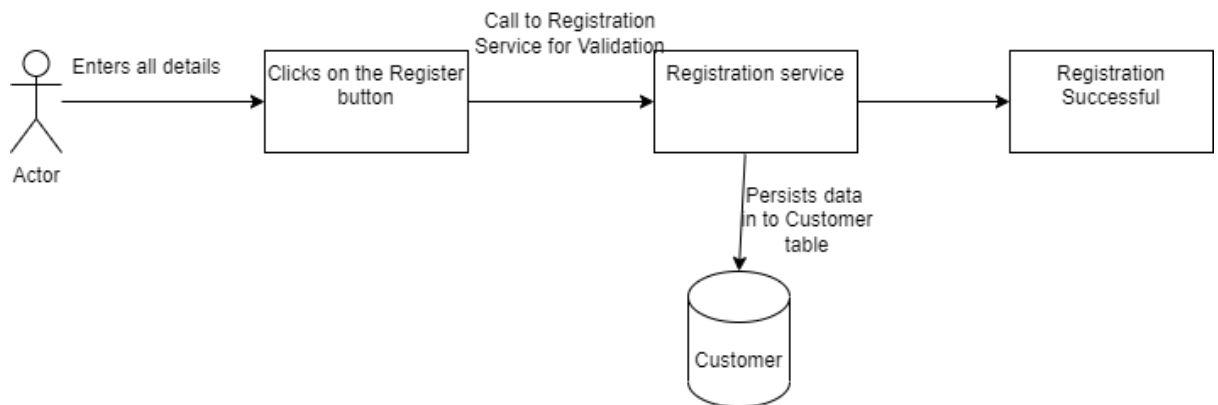
There are two sensitive data groups that are handled separately. They are

1. User passwords
2. PII(Personally identifiable information) of stakeholders

5. Use Case Implementation

Register:

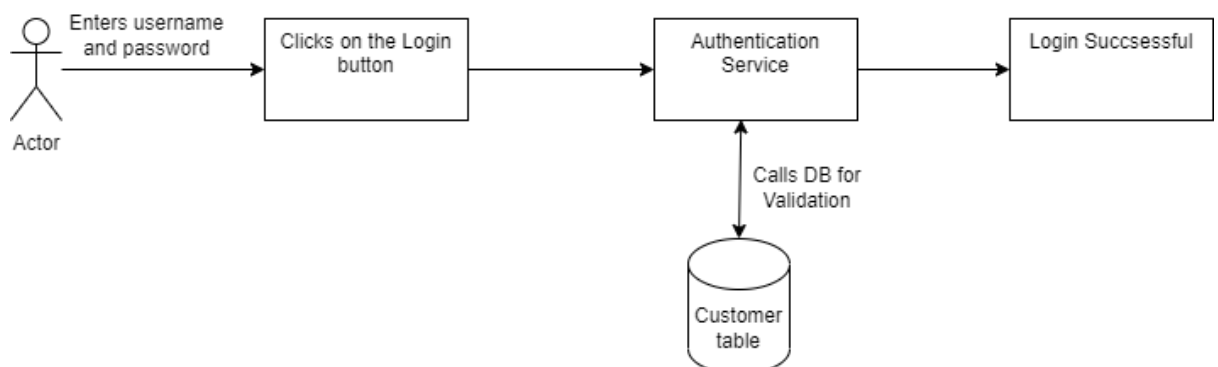
- The customer will enter all the required information on the signup page and clicks on the signup page
- We will perform both client-side validation and server-side validation for the given inputs and thoroughly checks all the fields for any harmful data.
- After completing our validations, we will persist data in the customer table



Picture 3: Customer Registration Data flow

Login:

- Customer/Admin/Seller will enter a valid username and password and clicks on the Login Page.
- If the seller is already registered on the platform, the below action can be performed.
- Authentication service will be able to verify the user that is trying to log in and validates and if the credentials are correct, we send a successful message to the web server.



Picture 4: Customer Login Data Flow

Search items:

- Once a user successfully logged into the platform, he can be able to perform a search by entering the keywords in the search box.

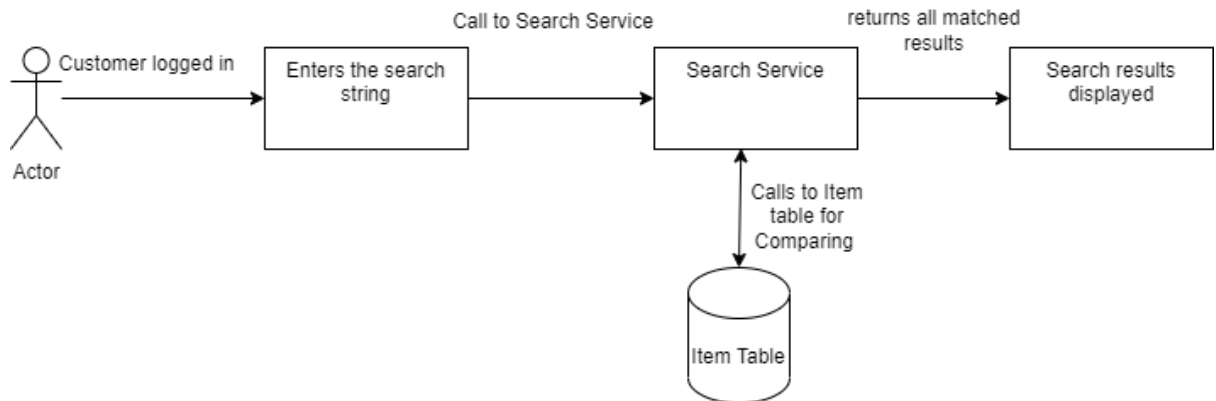
Application Design Document

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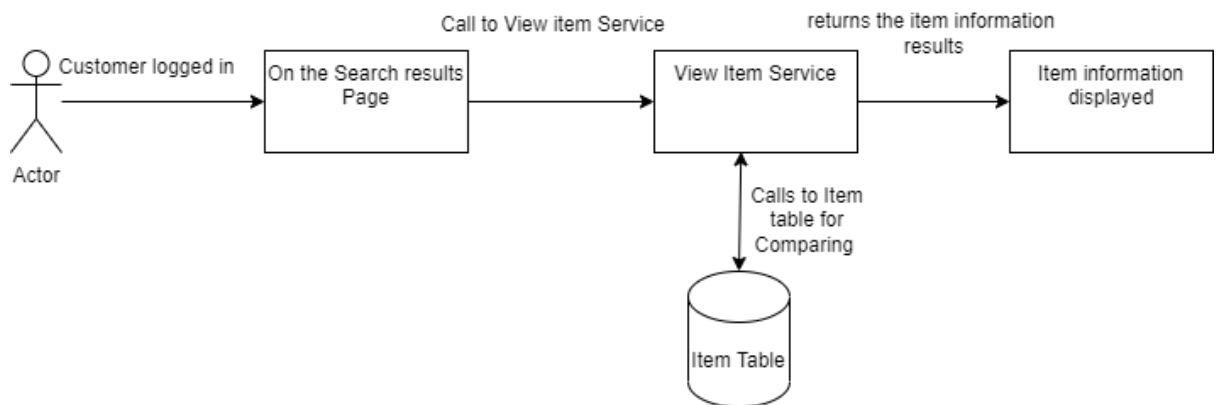
- The string entered will be compared in the Item table with the item names across all the item names and return all the matches to the webserver.
- The web server will be able to display all the items along with minimal details.



Picture 5: Item Search Data Flow

View Item:

- Customer was able to successfully login into the system and search for the interested item and then click on the “View Item”
- Now this will call the item entity and gets all the data of that item from the table. (Even if there is no stock)
- Customer will be able to see the complete details of the item.



Picture 6: View Item Data Flow

Add to cart:

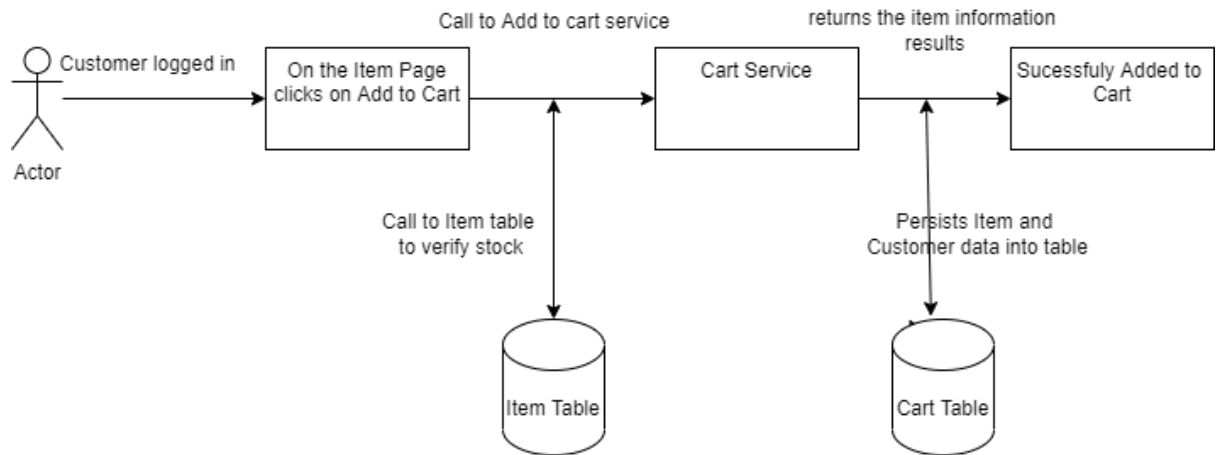
- Customer was successfully able to log in and view an item.
- Customer then clicks on add to cart button as he decides to buy, now we will check the inventory again on the item page for the available stock and if there is enough stock, we will add the item to the cart.

Application Design Document

Name: Pavan Sainath Atukuri

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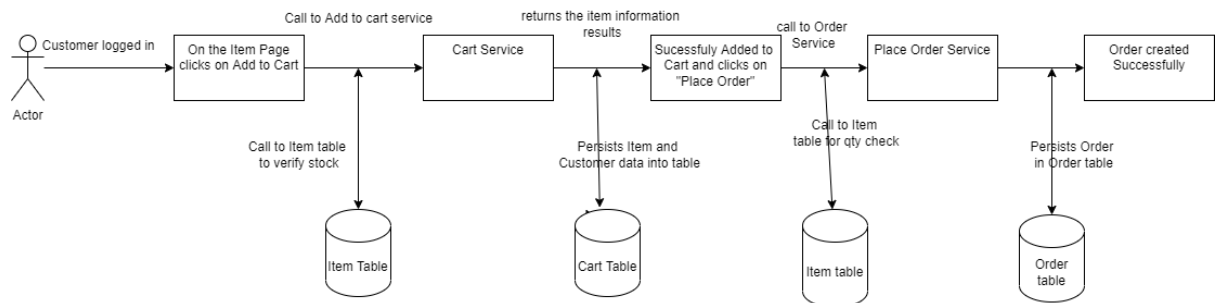
U Id: 119397428



Picture 7: Add to cart data flow

Place Order:

- Customer was able to log in successfully and able to add items to cart.
- Now customer clicks on the “Place Order” button, we will check the inventory again for stock availability and then confirms the Order if the stock is available.
- We will create a unique id called order_id and return to the customer.



Picture 8: Place Order data flow

View Account Details:

- Customer was able to login successfully using his/her credentials.
- Now the customer clicks on the “View Account Details” button and all the customer details will be displayed.

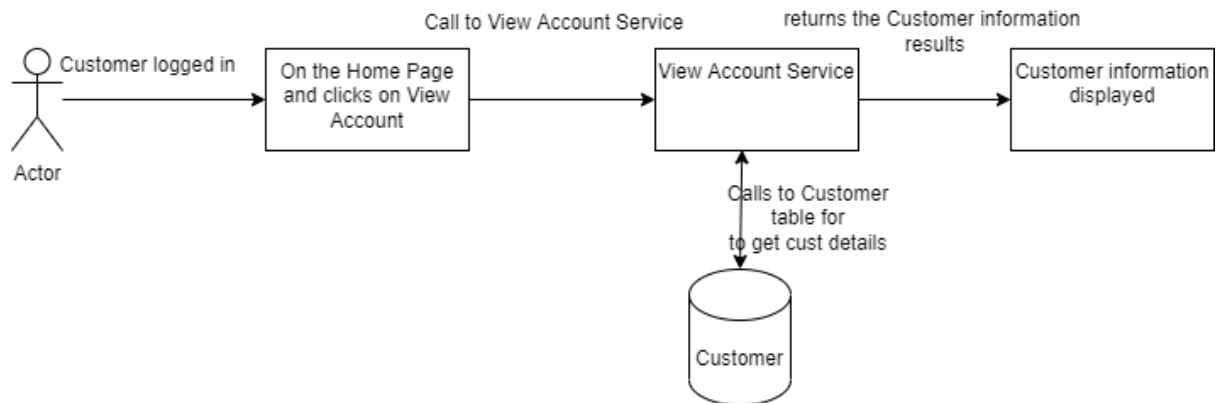
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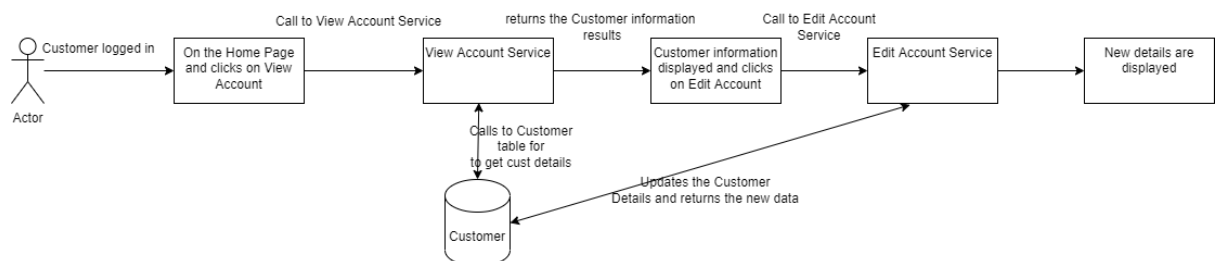
- These details will be passed from the customer entity and sent to the web server.



Picture 9: View Account Info data flow

Edit Account Details:

- Customer was able to log in successfully using the credentials.
- Now the customer clicks on the “View Account Details” button and all the customer details will be displayed.
- These details will be passed from the customer entity and sent to the web server.
- Now Customer will be able to edit the account information and click on the update button, this will persist the latest data in the Customer table.



Picture 10: View Account Info data flow

View Purchase History:

- Customer was able to log in successfully using the credentials.
- Now customer clicks on the “View Orders” button.
- This will call the order entity and return all the previous orders for the customer along with the item details. These details will be displayed to the customer.

Upload Item:

- Seller was authenticated successfully.
- Now seller will be available to upload the new item information and this action will persist the data in the “item” table.

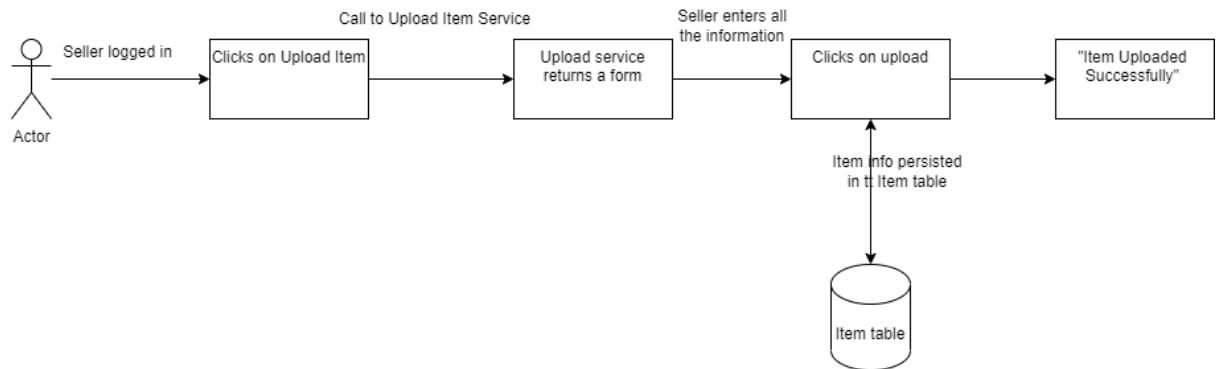
Application Design Document

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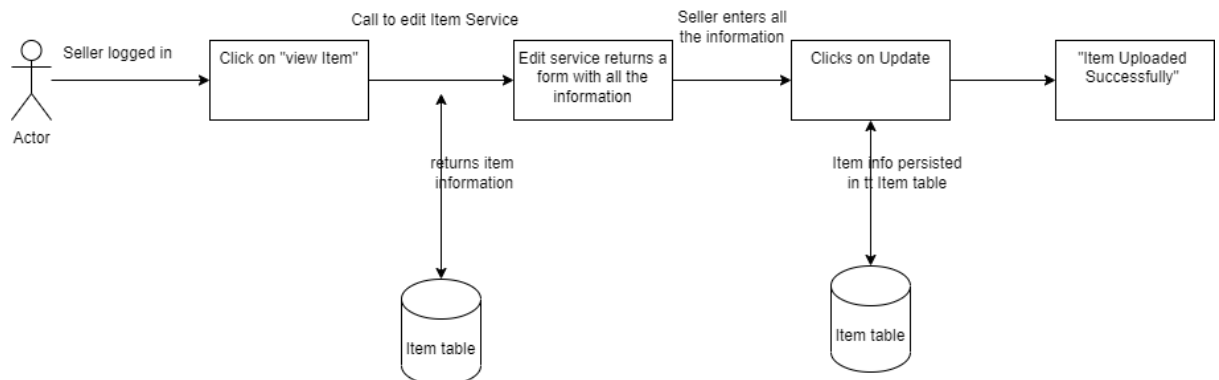
- We will confirm with the seller after the action is performed successfully by sending a text “Item uploaded successfully”.



Picture 11: Upload Item data flow

Edit Item:

- Seller was authenticated successfully.
- Now seller will be available to edit the new item information and this action will updates the data in to the “item” table.
- We will confirm the seller after the action is performed successfully by sending a text “Item updated successfully”.



Search Order:

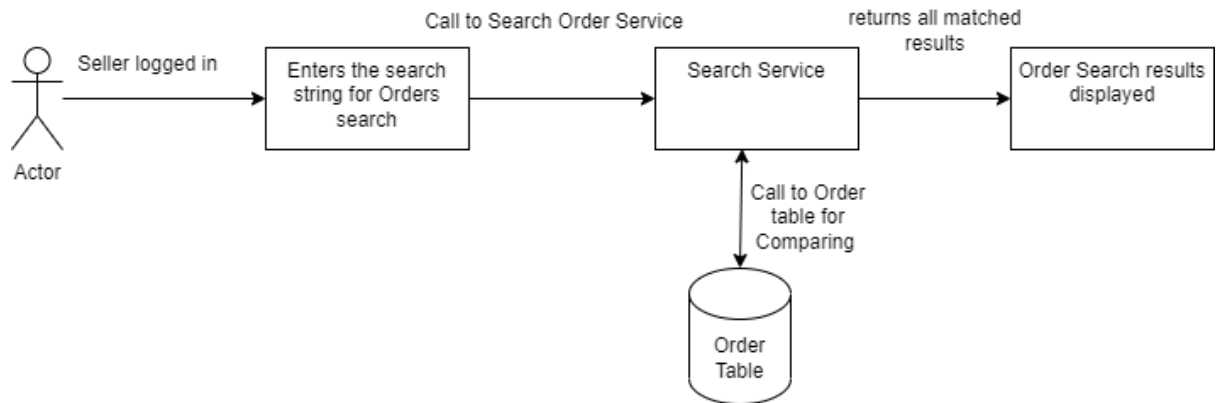
- Seller was authenticated successfully.
- Now seller searches for the order Id that needs to be serched by entering the keywords.
- This action will call the data from the order entity and filters for the string and the seller Id and return the order details.

Application Design Document

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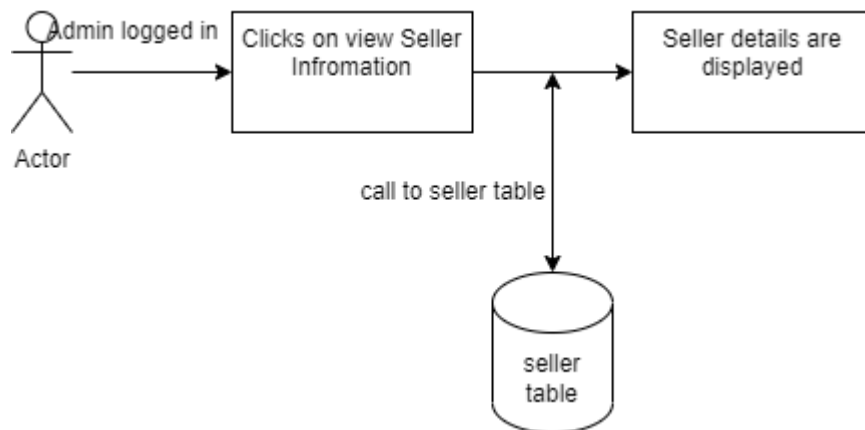
U Id: 119397428



Picture 12: Order search data flow

View seller information:

- Admin was successfully authenticated.
- Admin will click on the “View All Seller Information”
- This action will call the data from the Seller table and displays all the seller information in the list.



View Revenue:

- Admin was successfully authenticated.
- Admin will click on the “View Revenue “button”, this action will calls the data from the order entity and filters by grouping sellers.
- All the data will be displayed using a list.

6. Session Management

- Session management is one of the important aspects of security. It is vulnerable to a lot of attacks if it's implemented without proper planning. Our system took some measures to implement session management securely. They are
- A separate service has been established for authentication. It takes care of session management, authentication, and registration.

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- Only HTTPS cookies are used so that it's difficult for the attacker to get session cookies.
- The expiry time of session cookies is set properly.
- The authentication service contains user_id and session cookie mapping entries. So it will be used to display a list of users who are in session to the customer organization.

7.Logs and Error Handling

In order to avoid repudiation attacks, every action in our system must be logged.

The actions that are logged in our system are

- Every error that occurs in our system.
- Item creation, updating, and deletion
- Profile update time stamps of the customer
- Item Deletion time stamp.

Error handling is very important to debug the exceptions and build useful monitoring dashboards using the data.