

Introduction to Database Systems

<COVID-19 Health Care>

<Project Proposal Report>

Team Number: 17

Team Members:

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❖ **Introduction:**

Our proposed database system is a system that stores information related to the COVID-19 provided by The Egyptian Ministry of Health, the platform designed will be specifically directed towards offering information regarding Corona's healthcare including vaccines. The users of this platform are Egyptian citizens as well as hospital/healthcare centers workers and government officials. What inspired us with that idea is how pivotal the pandemic is until today, there is no single family that hasn't required help with services related to healthcare when a member gets infected or with booking their vaccine doses.

COVID-19 is a disease that we should be capable to handle, although there are many services that are present still some of these services are out of reach and are provided in an unorganized manner, that results in more chaos along the consequences itself. The chosen database will have different interfaces, one that can address each user with the required functionalities. The first interface will act as a platform for citizens as it will provide all the services for the Egyptian citizens related to COVID-19 in a single application. Moreover, the second interface will contain data for the Egyptian Ministry of Health such as the vaccine stocks and the number of citizens on the wait to be vaccinated. Finally, third interface on a wider scale, the Egyptian government will have the needed information and statistics on how many fully, partially, or yet to be vaccinated citizens.

❖ **USERS:**

1. Citizens
2. Hospitals/Healthcare centers
3. Government officials

❖ **Entities in the system:**

- 1- Citizens
- 2- Patients
- 3- Health Status
- 4- Hospitals
- 5- Health care centers
- 6- Vaccine
- 7- Services
- 8- Insurance Companies
- 9- Vaccine suppliers
- 10- Medical Staff

❖ **The functionalities our system provides:**

- **For Egyptian Citizens:**

- 1- The ability to book their vaccine dose in the nearest available hospital
- 2- Offering hospitalization services for covid-19 patients
- 3- Use the insurance discounts for any needed paid service
- 4- Make use of at-home services for COVID-19 patients
- 5- Book and receive PCR results
- 6- Searching for the nearest quarantine hospitals
- 7- Look for multiple substitutes for quarantine services

- **For Hospitals and health care centers**

- 1- Check available resources in comparison to patient numbers
- 2- Determine whether to request further supply and equipment
- 3- Request vaccine shipments from the government
- 4- Apply the insurance discounts if any
- 5- Check the number of COVID-19 patients in need for help in the nearby location
- 6- Offer help for the requested at home services
- 7- Update the amount of vaccine in stock
- 8- Organize vaccine and PCR appointments

- **For Government officials**

- 1- Trace the number of vaccinated citizens
- 2- Inspect the statistics of the COVID-19 patients
- 3- Provide aid for hospitals
- 4- Supply vaccine shipments for the in shortage locations
- 5- Examine highly infected areas
- 6- Provide instant funding or help to critical areas
- 7- Use the statistics in research or media coverage

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<Project Design Phase_ER Diagram>

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1-Problem Definition:

In recognition to the current conditions that the world has been witnessing. It has come to our minds how vital it is that the corona disease should have an organized database recording all the information regarding patients and hospitals. The database will be holding information that interest the government (Ministry of Health), hospitals and healthcare centers and of course the main party which are patients. It is aimed that the database will make it easier for patients to allocate and reserve services related to COVID19, Collect data needed by the government to track the situation, generate statistics and take decisions accordingly. Finally, connect the hospitals to the patients for offering better and more instant services and to the government for sharing up to date information and requesting vaccines and funds.

2-Users and their privileges:

1)Citizens:

- Have access to all the facilities offered by the other 2 parties
- Can send queries to either insert (reserve a service)/ update (edit their personal information like addresses) or delete (unregister themselves from a service)

2) Hospitals/ Healthcare centers:

- Have access to patients' database (the patients registered on their system)
- Can send queries to insert (add services and patients to their system) / Update (patients' health state, stock levels, number of quarantine rooms and available beds) / delete (remove specific services that are no longer provided)

3)Government:

- Track the amount of: vaccinated, cured and infected citizens per day and thus generating all statistics needed
- Receive the vaccine requests from different institutes and either directly supply or order shipments in respond to those requests

3-Entities and their description

1) Citizens:

The table with information that identifies any citizen when first registered on the system

2)Patients:

A weak entity of citizens that assign themselves as currently infected with COVID19.

3)Hospitals & Healthcare centers:

Hospitals that are registered in the system and has quarantine chambers, gives vaccines or provides corona healthcare.

4)Vaccine:

Tables that saves all the information regarding available vaccines including: stock amounts, different types and their prescription (to match every patient case), availability in hospitals and expiry dates.

5)Services:

Various corona related services that can be booked by citizens/patients like a specialist home call or ordering oxygen tanks, ...etc. They are offered by hospitals and health centers.

6)Insurance Companies:

Includes information about different insurance companies including the discount percentages and the hospitals they cover and whether a patient is registered in one of them.

7)Medical Staff:

medical staff of the hospitals/health centers that offer services like home calls or consultation

3-Relationships and their description:

1] Request: Citizens_ Request _ Service

- A relationship between citizens and services where every citizen can request many services and each service can be requested by more than one service.
- Has two additional attributes:
 - 1- Status (either pending or accepted)
 - 2- Offered by (the institute that accepted that request)

2] Are: Citizens_ Are _ Patients

- An identifying relationship between citizens and patients where not every citizen has to be a patient but every patient is identified as a citizen

3] Offered_by Services_ Offered_by _ Hospital/Health Center

- A relationship that specifies which services are offered by which institutes. Where each service must be offered by at least one institute and every institute should offer at least one service
- Has an additional attribute:
 - Available (recording whether the service is currently available in the hospital or not)

4] Assigned_to Patients_ Assigned_to _ Hospital

- When a patient is hospitalized in a certain hospital where not every infected patient should be assigned to a hospital (he could book other services)
- Has an additional attribute:
 - Date (recording the date when the patient entered the hospital)

5] Belong_to Citizens_ Belong_to _ Insurance Company

- A relationship that specifies whether a citizen belongs to any insurance company (maximum one)

6] In_Insurance Hospital/Health Centers_ In Insurance _Insurance Company

- A relationship that records the hospitals that are within the insurance of the companies where every insurance company should include at least one hospital in its insurance and not every hospital has to be in the insurance of any company

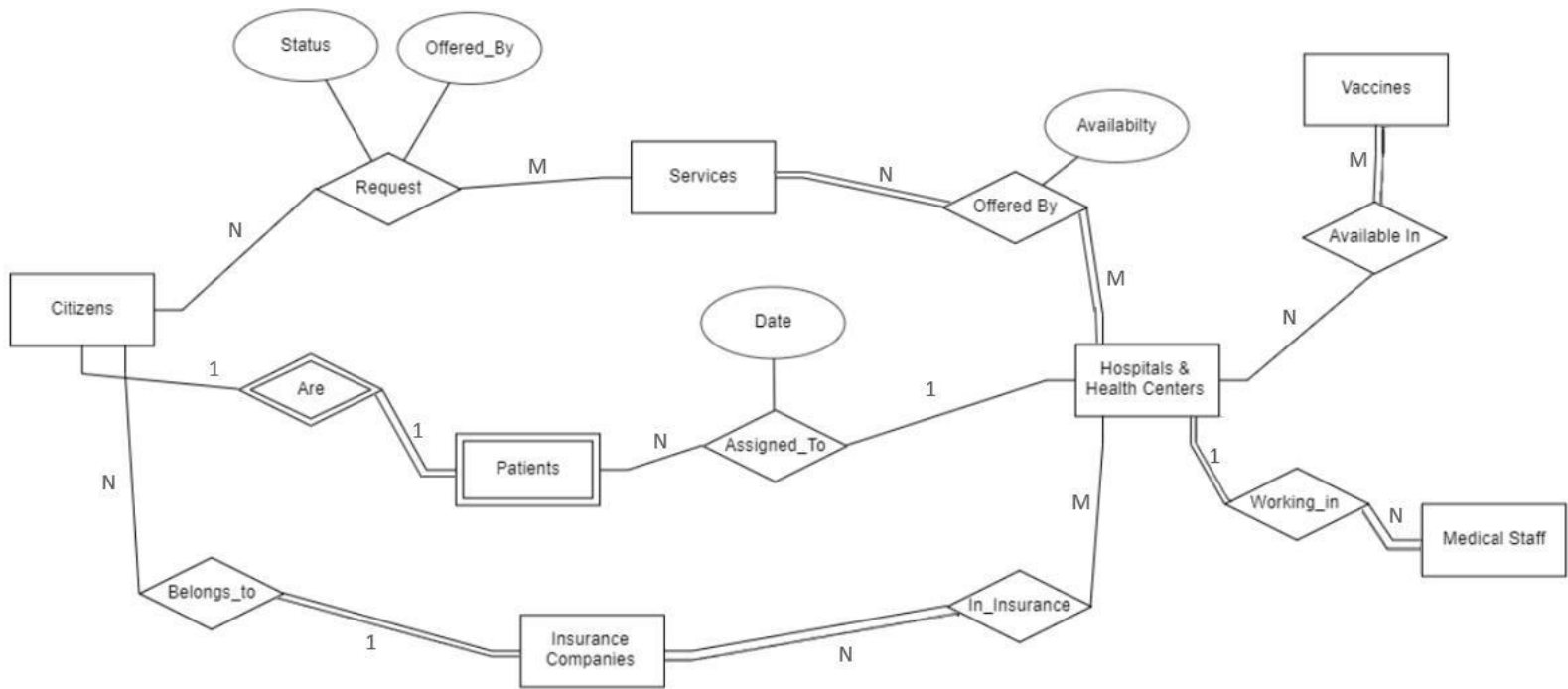
7] Working_In Medical staff _ Working_In _Hospitals/Health Centers

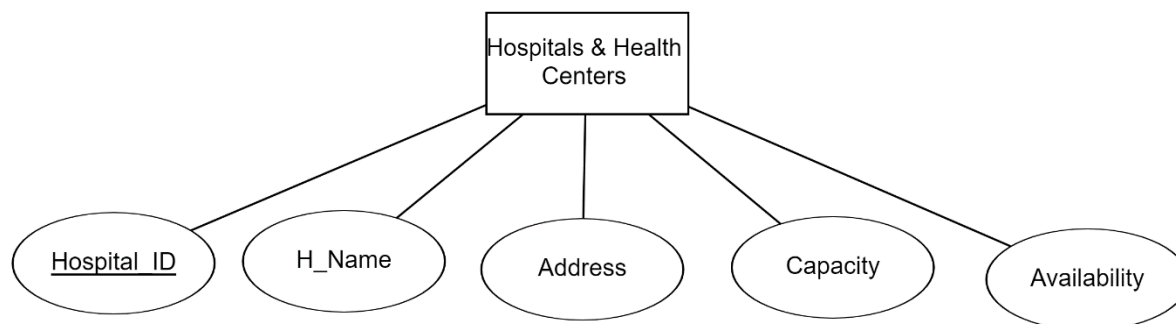
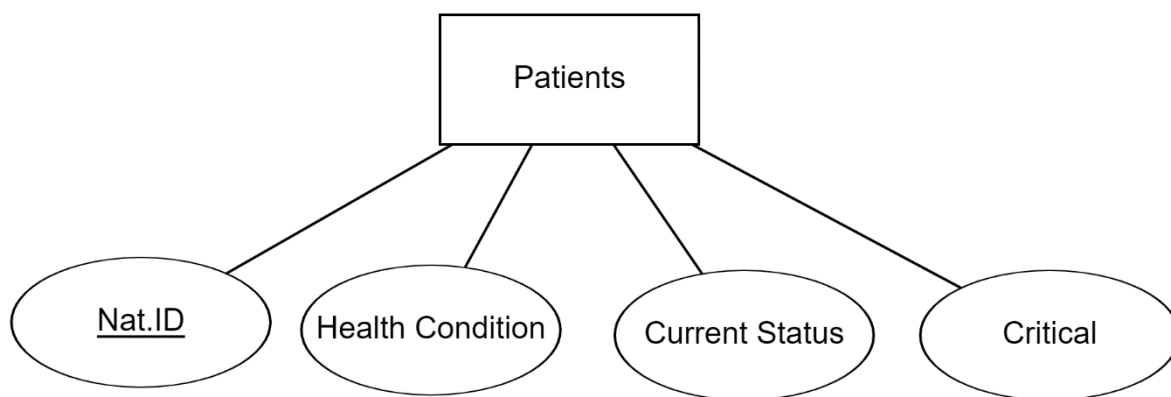
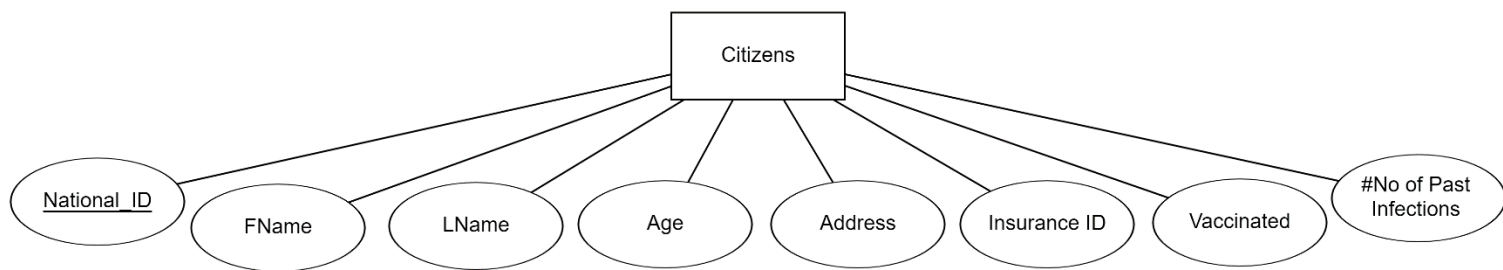
- A relationship between the medical staff and the institute they work in where every institute should have medical staff and every member of the staff should belong an institute (only one)

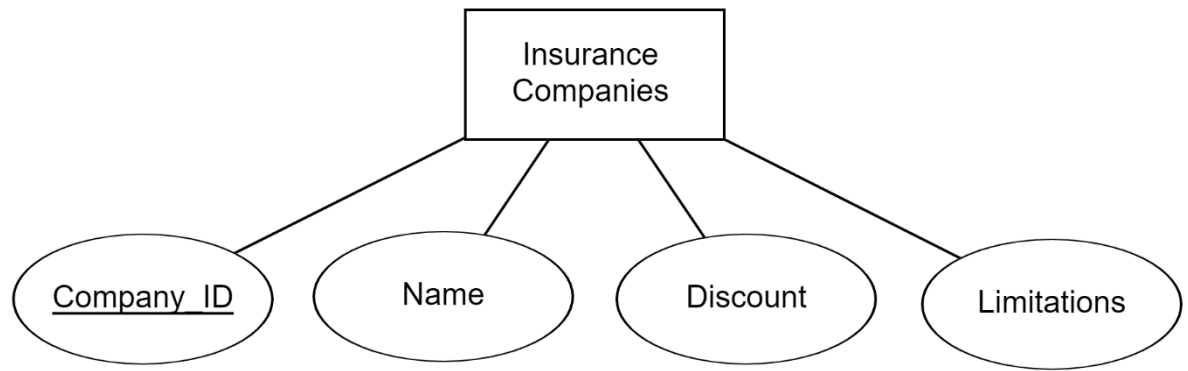
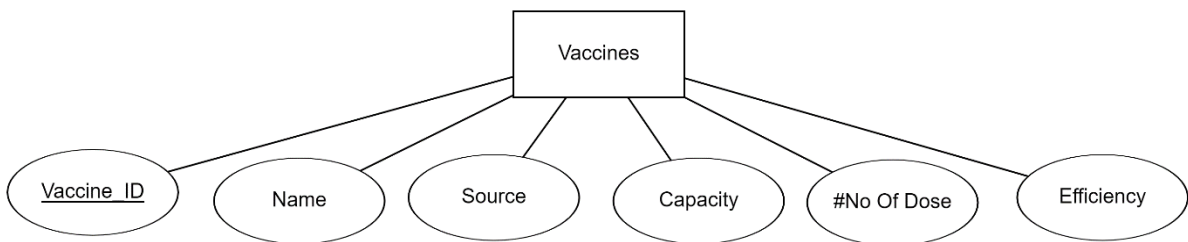
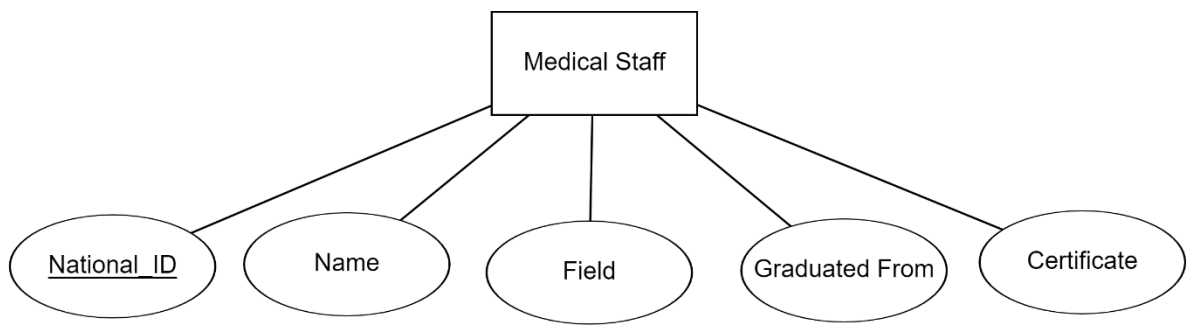
8] Available_In Vaccines_ Available_In _Hospitals

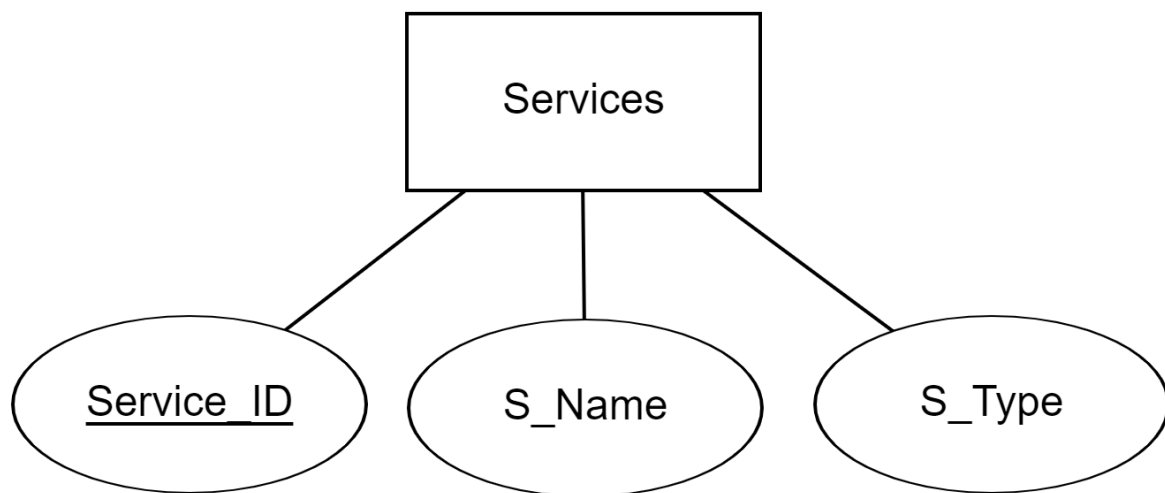
- A relationship that shows which vaccines are available in what hospitals where not every hospital has vaccines but every vaccine should be present in at least one hospital

ER-Diagram









<u>National ID</u>
FName
LName
Age
Address
Insurance ID
Vaccinated
#No of Past Infections
Password

<u>National ID</u>
FName
LName
Age
Address
Insurance ID
Vaccinated
#No of Past Infections
Password

<u>Nat.ID</u>
Health Condition
Current Status
Critical

<u>Nat.ID</u>
Health Condition
Current Status
Critical

<u>National_ID</u>
<u>Hospital_ID</u>
MNational_ID

<u>National_ID</u>
<u>Hospital_ID</u>
MNational_ID

<u>Nat_ID</u>
<u>Ser_ID</u>
Hospital_ID

<u>Nat_ID</u>
<u>Ser_ID</u>
Hospital_ID

<u>Hospital ID</u>
H_Name
Address
Capacity
Availability

<u>Hospital ID</u>
H_Name
Address
Capacity
Availability

<u>Service ID</u>	←
S_Name	
S_Type	

<u>Service ID</u>	←
S_Name	
S_Type	

<u>Vaccine ID</u>
Name
Source
Amount
Dose

<u>Vaccine ID</u>
Name
Source
Amount
Dose

<u>Company ID</u>
Name
Discount

<u>Company ID</u>
Name
Discount

<u>National ID</u>
Name
Field
Graduated From
Certificate

<u>National ID</u>
Name
Field
Graduated From
Certificate

