

WHITE PAPER

Drone Impact During **COVID -19** Pandemic

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Drone Impact During COVID -19 Pandemic

Executive Summary

Currently the World is facing a Huge catastrophic event that has claimed lives in the thousands as of this day. The crisis appeared silently under the Radar and has now affected around 3 Million people worldwide, with casualties around 2 Lakh. Such numbers have overshadowed the previous Ebola pandemic by a huge margin. With no vaccine in sight, the numbers and graphs do not show any sign of downward trend yet. While whole countries are in lock down, there is only so much the government can do using traditional containment methods. Current methods require significant amount of manpower and resources to enforce rule in the public.

India, A Developing country with the population of around 1.2 Billion people faces even a bigger threat from COVID-19. This is evident especially as the country has been on total Lockdown for the past 5 weeks, while the Health workers and Police have been fighting nonstop on the frontlines. Most recently there has been a new addition to the forces reducing the workload and enhancing the impact our forces have on the fight against the virus – The Drones. Drones have been helping the Police in Surveillance and Monitoring vast areas and Narrow pathways previously not reachable. This White paper aims to enlighten on how the Drones have helped and will be helping in negating the effects and increasing the efficiency of our forces to tackle the virus without putting themselves at high Risk.



Containing the Situation

Due to the swift effects of recent events, many countries have had a hard time taking necessary preventive measures before the situation worsens. Most countries have opted it to be in their best interests to keep the whole country under lockdown to reduce the number of infected.



During lockdowns there is much need for social distancing and isolation. But large populations are hard to control, especially when the lockdowns had to be enforced suddenly. Many governments have thus started investing in new technologies to safeguard the public by keeping a close eye on them. Drones are one such helpful tool that allows the government to keep control of their large population. Many countries such as USA, Sweden, France, China, Japan, Canada etc. have deployed drone for Surveillance and

Security purposes. During the pandemic USA and China have been using drones as a means of remote disinfectants, allowing them to disinfect large areas in a relatively short period of time. France, Italy, Singapore and most other countries have recognized the effectiveness of drones to combat such situations. Drone delivery has also been a prominent feature that has allowed quick and fast doorstep delivery by drones of food and medical supplies. The Indian Government has recently taken the initiative to deploy Drone technology for the purpose of public Monitoring. States like Gujrat and Kerala have already Systems in place for remote monitoring through drones. This has allowed a significant reduction in required manpower and easier access to narrow streets and alleys. Delhi Police have been using drones to make announcements to the public gathering in Narrow spots. To prevent people from gathering in the dark, Ahmedabad police forces have been making use of thermal imaging to spot heat signatures in dark alleys.

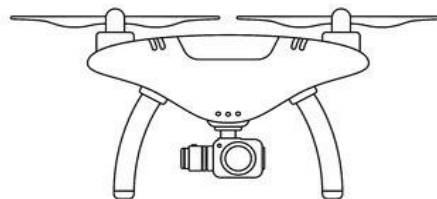


Drones Against COVID-19

Traditional means of public quarantine have proved to be a huge liability, due to the huge economic downfall. Securing areas require man-power and thus the costs to maintain public safety stack up significantly during a pandemic. Thus, more reliable methods need to be adopted in order to ensure a faster recovery from such a situation. One such technology being used currently are Drones. Ranging from, small micro drone weighing a few grams to huge drones that are able to carry weight equivalent to two times that of an average human, drones have proved to be one of the best tools to tackle the situation. Drones have been able to help police in several situations such as:

- Drone Surveillance and Monitoring Large areas.
- Cleaning and Quarantine situations.
- Thermal Cameras to detect sick people and people gathering during the night.
- A.I combined with drone technology can detect people sneezing or coughing in public.
- Drone delivering Essential and Medical Supplies. Prescriptions are being delivered to ill people in home quarantine.
- Microphones on drones to Broadcast news to the general public.
- Certain cities have been using drone to provide virtual tours of their cities to boost public morale
- Emergency situations allow the police to deploy drones to assess the situations before

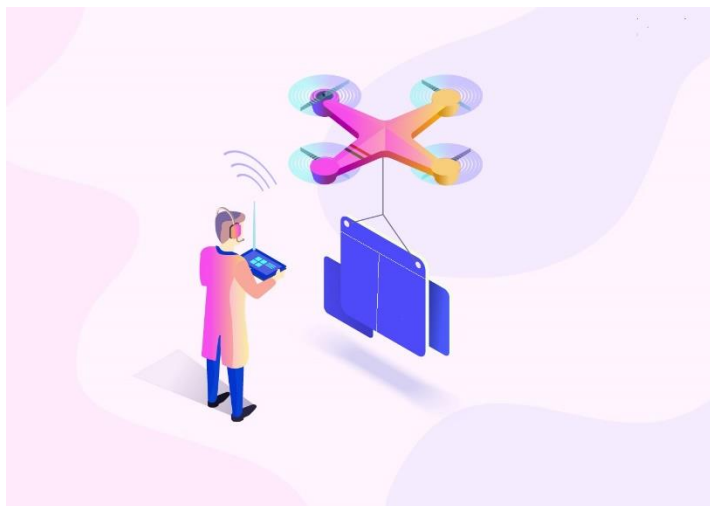
Thus, several sectors like Medical, Security and Public safety have been able to utilize drones to tackle current health and safety concerns of the government in regard to the Pandemic.



Surveillance and Monitoring

Traditional methods of monitoring include CCTV cameras and for Aerial surveillance helicopters were used to keep an eye on the public, while CCTVs provide a decent area they are fixed in their locations and Helicopters are way too expensive to be used constantly for surveillance operations. This pandemic required a quick and fast tool to cover vast areas in a short span of time. Mumbai is home for more than 1.5 Crore people, so even with huge Police force it is not easy

to maintain security procedures overall for the whole city. Thus, using drones it they are able to reduce the manual labor required for the task and cover larger areas. This has been the most prominent use of drones in our current pandemic situation.



A typical Drone can fly around 2 Km in an unobstructed area, in a city area this range reduces due to high rises but still the drones can cover a significant radius of the city in a single flight. Most drones are equipped with cameras and thus, allow its usage without much modifications. Due to on board gimbal in modern drone the footage received are very stable and allow

the users to view a good video feed from the drone's camera. With a comprehensive coverage the drones cover all the blind spots in the city's radius, allowing no hidden areas in the city that the people can gather around.

Due to its high maneuverability, drone offer and extensive options to follow the suspects and trace them back to their homes. The accurate real time data is provided to the authorities of the suspect. Remote Monitoring also allows several higher authorities to have a visual feed from the drone from wherever they need. Video feed is securely transferred to a server where only regulatory authorities can access the stream.

Disinfecting Public Spaces

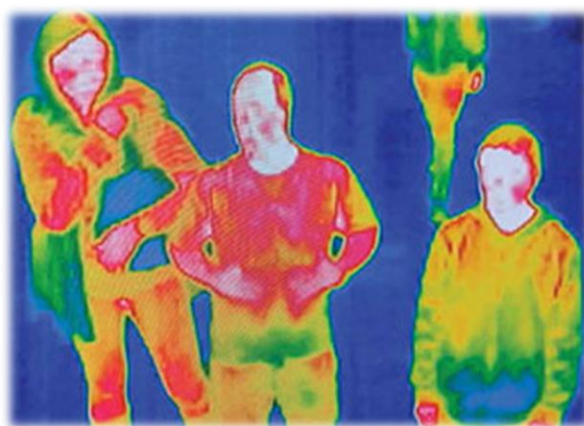
For long drones have been utilized in agriculture in order to protect the plants from pests and maximize the speed of crop production. This approach has made its way into the current pandemic which has allowed for a safer approach to disinfection. Tradition methods involve providing Sanitary workers with tanks on disinfectants that could be sprayed onto surfaces. This has led to a large requirement in Man Power and the process is also quite time consuming. Drones, on the other hand have been quite useful in this regard. Due to their ability



to reach tight spots and maintain high level of maneuverability they can be deployed for spraying disinfectants around the city through every street. Not only this allows faster disinfections of larger area but also reduction in Manpower required to finish the task. A single drone can easily cover a Few hundred meters of area provided it is given abundant amount of disinfectant liquid. Most feasible approach is to move the liquid tank around with the drone, which allows for a much faster rate of disinfection.

Thermal Imaging

Quite recently there have been drones that allow their payloads to carry thermal cameras. Thermal imaging technology has a significant advantage over regular camera, as they're able to see in the dark when normal light is not present. The technology relies on heat emitted from a body of mass, which can be calculated and displayed accurately to up-to 0.1 °C. Thus, thermal imaging has been useful in multiple regards to fight against the virus.



One method is to use the drone in dark alleys and streets to find potential gatherings and monitor the activities of the gatherers. Most recent use-case is of thermal imaging is to spot sick people among the regular crowd. Elevated body temperatures can be spotted among the crowds to confirm people with fever. This could lead to proper identification of cases of the virus and help protect innocent public from people spreading the virus knowing and unknowingly through a human carrier. This will allow in significant reduction in cases that can be caught due to negligence of the general public. Many drones and Thermal Camera manufacturers have allowed compatibility between attachments to make it easy to deploy thermal drones much faster.



Drone Broadcast and Virtual tours

Drones have a high level of presence in the sky, due to which general public is often more inclined to pay attention to one when spotted above the crowd or their homes. This is the general idea behind using drones to relay messages to the public. Loud speaker and Microphones are attached to drones which allow public broadcast to reach further to people living even on the remote corners of the city. Important news and public safety announcements are a necessary tool in fighting the pandemic. More people have information



on the whereabouts and local situations, more the people are willing to cooperate toward the effort of fighting along with our forces. News regarding local cases and curfews are important. This also provides a boost in morale among the public as they have a clear idea how to deal with the situations. Local Health check ups can be notified to a broader area using drones.

New York has been using drones to provide virtual tours of their city to the people isolated in their own homes and have not been able to see their own cities. This is also a very good way to increase the public's morale that has been severely undermined due to Social Distancing from their Peers and Families.

Integrating A.I to detect Symptomatic people

Drones combined with Thermal Technology and A.I Have been used to identify people who show signs of fever and common symptoms related to the virus. Images and videos from the camera are fed to an A.I Model which helps identify people that could be a potential danger in public. Some common visible symptoms of COVID-19 include:

- Cough
- Fever
- Runny Nose
- Body Ache



Such Symptoms can be easily identified with an A.I trained for the specific purpose.

Drone Delivery

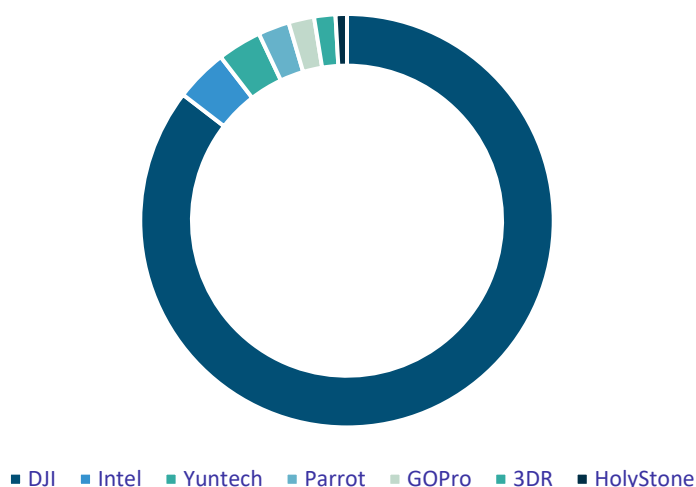


Delivering goods and services has been a huge challenge during the current pandemic due to Social Distancing between public. Home Deliveries are either completely stopped or are done on a partial basis. Companies have opted to stop their services, as the delivery employees are at a high risk of getting infected and infecting others to whom they would come in contact with. Thus, many critical transports such as Safety Equipment, Food and Medical supplies are not being delivered to essential areas. Drones are especially useful in such cases, as they are able to deliver essential packages throughout the city. Delivering using drones requires proper laws to be place before it can be used for transporting packages to essential sectors. Many countries have adopted the technology since it is quite fast and more efficient than normal delivery service. Especially during pandemic where essentials need to be sent their way much faster and maintain a level of cleanliness regarding the package delivery.

China's Global Monopoly

Drones used today are mostly Chinese drones manufactured by DJI, which are so widely spread across the world that DJI own up to 78% market share in USA and similar or higher numbers in most other countries. Due to this monopoly over the market DJI can freely control their prices and drone manufacturing to an extent where it might become the only company in the drone industry to manufacture commercial drones for the public. Their drones are mostly commercial focused, but due to their efficient tech and in box hardware and software that can be used for multiple purposes they have gained a huge crowd following their technology. The company is estimated to grow from current 5 billion to around 64 billion worth by the year 2025.

USA Drone Market share



India's Drone Market

Currently just like most countries India's drone market is also dominated by DJI drones to a large extent. Due to the current pandemic the need for drones has risen significantly in the market. Most drone companies in India are providing the police custom solutions to specific problems the police face during the pandemic. During this period of 5 weeks the drones have helped police significantly to reduce their costs and workload required to keep the situation under wraps. Even with DJI hogging the markets Indian drones have started to make a small dent in their impact. The research being put into drones has significantly helped Indian Drone manufacturers to get a hold on the market. Another reason is that Drones made in our country have been quite useful for various specific use cases and have been providing a low-cost solution to the current market alternative. Indian Drone market is estimated to reach around

885.7\$ Mil by the end of 2021, representing that the fast-growing market is going to lead in significant advances in drone technology by the end of 2020.

Conclusion

The Current pandemic has been a tough nut to crack for our nation, but due to national reforms and adopting more modern methods for quarantine has allowed the forces to have the upper edge in the fight. Drone have time and again proven to be the best tools at our disposal to maintain the proper methods of Social Distancing needed to prevent the virus from spreading. From Surveillance to Disinfection to Delivery, drones can carry out the utmost required tasks that are important for a city to function and have access to all its resources at disposal. For the current situation drones allow a quick solution for the government such that they can provide more efficiency at reduced costs on manpower. Even after this Pandemic, drones will be useful for many more purposes and having Multi functioning drones helps elevate the level of sophistication and accuracy that was an always needed upgrade to our current force.

Adopting this new technology will take some time to get used to, as getting accustomed to new tech in the beginning is not easy. Many changes have to be made to the system, while making sure they do not violate any human rights and also without compromising security. With new reforms being made to contain drones and create a proper record of every drone flying it is very likely that India will be among the top countries in regards to drone tech. After this Pandemic ends, drone tech will mostly be the prominent technology and much more progress would have been made in this sector in a very short amount of time due to its high demand.

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