Project Proposal: Inventory Management System (MERN Stack)

1. Introduction

Many businesses in Nepal continue to manage inventory using manual records or basic spreadsheets. These approaches often result in stock mismatches, delayed purchasing decisions, poor visibility, and financial losses.

The proposed Inventory Management System (IMS) is a web-based solution designed to manage products, suppliers, purchases, sales, and real-time stock levels in a centralized system. Built using the MERN stack, the system will be secure, scalable, and suitable for growing businesses such as retail stores, wholesalers, and warehouses.

2. Objectives

- Maintain accurate, real-time inventory records
- Track stock movement across purchases and sales
- Minimize inventory loss and overstocking
- Provide detailed reports to support management decisions
- Improve operational efficiency and accountability

3. Key Features

Core Features

- Product and Category Management
- Stock In and Stock Out Management
- Supplier and Purchase Management
- Sales and Dispatch Records
- Low Stock Alerts
- Inventory Reports (PDF and CSV)
- Role-Based User Access (Admin, Staff)
- Secure Authentication

4. Team Structure (4 People)

Role	Responsibility
Full-Stack MERN Developer	Complete frontend and backend development
Backend & Database Support	Data modeling, performance optimization, backups
QA & Tester	Validation of stock calculations and workflows
Project Manager / Documentation & Training	Project coordination, documentation, staff training

This lean team structure minimizes overhead while maintaining quality, accountability, and efficient communication.

5. Technology Stack

- **Frontend:** React.js with Tailwind CSS
- **Backend:** Node.js with Express.js
- **Database:** MongoDB (Cloud-based)
- **Authentication:** JWT-based authentication
- **Hosting:** AWS (1-year deployment)

6. Cost Estimation (in NPR)

Component	Description	Cost (NPR)	Justification
Full-Stack Development	Core MERN system	125,000	Approximately 6 weeks of development
Inventory Logic & Reporting	Stock rules, alerts, reports	35,000	High accuracy and validation required
Admin Dashboard	Tables, filters, summaries	30,000	Business-level monitoring and reporting
Hosting & Deployment	Server, domain, SSL	15,000	One-year infrastructure and setup
Testing & QA	Functional and edge-case testing	18,000	Prevents stock mismatches and errors
Documentation & Training	User manual and staff training	10,000	Ensures smooth system adoption

Total Estimated Cost:

Rs. 2,33,000 (Approx.)

7. Project Timeline

Phase	Duration
Requirement Analysis	1 week
UI/UX Design	1 week
Development	6 weeks
Testing and Fixes	2 weeks
Deployment and Training	1 week

Total Project Duration: 9–10 weeks

8. Optional Enhancements

Feature	Additional Cost (NPR)
Barcode Scanner Integration	30,000
Multi-Warehouse Support	45,000
Accounting Software Integration	40,000
Mobile Application (Flutter)	90,000
Nepali Language Support	12,000

9. Cost Justification

Inventory management systems may appear simple, but their true value lies in accuracy, reliability, and consistency.

- Incorrect stock logic can directly lead to financial losses
- Every purchase and sale involves multiple database operations
- Inventory reports must always match real-time stock levels
- Thorough testing is essential to prevent compounding errors
- A skilled full-stack developer reduces handoff risks but must be fairly compensated

At Rs. 2.33 lakh, this system is:

- Affordable for Nepali businesses
- Professionally developed and tested
- Scalable for future expansion
- Significantly more cost-effective than commercial ERP solutions

10. Conclusion

The proposed Inventory Management System will replace manual inventory tracking with a reliable, centralized digital platform that enhances accuracy, efficiency, and decision-making.

With a 4-person optimized team and a realistic budget, this project delivers long-term value while maintaining quality, scalability, and cost efficiency.