

Cognizant



- The Lakshmana Rekha for Geofencing

Theme: Community Cooperation

Solution Title: **Aarogya Rekha™** – IoT enabled non-removable GeoFencing Solution

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20 CALL
20 FOR
CODE®
Global Challenge

Covid-19 Threats & Challenges

- In this unprecedented situation of COVID-19, it had brought modern life to a screeching halt, disrupting our healthcare, education and economic systems.
- One of the biggest challenge faced by Government is to restrict the spread of this deadly virus via Community Transmission (Stage 3) by individuals who are home-quarantined and returned from abroad.

Statistics

- ❑ On an average, **35** people break Quarantine norms/day
- ❑ **1** infected person can infect **406** people in **30** days
- ❑ **17M** cases worldwide and **673K** deaths reported globally (as on July 31)
- ❑ **60M** Quarantined in China
- ❑ Italy places **Entire** Country in Quarantine (more Countries to follow)

Challenges

- ❑ People with Foreign travel history are ordered to remain in home quarantine.
- ❑ Governments enforcing strict laws to not violate quarantine rules
- ❑ Global Economy is being hit
- ❑ High chances of Police and Health officials getting infected



COVID-19: More than 500 migrant workers in Nepal escape ...
Down To Earth Magazine - 31-Mar-2020
Some 540 quarantined workers who migrated back to Nepal from India fled on March 23, 2020 and escaped from a quarantine centre in the ...



On an average, 35 people break home quarantine norms ...
The Hindu - 05-Apr-2020
On an average, 35 people break home quarantine norms every day ... the last international traveller who landed in Bengaluru will complete the ...



Business Today

Coronavirus crisis: Mary Kom breaks quarantine to attend breakfast with President Kovind

21 Mar



Covid-19: 1 patient can infect 406 people in 30 days, finds ...
The Hindu BusinessLine - 07-Apr-2020
It tells the average number of people who will catch a disease from one infected person. "If we take the 'R0' to be 2.5, then one positive person ...
With and without social distancing, how many people can a ...
THE WEEK - 07-Apr-2020


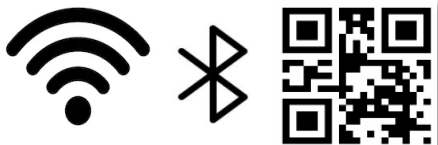

Source: Johns Hopkins, WHO, UN, ICMR, The Hindu, The BorderMail, LA Times

The Need of the Hour... Rigorous Quarantine Control Measures



How can the Government restrict Quarantined Individuals in **real-time** by enforcing a **Geofence** and remote monitor their **Health Vitals** (Body Temperature, Pulse Rate, Oxygen level and Mental Health symptoms) to combat Covid-19 outbreak

Measures Taken So Far...

EXISTING MEASURES		LIMITATION	
Manual Monitoring by Police & Health Officials	▶	<ul style="list-style-type: none">▪ Lot of dedicated man power needed for 24/7 surveillance▪ High manual efforts (Barricades, Patrol vehicles etc)▪ Likelihoods of becoming next victims	
Wi-Fi, Bluetooth & QR code	▶	<ul style="list-style-type: none">▪ Tied to mobile network (Leaving mobiles in home)▪ Unreliable source	
Tracking home-quarantined people using mobile GPS location	▶	<ul style="list-style-type: none">▪ Tied to mobile network (Leaving mobiles in home)▪ Mobile GPS signals are not accurate▪ Unreliable source	

Cognizant Solution – Aarogya Rekha



Aarogya Rekha is an **IoT enabled real-time GeoFencing** and Quarantine Tracking Platform which transmits the **Latitude, Longitude, Body Temperature, Pulse Rate, Oxygen Level and Human Emotions** via **Non removable wristband** to the Government Control Room Dashboard/Mobile app for taking necessary actions to combat **Covid-19 Outbreak**

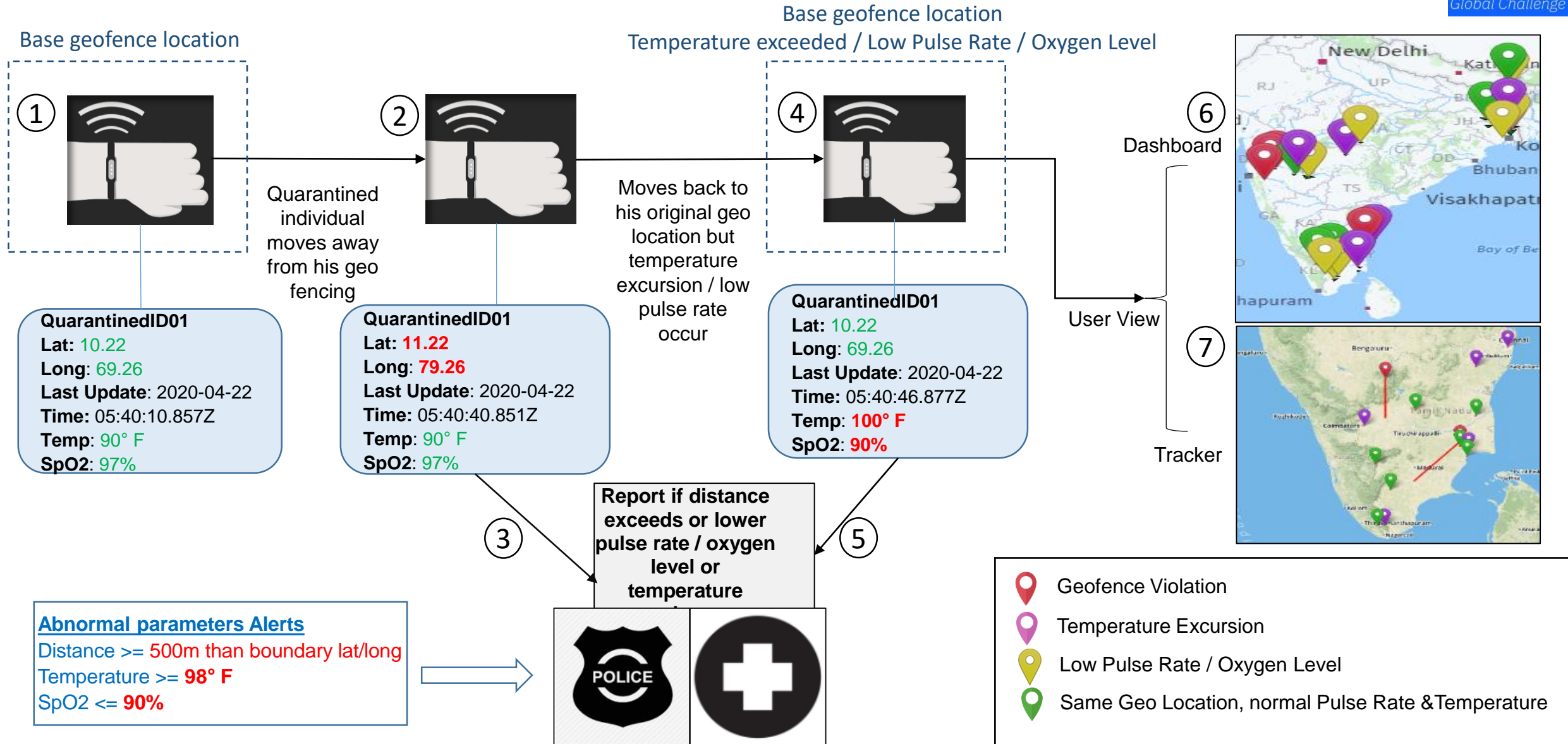
Aarogya Rekha - Product Features

- ❖ IoT enabled **GeoFencing** for effective Quarantine Control
- ❖ Body **Temperature, SpO2** Level Measurement & human **emotions** for right **medical attention**
- ❖ Real-time **Covid-19 Hotspots Zones**
- ❖ Quarantine **Tracing**
- ❖ Potential Victim Connects by **Social Media**

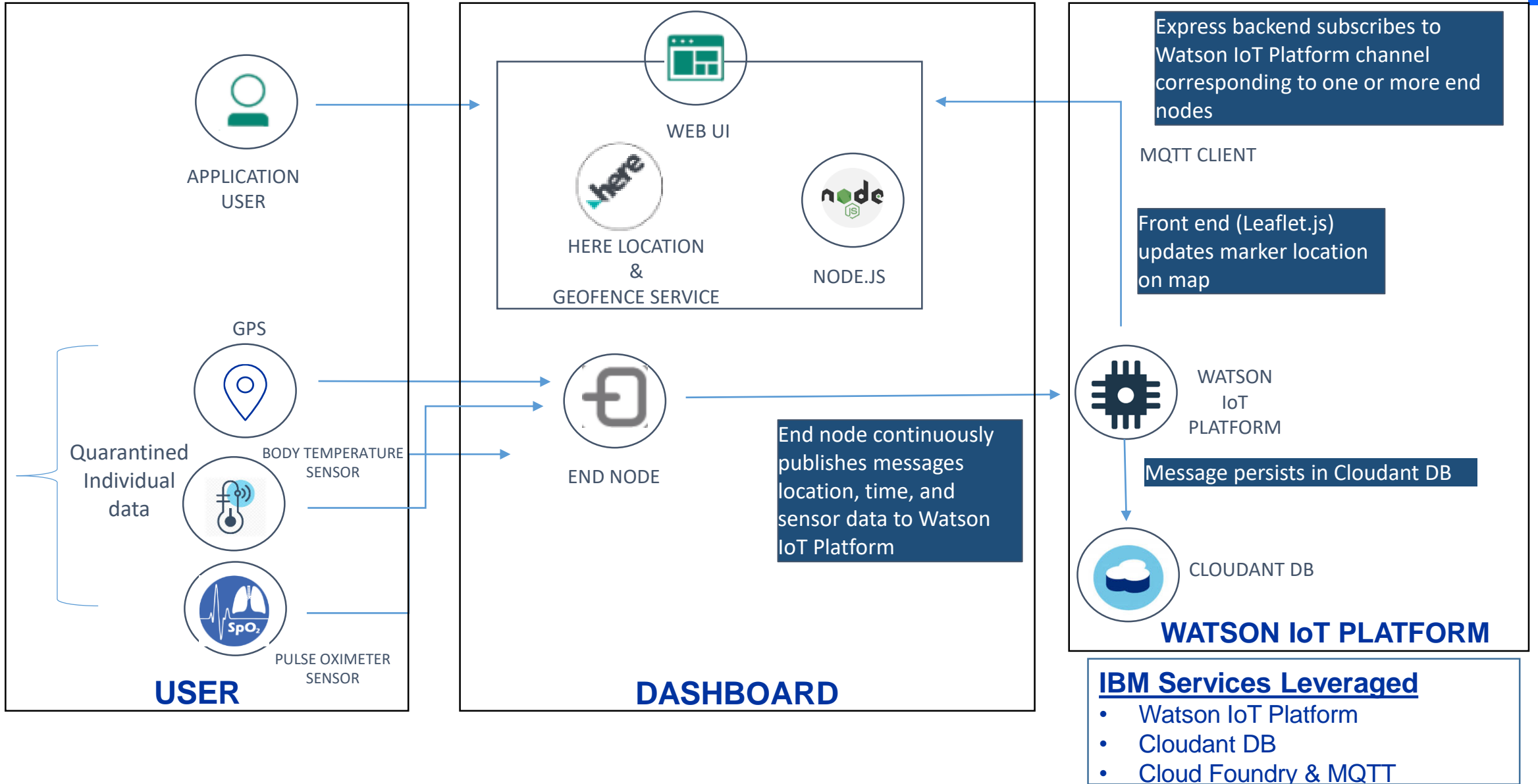
Aarogya Rekha - Product Specifications

- ❖ **Wristband Material:** Non-toxic Health Silicone or similar
- IoT Sensors:**
 - ✓ BHI160BP – GPS location sensor
 - ✓ MAX30205 – Body Temperature Sensor
 - ✓ EMOTIBIT – Emotion Sensor
 - ✓ Strain Sensor – Respiratory rate
- ❖ **IoT Device:** Arduino Nano 33 or similar


Aarogya Rekha - Solution Process Flow



Technical Architecture



What's In It For The Stakeholders

	Quarantined Individual	<ul style="list-style-type: none"> • Helps to be Geo fenced • Helps to monitor Health Vitals like Pulse Rate, O₂ Level, Body Temperature
	Community	<ul style="list-style-type: none"> • Visibility of Wristband to People • Avoid getting Infected • Restricting Community Spread (Stage 3)
	Health Department	<ul style="list-style-type: none"> • Real-time alert for Health Vital Excursion • Reducing huge manual efforts for Health Frontline workers • Prioritize Covid-19 Pandemic work effectively for needed patients
	Police Department	<ul style="list-style-type: none"> • Real-time alert for Geo fencing Violation • Reducing huge manual efforts (Barricades, Patrol vehicles etc) • Prioritize Covid-19 Pandemic work effectively for monitoring
	Government	<ul style="list-style-type: none"> • Real time Monitoring Control room Dashboard • Lot of manpower saved • Reduction in huge Cost Expenditure in Quarantine Control

USP of Our Solution - Aarogya Rekha



Real Time Monitoring

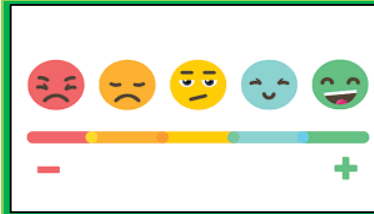
Aarogya Rekha control room for real time Geofence, tracking, pulse rate, SpO2 oxygen levels and human body temperature for right medical attention



Covid-19 Hotspots

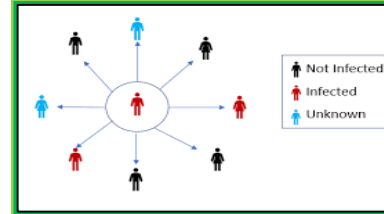
Hotspots Identification based on real time data

Centralized monitoring of Covid-19 hotspots



Mental Health Monitoring

Individual mental stability using emotion sensors for right medical counselling at early stages of isolated individuals



Contact Tracing

Potential victim connects using Social media and Local Travel History



First of its kind

First of its kind using IoT Technology

Non-removable wristband for preventing tampering of the Wearable device



Report & Analytics

Daily Analytical Reports to the Control Room

Our MVP is a compressive solution which provides details about individual who violates geofence, pulse rate, SpO2 & body temperature

Accomplished in MVP

Future Roadmap

Caveats & Assumptions

Health Department	▶	Providing Internet facility to all the Hotspot
Initial Geo Location, Pulse Rate, Oxygen Level & Temperature Data	▶	The datasets has to be updated for every new Quarantined Individual's Geo Location
Real Sensors	▶	For Actual Solution Deployment, we will use the real sensors like Location and Temperature Sensors
Privacy Data Storage	▶	The required datasets will be stored only for the Quarantined period (14 or 28 days).
Simulators	▶	MVP solution is using IBM's IoT Watson Simulators

Product Cost

Aarogya Rekha™ (IoT enabled)

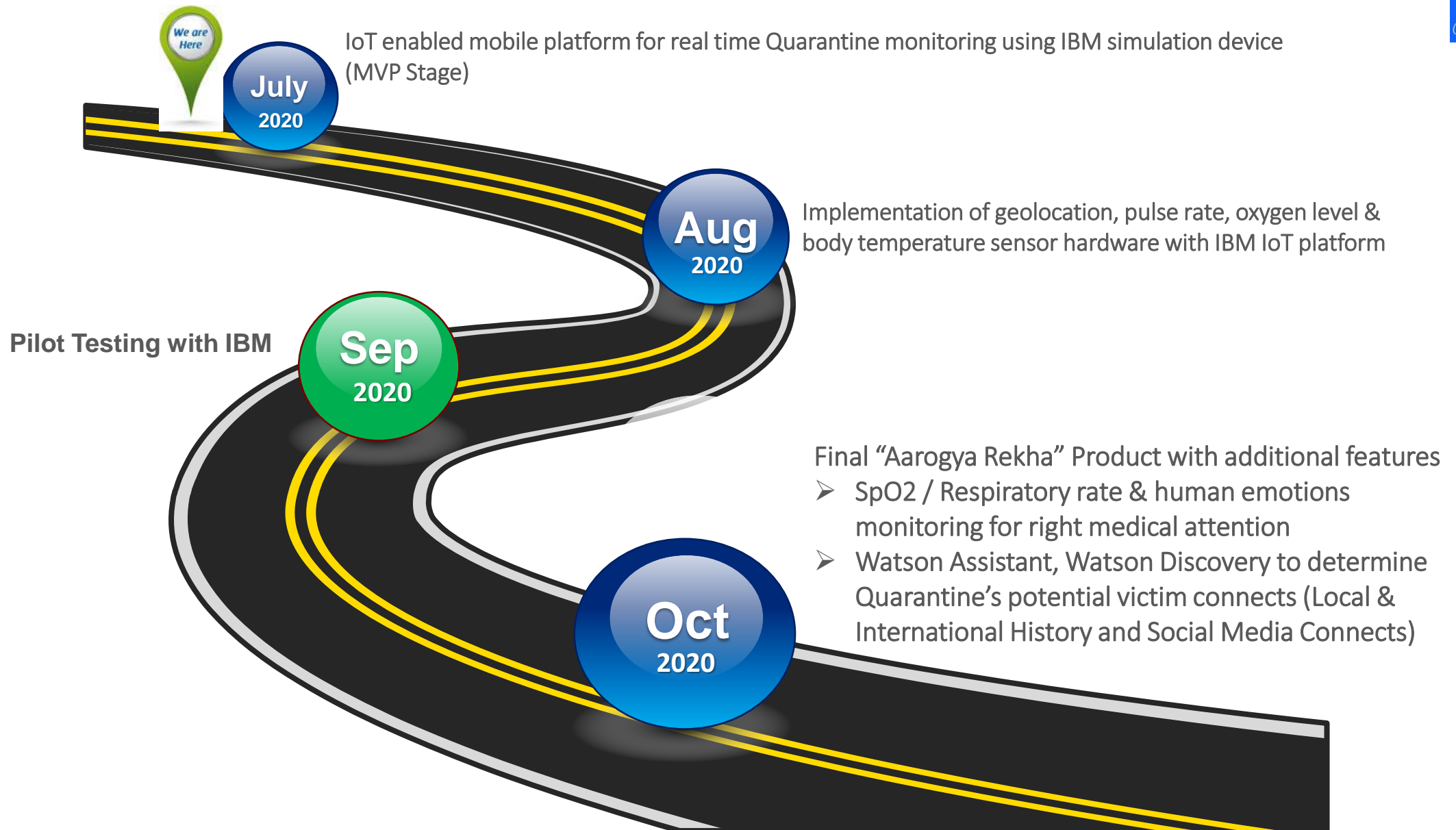


- Estimated Cost to be ~ Rs 1500/piece (Inclusive of IoT sensors & devices, wristband)
- Aarogya Rekha is re-usable for all crisis situations
- One time investment for community cooperation

Existing Measure Cost

- Huge Cost for dedicated Police Officials 24/7 Surveillance
- Barricades, Patrol vehicles cost expenditure etc
- Requires Huge Man Power in involving Home Quarantine Seals, Health Authorities Travel expenditure etc

Product Road Map



Ideated and Developed by Cognizant CDB IoT Team



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Thanks to IBM Mentors