

# The Inside Story of **coronasafe**

Hidden in Every Crisis is an Opportunity

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**Act 1**

# Signal v/s Noise

**Act 2**

# Digital Transformation of Disaster Management

**Act 3**

# CoronaSafe Engineering Fellowship

**Annexure**

## People Behind CoronaSafe



# Signal Vs Noise

**ACT 1**

# SIGNAL VS NOISE

What happened in January 2020



## Stage 1

We were tracking the virus outbreak in Wuhan as one of the many things and it was intuitively clear that this is going to really be a serious challenge in 2020.

Jan, 2020

## Stage 2

Based on our experience in working with Kerala Floods, we booked a domain Coronasafe.in, and started collaborating on this together.

10th March,  
2020

## Stage 3

Beginning of Coronasafe

Indicators	Covid Infected Population	1 in 100,000	1 in 10,000	1 in 1,000	10,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000	1000,000
		Percentage of People	0.0001	0.001	0.01	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1
Total Infected (In Lakhs)	0.053	0.30	3.0	30	60	90	120	150	180	210	240	270	300	330
Severity	Total Infected (In Lakhs)	330	330											
1. Stay At Home	80% asymptomatic infections	0.00017	0.0017	0.017	0.17	0.34	0.51	0.68	0.85	0.98	1.11	1.24	1.37	1.50
2. Hospital Hospitalisation	10% asymptomatic infections	0.00019	0.0019	0.019	0.19	0.38	0.57	0.76	0.94	1.12	1.31	1.50	1.69	1.88
3. ICU	3% asymptomatic infections	0.00016	0.0016	0.016	0.16	0.32	0.48	0.64	0.80	0.96	1.12	1.28	1.44	1.60
Low Risk	Population below 50	0.0261000	0.261000	2.61000	26.1000	52.2000	78.3000	104.4000	130.5000	156.6000	182.7000	208.8000	234.9000	261.0000
Medium Risk	Population 50-60	0.0172300	0.172300	1.72300	17.2300	34.4600	51.7000	68.9400	86.1800	103.4200	120.6600	137.9000	155.1400	172.3800
High Risk	Population above 60	0.0096340	0.096340	0.96340	9.6340	19.2680	28.9040	38.5400	48.1760	57.8120	67.4480	77.0840	86.7200	96.3560
Projected Deaths	Death rate 0.1%	0	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Death rate 0.5%	70	20%	2000	20000	200000	2000000	2000000	2000000	2000000	2000000	2000000	2000000	2000000
	Death rate 1.0%	0	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

# Mathematical Model

We along with Dr. Ram Mohan, built out one of the first mathematical models in India of how many people could potentially die if the pandemic spread to 70% of the population and shared the information with the Chief Ministers Office.

# Approval for Pilot team

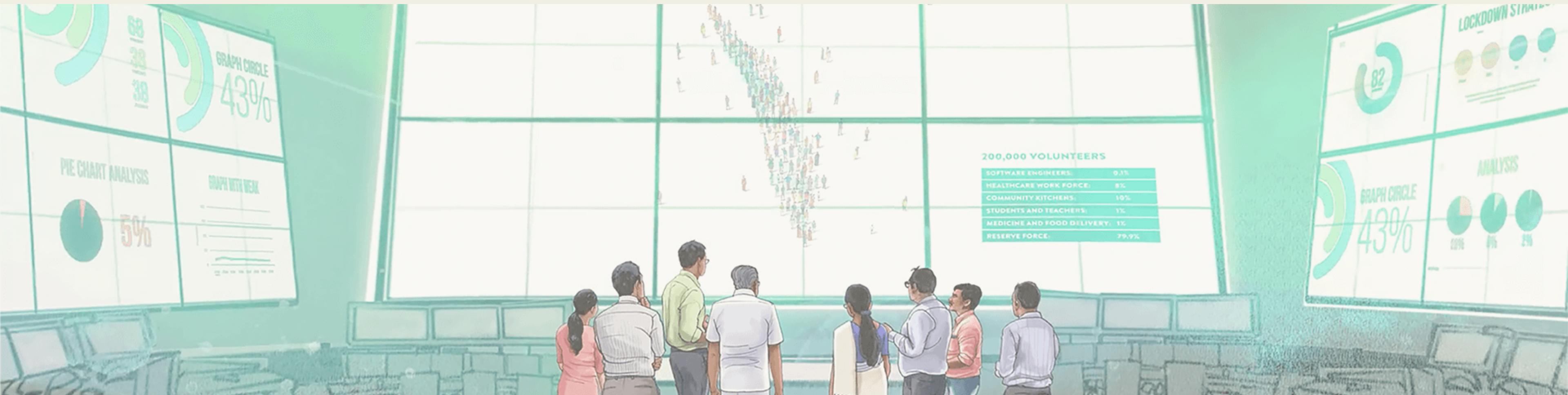
CMO gave approval to build a pilot and create a plan for the worst-case scenario while the state worked on immediate priorities like contact tracing, isolation and building up of infrastructure.

14th March  
2020

# ACT 2

# DIGITAL TRANSFORMATION

Digital Transformation from Pen and Paper to  
Software Tools and Digital Dashboards



March, 2020

# Integration of Digital and Physical Worlds

With support from experts at World Health Organisation, National Health Mission, Indian Medical Association and District Health Authorities, the first baby steps to integrate physical and digital worlds was being taken.



Photo of the first *digital* war room at DEOC (District Emergency Operations Control Room) in Ernakulam.

March, 2020



Telemedicine Unit set up in March 2020, in IMA, to support COVID patients virtually.

April, 2020



Discussions with Health experts from WHO, NHM at IMA, Kochi



Discussions with District Collector - Mr Suhas, DPM - Dr Mathews and team at Ernakulam Collectorate

April, 2020

CoronaSafe Developer and the Screens set up in IMA  
House for digital dashbaords.



30  
DAYS

CAPACITY MAP PATIENT MANAGEMENT SYSTEM JOURNAL AYURAKSHA  
FOOD DELIVERY APP FACILITY MANAGEMENT SYSTEM TELEMEDICINE TRUCK  
STAY KERALA DASHBOARD UBER FOR AMBULANCE MEDICINE DELIVERY APP  
CURFEW PASS MANAGER CALL CENTER MANAGEMENT AUTOMATED BOTS



Dr. Mathews Nampeli, District Program Manager, Ernakulam for National Health Mission giving a briefing on the public health system in Kerala to the CoronaSafe Volunteers. (April, 2020)

## Mathai Test!

An even bigger challenge than rapidly building software was the biggest challenge to get government health officials to successfully use the software.

An ingenious test called the "Mathai Test" was relied on to test user ease and experience. All software screens and workflows were tested first by Dr Mathews Nampeli who led the District Operations for National Health Mission.

# Mock Drill



A Dummy patient, being treated in the ICU at PVS Hospital (Apex COVID Treatment Centre)

An extensive Mock Drill was conducted on 22nd April 2020 with over 200 personnel from the Health department, Indian Navy, District administration and Indian Medical Association participating to test how the software systems would function at the time of emergency.

6 dummy patients were confidentially planted across the district to test out the efficiency of the various systems and the coordination among them.

This event dramatically increased the confidence of all stakeholders that a digital network can aid in disaster management efforts.



Mock drill patients being admitted to Model FLTC, Cheranalloor.



Mock drill patient being transported via ambulance through the  
SUREKSHA AMBULANCE NETWORK



Mockdrill Control Room at IMA House. Screens showing the live feed from the various sites on the field.



The observers from the Health department monitoring the actions on the field, stationed at the IMA House.

22nd April  
2020



Ernakulam Assistant Collector - Madhavikutty monitoring actions in field, in the Control Room at IMA House



Obeservers of the Mockdrill timing the actions taking place in the field to test the promptness of the system



Snehil Kumar Singh, IAS, Sub-Collector of Ernakulam as one of the observer at the MockDrill

# THE GOVERNMENT ORDER

## Securing the Government Order from Chief Minister

The results were presented at the State Crisis Management Committee and after being signed by six secretaries and state ministers of health and education, *it was approved by the Chief Minister to build out CoronaSafe Network as a futuristic disaster management software not just for corona but for all disasters in the future.*



GOVERNMENT OF KERALA

### Abstract

Electronics & Information Technology Department - Adoption of functionalities provided by the CoronaSafe Network for disaster management - Approved - Orders issued

ELECTRONICS & INFORMATION TECHNOLOGY (B) DEPARTMENT

G.O.(Ms)No.12/2020/ITD Dated,Thiruvananthapuram, 05/06/2020

### ORDER

The emergency response plan for the management of patients and resources during COVID-19 pandemic requires swift and coordinated efforts by all stakeholders including private hospitals in the State. To aid authorities across different departments in real time decision making, data and information dashboards that can provide real time capacity vis-a-vis actual utilization of hospital beds, ICUs, ventilators and other essential resources, are necessary both at district and state level.

To prepare for a scenario where there may be a surge in cases and the patient load, it is critical to have ambulance command and control systems that can take the patients/high risk individuals to the nearest available COVID hospitals efficiently. Healthcare facilities also require sample management systems to keep an effective track of Covid-19 samples being tested at labs so that information is received by the authorized officers in a time-bound manner for effective quarantine and for the treatment of those who are tested positive. Besides this, other facilities like telemedicine systems are essential to ensure that people in quarantine receive prompt medical advice and are guided correctly for their medical needs.

2. A software system is required to achieve a high degree of coordination between multiple stakeholders at district level and for passing information to the State level. An interdisciplinary group of volunteers from various domains such as public health specialists, software engineers and government officers have come together to create a free and open source solution called Coronasafe Network (<https://coronasafe.network/>).

The software has been field tested in Ernakulam District and has been found to be effective. Medical officers and district administration have expressed their satisfaction with the system. The software network along with the associated applications were presented before the Crisis Management Group chaired by the Chief Secretary on 08/05/2020. The Group felt that the system will be very helpful in managing and

**G.O. issued on 5th of July recommending CoronaSafe Tools as a complete disaster management solution.**

# Coronasafe Network for all dists

## Technology Will Help Track Facilities Available On A Real-Time Basis

KP.Saikiran@timesgroup.com

**Thiruvananthapuram:** Coronasafe Network – the open source, information dashboard that became a successful model after testing in Ernakulam – will be emulated in all districts. Chief secretary Vishwas Mehta ordered the implementation of Coronasafe Network in all districts under state disaster management authority (SDMA).

Coronasafe Network is an open source, public utility with various elements like a tracking system to record and analyse suspects and contacts, a telemedicine call management network, data about the available hospital beds and quarantine facilities in the district, food delivery services and ambulance network and a crowd-sourced guide to staying safe during the pandemic.

However, this time, the government has taken enough precautions to ensure that the truckload of data

### STEPS TAKEN FOR DATA SECURITY

Pic: E Gokul

► Ownership of entire data, its security will rest with health dept while hardware and software network will be owned by SDMA

► Collector, officials from health, revenue and LSG depts will form a core team to manage this network



A person shows his access control card before entering the Hydros mosque for prayers. The mosque authorities had deployed the system to keep track of visitors

► Data shall be stored in servers located within India, which are empanelled as cloud infrastructure service

providers with the ministry of electronics and IT

► Health dept should ensure that SDMA is given entire access to the network and data through secure, standardized info exchange protocols

tabase administration and business continuity planning shall be done by the nodal health department," said the order issued by Mehta.

The decision was taken after the software network, along with associated applications that was implemented in Ernakulam, were presented before the crisis management group (CMG) chaired by Mehta. CMG said the system will be helpful in managing and monitoring the worst-case scenario in state, especially at a time when a lot of NRKs and students are returning home.

The software system required for successful coordination between multiple stakeholders at district-level and to pass information to the state-level was created by an interdisciplinary group of volunteers from various domains such as public health specialists, software engineers and government officers. They came together to create a free and open source solution.

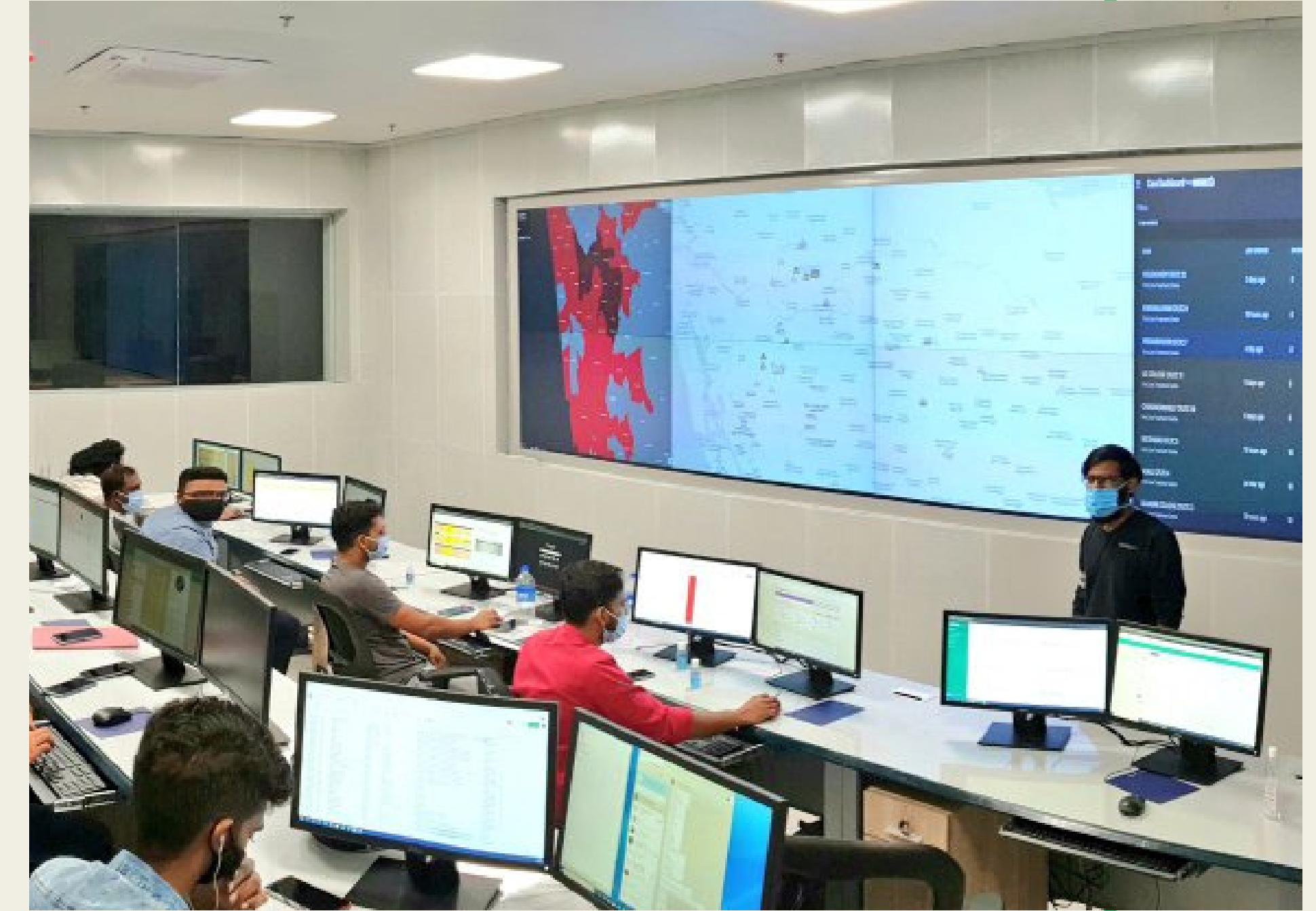
that will pour into the system will remain in its custody and there will not be any licensed software which will be used for the network. Precautions have been taken in the wake of recent experience with Sprinklr that had

stirred a hornet's nest. "There shall not be an element of vendor lock-in for licensing. While ownership of entire data would rest with health department, hardware and software network will be owned by SDMA. Da-

June, 2020



The Pilot First-Line Treatment Center set up at ADLUX  
Exhibition hall, Angamaly (08th June 2020)

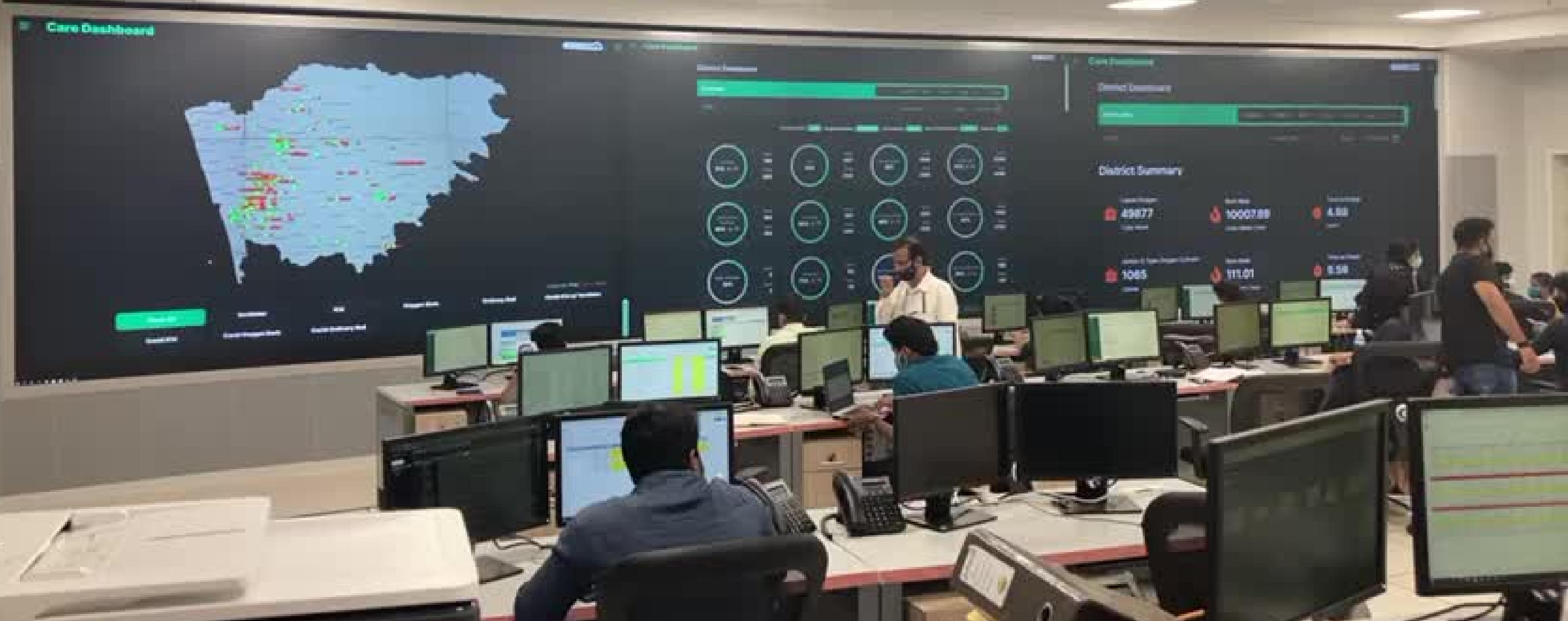


The Shifting Control Centre set up at the facility of  
Cochin Smart City Mission, Kaloor. (July 2020)

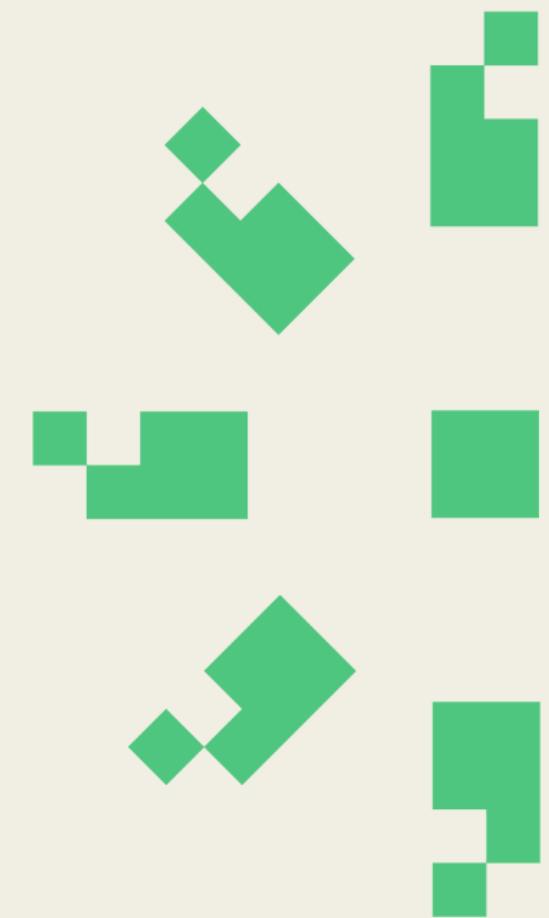
July, 2020

# Reimagining Pandemic Management





# ACT 3



CoronaSafe  
Engineering  
Fellowship

# Impact till now

SINCE LAUNCH CORONASAFE NETWORK HAS SERVED  
**2,55,926 PATIENTS**  
AND  
**91,377 AMBULANCE SHIFTING**

(08 May, 2020)



## **CORONASAFE IS A TEAM EFFORT**

Over 300 professional engineers have contributed Code to build CoronaSafe but everyone has a full time day job thus reducing the time that can be committed to building new features.

## **STUDENTS AT THE FOREFRONT**

Students had also contributed to building CoronaSafe Network and we believed that by giving students the best possible training under industry guidance, we can not just upgrade CoronaSafe Network but also showcase a better way for teaching software programming in India.

## **RAISING AN ELITE CADRE**

Thus, the programme was designed in Aug/Sep 2020 and funded by donors by Oct/Nov 2020 allowing the launch the national campaign by Dec 2020 to raise a student cadre of elite full stack developers who can build public digital assets for the nation.

## **SCALING KNOWLEDGE TO 24M CHILDREN**

Insights from the admission funnel is being created as a national report on the missing fundamentals in software programming education and how to fix them. Our aim is to scale the programme from 24 students to 2.4Crore students in India.

**Bodhish Thomas**

bodhish.in

github.com/bodhish

**Community Slack**

slack.coronasafe.in