# Company Database Management System

# CS 306 – PROJECT PHASE 1
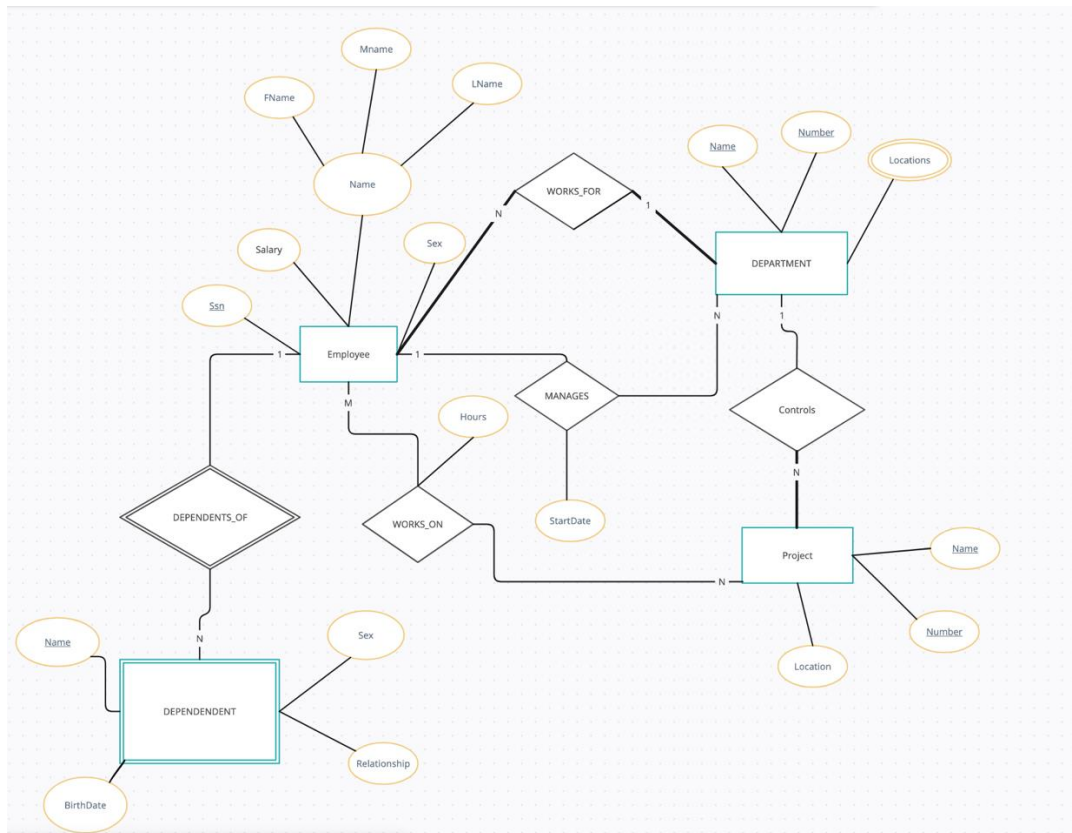
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# Company Database Management System

I am designing a database application for a company where there are employees, departments, projects, and dependents. Employees have a unique social security number (Ssn), along with a first name, middle name, last name, salary, and gender. The Ssn uniquely identifies an employee. Employees work for a department, and each department has a name, location, and a unique department number. Employees can also have dependents, who are identified by a name, birthdate, gender, and their relationship to the employee.

In addition to working for a department, employees can work on multiple projects. Projects have a unique project number, a name, and a location. Each project is controlled by one or more departments, and a department can control multiple projects. Employees contribute to projects by working a certain number of hours on them.

Departments must be managed by one employee, and each department can only have one manager at a time. The system also tracks the start date of the employee's managerial role. All employees must work for a single department, and every department must have at least one employee working for it. Finally, each project must be controlled by at least one department

# ER Diagram

# ER Diagram to Relational Model

```
CREATE TABLE Employee (
    Ssn VARCHAR(9) PRIMARY KEY,
    FName VARCHAR(50),
    MName VARCHAR(50),
    LName VARCHAR(50),
    Salary DECIMAL(10, 2),
    Sex CHAR(1)
);

CREATE TABLE Dependent (
    Dependent_Name VARCHAR(50),
    BirthDate DATE,
    Sex CHAR(1),
    Relationship VARCHAR(50),
    Ssn VARCHAR(9),
    PRIMARY KEY (Dependent_Name, Ssn),
    FOREIGN KEY (Ssn) REFERENCES Employee(Ssn) ON DELETE CASCADE
);
```

```sql
CREATE TABLE Department (
    Department_Number INT PRIMARY KEY,
    Department_Name VARCHAR(50),
    Location VARCHAR(50)
);

CREATE TABLE Project (
    Project_Number INT PRIMARY KEY,
    Project_Name VARCHAR(50),
    Location VARCHAR(50)
);

CREATE TABLE Works_For (
    Ssn VARCHAR(9),
    Department_Number INT,
    PRIMARY KEY (Ssn, Department_Number),
    FOREIGN KEY (Ssn) REFERENCES Employee(Ssn) ON DELETE CASCADE,
    FOREIGN KEY (Department_Number) REFERENCES Department(Department_Number) ON
DELETE CASCADE
);

CREATE TABLE Manages (
    Ssn VARCHAR(9),
    Department_Number INT,
    StartDate DATE,
    PRIMARY KEY (Ssn, Department_Number),
    FOREIGN KEY (Ssn) REFERENCES Employee(Ssn) ON DELETE CASCADE,
    FOREIGN KEY (Department_Number) REFERENCES Department(Department_Number) ON
DELETE CASCADE
);

CREATE TABLE Works_On (
    Ssn VARCHAR(9),
    Project_Number INT,
    Hours DECIMAL(5, 2),
    PRIMARY KEY (Ssn, Project_Number),
    FOREIGN KEY (Ssn) REFERENCES Employee(Ssn) ON DELETE CASCADE,
    FOREIGN KEY (Project_Number) REFERENCES Project(Project_Number) ON DELETE CASCADE
);

CREATE TABLE Controls (
    Department_Number INT,
    Project_Number INT,
    PRIMARY KEY (Department_Number, Project_Number),
```

```sql
    FOREIGN KEY (Department_Number) REFERENCES Department(Department_Number) ON
DELETE CASCADE,
    FOREIGN KEY (Project_Number) REFERENCES Project(Project_Number) ON DELETE CASCADE
);
```

**INSERTING DATA TO EACH TABLE
IN DATABASE**

```sql
INSERT INTO Employee (Ssn, FName, MName, LName, Salary, Sex)
VALUES
('123456789', 'John', 'A', 'Doe', 55000.00, 'M'),
('987654321', 'Jane', 'B', 'Smith', 65000.00, 'F'),
('456789123', 'Robert', 'C', 'Brown', 48000.00, 'M'),
('789456123', 'Emily', 'D', 'Johnson', 72000.00, 'F'),
('321654987', 'Michael', 'E', 'White', 58000.00, 'M'),
('654321789', 'Emma', 'F', 'Davis', 70000.00, 'F'),
('147258369', 'William', 'G', 'Miller', 50000.00, 'M'),
('963852741', 'Olivia', 'H', 'Wilson', 80000.00, 'F'),
('258963147', 'James', 'I', 'Moore', 62000.00, 'M'),
('852741963', 'Sophia', 'J', 'Taylor', 67000.00, 'F');
INSERT INTO Dependent (Dependent_Name, BirthDate, Sex, Relationship, Ssn)
VALUES
('Anna Doe', '2010-06-15', 'F', 'Daughter', '123456789'),
('Mark Doe', '2012-08-22', 'M', 'Son', '123456789'),
('Lucas Smith', '2014-09-05', 'M', 'Son', '987654321'),
('Emma Smith', '2016-11-03', 'F', 'Daughter', '987654321'),
('Michael Brown', '2009-01-12', 'M', 'Son', '456789123'),
('Sophia Johnson', '2011-02-25', 'F', 'Daughter', '789456123'),
('Oliver White', '2013-03-30', 'M', 'Son', '321654987'),
('Emily Wilson', '2017-12-18', 'F', 'Daughter', '963852741'),
('Isabella Miller', '2008-07-08', 'F', 'Daughter', '147258369'),
('James Moore', '2015-05-10', 'M', 'Son', '258963147');



INSERT INTO Department (Department_Number, Department_Name, Location)
VALUES
(1, 'Human Resources', 'New York'),
(2, 'Finance', 'San Francisco'),
(3, 'Engineering', 'Los Angeles'),
(4, 'Marketing', 'Boston'),
(5, 'Sales', 'Chicago'),
```

```
(6, 'IT Support', 'Dallas'),
(7, 'Research', 'Seattle'),
(8, 'Logistics', 'Houston'),
(9, 'Operations', 'Phoenix'),
(10, 'Legal', 'Philadelphia');



INSERT INTO Project (Project_Number, Project_Name, Location)
VALUES
(101, 'Project Alpha', 'New York'),
(102, 'Project Beta', 'San Francisco'),
(103, 'Project Gamma', 'Los Angeles'),
(104, 'Project Delta', 'Boston'),
(105, 'Project Epsilon', 'Chicago'),
(106, 'Project Zeta', 'Dallas'),
(107, 'Project Eta', 'Seattle'),
(108, 'Project Theta', 'Houston'),
(109, 'Project Iota', 'Phoenix'),
(110, 'Project Kappa', 'Philadelphia');

INSERT INTO Works_For (Ssn, Department_Number)
VALUES
('123456789', 1),
('987654321', 2),
('456789123', 3),
('789456123', 4),
('321654987', 5),
('654321789', 6),
('147258369', 7),
('963852741', 8),
('258963147', 9),
('852741963', 10);



INSERT INTO Manages (Ssn, Department_Number, StartDate)
VALUES
('123456789', 1, '2015-01-01'),
('987654321', 2, '2016-03-15'),
('456789123', 3, '2017-07-20'),
('789456123', 4, '2018-02-25'),
('321654987', 5, '2019-11-10'),
```

```
('654321789', 6, '2020-09-30'),
('147258369', 7, '2013-05-15'),
('963852741', 8, '2014-08-10'),
('258963147', 9, '2012-12-01'),
('852741963', 10, '2011-06-20');




INSERT INTO Works_On (Ssn, Project_Number, Hours)
VALUES
('123456789', 101, 35.5),
('987654321', 102, 40.0),
('456789123', 103, 28.0),
('789456123', 104, 42.5),
('321654987', 105, 30.0),
('654321789', 106, 37.5),
('147258369', 107, 50.0),
('963852741', 108, 33.0),
('258963147', 109, 25.0),
('852741963', 110, 45.0);

INSERT INTO Controls (Department_Number, Project_Number)
VALUES
(1, 101),
(2, 102),
(3, 103),
(4, 104),
(5, 105),
(6, 106),
(7, 107),
(8, 108),
(9, 109),
(10, 110);
```