Group Assignment - 1

Team - Datadiggers

Introduction

The assignment is based on COVID-19 vaccine campaign that is ongoing in India. India administered more than 180 million doses in August as it continues to ramp up its vaccination drive to stave off a third wave of Covid. The government aims to vaccinate all eligible Indians by the end of 2021. But regional disparities also persist with larger and poorer states lagging behind smaller and richer ones. To treat these issues and to achieve the aim we need a campaign for COVID vaccination drive.

Purpose

The database's purpose is to help in the organizing of vaccination campaigns in various states of India and to make it easier to run and track its various components, such as gathering information about volunteers,vaccines, vaccination status of the population, and contact information. Finally, addition, deletion, and updating the data by the user is also a purpose.

Users

Users who can access the database are

1) General Public
2) Government
3) Volunteers
4) Media
5) Website developers

Applications

The database's uses would include keeping track of the public's information, their vaccination status, and vaccination centres, as well as controlling the schedule of distributing the vaccines. Users would also be able to query the database to easily add, delete, and update data. Finally providing this information to the government to keep records and to shops, stores, malls etc. so they can ensure only vaccinated people are allowed.

Database Requirements

Entities

1) **Person**
    - **a) Name**
        - i) VARCHAR(100)
        - ii) NOT NULL
    - **b) Date_of_Birth**
        - i) DATE
        - ii) NOT NULL
    - **c) Age**
        - i) Derived attribute
        - ii) INT > 0
        - iii) NOT NULL
    - **d) Address**
        - i) Composite attribute
        - ii) VARCHAR(1000)
        - iii) NOT NULL
    - **e) Phone_no**
        - i) Multi-valued attribute
        - ii) INT > 0

iii) NOT NULL

f) Gender

i) VARCHAR(15)

ii) NOT NULL

g) Aadhar_no

i) Key attribute

ii) INT > 0

iii) NOT NULL

2) <u>State</u>

a) State_name

i) Key attribute

ii) varchar(30)

iii) NOT NULL

b) No_of_people_vaccinated

i) INT >= 0

ii) NOT NULL

c) Population

i) INT >= 0

ii) NOT NULL

d) No_of_volunteers

i) INT >= 0

ii) NOT NULL

3) <u>Vaccination_status</u>

a) Status

i) varchar(50)

ii) NOT_NULL

b) Date_of_first_vaccination

i) DATE

c) Date_of_second_vaccination

i) DATE

d) Due_date_of_second_vaccination

i) DATE

e) Vaccine taken

i) VARCHAR(30)

4) **<u>Vaccine</u>**

a) Vaccine_name

i) Key attribute

ii) VARCHAR(30)

iii) NOT NULL

b) Manufacturing_company

i) VARCHAR(100)

ii) NOT NULL

c) Efficacy

i) INT >= 0

ii) NOT NULL

5) **<u>Vaccination_centre</u>**

a) Vaccination_centre_name

i) Key attribute

ii) VARCHAR(100)

iii) NOT NULL

b) Vaccination_centre_address

i) Composite attribute

ii) VARCHAR(100)

iii) NOT NULL

c) Contact_no

i) Multi-valued attribute

ii) INT >=0

iii) NOT NULL

6) **<u>Volunteers</u>** - It has two subclasses

a) <u>Volunteers_to_spread_awareness</u>

i) Name

(1) VARCHAR(100)

(2) NOT NULL

ii) Volunteer_ID

(1) Key attribute
(2) INT > 0
(3) NOT NULL

iii) **Volunteer_address**
(1) Composite attribute
(2) VARCHAR(1000)
(3) NOT NULL

iv) **Volunteer_gender**
(1) VARCHAR(15)
(2) NOT NULL

v) **Volunteer_date_of_birth**
(1) DATE
(2) NOT NULL

vi) **Volunteer_age**
(1) Derived attribute
(2) INT > 0
(3) NOT NULL

vii) **Volunteer_Aadhar_No**
(1) Key attribute
(2) INT > 0
(3) NOT NULL

b) **Volunteers_to_vaccinate_people**

i) **Name**
(1) VARCHAR(100)
(2) NOT NULL

ii) **Volunteer_ID**
(1) Key attribute
(2) INT > 0
(3) NOT NULL

iii) **Volunteer_address**
(1) Composite attribute
(2) VARCHAR(1000)

(3) NOT NULL

iv) **Volunteer_gender**
   (1) VARCHAR(15)
   (2) NOT NULL

v) **Volunteer_date_of_birth**
   (1) DATE
   (2) NOT NULL

vi) **Volunteer_age**
   (1) Derived attribute
   (2) INT > 0
   (3) NOT NULL

vii) **Volunteer_Aadhar_No**
   (1) Key attribute
   (2) INT > 0
   (3) NOT NULL

7) **Dependents_of_volunteers**

a) Name

i) Multi-valued attribute
ii) VARCHAR(100)
iii) NULL

Weak Entities

Here **Vaccination_status** and **Dependents_of_volunteers** are weak entities since both of them do not have any key attributes and they depend on that particular person and that particular volunteer respectively.

Entity with two primary key attributes

Volunteers_to_vaccinate_people or
Volunteers_to_spread_awareness is the entity with two primary key attributes which are **Volunteer_ID** and **Volunteer_Aadhar_No.**

Entity with subclasses

Volunteers - It has two subclasses **Volunteers_to_vaccinate_people, Volunteers_to_spread_awareness.**

N > 3 relationship

Person is vaccinated by a **volunteer**, vaccinated by a **vaccination centre**, vaccinated by a **vaccine**.

Relationships

1) Belongs to
    a) Occurrence: Person belongs to a state.
    b) Degree: 2
    c) Cardinality Ratio: N:1
2) Related to
    a) Occurrence: Volunteer is related to dependents
    b) Degree: 2
    c) Cardinality Ratio: 1:N
3) Vaccinated by (N>3 Relationship)
    a) Occurrence: Person is vaccinated by a volunteer, vaccinated by a vaccination centre, vaccinated by a vaccine
    b) Degree: 4

c) Cardinality Ratio:

- Person is vaccinated by a volunteer: N:1
- Person vaccinated by a vaccination centre: N:1
- Person vaccinated by a vaccine: N:1

Functional Requirements

Retrievals

1) Selection:
    a) Retrieve the list of no.of vaccinated people in each state.
    b) Retrieve the list of vaccines available in the country.
2) Projection:
    a) List all the states from which more than 10,000 people got vaccinated.
    b) List all the vaccines with efficacy more than 80%.
3) Aggregate:
    a) The sum of vaccinated people of all the states.
    b) The vaccine with the maximum efficacy.
4) Search:
    a) Partial text match with volunteers.
    b) Partial text matches with states.
5) Analysis:
    a) The states which have more than 50% of its population fully vaccinated.
    b) Most taken vaccine.
    c) The states ranking based on no.of volunteers.

Modifications

1) **Insertion**:
    a) Insert new volunteers.
    b) Insert new vaccination centres.
    c) Insert new vaccine types.
    d) Insert new people.

2) Update:
    a) Update vaccination status.
    b) Update person details.
    c) Update vaccine efficacy.
    d) Update no.of vaccinated people in a state.

3) Delete:
    a) Delete a volunteer.
    b) Delete a person.