NewUniverse Stock Management System

System Architecture Report

Client: Mr. Ashan
Project: Cloud-Based Stock Management System for Garment Orders & Raw Materials
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1. Project Overview

The proposed system is a comprehensive cloud-based Stock Management System designed to replace the manual Excel-based tracking used in the garment factory. It manages raw materials, production consumption, orders, and finished goods while providing clear and real-time visibility of in-out material balances, order status, and wastage tracking. The system also includes data export functionality (Excel/PDF) and supports handling repeat orders and BOM-based consumption.

2. Business Objectives

- Smooth raw material and production stock handling
- Automate material consumption calculations based on BOM
- Monitor real-time material usage, stock levels, and wastage
- Ensure traceability from raw material receipt to product completion
- Reduce errors, duplication, and manual effort
- Enable secure, role-based access and cloud availability
- Improve reporting and decision-making via dashboards and downloadable summaries

3. System Modules

3.1 User Management

- System Admin, Stock Manager, Production Manager, Order Entry Staff, Viewer(Read-Only)
- Role-based access control
- Audit trails for actions

3.2 Raw Material Management

- Raw material master (Fabric name, composition, width, color, GSM, etc.)
- Fabric receiving logs (date, quantity, source, remarks)
- Stock ledger (auto-calculated balance after each transaction)

3.3 Product & BOM Management

- Product master (style_no, item type, category, description)
- Bill of Materials (BOM): raw material per piece basis
- Reusable BOM templates for repeat orders

3.4 Order Management

- Order master (PO No, date, customer, style, quantity)
- Automatically pull BOM to calculate required raw material
- Link to cutting and production processes

3.5 Production & Cutting Management

- Record cut quantity, used fabric, and actual wastage
- Fabric allocation logs per order
- Update material ledger automatically

3.6 Reports & Exports

- Fabric usage summary by date/order
- In-out stock balance
- Order fulfillment status
- Wastage analysis
- Export to Excel / PDF

3.7 Notifications & Alerts

- Low stock alerts
- Excess wastage alerts
- Delayed order/production alerts

4. System Architecture

4.1 Architecture Style

- Cloud-based modular architecture (Microservice-ready)

- RESTful API-driven backend
- Secure user interface with responsive design

4.2 High-Level Components

- **Frontend:**
    - ReactJS
    - Responsive UI
- **Backend:**
    - Node.js
    - REST API Layer
- **Database:**
    - MySQL (main)
    - MongoDB (optional) for logs
- **Authentication:**
    - JWT-based token security
    - Role-based access control

5. Data Model Overview

- **User** (UserID, Role, Name, Email, Password)
- **RawMaterial** (MaterialID, Name, Composition, Width, Color, GSM, Unit, ReorderLevel)
- **StockTransaction** (TxnID, MaterialID, Type[In/Out], Qty, Date, Remarks)
- **Product** (ProductID, StyleNo, Name, Category, Description)
- **BOM** (ProductID, MaterialID, QtyPerPiece)
- **Order** (OrderID, PONo, ProductID, Qty, OrderDate, DeliveryDate, Status)
- **Production** (ProductionID, OrderID, CutQty, UsedFabric, Wastage, Date)
- **ReportExport** (ReportID, Type, ExportedBy, Date, FilePath)

6. Security & Compliance

- HTTPS secure communication
- JWT-based auth and session control
- Role-based access to modules/data
- Daily backup & restore functionality
- Audit logs for key operations

7. Scalability & Performance

- Modular services allow for scaling
- Load-balanced API services
- Indexed database tables for fast search/reporting
- Caching for frequently accessed reports

8. Future Enhancements

- Mobile app for production floor updates
- QR/barcode-based raw material scanning
- Customer portal for order tracking
- AI-based forecasting of fabric requirements

10. Conclusion

This proposed system offers a tailored solution to the garment factory's raw material and order management needs. It replaces error-prone Excel sheets with a centralized, scalable, and intelligent cloud platform. It ensures traceability, real-time insights, and efficient use of materials while reducing operational risks and improving production planning.