**Name: Tejashwi Bendapudi  
Student ID - 02081378**

**Final Project – Database Management**

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**1. Summary of the Project**

This project involves the design and implementation of an Inventory Management System for an inventory management franchisee based in India. The primary objective of this project is to create a comprehensive database that can manage and track products, suppliers, transactions, customers, and inventory levels efficiently. The database was designed to store data from May 10th to May 17th, and several SQL queries were developed to extract valuable business insights.

The functionalities of the database include recording customer orders, managing product details, tracking supplier information, monitoring inventory levels, and logging transactions and payments. The potential use of this database extends to improving inventory control, optimizing order processing, enhancing customer relationship management, and providing detailed analytics for business decisions.

**2. Project Description**

**2.1 Company Background**

The company is an inventory management franchisee that operates in India. The business involves managing various products, coordinating with suppliers, handling customer orders, and maintaining optimal inventory levels.

**2.2 Business Activity**

One critical business activity in this company is the management of customer orders and inventory. This activity includes tracking which products are ordered by customers, managing supplier deliveries, ensuring products are in stock, and processing payments. Effective database support is crucial for streamlining these operations, reducing errors, and providing actionable insights.

**2.3 Business Requirements**

The database project aims to achieve the following:

- Efficiently record and manage customer orders.

- Track supplier details and their associated products.

- Monitor inventory levels and stock quantities.

- Log transactions and payments accurately.

- Provide detailed analytics for business decisions.

Targeted users of this database include inventory managers, sales staff, and business analysts. The database system aims to solve issues related to inventory control, order processing, and data accuracy.

**2.4 Project Management Activities**

The project was managed by setting milestones and allocating hours to each component. Challenges encountered included issues with database relationships in MySQL Workbench and learning new SQL functionalities. Key lessons learned include the importance of meticulous data entry and thorough testing of queries.

**3. Database Design**

**3.1 Entities and Relationships**

The database includes the following entities:

- \*\*Customer\*\*: Stores customer details such as name, email, address, and phone number.

- \*\*Order\*\*: Records customer orders with details such as order date, status, and total amount.

- \*\*Payment\*\*: Logs payment information including payment date, method, and amount.

- \*\*Cart\*\*: Contains details of products in a customer's cart.

- \*\*Product\*\*: Stores product details including name, description, category, price, and stock quantity.

- \*\*Inventory\*\*: Tracks inventory levels and warehouse locations.

**3.2 Rationale Behind the Design**

The design was based on the need to track customer interactions, manage product details, and monitor inventory levels efficiently. Relationships were established to link customers to their orders, products to their suppliers, and inventory to products.

**3.3 E-R Diagram**

The E-R diagram illustrates the relationships between the entities. Note that the `customer\_ID` in the `Customer` table is related to the `customer\_ID` in the `Transaction` table as a foreign key. However, due to an issue with MySQL Workbench, the relationship entity between these two tables could not be drawn manually.  
  
A diagram of a product

Description automatically generated with medium confidence

**4. Database Creation and Population**

The database was created using MySQL Workbench, and data was extracted from the company's operational records for a specified period. The following steps were undertaken to create and populate the database:

1. \*\*Database Creation\*\*: Tables were created to store information about customers, products, suppliers, transactions, and inventory.

2. \*\*Data Population\*\*: Data was imported into the tables from the company's records.

3. \*\*Error Handling\*\*: An issue was encountered where `customer\_IDs` were initially entered as 1, 2, 3, and so on, instead of the intended format of 1001, 1002, 1003, and so on. This was identified and corrected later.

This project demonstrates the practical application of database management principles in a real-world business scenario, providing a robust solution for inventory management and operational efficiency.

**5. Conclusion**

The Inventory Management System project successfully designed and implemented a comprehensive database to manage and track products, suppliers, transactions, customers, and inventory levels. Despite encountering challenges, such as relationship issues in MySQL Workbench and incorrect initial customer IDs, these were resolved effectively. The database provides essential functionalities for inventory control, order processing, and customer relationship management. The SQL queries developed offer valuable insights, enhancing decision-making processes. This project showcases the practical application of database management principles and contributes significantly to improving business operations for the inventory management franchisee.