Project Proposal

On

INVENTORY MANAGEMENT SYSTEM

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Table Of Contents

Index

INTRODUCTION

The Inventory Management System (IMS) is a software application developed to automate and streamline the process of managing inventory within an organization.

Manual inventory handling often leads to issues such as data inconsistency, inaccurate stock levels, delays in decision-making, and difficulty in generating reports.

The proposed IMS ensures accurate, real-time tracking of stock, purchases, sales, suppliers, and item records.

It enhances efficiency, reduces human error, and improves overall organizational performance.

OBJECTIVE

- To maintain inventory records in a digital, centralized system.
- To track stock levels in real time.
- To integrate purchase and sales transactions directly with inventory.
- To prevent stock-out and overstock situations through automated alerts.
- To maintain detailed records of suppliers and item master data.
- To generate accurate, fast, and meaningful reports for management.
- To reduce manual work, operational time, and cost.

PROJECT CATEGORY

Frontend: Java (Swing / JavaFX)

Backend: Java + JDBC

Database: MySQL

Connectivity: JDBC drive

Below main tables with recommended datatypes and brief notes.

ITEMS

- item_id INT AUTO_INCREMENT PRIMARY KEY
- item_code VARCHAR(50) UNIQUE NOT NULL
- item_name VARCHAR(200) NOT NULL
- category_id INT NOT NULL — FK to CATEGORIES
- unit VARCHAR(20) NOT NULL — e.g., pcs, kg
- sku VARCHAR(100) NULL
- barcode VARCHAR(100) NULL
- purchase_price DECIMAL(10,2) NOT NULL DEFAULT 0.00
- sale_price DECIMAL(10,2) NOT NULL DEFAULT 0.00
- reorder_level INT DEFAULT 0
- gst DECIMAL(5,2) DEFAULT 0.00
- expiry_date DATE NULL — optional
- is_active TINYINT(1) DEFAULT 1
- created_at DATETIME DEFAULT CURRENT_TIMESTAMP

CATEGORIES

- category_id INT AUTO_INCREMENT PRIMARY KEY
- category_name VARCHAR(100) NOT NULL UNIQUE
- description VARCHAR(255) NULL

SUPPLIERS

- supplier_id INT AUTO_INCREMENT PRIMARY KEY
- supplier_name VARCHAR(150) NOT NULL
- contact_person VARCHAR(100) NULL
- phone VARCHAR(20) NULL
- email VARCHAR(100) NULL
- address VARCHAR(255) NULL
- created_at DATETIME DEFAULT CURRENT_TIMESTAMP

PURCHASES (purchase bills)

- purchase_id INT AUTO_INCREMENT PRIMARY KEY
- supplier_id INT NOT NULL — FK SUPPLIERS
- invoice_no VARCHAR(100) NOT NULL
- purchase_date DATE NOT NULL
- total_amount DECIMAL(12,2) NOT NULL
- tax_amount DECIMAL(10,2) DEFAULT 0
- discount DECIMAL(10,2) DEFAULT 0
- status VARCHAR(20) DEFAULT 'received' — (pending/received/partially_received)
- created_by VARCHAR(50) NULL
- created_at DATETIME DEFAULT CURRENT_TIMESTAMP

PURCHASE_ITEMS (line items)

- pi_id INT AUTO_INCREMENT PRIMARY KEY
- purchase_id INT NOT NULL — FK PURCHASES
- item_id INT NOT NULL — FK ITEMS
- quantity DECIMAL(10,2) NOT NULL
- unit_price DECIMAL(10,2) NOT NULL
- amount DECIMAL(12,2) NOT NULL

SALES

- sale_id INT AUTO_INCREMENT PRIMARY KEY
- invoice_no VARCHAR(100) NOT NULL
- sale_date DATE NOT NULL
- customer_name VARCHAR(150) NULL
- total_amount DECIMAL(12,2) NOT NULL
- tax_amount DECIMAL(10,2) DEFAULT 0
- discount DECIMAL(10,2) DEFAULT 0
- status VARCHAR(20) DEFAULT 'completed'
- created_by VARCHAR(50) NULL
- created_at DATETIME DEFAULT CURRENT_TIMESTAMP

SALES_ITEMS

- si_id INT AUTO_INCREMENT PRIMARY KEY
- sale_id INT NOT NULL — FK SALES
- item_id INT NOT NULL — FK ITEMS
  quantity DECIMAL(10,2) NOT NULL
  unit_price DECIMAL(10,2) NOT NULL
- amount DECIMAL(12,2) NOT NULL

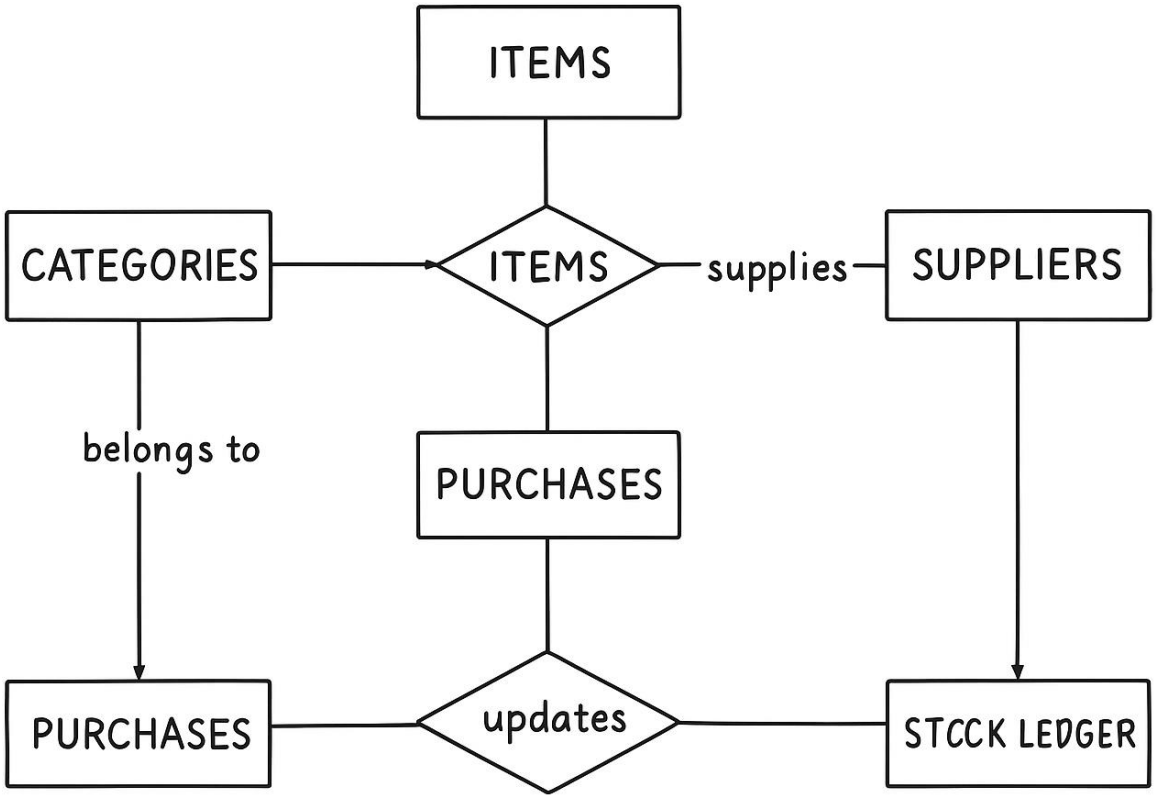
STOCK_LEDGER (transactional stock movements)

- ledger_id INT AUTO_INCREMENT PRIMARY KEY
- item_id INT NOT NULL
- transaction_type VARCHAR(20) NOT NULL
- reference_id INT NULL
- quantity DECIMAL(10,2) NOT NULL
- balance_quantity DECIMAL(12,2) NOT NULL
- transaction_date DATETIME DEFAULT CURRENT_TIMESTAMP
- remarks VARCHAR(255) NULL

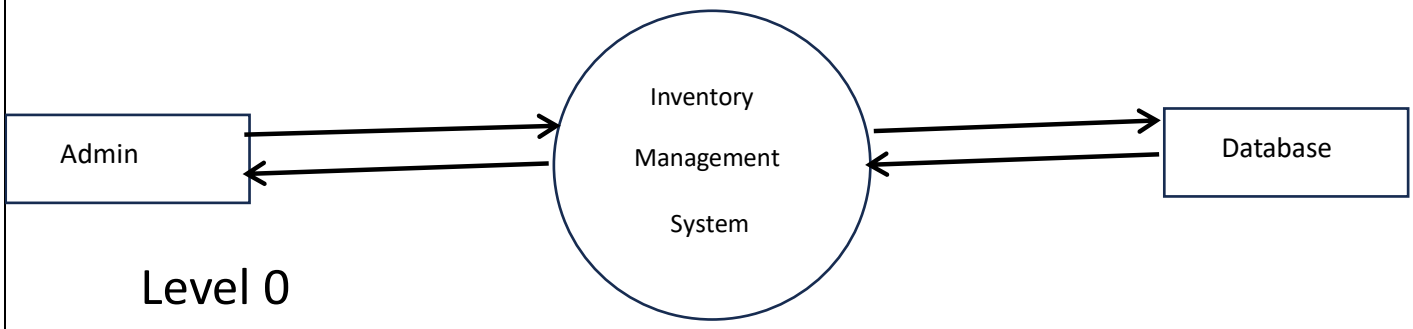
USERS

- user_id INT AUTO_INCREMENT PRIMARY KEY
- username VARCHAR(50) UNIQUE NOT NULL
- password VARCHAR(255) NOT NULL — hashed
- role VARCHAR(30) DEFAULT 'storekeeper'
- full_name VARCHAR(100) NULL
- created_at DATETIME DEFAULT CURRENT_TIMESTAMP

ER DIAGRAM

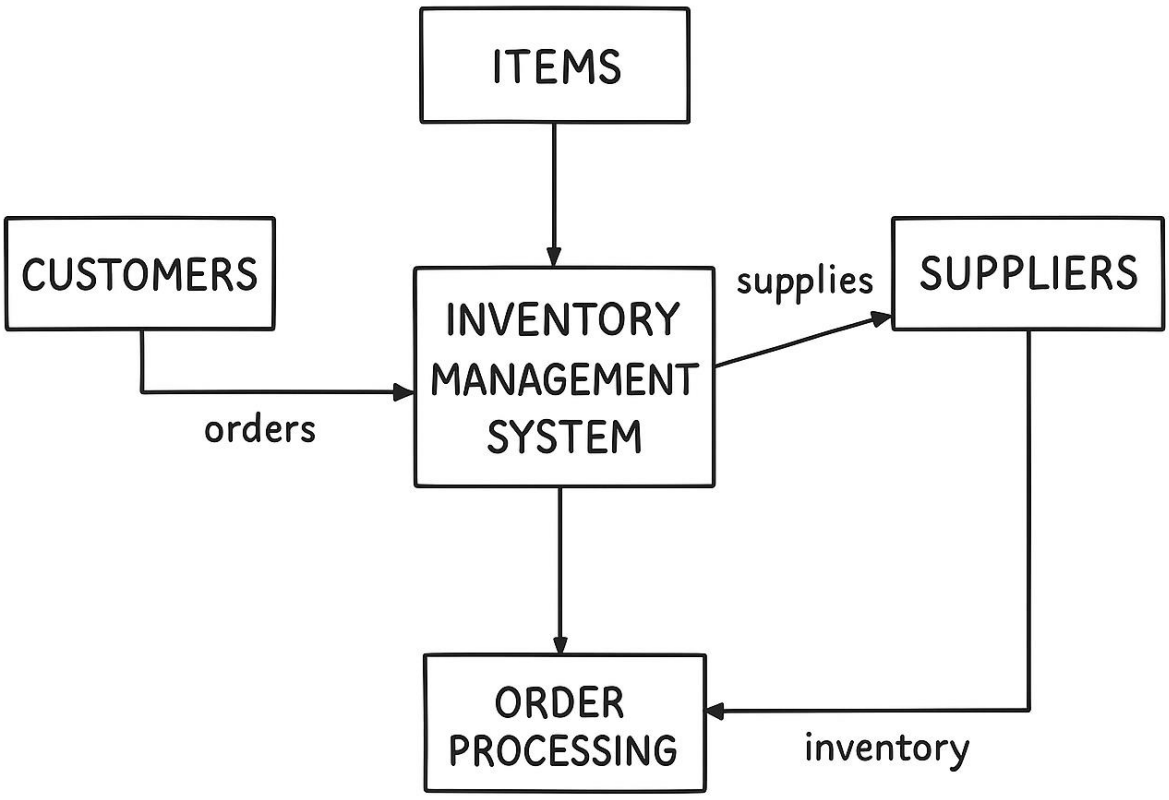

ITEMS
CATEGORIES
ITEMS
supplies
SUPPLIERS
belongs to
PURCHASES
PURCHASES
updates
STCCK LEDGER

DATA FLOW DIAGRAM (DFD)



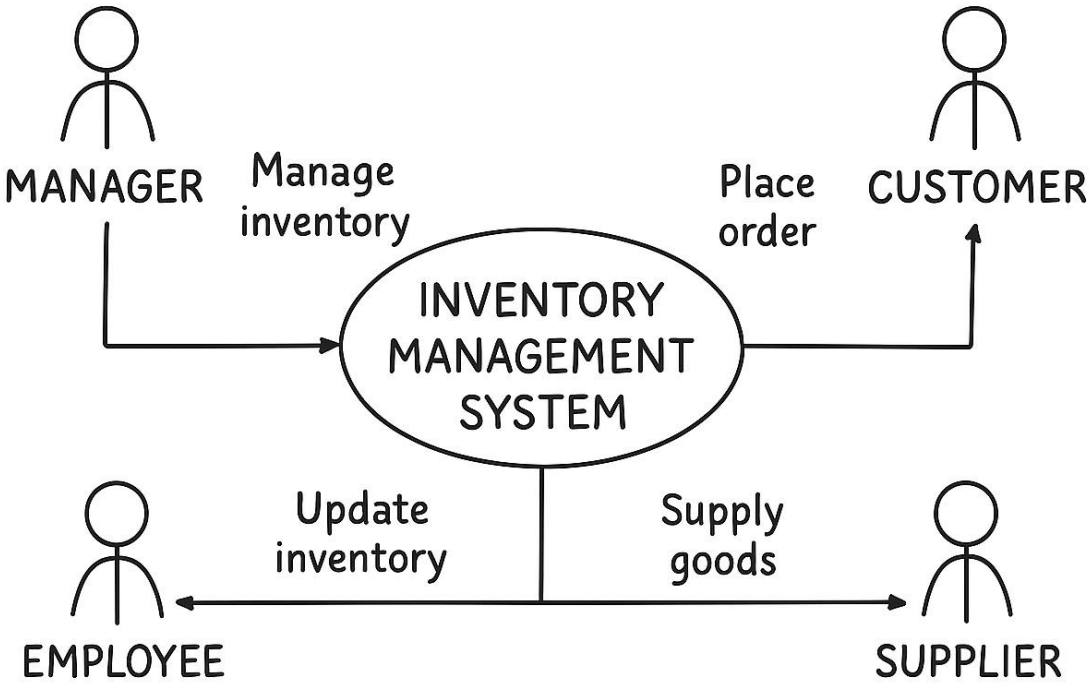
Level 0

Level 1



COMPLETE STRUCTURE

- Process Logic Diagram



Platform Used

a) Hardware Requirements

- Processor: Intel i3 or higher
- RAM: Minimum 4GB
- Hard Disk: 500MB free space
- Operating System: Windows/Linux/Mac

b) Software Requirements

- JDK 8 or above
- MySQL Server
- MySQL Workbench / phpMyAdmin
- IDE: Eclipse / IntelliJ IDEA / NetBeans
- JDBC Driver
- OS: Windows 10/11

FUTURE SCOPE

- Integrate with barcode scanners / mobile scanning app (Android).
- Bi-directional sync with accounting software (Tally / QuickBooks).
- Multi-branch inventory support.
- Batch & expiry management for pharma/food.
- Cloud-hosted SaaS with role-based dashboards.
- Predictive reorder using sales trends (ML).
- Mobile app for sales & stock checks.

BIBLIOGRAPHY

- MySQL Official Documentation
- JDBC API Guide
- Oracle Java Documentation
- Tutorials/GeeksforGeeks/JavaTpoint articles for Swing/JavaFX and JDBC