Project Overview:

The goal is to create a unified system that streamlines the entire supply chain process—from order placement to delivery—by integrating OMS, TMS, and DMS modules. Each module will function as a component within the larger ecosystem, allowing for seamless data flow and improved operational efficiency.

Modules and Their Functions:

1. Order Management System (OMS):

- Capture and validate customer orders from multiple channels (online, in-store, mobile apps).

- Real-time inventory checks to confirm product availability.

2. Transportation Management System (TMS):

-Route Planning and Optimization:

- Calculate the most efficient delivery routes considering distance, traffic, and delivery windows.

-Carrier Management:

- Interface with third-party logistics providers and carriers.

- Freight Auditing and Payment:

- Automate freight billing and payment processes.

- Real-Time Tracking:

- Monitor the location of shipments using GPS and IoT devices.

3. Distribution Management System (DMS):

- Warehouse Management:

- Oversee storage, picking, packing, and shipping operations.

- Inventory Control:

- Track stock levels across multiple warehouses.

- Demand Forecasting:

- Use historical data to predict future inventory needs.

- Returns Management:

- Handle product returns and restocking efficiently.

System Design:

A. Architecture Overview:

- Modular Design:

- Each module (OMS, TMS, DMS) operates independently but communicates via APIs.

- calable Infrastructure:

- Utilize cloud services to handle varying loads and ensure high availability.

- TMS plans the delivery route.

- Assigns the shipment to a carrier.

- Provides real-time tracking information to OMS and DMS.

- Delivery confirmation is sent back to all modules.

Distribution Management System (DMS):

Best Practices:

- Use automation (e.g., conveyor belts, robotic pickers) to increase efficiency.

- Implement just-in-time inventory practices to reduce holding costs.

Challenges:

- Managing returns and reverse logistics.

- Ensuring accurate inventory counts.

Timeline (TAT: 20 Days):

Days 1-5:

- Complete in-depth research on OMS, TMS, DMS.

- Finalize system requirements and specifications.

Days 6-10:

- Develop detailed design documents.

- Create architectural and data flow diagrams.

Days 11-15:

- Design backend structures (database schemas, API endpoints).

- Begin frontend wireframes and mockups.

Days 16-20:

- Review and refine designs.

- Prepare final design documentation for submission.

Submission Guidelines:

-Format:

- Submit all design documents in PDF format.

- Include diagrams in high-resolution images or embedded within documents.

-Contents:

- Comprehensive system design covering all modules.

- Clear explanations of how each module functions and integrates.

- Backend and/or frontend designs as per the initial phase requirements.