Project Team 4 INFO6210

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DATABASE FOR

E-COMMERCE:

DATABASE DESIGN DOCUMENT

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### PART1. Problems Addressed

#### 1-1.Problems Addressed by Database

* Understanding which products are purchased together.
* Predicting future likelihood of a customer purchasing a product.
* Minimizing potential of products being lost – inventory access and tracking.
* Minimizing inaccurate purchase orders.
* Establishing a better balance between overstock and stockout.
* Better operation cost management – identifying opportunities to maximize profits.
* Improving time management by minimizing order/return fulfillment delays.
* Increasing employee satisfaction with better communication and management system.
* Developing clear responsibilities of employees in the warehouse.
* Identification of redundant processes that could save time and money – streamlined approach.
* Ability to meet customer needs by diversifying products and eliminating unpopular products.
* Understanding time-based changes in customer demands.
* Developing effective methods of communication between warehouses.

### PART2. Bussiness Rules & Entities & Key Decisions

#### 2-1. Business Rules

|  |  |
| --- | --- |
| CATEGORIES | BUSINESS RULES |
| Customer | Each Customer will have one or many Orders. |
| Order | Each Order will have zero or many Returns. Each Order must have one Shipping Task. Each Order must have one Order Detail. |
| Revenue | Each Revenue will have zero or many Orders. |
| Return | Each Return must have one Warehouse Product. |
| EmployeeSalary | Each Employee Salary Record will have zero or many Revenues. |
| Warehouse | Each Warehouse will have one or more Warehouse Products. |
| Employee | Each Employee will stay in one or many Warehouses. Each Employee will have one or many Records of Employee Direct Deposit. Each Employee will have zero or many Employee Reimbursements. Each Employee will have one Employee Salary. Each Employee will have zero or many Shipping Task. |
| ShippingTask | Each Shipping Task will have one Shipping Record. |
| WarehouseProduct | Each Warehouse Product will have one or many Products. |
| Product | Each Product will have one or many Supplies Product Details. Each Product will only be stored in one Warehouse. |
| Supplies | Supplies will have one or many Supplies Product Details. Supplies action date should be recorded in supplies action date. |
| OrderDetail | Each Order Detail will have one or many Warehouse Peoducts. |

#### 2-2. Entities and Its Attributes

|  |  |  |
| --- | --- | --- |
| Entity | Key Attributes | General Attributes |
| WebsiteCustomerAccount | CustomerID{PK} | CustomerEmailAddress,  CustomerLastName,  EncryptedPassword |
| CustomerOrder | OrderID{PK}, CustomerID{FK}, RevenueID{FK} | BillingStreetAddress,  BillingAddressCity,  BillingAddressState,  BillingAddressZipcode,  ShippingStreetAddress,  ShippingAddressCity,  ShippingAddressState,  ShippingAddressZipcode,  TrackingNumber,  OrderDate,  TotalPrice,  ShippingMethods |
| Return | ReturnID{PK}, OrderID{FK}, ProductID{FK}, WarehouseID{FK} | ReturnDate, ReturnQuantity |
| Revenue | RevenueID{PK}, EmployeeSalaryID{FK} | Tax,  TotalRevenue,  Date |
| OrderDetail | OrderDetailID{PK}, OrderID{FK}, ProductID{FK}, WarehouseID{FK} | Quantity |
| ShippingTask | TaskID{PK}, OrderID{FK}, EmployeeID{FK}, TrackingNumber{FK} | ShippingDate |
| ShippingRecord | TrackingNumber{PK} | ShippingMethod, PackageWeight, ShippingName,  Street,  City,  State,  Zipcode,  ShippingDate |
| WarehouseProduct | WarehouseID{PK, FK}, ProductID{PK, FK} | ProductQuantity, ProductName |
| Warehouse | WarehouseID{PK}, EmployeeID{FK} | StreetAddress,  City,  State,  Zipcode |
| EmployeeInfo | EmployeeID{PK} | EmployeeFirstName,  EmployeeMiddleName,  EmployeeLastName,  PhoneNumber,  SickDays,  VacationDays,  JoininDate, DesignationLeaveDate,  EmployeeTitle,  EmployeeEmailAddress,  ManagerID,  EmployeeCheckingSavingAccountNumber,  EncryptedSSN |
| EmployeeSalary | EmployeeSalaryID{PK}, EmployeeID{FK} | BaseSalary,  Bonus,  TotalSalary |
| Product | ProductID{PK} | ProductName,  ProductColor, ProductMaterial, ProductPrice,  ProductImage,  WebsiteLink |
| EmployeeReimbursement | ReimbursementID{PK}, EmployeeID{FK} | ReimbursementDescription,  Price,  ReceiptInfo,  DateforReceipt,  DepositDate |
| EmployeeDirectDeposit | EmployeeID{PK}, DepositDate{PK} | DepositAmount |
| SuppliesProductDetail | SuppliesProductID{PK}, SupplierID{FK}, ProductID{FK} | SupplyDate |
| Supplies | SupplierID{PK} | SupplierName, SupplierStreetAddress, SupplierCity, SupplierState, SupplierZipcode, SupplierContactInfo |

#### 2-3. Key Decisions

|  |  |
| --- | --- |
| ENTITY NAME | KEY DECISION |
| **Product** | The product entity allows for identification of every product’s specification in the warehouse. |
| **WarehouseProduct** | The warehouse product entity specifies the type and quantity of products in different warehouses. |
| **CustomerOrder** | The customer order entity establishes a relationship between the customer information and product ID and the specifics required to fulfill the customer’s order. |
| **WebsiteCusomerAccount** | The website customer account entity stores the information regarding the customer to facilitate their order placements. |
| **ShippingRecord** | The shipping record entity includes all the information necessary to send a product to the customer. |
| **ShippingTask** | The shipping task entity assigns a particular order’s shipping duties to an employee. |
| **Return** | The return entity stores the information regarding a product return made by a customer. |
| **Warehouse** | The warehouse entity includes information about all the different warehouses and the employees who work there. |
| **Employee** | The employee entity stores the information regarding each employee to delineate their roles and manage their responsibilities and payments. |
| **EmployeeSalary** | The employee salary entity informs the compensation an employee requires based on their duties. |
| **EmployeeReimbursemsent** | The employee reimbursement entity includes the information required for the business to compensate any company expenses covered by an employee’s own funds. |
| **EmployeeDirectDeposit** | The employee direct deposit entity monitors the payments made to employees by the business. |
| **Supplies** | The suppliesentity stores the information regarding each supplier that works with the company. |
| **Revenues** | The revenue entity allows for calculation of the total revenue made based on items sold and their cost vs expenditure. |