

Drones: The Future Is Taking Place Now

Introduction

Drones, Drones, Drones and Drones. In just a few years drones have gone from being an obscure military term word to a buzz word in every part of life. It would be hard to find anyone in India who has not seen a drone or heard about them. Though we conversationally refer to these flying machines as drones, the technical term used by many is Unmanned Aerial



Drone - Joshua Goldman/CNET

System or UAS for short.

Undoubtedly videography remains one of the most popular use cases for drones. But hidden away from the public eye, drones are adding immense value to diverse industries across the globe. For example, the New York Power Authority recently tested using drones to inspect an ice boom near Lake Erie. Inspecting one of these ice booms normally costs \$3,500 to send a helicopter or \$3,300 to send a boat to perform the task, but it costs less than \$300 to deploy a drone.

Excitement, Passion & maybe Concerns?

As a professional aviator I am super excited about drones. With our shared passion for flying machines, I am sure that you share my excitement and passion for drones too.

That being said, do you share a tinge of concern be it failure of hardware, software, mechanical or even privacy? Are multiple thoughts racing through your mind? Of course there are since we understand the risks associated with being in the air more and better than most.

Pilots & The Ghost in the Machine

Aircrafts are becoming more complex and airspaces more dense. While autopilots are reliable, no system can ever be foolproof. Hence, it is essential to ensure that there is a well trained pilot sitting in the cockpit, who can react appropriately to any emergency.

On the other side of the equation, the exponential and continued growth of Artificial Intelligence, Machine Learning and wireless communications has enabled autonomous operations of UAS systems.

Given the diverse roles and applications of manned and unmanned systems, the two are likely to co-exist for the foreseeable future.

Where are the Drones Flying & for What Purpose?

Given their varied shapes and sizes, one can find drones in a wide variety of applications. Here are some of the more prominent use cases.

The Battle Front

The birth of drones goes back to World War-I. Back then the US Army placed an order for an unmanned “flying bomb” which could hit a target at a range of 64 kilometres. The kettering bug as it came to be known, made its first flight in October 1908 and met with limited success.

Since then armies around the world have continued to employ drones for military purposes.

Today’s military drones are highly sophisticated machines often being controlled from the other side of the world. With the pilots sitting safely in their home bases, these drones can venture over heavily defended areas and provide valuable information. Modern drones are capable of undertaking a variety of missions including, reconnaissance, close air support, homeland security and so on.

Drones like the General Atomics Predator have shot to fame thanks to the American media broadcasting exploits all around the world. These ghosts in the sky often stayed on station for hours stealthily stalking their target. When the time was right, these drones unleashed their precision guided munitions that decimated the target. With drones gathering so much attention from militaries across the world, the behemoths of the aerospace industry are putting their weight behind this class of aircraft. Consequently several billion dollars have been spent on research and development of advanced UAS concepts.

Boeing has a program called the Boeing Airpower Teaming System (ATS), also known as the Loyal Wingman project, which serves as a force multiplier, where unmanned airplanes fly together with manned fighters. As of March 2021, the loyal wingman has successfully completed maiden flight trials in Australia. The Indian Armed forces are also integrating drones into their arsenal. These include the IAI Heron, Searcher and Harpy Drones. In addition the Indian armed forces also use the Lashkya target drone developed by the



Zipline Drone dropping Supplies - Credit: Gavi/2 '018/KAREL PRINSLOO

DRDO. The indigenous Rustom UAS is also under development.

Drones for Logistics

Drones have immense potential to disrupt traditional road and rail logistics, especially in remote areas where infrastructure is scarce. With their high degree of autonomy, moderate payload and high reliability, drones are well suited for delivery applications. Some early applications of this concept can be seen in places as far flung as Africa. Zipline, a California based company has successfully operationalized drone based delivery of medical supplies for critical patients in remote rural areas in Rwanda & Ghana.

In India, the Director General of Civil Aviation (DGCA) has given a nod to food startups like Zomato, Swiggy and Dunzo to start testing beyond the visual line of sight (BVLOS) drones for deliveries. Globally, a number of logistics companies such as Amazon's Prime Air and others like UPS & FedEx are exploring the use of drones to enhance their operating efficiency.

Drones for Agriculture

Drones are proving particularly useful in the agriculture sector, where their high resolution video feeds can help farmers monitor huge tracts of land. Advanced agricultural drones are often equipped with multi spectral imaging cameras that aid in identifying problems.

Drones were successfully used to assist in handling the locust menace that swept through parts of Rajasthan, Punjab and Haryana. Drones are also being developed for plant health

monitoring, and eventually for spraying applications. This will eventually result in enhanced yield of crops.

Drones in India

Let's circle back to the questions raised regarding safety raised at the beginning of this article. Before the government can freely permit the use of drones, the aviation community must answer the question "What does it take to ensure that unmanned aircraft share the skies SAFELY with conventional manned aircraft?"

In a monumental move forward, the Indian Government through the Ministry of Civil Aviation, has published The UAS Rules, 2021. This is a continuation of the original CAR



Left to Right- Capt Kush Agarwal and Mr. Kiran Shah, of YelloSKYE

that was published in December 2018. These regulations pave the way for safe operation of drones in Indian airspace. The DGCA has deployed and continues to develop the Digital Sky platform.

DigitalSky is a Ministry of Civil Aviation initiative, a highly secure and scalable platform which supports technology frameworks such as NPNT (No permission no take-off) designed for enabling flight permission digitally and managing Unmanned Aircraft operations and traffic efficiently. This platform ensures that drones are properly registered and are only operated by trained operators in an authorized airspace. Drones have

also been categorized into weight categories, and minimum standards of equipment and licensing for each category have also been defined. The Indian regulatory framework along with the Digital Sky platform is one of the most comprehensive pieces of governance in the world.

Building a world class governance structure is only the tip of the iceberg. Behind the scenes the drone ecosystem in India is coming to life. Crucial players in this ecosystem include drone manufacturers, trained operators, pilot training organizations, maintenance organizations, specialist software developers and drone data analytics platforms. These parts of the ecosystem are becoming operational in preparation for a full-fledged unmanned aircraft industry.

The Future is Taking Place Now

With their unique capabilities and immense commercial potential, drones are here to stay. Advanced analytics, machine learning and other cutting edge technologies shall drive us towards a future where a significant portion of aviation is unmanned.

If the drone show of the 2021 Tokyo Olympics feels like it was taken from a science fiction movie, then clearly the Future is Taking Place Now.

YelloSKYE

YelloSKYE is a professional company that offers consultancy and operational expertise on drones. Its management team comprises experts in commercial aviation, banking, capital markets, and deep technology including AI and ML. The objective at YelloSKYE is to build professional, safe and scalable drone operations for India.

Watch this space for your regular dose on Drones.