FurniHub

"Augmented Reality Based Furniture Marketplace App"

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FINAL PROJECT REPORT

Project Title: FurniHub - Augmented Reality-Based Furniture Marketplace App

Problem Statement:

FurniHub aims to revolutionize the furniture retail experience by leveraging Augmented Reality (AR) technology to allow users to visualize furniture realistically in their personal spaces. This mobile application will provide users with a convenient platform to explore, select, and purchase furniture without the need for physical store visits. Our main objectives include enhancing user experience, addressing current pain points in traditional furniture shopping, and establishing a digital presence in the furniture retail market.

Executive Summary

- **Pain Points:**

  Current e-commerce platforms lack immersive experience, leading to high return rates and customer dissatisfaction due to mismatched expectations.

- **Proposed System Features:**

  Augmented reality visualization

  Robust filter functionalities

  3D View

  Cloud-based storage.

- **Goals and Benefits:**

  1. Introduce Augmented Reality for realistic furniture visualization.
  2. Provide a convenient mobile platform accessible from anywhere.
  3. Enhance user experience and eliminate the need for physical store visits.
  4. Establish FurniHub as a digital leader in the furniture retail market.

Background

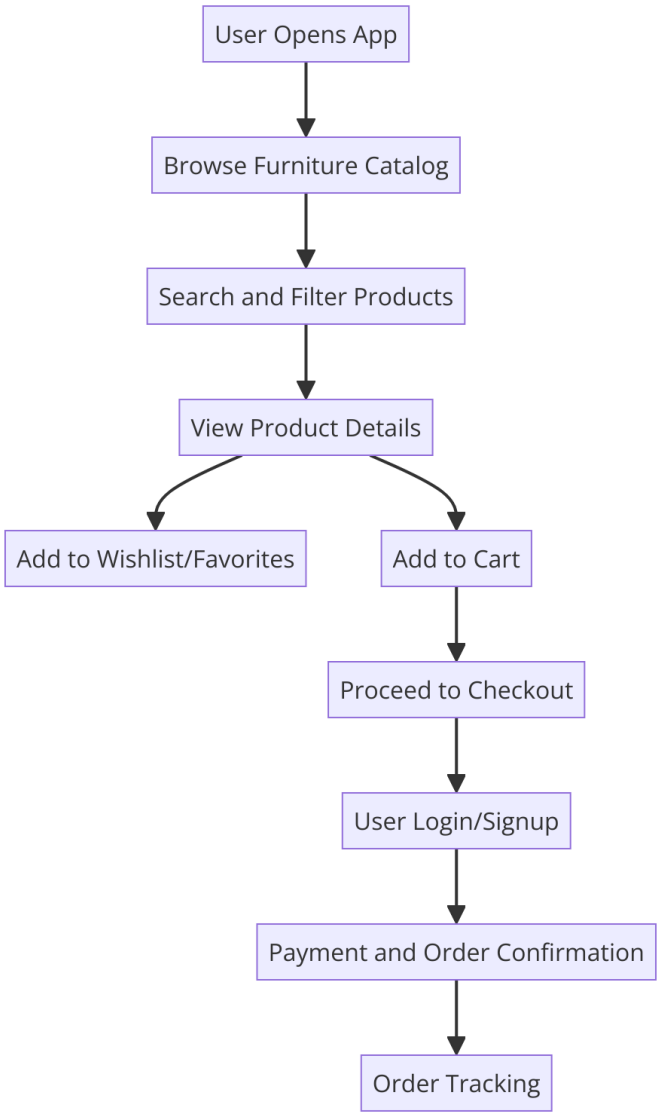
- **Current System Overview:**

  Traditional online furniture stores with static images and limited interaction.

- **Key Issues and Pain Points:**

  Inability to visualize products in the actual usage environment, leading to poor purchase decisions.

- **System Flow Chart of the Current System:**



- **Addressing Gaps:**

  FurniHub integrates AR to bridge the gap between digital product displays and real-world usage.

Proposed System Functionality

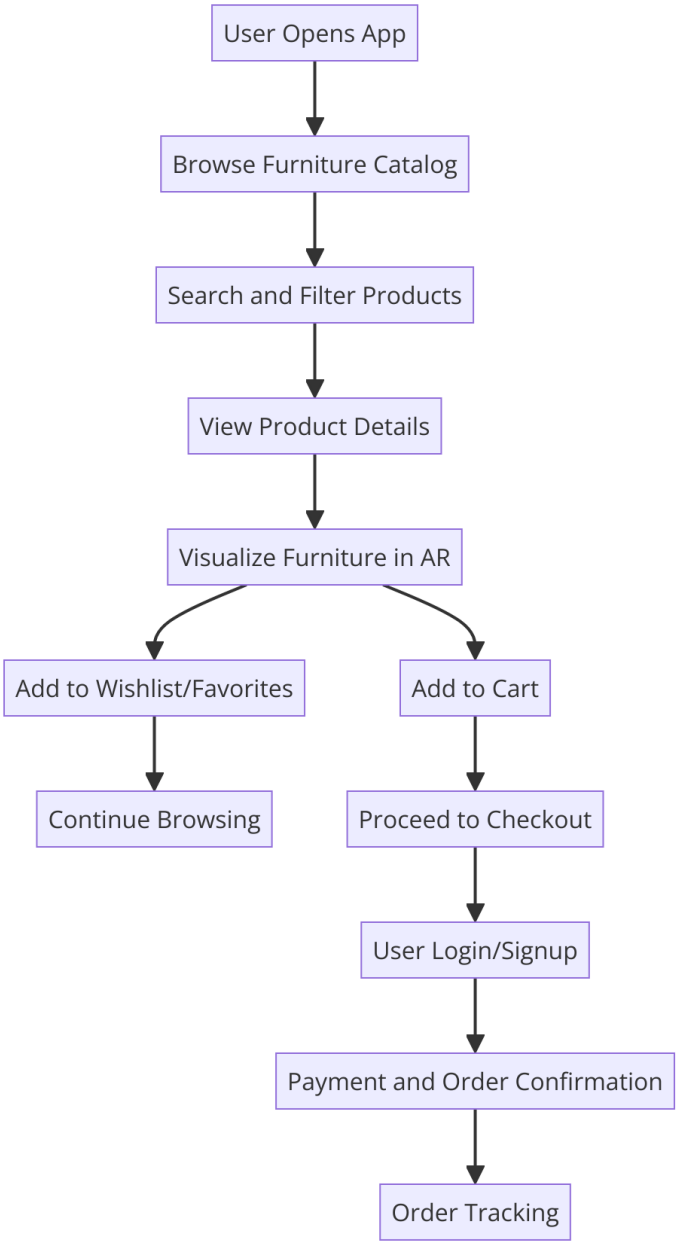
- **Functional Requirements:**

  AR visualization

  secure login

  customer service chat

- **System Flow Chart of the Proposed System:**



- **Personas/User Roles:**

  Shoppers

  Guest Users

  Admin

- **External Interactions:**

  Interfaces with payment gateways and social media platforms for login and sharing.

Technical Specifications

- **Technologies and Frameworks:**

  Flutter

  Dart

  Android Studio

  AR Core

  Firebase

- **Compatibility:**

  Compatible with iOS and Android devices supporting AR.

- **Security Needs:**

  OAuth for secure Google-based authorization, encrypted data storage and transmission.

System Alternatives

- **Alternatives:**

  Traditional e-commerce app, VR-based app.

- **Evaluation:**

  AR is less disorienting than VR and more interactive than traditional e-commerce.

- **Recommended Solution:**

  AR-based app due to its balance of immersion and accessibility.

Feasibility Analysis

- **Technical Feasibility:**
  - **Software and Hardware Requirements:**

    Flutter, Dart, Android Studio, AR Core, cloud-based data storage solutions, and Google-based authorization systems.

  - **Organizational Expertise**

    The system can be built based on organization's technical expertise and infrastructure constraints.

  - **Complexity and Risks**

    There is complexity of integrating AR technology into the app and identify potential risks associated with development, implementation, and ongoing maintenance.

- **Economic Feasibility:**

  ESTIMATED COST OF HARDWARE EQUIPMENT

  Devices compatible with AR Core for development and testing, depending on the model and specifications, multiple devices may be required, resulting in a total hardware cost.

  ESTIMATED COST OF SOFTWARE EQUIPMENT

  - The tools used are open-source and free to use, requiring no direct expenses.
  - Although AR Core is also free to use, there may be associated costs with additional plugins or premium features

  BENEFITS IN TERMS OF MONEY

  - Estimated to generate a significant increase in sales revenue, potentially ranging from 10% to 30% based on market analysis and consumer trends.
  - Enhanced visualization and AR features can lead to reduced instances of returns due to inaccurate expectations, resulting in cost savings estimated at 5% to 10% of total sales.

  RECURRING COST

  - Cloud-based data storage scalable storage solutions, depending on the volume of data stored.
  - for ongoing maintenance, bug fixes, and updates to ensure optimal performance and user experience**.**
  -

- **Operational Feasibility:**

  THROUGHPUT:

  Handle user interactions and transactions efficiently and ensure timely and accurate information presentation to users and managers.

  RESPONSE TIME:

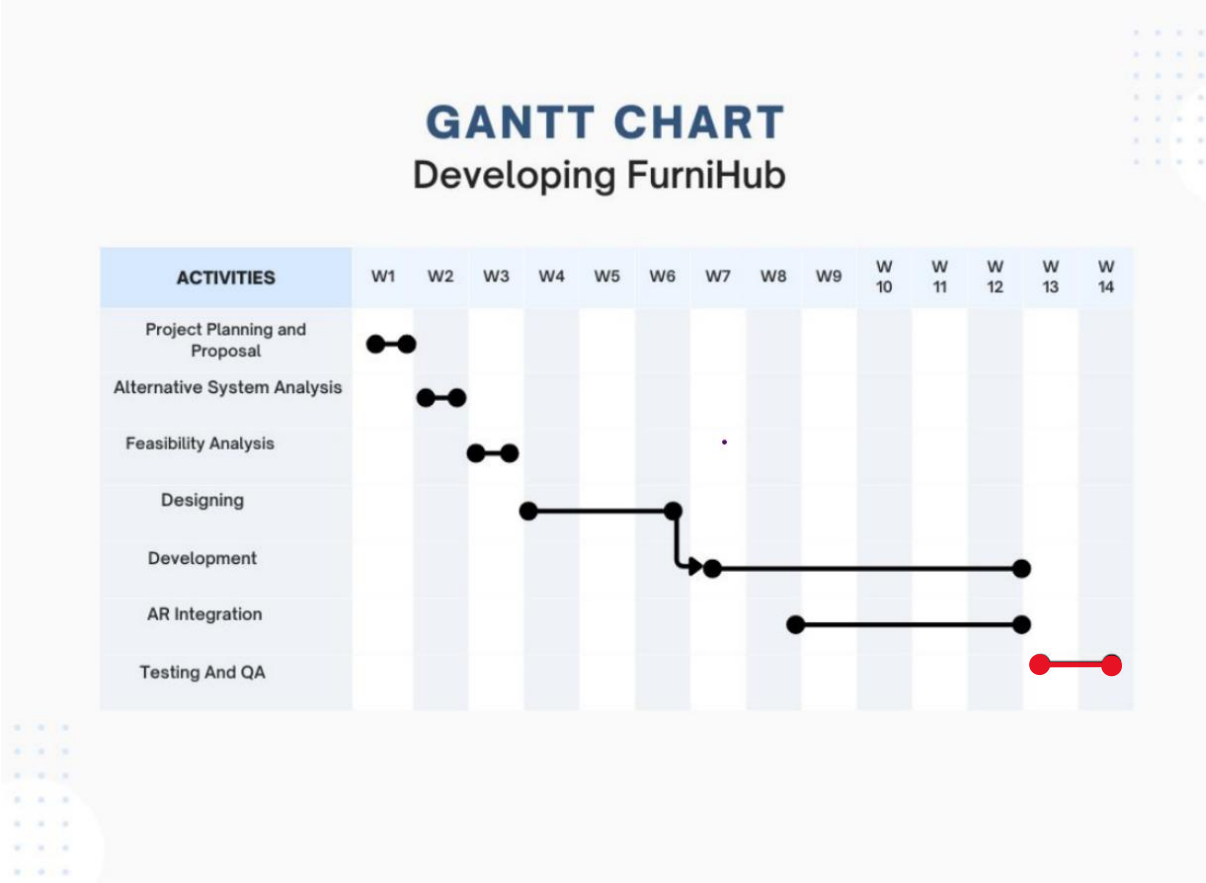
  Fast streamlined furniture shopping experience, efficient visualization through AR, and intuitive search and filter functionalities.

  EASE OF USE:

  Intuitive mobile interface, AR-enhanced user experience and ease of navigation.

Activity Planning and Control

- **Project Timeline:**



Milestones:

Prototype completion, beta testing, final launch.

Requirements Elicitation

- **Methods Used:** LAB

  Survey Process:

  Conducted interviews, questionnaires, and surveys among potential users, focusing on city dwellers with busy lifestyles in online.

  Age Distribution:

  - 19-25: 77%
  - 25-45: 23%

  Professions:

  - Students: 77%
  - Professionals: 13%
  - Others: 10%

- **Findings Summary:**

  High demand for AR in furniture shopping, especially among city dwellers.

Requirements Analysis

- **Functional Requirements Validation:**

  ● Define the core functionality, features and capabilities of the system

  ● They directly support and enable the primary business operations

  ● Examples: User login, product ordering, inventory management, reporting

  ● Usually specified through use cases, process workflows, data entities

Non-Functional Requirements

  ● Define system properties, qualities, and constraints

  ● They support and enhance the functional requirements

  .Examples:

  ○Performance - response times, throughput

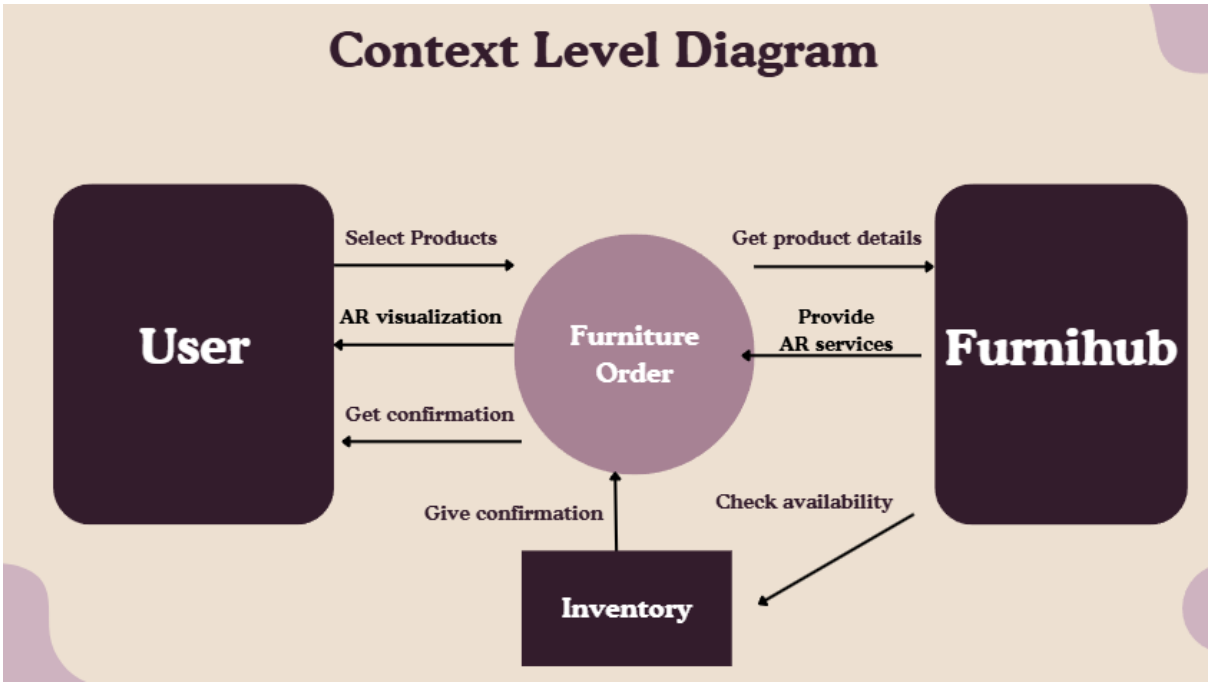
  ○ Security - authentication, access controls

- Usability - UI guidelines, accessibility needs
- Availability, backup, disaster recovery
- Scalability, compatibility/integration
- Compliance, legal, and regulatory aspects

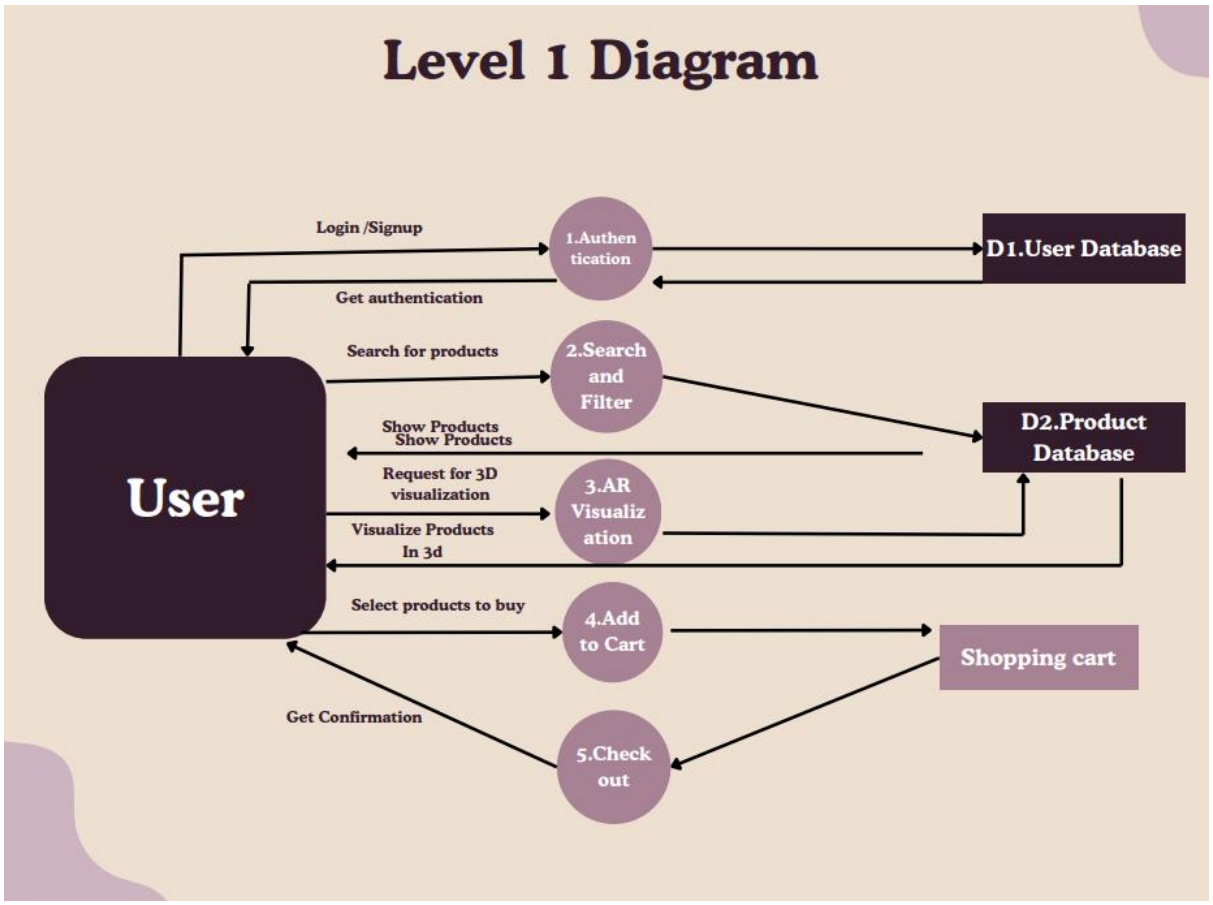
Data Flow Diagrams

- **Overview:**

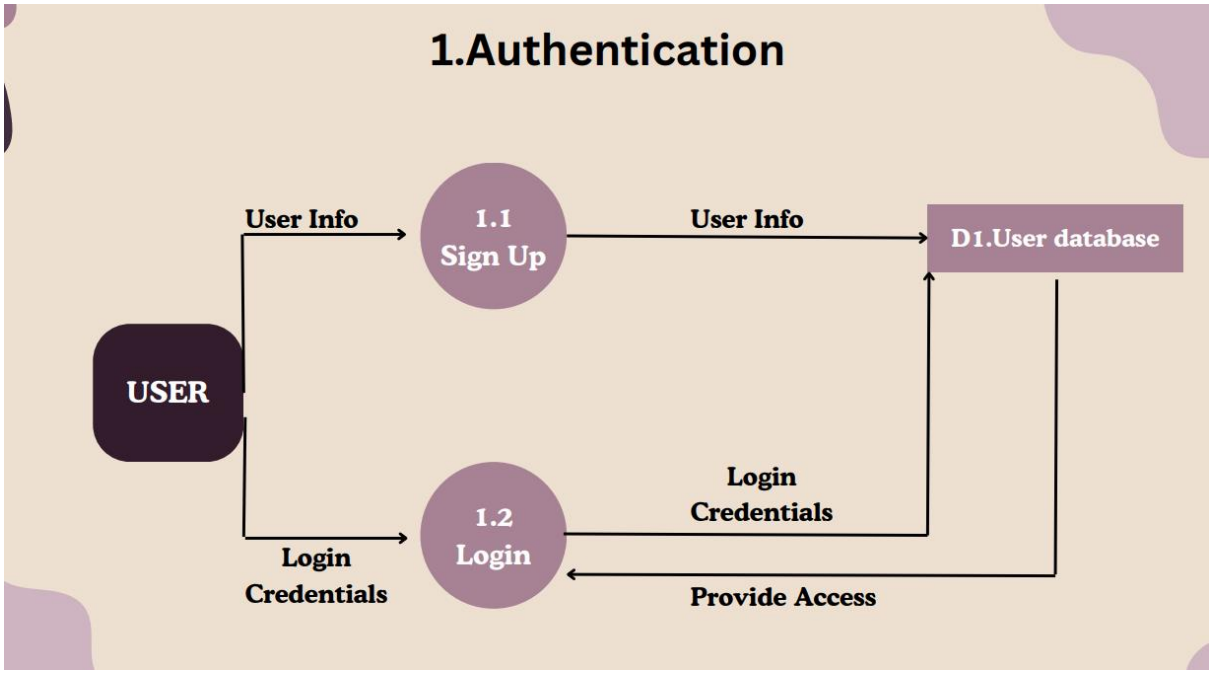
Context Level Diagram:



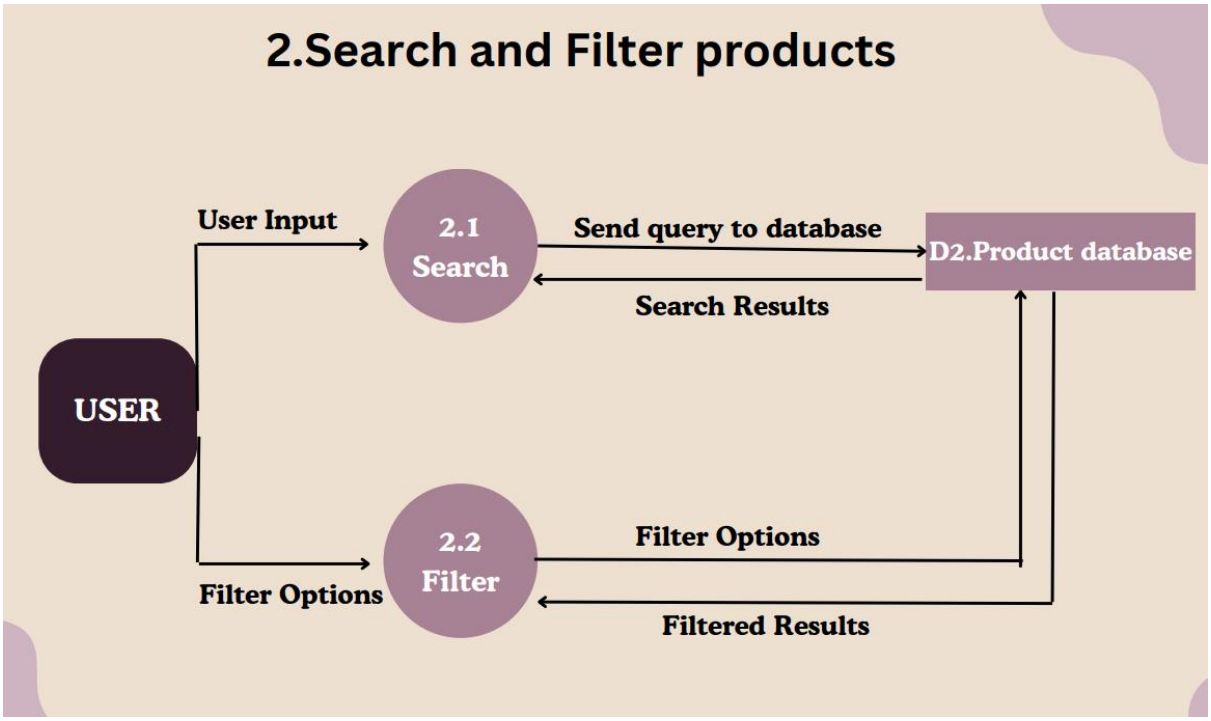
Level 1 Diagram:



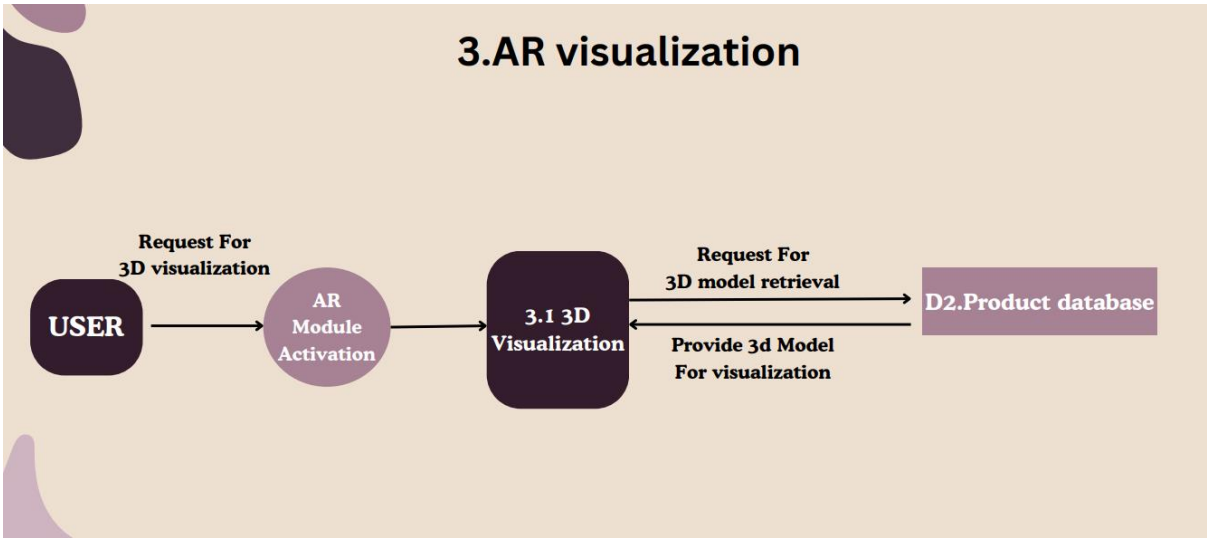
1.Authentication:



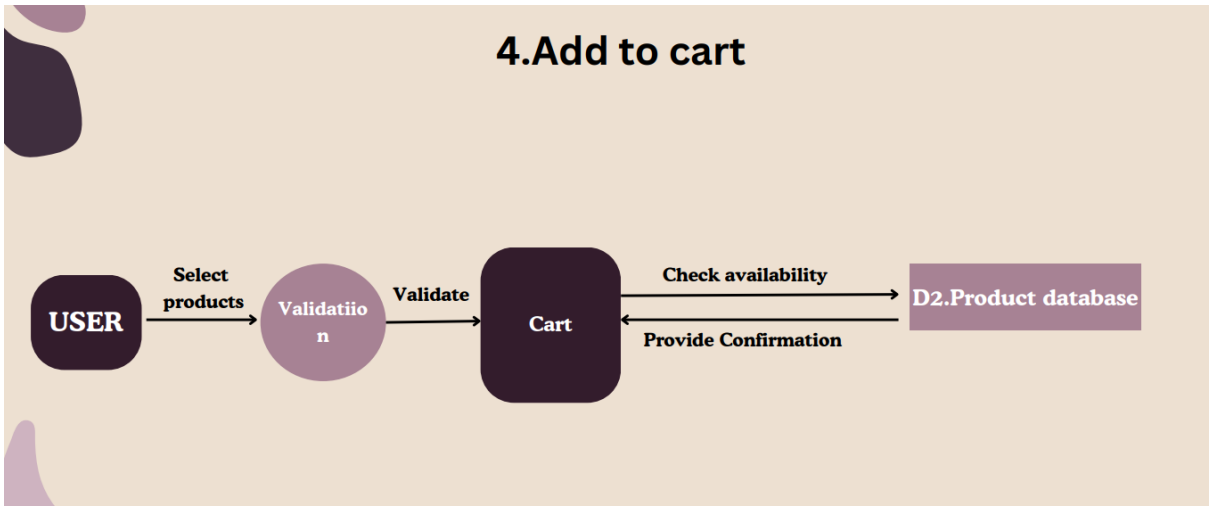
2.Search and filter



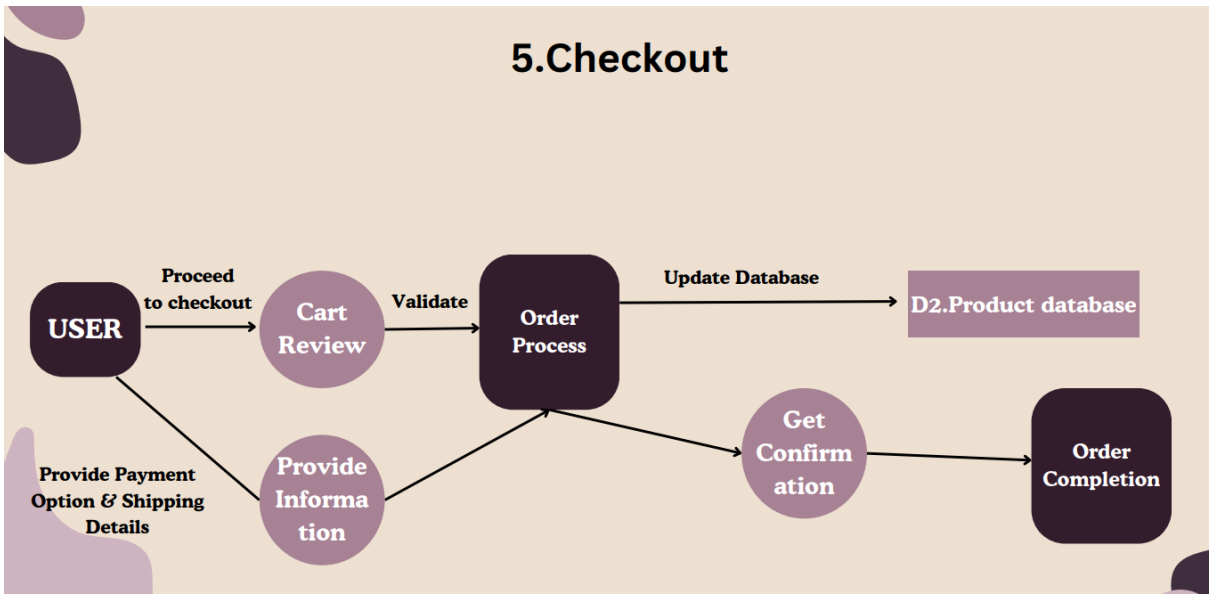
3.AR Visualization



4.Add to Cart



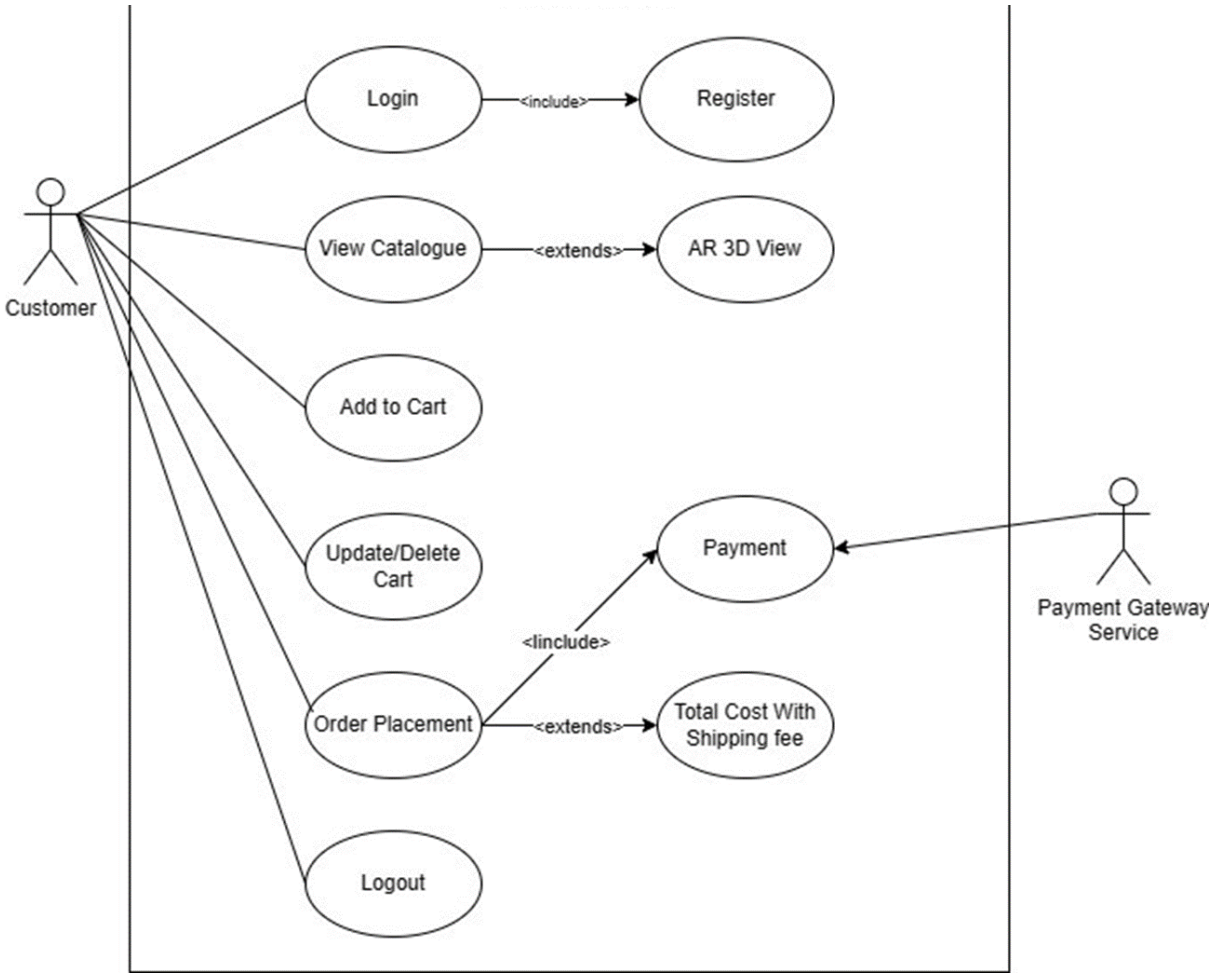
5.Check Out



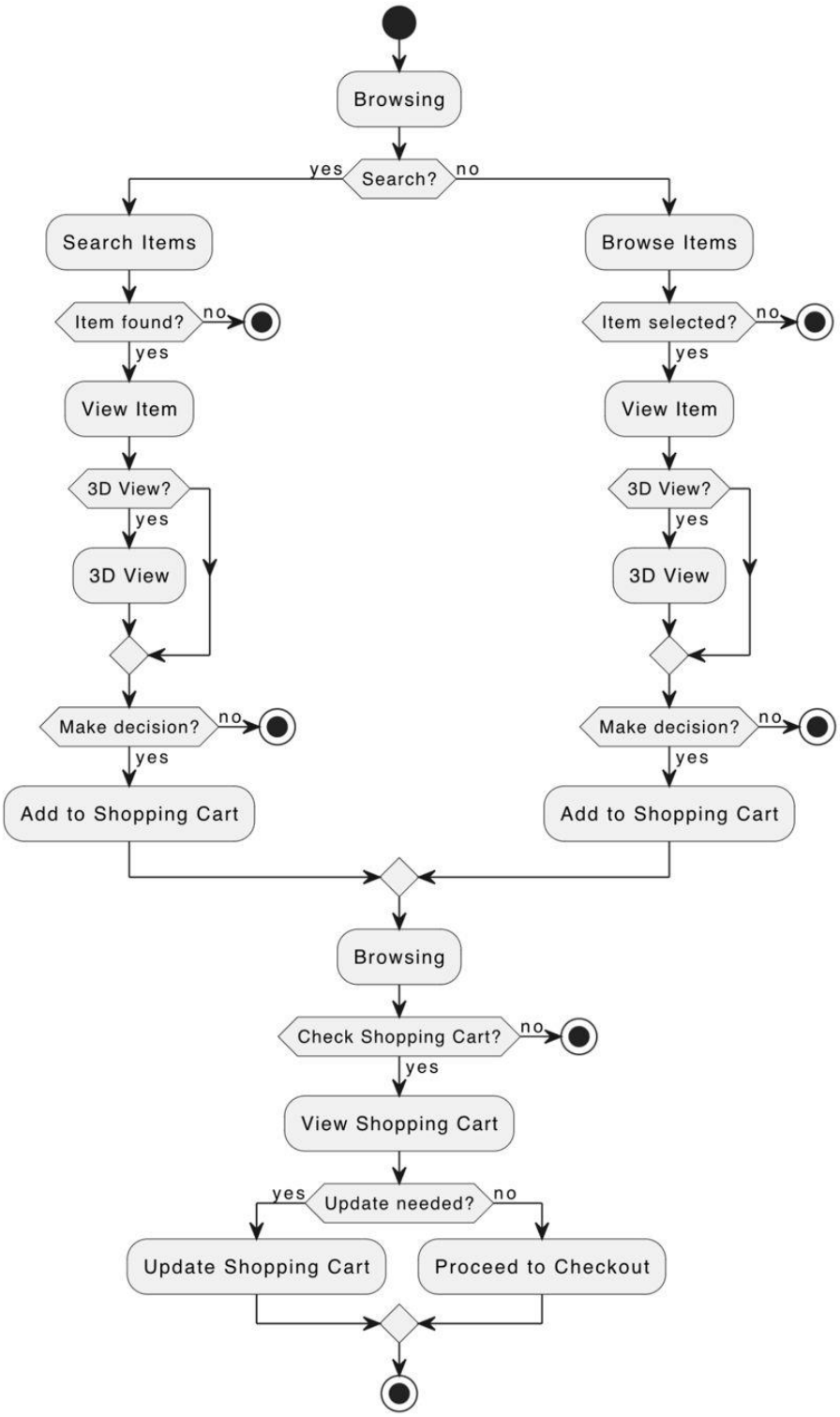
UML Diagrams:

- **Types Included:**

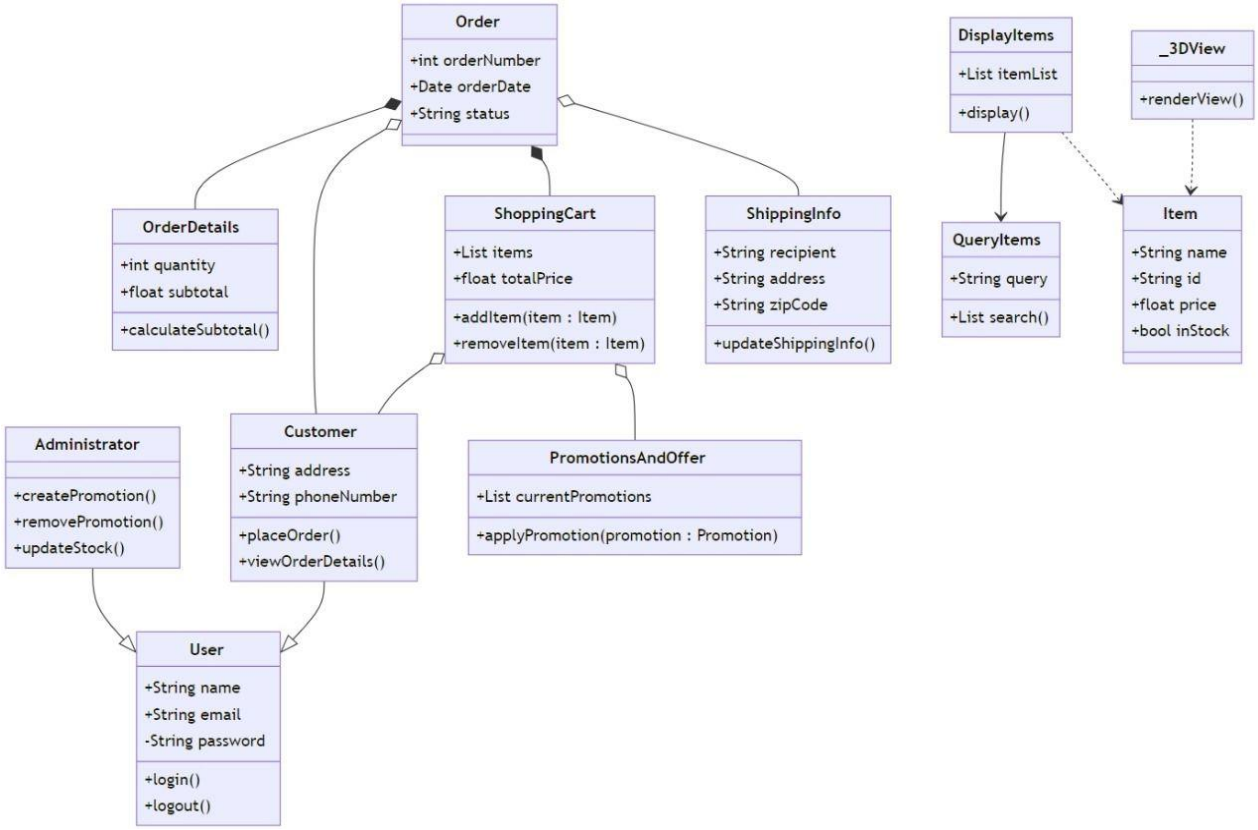
  Use Case:



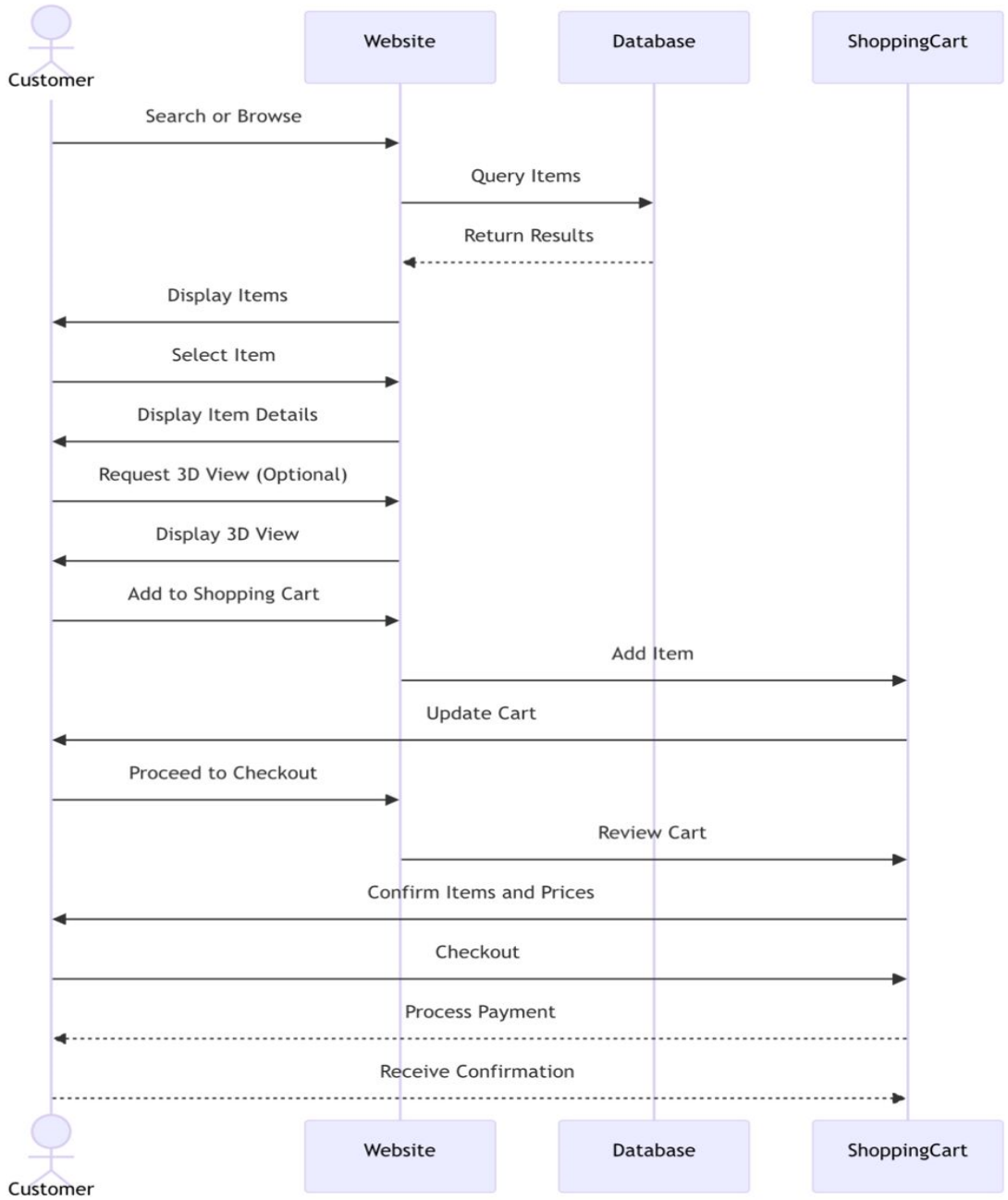
Activity Diagram:



Class Diagram:



Sequence diagram:



Project Repository

[sakibahmedshanto/Furnihub (github.com)]