**Digital Data Management System for E-Pharmacy**

**FINAL PROJECT REPORT**

**Project Write up:**

Digital Data Management System for E-Pharmacy: Business Scenario and Project Plan

Executive Summary:

The E-Pharmacy industry is rapidly evolving, and effective digital data management is crucial for ensuring seamless operations, customer satisfaction, and regulatory compliance. Our proposed Digital Data Management System for E-Pharmacy aims to provide a comprehensive solution for managing various aspects of the pharmacy business. This system will leverage a set of interconnected tables to organize and streamline data related to products, customers, orders, inventory, and more. Through a user-friendly interface, the system will support essential queries, triggers, stored procedures, and functions to enhance operational efficiency.

Business Scenario:

The E-Pharmacy operates in a dynamic environment where customers expect quick and accurate access to pharmaceutical products. The Digital Data Management System is designed to address the challenges faced by the pharmacy in managing its digital information effectively. The project encompasses various components to handle everything from product listings to customer orders and regulatory compliance.

Project Features:

**Products and Categories Management:**

Efficiently manage product listings and categorization.

Keep track of product details, including inventory levels and drug information.

**Customer Interaction and Order Processing:**

Capture and store customer information securely.

Facilitate seamless order placement, payment processing, and prescription verification.

**Reporting and Analytics**:

Provide insightful reports on top-selling products, customer behavior, and order trends.

Analyze sales data for informed decision-making.

**Promotions and Discounts:**

Implement promotional strategies to attract and retain customers.

Manage discounts and offers for specific products or customer segments.

**Regulatory Compliance**:

Ensure compliance with pharmaceutical regulations.

Keep track of regulatory requirements and updates.

**Return Order Handling:**

Streamline the process of managing return orders.

Monitor reasons for returns and implement improvements accordingly.

Project Objectives:

**Efficient Data Management:** Design and implement a robust digital data management system that efficiently organizes, and stores information related to products, customers, orders, inventory, and regulatory compliance in the E-Pharmacy.

**Enhanced Operational Efficiency**: Improve operational efficiency by implementing features such as queries, triggers, stored procedures, and functions to automate common tasks, reduce manual efforts, and streamline processes like order processing, inventory management, and return handling.

**Customer Satisfaction**: Enhance customer satisfaction through a user-friendly interface, secure customer information storage, and seamless order processing. Focus on features like prescription verification, easy order placement, and clear communication of product details.

**Business Analytics and Informed Decision-Making**: Provide reporting and analytics features to enable informed decision-making. Generate insightful reports on top-selling products, customer behavior, order trends, and other key performance indicators for strategic planning and business analysis.

**Promotions and Marketing Strategies**: Implement a promotions and discounts management system to attract and retain customers. Enable the pharmacy to run targeted promotional campaigns, manage discounts, and analyze the effectiveness of marketing strategies.

**Regulatory Compliance**: Ensure compliance with pharmaceutical regulations by tracking and managing regulatory requirements and updates. This includes features to handle prescription verification, adherence to industry standards, and staying informed about legal and regulatory changes.

**Adaptability to Market Changes**: Develop a system that can adapt to market changes and trends by providing features such as top-selling product analysis, order trend analysis, and customer segmentation. This adaptability ensures that the E-Pharmacy can stay competitive and responsive to shifting customer demands.

**Revolutionize Digital Infrastructure**: Revolutionize the E-Pharmacy's digital infrastructure to provide a solid foundation for growth. This involves creating a scalable and flexible system that can accommodate increased data loads, additional features, and evolving business requirements in the rapidly changing E-Pharmacy landscape.

Business Plan:

Implementation Strategy: The Digital Data Management System for E-Pharmacy will be rolled out in a phased approach to facilitate a seamless integration into pharmacy operations. Initial phases will concentrate on fundamental functionalities like product listings, customer information, and order processing. Subsequent phases will introduce advanced features such as promotional strategies, analytics, and compliance measures.

Revenue Model: The project will employ a revenue model based on subscription fees. E-Pharmacy businesses will pay a recurring fee determined by factors such as transaction volume, product catalog size, and the selected features. This subscription-based model ensures a steady revenue stream to support continuous system improvements, regulatory compliance updates, and ongoing customer support.

Marketing and Outreach: Our marketing strategy aims to generate awareness through targeted campaigns on digital platforms, industry partnerships, and participation in relevant pharmacy conferences and events. Success stories of E-Pharmacies that have embraced the Digital Data Management System will be highlighted to showcase the system's positive impact on operational efficiency and compliance.

Support and Training: Ensuring a successful implementation, we will provide comprehensive training programs tailored for pharmacy administrators, staff, and other stakeholders. Ongoing support will be delivered through a dedicated help desk, regular updates, and informative resources to address evolving needs within the E-Pharmacy landscape.

Security Measures: The paramount concern is data security. The Digital Data Management System for E-Pharmacy will incorporate industry-standard encryption protocols, undergo regular security audits, and adhere to data protection regulations. This commitment aims to safeguard sensitive information related to products, customers, and regulatory compliance stored within the system.

Queries:

The system supports a range of queries, including identifying top-selling products, analyzing customer behavior, and retrieving specific order details. These queries provide valuable insights into decision-making and business strategy.

Triggers:

Several triggers have been implemented to automate key processes. These include automatic order ID generation, updating delivery status, and preventing orders on out-of-stock products.

Stored Procedures:

Stored procedures are designed to streamline common tasks, such as placing orders, retrieving customer order history, and deleting expired promotions.

Functions:

Functions enhance the system's capabilities by calculating order totals, checking product availability, and retrieving remaining stock quantities.

**Relational Data Model:**

**Relational Data Model:
** The above relational data model illustrates the relationship between various tables in our database and the data each table contains.

* Relational data model showcases the structure of a database, emphasizing how different entities relate to one another. Below are the entities and relations in our database.

**Entities:**

* **Products** (ProductID [PK], BrandName, GenericName, Dosage, Price, CategoryID [FK])
* **ProductCategories** (CategoryID [PK], CategoryName)
* **Customers** (CustomerID [PK], FirstName, LastName, Email, Phone, ShippingAddress)
* **ProductReviews** (ReviewID [PK], ProductID [FK], CustomerID [FK], Rating, Review, ReviewDate)
* **Inventory** (ProductID [PK], StockQuantity)
* **Orders** (OrderID [PK], CustomerID [FK], OrderDate, TotalAmount, ShippingID [FK], PaymentID [FK], DeliveryID [FK])
* **Prescription** (PrescriptionID [PK], CustomerID [FK], PrescriptionData, UploadDate)
* **ShippingMethods** (ShippingID [PK], MethodName)
* **PharmacistVerification** (PrescriptionID [PK, FK], PharmacistID, VerificationStatus, VerificationDate)
* **Payment** (PaymentID [PK], OrderID [FK], PaymentDate, PaymentMode, Amount)
* **Delivery** (DeliveryID [PK], OrderID [FK], CustomerID [FK], DeliveryStatus, DeliveryDate)
* **DrugInformation** (ProductID [PK, FK], UsageInstructions, SideEffects, Interactions)
* **Users** (UserID [PK], Username, Password, Role)
* **Reports** (ReportID [PK], ReportName, ReportData)
* **Promotions** (PromoID [PK], CustomerID [FK], PromoCode, Discount, ExpiryDate)
* **OrderHistory** (OrderHistoryID [PK], CustomerID [FK], OrderID [FK], OrderDate, TotalAmount)
* **RegulatoryCompliance** (ComplianceID [PK], SalesRecordID [FK], PrescriptionID [FK], CustomerID [FK], AuditDate)
* **ReturnOrders** (ReturnID [PK], OrderID [FK], ReturnDate, Reason)
* **Suppliers** (SupplierID [PK], SupplierName, ContactInformation, ProductsSupplied, DeliveryLeadTime)
* **Discounts** (DiscountID [PK], DiscountCode, DiscountPercentage, ApplicableProducts, ExpiryDate)

**Relationships:**

* Products (ProductID) relate to Inventory (ProductID), ProductReviews (ProductID), and DrugInformation (ProductID).
* ProductCategories (CategoryID) relates to Products (CategoryID).
* Customers (CustomerID) relates to ProductReviews (CustomerID), Orders (CustomerID), Prescription (CustomerID), PharmacistVerification (CustomerID), Payment (CustomerID), Delivery (CustomerID), Promotions (CustomerID), OrderHistory (CustomerID), RegulatoryCompliance (CustomerID), and ReturnOrders (CustomerID).
* Orders (OrderID) relate to Payment (OrderID), Delivery (OrderID), ReturnOrders (OrderID), and OrderHistory (OrderID).
* Prescription (PrescriptionID) relates to PharmacistVerification (PrescriptionID) and RegulatoryCompliance (PrescriptionID).
* Suppliers (SupplierID) relates to Products (SupplierID).

**Assumptions/Notes About Data Entities and Relationships:**

**Products - ProductReviews:**

Relationship: Products are reviewed in ProductReviews. One-to-Many (A single product can have multiple reviews).

**Customers - ProductReviews:**

Relationship: Customers write ProductReviews. One-to-Many (A single customer can write multiple reviews).

**Customers - OrderDetails:**

Relationship: Customers place Orders (captured in OrderDetails). One-to-Many (A single customer can place multiple orders).

**Products - OrderDetails:**

Relationship: Products are ordered in OrderDetails. One-to-Many (A single product can be ordered multiple times across different orders).

**Customers - Prescription:**

Relationship: Customers have Prescriptions. One-to-Many (A single customer can have multiple prescriptions).

**Customers - ShippingMethods:**

Relationship: Customers choose ShippingMethods. One-to-Many (A single customer can choose multiple shipping methods).

**Prescription - PharmacistVerification:**

Relationship: Prescriptions are verified by PharmacistVerification. One-to-One (Each prescription is verified once).

**OrderDetails - Payment:**

Relationship: OrderDetails are paid for by Payments. One-to-One (Each order detail has one payment record).

**OrderDetails - Delivery:**

Relationship: OrderDetails are delivered via Delivery. One-to-One (Each order detail has one delivery record).

**Products - Inventory:**

Relationship: Products are stocked in Inventory. One-to-One (Each product has a corresponding inventory record).

**Products - DrugInformation:**

Relationship: Products have DrugInformation. One-to-One (Each product has a corresponding set of drug information).

**Customers - Promotions:**

Relationship: Customers receive Promotions. One-to-Many (A single customer can receive multiple promotions).

**OrderDetails - Return\_orders:**

Relationship: OrderDetails can result in Return\_orders. One-to-Many (An order detail can result in multiple return orders, although typically this might be one-to-one).

**Customers - OrderHistory:**

Relationship: Customers have an OrderHistory. One-to-Many (A single customer can have multiple order history records).

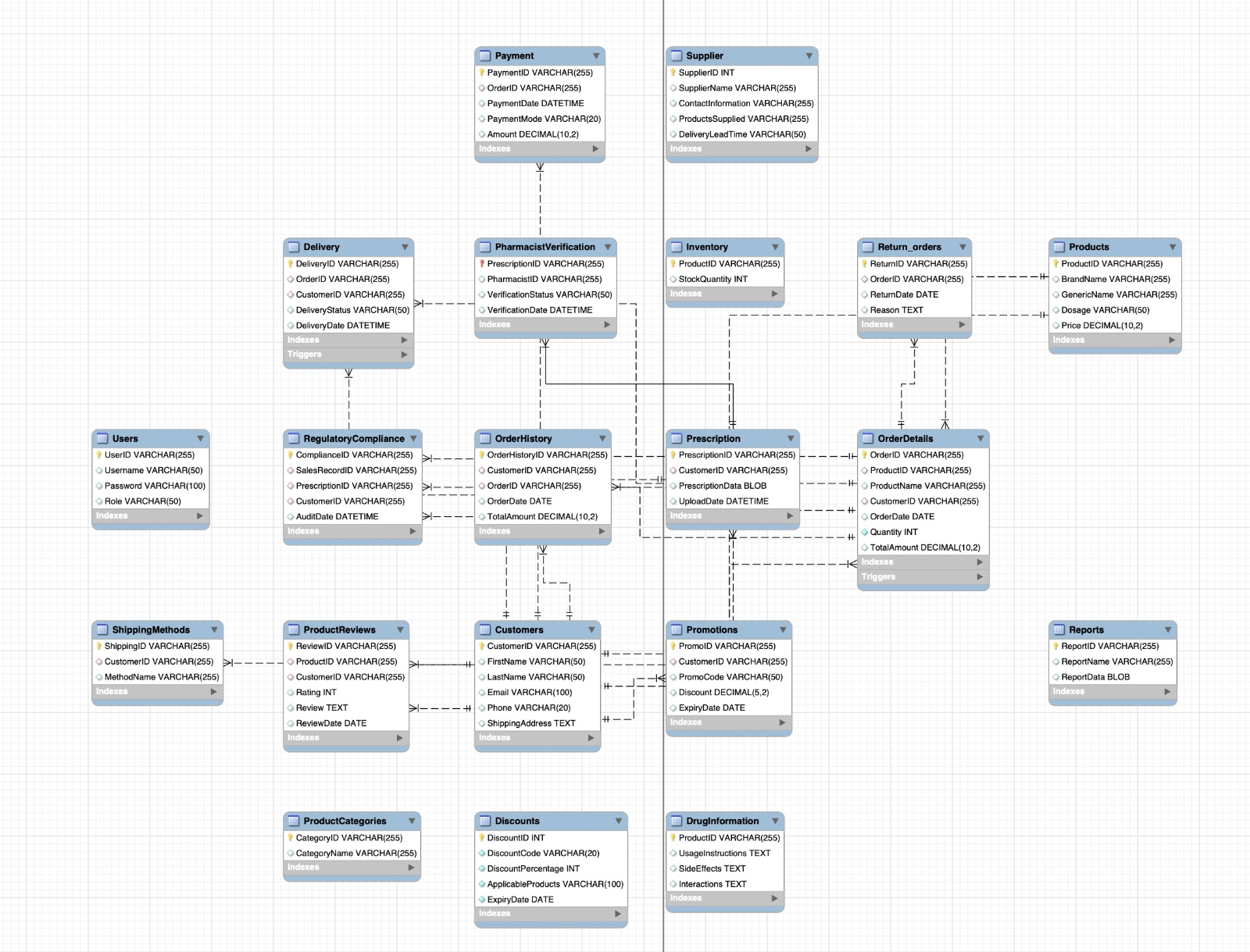
**RegulatoryCompliance - OrderDetails, Prescription, Customers:**

Relationship: RegulatoryCompliance checks OrderDetails, relates to Prescriptions, and is associated with Customers. One-to-Many (One compliance record may check multiple order details, relate to multiple prescriptions, and be associated with multiple customers).

**Notes about Functions/Triggers:**

* OrderID can be automatically generated using order details.
* Delivery status and date can be automatically updated after the order delivery.
* Out-of-stock products can’t be ordered, customers get the message saying orders can’t be placed automatically when the product is out of stock.
* Order total can be calculated automatically based on the price and quantity.
* Product availability can be checked from inventory based on the stock quantity.
* Stock availability of a particular product can be known using ProductID.

**ERR Diagram:**



**Design of the Database:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Products | ProductID |  | BrandName, GenericName, Dosage, Price | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| ProductCategories | CategoryID |  | CategoryName | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Customers | CustomerID |  | FirstName, LastName, Email, Phone, ShippingAddress | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| ProductReviews | ReviewID | ProductID | CustomerID, Rating, Review, ReviewDate | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Inventory | ProductID |  | StockQuantity | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| OrderDetails |  |  | ProductName, CustomerID, OrderDate, Quantity, TotalAmount | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Prescription | PrescriptionID | CustomerID | PrescriptionData, UploadDate | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| ShippingMethods | ShippingID | CustomerID | MethodName | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| PharmacistVerification | PrescriptionID |  | PharmacistID, VerificationStatus, VerificationDate | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Payment | PaymentID | OrderID | PaymentDate, PaymentMode, Amount | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Delivery | DeliveryID | OrderID, CustomerID | DeliveryStatus, DeliveryDate | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| DrugInformation | ProductID |  | UsageInstructions, SideEffects, Interactions | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Users | UserID |  | Username, Password, Role | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Reports | ReportID |  | ReportName, ReportData | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Promotions | PromoID | CustomerID | PromoCode, Discount, ExpiryDate | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Return\_orders | ReturnID | OrderID | ReturnDate, Reaso | 10 |

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| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| OrderHistory | OrderHistoryID | CustomerID | OrderID, OrderDate, TotalAmount | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| RegulatoryCompliance | ComplianceID | SalesRecordID, PrescriptionID, CustomerID | AuditDate | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Supplier | Supplier ID |  | SupplierName, ContactInformation, ProductsSupplied, DeliveryLeadTime | 10 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table Name** | **Primary Key** | **Foreign Key** | **Non-key attributes** | **# of Rows in Table** |
| Discounts | DiscountID |  | DiscountCode, DiscountPercentage, ApplicableProducts, ExpiryDate | 10 |

**Scenarios covered for the database:**

In medical store database management system, several scenarios should be considered to address the dynamic nature of inventory, sales, and other operations.

1. **Top-Selling Products by Total Sales Revenue:**
   * **Scenario Explanation:** This query is essential for business analysis. It helps identify the top-selling products based on total sales revenue. This information is crucial for inventory management, marketing strategies, and understanding customer preferences.
2. **Customers with Specific Shipping Method:**
   * **Scenario Explanation:** Useful for tracking and managing orders, this query identifies customers who have chosen a specific shipping method (e.g., ‘Express Shipping’). It aids in logistics and ensures that customers who prefer or pay for expedited shipping are served accordingly.
3. **Customers and Popular Payment Mode:**
   * **Scenario Explanation:** This query provides insights into customer payment behavior. It identifies customers who use a specific payment mode (e.g., ‘Credit Card’) and determines the popularity of that payment mode. This information is valuable for financial analysis and improving payment processes.
4. **Product Details with Average Review Rating:**
   * **Scenario Explanation:** For e-commerce platforms, this query is crucial for presenting product information to users. It retrieves product details along with the average review rating, helping potential buyers make informed decisions based on the collective opinion of previous customers.
5. **Order Trends by Month and Top-Selling Product:**
   * **Scenario Explanation:** Analyzing order trends by month is vital for understanding seasonal variations in sales. This query not only provides insights into monthly sales but also identifies the top-selling product for each month, aiding in demand forecasting and marketing strategies.
6. **Customer Information with Average Order Value and Total Spent:**
   * **Scenario Explanation:** Businesses use this query to analyze customer spending behavior. It retrieves customer information along with average order value and total spent within a specified date range. Sorting by these values helps identify high-value customers.
7. **Total Number of Orders by Customer:**
   * **Scenario Explanation:** This query calculates the total number of orders placed by each customer. It’s useful for customer segmentation, identifying loyal customers, and evaluating customer engagement with the platform.
8. **Product Sales in the First Quarter of 2023:**
   * **Scenario Explanation:** For sales and inventory management, this query calculates product sales in the first quarter of 2023. It provides insights into product performance over a specific period, helping businesses adapt their strategies accordingly.
9. **Customers with Prescriptions but No Orders:**
   * **Scenario Explanation:** In healthcare-related scenarios, this query identifies customers who have uploaded prescriptions but haven’t placed orders. It helps ensure that customers receive the necessary medications and can be followed up for potential orders.
10. **Identifying Customers with Similar Purchase Patterns:**
    * **Scenario Explanation:** This query is useful for market basket analysis. It identifies customers with similar purchase patterns by finding those who have ordered the same product combinations. Recommendations and targeted marketing.

**3NF Database:**

**TO achieve 3NF in our database we can do the following:**

* Ensure there are no transitive dependencies within tables.
* Break tables with repeating groups into separate tables.
* Verify all columns in a specific table relate directly to the primary key.

**Changes:**

**Merging OrderDetails and OrderHistory tables:**

OrderDetails and OrderHistory tables contains similar information like OrderID, CustomerID, TotalAmount. Merging them into one table avoids duplication.

**Adjusting the DrugInformation table:**

Linked the drug information table directly to Products table instead of having a separate primary key for DrugInformation table.

**Updating the RegulatoryCompliance table:**

Removing SalesRecordID and linking compliance directly to orders through OrderDetails table.

**Restructuring the Supplier table:**

Linking Supplier table directly to Products supplied avoids redundant information.

***Views & Stored Procedures created on Database:***

# Views

1. **Customer Order History View:**

To give a thorough summary of customer order history, this view integrates data from the Customers, OrderDetails, and Order History tables. Order IDs, product information, order dates, quantities, and total amounts are among the details that are included. The view makes it simple to keep track of previous orders placed by clients and the related order history.

1. **Verified Prescriptions View:**

Filtering and displaying validated prescriptions with associated data is the Verified Prescriptions View. It presents medication facts such as Prescription ID, Customer ID, Upload Date, and the pharmacist's verification status and date by pulling information from the Prescription and Pharmacist Verification databases. This view is especially helpful for getting information about prescriptions that pharmacists have successfully confirmed.

1. **Product Order Review View:**

By combining information from the OrderDetails, Product Categories, Products, and Product Reviews tables, this view provides a thorough overview of product order reviews. Along with order-specific data like Order ID, Order Date, Quantity, and Total Amount, it also contains product details like Product ID, Brand Name, Generic Name, Dosage, and Price. It also includes product reviews, complete with written reviews, ratings, and review dates. A comprehensive study of product orders and related client feedback is made easier with this view.

# Stored Procedures

**1. Place Order Procedure:**

|  |
| --- |
| PlaceOrder |
| It takes three key parameters `p\_Quantity` for the product quantity, `p\_ProductID` for the product being ordered, and `p\_CustomerID for the client who is submitting the order. The process adds the latest order with the supplied customer ID, product ID, quantity, and the current date to the `OrderDetails` table. |

Before Calling the Procedure:

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After Calling the Procedure PlaceOrder:

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Here the orderDetails table is updated with the latest order details.

**2. Get Customer Order History Procedure:**

The purchase history for a particular client can be retrieved using the `GetCustomerOrderHistory` stored procedure

|  |
| --- |
| Get Customer Order History |
| p\_CustomerID, the client for whom the order history is requested, is the only input argument required. Next, a SELECT query is executed on the OrderDetails table by the process, yielding all entries whose customer ID corresponds with the input supplied. |

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Here the output displays the order History of the desired custome

3) **Delete Expired Promotions Procedure:**

|  |
| --- |
| DeleteExpiredPromotions |
| This procedure removes data from the `Promotions` table when the `Expiry Date` is older than the present date and time, without requiring any input parameters. Eliminating promotions that are expired, contributes to keeping an updated promotions table. |

Before calling the Procedure:

We can see that the table has expired promotions dated ‘2023-10-31’.

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After Calling the Procedure DeleteExpiredPromotions:

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Here the output displays that the table is updated deleting the expired Promotions.

***ViewTriggers***

1)

|  |
| --- |
| **Customer Order History View** |
| This view integrates data from the Customers, OrderDetails, and Order History tables. Order IDs, product information, order dates, quantities, and total amounts are among the details that are included. The view makes it simple to keep track of previous orders placed by clients and the related order history. |

2)

|  |
| --- |
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|  |
| --- |
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***Functions:***

1)

|  |
| --- |
| **CalculateOrderTotal** |
| This Function takes Order id as input and returns total orders |

In this query we are calculating the total order for a given order id, we are giving order id as the input to the function CalculateOrderTotal and displaying result as OrderTotal.

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2)

|  |
| --- |
| **CheckProductAvailability** |
| This Function takes product id as input and returns the total quantity of the product available. |

In this query we are displaying Product details and its availability for the product id 'P101'. Here we are also checking the availability of the product in the inventory by using the function CheckProductAvailability. We are giving productID as the input to this function and displaying the result in IsAvailable column in the output

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3)

|  |
| --- |
| **GetRemainingStockQuantity** |
| This function takes Product id as input and returns the remaining quantity of the product available. |

n this query we are displaying Product details and its remaining quantity in the inventory for the product id 'P101'. We are checking the remaining quantity of the product in the inventory by using the function GetRemainingStockQuantity. We are giving productID as the input to this function and displaying the result in RemainingStock column in the output.

**E-pharmacies offer unique solutions:**

E-pharmacies offer unique solutions to several challenges faced by traditional brick-and-mortar pharmacies, addressing these problems in innovative ways:

1. **Accessibility and Convenience:**
   * E-pharmacies allow customers to purchase medications and healthcare products from anywhere at any time, overcoming the constraints of physical locations and operating hours.
2. **Wide Product Range and Information Accessibility:**
   * Online platforms offer a broader range of products and detailed information about medications, empowering customers to make informed decisions.
3. **Customer Privacy and Confidentiality:**
   * Online pharmacies provide discreet services for customers who prefer privacy when purchasing sensitive medications or healthcare products.
4. **Cost Savings and Comparison:**
   * E-pharmacies often offer competitive pricing, discounts, and the ability to compare prices easily, providing cost-effective options for customers.
5. **Efficient Inventory Management:**
   * Digital systems in e-pharmacies help manage inventory more efficiently, reducing instances of stockouts or overstocking.
6. **Customer Service and Support:**
   * Online platforms provide accessible customer support for queries and concerns, enhancing overall customer experience.
7. **Delivery and Logistics:**
   * E-pharmacies ensure timely and secure delivery to customers' doorsteps, overcoming geographical limitations and providing convenience.
8. **Addressing Regulatory Compliance:**
   * E-pharmacies work toward complying with regional regulations, ensuring data security, and adhering to laws governing the sale of medications online.
9. **Innovative Technology Implementation:**
   * Adoption of innovative technologies ensures efficient operation and offers a seamless user experience, further enhancing customer satisfaction.
10. **Educational Initiatives:**
    * Online pharmacies educate customers about medications, potential side effects, and the importance of consulting healthcare professionals.

By leveraging technology, accessibility, information dissemination, and customer-centric approaches, e-pharmacies address various challenges faced by traditional pharmacies, striving to provide a more convenient, accessible, and customer-friendly healthcare experience.

***Triggers***

Trigger to Automatically Generate OrderID:

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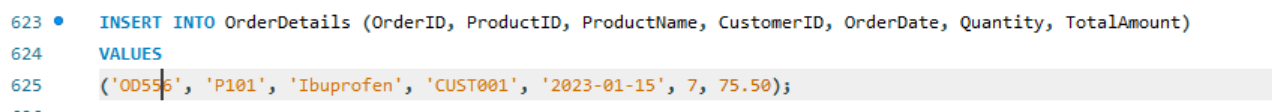
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Results in OrderDetails table as of now

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Now we are inserting below details in orderDetails table



The following orderId is autogenerated by the trigger BeforeOrderInsert A screenshot of a computer

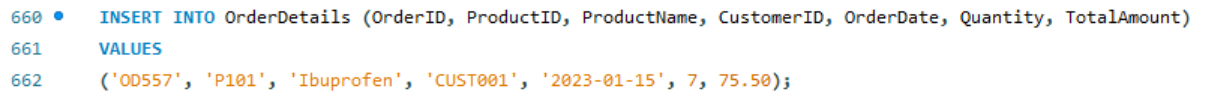
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2) Trigger to Prevent Orders on Out-of-Stock Products:

For ProducId P101 the stock Quantity is 0 in inventory table

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Conclusion:

The Digital Data Management System for E-Pharmacy represents a pivotal step forward in addressing the complex challenges faced by the rapidly evolving E-Pharmacy industry. Through meticulous planning and implementation, this project has laid the foundation for a comprehensive solution that not only meets but exceeds the specific needs of the pharmacy business.

The integration of advanced queries, triggers, stored procedures, and functions has ushered in a new era of efficiency and accuracy in data management. By focusing on key areas such as product and category management, customer interaction, reporting and analytics, promotions, regulatory compliance, return order handling, and more, the system ensures a holistic approach to the intricate operations of an E-Pharmacy.

The emphasis on customer satisfaction is evident in the user-friendly interface, secure order processing, and features that facilitate prescription verification. Additionally, the implementation of robust analytics tools empowers decision-makers with valuable insights into customer behavior, top-selling products, and market trends, fostering a data-driven approach to strategic planning.

Moreover, the project's commitment to regulatory compliance underscores its dedication to maintaining the highest standards within the pharmaceutical industry. The system's adaptability to market changes, coupled with its scalability, positions the E-Pharmacy for sustained growth and success in an increasingly competitive market.

In conclusion, the Digital Data Management System for E-Pharmacy not only addresses current challenges but also anticipates future needs, revolutionizing the digital infrastructure of the pharmacy business. This project is not just a technological advancement; it is a strategic investment in operational excellence, customer satisfaction, and compliance, setting the stage for the E-Pharmacy to thrive in the dynamic landscape of digital healthcare.