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A Research Study on the Technology Variants Utilized by China to Combat the Covid-19 Pandemic: For Mobilizing India to Work on Similar

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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, it 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 and Prediction Algorithms in Big Data and 5G 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.

I 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, 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 Psychology of People about Covid-19 Pandemic
Role of the Government in Saving Lives of People
Why China took stringent actions?
Why India could not Deploy as much Technology as China could?

II Technology and Methods Used by China to Combat Covid-19 Pandemic

China has almost diminished the dire and deleterious effects of Covid-19 by employing different technologies and methods as discussed below.

1. Drone Technology

China timely recognized the usefulness of drone technology and started using drones for a variety of purposes. 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. They designed and produced new models of drones to protect the health care sector.

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. 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 pandemic Covid-19 disease.

Figure 1. Drones as Covid-19 Disinfectant Sprayers

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 its spread. 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 virus. They needed the GPS navigation system to find the locations and to deliver the medical samples effectively.

Figure 2. Drones to Deliver the Medical Samples

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. 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.

Figure 3. Delivery of all the Essential Consumables using Drones

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 gets transmitted from Covid-19 positive persons to the so far 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 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. 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.

Figure 4. Alerting the People using Drones

1.5 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 Global Positioning System (GPS) trackers they could identify the specific location with the infected persons and the drones can alert the nearby people who are in contact with them. The contactless features of drones are used effectively to mitigate the effects of Corona virus outbreak.

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. Robots have 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. Robots are also used for delivering groceries. China used robots to kill the virus by using UV light rays. They used autonomous vehicles to deliver the food supplies using navigation services.

2.1 Delivery Robot

2.2 Disinfectant spray Robot

2.3 Temperature screening Robots

2.4 UV Ray Dispenser using Robot

2.5 Temperature Monitor Robot

2.6 Mass Surveliance Tracker

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. 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.

3. AI Based Data Analyticts and Machine Learning Algorithms

Digital health 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 (health), 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 combatting 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 patients location wise and alerted all the neighboring locations and common people. 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 alerts the common people immediatley without any physical contact. 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 ith the help of Smarphone 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.

Figure 3.1 Monitoring the infected patients

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.

III Conclusions and Future Work

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.

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