

# Country Adoption Playbook

**DIVOC**

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## Version Control

Version	Date of Revision	Description for Change	Author	Reviewer	Approved By
1.0	Jan 8, 2021	Country Adoption Playbook	DIVOC Program Management Unit	Sahaj and eGov Foundation	Dr Pramod Varma
2.0	Feb 10, 2021	Revised DIVOC full-form, platform screens, modules and technology stack	DIVOC Program Management Unit	Sahaj and eGov Foundation	Dr Pramod Varma
3.0	March 1, 2021	Addition of citizen registration and appointment module	DIVOC Program Management Unit	Sahaj and eGov Foundation	Dr Pramod Varma

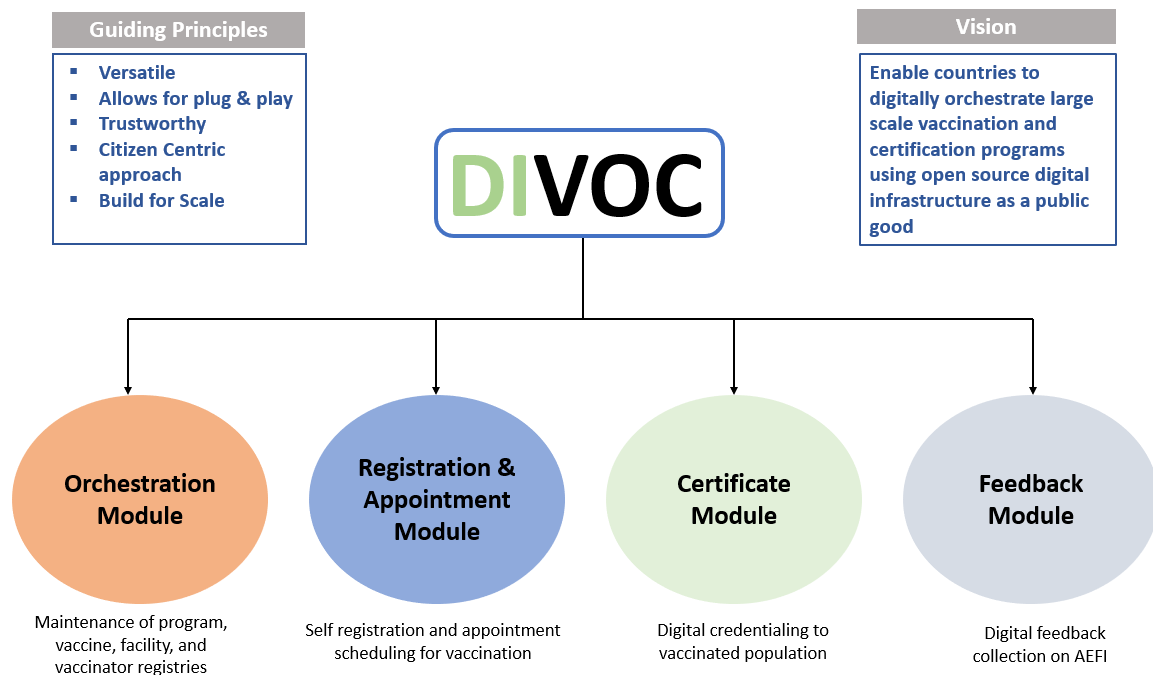
## Chapter 1: About DIVOC

DIVOC stands for **D**igital **I**nfrastructure for **V**accination **O**pen **C**redentialing, it is an **open source platform** for facilitating the last mile delivery of **COVID-19 vaccination** and digital certification.

It includes the following:

- Digital orchestration of rollout
- Registration and appointment booking
- Certificate issuance
- Post-vaccination feedback

## Digital Infrastructure for Vaccination Open Credentialing



### 1.1 Background

DIVOC is a community-effort led by eGov Foundation (a not-for-profit organization that has developed DIVOC as an open-source, flexible and extensible software, designed to facilitate orchestration and certification of large-scale vaccination including but not limited to scope listed in the document below using open-sources technologies and a scalable, data driven architecture), under the guidance of Mr. Nandan Nilekani (former chairman of UIDAI) and Co-founder of Infosys, and Dr Pramod Varma (former Chief Architect of UIDAI). DIVOC is a part of eGov's "DIGIT" open-source digital infrastructure provisioned for Governments to streamline public governance and administration.

Ability to **vaccinate and certify** the entire population at **speed and scale** in a controlled manner.

To manage the entire vaccination process by **leveraging existing ecosystems** and source of funds in a unified manner

To **control and manage** the approved medicine, its supply, facilities, operators, geographies of operation and the daily vaccination rate as per the supply of vaccines and the country's priorities.

To facilitate the above using a **digital backbone** in a seamless, efficient, auditable and a trustable manner, keeping choice, privacy and security in mind.

Issue a portable **digitally verifiable certificate** to citizens so that they can get back to work.

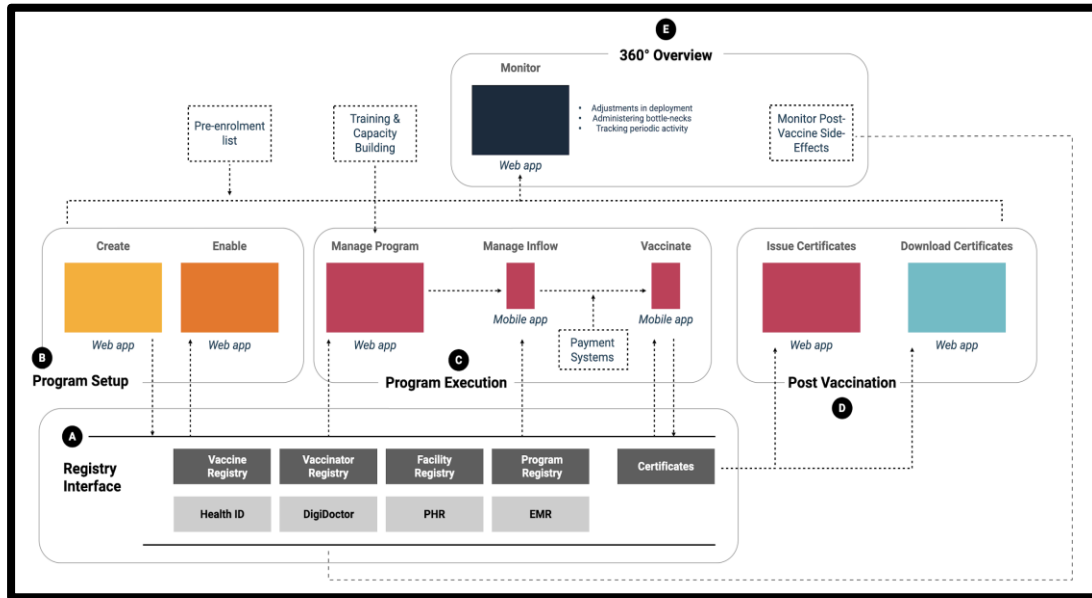
Obtain operational and **post vaccination feedback** in self-service and assisted modes

## 1.2 What DIVOC offers

As explained earlier, DIVOC offers three key modules;

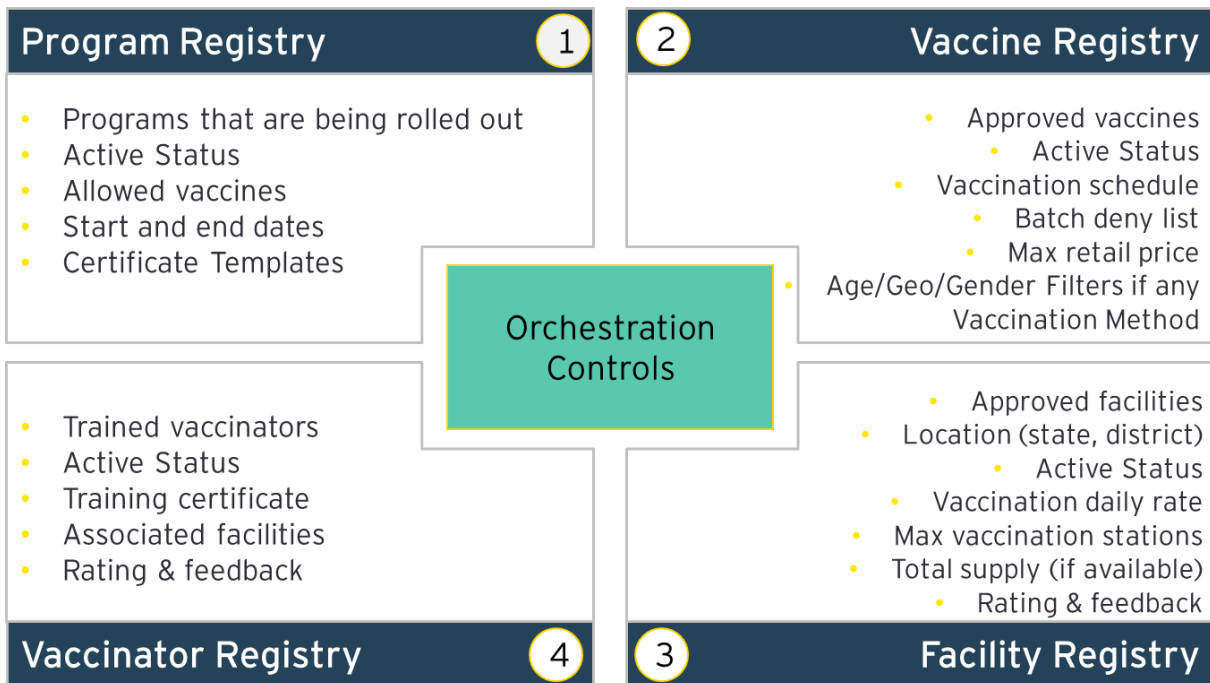
- A “Certificate” module – which has the ability to generate WHO-FHIR DDCC and W3C-compliant digital vaccination certificates, for every resident after successful inoculation. This certificate will be a simple QR code that can be easily accessed/scanned from an individual’s mobile phone, and which can be used by country authorities to independently verify the individual’s current COVID-vaccination status. The DIVOC team is also actively working with WHO presently, to define the technology specifications for this global digital vaccination certificate standard, which will then be proposed for adoption in all WHO member states.
- A “Feedback” module – which offers a resident-reporting portal for a country’s population to self-report feedback on the vaccination episode. This will entail choices for a resident to report feedback on the vaccinator who performed the inoculation, the facility where the inoculation was performed, whether there are any side effects from the vaccination, and so forth. In future, this module is also planned to be upgraded, to accommodate in-facility reporting of feedback by the vaccinator (i.e. whether there are any side effects on the resident when he/she is still in the facility). This module will also have open interfaces to integrate with a country’s existing AEFI reporting systems.
- An “Orchestration” module – which covers the registration and setup of the administrative functions necessary for a country, before initiating the vaccine rollout program. That is, this module allows a country’s vaccine administration taskforce to set up the facilities, the vaccinator profiles, the targeted resident list, and so forth. This module can also support interfaces to integrate with a country’s foundational/functional ID systems (e.g. National ID system, Civil registry system, Voter registry system) for validating each resident before he/she is put through the inoculation process.

The DIVOC platform has been designed to accommodate the various events occurring during the last-mile vaccine administration and certification lifecycle, as illustrated below;



Further details on the 4 core DIVOC modules are outlined below;

### 1) Orchestration Module

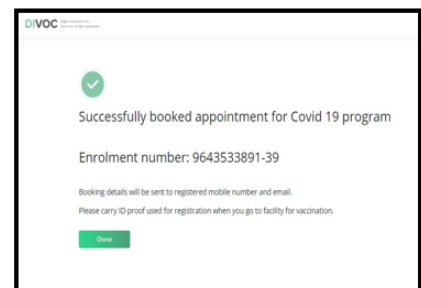
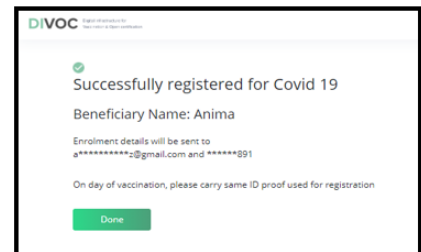


### 2) Registration and Appointment Module

#### FEATURES

Self registration by citizens for the country's vaccination drive. Features included are:

- Selection of vaccination program
- Eligibility check
- Up to 4 members can be added using one mobile number
- Feature for selecting health facility using pin code
- Feature for scheduling appointment
- Feature to delete appointment



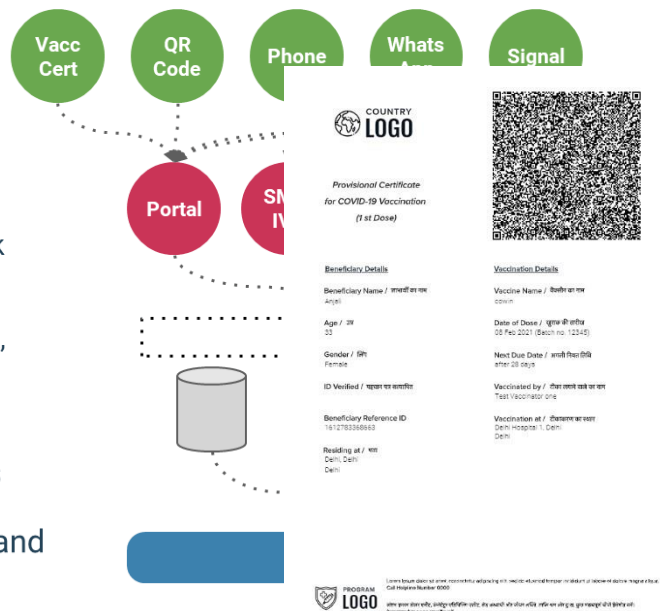
### 3) Certificate Module

- Conforming to WHO/IHR guidelines\* based on W3C verifiable credential\* specifications
- Authenticity verifiable via digitally signed QR code
- Available digitally on smartphone with QR code
- Printable for non-smartphone users
- Multilingual templates (for data and layout)
- Ability for users to download/print after vaccination either at facility or from home in self/assisted modes
- Integratable to health Lockers and certificate lockers
- Easy integration with immunization e-registry



### 4) Digital Feedback Module

- Structured feedback
  - Configurable, expert driven
- 3 Types
  - Facility rating & feedback
  - Vaccinator rating & feedback
  - Vaccination response feedback
- Multi channel, multi-lingual
  - Public portal, inbound sms, IVR, WhatsApp, other apps via API
  - Multiple languages
- Self service and assisted modes
- Integratable with AEFI systems and processes.



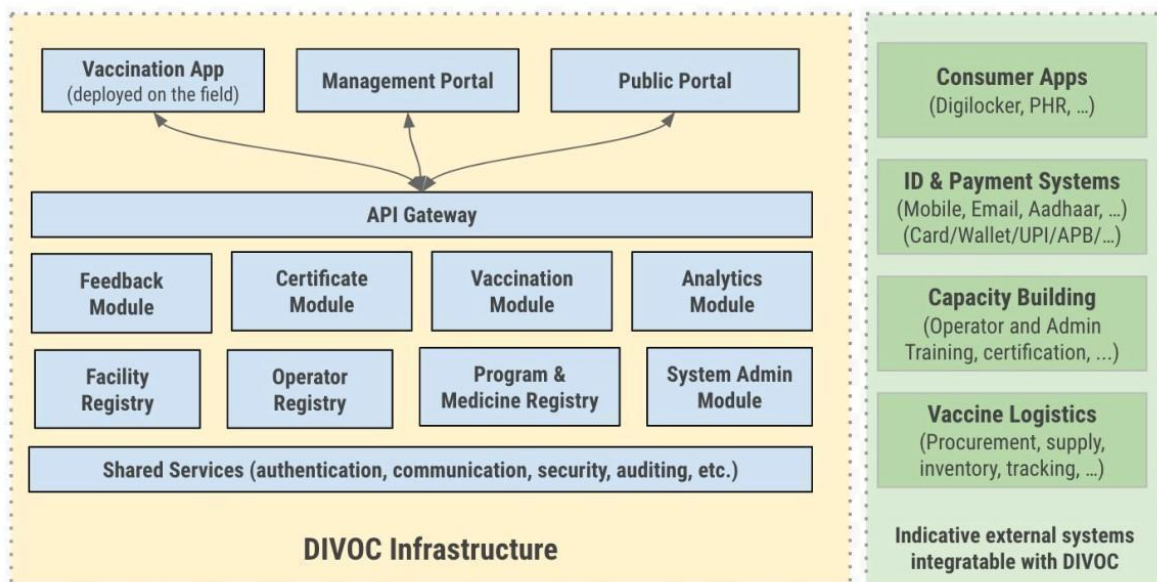


### 1.3 DIVOC Architecture

DIVOC is a flexible & extensible software allowing multiple parties/systems to plug in based on countries requirement. Following are the architectural principles of the platform:

1. Microservices and API based
2. Interoperable (with various ID, payment, and other systems)
3. Scalable
4. Flexible and configurable (for allowing medicines, vaccination frequency, facilities, operators, rules of certification, different authentication and flows, etc.)
5. Observable via telemetry
6. Resilient (failure resilience, automation, devops, testing, deployment, manageability, monitoring, etc)
7. Privacy and Security by design
8. Built on open source and open standards
9. Trustable (use of digital signature, registries, attestations, audits, etc.)
10. Internationalize (multi-lingual support and ability to adapt and use DIVOC OSS across the world)

The following diagram depicts the overall architecture of DIVOC.



The DIVOC architecture provides flexibility to add new components into solution, based on countries specific needs. Further module details are outlined under the “User Journey” section of this document.

The following technology stack is used primarily in the DIVOC open-source stack;

- Front End: AngularJS, HTML5, Go
- Framework: Spring Boot
- DB: Postgres
- Components: Opensaber, Apache Kafka, Redis
- Identity and Access Management - KeyClock
- Deployment: Docker
-

## Chapter 2: How can countries adopt DIVOC?

The plug-n-play nature of DIVOC allows a country to choose either the complete package or any specific module(s), basis its need. For any country to adopt DIVOC, depending on the level of digitization and available infrastructure, the following pre-requisites should be met;

### 2.1 Technological Prerequisites

#	Availability of Systems	Scenarios	Pre-requisite	Adoption Approach
1.	Country wide Vaccine Supply Chain System with last mile connectivity	Not Available	1. Manual Entry of Stock: <ul style="list-style-type: none"> <li>Facility wise availability of vaccine stock</li> </ul> 2. Stock Entry via Import (Central/ State/ Facility level): <ul style="list-style-type: none"> <li>Facility wise availability of stock in provided standard format (Excel/CSV)</li> </ul>	<ul style="list-style-type: none"> <li>DIVOC can be customised to provide feature for manual entry of available stock to System/Facility Admin</li> <li>DIVOC can be customised to provide import functionality for entry of available stock to System/Facility Admin</li> </ul>
		Connectivity till Facility Level	1. Vaccine Supply Chain System should be API Integrable for exchanging stock consumption with (Type, Serial Number, Validity, etc)	<ul style="list-style-type: none"> <li>DIVOC forms two-way communication on stock availability and consumption with Supply chain system</li> </ul>
		Available till Patient level	1. Vaccine Supply Chain System should be API Integrable 2. Vaccine Supply Chain System should share: <ul style="list-style-type: none"> <li>Consumed Vaccine details</li> <li>Vaccinator</li> <li>Location (Facility) details</li> <li>Timestamp</li> </ul> 3. Common Facility Registry in both systems	<ul style="list-style-type: none"> <li>System captures details on Vaccination &amp; Vaccinator for issuance of certificate</li> </ul>

#	Availability of Systems	Scenarios	Pre-requisite	Adoption Approach
			4. Common Vaccine Registry in both systems	
2.	Learning Management System (LMS) for Vaccinator	Available	<ol style="list-style-type: none"> <li>1. LMS should be API Integrable</li> <li>2. Unique Vaccinator Id in both systems</li> </ol>	<ul style="list-style-type: none"> <li>• Future versions of DIVOC will integrate with LMS for Verification of Vaccinator Certificates</li> </ul>
		Not Available	<ol style="list-style-type: none"> <li>1. Availability of Physical / Digital Copy of Vaccinator certificate</li> </ol>	<ul style="list-style-type: none"> <li>• Manual Verification of Vaccinator Certificates will be performed at Central / State/ Facility Level</li> </ul>
3.	Drug Data Bank / Vaccine Registry	Available	<ol style="list-style-type: none"> <li>1. Drug Bank / Vaccine Registry should be API Integrable</li> <li>2. Vaccine Rate Card (for Paid Vaccination) should be available</li> <li>3. In Case of Multiple Authentic Drug registry: Drug registry with most relevant drug details to be selected for Integration</li> </ol>	<ul style="list-style-type: none"> <li>• DIVOC integrates with Vaccine Registry to fetch Vaccine details</li> </ul>
		Not Available	<ol style="list-style-type: none"> <li>1. Availability of Vaccine Details</li> </ol>	<ul style="list-style-type: none"> <li>• Manual creation of Vaccine details by System Admin</li> </ul>
4.	e-Payment System	Available	<ul style="list-style-type: none"> <li>• API Details of Payment gateway</li> <li>• Registration on Payment gateway</li> <li>• Service &amp; Vaccine Rate card</li> </ul>	<ul style="list-style-type: none"> <li>• Future version of DIVOC can be integrated with Payment Portal for Paid Vaccination</li> </ul>
		Not Available	<ol style="list-style-type: none"> <li>1. Service &amp; Vaccine Rate card</li> </ol>	<ul style="list-style-type: none"> <li>• DIVOC provides flexibility to extend and capture vaccine and service rates.</li> </ul>
5.	Digital Citizen Registry (EHR/ PHR/ HIS / National ID / National/Regional disease)	Available	<ol style="list-style-type: none"> <li>1. Citizen Registry should be API integrable</li> <li>2. Authorization to connect with Citizen Registry</li> </ol> <p>OR</p>	<ul style="list-style-type: none"> <li>• DIVOC integrates with Recipient Registry to enrol for Vaccination (For ex BPL Recipients to be enrolled by Government Agency/Dept.)</li> <li>• DIVOC will perform Online verification of Recipient</li> </ul>

#	Availability of Systems	Scenarios	Pre-requisite	Adoption Approach
	surveillance registries)		3 Multiple Authentic Citizen registry but not covering 100% of Recipient 4 Selection of registry with maximum relevant entry	<ul style="list-style-type: none"> <li>Manual enrolment and verification of Recipient (Bulk/Single) which are eligible but not yet part of selected integrable registry</li> </ul>
		Not Available	1. Availability of Physical document to verify Recipient	<ul style="list-style-type: none"> <li>Manual enrolment and verification of Recipient (Bulk/Single) in DIVOC</li> <li>Manual verification of any identified documents for Recipient</li> </ul>
6.	Health Platform (Facility/ Vaccinator Registry)	Available	1. Health Registry should be API Integrable 2. Availability of Facility Data 3. Availability of Vaccinator data mapped to Facility 4. In Case of Multiple Authentic Health registry: selection of Registry with most relevant data	<ul style="list-style-type: none"> <li>DIVOC integrates with Health Registry to fetch required data of Recipient/Facility/Vaccinator</li> </ul>
		Not Available	1. Availability of Facility and Vaccinator Details in required format	<ul style="list-style-type: none"> <li>Manual creation of Facility/Vaccinator details (Bulk/Single) in DIVOC</li> </ul>
7.	Digital Signature	Available	1. API Integrable: e-Sign/Digital signature Platform	<ul style="list-style-type: none"> <li>Certificates will be Digitally signed</li> </ul>
		Not Available	None	<ul style="list-style-type: none"> <li>Certificates will be manually signed &amp; stamped by authorised signatory</li> </ul>
8.	Health insurance (Public/Private) systems	Available	1. API Integrable – Insurance Platform	<ul style="list-style-type: none"> <li>DIVOC can be customised to capture Insurance Id</li> <li>DIVOC can be customised to Fetch Insurance details for verification and avail benefits</li> </ul>
		Not Available	None	NA

#	Availability of Systems	Scenarios	Pre-requisite	Adoption Approach
9.	Digital Document Vault (National / Regional)	Available	1. API Integrable – Document Vault	<ul style="list-style-type: none"> <li>DIVOC can be tweaked to push/store Certificates on Digital vault</li> <li>Recipient can download certificates from Document Vault or DIVOC Platform</li> </ul>
		Not Available	NA	<ul style="list-style-type: none"> <li>Certificates will be issued over Mail/ In Hard &amp; Soft Copy / WhatsApp (if services are procured)</li> </ul>
10.	Application Access for Facility Staff/Admin	<ul style="list-style-type: none"> <li>Mobile No./ Email availability</li> <li><b>OR</b></li> <li>Mobile No./ Email Id linked to National Id/ Employee Id</li> </ul>	None	<ul style="list-style-type: none"> <li>Mobile Number / Email &amp; OTP based login</li> </ul>
		National Id/ Employee Id and Mobile & Email are not available for Staff/Admin	NA	<ul style="list-style-type: none"> <li>Manual User creation by System/Facility Admin and login by provided Id / Password</li> </ul>
11.	Application Access for Recipient	<ul style="list-style-type: none"> <li>Mobile/ Email availability</li> <li><b>OR</b></li> <li>Mobile No./ Email Id linked to selected Recipient registry</li> </ul>	None	<ul style="list-style-type: none"> <li>Mobile Number / Email &amp; OTP based login &amp; Access to issued Certificate/Appointment Details</li> </ul>
		No Mobile No./Email available with Recipient	Availability of Physical copy of any ID Proof	<ul style="list-style-type: none"> <li>Manual Enrolment &amp; Verification of Document</li> <li>Provisioning printed copy of Certificate</li> </ul>

## Pre-requisites on Availability of National ID(s)/National Health ID(s)/EHR/PHR/Scheme Registry

Countries implementing DIVOC can have following approaches (based on the availability of National ID(s) in Digital / Physical format);

1. Availability of National ID(s) in **Digital** format which is secure and API Integrable or with Export feature with **100% coverage**
  - Recipient/Vaccinators Identification /Enrolment / Verification:
    - a. DIVOC provides feature to integrate with National Id registry for online Identification and Verification of Recipients
    - b. In case registry of National Id/Health Id also provides, citizen categories (such as lower economical class/below poverty levels/scheme enrolments), DIVOC can be extended to fetch pre-enrolled list of Recipients
    - c. Online Identification and Verification of Vaccinator
2. Availability of National ID(s) system(s) in **Digital** format which is (are) secure and API Integrable or with Export feature with **< 100% coverage**
  - a. Selection of Registry with maximum coverage of relevant entries
  - b. Manual enrolment and verification of Recipients, which are eligible but not yet part of selected integratable registry
  - c. Manual verification of Vaccinator, which are eligible but not yet part of selected integratable registry
3. Availability of National Id(s) in **Physical** format
  - a. Manual enrolment and verification of Recipients, which are eligible but not yet part of selected integratable registry
  - b. Manual verification of Vaccinator, which are eligible but not yet part of selected integratable registry

## 2.2 Digital Infrastructure Prerequisites

### 1) Hosting Infrastructure

#	Component	Scenarios	Pre-requisite	Specifications
1	Server	Physical Server	<ol style="list-style-type: none"> <li>1. Internet Connectivity</li> <li>2. Storage and Computing power as per platforms hosting requirement</li> </ol>	<ul style="list-style-type: none"> <li>• Containerized deployment using docker-compose or kubernetes</li> <li>• Exact specifications will depend on various factors such as rollout span, population planned and usage scenarios for certificate access</li> <li>• To start with Medium instance nodes with ~4 core and 16 GB ram. For Redundancy and failover adding nodes horizontally would be needed.</li> </ul>

#	Component	Scenarios	Pre-requisite	Specifications
		Cloud Deployment	1. Storage and Computing power as per platforms hosting requirement	<ul style="list-style-type: none"> <li>Containerized deployment using docker-compose or kubernetes</li> </ul>

## 2) Facility Level Infrastructure

#	Device	Scenarios	Pre-requisite	Specifications
1	Biometric Authentication Devices	Available	1. Availability of registry with Vaccinator / Recipient biometric data 2. Availability of API Integrable registry to connect with Biometric device	<ul style="list-style-type: none"> <li>Vaccinator / Recipient Verification to be performed using Biometric Device</li> </ul>
		Not Available	None	<ul style="list-style-type: none"> <li>Physical verification of Vaccinator / Recipient documents</li> </ul>
2	Facility level Operating Devices	Computer / Laptop	1. Internet connectivity 2. Web Browser	<ul style="list-style-type: none"> <li>Application accessed on Web browser</li> </ul>
		Tablet / Mobile	1. Internet connectivity 2. Web Browser	<ul style="list-style-type: none"> <li>Application is Responsive and can make use of Web browser</li> <li>Mobile App will be used for accessing application</li> </ul>

## 2.3 Operational Pre-requisites

In addition to the technical pre-requisites, the following operational pre-requisites are also key determinants for assessing a country's readiness to accommodate DIVOC, as part of its COVID vaccination program;

1. Readiness on vaccination strategy
  - a. Identification, approval and procurement of vaccines
    - i. Identification of approved vaccines for administration to the population
    - ii. Procurement mechanism for large scale vaccination roll out in the country through international alliances or national manufacturing processes
  - b. Distribution mechanism
    - i. Distribution of vaccines at State, District and facility levels
    - ii. Prioritization of states based on vaccine availability
    - iii. Availability of vaccines to each vaccination centre
  - c. Logistics management
    - i. Supply of medicines to vaccination centres
    - ii. Maintenance of optimal temperature for vaccines
    - iii. Leveraging existing supply chain logistics for vaccines in the country
    - iv. Identification of medical store depots for last mile delivery
  - d. Coverage under Government Schemes
    - i. Identification of government schemes to cover beneficiaries for vaccination
    - ii. Identification of priority groups covered under health schemes in the country for state sponsored vaccination
  - e. Last mile administration and monitoring
    - i. Availability of vaccines to each citizen in the country
    - ii. Monitoring of vaccine availability, administration and feedback
2. Capacity building
  - a. Identification of vaccinators
    - i. Identifying human resource for large scale vaccination roll out
    - ii. Maintenance of national vaccinator registries for monitoring
  - b. Training on vaccine administration
    - i. Training of identified vaccinators for vaccine administration
    - ii. Classroom cum e-learning training modules for capacity building
3. Infrastructure
  - a. Availability of vaccine centres
    - i. Identification of existing health facilities in the country that can be converted to vaccine centres
    - ii. Setting up of makeshift vaccine booths for COVID-19 vaccination
  - b. Availability of digital infrastructure to facilitate large scale vaccination roll out
    - i. Computers/Laptop at each vaccination centre
    - ii. Tablet/Mobile phones with the vaccinators and facility staff
    - iii. Biometric authentication devices for identification of vaccine recipients
    - iv. Servers
    - v. Connectivity



4. Government protocols
  - a. Criteria for beneficiaries
    - i. Establishing identification parameters for phase wise vaccination
    - ii. Identification of frontline workers and vulnerable population
  - b. Vaccine administration
    - i. Standard treatment protocols for administration of vaccine
    - ii. Medical protocols to be followed by each vaccinator with proper training
  - c. AEFI and post-event monitoring protocols
    - i. Establishing protocols for feedback collection from vaccine recipients to identify adverse effects of the vaccine post administration
    - ii. Feedback collection to be based on approved guidelines as per WHO
    - iii. Monitoring mechanism for AEFI for future policy and dynamic decision

## 2.4 Implementation Guidelines

### How do you configure DIVOC to suit your country needs?

DIVOC is cloud-agnostic platform and can be deployed either in a containerized fashion or in bare-metal fashion. DIVOC requires the following modifications to suit a specific out-of-the-box implementation;

- Template for certificate format to match the schema
- Set up of keys to sign the certificate and safe store the private keys
- Providing the appropriate logos and the tagline
- Configuration service to select local language mapping
- Schema and properties of the registry
  - Facility json schema
  - Vaccinator schema
  - Medicine schema
  - Certificate schema
- Adapters (standards-driven: for e.g. eHealth standards for message syntax) for integration with
  - Notification services
  - Digital identity system, if any
  - Other eHealth systems
- Plugin for integration with any country specific digital infrastructure

### How do you Integrate DIVOC with other systems?

The platform provides various APIs to integrate with various system partners in a country's COVID vaccination program. The following (below) are key services provided by DIVOC;

- Login: Token based login
- Fetch Configuration details
  - Application Flow
  - Vaccination Program
  - Vaccinators Mapped to Facility for the operator / facility.
- Get Vaccination Details
  - User Information
  - Pre enrolment information
  - All pre enrolments applicable to assigned facility
- Certification
  - Certify the one or more vaccination: Certification happens asynchronously, this requires vaccinator authorization and the vaccinator should be trained for the vaccination that is being certified.
  - Upload certification csv for bulk ingestion: Certify all the data in uploaded csv
- Identity: Validate identity if the person
- Default:
  - Get certificate json
  - Send events for monitoring / tracking purpose.
  - Server heartbeat operation: his operation shows how to override the global security defined above, as we want to open it up for all users.
- Side Effects: Get Side Effects Metadata
- Report Side Effects: Create reported side effects
- Digital Vaccination certification verification API
  - Verify digitally signed vaccination certificate accepts signed certificate and verifies the claim.
- Admin API
  - get facilities
  - Upload facility csv for bulk ingestion
  - Update facility
  - get enrolments
  - Upload facility csv for bulk ingestion of pre enrolment
  - Get vaccinators
  - Upload facility csv for bulk ingestion
  - Get & Create Program List
  - Get & Create medicines
  - Get & Create Facility Users
  - Get Analytics Query

For more information on the various APIs enabled through DIVOC, please refer the table below;

#	API Calls	Link
1	Certify one or more Vaccinations	<a href="https://github.com/egovernments/DIVOC/developer-docs/api/admin-api.html#/vaccination-api.yaml">https://github.com/egovernments/DIVOC/developer-docs/api/admin-api.html#/vaccination-api.yaml</a>
2	Verification API	<a href="https://github.com/egovernments/DIVOC/developer-docs/api/admin-api.html#/divoc-verification.yaml">https://github.com/egovernments/DIVOC/developer-docs/api/admin-api.html#/divoc-verification.yaml</a>
2	Admin API	<a href="https://github.com/egovernments/DIVOC/developer-docs/api/admin-api.html#/">https://github.com/egovernments/DIVOC/developer-docs/api/admin-api.html#/ </a>

## Chapter 3: User Journey

### 3.1 Orchestration Module Overview

The Orchestration module in DIVOC has also been developed on the principle of Plug and Play allowing it to work Independently and can integrate with other modules or any external application/portal/system.

Main functions of the orchestration module are:

1. Ingest/upload bulk data
2. Setting up the program
3. Setting control parameters (activation & throttling)

#### LOGIN

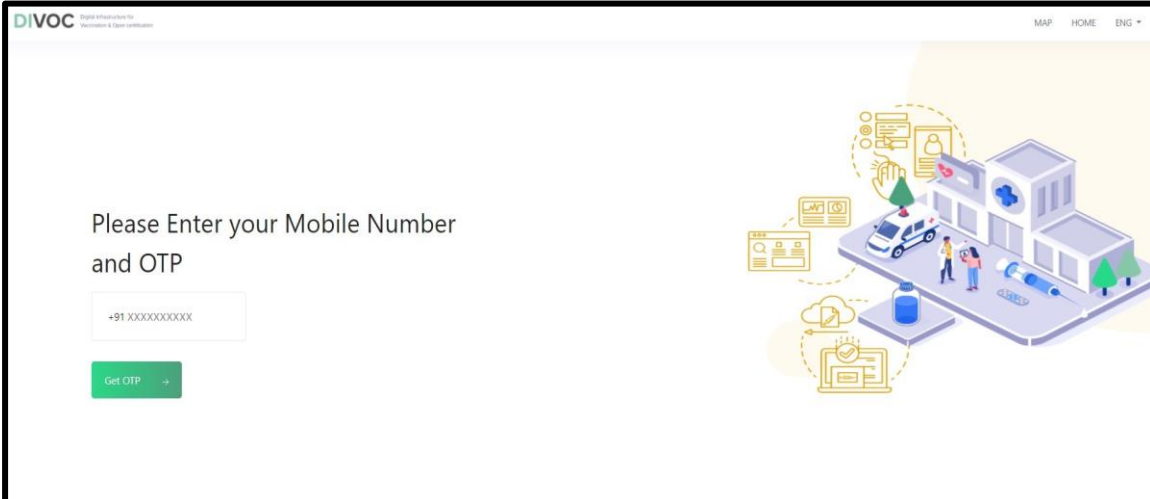
Public portal: <<the production URL will have to be provided by the country>>

##### Citizen:

- Link to Download Vaccination Certificates
- Get Latest updates on Platform
- Platform Documentations

##### System Users

- Mobile Number & OTP based login



#### MANAGEMENT PORTAL

##### 1. Facility Registry

###### a. System Admin functions

- Bulk Upload of Facility Data
- Download Error Files in Bulk Upload
- Trend line of record counts
- API Integrable with external already available facility registries

**23 Records in the DIVOC Facility Registry**

**BULK UPLOAD SCREEN**

**All Facilities**

FACILITY ID	FACILITY NAME	STATE	UPLOADED ON
BLR12	Bengaluru Hospital	Karnataka	
DEL016	Awesome Hospital	Delhi	
BLR99	Bengaluru Hospital	Karnataka	
BLR9	Bengaluru Hospital	Karnataka	
MAA2341	Madras	TN	
BLR13	Bengaluru Hospital	Karnataka	
DEL016	Awesome Hospital	Delhi	
DEL013	Awesome Hospital	Delhi	
DEL016	Awesome Hospital	Delhi	
DEL013	Awesome Hospital	Delhi	

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**Uploads History**

FILE NAME	DATE	TIME	SUCCESS	ERRORS
facilities_template.csv	05-Feb-2021	23:48	1	0
facilities.csv	05-Feb-2021	16:05	1	0
facilities.csv	04-Feb-2021	22:47	1	0
facilities.csv	04-Feb-2021	22:44	1	0
facilities.csv	04-Feb-2021	20:34	1	0
facilities.csv	04-Feb-2021	20:22	1	0
facilities.csv	04-Feb-2021	20:21	1	0
facilities.csv	04-Feb-2021	20:20	1	0
facilities.csv	04-Feb-2021	19:08	1	0
MyFacilities.csv	03-Feb-2021	22:46	1	0

Rows per page: 10 1-10 of 30

## b. Controller functions

- Filter Type/Region and Activate/Deactivate Facility
- Set/Edit Vaccination Rate
- Email / SMS trigger to the Facility Admin
- Audit Log

## DIVOC facility activation screen

**Facility Activation**

Adjusting Rate

All Facilities

**facilities**

CODE	NAME	TYPE	PROGRAM STATUS	
BLR99	Bengaluru Hospital	GOVT	Active	
BLR9	Bengaluru Hospital	GOVT	Active	
BLR9	Bengaluru Hospital	GOVT	Active	
BLR9	Bengaluru Hospital	GOVT	Active	
BLR9	Bengaluru Hospital	GOVT	Active	
BLR8	Bengaluru Hospital	GOVT	Active	
BLR8	Bengaluru Hospital	GOVT	Active	
BLR8	Bengaluru Hospital	GOVT	Active	
BLR15	Bengaluru Hospital	GOVT	Active	
BLR16	Bengaluru Hospital	GOVT	Active	

Make 0 facilities inactive for the c19

**MAKE INACTIVE**

**Facility Activation**

c19

All of India

Karnataka

Please select District

- ☐ Bagalkot
- ☐ Ballari (Bellary)
- ☐ Belagavi (Belgaum)
- ☐ Bengaluru (Bangalore) Rural
- ☐ Bengaluru (Bangalore) Urban

**Type of Facility**

- ☒ Govt
- ☐ Private

**Status**

- ☒ Active
- ☐ Inactive

## DIVOC rate adjustment at facilities by the Controller

**Facility Activation** **Adjusting Rate** **All Facilities**

**facilities**

CODE	NAME	TYPE	PROGRAM RATE	LAST ADJUSTED	
D1	D1 Hospital	GOVT	15	25-Jan-2021	

**Set Rate**

No. Of Facilities	Current Rate	Set New Rate
1	15	15

**SET RATES**

## 2. Vaccinator Registry

## a. System Admin functions

- Bulk Upload of Vaccinator Data
- Activate / Deactivate Vaccinator
- Download Error Files in Bulk Upload
- Audit History
- Trend line of record counts
- API Integrable with external already available Vaccinator registries
- Email / SMS trigger to the vaccinator to add associated facilities / modify any personal details / add certificates

## DIVOC bulk upload screen for vaccinators registry

**BULK UPLOAD SCREEN**

1 Records in the DIVOC Vaccinator Registry

**All Vaccinators**

National ID	NAME	UPLOADED ON
3333333337	ram	
VAC45	Dr Vaccinator45	
87634562	sam	
7311990788	Bb4	
4365469609	BRR	
6051330355	RR	
3733879826	BRR2	
111222333	ANM-123	
234	Rashid	
87533564646	Dr Anjali Gupta P	

**Uploads History**

FILE NAME	DATE	TIME	SUCCESS	ERRORS
t_vaccinator.csv	03-Feb-2021	18:45	1	0
t_vaccinator.csv	03-Feb-2021	18:44	0	1

Rows per page: 10 1-10 of 10

## b. Facility Admin functions

- Approval of Vaccinator Details
- Search & Activate / Deactivate Vaccinator
- Manual Add / Edit Vaccinator details with certificate
- Integrable with LMS for verification of training & certificates
- Configurable role creation
- Configurable Role and Vaccinator/Other System User Mapping

### Activation/Approval of Vaccinators in the facility by Facility Admin

**VACCINATOR LIST**

OPERATOR NAME	PROGRAM TRAINED FOR	CERTIFIED	SIGNATURE	STATUS	ACTIONS
sagar	-	<span style="color: red;">i</span>	<span style="color: red;">i</span>	Inactive	Make Active   Edit Profile
Test User	c19	<span style="color: green;">✓</span>	<span style="color: green;">✓</span>	Inactive	Make Active   Edit Profile

### Add/Edit feature for Vaccinator Details by Facility admin\*

**Vaccinator Details**

SAVE BACK

#### Personal Details

Name \*  
sagar

Email \*  
sagar@gmailcom

Mobile \*  
+91 8788622517

Aadhaar \*  
234243242324

Licence Number \*  
7867868687

Signature

#### Training & Certification

Certification (if any)  
Please select Program

Certified ☐

**ADD/EDIT VACCINATOR DETAILS**

\*Input screen

### Setting up of roles in the facility by Facility Admin

**Role Setup**

Role Type	Name	Mobile Number	Employee ID	Status	Actions
facility staff	rol1	[Redacted]	r1	Enabled	SAVE SET RATE DELETE
facility printing staff	rol2	[Redacted]	r2	Enabled	SAVE SET RATE DELETE

DISABLED USERS CANNOT LOGIN

**ROLE SETUP**

### 3. Vaccine Program Registry System Admin functions

- Create New Vaccine/Immunisation Program
- View / Edit Program Details
- Activate / Deactivate Program
- Audit History

### Setting up of Vaccination Programs by System Admin

**Register New Vaccine Program**

Program Name\*

Program Description\*

Program Logo

Vaccine

**List of Registered Vaccine Programs**

Program Name	Program Logo	More Details ->
c19	C-19 PROGRAM	More Details ->
sars-1	C-19 PROGRAM	More Details ->

**SETUP VACCINE PROGRAMS**

### 4. Vaccine Registry System Admin functions

- Add New Vaccine in System
- View / Edit Vaccine Details
- Activate / Deactivate Program
- Audit History

### Addition of approved Vaccines by System Admin

The screenshot shows the DIVOC interface with the 'Vaccines' tab selected. On the left, the 'Register New Vaccine' form includes fields for 'Name of Vaccine / Medicine\*', 'Manufacturer\*', 'Administration Type' (set to 'muscular injection'), and 'Schedule Details' (Repeat times). On the right, the 'List of Registered Medicines / Vaccines' shows two entries: 'cowin' and 'sars', each with a 'LOGO' and a 'More Details ->' link. A red box highlights the form and list area, with the text 'ADD APPROVED VACCINES' in red at the bottom right.

### 5. Beneficiary Pre-enrolment System Admin features

- Bulk Upload of Citizen Data
- Integrable with National ID/ Immunisation Registries
- Add/Delete Citizen
- Download Error Files in Bulk Upload
- Email / SMS trigger to the beneficiary

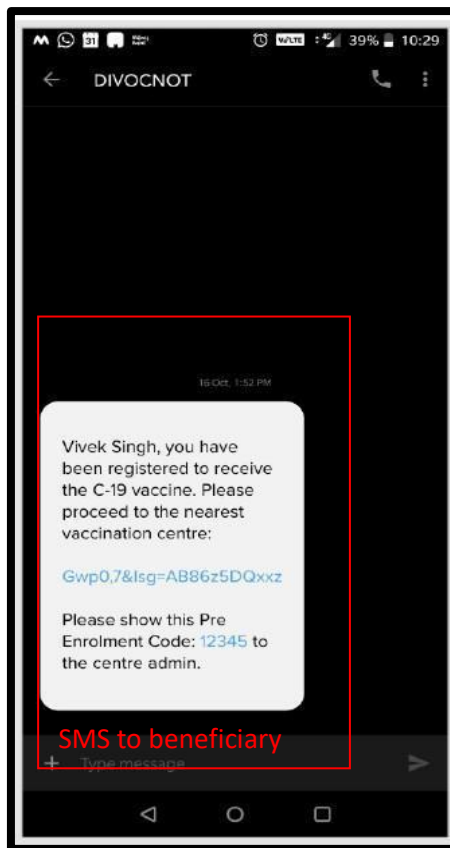
### Bulk upload of pre-enrolment list by System Admin

The screenshot shows the DIVOC interface with the 'Pre-Enrollment' tab selected. It features a 'DOWNLOAD TEMPLATE' button and a 'Records in the DIVOC Pre-Enrollment registry' section. The 'All Pre-Enrollments' table lists records with columns for National ID, NAME, and UPLOADED ON. The 'Uploads History' table lists file uploads with columns for FILE NAME, DATE, TIME, SUCCESS, and ERRORS. A red box highlights the 'All Pre-Enrollments' and 'Uploads History' tables, with the text 'BULK UPLOAD' in red at the bottom right.

National ID	NAME	UPLOADED ON
234234234234	kiran	
234234234234	kiran	
234234234234	kiran	
234234234234	kiran	
234234234234	Rahul	
234234234234	Rahul	
121212121212	Meera K	
232323232323	Raj Dhingra	
234234234234	kiran	

FILE NAME	DATE	TIME	SUCCESS	ERRORS
MyPreEnrollmentList.csv	03-Feb-2021	22:33	2	0
t_enrollments 2.csv	03-Feb-2021	18:49	1	0
t_enrollments.csv	03-Feb-2021	18:48	0	1
blt_enrollments.csv	03-Feb-2021	14:20	3	0
enrollments.csv	03-Feb-2021	11:57	3	0
enrollments.csv	02-Feb-2021	11:47	1	0
enrollments.csv	02-Feb-2021	11:04	1	0
enrollments.csv	02-Feb-2021	11:03	1	0





### 3.2 Registration and Appointment portal

Registration and appointment module can be used by citizens to register themselves and 3 other members and for seeking appointment for vaccination. This module has been developed on the principle of Plug & Play and can work Independently or integrate with other modules of DIVOC or any external application/ portal/ system.

The module has the following features:

- Selection of vaccination program
- Mobile and OTP based registration
- Eligibility check based on the age group defined by the country for vaccination
- Citizen registration for self and 3 more family members with a single mobile number
- Selection of co-morbidities
- Appointment facility by selecting nearest health facility and date and time
- Delete appointment option

**OTP based Login**

**4 members registration**

DIVOC

Digital infrastructure for  
Registration & Open certification

## Registration and Appointment Portal

Get Started by entering your mobile number

O

T

P

Get OTP

DIVOC

Digital infrastructure for  
Registration & Open certification

## Registered Beneficiaries (You can add upto 4 members)

No members have enrolled yet.

+ Member

### Eligibility check

DIVOC

Digital infrastructure for  
Registration & Open certification

## Check eligibility

Enter beneficiary's year of birth

Year of birth \*

1995

Does the beneficiary have any of the following comorbidities?

☐ Heart Problem

☐ Asthma

☐ Hypertension or BP

☐ Pulmonary fibrosis

☐ Diabetes

☒ Cystic fibrosis

☐ Liver disease

☐ Neurologic conditions

Back

Continue →

### Citizen details input screen

**DIVOC** Digital infrastructure for Vaccination & Open Certification

Provide details to complete enrollment

**ID details**

ID Type \*  
Pan Card

ID Number \*  
CGQPR88588

**Beneficiary Details**

Name \* (As per ID card)  
Anima

Gender \*  
Select Gender

Age  
26 Years

**Contact Information for e-certificate**

Mobile Number  
9643533891

State \*  
Delhi

District \*  
South West Delhi

Email ID  
anima.animuz@gmail.com  
anima.animuz@gmail.com

[Back](#) [Continue →](#)

### Successful registration screen

**DIVOC** Digital infrastructure for Vaccination & Open Certification

✓

## Successfully registered for Covid 19

Beneficiary Name: Anima

Enrolment details will be sent to  
a\*\*\*\*\*z@gmail.com and \*\*\*\*\*891

On day of vaccination, please carry same ID proof used for registration

[Done](#)


### Up to 4 members can be added

Registered Beneficiaries (You can add upto 4 members)

Registrations are open only for citizens 30 years and above.

<b>Robert</b> Registration Date: 1-Mar-2021 Enrollment number: 9643533891-39 Appointment: Madras, Chennai, TN, 600069 4-Mar-2021, 09:00-12:00	<b>Anima</b> Registration Date: 1-Mar-2021 Enrollment number: 9643533891-613 <a href="#">Book Appointment</a>
<b>Anjali</b> Registration Date: 1-Mar-2021 Enrollment number: 9643533891-732 <a href="#">Book Appointment</a>	<b>Anima</b> Registration Date: 1-Mar-2021 Enrollment number: 9643533891-300 <a href="#">Book Appointment</a>

### Appointment booking by selecting facility and available date and time slot



DIVOC

Digital infrastructure for

Vaccination & Open certification

Select Facility

Search by Pincode

Facilities availability for next few days

Madras

ABC, DEF, Chennai, TN, 600069

Walk-in

Appointments

Available Time Slots for Madras

26-Feb-2021

27-Feb-2021

1-Mar-2021

2-Mar-2021

3-Mar-2021

4-Mar-2021

5-Mar-2021

6-Mar-2021

09:00-12:00

19

59

19

20

20

20

20

60

14:00-18:00

80

80

80

80

80

80

09:00 - 18:00

-

09:00 - 18:00

-

09:00 - 18:00

-

09:00 - 18:00

-

Confirm Appointment Details

For Robert

At Madras,


ABC, DEF, Chennai, TN, 600069

4-Mar-2021

09:00-12:00

CONFIRM

## Successful appointment screen



DIVOC

Digital infrastructure for

Vaccination & Open certification

Successfully booked appointment for Covid 19 program

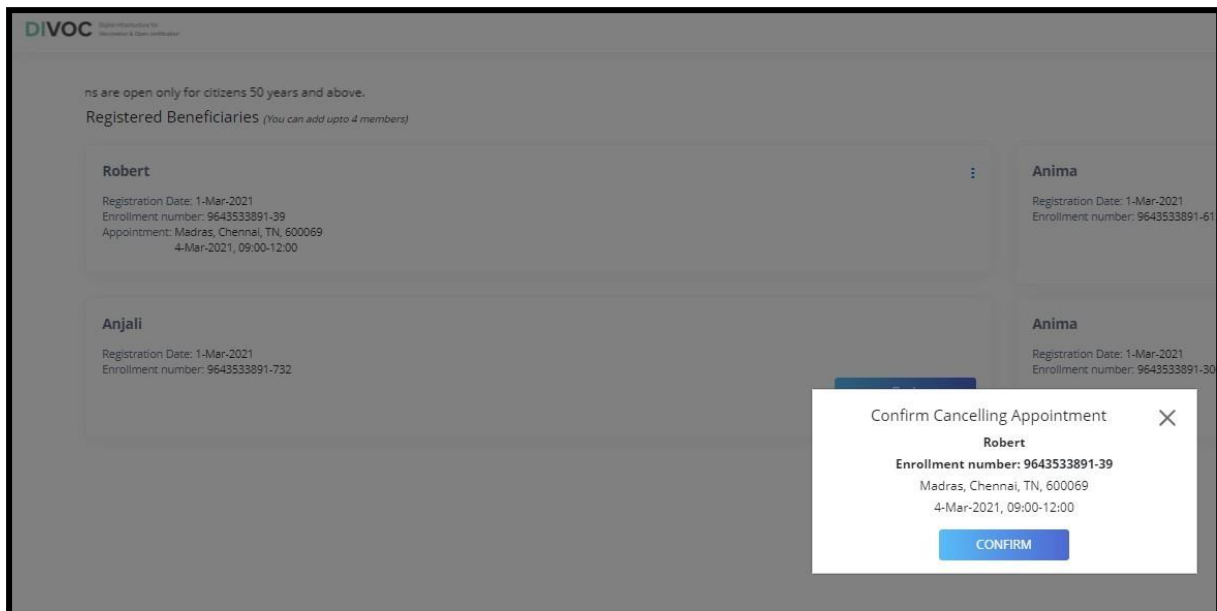
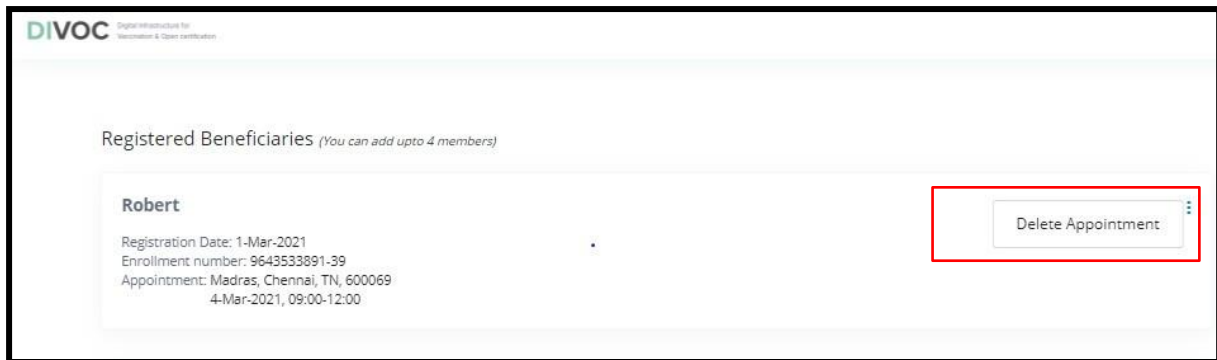
Enrolment number: 9643533891-39

Booking details will be sent to registered mobile number and email.

Please carry ID proof used for registration when you go to facility for vaccination.

Done

## Delete appointment



### 3.3 Vaccination Module

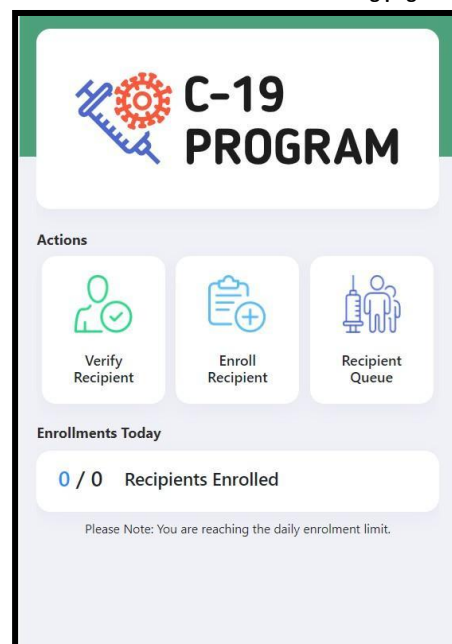
Vaccination module is an application-based module to be used by facility staff to carry out day-to-day tasks in the facility. This is a multilingual application and the staff can choose the language as per their comfort and convenience. The vaccination module has the following features:

- Verification of beneficiaries which were pre enrolled in the system at the time of registry set up by System Admin.
- Enrolment of beneficiaries who walk into the facilities for on the spot registration and vaccination.
- Recipient queue to view and manage the list of beneficiaries enrolled into the system.
- Multilingual application to choose the language by the user.

**LOG IN:** <<the production URL will have to be provided by the country>>

- Verify pre enrolled recipients
- Enrol walk in recipients
- Manage recipient queue

Vaccination Module landing page



## Verification and Enrolment of recipients by Facility Staff\*

Verify Recipient

Enter Mobile Number & Pre Enrolment Code

+91-XX|XXXXXX

XXXXX

CONFIRM

Enroll Recipient

Name\*

Anima

Select Gender\*

Female

Nationality\*

Indian

Date of Birth\*

12-01-1995

Email\*

anima123@gmail.com

Email

anima.rawat@in.ey.com

Mobile No.\*

9643583821

\*Input screen

Recipient Queue

No	Name	Status
1	Anima Female, 1995-01-12	

1 Recipient Waiting

0 Certificate Issued

Recipient Queue

## Assigning Vaccinator and Batch to recipients in the

Confirm Vaccinator and Batch

Nayan A

Krishna Reddy

Vaidya Acharya

Narayan Reddy

Test User

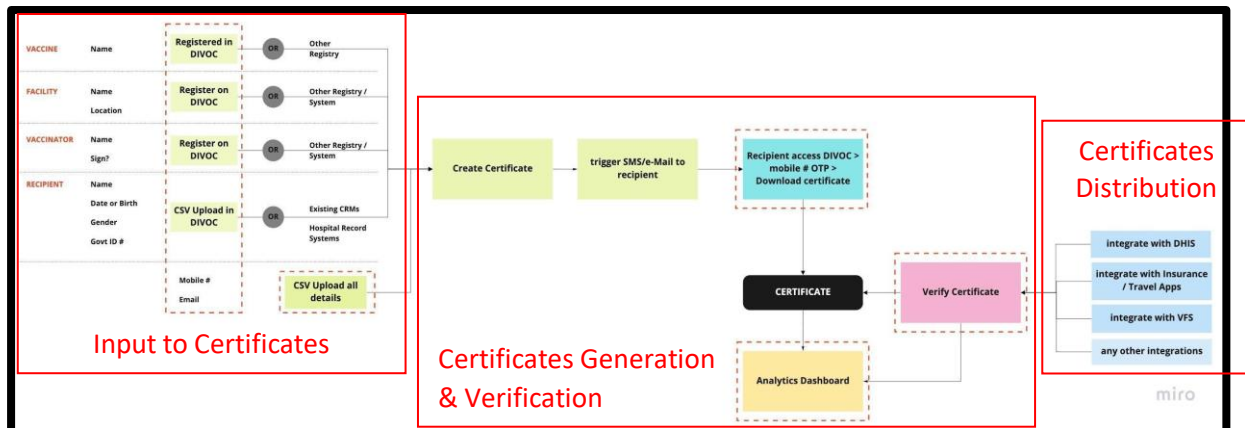
sagar

Narayan Reddy

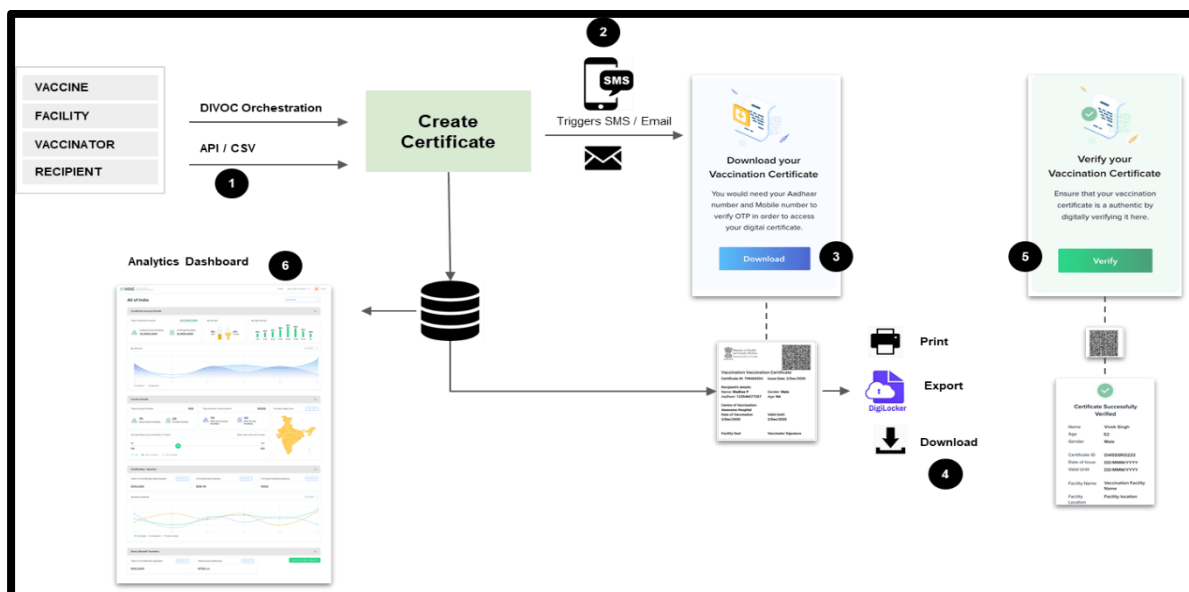
NEXT

### 3.4 Digital Certification Module Overview

The Certification module in DIVOC has been developed on the principle of Plug & Play with microservice and API based architecture. This allows the module to work Independently and can integrate with other modules of DIVOC or any external application/portal/system.



#### System Flow: Certificate Input and Generation by Facility Staff



#### Certificate Input:

- Input for the certificate can be provided in four separate methods:
  - From DIVOC Orchestration Module
  - Using API Call from any other parallel application
  - Manual CSV upload
  - Manual Form Entry
- The Certificates templates are configurable
- Following are the Sample Inputs for Certificate generation
  - Recipient Details (Name, Gender, Age, Aadhaar (or any National ID))
  - Centre of Vaccination with Facility Seal
  - Vaccinator Details with Signature

- Date of Vaccination
- Validity of Certificate

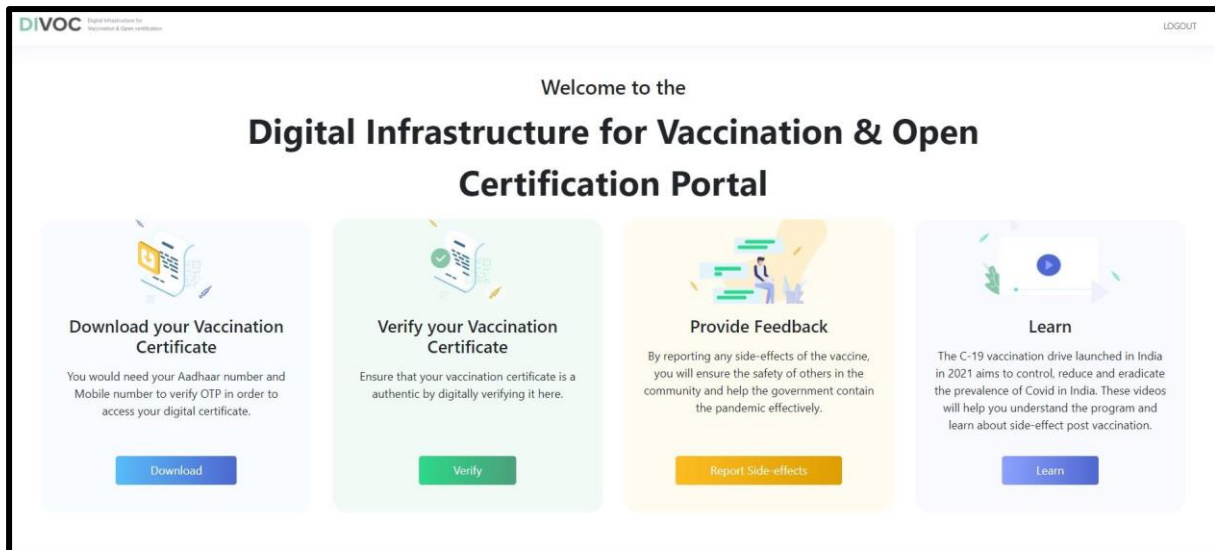
*Input Process:*

- **Certificate Input using CSV Upload**
  1. User Click on Certificate Entry tab
  2. User Click on “Upload CSV” option on screen
  3. Select the File and Upload
    - File content should be in provided templatized format
    - On successful import, data will get added in portal and shown in of Table
    - On failure, list of failed records will be shown. The error logs are also available for downloading
- **Certificate Input via Manual Form Entry**
  1. Click on Certificate Entry tab
  2. Click on “Enter Certificate Details”
  3. Enter Following Details
    - a. Recipient Details (Name, Gender, Age, Aadhaar (or any National ID))
    - b. Centre of Vaccination with Facility Seal
    - c. Vaccinator Details with Signature
    - d. Date of Vaccination
    - e. Validity of Certificate
  4. Click on Save
- **Certificate Input via API call from Orchestration module of DIVOC or Other Parallel Application**
  1. Service call will be made from application backend with Manual, Automated or Scheduled Trigger
  2. Please refer Annexure A for details on API Calls

*Certificate Generation Process:*

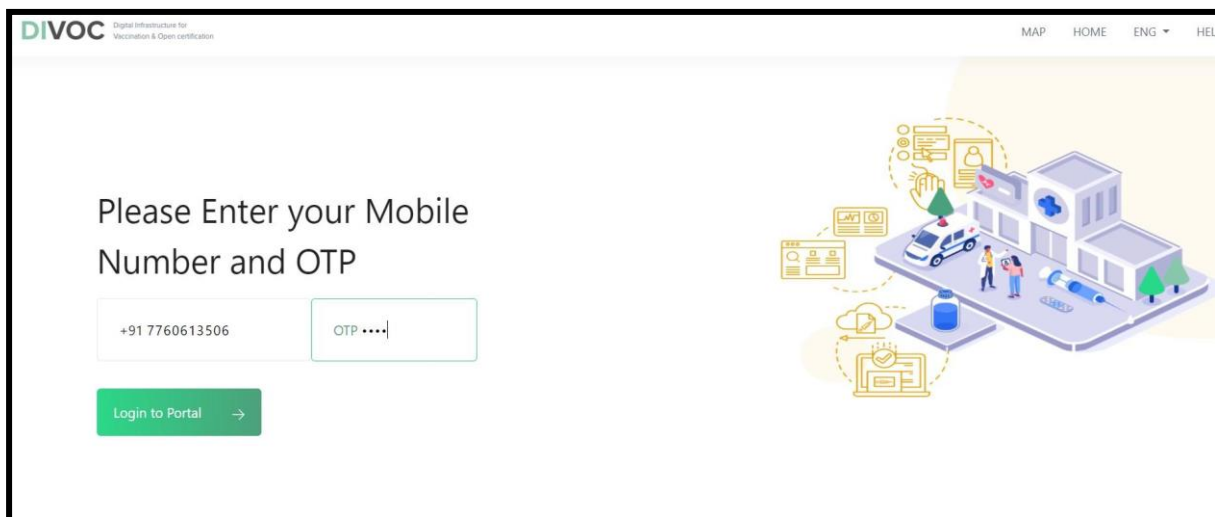
- On generation of Certificate based on provided inputs, system will trigger and send Email/SMS to recipient for user to Print / Export / Download it
- The Generated certificate will have Bar/QR code for its verification and confirmation
  1. Open URL: <<the production URL will have to be provided by the country>>
  2. Click on Download Certificate






### 3. Enter Mobile Number and OTP

#### Mobile number login page for vaccinated recipients accessing vaccination certificate




4. Click on Print or Download Certificate
5. On Click, Certificate will be available to Download/ Upload to Document repository/Print

### Sample Covid-19 vaccination certificate



COUNTRY  
LOGO

Provisional Certificate  
for COVID-19 Vaccination  
(1st Dose)



Beneficiary Details

Beneficiary Name / लाभार्थी का नाम

Anjali

Age / उम्र

33

Gender / लिंग

Female

ID Verified / पहचान पत्र सत्यापित

Beneficiary Reference ID

1612783368663

Residing at / पता

Delhi, Delhi

Delhi

Vaccination Details

Vaccine Name / वैक्सीन का नाम

covin

Date of Dose / खुराक की तारीख

08 Feb 2021 (Batch no. 12345)

Next Due Date / अगली नियत तिथि

after 28 days


Vaccinated by / टीका लगाने वाले का नाम

Test Vaccinator one

Vaccination at / टीकाकरण का स्थान

Delhi Hospital 1, Delhi

Delhi



PROGRAM  
LOGO

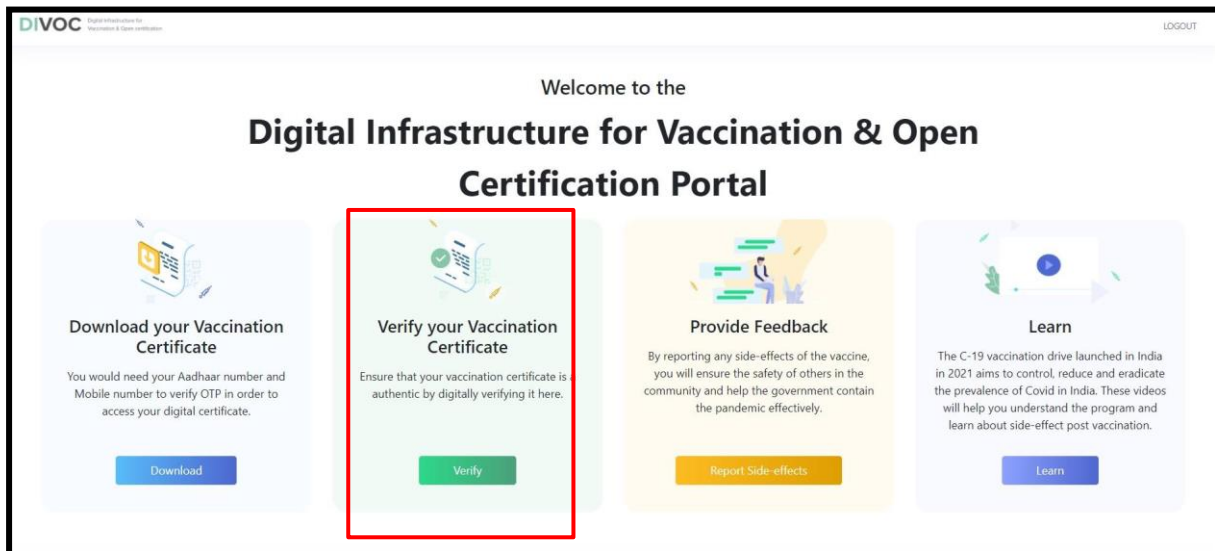
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Call Helpline Number 0000

भारत सरकार द्वारा, कोविड-19 रोकथाम के लिए, एक अभियान शुरू किया गया है। यह अभियान देश भर में चल रहा है। हमें इस अभियान में सक्रिय भाग लेना चाहिए। हमें अपने अपने क्षेत्र में जाकर लोगों को टीका लगाने के लिए प्रेरित करना चाहिए। हमें अपने अपने क्षेत्र में जाकर लोगों को टीका लगाने के लिए प्रेरित करना चाहिए। हमें अपने अपने क्षेत्र में जाकर लोगों को टीका लगाने के लिए प्रेरित करना चाहिए।

### Certificate verification process

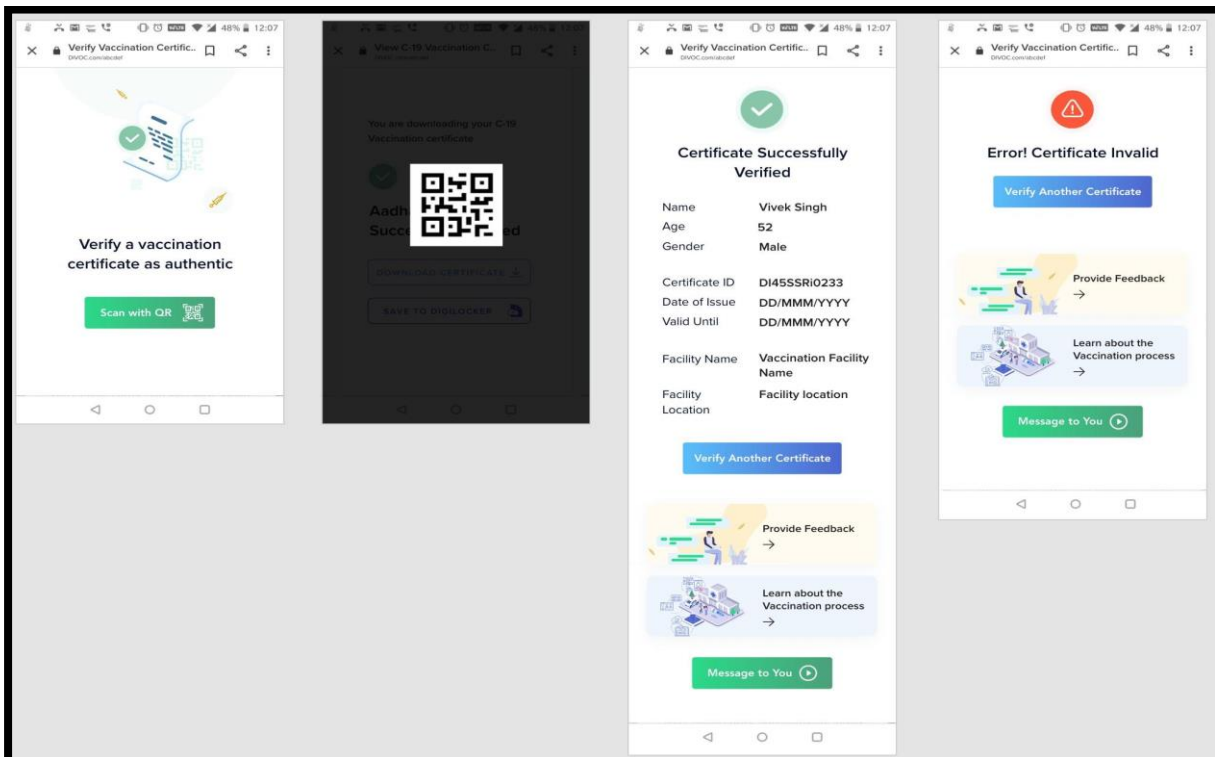
- Recipient can access DIVOC public portal
- Click on Verify Certificate

## Public portal landing page for certificate verification



- Scan the QR Code
- On Successful verification, Certificate details will be shown on screen
- On Un successful verification, message will be shown as “Certificate Invalid”

## Certificate Verification process followed by vaccinated recipients



Verification of the Certificate can be done by other 3rd party systems, by consuming the Verification

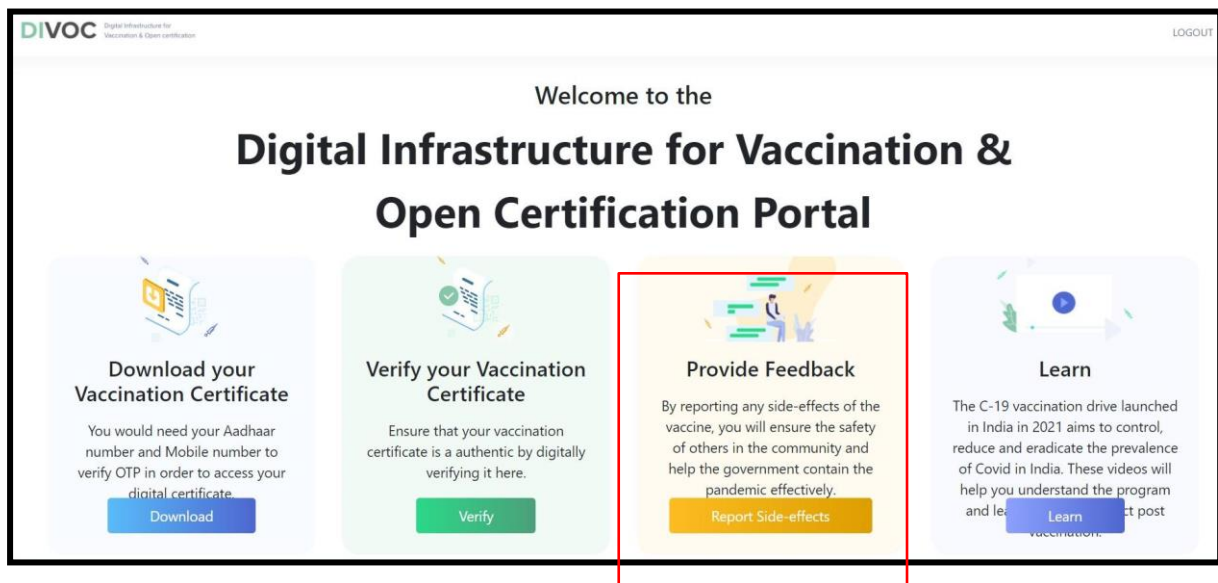
### 3.5 Feedback Module Overview

Like other DIVOC modules, Feedback module also has Plug and Play with Micro-Service and API based architecture. The module works Independently and can integrate with other modules of DIVOC or any external application/portal/system.

**LOG IN:** <<the production URL will have to be provided by the country>>

- Choose Provide feedback on DIVOC homepage
- Click on Report side effects
- Select and confirm symptoms

#### Public portal landing page for feedback on vaccination



#### Reporting of side-effects post vaccination by vaccinated recipients

Provide Feedback

By reporting any side-effects of the vaccine, you will ensure the safety of others in the community and help the government contain the pandemic effectively.

Report Side-effects

Select Symptoms

Temperature

90

90°F108°F

Arm Soreness

No

Chills

No

Cough

No

Fatigue

No

Flu-like symptoms

No

Headache

No

Migraine

No

- On confirmation of symptoms, a login page will be displayed where users can login using their mobile number and OTP.
- On successful login, a patient verification page will be displayed, and users can choose amongst list of patients and confirm submission after verifying details
- Once the patient has submitted the feedback, a notification to the healthcare facility where the patient was vaccinated will be sent. The screen displays details of the nearest health facility that the patient can visit in cases of emergency and extreme symptoms.

#### Patient identification on feedback module

Can you help us identify the patient with these symptoms

Please choose the patient

☐ Sagar  
Male, 32

☐ Anjali  
Female, 33

Can you help us identify the patient with these symptoms

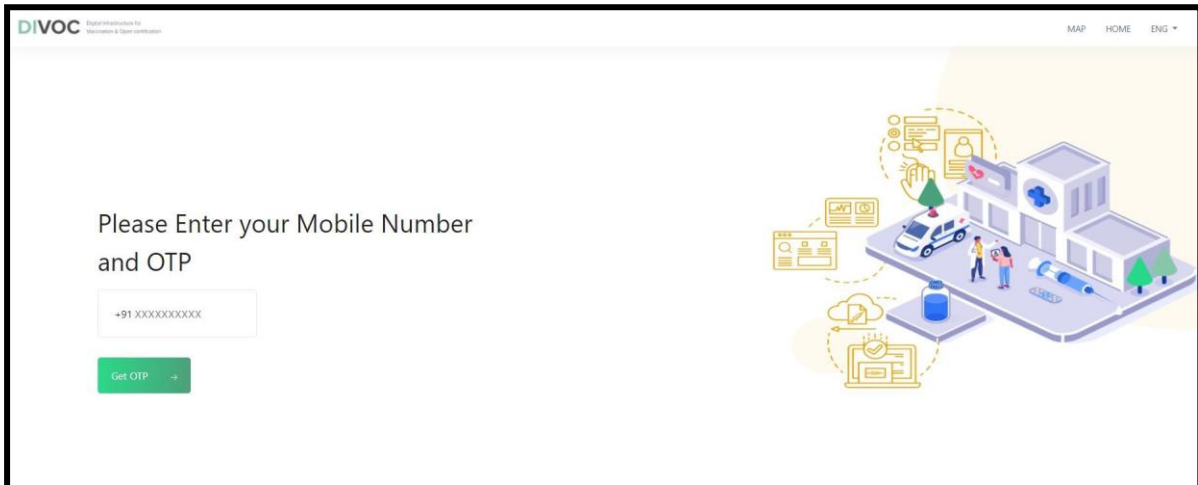
Name	Anjali
Age	33
Gender	Female
Certificate ID	723903368
Date of Issue	2021-02-08
Valid Until	2021-03-08
Dose	1
Total Doses	2
Vaccination Facility	Delhi Hospital 1

☒ I confirm that this patient is having the identified symptoms

### 3.6 Dashboard

- National/State/Facility Level Dashboard
- Heat Map
- Performance Monitoring
- Showcase Funding's distribution and its Utilisation
- Highlights Vaccination Rate
- Feedback tracker

#### Login page for DIVOC dashboard



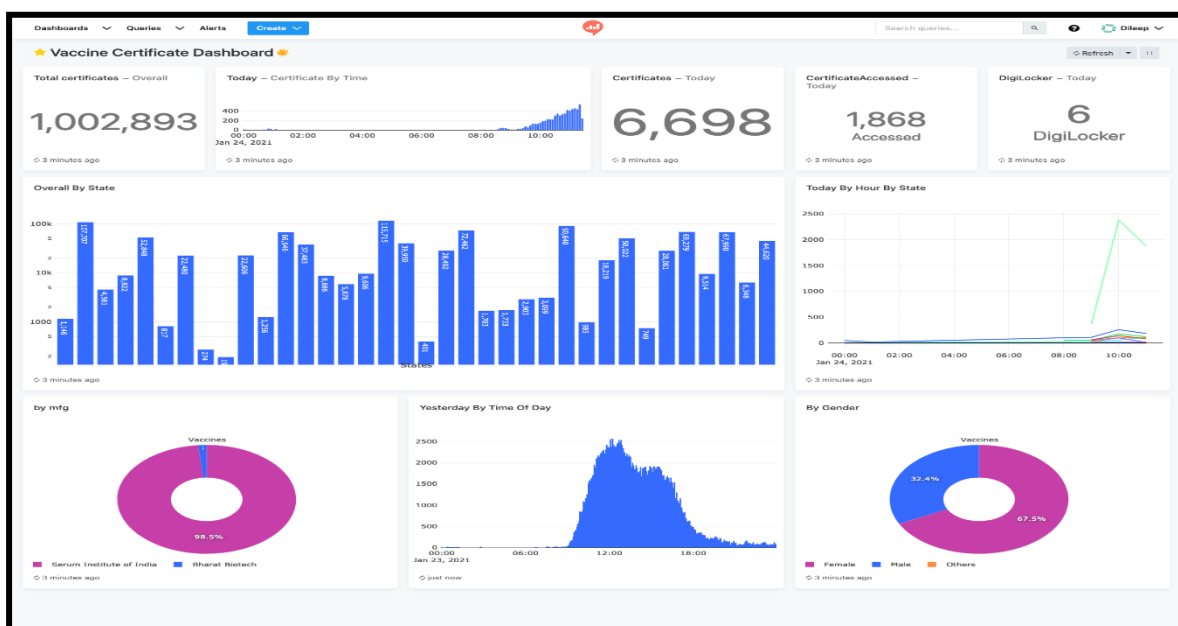
The login page for the DIVOC dashboard features a clean, modern design. On the left, there is a text prompt "Please Enter your Mobile Number and OTP" followed by a text input field containing "+91 XXXXXXXXXX" and a green "Get OTP" button. On the right, there is a colorful illustration of a healthcare facility with a building, a car, and people, surrounded by icons representing various services like a microscope, a person, and a document. The top navigation bar includes links for "MAP", "HOME", and "ENG".

The dashboard gives reports on the following:

1. Certificate issuing details – gender, age group, date, region
2. Certificate download details – date-wise download, verification and invalid verification
3. Facility details – total issuing facilities, total number of vaccinators and average rate across facilities

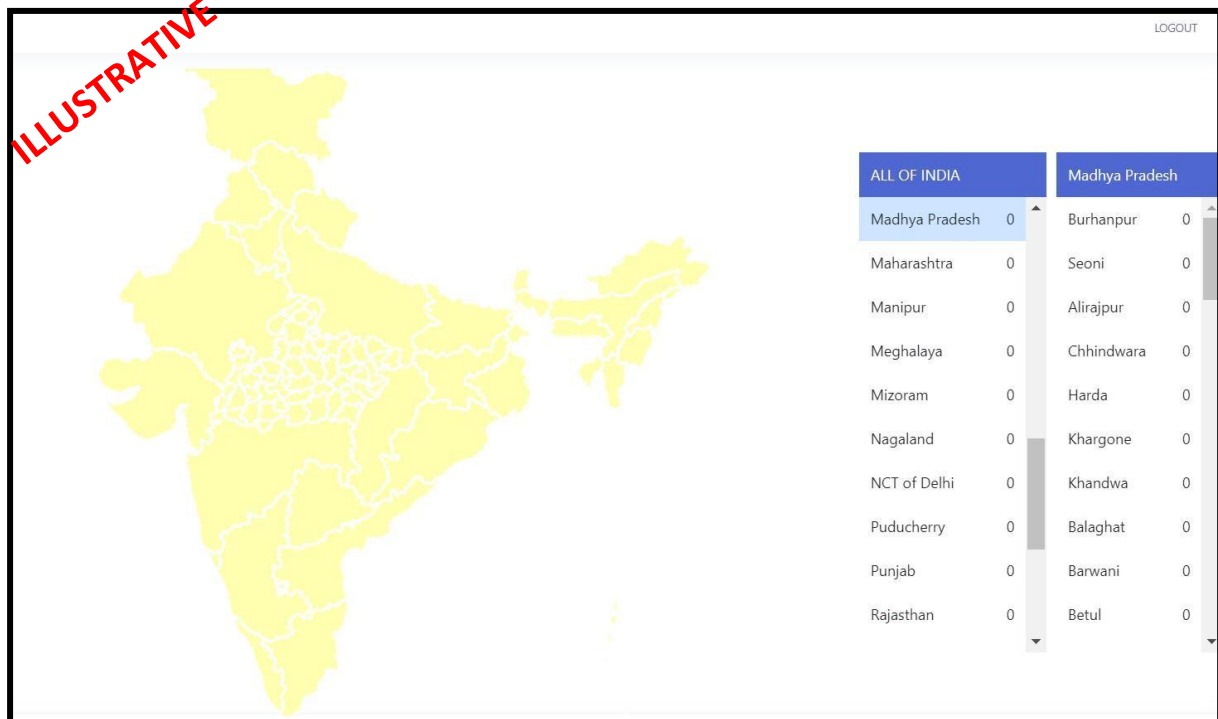
It helps the authorities in Planning Immunisation Drive, determining fund utilisation and carrying out real time monitoring of Vaccines efficacy.

#### DIVOC dashboard



**Analytical Dashboards on Generated Certificates:**

- DIVOC provides details on Certificate generation and its distribution for further analysis on following indicators
  - a. Region (Geographical)
  - b. Gender / Age
  - c. Type of Facility
  - d. Fund Type
  - e. Other
- Users can Drill Down and based on User level dashboard will be visible for detailed analysis of certification generation across the country. An illustrated use case for India has been depicted below.

**Illustrative geographic drill down feature on DIVOC dashboard**

## Chapter 4: Effort Estimate Template

The table below summarizes a template for countries to estimate efforts for customising DIVOC for country-specific requirements, customisation/configurations and deployment. The table is only illustrative in nature, and the intent is to help country authorities make the necessary planning considerations, when customizing and deploying DIVOC for their vaccine programs.

Effort Estimation			Resource Type wise efforts				
S. No	Activities	Effort (Man Months)	BA	Developer	Sr. Developer	Tester / QA	System Admin
1	Requirement						
2	Design						
3	Customisation and Configuration of DIVOC						
4	System Integration Testing						
5	Security Testing						
6	Performance Testing						
7	User Acceptance Testing (UAT) & Bug Fixing						
8	Implementation & Rollout						
Total Customisation and Rollout Effort (Man-Months)							
9	Support and Maintenance of only Application for remaining 6 months						
10	Capacity Building						
Overall Efforts							