FACULTY OF COMPUTING & INFORMATION TECHNOLOGY
KING ABDULAZIZ UNIVERSITY

كلية الحاسبات وتقنية المعلومات
جامعة الملك عبدالعزيز

CPIT 240- Group Project

(Hospital Leaves Reservation DB)

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Phase-1: Introduction

We will design a database system for leave reservation in King Abdulaziz naval base hospital. The employee faces difficulties due to requesting their vacations manually, through the papers.

Structure and the requirement

The disadvantages of paperwork that each employee needs to disappear from his workstation to sign his vacation papers from different administrations. It is also possible that the paper requests will be lost or missed; delay of vacation could happen because the administrations are very busy, miss calculation or date mistakes in addition to the difficult arrangement of the vacations. Each employee has different leave days; it created the main issue in calculating leave requests. The structure of our system will be the following:

- The hospital is organized into DEPARTMENTs. Each DEPARTMENT has a Name, unique Department number and an employee who manages the department.
- Each DEPARTMENT keeps track of its employees Vacation days.
- EMPLOYEE requests a VACATION and it keeps track of Starting days, Place of vacation.
- Each EMPLOYEE has a Name, unique Employee number, unique ID or Iqama, Salary, Sex, Ssn, Birth Date, Address, Rank, Job position, Contact number, Type, and works for a DEPARTMENT.
- DEPARTMENTs control the VACATION.
- A VACATION has Types and Number of days.

Operations

The hospital has different categories of employee and different types of vacation for each category. So, we decided to design this system to solve these problems by design, construct, and maintain a database that will include all these categories and types.

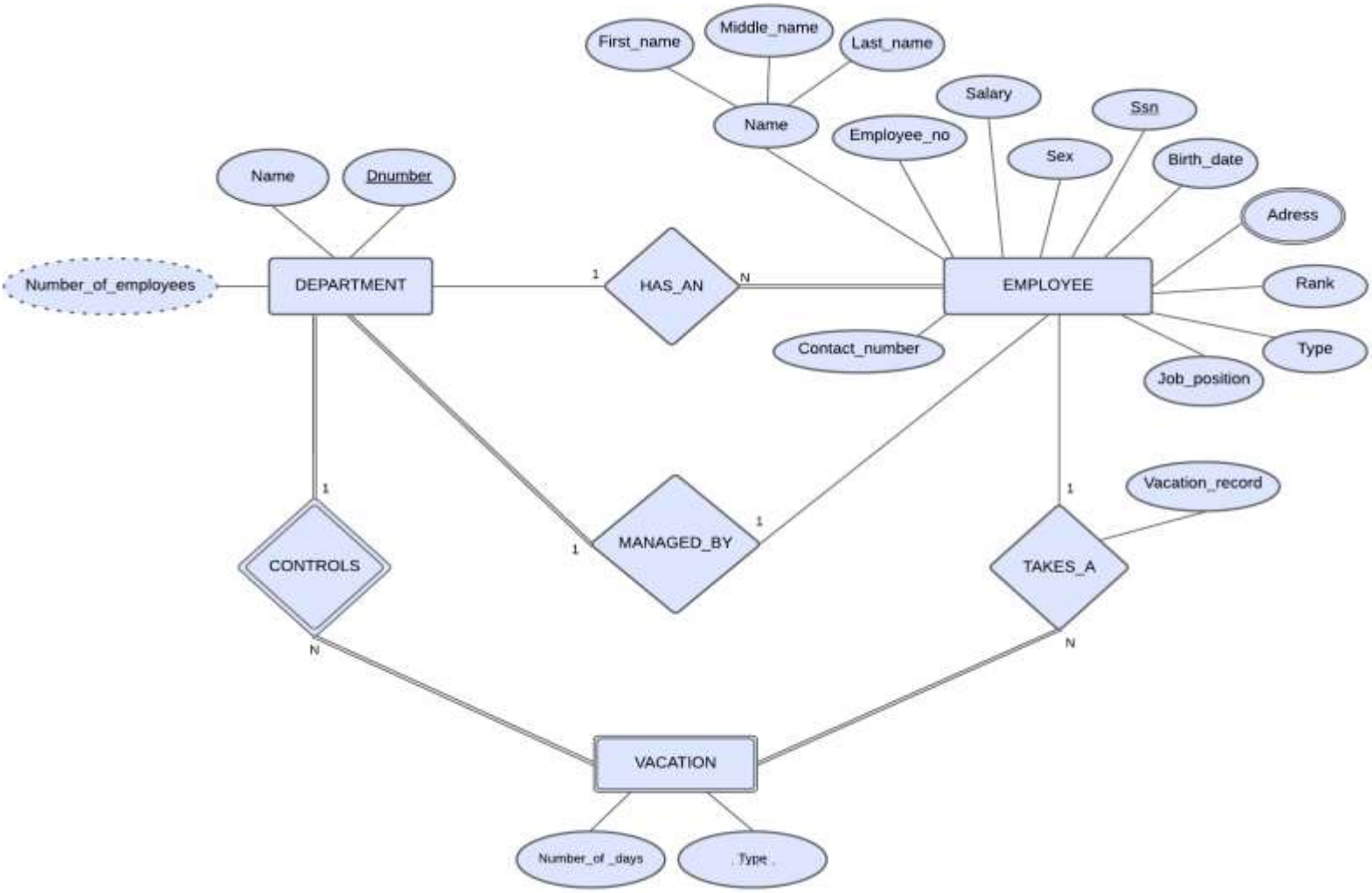
The system contains registration of employees with their data and registration of vacations with their types, vacation requests. The system will have the ability to add and remove employees or modify remaining days and request status or update vacation lists. Employees can send leave requests and the head of each department can give a quick approval or disapproval.

The hospital does not have an appropriate system containing all these features therefore, this system was the best solution.

Constraints

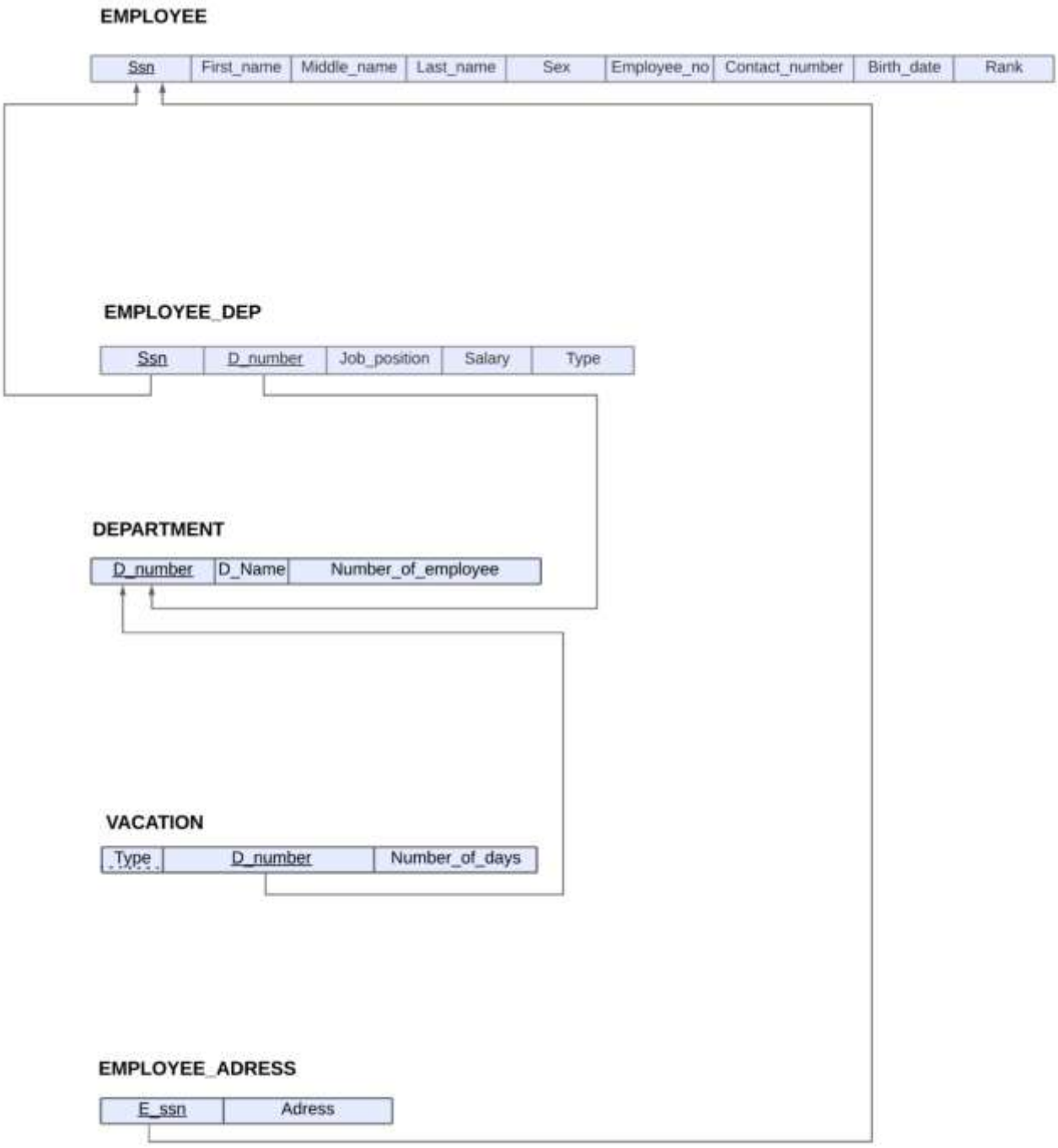
- The employee should not take more vacations than the required number.
- The application must be sent before the desired vacation date.
- The head of the departments is the only one who can accept or reject the request.
- An employee can only take types of leave according to his category.
- Only heads of the departments are allowed to modify the data.
- The employee cannot send the request until he has filled out the form and wrote the reason for the leave request.

Phase-2| part-1: ERD



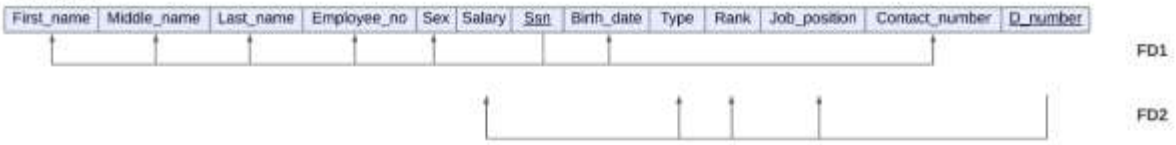
Phase-2| part-2: RDB

Phase-3: Normalization



(a)

EMPLOYEE



2NF Normalization

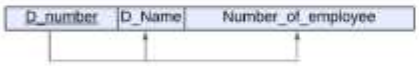
EMPLOYEE

EMPLOYEE_DEP

(b)

1NF & 2NF & 3NF Normalization

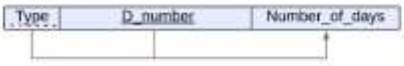
DEPARTMENT



(c)

1NF & 2NF & 3NFNormalization

VACATION



(d)

1NF & 2NF & 3NF Normalization

EMPLOYEE_ADRESS

Phase-4| part-1: Implementation of Database Schema

DDL STATEMENTS

```
create table EMPLOYEE
(Ssn number(8) not null PRIMARY KEY,
Employee_no number(10) not null UNIQUE,
First_name varchar2(20) not null,
Middle_name varchar2(20) not null,
Last_name varchar2(20) not null,
Sex varchar2(10) not null,
Contact_number number(10) not null,
Birth_date date not null)
/

create table Employee_DEP
(Ssn number(8) references employee(Ssn),
D_number number(5) references department(D_number),
Job_position varchar2(30) not null,
Salary number(38) not null,
Type varchar2(30) not null,
Rank int not null)
/
```

```
create table VACATION
(Type varchar2(80) NOT NULL,
D_number number(5) references department(D_number),
Number_of_days numeric(3,0) )
/

create table DEPARTMENT
(D_number number(5) not null,
Dname varchar2(70) not null,
Number_of_employee number(30) not null,
PRIMARY KEY (D_number))
/

create table EMPLOYEE_ADRESS
(Essn number(8) references employee(Ssn),
Adress varchar(100))
/
```

DML STATEMENTS

EMPLOYEE

INSERT INTO employee(Ssn, employee_no, First_name, Middle_name, Last_name, Sex, Contact_number, Birth_date)

VALUES(01907030, 1, 'Jeelan', 'Majid', 'Alotaibi', 'female', 0505969012, TO_DATE('11/05/2000', 'DD/MM/YYYY'))

/

INSERT INTO employee(Ssn, employee_no, First_name, Middle_name, Last_name, Sex, Contact_number, Birth_date)

VALUES(01911265,2, 'Elaf', 'Yousef', 'Aloufi', 'female', 0509117257, TO_DATE('15/05/2000', 'DD/MM/YYYY'))

/

INSERT INTO employee(Ssn, employee_no, First_name, Middle_name, Last_name, Sex, Contact_number, Birth_date)

VALUES(01906775, 3, 'Manar', 'Mutlaq', 'Altaiary', 'female', 0501432868, TO_DATE('17/07/2000', 'DD/MM/YYYY'))

/

INSERT INTO employee(Ssn, employee_no, First_name, Middle_name, Last_name, Sex, Contact_number, Birth_date)

VALUES(01907765, 4, 'Sara', 'Ahmed', 'Algamdi', 'female', 0583628554, TO_DATE('6/02/1997' , 'DD/MM/YYYY'))

/

INSERT INTO employee(Ssn, employee_no, First_name, Middle_name, Last_name, Sex, Contact_number, Birth_date)

VALUES(01988768 , 5 , 'Mohammed' , 'Ahmed' , 'Algamdi' , 'male' , 0548907658 , TO_DATE('7/09/1999', 'DD/MM/YYYY'))

/

EMPLOYEE_DEP

```
INSERT INTO employee_dep(Ssn,D_number, Job_position,Salary, Type, Rank)
VALUES(01907030, 2, 'Dental assistant', 45600, 'Full-time', 4)
/
INSERT INTO employee_dep(Ssn,D_number, Job_position,Salary, Type, Rank)
VALUES(01911265, 3, 'General Sergery Consultant', 40500, 'Full-time', 3)
/
INSERT INTO employee_dep(Ssn,D_number, Job_position,Salary, Type, Rank)
VALUES(01906775,3,'Cardiothoracic surgeon',20000,'full-time',5)
/
INSERT INTO employee_dep(Ssn,D_number, Job_position,Salary, Type, Rank)
VALUES(01907765, 4, 'Pharmacist', 6000, 'Part-time', 6)
/
INSERT INTO employee_dep(Ssn,D_number, Job_position,Salary, Type, Rank)
VALUES(01988768 , 5, 'Radiologic Technologist' ,21153, 'Casual', 2)
/
```

VACATION

```
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Annual leave' , 2, 30)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES  ('Emergency leave', 2, 10)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES ('National day leave', 2, 1)

/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Alfitr leave', 2, 11)

/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Aladhha leave', 2, 11)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Annual leave' , 1, 30)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Emergency leave', 1, 10)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('National day leave', 1, 1)
/
```

```
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Alfitr leave' , 1 , 11)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Aladhha leave' , 1, 11)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Annual leave', 3,30)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('National day leave', 3,1)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Alfitr leave',3,1)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Aladhha leave',3,11)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Emergency leave', 3,10)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Annual leave',4, 30)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Emergency leave', 4,10)
/
```

```
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('National day leave', 4,1)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Alfitr leave',4,11)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Aladhha leave',4,11)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Annual leave',5, 30)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('National day leave',5, 1)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Alfitr leave', 5, 11)
/
INSERT INTO vacation(Type, D_number, Number_of_days)
VALUES('Eid Aladhha leave',5, 11)
/
```

DEPARTMENT

```
INSERT INTO department(D_number,Dname,Number_of_employee)
VALUES(1 , 'Medical Record Department' , 100)
/
INSERT INTO department(D_number,Dname,Number_of_employee)
VALUES(2, 'Dental Department', 85)
/
INSERT INTO department(D_number,Dname,Number_of_employee)
VALUES(3,  'General Surgery Department', 70)
/
INSERT INTO department(D_number,Dname,Number_of_employee)
VALUES(4, 'Pharmacy Department',38)
/
INSERT INTO department(D_number,Dname,Number_of_employee)
VALUES(5, 'Radiology Department', 23)
/
```

EMPLOYEE_ADRESS

```
INSERT INTO employee_adress(Essn,Adress)
VALUES(01907030, 'Hamdaniyah Street' )
/
INSERT INTO employee_adress(Essn,Adress)
VALUES(01911265, 'Aziziyah StreetAz')
/
INSERT INTO employee_adress(Essn,Adress)
VALUES(01906775 , 'Sari Street')
/
INSERT INTO employee_adress(Essn,Adress)
VALUES(01907765, 'Alamal Plaza Hail Street' )
/
INSERT INTO employee_adress(Essn,Adress)
VALUES(01988768 , 'Tahlia Street' )
/
```

Phase-4| part-2: Queries

Simple Queries:

1) Retrive employee of the same sex

```
SELECT * FROM employee WHERE sex='female';
```

2) Retrieve employee first and last name

```
SELECT First_name, Last_name FROM employee;
```

3) Update employee's department number

```
UPDATE employee_dep SET D_number =3 WHERE Ssn = 1907030;
```

Complex Queries:

1)Retrieve employee first and last name if address is null

```
SELECT First_name, Last_name
FROM employee_adress , EMPLOYEE
WHERE Essn=Ssn AND adress IS NULL;
```

2) Retrieve Employee based on the address

```
SELECT * FROM employee_adress
WHERE ADRESS IN ('Hamdaniyah Street' , 'Sari Street') ORDER BY Essn;
```

3) Retrieve Department names based on specific vacation type

```
SELECT DISTINCT DNAME
FROM DEPARTMENT
WHERE D_NUMBER IN
                    ( SELECT D_NUMBER
                      FROM VACATION
                      WHERE TYPE= 'Annual leave'  );
```

Aggregate query

1) Retrieve number of rows

```
SELECT Count(*) FROM EMPLOYEE;
```

2) Retrieve maximum salary based on employee type

```
SELECT MAX(salary) FROM EMPLOYEE_DEP WHERE TYPE= 'Full-time' ;
```

3) Retrieve average salary of all employees

```
SELECT AVG(salary) FROM EMPLOYEE_DEP;
```