Project Title: TechMart E-Commerce Web Application

Course Teacher: Eng.Golam Rabbany

Course Title: Software Project VI

Course Code: CSE336

Dear Sir,

Re: **We are pleased to present the Enclosed Application Agreement for the** *El-Lavish E-Commerce Web Application***.**

At *TechMart*, we craft client-focused applications by blending technical excellence, creativity, and clear communication. Our e-commerce platform is designed to deliver innovative, user-friendly, and affordable solutions tailored to clients' unique needs. Prioritizing functionality and design, we ensure a seamless user experience with high technical standards.

The *TechMart* e-commerce Web Application features intuitive navigation, engaging product displays, and efficient order management, simplifying shopping and enhancing customer satisfaction through a responsive interface and robust backend. This document outlines the application's features and specifications. Kindly review and confirm your approval by signing if it meets your requirements.

Yours Truly,

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*TechMart **e-commerce Web Application**.*

1. Project Overview

- **Purpose:** To create a dynamic, responsive, and secure e-commerce platform that allows users to browse, order, and manage their shopping experience while providing admin tools to manage the inventory and content effectively.
- **Scope:** The platform includes the display of various product categories with detailed descriptions. Users can register, log in, and securely manage their accounts. Features like adding items to a cart, viewing order statuses, and browsing categories are available for customers. The admin panel provides functionalities such as adding, updating, and deleting products to keep the inventory up-to-date.
- **Definitions, Acronyms, and Abbreviations:**

  CRUD: Create, Read, Update, Delete

  JWT: JSON Web Token

  UI: User Interface

  DBMS: Database Management System

2. Overall Description

1. **Product Perspective**:
   Tech-Mart E-commerce uses a modern tech stack to provide a seamless shopping experience:

   - **Backend:** Built with Node.js, Express, and MongoDB for managing CRUD operations, user data, and order information.
   - **Frontend:** Designed with React for a responsive and interactive UI, supported by React Router for navigation and Tailwind CSS for styling.

   2.Product Functions:
   ☐ **For Customers:**

   - Browse curated product categories on the home page.

- Add desired products to the cart.
- Manage orders and view their statuses.
- Secure login and registration for personalized features.

☐ **For Admins:**

- Manage inventory with add, update, and delete product options.
- Oversee user data and order management via a secure admin panel.

3.User Characteristics:

- **Customer:** A general user who shops for products, manages a cart, and places orders.
- **Admin:** A privileged user with access to content and inventory management tools.
- **Constraints:** Requires a stable internet connection for seamless navigation and transactions. MongoDB database and Firebase Authentication need to be operational for data and security management.
- **Assumptions and Dependencies**: Users have access to a modern browser. The application is hosted on a server running Node js and Mongo DB.

3.System Features

1. User Roles and Permissions

•**Customer**:
  ○ Browse available product categories and curated items on the homepage.
  ○ Add products to the shopping cart for later purchase.
  ○ View and manage their order list, including tracking order statuses.

•**Admin**:
  ○ Access a secure admin panel to oversee user and order data.
  ○ Add, update, or delete product inventory.
  ○ Manage user records and ensure website content stays up-to-date.

2. User Interface
- A modern, visually appealing UI built using **React** and styled with **Tailwind CSS**, ensuring responsiveness across devices (desktop, tablet, mobile).
- Smooth navigation powered by **React Router** for a seamless browsing experience.
- Interactive JavaScript elements for features like real-time cart updates, alerts, and error messages.

3.Functional Modules

Customer Modules:
   Product Browsing:
   Access multiple categories like electronics, clothing, and home   appliances
   with detailed product descriptions and images.
   Add to Cart:
   Easily add products to the cart, with real-time cart updates.
   Order Management:
   Submit orders and view order statuses.

Admin Modules:

- **Dashboard Management**: Monitor user records, product inventory, and order details.

Search and Navigation:

The navigation bar in the **Tech-Mart E-Commerce** project includes links to **Home**, **Order List**, and **Admin Login** for easy navigation. It allows users to browse products, view their orders, and provides secure admin access. The responsive design ensures smooth functionality across all devices.
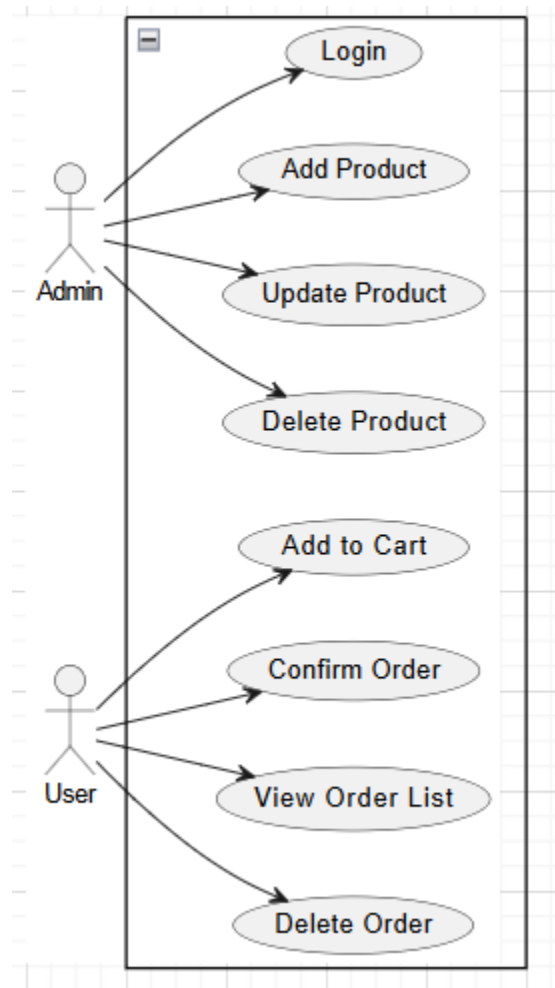
Use Case Diagram:

Fig 1: Use-Case Diagram for *TechMart* website
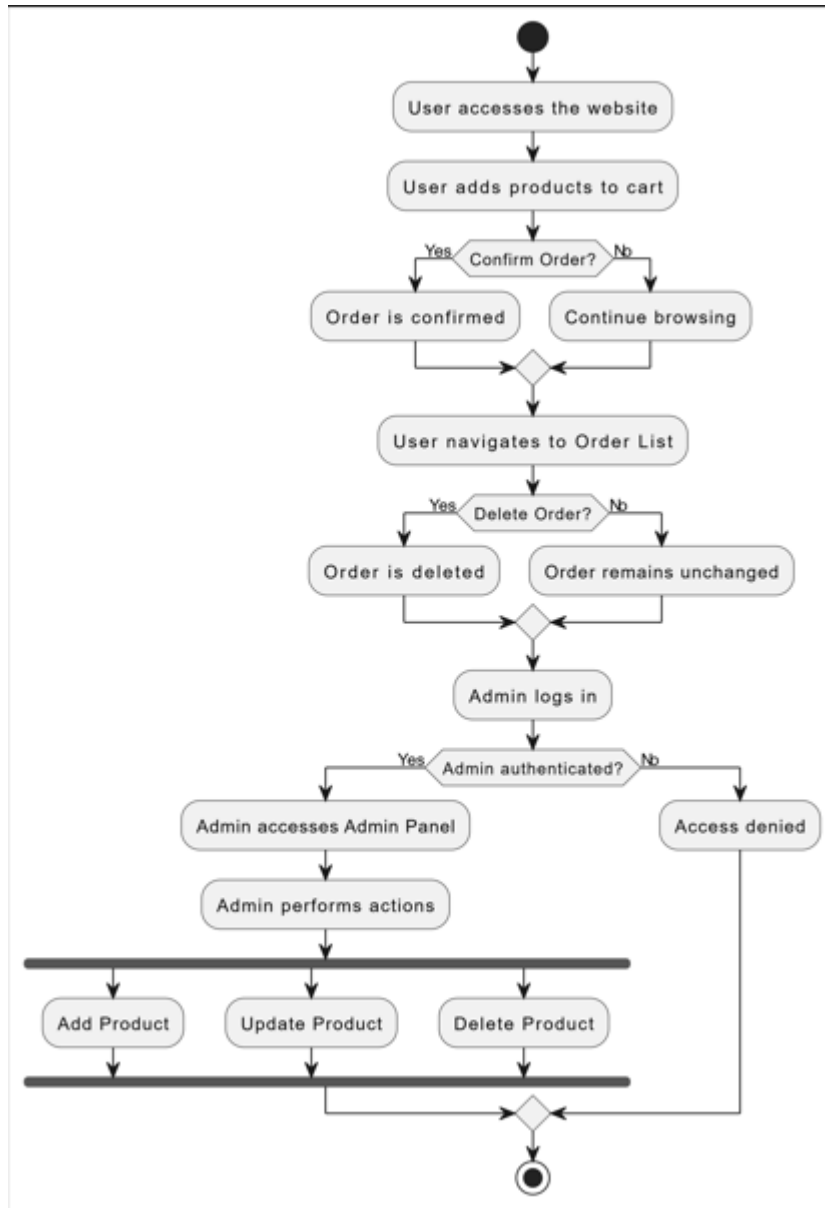
<u>Activity Diagram:</u>

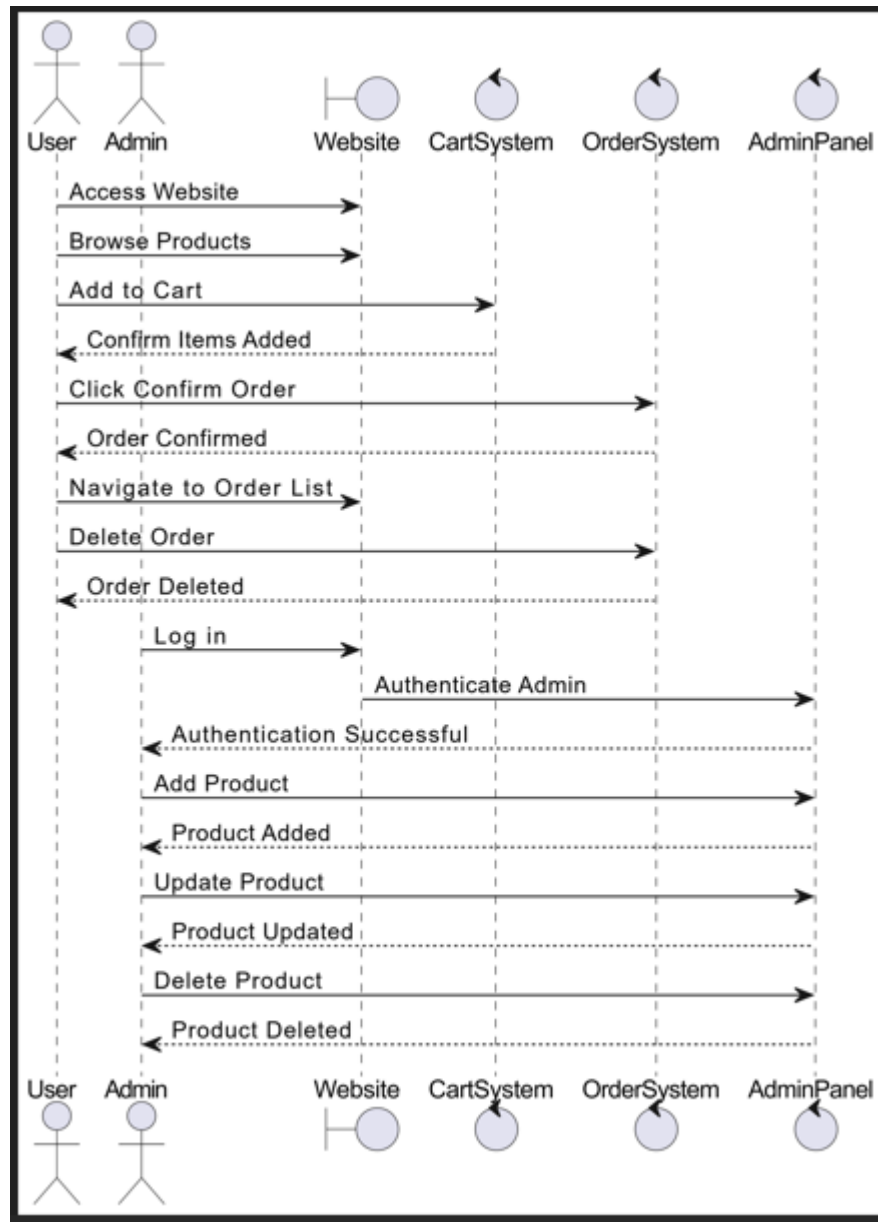<u>Fig 2: Activity Diagram for TechMart website</u>

Fig 3: Sequence Diagram for TechMart website

4.Detailed Workflows

Customer Workflow:
- **Browse Products:**
  Customers can explore visually categorized sections such as electronics, fashion, and home appliances. Product details, including price, description, and images, are displayed for an enhanced shopping experience.
- **Add to Cart:**
  Users can select desired products and add them to their shopping cart, with the total price dynamically updated.
- **Submit Orders:**
  After finalizing the cart, customers can confirm their purchase by entering their details (name, email, phone, and address) in the order form.

- **Cancel Orders:**
  Customers can navigate to the Order List and choose to delete an order. The system updates the database to reflect the cancellation

Admin Workflow:
- **View Orders:**
  Admins can log into the secure admin panel to access all user orders and related data stored in the database. This data is displayed in an organized table for easy management.
- **Modify Records:**
  Admins can add new products, update existing product details (e.g., price, stock), or delete obsolete entries from the inventory. Admins can also update or delete user order records directly from the admin panel.

5.Module Description

Customer Modules
☐ **Product Pages:**

- Category-based displays for products like electronics, clothing, and home appliances.
- Each product includes detailed descriptions, pricing, and high-quality images.

☐ **Order Management:**

- Allows customers to confirm orders by submitting details through a form.

- Enables customers to view their order history and cancel orders if needed, with all operations backed by MongoDB storage.

Admin Modules
Dashboard Access:

1. **View All Orders:**
    - o Admins can access a comprehensive list of all user orders and their details, including statuses.
2. **Add or Update Products:**
    - o Admins can add new products to the inventory or modify existing product details such as price, category, or stock availability.
3. **Delete Records Securely:**
    - o Admins have the ability to remove outdated or erroneous user orders and products, ensuring database accuracy and integrity.

6. Technology Stack

1. Frontend:

    a. **React** for building the user interface.
    b. **Tailwind CSS** for modern design and responsiveness.
    c. **JavaScript (ES6+):** For dynamic functionality and interactivity.

2. Backend:

    a. **Node.js** for server-side logic and runtime environment.
    b. **Express.js** as a lightweight web application framework.
    c. **MongoDB** for NoSQL database management.

3. Server Environment:

    a. **MEAN/MERN Stack (MongoDB, Express.js, React, Node.js)** for full-stack development.

7.Milestones and Timeline:

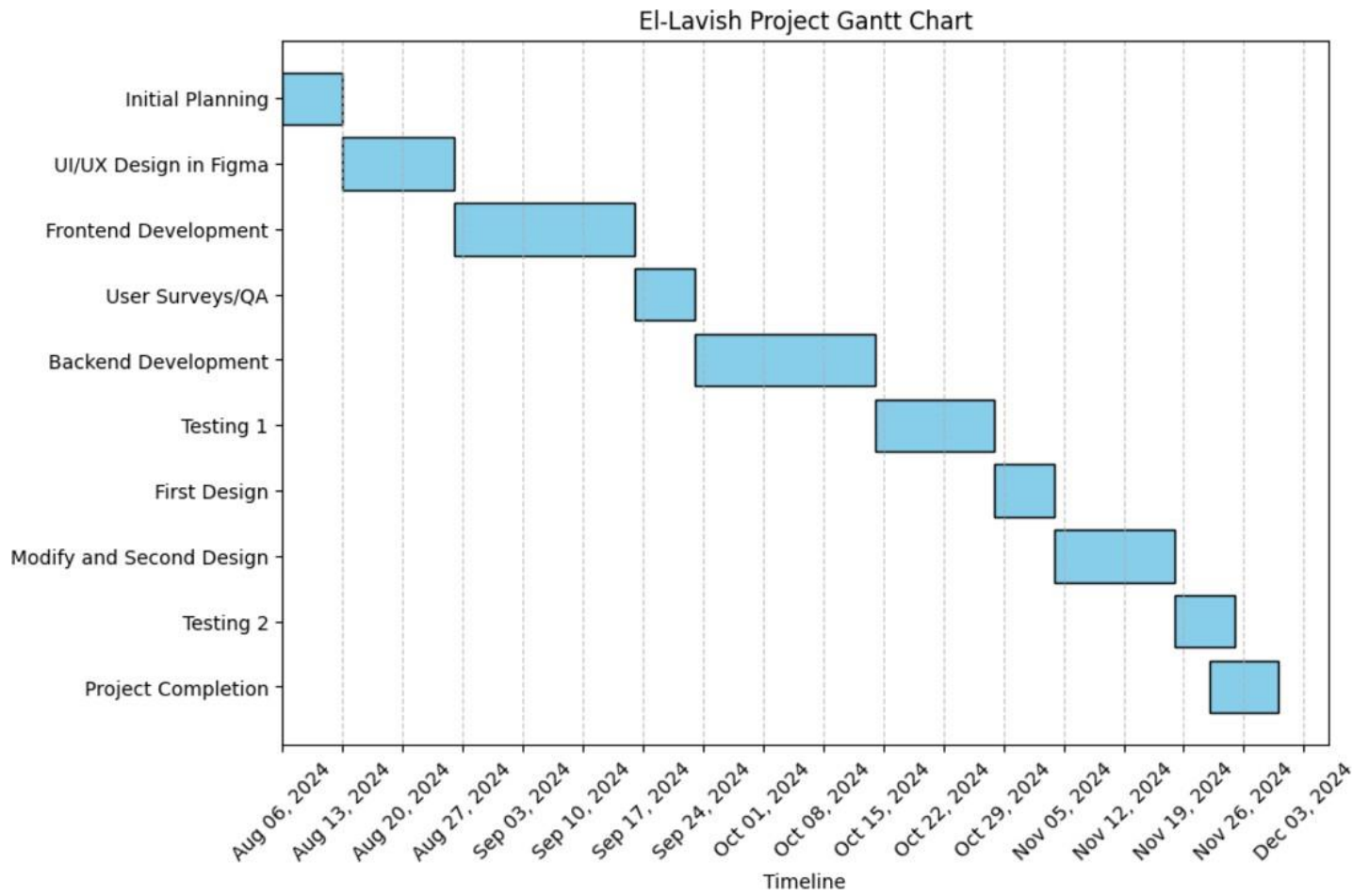| Milestone	Timeline
Initial Planning	Week 1 (August 6 - August 12, 2024)
UI/UX Design in Figma	Week 2 - Week 3 (August 13 - August 26, 2024)
Frontend Development	Week 4 - Week 6 (August 27 - September 16, 2024)
User Surveys/QA	Week 7 (September 17 - September 23, 2024)
Backend Development	Week 8 - Week 10 (September 24 - October 14, 2024)
Testing	Week 11 - Week 12 (October 15 - October28, 2024)
First Design	Week 13 (October 29 - November 4, 2024)
Modify and Second Design	Week 14 - Week 15 (November 5 - November 18, 2024)
Final Testing	Week 16 (November 19 - November 25, 2024)
Project Completion	Week 17 (November 26 - November 30, 2024)

Fig 4: Gantt Chart for Techmartwebsit

8.Testing Process:

1. **Unit Testing**
   - Validate individual components such as login forms, product pages, and admin panel features.
   - Ensure form fields for user registration, login, and order submission have proper validations (e.g., email format, required fields).
2. **Integration Testing**
   - Test the seamless connection between frontend React components and backend APIs developed using Node.js and Express.
   - Verify functionality such as adding items to the cart, submitting orders, and retrieving the order list from the database.
3. **End-to-End Testing**
   - Simulate complete user workflows, including:
     - Browsing products, adding to cart, and confirming an order.
     - Navigating to the order list and deleting an order.
   - Test admin workflows such as logging in, updating, adding, or deleting products.
4. **Security Testing**
   - Check authentication and authorization mechanisms using Firebase Authentication and JWT to ensure only authorized users can access the admin panel.
5. **Performance Testing**
   - Evaluate website performance under high traffic, especially during actions like order submission and admin data retrieval.
6. **User Acceptance Testing (UAT)**
   - Gather feedback from stakeholders and real users to validate that the platform meets their expectations in terms of usability and functionality.

9.Support and Maintenance :

☐ **Customer Support**

- Provide email-based support to address user queries and issues related to order placement, cancellation, and account management.
- Ensure prompt responses to user concerns and maintain a dedicated support team for troubleshooting.

☐ **System Maintenance**

- Conduct regular checks to ensure database integrity and optimize performance.

- Perform periodic updates to the frontend (React components) and backend (Node.js and Express) for compatibility and security improvements.
- Monitor Firebase Authentication and JWT configurations to maintain secure user login processes.
- Address bug fixes, implement new features, and ensure the UI remains responsive and functional across devices.

☐ **Performance Monitoring**

- Use tools to monitor server uptime, API response times, and website load times to ensure smooth operation under varying traffic conditions.

☐ **Scalability and Updates**

- Regularly review and update the website to handle increased traffic and add new functionalities as per business needs.
- Ensure compatibility with evolving technologies and frameworks like React, Tailwind CSS, and MongoDB.

10.Pricing and Payment Terms

☐ **Total Project Fee**

- $8,000 USD

☐ **Payment Schedule**

- **20%** ($1,600 USD) upon completion of requirement gathering and analysis.
- **40%** ($3,200 USD) after completing initial development and UI/UX design.
- **30%** ($2,400 USD) after successful testing and User Acceptance Testing (UAT).
- **10%** ($800 USD) upon final deployment of the Tech-Mart website.

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11.Roles and Responsibilities:

- **Client**

  o Provides project requirements and feedback.
  o Approves milestones and final deliverables.

- o Reviews and signs off on major features, such as the UI/UX design and final deployment.

- **Project Manager**

  - o Oversees the overall project execution and ensures timely delivery.
  - o Acts as the primary point of communication between the team and the client.
  - o Allocates resources effectively and manages risks to keep the project on track.

- **Frontend Developer**

  - o Develops the user interface of the Tech-Mart website using React and Tailwind CSS.
  - o Ensures the website is responsive and performs well on all devices.
  - o Collaborates with UI/UX designers to implement the design and improve the user experience.

- **Backend Developer**

  - o Develops server-side logic using Node.js and Express.
  - o Integrates the backend with MongoDB for data storage.
  - o Ensures the security, scalability, and performance of the backend services.

- **UI/UX Designer**

  - o Designs user interfaces that are visually appealing and easy to use.
  - o Creates wireframes and mockups for approval, ensuring a seamless user experience across devices.
  - o Works closely with the frontend developers to implement the design.

- **Quality Assurance (QA)**

  - o Tests the application for bugs, performance issues, and usability problems.
  - o Verifies that the project meets the specified requirements and delivers a high-quality user experience.
  - o Conducts end-to-end and security testing to ensure all features function correctly.

- **System Administrator**

  - o Manages hosting environments and server configurations to ensure minimal downtime.
  - o Ensures that the website is properly deployed and operates efficiently.
  - o Monitors and optimizes server performance as needed.

- **Admin (Internal)**

    - Manages internal tools and monitors the admin panel.
    - Generates reports and ensures that internal systems are functioning optimally.
    - Manages data and user records through the backend system.

12.Contact Us -

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