

MTH785P

Programming for Business Analytics

Project 2

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## **The Electronics Shop:**

### **Introduction of The Business Model:**

The electronics business in question is an order-receiving shop whose activities include sales and management of products and customer information. The store operates with core business information stored in an Access database together with an Excel worksheet-based application for data entry and modification. This makes it possible for employees to access customer information, view pending orders, and enter new products or orders to the system. The application integrates with an Excel sheet through a middleware in VBA, allowing the application to perform data management functions which, in turn, simplifies the conduct of business.

### **Database**

The database is created in Microsoft Access and has three key tables:

1. Customers: The table contains customer details like CustomerID, CustomerName, PhoneNumber, and SignupDate.
2. Orders: This table contains all orders issued by the customers. Fields include OrderID, CustomerID, ProductID, Quantity, OrderDate, Status (e.g. Pending, Delivered).
3. Products: This table contains inventory data such as ProductsID, ProductName, Price, and Stock.

Key Queries:

- Stock Remaining: A query that returns the remaining stock from the products.
- Total Revenue: A query that determines the total revenue from the products by multiplying Price and Quantity in all orders.
- Total Sales: A query that illustrates sales by product.

## **Front-End**

Business users will primarily utilize the front-end of the application implemented in Microsoft Excel. It is composed of several tabs:

1. Orders Tab:

- Utilizes orders from the Access database that have been pulled.
- Contains highlight conditional formatting of the order status (i.e., Pending is yellow, Delivered is green).

2. Sales Pivot Table Tab:

- Displays the pivot table showing total sales by product at different levels.
- Analyses sales on a whole stock level.

3. Order Form Tab:

- Useful for employees who want to create new orders.

- Incorporates invalid data prevention methods like validation dropdowns containing customer and product names obtained directly from the database.
- Triggers a VBA macro that sends an instruction to place a new order in the database.

## **VBA Middleware**

The application's functions are powered by a VBA code which is in between Excel and Access. The primary subroutines are listed below.

1. Subroutine to Import Data from the Database:
  - Imports data from the Access tables such Orders and fills an Excel sheet.
  - Removes previous data before importing to make sure it is accurate and fresh.
  - Is able to view database records in a more user-friendly manner.
2. Subroutine to Retrieve Customer and Orders Information
  - Imports customers' information with orders that have not been delivered yet.
  - Shows customers' personal information at the top of the sheet while putting the orders at the bottom.
  - Uses parameterized queries to ensure precision when retrieving customer data.
3. Subroutine to Add New Products
  - Takes the details of new products from an Excel sheet and adds them to the Products table in the database.

- Make sure that the product name is set, the price is greater than zero, and there is no negative stock.
- Shows confirmation messages after successfully executing.

#### 4. Subroutine to Submit New Orders

- Takes order details from the Order Form tab.
- Checks if the customer and corresponding products are in the database.
- Orders are placed, with a default status of Pending.

## Conclusion

This application showcases how a small electronics retail shop can use Excel, VBA, and an Access database to efficiently manage their daily operations. Its design is flexible and scalable, allowing the system to grow alongside the business. For instance, future enhancements could include:

- Automating email notifications to keep customers updated on their order status.
- Creating interactive dashboards to provide real-time insights into sales and inventory.
- Moving the database to a cloud-based platform, such as SQL Server, to enable multi-user access and improve collaboration.

By leveraging modern tools and technologies, this system can evolve into a comprehensive solution capable of meeting the demands of larger, more complex businesses. It not only simplifies day-to-day tasks but also positions the business for future growth and success.

Git Repo link:

<https://github.com/ShivaniNayak30/ElectronicsShopSample>