

Software Requirement Specification

For

Vaccination or Other Health Drives Database

Prepared By

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A. Introduction

1.1 Purpose:

The main purpose of this system is to create an improved and efficient management system for the vaccination drives and other disease control drives. The system will be able to manage all the details about users, vaccine centers, employees & managers of respective vaccine centers, etc. The system can be used in general-purpose for other types of vaccines or disease control systems also.

1.2 Intended Audience:

This srs document is intended for database engineers, project managers, section managers, the system design team, and developers. This will also be available as a reference for Health scientists and researchers and government officers.

1.3 Product Scope:

The software intends to make the process of Vaccination Drives and Disease control Drives simple. It has the following functionalities :

- Keeps track of all vaccination centers, stock of the vaccines, vaccine requirements per center, and also other disease control drives.
- Improves the efficiency of the vaccination process or Disease control drives.
- Keeps track of the user details who are already vaccinated or registered.
- Managing the database, related to the details of the users, strength of the vaccinated persons.

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-center name, 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.

B. Fact-Finding phase

1. Background readings with Description:

- **Websites:**

1. [CoWIN](#)
2. [COVID-19 vaccination in India](#)

In recent days, India and other countries have encountered the worldwide pandemic of coronavirus. In order to overcome this pandemic situation, governments of all the countries are collaborating with self-finance companies to start vaccination drives all over the world. Here we have discussed the working flow and limitations of, particularly covid-19 vaccination drive.

Specifically talking about India, the Indian government started COVID-19 Vaccination for the frontline workers in phase I, after phase I the government started the vaccination for all the residents through the online platform named COWIN. COWIN is the Indian government web portal for COVID19 vaccine registration and it is operated by India's Ministry of Health and Health Welfare.

- **Working flow and limitations of COWIN vaccination system**

For getting vaccinated every individual has to first register himself/herself to the COWIN portal, after that he/she has to be authenticated by OTP sent in one's phone number, after that one has to book a slot for the vaccines at a particular vaccination center on the COWIN web portal, the individual will get the vaccination date and the name of the vaccine with which he/she will be vaccinated, and after the vaccination, the individual will be provided a certificate of vaccination on the COWIN web portal itself. But here this system has some limitations, when an individual requests a vaccination slot, the system will sometimes provide all the vaccination centers without any concern of the availability or non-availability of a particular vaccination center's vaccines availability, also regardless of the vaccination center's

distance from the individual's location. Also, the individual was not able to pre-register the vaccination slots based on their convenience.

Document References:

- [Software Requirements Specification Personal Health Monitoring Application \(PHMA\)](#)

This document describes SRS for a project for the personal health monitoring application (PHMA). This document gives a broad idea about the functional and non-functional requirements along with design phases of the system, assumptions regarding the system, features, etc. for developing such health systems.

- [\(PDF\) Software Requirements Specification of E-Health Architecture for Nepal](#)

This document was prepared for developing the complete E-Health architecture for Nepal, this SRS document gives the general idea about the functional and non-functional requirements for developing efficient E-Health systems.

Requirements Gathered from Background readings

- The system should not display the unavailable slots for the vaccination.
- The system should show the nearest vaccination centers.
- The user should be able to pre-register for the slots.

2 Interviews:

2.1 Interview1:

System: Vaccination Drive Management

Project Reference: SF/SJ/2021/10

Interviewee: Dhairya Rupala

Designation: Head at civil health center

Interviewer: Satyam Bhut

Designation: Developer

Date: 05/10/2021

Duration: 40 mins

Mode: Online (Google meet)

Purpose of Interview: Meeting for sharing our ideas of the project and discussion about the requirements and features required as an admin(Head of programs) of the system.

Agenda:

- Problems regarding the currently existing system as an admin.
- What are the challenges faced or can rise, in conducting the disease control drives or vaccination drives?
- What are the expectations or privileges as an admin, in conducting the drives?
- Any new ideas regarding the system.

Documents to be brought to the interview:

- Rough plan of resources required for the system
- Rough plan of features and functionalities we will be implementing in the system.

Summary:

Que. Are there any required changes in the current system?

Ans. Yes, the UI should be more user-friendly and should be more efficient in terms of slot booking and vaccine information.

Que. Are there any functionality issues regarding the current system?

Ans. Yes, the User faces authentication issues sometimes (i.e OTP detection,...)

Requirements:

- UI should be more user-friendly.
 - The back-end of the system should be improved.
 - The slot booking system should be more efficient and optimal.
 - The authentication system should be improved.
-

2.2 Interview2:

System: Vaccination Drive Management

Project Reference: SF/SJ/2021/10

Interviewee: Hiten Padaliya

Designation: Manager at Civil Health center

Interviewer: Jenish Rathod

Designation: Developer

Date: 05/10/2021

Duration: 40 mins

Mode: Online (Zoom)

Purpose of Interview: Meeting for sharing our ideas of the project and discussion about the requirements and features required as a manager of the system.

Agenda:

- Problems regarding the currently existing system as a manager.
- Current development in the Vaccination management system
- How technology can help to manage the disease control drives or vaccination drives better
- Any new ideas regarding the system.

Documents to be brought to the interview:

- Rough plan of resources required for the system
- Rough plan of features and functionalities we will be implementing in the system.

Summary:

Que. Are there any issues going on in the current system?

Ans. Not so much, Some features are cluttered.

Que. As a manager do you find the current platform comprehensive?

Ans. Not very much, in my opinion, there should be features about current updates or guidelines about diseases or vaccines.

Requirements:

- The interface should be more comprehensive
 - There should be features like current guidelines and news updates about the diseases or vaccines.
-

2.3 Interview3:

System: Vaccination Drive Management

Project Reference: SF/SJ/2021/10

Interviewee: Hiten Padaliya

Designation: Employee at health center

Interviewer: Dhairya Rupala

Designation: Developer

Date: 06/10/2021

Duration: 30 mins

Mode: Online (Google meet)

Purpose of Interview: Meeting for sharing our ideas of the project and discussion about the requirements and features required as an employee of the system.

Agenda:

- Problems regarding the currently existing system as an employee.
- How smoothly can you conduct the drive if you use this system?
- What are the new ideas about the system?

Documents to be brought to the interview:

- Rough plan of resources required for the system
- Rough plan of features and functionalities we will be implementing in the system.

Summary:

Que. How smoothly can you conduct the drive/programs if you use the system?

Ans. Yes, with the help of the system we can organize or manage the vaccination drives/programs efficiently, but the role-based system feature is very good, as all the roles have their own privileges and features to work with.

Que. Are there any functionality issues regarding the current system?

Ans. Yes, sometimes due to unavoidable power failures or concurrent accesses lead to redundant data entries so, the new system should be able to handle the concurrent access issues.

Requirements:

- The system should have features to handle concurrent access issues.
 - The role-based system should be very helpful.
-

2.4 Interview4:

System: Vaccination Drive Management

Project Reference: SF/SJ/2021/10

Interviewee: Jenish Rathod

Designation: User (Civilians)

Interviewer: Hiten Padaliya

Designation: Developer

Date: 07/10/2021

Duration: 40 mins

Mode: Online (Google meet)

Purpose of Interview: Meeting about sharing ideas about the existing system and the need for improvement.

Agenda:

- To discuss the challenges that the user was facing in the current system.
- To take feedback regarding the current system.
- To discuss the new system and their implementation
- Any new ideas regarding the system

Documents to be brought to the interview:

- Pros and cons of the current systems.
- Rough plan of features and functionalities we will be implementing in the system.

Summary:

Que. Do you face any difficulties finding slots and booking?

Ans. Sometimes booked slots were also shown by the system.

Que. Are there any issues regarding the online registration process? Is it comprehensive?

Ans. Not so much, but if there is some display about registration steps then it would be very helpful.

Que. Would it help you, if the system can display the nearest available vaccination centers from your area?

Ans. Yes, it would be very helpful.

Requirements:

- The slot booking system has to be improved.
- The system should display the nearest available vaccination centers from the user's area.
- There should be some feature about showing the registration process for the slot bookings.

3. Questionnaires:

Below are the questions and responses gathered in the google form. We collected the responses from 3 types of designations who might possibly use the system, which are Users, Managers of health centers, and Administration (Government) of the vaccination drives/disease control programs.

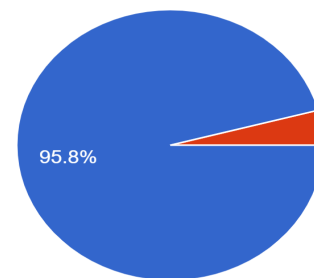
Have you ever taken any vaccine? *

☐ Yes

☐ No

Have you ever taken any vaccine?

72 responses



● Yes
● No

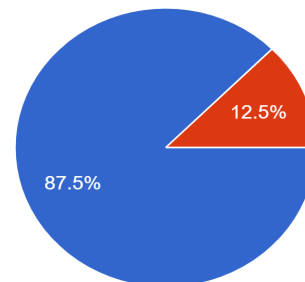
Preferred mode of registration. *

☐ Offline

☐ Online

Preferred mode of registration.

72 responses



● Online
● Offline

As a user what kind of functionalities do you expect in the system? *

☐ Displaying nearest available vaccination centers with slots

☐ Showing expected time for your turn to vaccinate

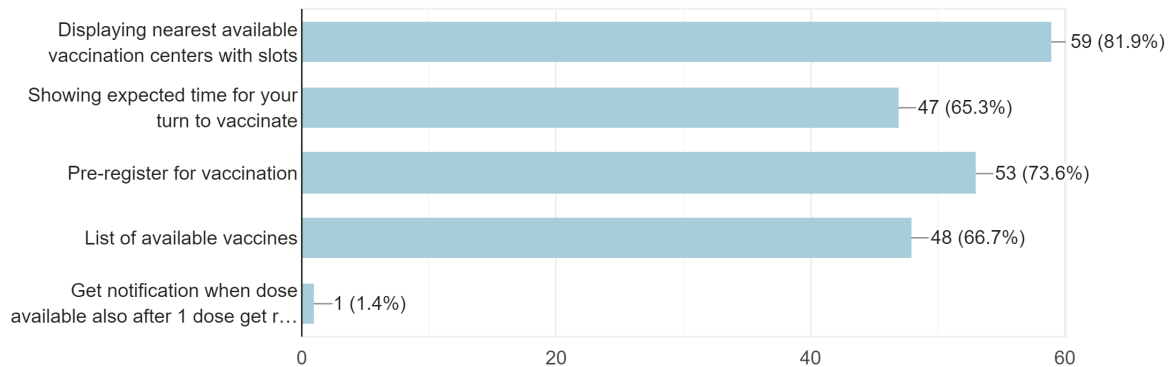
☐ Pre-register for vaccination

☐ List of available vaccines

☐ Other: _____

As a user what kind of functionalities do you expect in the system?

72 responses



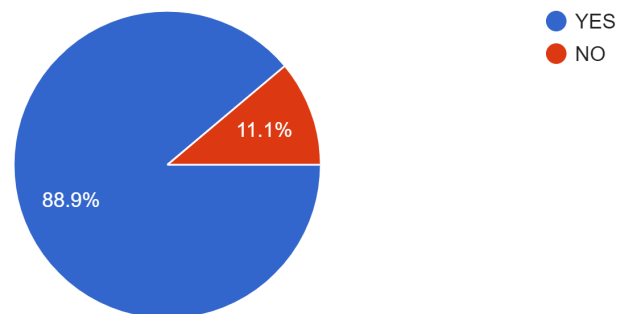
Would you like to receive notification when there is some available slots for vaccines? *

☐ YES

☐ NO

Would you like to receive notification when there is some available slots for vaccines?

72 responses



As a manager of particular vaccination center what kind of functionalities do you want in the system? *

☐ Generate the information about users who requested slots

☐ Generate the information about employees

☐ Can check and order vaccines based on the requirements

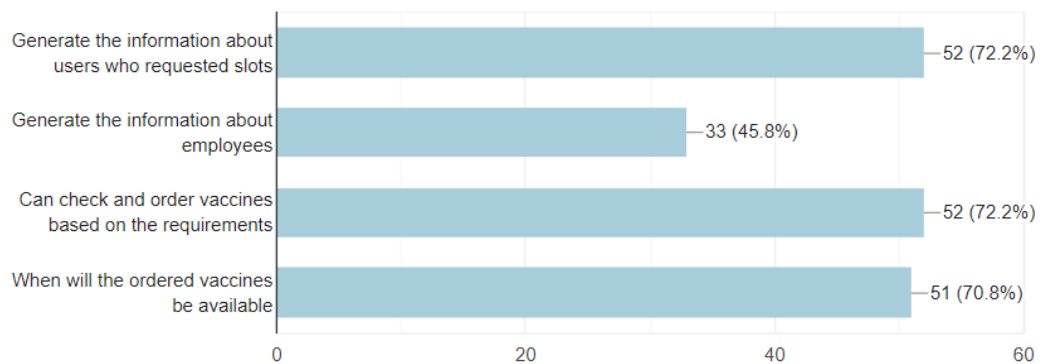
☐ When will the ordered vaccines be available

☐ Other: _____

As a manager of particular vaccination center what kind of functionalities do you want in the system?



72 responses

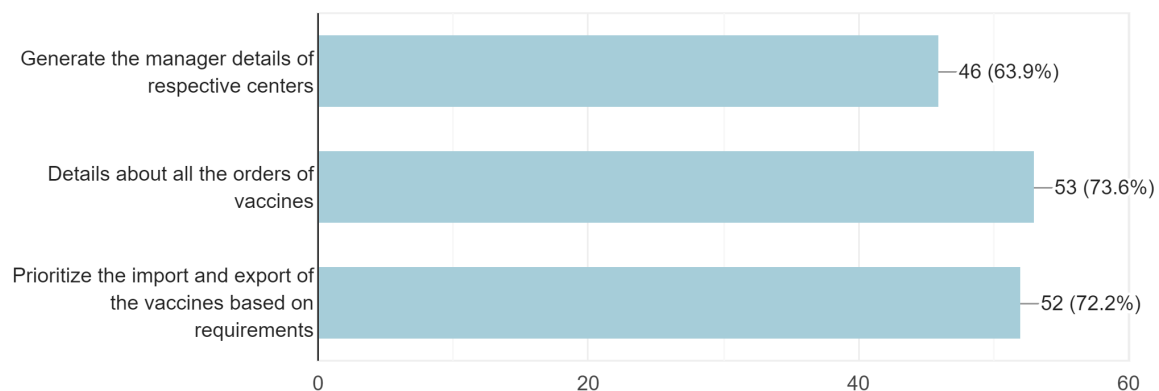


As a administration what kind of functionalities do you want? *

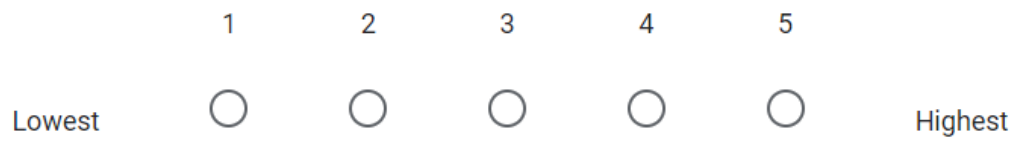
- ☐ Generate the manager details of respective centers
- ☐ Details about all the orders of vaccines
- ☐ Prioritize the import and export of the vaccines based on requirements
- ☐ Other: _____

As a administration what kind of functionalities do you want?

72 responses

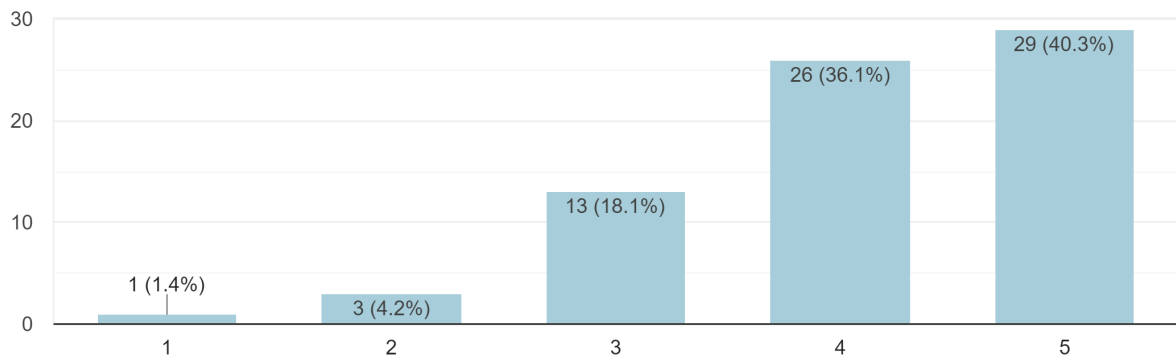


Rate the vaccination process. *



Rate the vaccination process.

72 responses



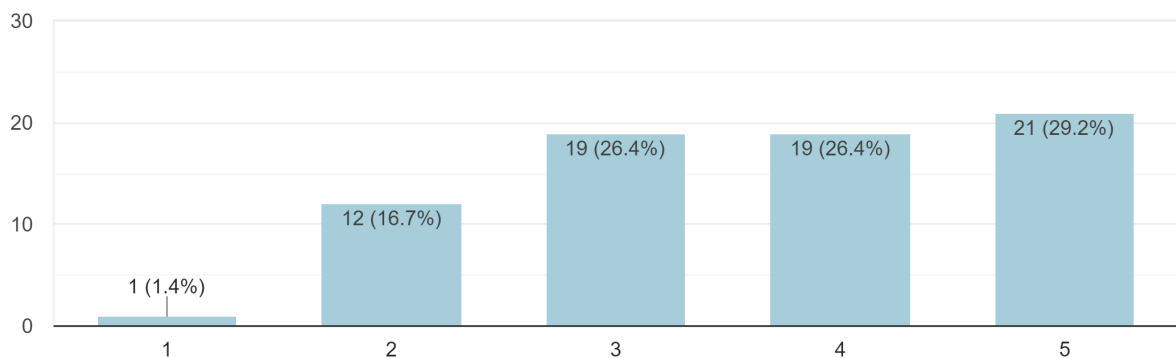
Rate the slot booking for vaccination drive. *

1 2 3 4 5

Lowest ☐ ☐ ☐ ☐ ☐ Highest

Rate the slot booking for vaccination drive.

72 responses



Requirements Gathered from QnA:

- Most of the users are familiar with the online registration systems and it was also more flexible to use.
- Most of the people are faced with issues in finding the nearest vaccination slots and also recommended the pre-registration process and get notified so they don't have to wait for vaccination availability.
- The majority of the users are quite satisfied with the current slot booking process but few of them are not much satisfied and it has to be improved.
- With respect to the manager, it would be better if the system is able to generate the final list of the users who requested slots and also generate the

information regarding the status of the vaccines and the list of the employees working in the center.

- With respect to the administration, it would be better if the system has the functionality to prioritize the orders of the vaccines and can monitor the information about the managers.
- The overall performance of the existing system is good, but it has some considerable issues to take care into account.

4. Observation:

Infsoft Softwares: Observations

System: Vaccination Management System

Project Reference: SF/SJ/2021/10

Observations by: Mitul Dave (Head developer at Infsoft software)

Date: 14/8/2003 **Time:** 14:30

Duration: 45 minutes

Place: Microsoft Teams (Online)

Observation:

- The core idea of the system is very intuitive and innovative.
- The system can be very useful for the Online management of vaccination drives/disease control programs.
- The current system has some bugs in the authentication procedure for the registration, it should be fixed.
- The overall architecture, performance, and functionality of the system are quite admirable.

Requirements Gathered from Observation

- Solve the issues regarding authentication while registering.

C. Fact-Finding Chart:

Objective	Technique	Subjects(s)	Time commitment
To get the ideas about workflows and management of existing systems	Background readings	Similar readings, few existing projects	1 Day
To gain understanding about the role of the administrator/corporation of the vaccine management drives/disease control programs	Interview	Admin(Head of drives/programs)	40 Minutes
To gain an understanding of the role of the manager of particular vaccination centers	Interview	Manager of a health center	40 Minutes
To gain an understanding of the role of the employees of particular vaccination centers	Interview	An employee of the health center	30 Minutes
To gain an understanding of the role of the users, who might use the system	Interview	Civilians	40 Minutes
To collect the information about the requirements	Questionnaire	Civilians	1 Day

D. Requirements

Requirements in the system for Users

- The system should display the nearest available vaccination center from the user's area.
- The user should be able to pre-register for the vaccination.
- The user should be able to see the list of the available vaccines/medicines and their information, also the user can update their personal details.
- The user should get a notification about the available vaccination slots.
- The system should display the expected time for the user's turn for the vaccination.
- The system's UI should be more user-friendly and comprehensive, also the authentication system should be improved.
- The system should have features like current guidelines or news updates for users.
- The system should show the registration steps to the users for the registration procedure.

Requirements in the system for Managers

- As a manager, the system should generate information about the users and their respective slots which are booked.
- The manager should be able to check the stock of the vaccines/medicines and can order based on the requirements for respective vaccination centers.
- Also, the manager should be able to see the expected arrival time for the ordered vaccines/medicines.
- As a manager, the system should also generate a list of the employees working in the center and can manipulate it. Also, the manager should be able to update his/her personal details.

Requirements in the system for Administrator

- Admin should be able to generate the details about the ordered vaccines/medicines which are requested from the manager and can manipulate with it or which admin ordered from the inventory itself.
- As an administrator, the system should be able to prioritize the orders of the vaccines based on the requirements.
- As an administrator, the system should be able to generate the details of the managers of particular centers and the admin should be able to manipulate it, also the administrator is able to update his/her own personal details.

E. User Classes and Characteristics:

- **Government Officials (Administrator/Head of programs):**

Government Officials use this system, to manage the vaccination drives/disease control programs, to handle the different vaccination centers, to assign managers, and give them privileges of the system to manage their assigned vaccination centers, also government officials use the system to handle the ordering of vaccines, update the stocks and also, update the current news and guidelines for the users.

- **Managers of the program:**

Managers use this system for handling the health programs in their vaccination centers, also managing the resources and ordering the required resources based on the needs in their respective vaccination centers, along with handling all the employees working in the vaccination centers. Managers provide some privileges to the employee working in the vaccination center to handle some tasks.

- **Employees:**

Employees working in the respective centers use the system for updating the information about the users who are vaccinated, also the employees have the privilege to provide the certificate or vaccination report to the users who are vaccinated.

- **Users (Civilians):**

Users or civilians use the system for registering themselves for vaccination, and they can book the slots based on their convenience and slots availability.

F. Operating Environment:

This system will run on an online platform, the main communication interface between the user's view and the database will be managed by SQL scripts.

1. Hardware, Software or connectivity requirements:

➤ Hardware:

- Processor: Intel i3 (minimum)
- Clock speed: 1.2GHz
- Memory: 50GB
- RAM: 2GB
- Operating System: Windows 7/8/10

➤ Software:

- Database Handler: SQL
- Software Building Tool/ Host language: Python

➤ Connectivity:

- Internet Speed: 15Mbps

2. External Interface Requirements:

- We need a Google Maps API to track the locations and to find the nearest centers of the various vaccination centers, also we will require an API for current guidelines about the diseases and vaccine information.

G. Product Functions

- **Register/ Sign up:**

Through this functionality, users or managers or employees, or admin can register themselves in the system. Users/managers/admin/Employees have to provide the details required for the registration process and password for signing up. The system will also provide the steps as a guideline to register on the system.

- **Sign In:**

Through the details provided in the sign-up process and password, the managers/users/employees or admin can sign in to the system.

- **Current_Guidelines:**

This functionality will provide the current news and guidelines about the diseases.

- **Retrieve_details**

This functionality can be used by the admin/managers or the employees, the admin will be able to see all the details about the managers, the manager will be able to see all the details about the employees, employees will be able to see all the details about the users.

- **Order_vaccines:**

This functionality is for both the managers and admins of the system, the manager can request the order of the vaccine from the admin and the admin can order the vaccines from the inventory based on the requirements.

- **update_vaccineStock:**

This functionality will help the manager and admins to see the vaccine stock and update the stock based on the orders.

- **add_manager:**

Using this functionality the admin can assign or recruit the manager for the respective vaccination center.

- **update_managerDetails :**

With this functionality, an admin can manipulate the information of managers. But the manager can update his/her own personal details only.

- **add_employee:**

This functionality will help the managers of the particular center to recruit or add employees.

- **update_employeeDetails:**

With the functionality Managers can update the information about all the employees but, a particular employee will be able to update his/her own details only.

- **update_userInfo:**

With this functionality, Employees/Users users will be able to update the user details and the employee will be able to update the status as vaccinated or not vaccinated only, but the user can update his/her own details only like name, location, etc.

- **provide_certificate:**

With this functionality, the Employees will be able to provide the certificates to the users who are vaccinated.

- **Search_vaccines:**

With the functionality, the user will be able to search for the required medicines or vaccines.

- **find_nearest:**

This filter/functionality will show the nearest available vaccination slot with center details to the users.

- **Book_slot:**

Using this functionality the user will be able to book the slot, at first, the user has to select the vaccine and the system will show the available slots along with centers, and if the user selects the filter *find_nearest* then the system will show the available slots and sort them according to the distance with respect to the user's location. Also, the user will be able to pre-register the slots.

H.Privileges:

Functions	Privileges
Sign Up, Sign in	Administration, Manager, Employee, User
Search_Vaccines	User
Slot_Booking	User
Provide Certificate	Employee
Manipulating with User_Details	Employee, User
Manipulating with Employees or Employee_Details	Manager, Employee
Manipulating with Managers or Manager details	Administration, Manager
Orders/Update of Vaccines	Administration, Manager
Guidelines related to Disease	Administration, Manager, Employee, User

** here the admin of the system will be able to access all the modules but, there is a specific role assigned for all the small tasks.*

I. Assumptions:

- Here the architecture will be focusing on providing better management for vaccination drives/disease control programs online.
- So it is presumed that the internet facility, power supply, internet speed/bandwidth is always up and running, also it is assumed that all the information and data is up to date.
- Also, the server of the system will be live 24x7, and the server has enough capability to handle large amounts of data.
- Also, it is assumed that all the users of this system will have the required hardware and software specifications.

J. Business constraints

- The system will contain all the updated information about the data of the users vaccinated, stocks of vaccines, availability of particular vaccines/medicines, etc.
- Also, all the information/data can be recovered and will not be corrupted in case any system failures or power shortage occurs.
- Also, the data should be flexible and consistent in case any migration occurs.
- The system will be secured in a way, such that all the personal details of the users, managers, or admin will not be compromised.