PROJECT DOCUMENTATION

1.   Team: Team Voltaire

2.   Team Members:

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2.   Problem Owners: Alex Trofimov, CEO, Sunny Services LLC

3.   Summary: The MIS 686 Consortium proposes to reduce the average work order completion time, increase customers satisfaction, retention rate, and market share by cutting procurement lead time in parts and electronic components with implementation of a database designed to support both operations and customer interactions.

4.   Business needs:
4.1.   10% of all incoming calls are about the status of parts in existing work orders, which could have been new customers bringing in more business
4.2.   The current system does not allow to track the incoming parts and timely replace those came defected, thereby resulting in dropped orders and lost customers
4.3.   It takes too long to provide a repair estimate as the part prices are scattered among various databases, which often causes one day delay in order completion
4.4.   Existing spare parts warehouse is not efficient as the heuristic method of keeping certain items in stock produces too much risk of non-essential spending

5.   Business activities:
5.1.   Technical teams conduct service calls and repairs
5.2.   Office leads order parts and issue invoices to customers
5.3.   Office leads plan weekly workload for Technical teams
5.4.   Customers pay their invoices
5.5.   Part managers plan spare parts purchases

6.   Business value:
6.1.   Instant information on part prices and availability minimizes the time between a service call and the moment customers receive repair estimates and invoices
6.2.   A link to the tracking information provides office leads and customers with a prospective date of repair completion, thereby increasing customers satisfaction
6.3.   Clear, table-view information on arriving parts helps to optimize Technical teams workload, resulting in conducting more service calls, gaining more market share
6.4.   Historical data on highly demanded parts navigates Part managers to optimal spare parts restocking

7.   Constraints:

7.1.   Must be data compatible with the ERP and CRM systems used by Sunny Services

7.2.   Must exchange data with the main vendors' existing product databases

7.3.   The project cost must not exceed $12,000

7.4.   Must be deployed by Dec 30, 2020

Data Model

UML Class Diagram: Sunny Services LLC
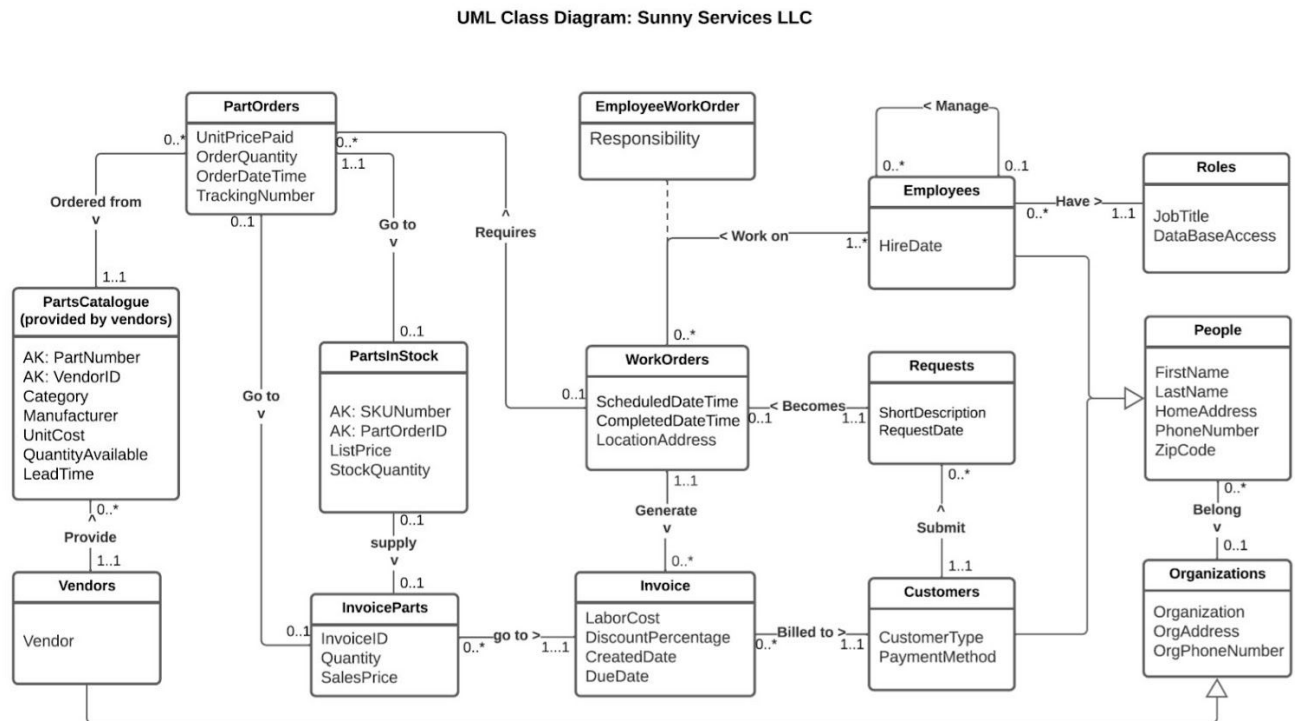
Logical Database Design

WORKORDERS (WorkOrderID, RequestID, ScheduledDateTime, CompletedDateTime, LocationAddress)

      foreign key RequestID references REQUESTS

      not null RequestID

EMPLOYEES (EmployeeID, HireDate, RoleID, ManagerID)

      foreign key EmployeeID references PEOPLE

      foreign key RoleID references ROLES

      foreign key ManagerID references EMPLOYEES

      not null RoleID, HireDate

ROLES (<u>RoleID</u>, JobTitle, DatabaseAccess)
      not null JobTItle, DatabaseAccess

REQUESTS (<u>RequestID</u>, ShortDescription, RequestDate, CustomerID)
      foreign key CustomerID references CUSTOMERS
      not null CustomerID, RequestDate

INVOICES (<u>InvoiceID</u>, WorkOrderID, CustomerID, LaborCost, DiscountPercentage, CreatedDate, DueDate)
      foreign key WorkOrderID references WORKORDERS
      foreign key CustomerID references CUSTOMERS
      not null WorkOrderID, CustomerID, CreatedDate, DueDate

INVOICEPARTS (<u>InvoicePartID</u>, PartsInStockID, PartOrderID, InvoiceID, Quantity, SalesPrice)
      foreign key PartsInStockID references PARTSINSTOCK
      foreign key PartOrderID references PARTORDERS
      foreign key InvoiceID references INVOICES
      not null InvoiceID, Quantity, SalesPrice

CUSTOMERS (<u>CustomerID</u>, CustomerType, PaymentMethod)
      foreign key CustomerID references PEOPLE

PEOPLE (<u>PersonID</u>, FirstName, LastName, HomeAddress, ZipCode, PhoneNumber, OrganizationID)
      foreign key OrganizationID references ORGANIZATIONS
      not null FirstName, LastName, HomeAddress, ZipCode, PhoneNumber

VENDORS (<u>VendorID</u>, AK: Vendor)
      foreign key VendorID references ORGANIZATIONS
      unique not null Vendor

ORGANIZATIONS (<u>OrganizationID</u>, AK: Organization, OrgAddress, OrgPhoneNumber)
      unique not null Organization
      not null OrgAddress, OrgPhoneNumber

PARTSCATALOG (<u>PartsCatalogID</u>, AK: (PartNumber, VendorID), Category, Manufacturer, UnitCost, QuantityAvailable, LeadTime)
      foreign key VendorID references VENDORS
      unique (PartNumber, VendorID)
      not null PartNumber, VendorID, Category, Manufacturer, UnitCost,
      QuantityAvailable, LeadTime

PARTSINSTOCK (<u>PartsInStockID</u>, AK: (SKUNumber, PartOrderID), StockQuantity, ListPrice)
      foreign key PartOrderID references PartOrders
      not null StockQuantity, ListPrice, PartOrderID, SKUNumber
      Unique (SKUNumber, PartOrderID)

PARTORDERS (<u>PartOrderID</u>, PartsCatalogID, WorkOrderID, UnitPricePaid, OrderQuantity, OrderDateTime, AK: TrackingNumber)
      foreign key WorkOrderID references WORKORDERS
      foreign key PartsCatalogID references PARTSCATALOG
      not null PartsCatalogID, UnitPricePaid, OrderQuantity, OrderDateTime, TrackingNumber
      unique TrackingNumber

EMPLOYEEWORKORDERS (PK(WorkOrderID, EmployeeID), Responsibility)
      Foreign key WorkOrderID references WORKORDERS
      Foreign key EmployeeID references EMPLOYEES
      Not null Responsibility

Query Dictionary

1. Q1. Ref BR5. What date will the most recent order for part 0230K00001 arrive?
   a. Show: PartNumber, OrderDateTime as OrderDate, LeadTime, OrderDateTime plus leadTime As Delivery Date
2. Q2. Ref BR1. Katie Fernandez complained that the employee who completed her last work order did a bad job. What is the name of the employee?
   a. Show: FirstName, LastName, EmployeeID
3. Q3. Ref BR3. Which employee is working on a work order? What is his/her responsibility?Where and when did the work order complete? How many work orders this year?
   a. Show: EmployeeID, EmployeeName, WorkOrderID, Responsibility, LocationAddress, CompletedDateTime, and total number of work orders this year. Display in ascending order by EmployeeID.
4. Q4. Ref BR2. When the office leads issue invoices to customers, they'd like to know how much discount is given to a specific customer? What type is the customer? What payment method the customer uses?
   a. Show: InvoiceID, CustomerID, CustomerType, PaymentMethod, DiscountPercentage, the time between the customer making the request and the scheduled date to complete the work order. Display in ascending order by CustomerID.

5. Q5. Ref BR1. List the technician who worked on each request that required an AC Unit installation.
   a. Show: RequestID, ShortDescription, LastName plus FirstName as Name
6. Q6. Ref BR5. What was the total cost of AC units we purchased from vendors in the month of october?
   a. Show: the month of OrderDateTime as Month, sum of UnitPricePaid * OrderQuantity as OrderTotal
7. Q7. Ref BR4. Pull out all the invoices on WorkOrders completed in May 2020.
   a. Show: InvoiceID, CustomerID, Organization and it's ID (if any affiliations), Customer's full name and contact phone number, Short Description of the work done, Labor cost and discount (if any), Information on the parts used (StockID, PartNumber, ListPrice, Quantity used), Cost of Labor, Parts, and the Total cost charged to the customer.
8. Q8. Ref BR2. Create a VIEW showing all Parts arriving to the office within a week from the current date.
   a. Show: PartOrderID, Vendor, WorkOrderID (if the part was ordered in association with a specific WorkOrder), PartNumber, OrderQuantity, TrackingNumber, Order Placement date, Expected Arrival Date.
9. Q9. Ref BR1. Assume a customer is calling you asking about an AC unit installation that their organization commissioned with SunnyServices at one of their properties some time earlier this year. They are unable to find the Invoice that they need for a tax write-off.
   a. Show: InvoiceID, WorkSite Address, Short Description, Completion date, Total Invoice amount charged, as well as the Contact Person full name and Organization to verify the identity of the person calling based on their phone number: (415) 494-1744.
10. Q10.Ref BR2. List the CustomerID, full name (First Name & Last Name), total quantity ordered for the customer(s) who ordered the most parts last year.
    a. Tables: People, Customer, Invoices, InvoicesParts