INVENTORY MANAGEMENT SYSTEM

BAN 5501-01

Group - 2
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Contents

Description:

What Is It?

An inventory management system is a combination of technologies (hardware and software) as well as processes and procedures that supervise the monitoring and maintenance of stored products, whether they be corporate assets, raw materials, or completed commodities.

Materials and supplies, as well as finished items, that are ready for shipment to suppliers or end customers.

Small enterprises, department stores, and international organizations all use this method to keep track of their inventory. It also includes information like management information and client information. We may use this method to specify a minimum amount of any inventory for which we must place an order. This will help us achieve high sales results and avoid items going out of stock.

This will help us keep an exact count of any products.

Can help us set a minimum amount of any items for which we can order from the manufacturer.

Can aid in reducing duplicate entries.

Who Is It For?

An inventory management system is beneficial to every business that deals with inventory, regardless of size or industry. It is useful for firms with complex supply chains since it helps control inventory levels across several locations and providers. Inventory managers, buying managers, operations managers, and other inventory management staff use the system to record and update information on inventory goods, suppliers, purchases, sales, and customers. After that, the data may be utilized to make educated decisions and optimize inventory levels.

Why Is It Important

Businesses need an inventory management system to maintain track of inventory levels, minimize stockouts, and cut inventory carrying costs. It also contributes to increased efficiency by making inventory data more accessible, creating reports, and making educated decisions. Furthermore, by giving data on supplier performance, customer demand, and sales trends, it assists in making wise purchasing and sales decisions, which may boost profitability and competitiveness.

How Will It Work?

The inventory management system works by offering a single platform for organizations to manage their inventory and supply chain activities. The following are the essential components of how the system normally operates:

Data Entry: The system allows users to enter inventory-related data such as product information, stock levels, supplier information, and purchase orders.

Real-Time Inventory Tracking: The system tracks inventory in real-time, giving firms up-to-date information on stock levels, sales, and order fulfillment.

Automated Alerts: When inventory levels fall below a specific threshold, the system creates an automated warning, allowing businesses to refill stock before it runs out.

Analytics and reporting: The system gives analytics and reporting capabilities to enterprises to assist them in identifying patterns, optimizing inventory levels, and making educated decisions about their supply chain operations.

Integration: To streamline operations and enhance efficiency, the system connects with various business tools and software such as point-of-sale systems, accounting software, and shipping platforms.

Multi-Location Management: The system enables organizations to manage inventories across various locations, allowing them to have a consolidated view of their complete supply chain.

Overall, the inventory management system functions by giving organizations a strong tool for controlling inventory and supply chain activities, increasing efficiency, and lowering costs. Businesses may make educated decisions regarding inventory levels, order fulfillment, and overall supply chain strategy by employing real-time data and analytics.

Project Objective:

We intend to create an inventory management system utilizing MySQL, which will give a more precise and efficient manner of managing the store's inventory.

Our system will include a database that will hold all important data about the store's inventory, such as item names, quantities, pricing, suppliers, and sales history.

The system will also have a user-friendly interface for inputting and maintaining inventory data, providing reports on stock levels, sales trends, and supplier performance, and automatically updating stock levels based on sales and purchase data.

Scope of the project:

The project includes developing features such as inventory tracking, order management, sales management, purchase management, reporting, and analytics. The system can also integrate with other software applications such as accounting software, point-of-sale systems, and e-commerce platforms. The project aims to develop a comprehensive inventory management system that is user-friendly and can help businesses optimize their inventory levels, reduce costs, and improve customer satisfaction.

Importance:

Inventory management is essential for every company that sells physical commodities or products. Here are some of the most essential reasons for inventory management:

Addressing consumer demand: good inventory management ensures that you have enough items on hand to fulfill client demand. This might boost client satisfaction and lead to repeat business.

Keeping proper inventory: levels guarantees that you have neither too much nor too little supply. Overstocking consumes capital and raises storage expenses, while understocking causes stockouts and missed revenues.

Cost savings: good inventory management may assist decrease the expenses of carrying inventory, such as storage, insurance, and handling. It can also assist in eliminating the requirement for last-minute shipments and expedited processing.

Increased efficiency: Effective inventory management procedures can lead to increased supply chain efficiency. This includes enhanced supplier cooperation, improved order fulfillment, and more precise forecasting.

Improved decision-making: Correct inventory data may assist organizations in making better purchasing, pricing, and promotion decisions. This can lead to higher profitability and a competitive market edge.

To summarize, inventory management is crucial because it assists firms in meeting consumer demand, maintaining ideal inventory levels, reducing costs, improving efficiency, and making better judgments.

Motivation

Businesses need to reduce costs associated with excess inventory or stockouts, improve customer satisfaction, or streamline inventory management processes. A comprehensive inventory management system can help businesses achieve these goals by supplying real-time visibility into inventory levels, automating inventory management processes, and supplying insights into sales and buying behavior. With an inventory management system, businesses can improve their overall efficiency, reduce costs, and enhance their ability to meet customer demands.

Database Environment

Client Profile

Description of Business:

The client runs a retail business that sells various products to customers. They have both an online and physical store and have been in operation for several years. The client has a wide range of products and receives orders from customers both online and in-store.

Size:

The client's business is a mid-sized retail business with many customers, sales, and inventory. The client has many products in their inventory, and their sales data must be analyzed regularly to perfect the business's performance.

Database Need:

The client needs a database management system that can handle their high volume of inventory and transactions. The database should be reliable, secure, and scalable to accommodate the growth of their business. The database should also be able to handle both online and offline transactions, as the client runs both a physical and online store.

Input Data:

The input data for the database would include information on products, customers, suppliers, orders, transactions, inventory, and employee data. This information needs to be organized and stored so that it allows easy access and retrieval. The database would also need to be able to handle the processing and analysis of this data, such as calculating inventory levels, tracking sales, and generating reports.

User Profile

The database will be used by employees of the client company who will handle various operations related to the business. The users will include managers, sales representatives, warehouse personnel, and customer support staff.

The managers will handle monitoring and analyzing sales data, creating reports, and making business decisions based on the insights gained from the database. The sales representatives will use the database to manage their accounts and track their sales performance. Warehouse personnel will use the database to manage inventory and logistics, while customer support staff will use it to handle customer queries and complaints.

The users will have varying levels of computer skills and database experience, with some being experts and others being novices. The database will need to have a user-friendly interface with

clear and concise instructions to enable the users to navigate and use it effectively. The users would prefer a responsive and intuitive interface that allows them to access the information quickly and easily they need.

Overall, the database will be crucial in the day-to-day operations of the company, and its success will depend on how well it meets the needs and preferences of the users.

User Interface Designs

DDL & SQL Script

Client goals

- Efficiently manage inventory and track product availability
- Streamline the order process and improve order accuracy.
- Provide a seamless and user-friendly e-commerce experience for customers.
- Generate sales reports and analytics to inform business decisions.
- Ensure the security and integrity of customer and business data.

User requirements

- The ability to add, edit, and delete products and inventory information.
- A streamlined and intuitive order management system
- Integration with a payment gateway to securely process transactions.
- Customizable product categories and filtering options for customers
- Access to detailed sales reports and analytics
- User roles and permissions to ensure data security and privacy.

Database objectives

- The database's major goal is to record and manage data relating to inventory products, suppliers, customers, orders, and shipments.
- The database should give real-time visibility into stock levels, locations, and movement, as well as automatic reordering.
- The database should be scalable to manage vast amounts of data and easy to integrate with other business systems such as point-of-sale and accounting software.
- To secure sensitive data, such as client details and sales data, the database should have robust security measures.

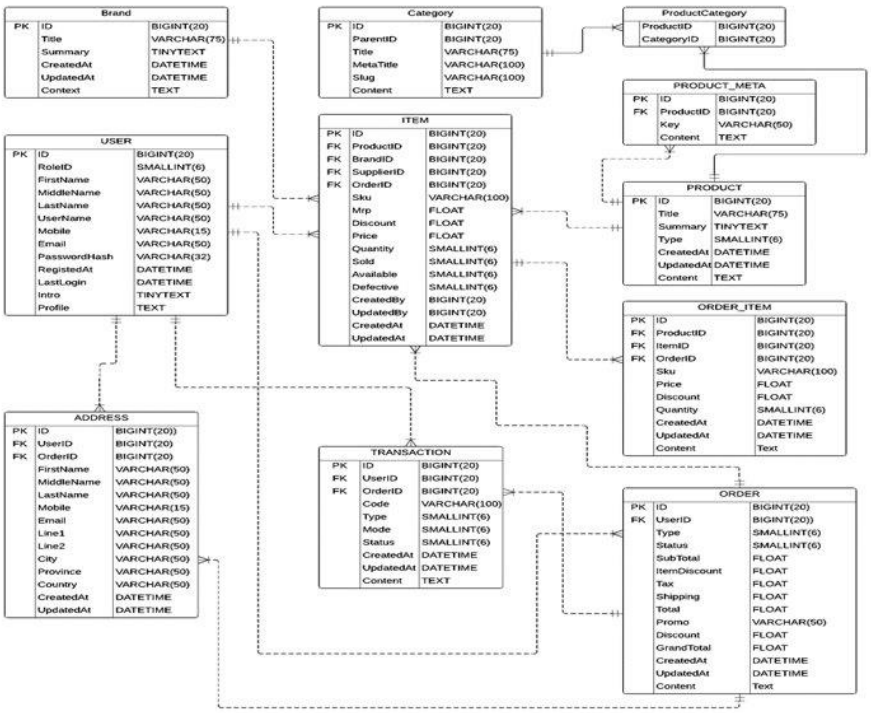
Database Profile

Business Rules:

- The ID column is the Primary Key for all tables except for the Product_Category table.
- The User table should have ID, RoleID, PasswordHash, and RegisteredAt.
- One user can have one or many Items, one item belongs to one and only one user.
- One user can make one or many Orders, One order can be made by one and only one user.
- One user can make one or many transactions, One transaction can be made by one and only one user.
- One user can have one or many addresses, one address belongs to one and only one user.
- The Product_Meta table should have ID, ProductID, and Key.
- One Product_Meta belongs to one and only one Product, One Product can have one or many Product_Meta data.
- The Product table should have ID, Title, Type, CreatedAt.
- ProductID is the foreign key for Product_Meta with reference to the Product table.
- The Category Table should have ID, Title, and Slug.
- ParentID is a foreign key of the Category table with reference to the Inventory table.
- One Category can have one or many Products, One product belongs to one or many Categories.
- The Product_Category should have ProductID, and CategoryID.
- Product_Id and Category_ID are the foreign keys of Product_Category with reference to Product and Category tables.
- ProductID and CategoryID are the primary keys of the Product_Category table.
- The Brand table should have ID, Title, CreatedAt.
- One Brand can produce one or many Items, One item belongs to one and only one Brand.
- The Order table should have ID, UserID, Type, Status, Subtotal, ItemDiscount, Tax, Shipping, Total, Discount, GrandTotal, CreatedAt.
- User_ID is the foreign key of the Order table with reference to the User table.
- The Address should have ID, CreatedAt.
- UserID and OrderID are the foreign keys of Address with reference to the user and Order tables.
- One Address belongs to one and only one Order, One Order can have one or many Addresses.
- The Item table should have ID, ProductId, BrandID, SupplierID, OrderID, Sku, MRP, Discount, Price, Quantity, Sold, Available, Defective, CreatedBy, CreatedAt.
- One Item belongs to one or many Order_Items, One Order_Item can have one and only one Item.
- One Item belongs to one and only one Order, One order can have one or many Items.
- One Order has one or many Order_Items, One order_Item belongs to one and only one Order.
- The Brand_ID, Supplier_ID, Product_ID, Order_ID are the foreign keys of the Item Table with reference to the Brand, User, Product, and Order tables.
- One item can have one and only one product, one product belongs to one or many Items.
- The Order_Item table ID, ProductID, ItemID, OrderID, Sku, Price, Discount, Quantity, CreatedAt.
- Product_ID, Item_ID, Order_ID are the foreign keys of the Order_Item table with reference to Product, Item, and Order tables.

- The Transaction table should have ID, User_ID, OrderID, Code, Type, Mode, Status, and Created At.
- User_ID and Order_ID are the foreign keys of the Transaction table with reference to user and order tables.
- One transaction belongs to one and only one Order, One Order can have one too many Transactions.

ERD



Data Dictionary

Table: User

Field Name	Data Type	Length	Key	Not Null	Description
id	INT	11	Primary Key	Yes	Unique identifier for each user
name	VARCHAR	255	-	Yes	User's name
email	VARCHAR	255	-	Yes	User's email address

password	VARCHAR	255	-	Yes	User's password (stored in hashed format)
role	ENUM	-	-	Yes	User's role (admin, customer, etc.)
phone	VARCHAR	20	-	No	User's phone number
created at	TIMESTAMP	-	-	Yes	Date and time of user creation
updated at	TIMESTAMP	-	-	Yes	Date and time of last user update

Table: Product

Field Name	**Data Type**	**Length**	**Key**	**Not Null**	**Description**
id	INT	11	Primary Key	Yes	Unique identifier for each product
name	VARCHAR	255	-	Yes	Name of the product
description	TEXT	-	-	No	Description of the product
image	VARCHAR	255	-	No	URL of the product image
created at	TIMESTAMP	-	-	Yes	Date and time of product creation
updated at	TIMESTAMP	-	-	Yes	Date and time of last product update

Table: Brand

Field Name	**Data Type**	**Length**	**Key**	**Not Null**	**Description**
id	INT	11	Primary Key	Yes	Unique identifier for each brand
name	VARCHAR	255	-	Yes	Name of the brand
description	TEXT	-	-	No	Description of the brand
image	VARCHAR	255	-	No	URL of the brand image
created at	TIMESTAMP	-	-	Yes	Date and time of brand creation

updated at	TIMESTAMP	-	-	Yes	Date and time of last brand update

Table: Product Meta

Field Name	**Data Type**	**Length**	**Key**	**Not Null**	**Description**
id	INT	11	Primary Key	Yes	Unique identifier for each product meta
Product_id	INT	11	Foreign Key	Yes	Foreign key referencing the product table
key	VARCHAR	255	-	Yes	Key for product meta
value	VARCHAR	255	-	Yes	Value for product meta
created at	TIMESTAMP	-	-	Yes	Date and time of product meta creation
updated at	TIMESTAMP	-	-	Yes	Date and time of last product meta update

Table: Address

Field Name	**Data Type**	**Length**	**Key**	**Not Null**	**Description**
id	INT	-	PRIMARY	YES	Unique identifier for the address
user_id	INT	-	FOREIGN	YES	Foreign key referencing the **user** table for the user who owns the address
type	ENUM	-	-	YES	Type of address (e.g., home, office)
line1	VARCHAR	255	-	YES	First line of the address
line2	VARCHAR	255	-	NO	Second line of the address (optional)
city	VARCHAR	100	-	YES	City of the address
state	VARCHAR	100	-	YES	State of the address
country	VARCHAR	100	-	YES	Country of the address
zip_code	VARCHAR	20	-	YES	Zip or postal code of the address
created_at	TIMESTAMP	-	-	YES	Date and time when the address was created

updated_at	TIMESTAMP	-	-	YES	Date and time when the address was last updated

Table: Item

Field Name	**Data Type**	**Length**	**Key**	**Not Null**	**Description**
id	INT	-	PRIMARY	YES	Unique identifier for the item
product_id	INT	-	FOREIGN	YES	Foreign key referencing the **product** table for the product of the item
brand_id	INT	-	FOREIGN	YES	Foreign key referencing the **brand** table for the brand of the product
supplier_id	INT	-	FOREIGN	YES	Foreign key referencing the **user** table for the supplier of the product
order_id	INT	-	FOREIGN	NO	Foreign key referencing the **order** table for the order that the item belongs to (optional)
created_by	INT	-	FOREIGN	YES	Foreign key referencing the **user** table for the user who created the item
updated_by	INT	-	FOREIGN	YES	Foreign key referencing the **user** table for the user who last updated the item
sku	VARCHAR	50	-	YES	Stock keeping unit (SKU) for the item
mrp	DECIMAL	10,2	-	YES	Maximum retail price (MRP) of the item
discount	DECIMAL	10,2	-	NO	Discount applied to the item (optional)
price	DECIMAL	10,2	-	YES	Selling price of the item
quantity	INT	-	-	YES	Quantity of the item
sold	INT	-	-	NO	Number of items sold (optional)
available	INT	-	-	YES	Number of items available
defective	INT	-	-	NO	Number of defective items (optional)
created_at	TIMESTAMP	-	-	YES	Date and time when the item was created
updated_at	TIMESTAMP	-	-	YES	Date and time when the item was last updated

Table: Category

Field Name	Data Type	Length	Key	Not Null	Description
id	INT		PRI	YES	Unique identifier for the category
name	VARCHAR	255		YES	Name of the category
created_at	TIMESTAMP			YES	Date and time when the category was created
updated_at	TIMESTAMP			YES	Date and time when the category was last updated

Table: Product Category

Field Name	Data Type	Length	Key	Not Null	Description
id	INT		PRI	YES	Unique identifier for the product category
product_id	INT		MUL	YES	Foreign key referencing the product that belongs to this category
category_id	INT		MUL	YES	Foreign key referencing the category that this product belongs to
created_at	TIMESTAMP			YES	Date and time when the product category was created
updated_at	TIMESTAMP			YES	Date and time when the product category was last updated

Table: Order

Field Name	Data Type	Length	Key	Not Null	Description
id	INT		PRI	YES	Unique identifier for the order
user_id	INT		MUL	YES	Foreign key referencing the user who placed the order
total	DECIMAL	10,2		YES	Total amount of the order
status	ENUM			YES	Current status of the order
created_at	TIMESTAMP			YES	Date and time when the order was created

updated_at	TIMESTAMP			YES	Date and time when the order was last updated

Table: Order Item

Field Name	Data Type	Length	Key	Not Null	Description
id	INT		PK	Yes	Unique identifier for order item
product_id	INT		FK	Yes	Foreign key referencing the product table
item_id	INT		FK	Yes	Foreign key referencing the item table
order_id	INT		FK	Yes	Foreign key referencing the order table
sku	VARCHAR	255		Yes	Stock Keeping Unit
price	DECIMAL	10,2		Yes	Price of the product
discount	DECIMAL	10,2		Yes	Discount applied to the product
quantity	INT			Yes	Quantity of the product
created_at	DATETIME			Yes	Timestamp of when the order item was created
updated_at	DATETIME			Yes	Timestamp of when the order item was last updated
content	TEXT			No	Additional content related to the order item

Table: Transaction

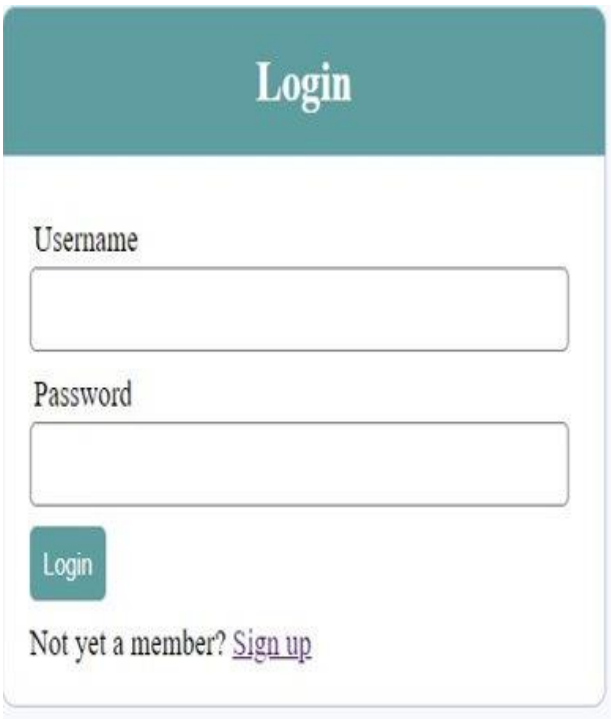
Field Name	Data Type	Length	Key	Not Null	Description
id	INT		PK	Yes	Unique identifier for transaction
user_id	INT		FK	Yes	Foreign key referencing the user table
order_id	INT		FK	Yes	Foreign key referencing the order table
code	VARCHAR	255		Yes	Code for the transaction
type	ENUM			Yes	Type of transaction (Credit or Debit)

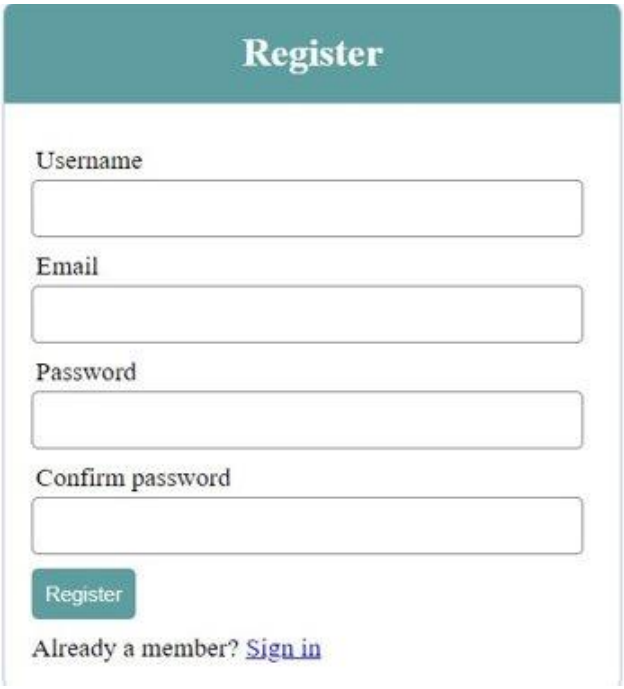
mode	ENUM			Yes	Mode of payment (Offline, Cash on Delivery, Cheque, Draft, Wired, Online)
status	ENUM			Yes	Status of transaction (New, Cancelled, Failed, Pending, Declined, Rejected, Success)
created_at	TIMESTAMP			Yes	Timestamp of when the transaction was created
updated_at	TIMESTAMP			Yes	Timestamp of when the transaction was last updated
content	TEXT			No	Additional content related to the transaction

List of Database system tasks performed.

- Designing the database schema
- Defining relationships and constraints between tables
- Creating the database and tables
- Populating the tables with data
- Writing SQL queries for data retrieval and manipulation
- Optimizing database performance

Reports





Expected Reports

- Dashboard: A visual overview of the key performance indicators (KPIs) such as sales, revenue, inventory levels, etc.

- Product listing: A list of all the products available for sale, with their images, names, descriptions, prices, and stock levels.
- Product details: A detailed view of a specific product, with additional information such as product specifications, ratings, reviews, and related products.
- Cart and checkout: A shopping cart where customers can add or remove products and proceed to checkout, where they can enter their shipping and payment details.
- Sales report: A report showing the sales trends over a specific period, with data such as sales volume, revenue, profit margins, and top-selling products.
- Inventory report: A report showing the current inventory levels of all products, with data such as stock on hand, stock on order, reorder points, and lead times.
- Customer management: A feature that allows the store owner to manage customer information such as names, addresses, order history, and loyalty points.
- Vendor management: A feature that allows the store owner to manage vendor information such as names, contact information, and products supplied.
- Employee management: A feature that allows the store owner to manage employee information such as names, roles, and schedules.
- Alerts and notifications: A feature that sends alerts and notifications to the store owner or employees for low stock levels, new orders, order cancellations, and other important events.