

# DIVOC

Digital Infrastructure for Vaccination Open Credentialing

Pronounced \ dī-vōk \

DIVOC

## SHARED VISION

Enable countries to digitally orchestrate large scale vaccination and certification programs using open source digital infrastructure as a public good.

# Large scale vaccination needs multiple systems interplaying seamlessly and orchestrated digitally



VACCINE  
TESTING, APPROVALS,  
SUPPLY MANAGEMENT

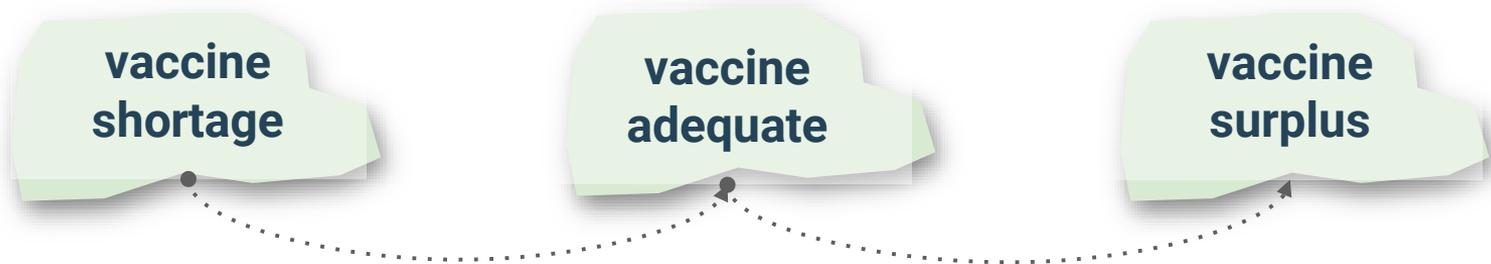


TRAINING,  
CERTIFICATION  
FIELD SUPPORT



ROLLOUT, MONITORING  
VACCINATION, FEEDBACK,  
CERTIFICATE ISSUANCE

## WE EXPECT 3 PHASES



**Infrastructure should seamlessly allow these transitions**

# COUNTRIES NEED

An approach that works at scale (10 million vaccinations/day) and scales what works (select the right vaccines based on their efficacy , safety, etc)

An elastic system (from 10,000 vaccinations a day to 10 million a day)

Digital first design

A system which is agile and responsive

Real time observability is key (vaccines efficacy, supply issues, rollout, monitoring)

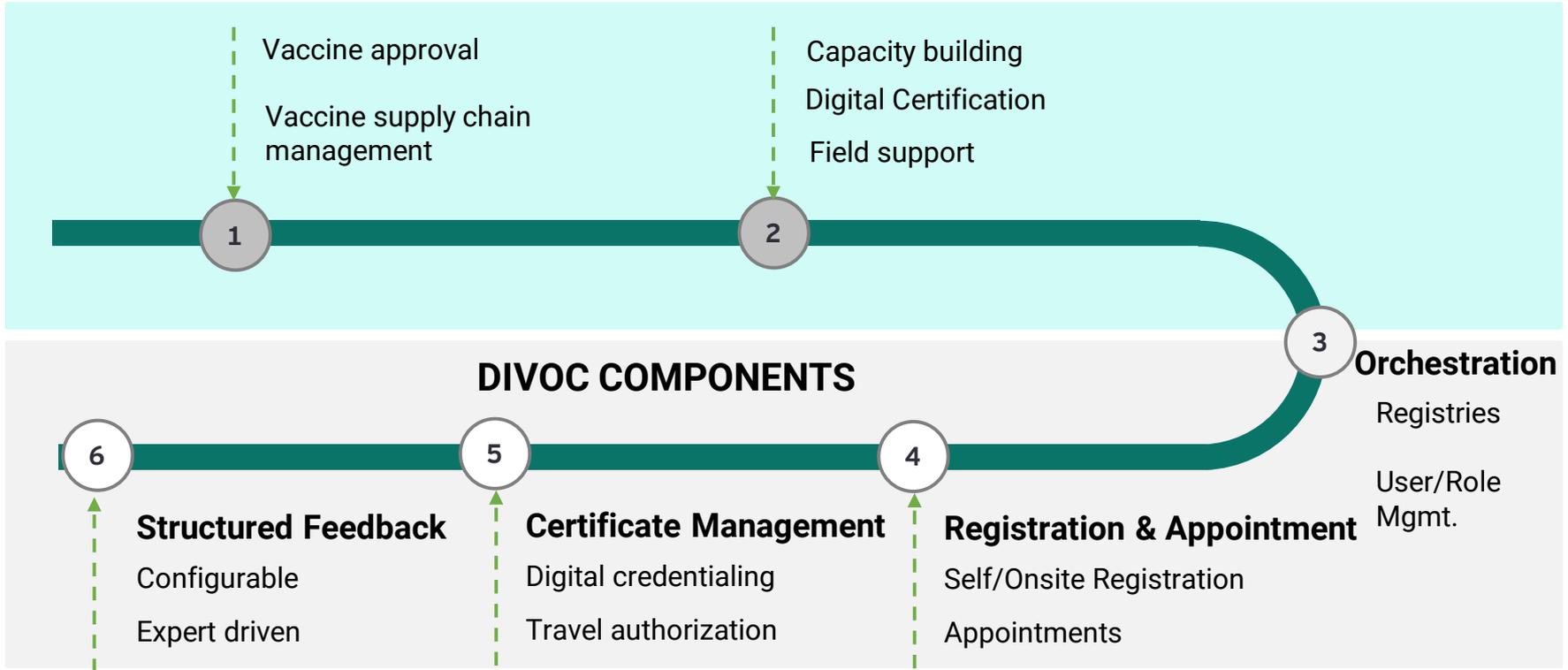
A well designed infrastructure (scale, orchestrate, monitor, evolve)

Ability to expand and manage new vaccination facilities and trained personnel

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- DIVOC**
- is a flexible & extendable software** ----- use across multiple programs, contexts, geographies
  - that helps countries to digitally orchestrate** ----- facilities, programs, vaccines across regions
  - large scale vaccination & certification** ----- digital certificate issuance, access, and management
  - using open source digital public goods** ----- built in India for the world as a digital public good
  - that is standards driven, scalable, & secure** ----- built for population scale using global standards
-

# DIVOC'S ROLE IN COUNTRY ROLL OUT

## WHAT DO COUNTRIES HAVE AND WHAT MORE IS NEEDED?\*



\*Countries need underlying IT infrastructure to support the vaccination roll out

## Guiding Principles

- **Versatile**
- **Allows for plug & play**
- **Trustworthy**
- **Citizen-centric approach**

## Architecture Principles

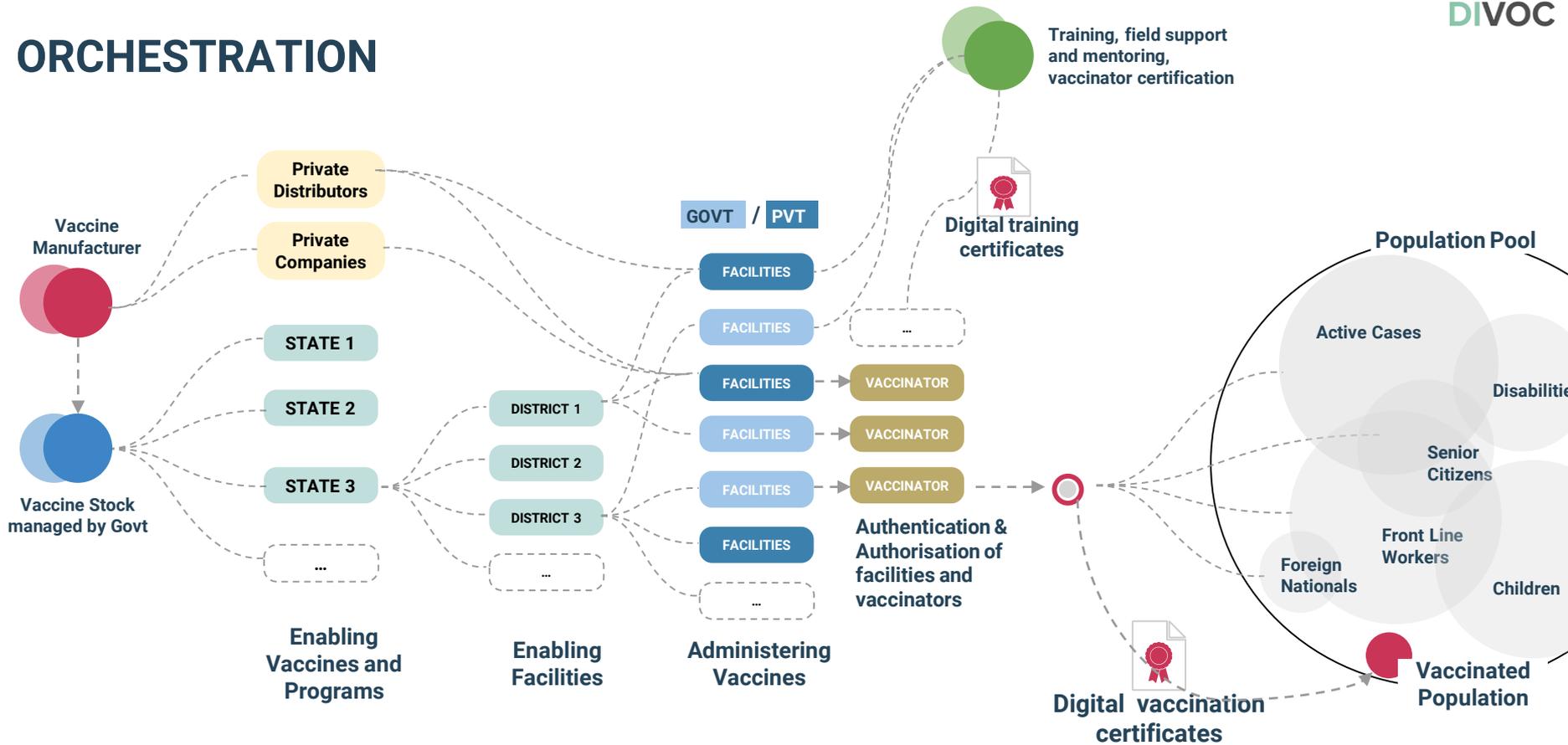
- **Micro-services & API based**
- **Interoperable**
- **Scalable**
- **Flexible & Configurable**
- **Observable**
- **Resilient**
- **Privacy & Security by design**
- **Open Standards**
- **Trustable**
- **Internationalizable**

# ORCHESTRATION MODULE

# Establishing the Registries for the Vaccination Program

PROGRAM REGISTRY	VACCINE REGISTRY	FACILITY REGISTRY	VACCINATOR REGISTRY
Vaccination programs	Approved vaccines	Approved facilities	Trained vaccinators
Active status	Active status	Location	Active status
Allowed vaccines	Vaccination schedule	Active status	Training certificate
Start and End dates	Batch deny list	Vaccination daily rate	Associated facilities
Certificate templates	Max retail price	Total supply	Rating & Feedback
	Vaccination method	Rating & Feedback	
	Age/Gender/Geo filter	Maximum vaccination stations	

# ORCHESTRATION

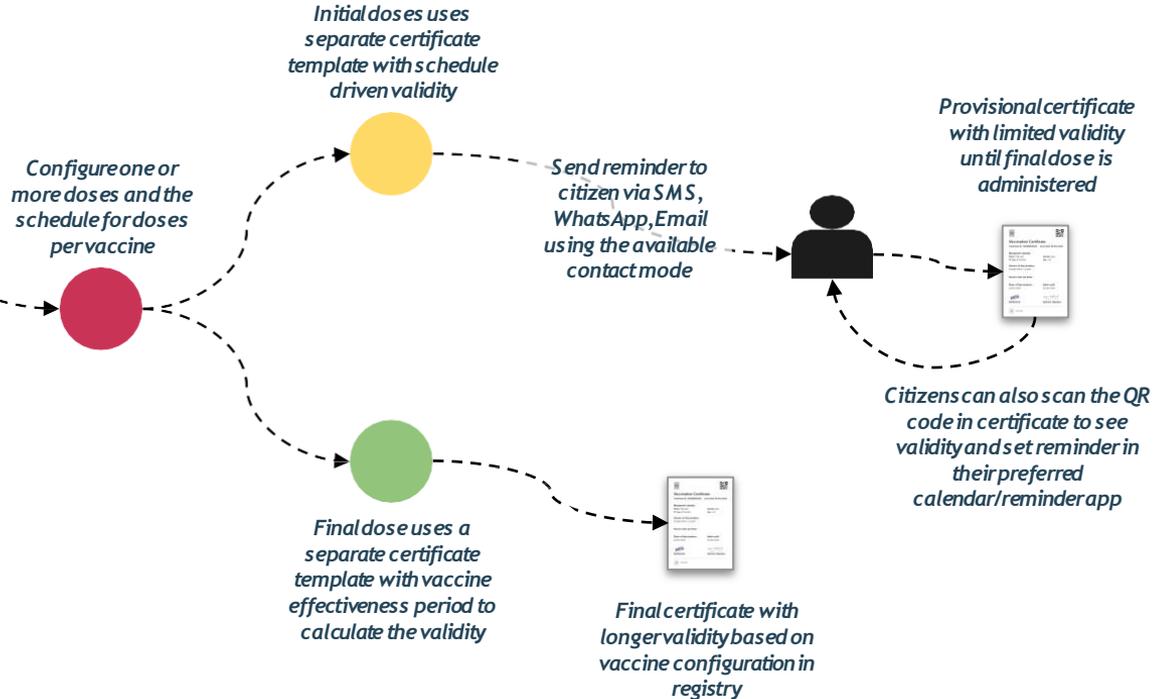


A platform to orchestrate the complexity within an ecosystem of diverse players to administer a vaccine program across the country successfully.

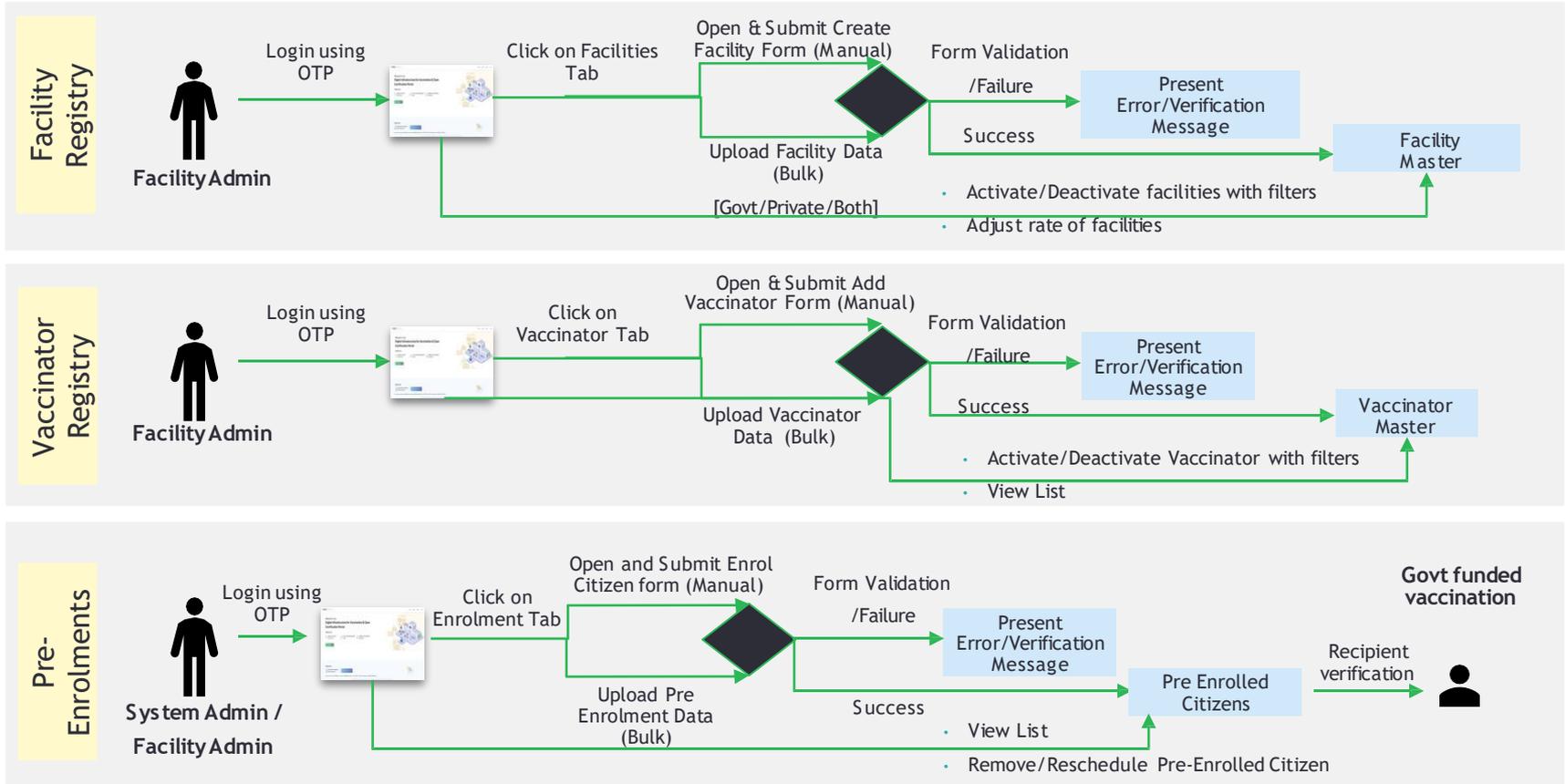
# HANDLING MULTIPLE DOSES AND REMINDERS

## VACCINE REGISTRY

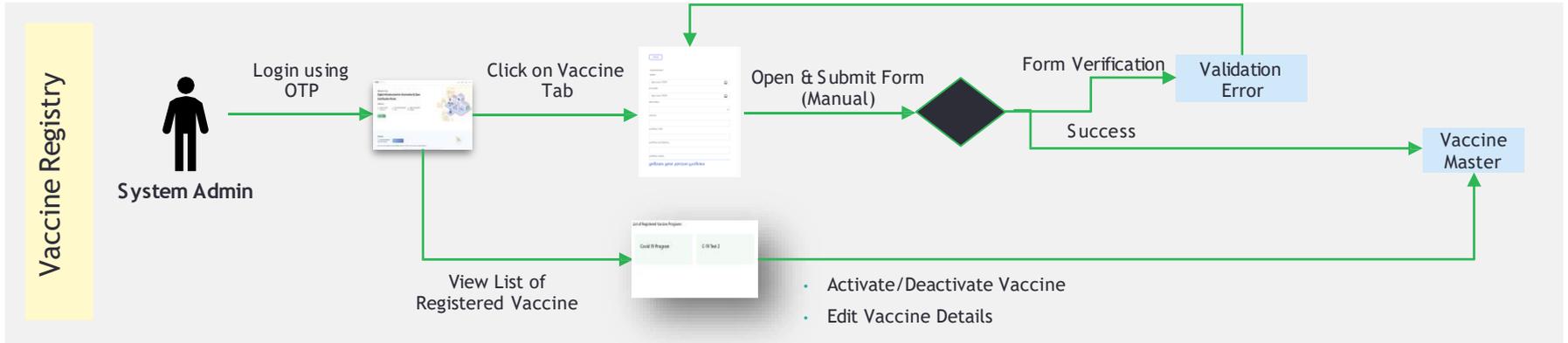
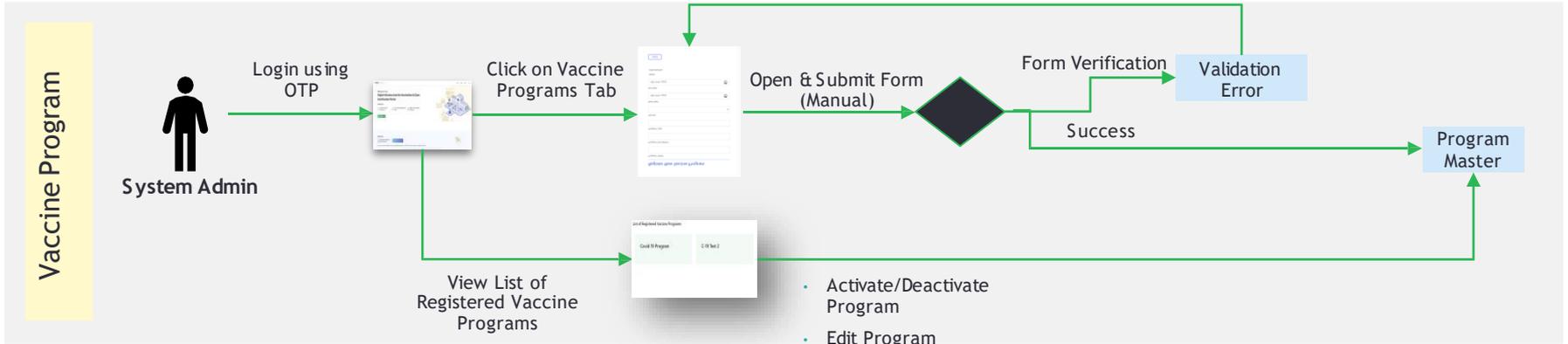
- Approved vaccines
- Active Status
- Vaccination schedule
- Batch deny list
- Max retail price
- Age/Geo/Gender Filter
- Rule if any (in future)
- Vaccination Method



# USER JOURNEY: Admin - Management Portal (1/2)



# USER JOURNEY: Admin - Management Portal (1/2)



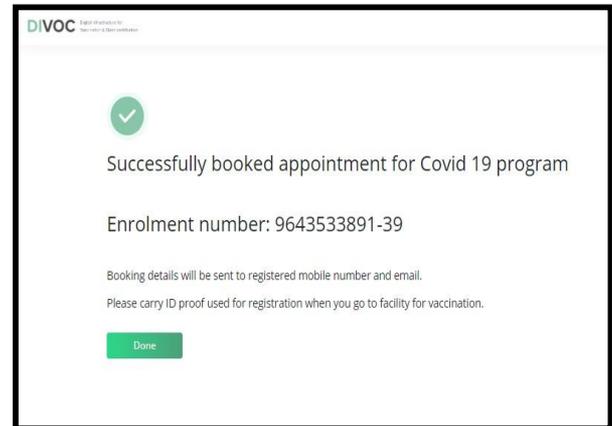
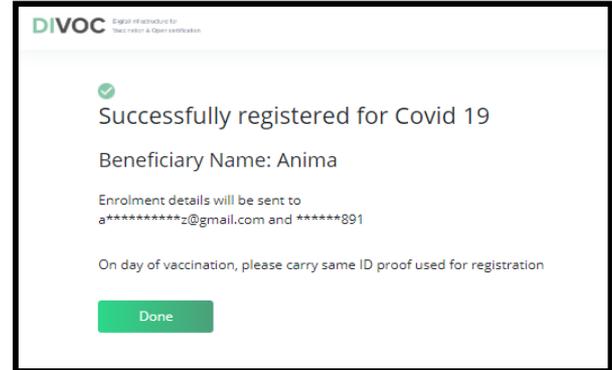
# REGISTRATION & APPOINTMENT MODULE

# Self-Registration & Appointment Scheduling

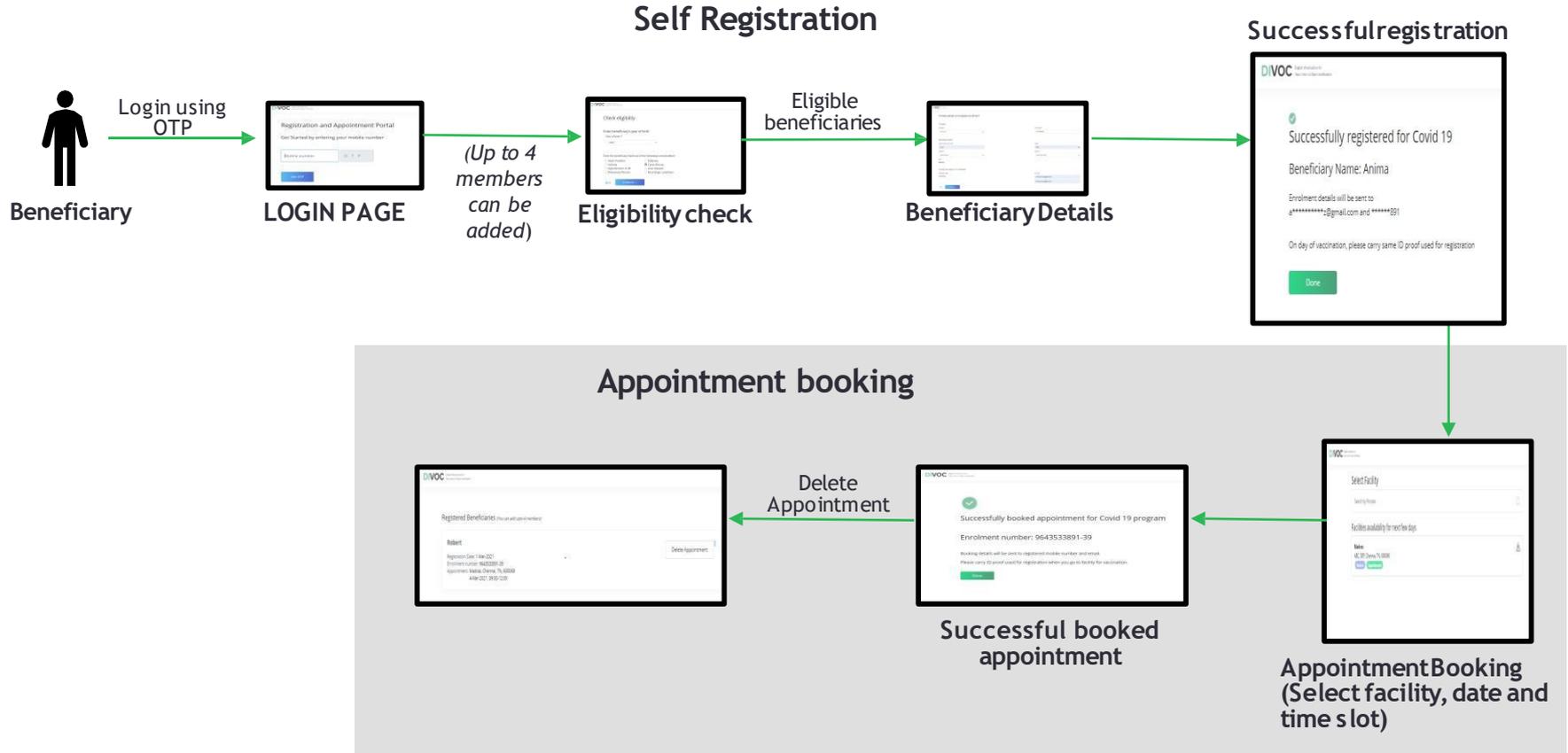
Provision to enable self-registration and appointment scheduling by citizens for the country's vaccination drive.

Features included are:

- Selection of vaccination program(s)
- Conduct eligibility check (program-based)
- Provision to register up to 4 members, using one Mobile number
- Provision for selecting health facilities using Pin/ZipCode
- Provision for viewing available facility slots and scheduling appointment(s)
- Provision to delete appointment(s)



# USER JOURNEY: DIVOC – Registration & Appointment Module



# CERTIFICATE MANAGEMENT MODULE

# VACCINATION CERTIFICATE

- Conforming to WHO-DDCC/IHR guidelines\* based on W3C verifiable credential\* specifications
- Aligns with FHIR data model
- 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
- Integrable to health Lockers and certificate lockers
- Easy integration with immunization e-registry



country  
emblem



## Vaccination Certificate

**Certificate ID : DI45SSRI0233    Issue Date: 23 Dec 2021**

**Recipient's details:**

Name: First Last	Gender: xxxx
ID Type: ID Number	Age : XX

**Centre of Vaccination:**

Hospital Name, Location

**Vaccine Code and Name**

**Date of Vaccination:**

23 Dec 2021

**Valid until:**

23 Dec 2022



**HOSPITAL**

Facility Seal:



Operator Signature:

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logo

Ministry Name

# ENERGIZED VACCINATION CERTIFICATE



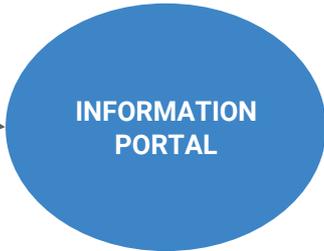
**MACHINE READABLE**  
**PRINTABLE**  
**DIGITALLY VERIFIABLE**  
**MULTILINGUAL**  
**PRIVACY PROTECTING**  
**EXTENSIBLE**



**Online & Offline verification**  
**Manage revocations**  
**Access taxonomy**  
**Access reference app**

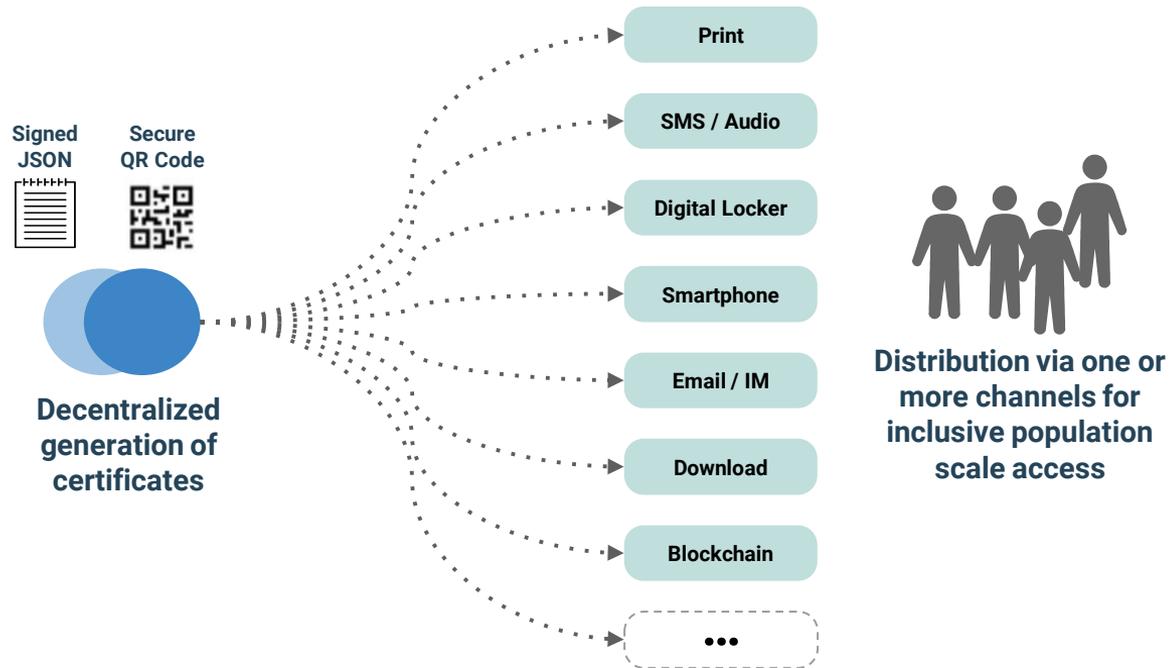


**Single click access to feedback portal**  
**Get real time feedback**  
**Access to download**  
**Get reminders**

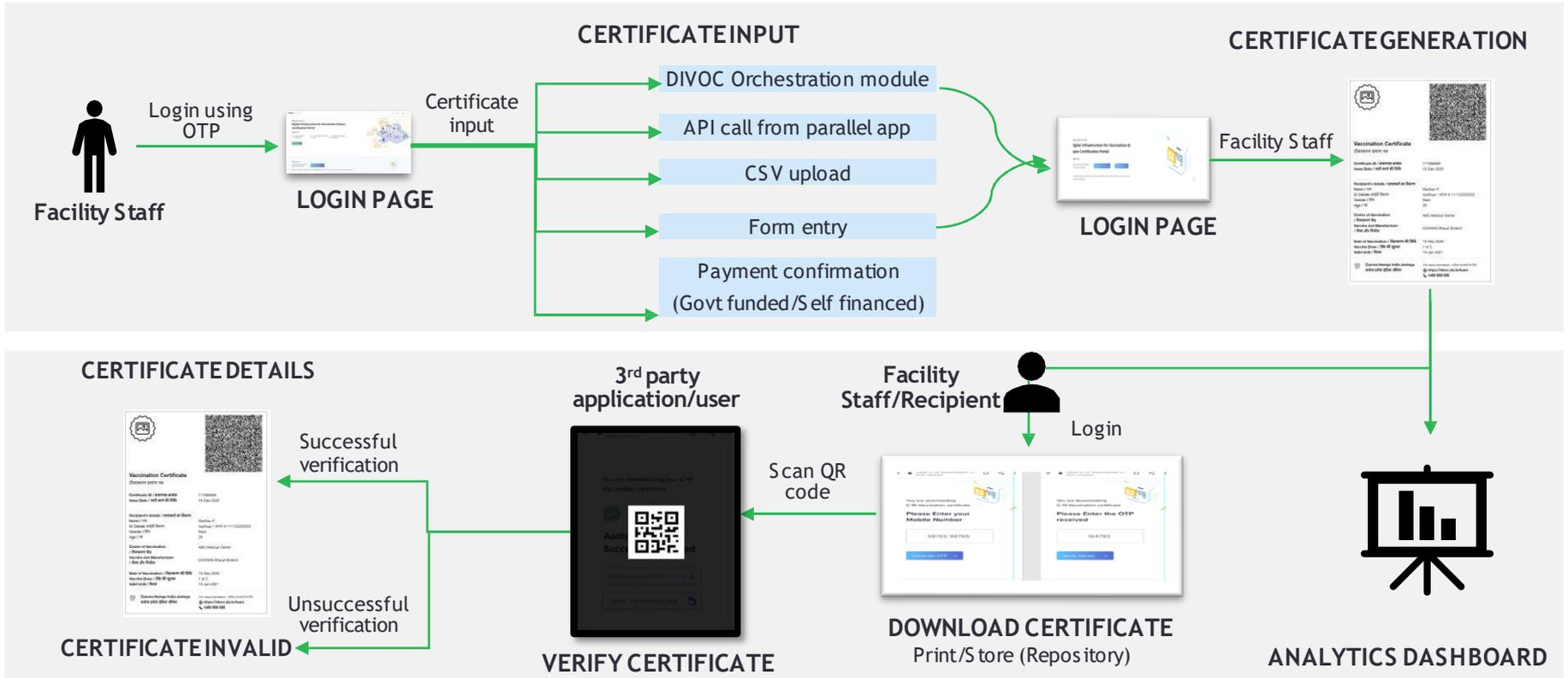


**Single click access to information portal**  
**Fight fake news and information asymmetry**  
**Dynamic information update**  
**Awareness and courses**

## ONCE THE CERTIFICATE IS ISSUED, MULTI-CHANNEL DISTRIBUTION AND PRINT SCHEMES SHOULD WORK TO ENSURE COUNTRIES AND USERS HAVE A CHOICE



# USER JOURNEY : Certificate Module



# FEEDBACK MODULE

# Citizen Feedback Mechanism

## Structured feedback

- Configurable and expert driven

## Various types

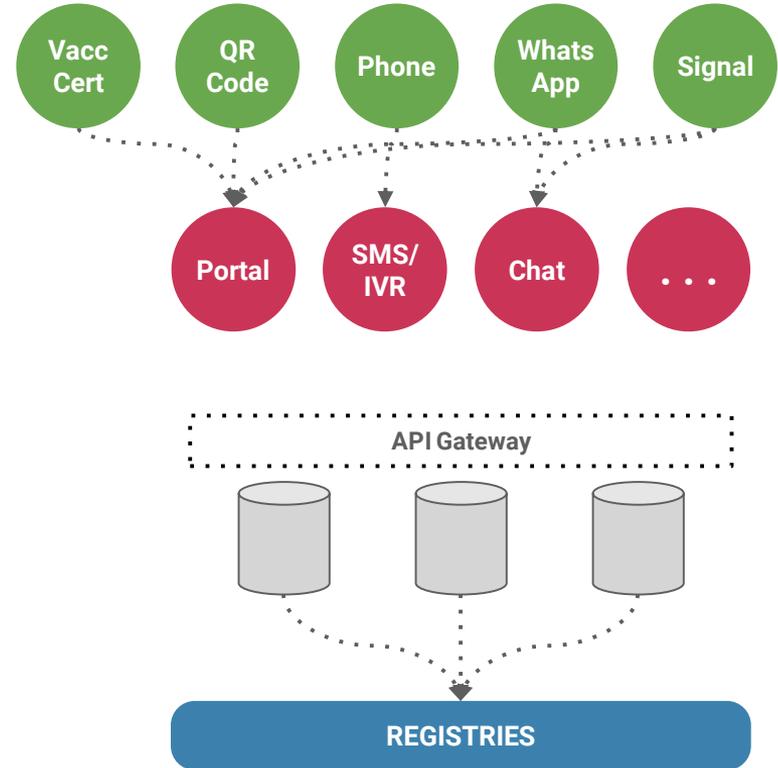
- Facility rating & feedback
- Vaccinator rating & feedback
- Vaccination response feedback

## Multi channel/lingual

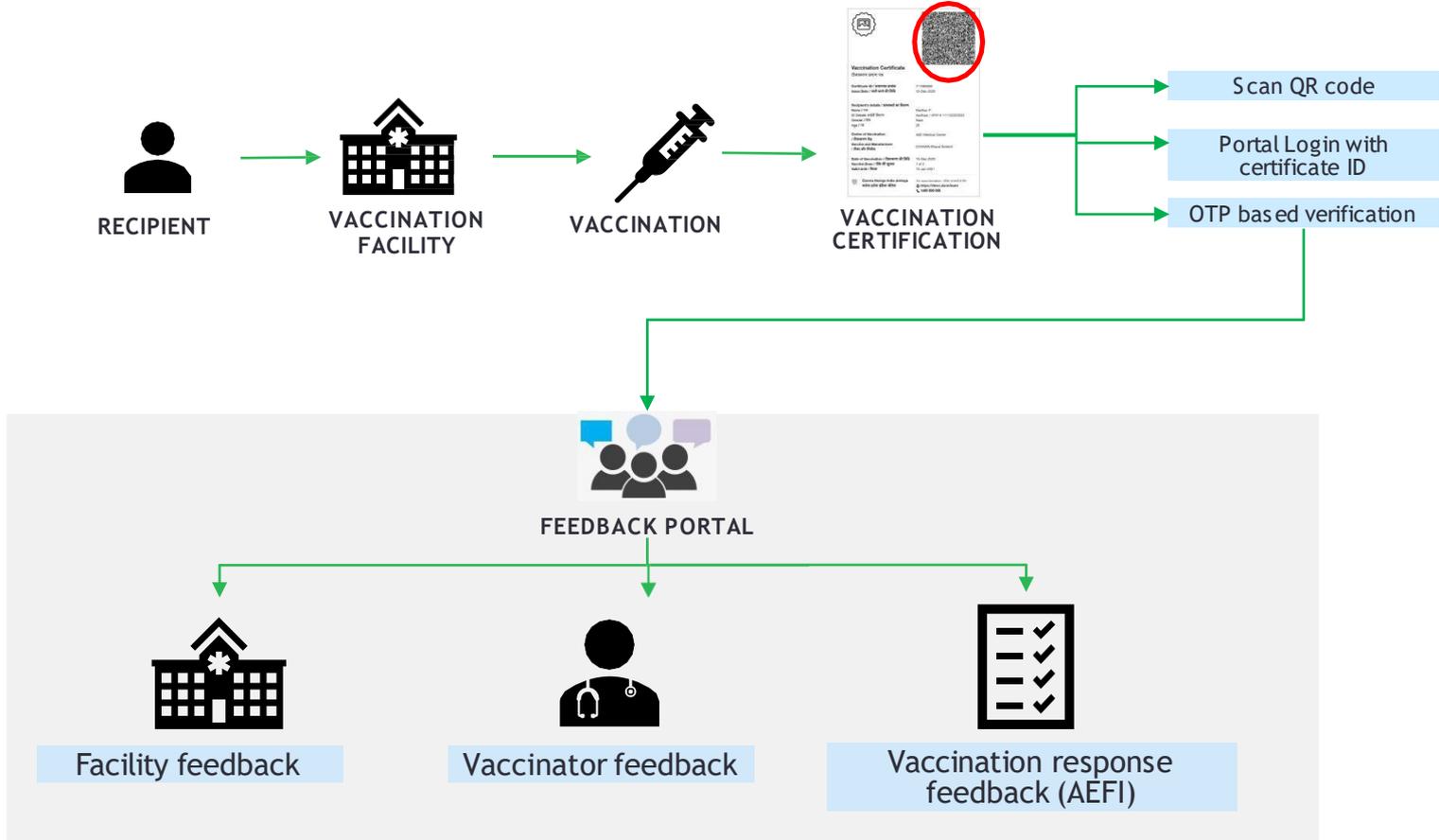
- Public portal, inbound SMS, IVR, WhatsApp, other apps via API
- Multiple languages

## Self service and assisted modes

Can be integrated with AEFI systems and processes

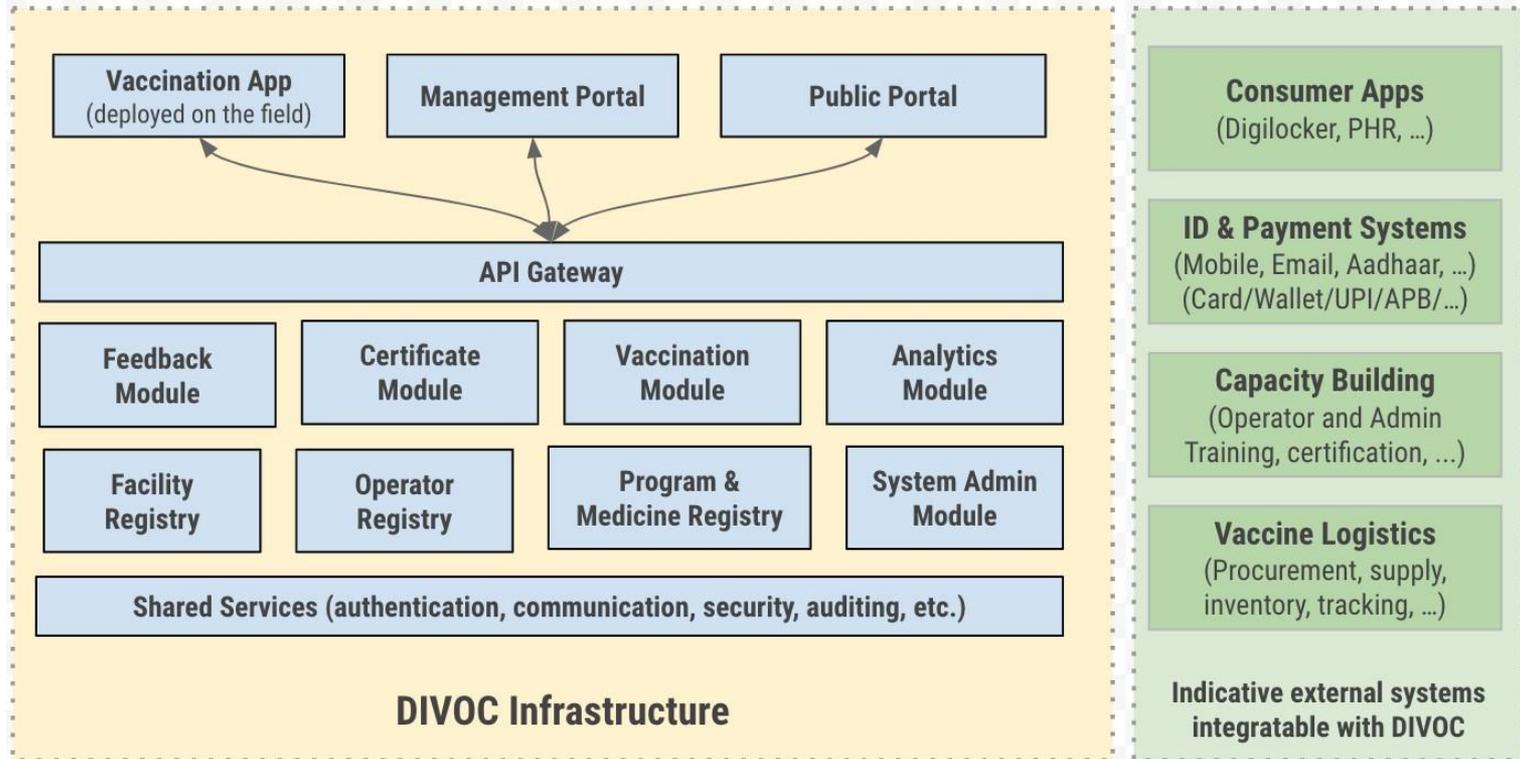


# USER JOURNEY : Feedback Module

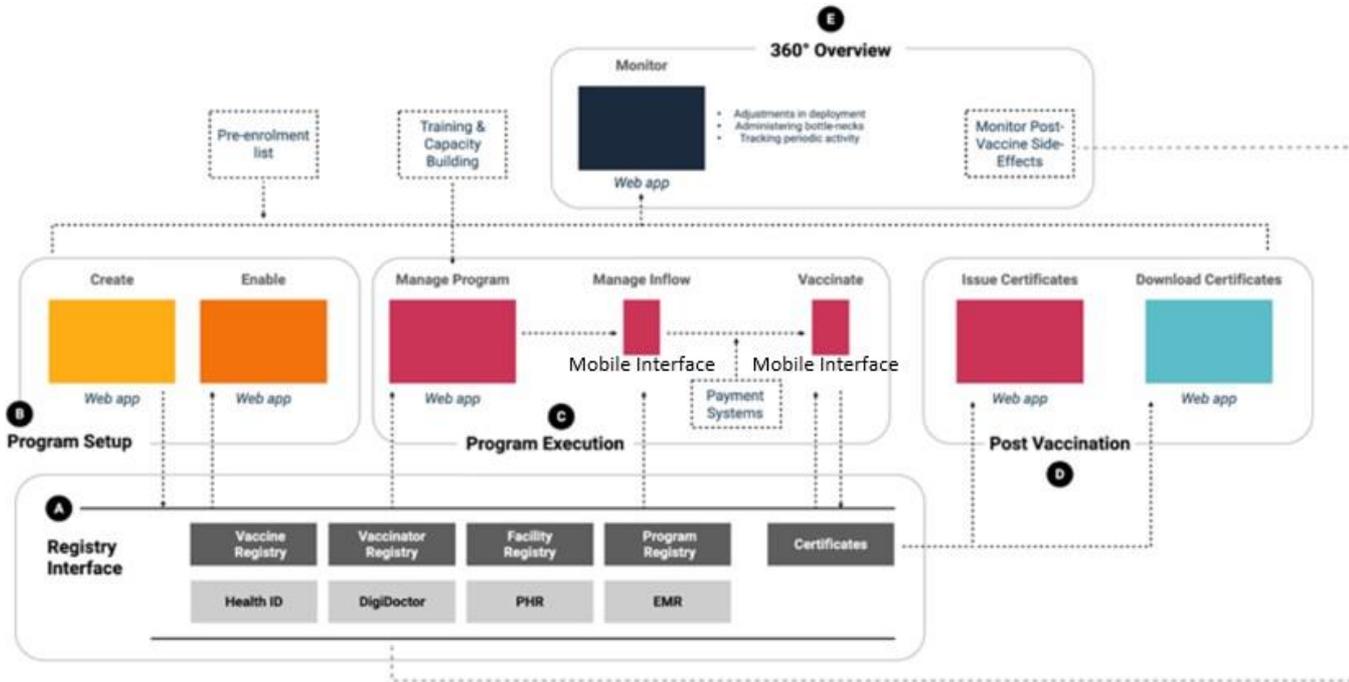


# SYSTEM DETAILS

# HIGH LEVEL ARCHITECTURE



# SYSTEM DETAILS



## REGISTRY INTERFACE

### Registry control parameters

- Facility vaccination rate
- Facility enablements
- Health worker authorisation

### Interacting with the DIVOC platform in 3 ways -

#### Using DIVOC Front-end interface

Individuals / Institutions or Facilities can use the web application to add relevant details about the vaccine, vaccine administrator and the participating facility.

#### Using Existing Registries

Seamless integration can be achieved using the DIVOC's open APIs.

#### Backend uploads by System Admin

Data from MS Excel can be used for bulk-upload of information into the registry.

## REGISTRY INTERFACE

**DIVOC** Digital Infrastructure for Vaccination & Open Certification LOGOUT

[Facilities](#) [Vaccinators](#) [Vaccine Programs](#) [Vaccines](#) [Pre-Enrollment](#) DOWNLOAD TEMPLATE ↓

**23** Records in the DIVOC Facility Registry UPLOAD CSV

### 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	

Rows per page: 10 ▾ 1-10 of 10 < >

### 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

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## PROGRAM SETUP

### Part 1

#### Vaccination Program Setup

- Approved vaccines & medicines
- Vaccination schedule
- Vaccination Method
- Program Description
- Start & End dates
- Effective until
- Price

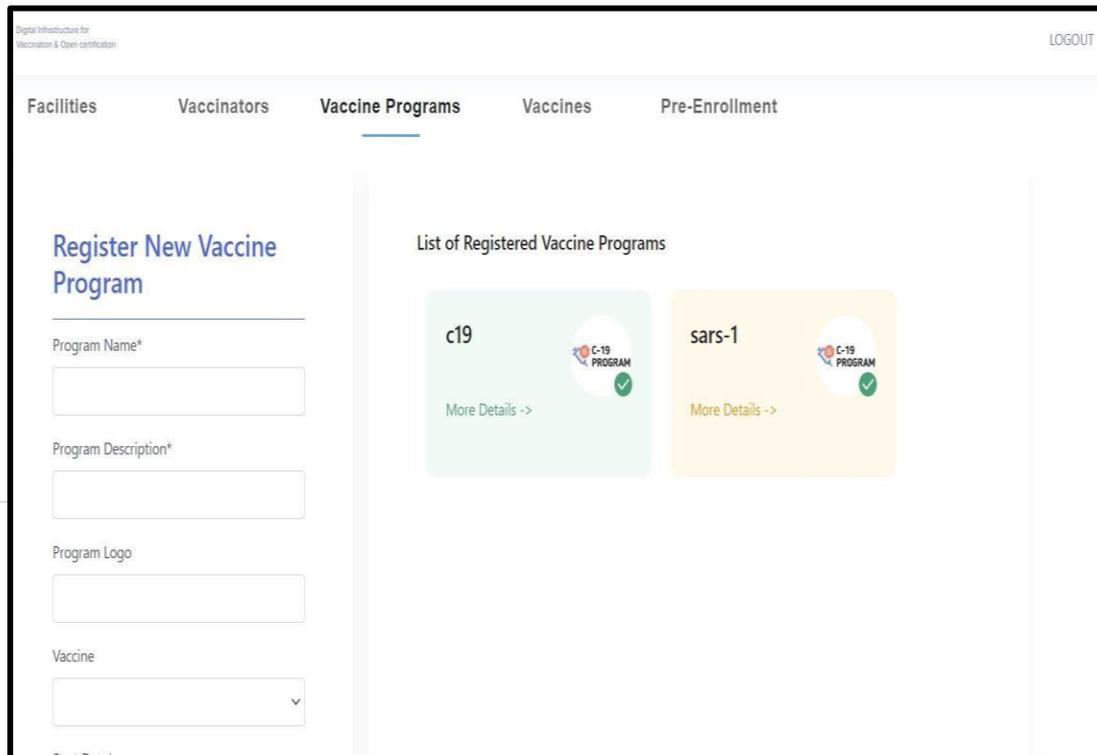
Vaccination program setup can be done by the Ministry of Health & Welfare using the DIVOC frontend interface

### Part 2

#### Execution Plan Setup

- Enabling approved facilities
- Enabling approved administrators
- Enabling zones for program deployment
- Vaccine stock allocations

Execution plan setup can be done by the Central / State / District health officials



## PROGRAM EXECUTION

### Part 1

#### Facility Admin Module

- Add / authenticate vaccinators
- Manage and track all on-going vaccination programs at the facility
- Print digital receipts /certificates
- Communication interface with the central/state/district health offices
- Generate reports for internal audits and analytics

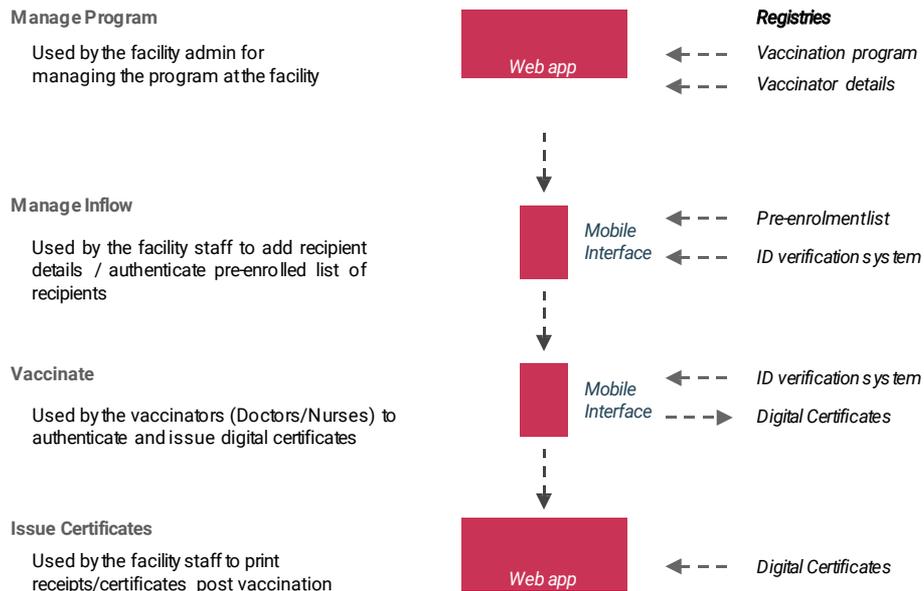
This web-application is used by the facility manager to manage and track the overall program at that facility.

### Part 2

#### Facility Vaccination Module

- Authenticate the inflow of recipients
- Manage the daily vaccination workloads
- Verify recipient and create digital certificates

This will be used by the health worker while administering the vaccine.



## PROGRAM EXECUTION

### Manage Program

Used by the facility admin for managing the program at the facility

**DIVOC** Digital Infrastructure for Vaccination & Open certification LOGOUT

Facilities    Vaccinators    **Vaccine Programs**    Vaccines    Pre-Enrollment

### Register New Vaccine Program

Program Name\*

Program Description\*

Program Logo

Vaccine

### List of Registered Vaccine Programs

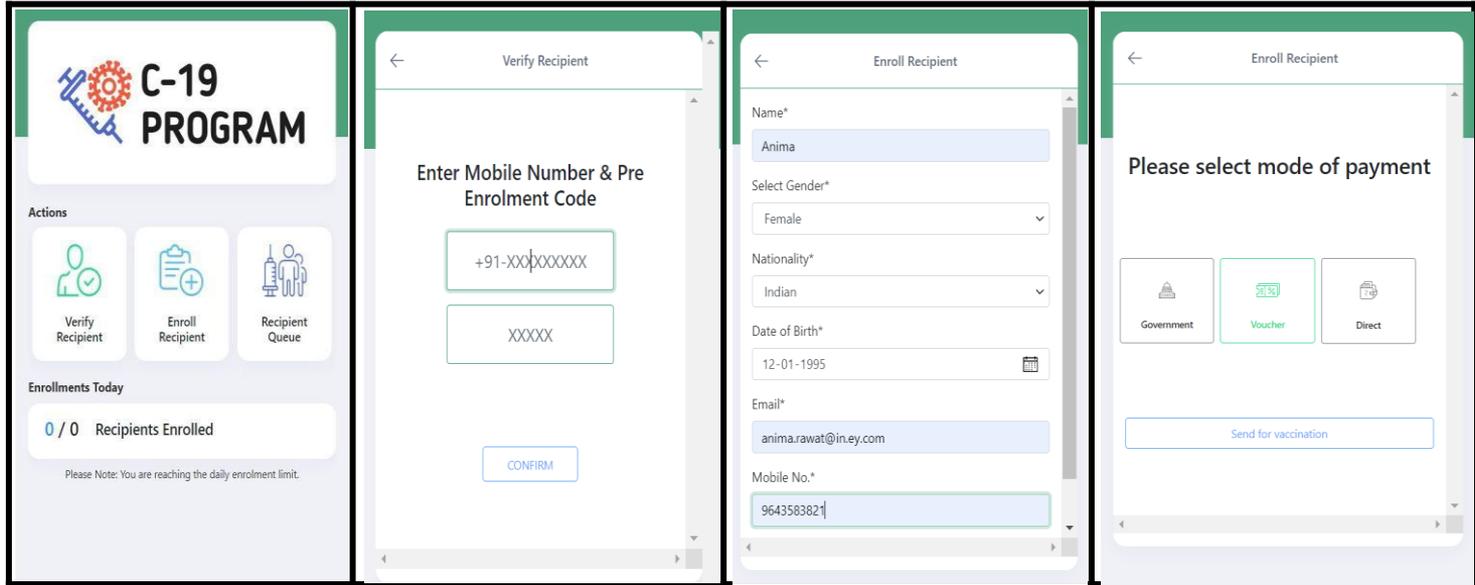
- c19** [More Details ->](#)
- sars-1** [More Details ->](#)

# SYSTEM COMPONENTS

## VACCINATION FLOW

### Manage Inflow

Used by the facility staff to add recipient details / authenticate pre-enrolled list of recipients



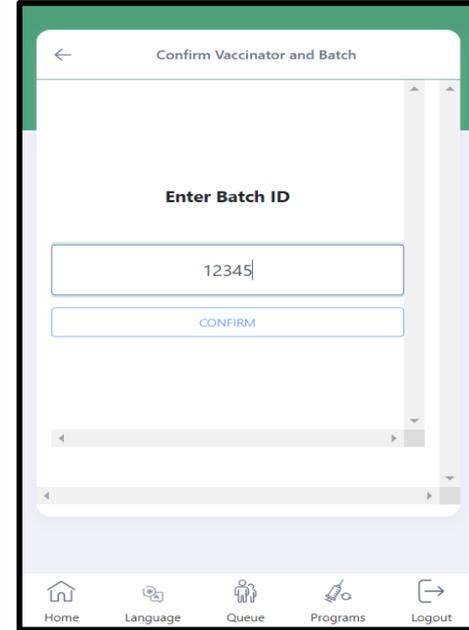
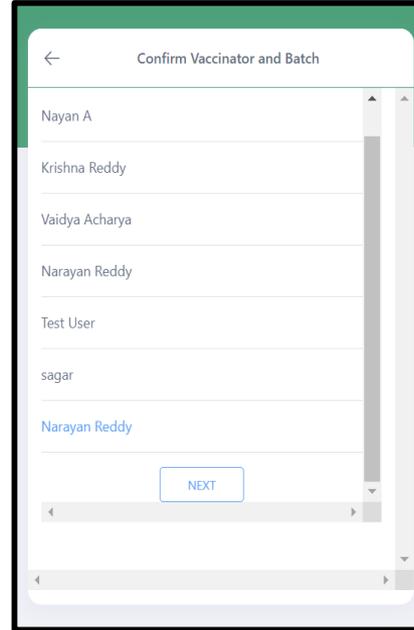
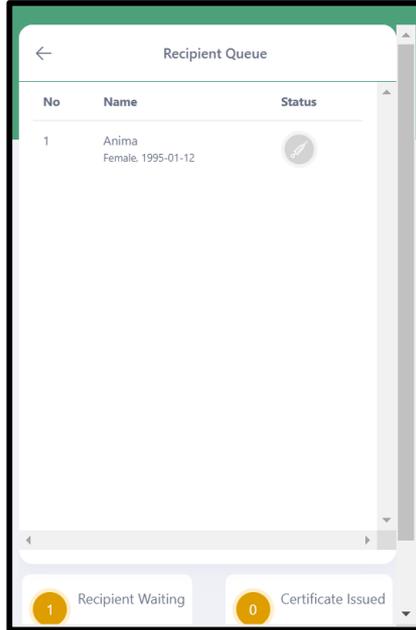
\* Only payment mode is captured. The actual payment transactions would happen on the prevalent digital payment systems present in a country.

# SYSTEM COMPONENTS

## VACCINATION FLOW

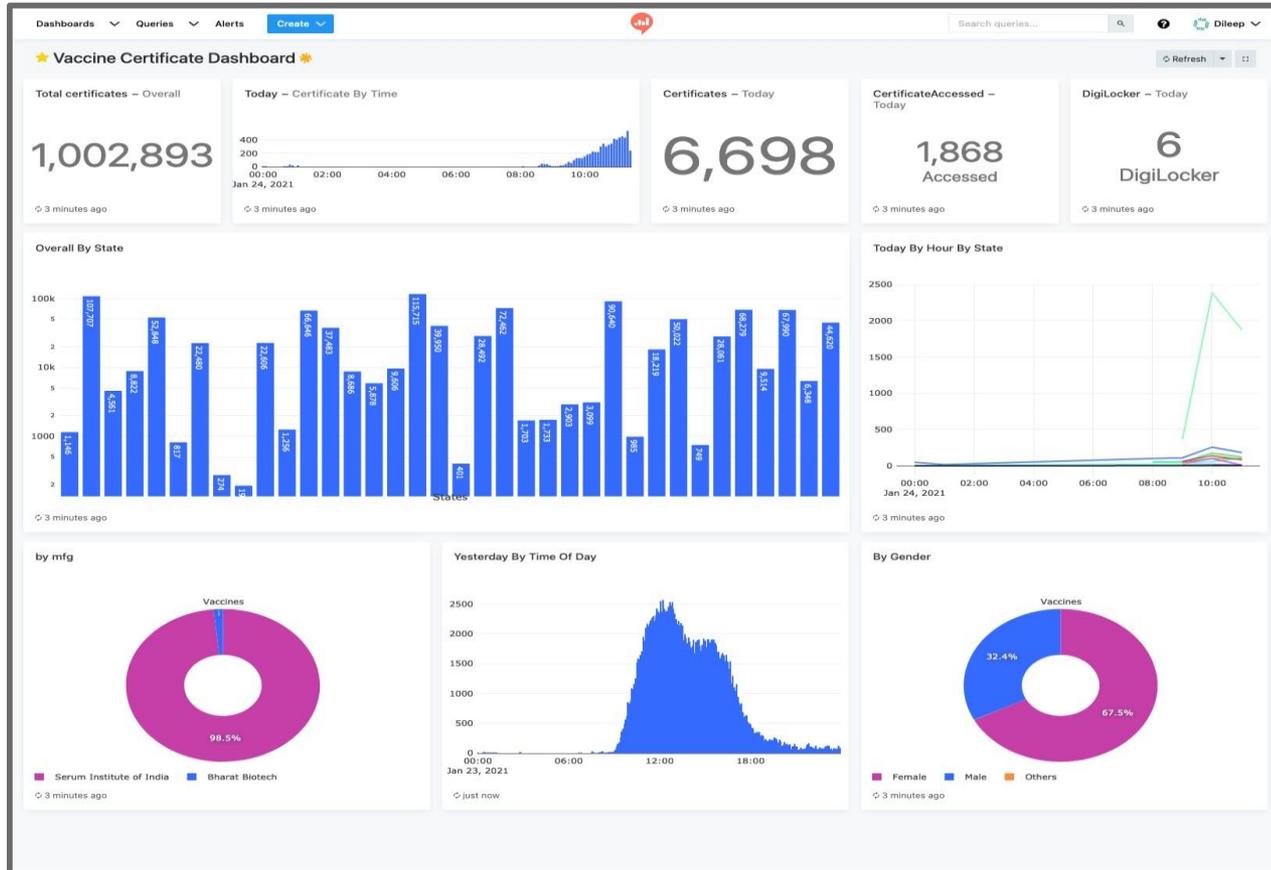
### Vaccinate

Used by the vaccinators (Doctors/Nurses) to authenticate and issue digital certificates



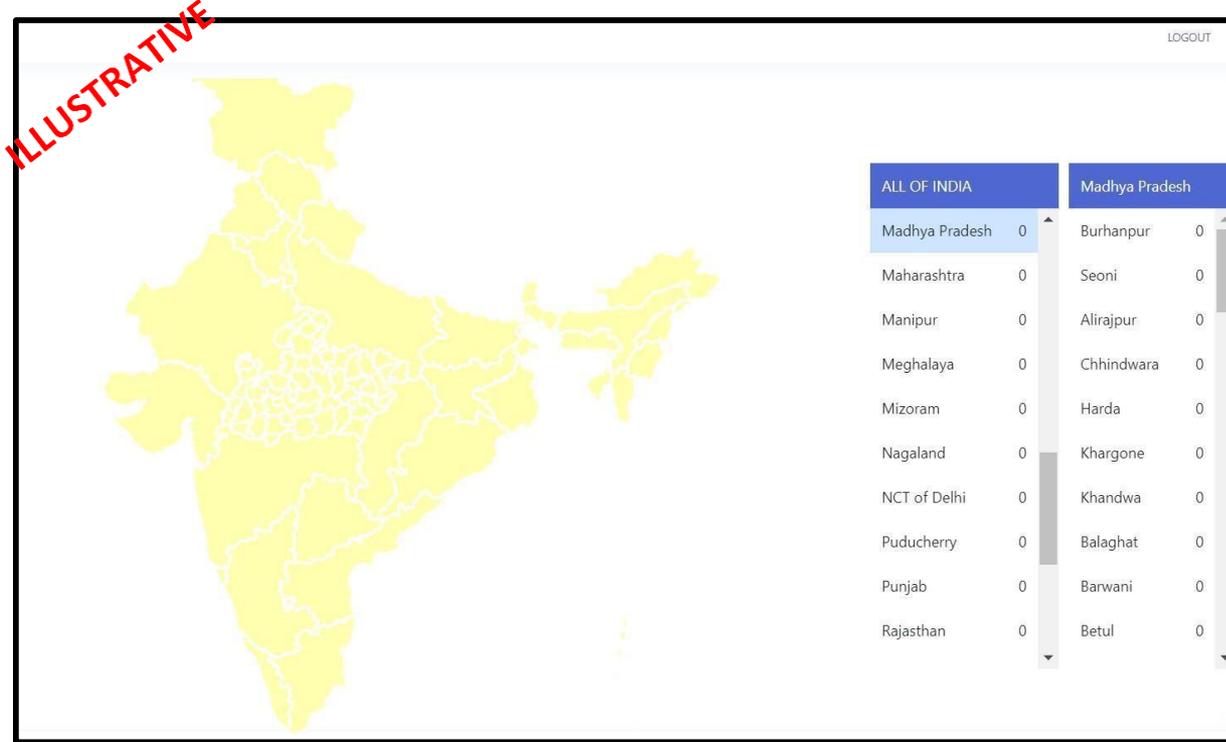
# SYSTEM COMPONENTS

## REAL TIME DASHBOARDS USING ANONYMIZED TELEMETRY



# SYSTEM COMPONENTS

## REAL TIME DASHBOARDS USING ANONYMIZED TELEMETRY



# IN SUMMARY

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

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

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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.

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

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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

**THANK  
YOU**

**DIVOC**

An open source,  
global digital public good,  
from the team who have built  
population scale platforms



<https://divoc.egov.org.in/>