Noun Analysis and ER-Diagram

For

Vaccination or Other Health Drives Database

Prepared By

Hiten Padaliya (201901401)
Satyam Bhut (201901408)
Dhairya Rupala (201901419)
Jenish Rathod (201901435)

Organization

Dhirubhai Ambani Institute of Information and Communication Technology

Final Problem Description

In earlier times when we didn't have enough technologies like today, so global diseases or pandemic situations lead to world crises and economic falls, hospitals can be flooded by patients and people would also lose financial support, due to these technological limitations, we were not able to organize well-managed vaccination drives. At that time people managed to take vaccines from the available hospitals or from local health centers. At that time all the people were not able to take vaccines, also there was not a well-managed database for the people who have already been vaccinated, there was not any management about stocks of vaccines, also there was not any kind of schedule for vaccination, etc.

If we take the reference of the COWIN online vaccination drive, if some users will request a vaccine slot then the system will provide all the available centers in an unordered way, but we can implement some functionality in the system such that the system will always provide the nearest available center with the available slots, whenever the user request for a slot. Also in the COWIN vaccination system, the user is not able to pre-register the slot for vaccines. These would lead to the idea of creating a better and well-managed efficient vaccination system.

This system will keep the database of the vaccination drives or disease control programs. The system will keep track of the details of all the vaccination centers along with their locations and stock of the vaccines at respective vaccination centers, also this will keep records of all the managers and employees working at respective vaccination centers.

The system will also keep a record of all the user information of the patients along with the age groups, and other details. The manager of the respective vaccination center will also be able to generate the report about all the users who are vaccinated at that particular vaccination center, and also the system can generate the report about all the vaccinated persons.

Prominent features/working flow:

- **Administration signup –** The administration (Government officials) first have to sign up in the system using their details such as admin name, admin gender, admin city, etc. Here the admins have all the privileges regarding all the functionalities and features in the system.

- **Slot booking through the query** - First of all, the users have to sign up into the system, using their details such as user-name, user-age, user-gender, user-city, etc. After signing up the Users can book slots according to their convenience and availability of slots, and the system will provide information about the booked slot such as slot timings.

- **Displaying the nearest available vaccination centers** - The system will be able to display the vaccination centers with available slots along with their details (i.e center-name, center-city, etc.) based on their ascending order of the distance from the particular user's location who requested a vaccination slot.

- **Certification and User report** - Each center will have some employees, the manager of the particular center will assign the employees. At first, the employees assigned to the respective vaccination centers have to sign up into the system with their details such as employee-name, employee-gender, etc. After that, the employees will be given some privileges in the system. The employees of a particular center will also be able to issue the certificates and also be able to generate the report about all the users who have been vaccinated or registered at the particular center.

- **Manager details** - All the managers first have to sign up in the system using their details such as manager-name,manager-gender, manager-centername, etc. Each center will have a manager, and The administration assigns the managers and also will be able to generate the details about all the managers of particular city centers. Also

- **Latest Guidelines and registration process** - The system will contain updated guidelines about the vaccines or medicines for particular diseases, proper steps for the registration process for booking particular vaccine slots.

- **Ordering of vaccines based on center requirements** - The system will take care of the total availability of the vaccines per center and managers of the respective centers can request the administration about the requirement of the vaccines and administration can order the vaccines from the inventory based on requirements.

- **Displaying the nearest inventories** - The system will be able to display the inventories details such as inventory name, inventory city, etc. based on their ascending order of distance from the particular administration location, which has requested the vaccine stock.

- **Slot vaccine quantity updation** - The system will be able to update the center's vaccine stock based on the order and the number of vaccines per slot on a daily basis.

- **Well-managed Inventory** - The system has a well-managed inventory tracking system for ordering, delivering, classifying the classes of the vaccines.

  Ordering of the vaccines for the particular center will be done by the manager, he has decided the particular threshold values to reorder the vaccines, if the current stock of the vaccines will drop to that threshold value then the manager will request the upper level (i.e Administration) for more stocks about the vaccines, and the Administration (Government official) has all the order details such as order id, vaccine-type, etc.. and admin is allowed to order the vaccines directly from the main inventory.

  To distinguish between the types of vaccines to order, each of the vaccines will be marked by a particular vaccine type. So the manager can get an idea about the particular vaccines to order. According to that, the manager keeps a record of different vaccines.

I. Noun (& Verb) Analysis:

(1) Nouns (Entities) and verbs (relationships) in the description.

Noun	Verb
Final problem description	can
technologies	Like
Global diseases	read
Pandemic situations	Be
World crisis	Would
Economic falls	lose
hospitals	support
patients	organize
Financial supports	classifying
Technological limitations	take
Vaccination drives	schedule
vaccines	reference
time	drive
time	will
hospitals	request
Local health centers	provide
vaccines	Implement
database	Register
Stocks of vaccines	Control

Schedule for vaccination	Track
reference	Keep
Cowin	Generate
Managers	Assigns
Vaccination drive	Record
users	Report
Order details	allowed
Order id	Delivering
vaccine slots	Flow
Main inventory	Query
Available centers	Display
system	order
Nearest available center	issue
administration	Assigns
Available slots	Process
user	Update
Cowin	Reorder
Vaccination system	Drop
user	Fall
slot	Is
vaccines	Programs
Vaccination system	Groups
database	steps

Vaccination drives	features
Disease control drives	Has
details	values
Vaccination centers	types
The stock of the vaccines	flooded
respective vaccination centers	managed
records	was
Manager	vaccinated
employees	based
Respective vaccination centers	requested
User information	decided
patients	allowed
manager	marked
Respective vaccination centers	ascending
report	creating
users	booking
Particular vaccination center	delivering
Vaccinated person	according
users	working
slot	using
Prominent features	book
slots	displaying
Nearest available vaccination centers	allocate

vaccination centers	
Available slots	
Vaccination slots	
User report	
employees	
Particular center	
certificates	
users	
manager	
administration	
managers	
Latest guidelines	
Registration process	
medicines	
vaccines	
Particular diseases	
Proper steps	
Vaccine slots	
managers	
administrations	
inventory	
administrations	
inventories	

Administration location	
Vaccine stock	
order	
Daily basis	
Classes of vaccines	
manager	
Threshold values	
Current stock of the vaccine	
Manager	
Upper level	
Administration	
stock	
vaccines	
administration	
government official	
Admin name	
Admin gender	
Admin city	
privileges	
functionalities	
User name	
User age	
User gender	

User city	
information	
Slots timings	
Center name	
Center city	
User’s location	
Employee name	
Employee gender	
Manager name	
Manager gender	
Manager centername	
Inventory name	
Inventory city	

(2) Accepted Noun and verbs list

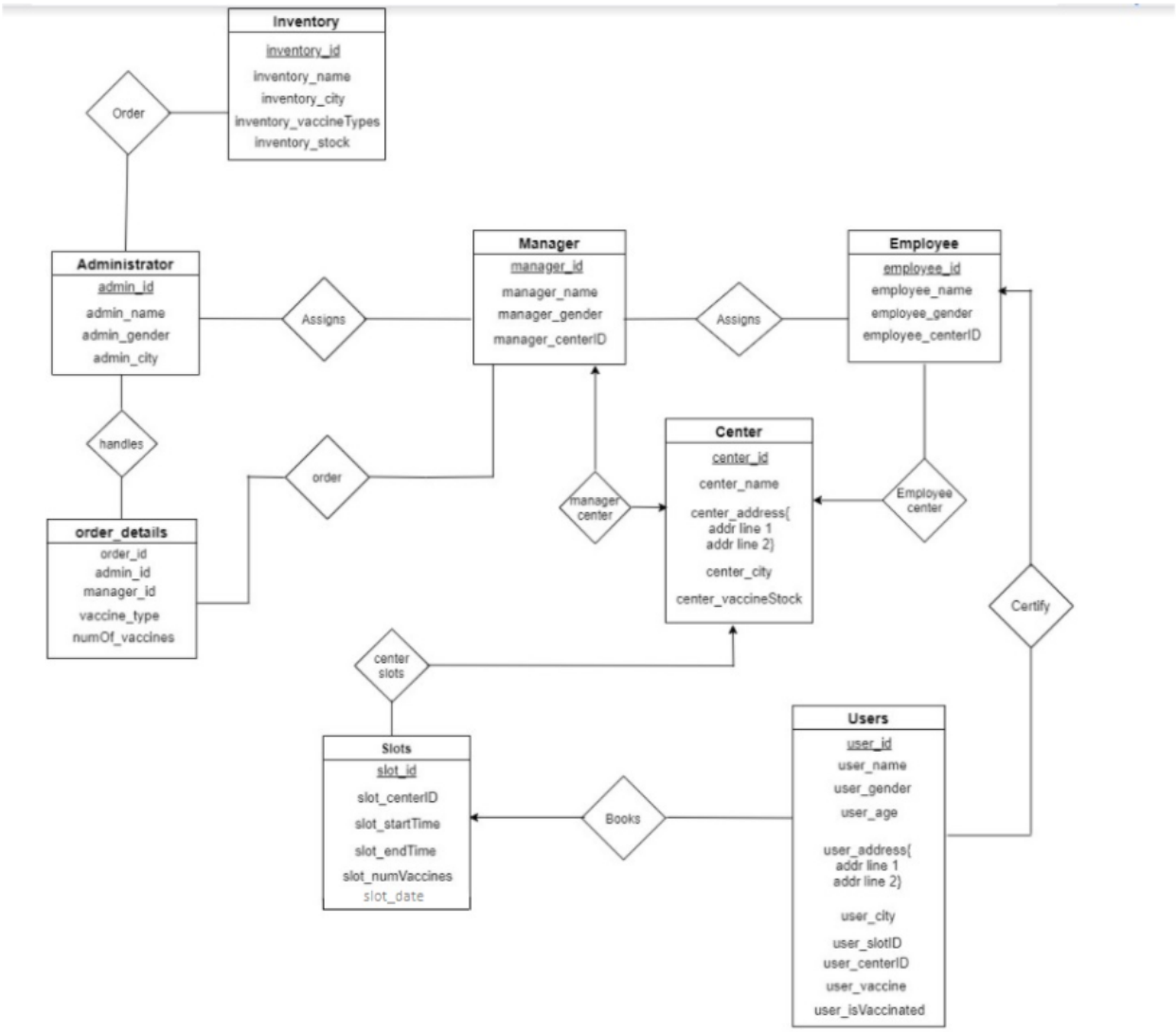
Candidate Entity Set	Candidate Attribute Set	Candidate Relationship Set
Admin	Admin name Admin gender Admin city	Order, assigns
Manager	Manager name Manager gender Manager centerName	Order, assigns
Users	User name User gender User age User city	book
Employee	Employee name Employee gender	Certify
Centers	Center name Center city	
Slots	Slots timings	
Inventory	Inventory name Inventory city	
Order details	Order id, vaccine type	

(3) Truncating Initial Noun List:

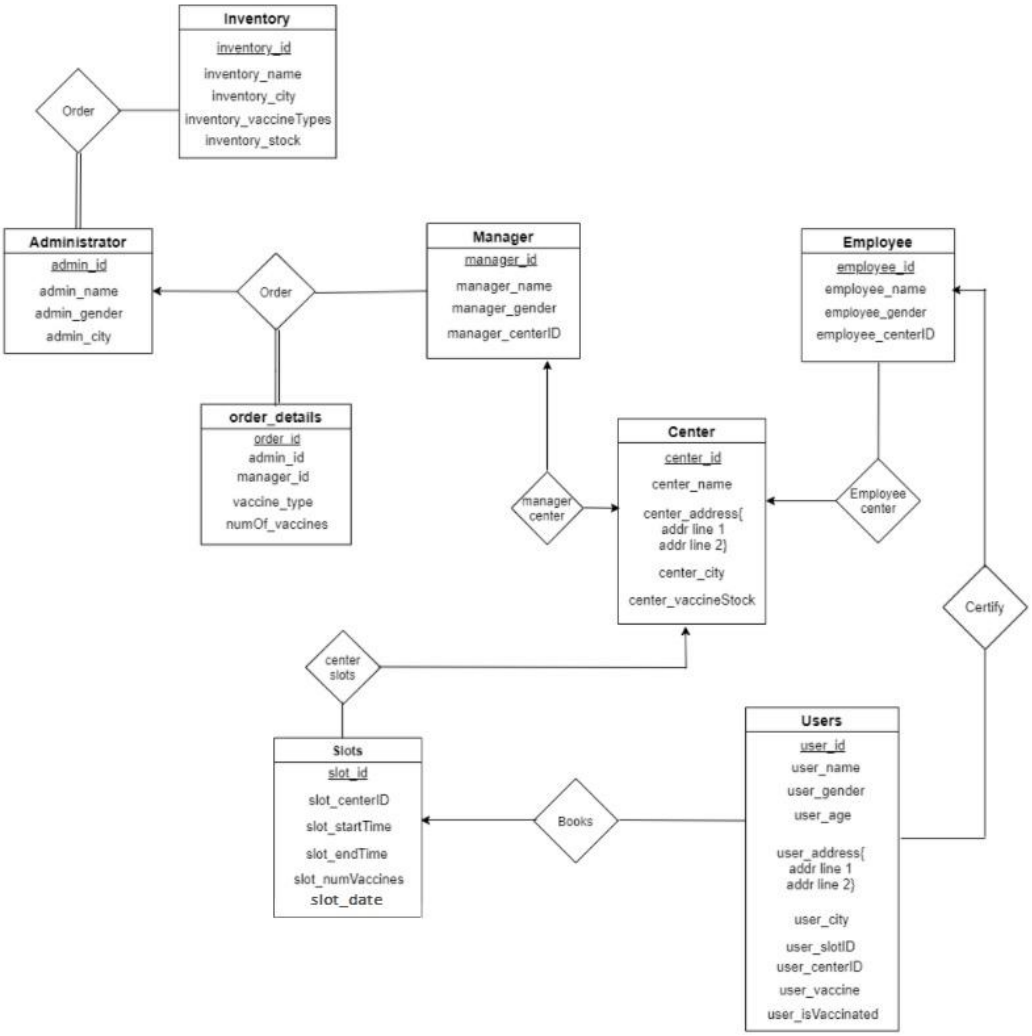
Noun	Reason
vaccination	Duplicates, General
vaccines	Duplicates, General
Available	Vague
stock	General, duplicate
drives	Vague, duplicate
system	general
respective	Irrelevant
Particular	Irrelevant
diseases	General, duplicates
hospitals	General, duplicates
patients	general
time	vague
database	general
Cowin	Duplicates
Nearest available centers	vague
report	general
Details	Associations
Final problem description	vague

technologies	irrelevant
Pandemic situation	general
World crisis	general
Financial supports	vague
Technological limitations	vague
Local health centers	General
Stocks of vaccines	vague
Reference	vague
details	General
Records	vague
User information	Vague
Prominent features	irrelevant
User report	general
Latest guidelines	General
Registration process	General
Proper steps	Vague
Administration location	attribute
Daily basis	Vague
Threshold values	Irrelevant
Upper level	vague

II. Develop the ER Diagram (ERD):



ER Diagram Final:



Relational Model:

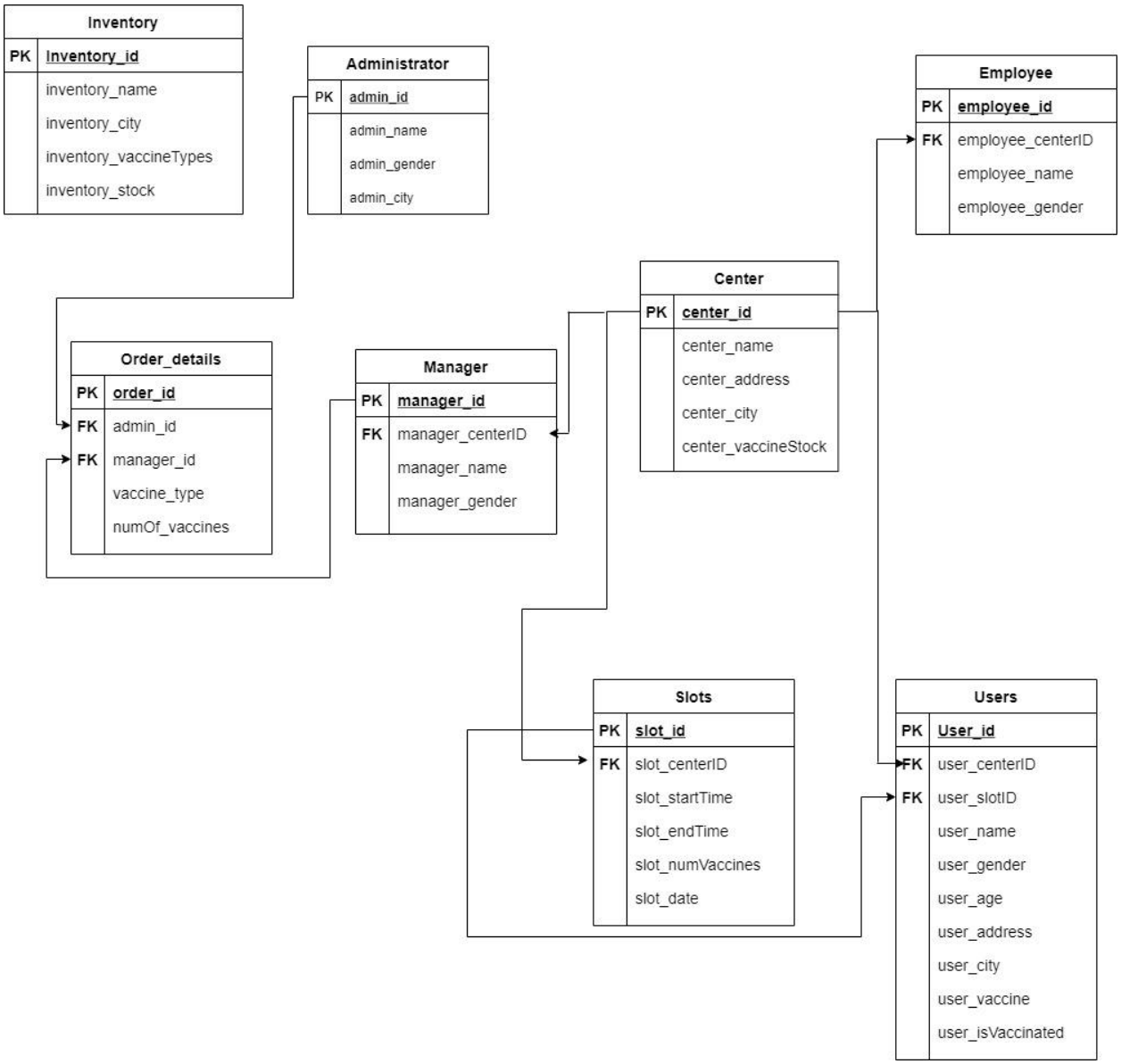


Table schema:

Inventory(Inventory_id, inventory_name, inventory_city, inventory_vaccineTypes, inventory_stock**)**

Administrator(admin_id, admin_name ,admin_gender, admin_city)

Center(center_id, center_name, center_address, center_city, center_vaccineStock)

Slots(slot_id, slot_centerID, slot_startTime, slotendTime, slot_numVaccines, slot_date)

Manager(manager_id, manager_centerID, manager_name, manager_gender)

Order_details(order_id, admin_id, manager_id, vaccineType, numOf_vaccines)

Employee(employee_id, employee_centerID, employee_name, employee_gender)

Users(user_id, user_centerID, user_slotID, user_name, user_gender, user_age, user_address, user_city, user_vaccine, user_isVaccinated)

DDL Scripts:

- **Inventory Table**

```
CREATE TABLE Inventory
(
        inventory_id int not null,
        inventory_name varchar(30) not null,
        inventory_city varchar(30) not null,
        inventory_vaccineTypes varchar(20) not null,
        inventory_stock Int not null default 0,
        primary key (inventory_id),
        check(inventory_stock>=0)
);
```

- **Administrator Table**

```
CREATE TABLE Administrator
(
        admin_id int not null,
        admin_name varchar(50) not null,
        admin_gender varchar(6) not null,
        admin_city varchar(30) not null,
        primary key (admin_id),
        check(admin_gender in ('Female','Male'))
);
```

- **Center Table**

```
CREATE TABLE Center
(
        center_id int not null,
        center_name varchar(50) not null,
        center_address varchar(200) not null,
        center_city varchar(30) not null,
        center_vaccineStock int not null default 0,
        primary key (center_id),
        check(center_vaccineStock>=0)
);
```

- **Slots Table**

CREATE TABLE Slots
(
slot_id **int not** null,
slot_centerID **int**,
slot_startTime **varchar not** null **default** '00:00',
slot_endTime **varchar not** null **default** '00:00',
slot_numVaccines **int not** null **default** 0,
Slot_date varchar **not** null default '00.00.0000',
check (slot_numVaccines>=0),
primary key (slot_id),
foreign key (slot_centerID) **references** Center(center_id) **on delete** cascade **on update cascade**
);

- **Manager Table**

CREATE TABLE Manager
(
manager_id **int** not null,
manager_centerID **int**,
manager_name **varchar(50)** not null,
manager_gender **varchar(6)** not null,
primary key (manager_id),
foreign key (manager_centerID) **references** Center(center_id) **on delete cascade on update cascade,**
check(manager_gender **in** ('Female','Male'))
);

- **Order_details Table**

CREATE TABLE Order_details
(
order_id **int not** null,
admin_id **int**,
manager_id **int,**
vaccineType **varchar(20)**,
numOf_vaccines **int** default 0,

primary key (order_id),
foreign key (admin_id) **references** administrator(admin_id) **on delete cascade on update cascade,**
foreign key (manager_id) **references** manager(manager_id) **on delete cascade on update cascade**
);

- **Employee Table**

CREATE TABLE Employee
(
employee_id **int not** null,
employee_centerID **int**,
employee_name **varchar(50) not** null,
employee_gender **varchar(6) not** null,
primary key (employee_id),
foreign key (employee_centerID) **references** Center(center_id) **on delete cascade on update cascade,**
check(employee_gender **in** ('Female','Male'))
);

- **Users Table**

CREATE TABLE Users
(
user_id **int** not null,
user_centerID **int**,
user_slotID **int**,
user_name **varchar(50) not** null,
user_gender **varchar(6**) **not** null,
user_age **int**,
user_address **varchar(200) not** null,
user_city **varchar(30) not** null,
user_vaccine **varchar(20) not** null,
user_isVaccinated **char(1) default** 'N',

primary key (user_id),
foreign key (user_centerID) **references** Center(center_id) **on delete cascade on update cascade,**

```
        foreign key (user_slotID) references Slots(slot_id) on delete cascade on update
cascade,
        check(user_gender in ('Female','Male')),
        check(user_age>0),
        check (user_isVaccinated in ('Y','N','y','n'))
    );
```