

# RESEARCH STUDY ON THE TECHNOLOGY VARIANTS UTILIZED BY CHINA TO COMBAT THE COVID-19 PANDEMIC FOR MOBILIZING INDIA TO WORK ON SIMILAR LINES

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## ABSTRACT:

*The Covid-19 pandemic originated in Wuhan in China. The Corona virus has spread rapidly in China which led to many deaths. The spread of virus increased across many countries in the world. Almost all the European countries are affected through the Covid-19 pandemic. Even though it started in China, China has controlled the Corona virus and now the people in China are leading normal life. They have constructed a good number of hospitals for Covid-19 patients within a short span of time as short as few days. In this paper, the technology variants utilized by China to control this Covid-19 pandemic are drones, robots, virus trackers, AI based data analytics, Prediction Algorithms in Big Data and 5G Technology against the spread of Corona virus are discussed. The number of Covid-19 cases in China has declined from the month of February itself. We like to propose that the same technology variants can be deployed in India also to have superior control against the spread of Covid-19 pandemic.*

*Keywords: Covid-19 Pandemic, Virus Trackers, Drones, Artificial Intelligence (AI), Machine Learning (ML), Predictive Algorithms.*

## 1. INTRODUCTION

The Covid-19 outbreak started in china in December 2019 in Wuhan. It belongs to the family of viruses called Coronaviridae. The symptoms of corona virus are fever, cough, cold, and difficulty in breathing. It will spread to others easily through inhaling the droplets of an infected person. It will also spread through touching the infected person. Covid-19 has a lot of negative impact on the society. Lot of deaths occurred in many countries. When it started in China, in the initial stages itself, they isolated all the infected patients in a separate hospital and started treating them. They started examining the movements of 4.3 million people out of china and the reported number of cases on each day in every city [1]. With the help of mobile trackers they have compared the cases in and out of Wuhan with and without travel bans. They have used sophisticated

technologies like Artificial Intelligence (AI), Machine Learning (ML) and Predictive Algorithms etc. to detect the infectious persons.

The organization of this paper is as follows. Section II provides the technology variants used by China to combat Covid-19 pandemic. Section III explains the psychology of people during Covid-19 Pandemic. Section IV describes the role of the Government in saving lives of people. Section V answers to the question: Did India Deploy as much Technology as China could do? Section VI concludes the paper.

## 2. TECHNOLOGY AND METHODS USED BY CHINA TO COMBAT COVID-19 PANDEMIC

China Government took many stringent actions to save the lives of its people from Covid-19 pandemic. China has almost diminished the dire and deleterious effects of Covid-19 by employing different technologies and methods as discussed below.

### 2.1 DRONE TECHNOLOGY

China very timely recognized the usefulness of drone technology and started using drones for a variety of purposes. They designed and produced new models of drones to protect the health care sector. The Chinese authorities used the drones effectively in five different ways as detailed below to reduce the contamination and spreading of Covid-19 to others.

### ***2.1.1 Drones to Spray Covid-19 Disinfectants***

Drones in China till now have been used in agriculture sector to spray the pesticides and chemicals on crops to protect them. They employed the same method to spray Covid-19 disinfectant chemicals in all public and private places to reduce the infection as shown in figure 1. Drones are proved to be fifty times more effective to reduce the Covid-19 contamination when compared to the manual spraying of the Covid-19 disinfectant chemical. This way drones help save lives of people from the Covid-19.



Fig.1. Drones as Covid-19 Disinfectant Sprayers

### ***2.1.2 Drones to Deliver Medical Samples to Strategic and Remote Test Locations***

The drone technology has been used by China for delivering medical samples to other isolated places to reduce the human contact and therefore to reduce the spread of Covid-19 as shown in figure 2. The journey time to deliver medical samples by drones is reduced to half when compared to the ground transport. The drone is useful to be fully loaded with medical samples at one place and will be sent to the remote and strategically located testing places to prevent the infection of this disease. The outstanding usage of drones by air transport to deliver medical samples reduced the physical contact and prevented the spread of Corona virus. They needed the Global Positioning System (GPS) navigation system to find the locations and to deliver the medical samples effectively.

### ***2.1.3 Drones to Deliver the Consumables***

The supply of goods through drones is one of the challenging tasks in China. To reduce the spread of Covid-19, China insisted people to stay at homes only. To reduce the mass gathering at groceries and shopping malls they have used drones to supply the food and goods to those who are in need as shown in figure 3. Drones are one of the best alternative modes of transport for supplying the consumables. They collaborated with E-commerce companies to deliver food to the common people. China took the help of a team who can conduct all the useful surveys for testing the air, space, flights and getting the permission for the access of drones. They started delivering all the essential consumables at the door step to all the people in China.



Fig.2. Drones to Deliver the Medical Samples



Fig.3. Delivery of all the Essential Consumables using Drones

#### ***2.1.4 Drones to Alert the People in Specific Ways***

The most significant and impactful fact about Covid-19 is that people if gathered in public places, the Corona virus gets transmitted from Covid-19 positive persons to the Covid-19 negative persons very fast and converts the later to Covid-19 positive persons. One preventive solution against the Covid-19 transmission is to alert the persons not to stay outside and not be near to the infected persons. If any infected person(s) is (are) nearby a given person, they started alerting and bewaring the persons regarding this situation using the drones effectively as shown in figure 4. They started finding the people who are roaming outside. They started using online maps to identify the infected people and sending alert messages to them. Drones have been installed with loudspeakers for alerting the common people who are coming outside and for insisting them to go to their houses and wash/sanitize their hands.



Fig.4. Alerting the People using Drones

#### ***2.1.5 Drones to Identify the Infected and Sick***

By using the drones they have started identifying the sick and infected people in public places. They installed thermal sensors on drones and started identifying the people with high fever. By using the GPS trackers they could identify the specific location of the infected persons and the drones can alert the nearby people who are in close contact with them. The contactless features of drones are used effectively to mitigate the effects of Corona virus outbreak.

### **2.2 ROBOTICS**

China started using robots for a variety of purposes. Since Covid-19 is a very contagious disease, human contactless solutions will serve well and ensures human safety. Robotic solutions are utilized by China to reduce/avoid the human contact as shown in figures 5 -10. Robots have been used for delivering groceries to the people's homes as shown in figure 5. These robots have also been used to deliver sanitizers to the patients and medical staff in hospitals. They started utilizing robots for spraying disinfectants in public places and corridors to control and avoid virus spread as shown in figure 6. Temperature screening robots and temperature monitor robots are used to screen and monitor the temperature as shown in figures 7 &8 which would help to detect Covid-19 victims. China used robots to kill the virus by using UV light rays as shown in figure 9. They used autonomous vehicles to deliver the food supplies using navigation services.

China is the only country which started collecting the people's mobile phone information, their location details and their travel history to find out the complete information about each and every individual. They started tracking of these persons, their temperature and health conditions too using this surveillance tracker as shown in figure 10. They maintained one centralized data base to monitor all these issues. They started analyzing the person's data using Big Data and Machine Learning algorithms.



Fig.5. Delivery Robot



Fig.6. Disinfectant spray Robot



Fig.7. Temperature Screening Robots



Fig.8. Temperature Monitor Robot



Fig.9. UV Ray Dispenser using Robot



Fig.10. Mass Surveillance Tracker

### 2.3 AI BASED DATA ANALYTICS AND MACHINE LEARNING ALGORITHMS

Digital health that includes digital care programs is the convergence of digital technologies with [health](#), [healthcare](#), living, and society to enhance the efficiency of [healthcare delivery](#) and make medicine more personalized and precise. Digital health includes categories such as mobile health (mHealth), health information technology (IT), wearable devices, telehealth and telemedicine, and personalized medicine. Digital health tools have the vast potential to improve our ability to accurately diagnose and treat disease and to enhance the delivery of health care for the individual. Digital tools are giving providers a more holistic view of patient health through access to data and giving patients more control over their health.

China is combating with Covid-19 using Artificial Intelligence (AI). AI plays a major role in monitoring the digital health policies. They have started analyzing all the Covid-19 infected patient's location and alerted all the neighboring locations and common people as shown in figure 11. To analyze the large amount of data, they have used the Alibaba Cloud to support the analysis on large amounts of data. AI helps in earlier diagnosis of Covid-19 cases [2]. AI helps in automatic monitoring and predicting the extent of virus spread [3]. In addition to AI, Machine Learning and Big Data, Predictive Analytics also plays a major role in analyzing the patients' risk factors and alerting the common people immediately without any physical contact [4-6]. ML algorithms helped to estimate the risk of deaths during the pandemic Covid-19 period. This helps them to identify and predict the future cases .

Contact tracing will be conducted for [close contacts](#) (any individual within 6 feet of an infected person for at least 15 minutes) of laboratory-confirmed or probable COVID-19 patients. AI also helps in contact tracing of the individual persons. Big Data and Facial Recognition help the people who are infected with virus and inform the media agencies and to alert the people even though they are wearing the mask. In addition, they are tracing the movements of persons with the help of Smartphone apps and trying to find out whether they are infected or not. They have installed CCTV facial recognition cameras in all main cities to combat against Corona virus.



Fig.11. Monitoring the Infected Patients

## **2.4 5G TECHNOLOGY**

5G is the term used to describe the next-generation of mobile networks beyond LTE mobile networks. The main advantage of these new networks is that they will have greater [bandwidth](#), giving higher [download speeds](#), eventually up to 10 [gigabits per second](#) (Gbit/s). Due to the increased bandwidth, it is expected that the new networks will not just serve cellphones like existing cellular networks, but also be used as general [ISPs](#) for laptops and desktop computers, competing with existing ISPs such as [cable internet](#), and also will make possible new applications in [Internet of Things](#) (IoT) and [Machine to Machine](#) areas. China used the 5G technology and smart applications in live telecasting of all the incidents that happened in and around China. 5G technology helps in remote consultation of the patients and medical nurses who are working in hospitals. In addition, they used the smart applications to trace the clusters and main hotspots of Corona virus infected patients. They can track the movements of the individuals very easily using this technology.

## **3. PSYCHOLOGY OF PEOPLE DURING COVID-19 PANDEMIC**

People have been hearing the death news through various media and listening to the fact that the Corona virus has been spreading rapidly across the world and pointedly in India. As per our observation, people in India have been adhering to the Philosophy of Life- which is to focus on resolving the existential questions about the human condition. In this process, we think that people are seeking God to protect them. Yes, life is the utmost important factor for anyone who came onto the earth from a woman's womb. They can utilize anything that surrounds them positively to protect their lives. This kind of thinking takes humans back to the Commandments of God that helps to think positively, and to Science through which people can communicate to each other and share.

## **4. ROLE OF THE GOVERNMENT IN SAVING LIVES OF PEOPLE**

A good government should protect citizens from violence, should provide goods and services that individuals can't provide individually for themselves, and invest in education to enable people to be creative thinkers and makers by providing resources to work with. Governments worldwide are playing a big role in saving the lives of people in all possible ways during this Covid-19 season also. They are making policies, taking good decisions and controlling all the systems in their limits to combat against Covid-19 pandemic.

## **5. DID INDIA DEPLOY AS MUCH TECHNOLOGY AS CHINA COULD DO?**

In India, usage of IT for E-Governance is quantitatively more during Covid-19 pandemic especially in the form of massive video conferences. Here, IT is helping in conducting virtual meetings to maintain social distance and thereby control the spread of Covid-19. Though the technology is used in India during Covid-19, the technology might be quite differently used and quantitatively less used in India compared to China. This is not a good sign for the development of the nation. The Government of India (GoI) should release grants to increase the awareness about Covid-19, to invent and produce Covid-19 vaccines, and the invention and usage of technology variants for avoiding human intervention for life critical services such as delivery of goods to people, spraying the disinfectants, cleaning the public utilities etc. GoI should allocate funds and grant them for science and technology research organizations to come up with a variety of IT and non-IT solutions to prevent Covid-19 from spreading as well as for recovering the Covid-19 patients.

## **6. CONCLUSION**

Even though the virus originated in China few months before, the count of the victims gradually decreased. China has the world's largest population, but it could fight with Corona virus well. This is because China has been utilizing all the latest technologies like drones, robots, virus trackers, smart applications and 5G technologies to combat with the Corona virus in a systematic and strategic way. If India also uses many or all of these technologies as discussed before, India can combat with Corona virus outstandingly. Technology can provide good solutions provided that the technology people are intelligent enough to think and apply their thoughts well and suggest suitable technology to the common people.

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