Proposal on

INVENTORY MANAGEMENT SYSTEM

Prepared for

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Executive Summary

We are a group of dedicated and ambitious students committed to creating innovative solutions for complex business challenges. Our mission is to simplify and optimize business processes, enabling small and medium-sized enterprises (SMEs) to achieve greater efficiency and success in their operations.

Our project, the **Inventory Management System (IMS)**, is a web application designed to streamline inventory operations such as ordering, storing, utilizing, and selling products. The IMS aims to reduce the workload of business managers by providing an intuitive platform to manage stock levels efficiently, track trends, and make data-driven decisions aligned with demand, supply, and budget constraints.

Inventory management is a critical business function that ensures the right quantity of stock is available at the right time. The system we are building will:

- Track inventory from purchase to sale, ensuring a seamless flow of goods.
- Respond to trends and notify managers of stock shortages.
- Prevent overstocking, which ties up capital and impacts cash flow negatively.
- Measure inventory turnover, an essential metric for gauging stock efficiency and avoiding deadstock.

Our primary customer base includes **Supply Chain Managers**, who oversee the entire lifecycle of a product, from raw material acquisition to final delivery. By adopting our Inventory Management System, these professionals will gain a powerful tool to streamline operations, reduce losses, and ensure that products are available at the right time and place.

Our goal is to empower businesses by simplifying the complexities of inventory management, ultimately helping them to focus on growth and profitability while achieving operational excellence.

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Introduction

Project introduction:

We are a team of dedicated students committed to creating innovative solutions for business challenges, aiming to empower small and medium-sized enterprises. Our project, Inventory Manager, is a web-based application designed to simplify inventory management processes, including ordering, storing, utilizing, and selling products. By streamlining stock management based on demand, supply, and budget, this system ensures businesses can maintain optimal stock levels, track inventory from purchase to sale, and respond proactively to trends or shortages. With its intuitive design, the Inventory Manager minimizes complexities and enhances decision-making, as detailed in the functional and non-functional requirements of this proposal.

Team introduction:

To efficiently manage and develop the Inventory Management System (IMS), roles have been divided among the team members based on their skills and interests. This ensures collaboration, productivity, and accountability at every stage of the project.

- **Md. Shefayer Ahmed-Developer & Database Designer**

  Focused on building the server-side logic, database integration, and APIs for the Inventory Manager.

- **Ibrahim Khalil Shuvo-UI/UX Designer & Project Manager**

  Focused on designing user-friendly experience using modern web technologies. Responsible for coordinating the project, managing deadlines.

- **Jannat Labiba- Quality Assurance & Documentation**

  Will Test the application for bugs, usability, and performance issues. Conduct user testing and provide feedback for improvements.

- **Md. Riaz Hossain - System Analyst**

  Tasked with analyzing system requirements, ensuring the application meets user needs and prepared for the delivery according to the choices.

Background of the study

What triggered the making of our software:

Inventory management is essential for a company's success, as it ensures an optimal balance of stock, minimizing the risks of stockouts and inaccuracies. Effective inventory management not only saves costs but also enhances cash flow and improves customer satisfaction. A well-designed software solution can greatly assist supply chain managers by providing comprehensive records, real-time product availability, and insights into cash flow status, simplifying their tasks significantly.

While many inventory management applications currently available in the market have notable shortcomings, our aim is to develop a software solution that addresses these gaps. By incorporating the features most frequently needed by supply chain managers and striving for minimal flaws, we promise to deliver a product that is reliable, efficient, and tailored to meet their operational demands.

Objectives

Primary Objectives

1. **Order Management:** Develop a system that efficiently handles customer orders, ensuring accurate tracking and processing from placement to fulfillment.
2. **Inventory Tracking:** Enable seamless buying, storing, and managing of products within the inventory to maintain accurate stock levels.
3. **Return Handling:** Implement functionality for customers to request refunds or returns, streamlining the reverse logistics process.
4. **Demand Forecasting:** Incorporate predictive analytics to identify future stock requirements based on customer trends, minimizing stockouts and overstocking.

Secondary Objectives

1. **Improve Customer Satisfaction:** Ensure a hassle-free shopping experience by offering transparent order statuses, easy refunds, and prompt service.
2. **Optimize Inventory Costs:** Reduce unnecessary expenses by maintaining optimal stock levels based on predictive insights.
3. **Enhance Operational Efficiency:** Automate routine tasks like order updates, stock tracking, and reporting to reduce manual workload and errors.
4. **Support Scalability:** Design the system to adapt to growing business needs, accommodating higher order volumes and expanding product ranges.

Methodology

Process Model: Prototyping Model

Here in this project, we will use the prototyping process model. **Prototyping Model** is a software development model in which prototype is built, tested, and reworked until an acceptable prototype is achieved. It is an iterative, trial and error method which takes place between developer and client.
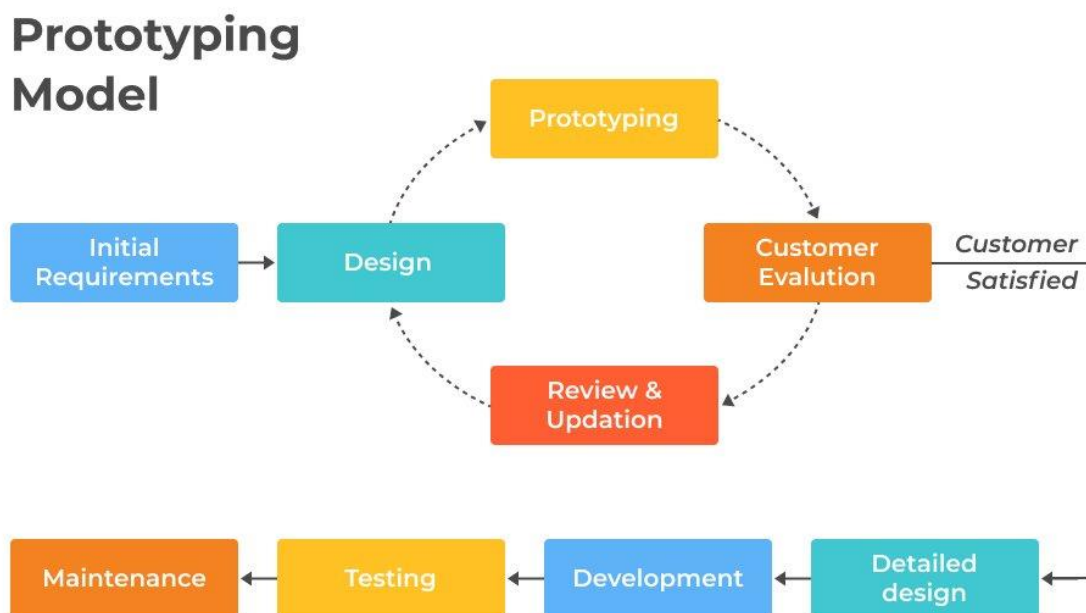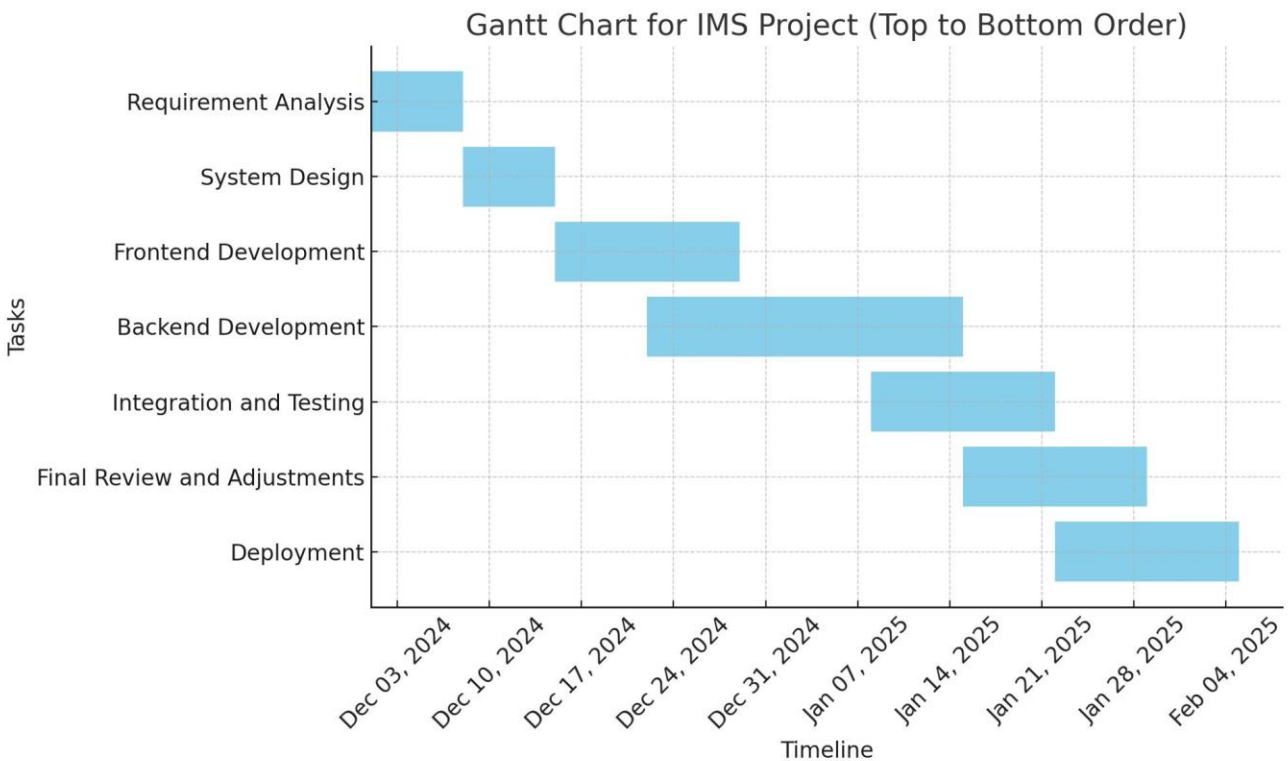

Reason for choosing prototype model:

We have chosen this for our project because this model helps to make sure that the user (chain supplier) gets satisfied by giving time to time feedbacks which is our primary goal.

Planning

Gantt chart:

Our Estimated Project Duration is 2 months (December 2024 to February 2025)

Project planning:

Industry visit -> Client requirements -> Project proposal -> UX Design -> Database Design -> Testing -> hosting & publishing

Our plan for the project is that first we do some research/requirement gathering and planning then design the database tables, then do the front-end part using html, CSS, js after that we do backend part using raw php, after that we do testing to find and solve bugs last but not least, we shall host and publish our project in public domain to make it available to users.

Modeling

Project features:

Introduction:

The application will provide functionalities like seeing the list of products to buy, see all the goods in warehouse, choose which ordered products to accept and which to reject, return and replacement orders. A manager can also see the past transaction histories and analyze overall business state.

Function Definitions:

Functional Requirements:

Registration & Login Page	
1	Registration form will have Name, email & password
2	Login form will have email & password

Product Acquiring Page	
1	List of products to acquire
2	Choosing quantity of the product
3	Total cost of the chosen products
4	Total space occupied by the chosen products

Inventory Product List Page	
1	List of products in inventory
2	Set Total space of the storage
3	Total space occupied by the products and remaining space
4	Discard product from inventory

Return & Replacement Page	
1	List of return requested products with quantity
2	Choice of accepting or rejecting the request

History Page	
1	Past purchase list with date and time
2	Past accepted order list with date and time

Analysis Page	
1	Sort most demanded products according to past orders to help forecasting
2	View overall cash flow analysis to understand current business state

Non-functional Requirements:

Performance	
1	The hosting site should have enough hardware capabilities
2	The project design and codes should be well optimized to fetch data and show quickly enough
3	Less redirects to reduce load on the server
4	Minimal media (image/audio/video ...) will be used to reduce unwanted pressure during fetch
5	No unnecessary heavy JavaScript usage to reduce resource usage in user device

| Portability	
1	Make the interface dynamic for all size and categories of devices
2	The frontend should be well optimized for low end devices to handle

| Security	
1	Only developer can alter the database structure, Only Admin should be able to alter the product categories and prices
2	Periodic backup data of the database
3	Input validation: Input validation is done so that only properly-formed data passes through the workflow in a web application

User friendliness	
1	The application should have a decent interface and should provide the user good experience.
2	While the coding done in the project, the developers must keep in mind that adding new features and bug fixes should be easier for the future and if new programmer is assigned, they must understand the codes easily.

Use case diagram
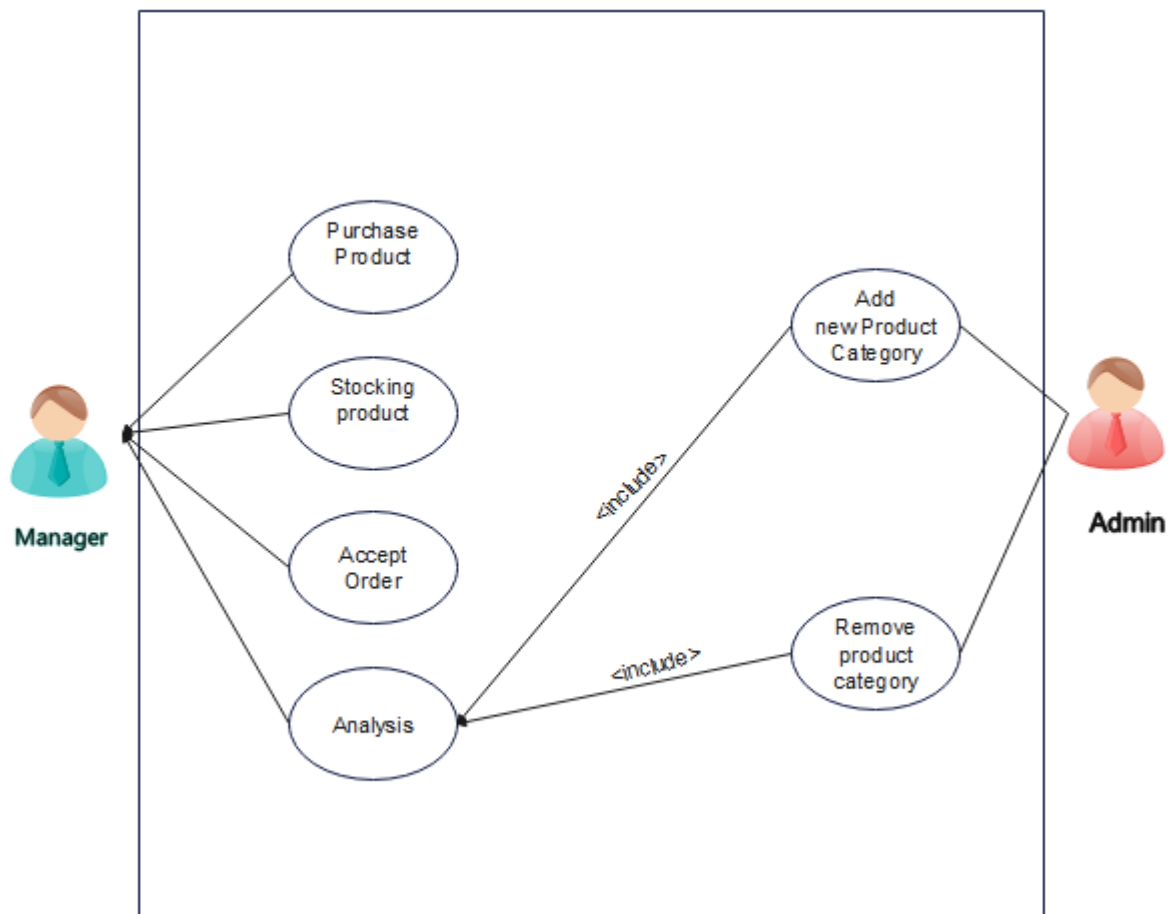
The user can access features like purchasing products, stocking products, accepting orders, and analysis. Whereas admin can add new product category remove product category and can also see analysis page.

Activity diagram
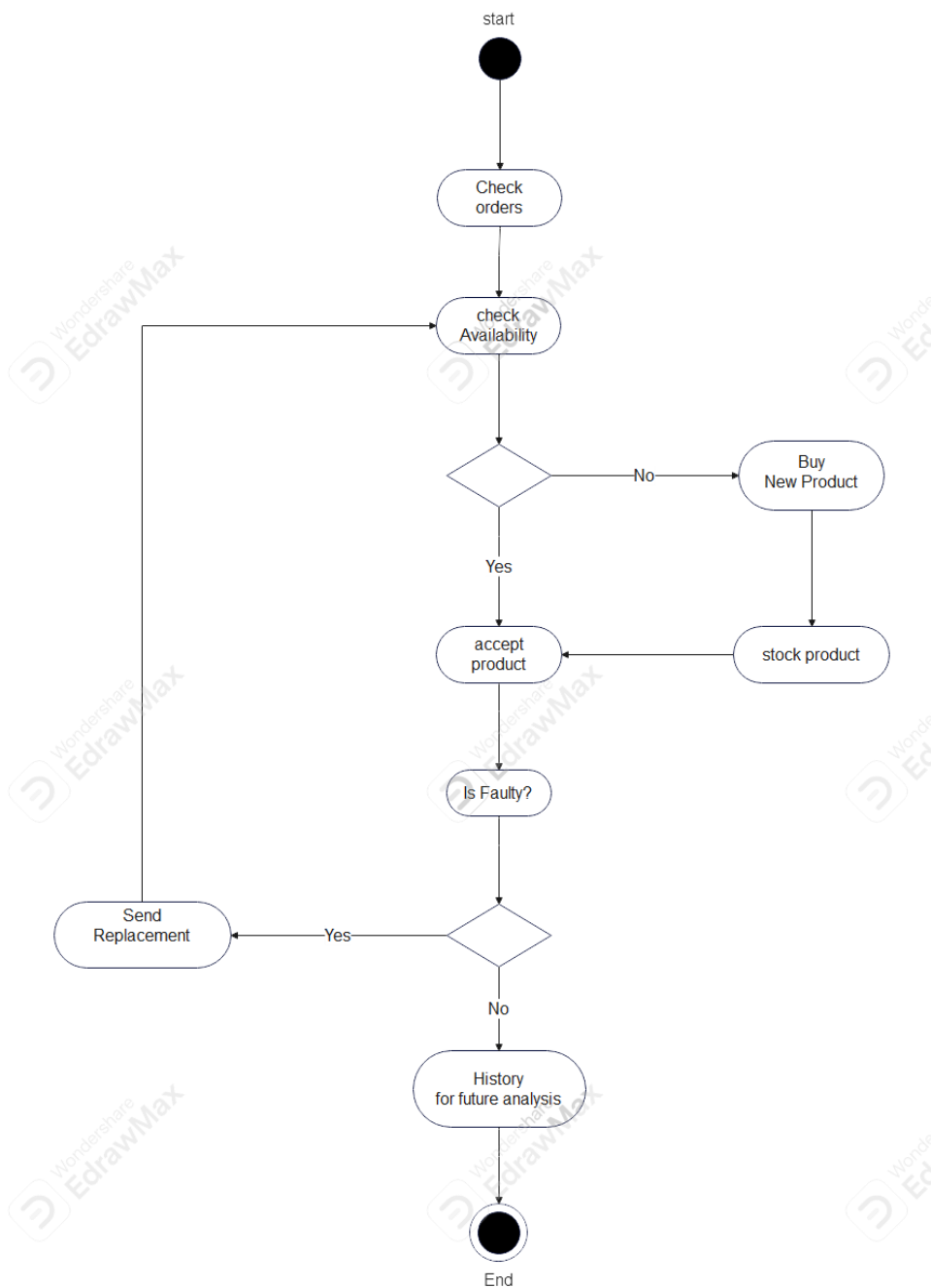
Construction

Development Environment:

- **Operating System: Windows**
- **Server: Apache**
- **Languages: HTML, CSS, PHP**
- **Database: MySQL**

Conclusion

Our proposed **Inventory Management System** is designed to streamline inventory processes, including order management, product storage, refunds, and demand forecasting. By addressing the flaws in existing solutions and focusing on essential features, the system aims to enhance efficiency, reduce costs, and support informed decision-making. This project is a step toward empowering businesses with a reliable, user-friendly tool to achieve operational success and customer satisfaction.