Name: Arun Sharma

Date: 07/14/2024

Assignment: Module 9 - Milestone 1

GitHub link: <https://github.com/SharmaArun017/CSD310.git>

Case study: Bacchus Winery Case Study

- Business Rules: (Some additional) as you already posted the business rules

* Bacchus Winery has a hierarchical employee structure with roles such as finance, marketing, production, and distribution.
* Each type of wine is produced in distinct batches, with each batch having a unique batch number.
* Supplier contracts are renewed annually and include clauses for on-time delivery.
* Inventory levels for supplies are monitored weekly, with automatic reorder triggers.
* Distributors must have a verified account to place orders online.
* Employee performance reviews are conducted semi-annually.
* The system supports bulk order discounts for distributors.
* The winery maintains a customer feedback loop for product improvement.
* Wine production data is tracked per batch for quality control.
* Financial reports are generated monthly to review expenses and revenue.

- Here are some additional business rules and assumptions I've thought of:

* Each wine type has a specific production cost and selling price.
* Each employee has a unique identifier and is assigned to specific roles such as winemaking, bottling, or sales.
* The system must track sales performance by employee and by wine type.
* Wine batches have a production date and an expiration date.
* Quality control checks are performed weekly and recorded in the system

- Assumptions : (Same as Team decision)

1. Each type of wine, supplier, distributor, order, and employee has a unique identifier (WineID, SupplierID, DistributorID, OrderID, EmployeeID).

2. Supplies are categorized into types such as bottles, corks, labels, boxes, vats, and tubing.

3. Deliveries are tracked monthly, and the system records both expected and actual delivery times.

4. Distributors can place orders and track shipments online, indicating the system supports an e-commerce functionality.

5. Employee working hours are tracked quarterly, with each employee associated with a specific department.

6. Each wine type has a specific price associated with it.

7. The system tracks the inventory of supplies, and each supply item is linked to a specific supplier.

8. Each distributor can carry multiple types of wine, and this relationship is tracked in the system.

### **Entities and Relationships**

#### ***Entities:***

1. **Wine**
   * WineID (PK)
   * WineName
   * Type
   * Price
2. **Supplier**
   * SupplierID (PK)
   * SupplierName
   * ContactInfo
3. **Supply**
   * SupplyID (PK)
   * SupplyType
   * Quantity
   * SupplierID (FK)
4. **Distributor**
   * DistributorID (PK)
   * DistributorName
   * ContactInfo
5. **Order**
   * OrderID (PK)
   * OrderDate
   * DistributorID (FK)
6. **OrderDetails**
   * OrderDetailsID (PK)
   * OrderID (FK)
   * WineID (FK)
   * Quantity
7. **Employee**
   * EmployeeID (PK)
   * EmployeeName
   * Department
   * HoursWorked

### **Simple Relationships**

* **One-to-Many**:
  + Supplier to Supply (One to Many)
  + Distributor to Order (One to Many)
  + Order to OrderDetails (One to Many)
  + Wine to OrderDetails (One to Many)
* **One-to-One**:
  + Employee to Department (for simplicity) (One to Many)

### **Summary of Relationships**

* **Supplier - Supply**:
  + One supplier can provide many supplies (One-to-Many).
* **Distributor - Order**:
  + One distributor can place many orders (One-to-Many).
* **Order - OrderDetails**:
  + One order can have many order details (One-to-Many).
* **Wine - OrderDetails**:
  + One wine can appear in many order details (One-to-Many).
* **Employee**:
  + For simplicity, each employee is linked to a single department (One-to-One).

ERD:

