HISTORY OF DRONES

The earliest recorded use of an unmanned aerial vehicle for war-fight occurred on August 22, 1849, when the Austrians attacked the Italian of Venice with unmanned balloons loaded with explosives.

At least some of the balloons were launched from the Austrian ship Vulcano. Although some of the balloons worked and successfully managed to bomb the Republic, others were caught in a change of wind and blown back over Austrian lines. The Austrians had been developing this system for months. The Pre: of Vienna, Austria, stated: "Venice is to be bombarded by balloons, a: lagunes prevent the approaching of artillery.

Five balloons, each twenty-three feet in diameter, are in construction at Trev In a favorable wind the balloons will be launched and directed as near to Venice as possible, and on their being brought to vertical positions over the town, | will be fired by electro magnetism by means of a long isolated copper wire ¥ a large galvanic battery placed on a building. The bomb falls perpendicular and explodes on reaching the ground." Balloons do not generally meet toc definition of a UAV. Once winged aircraft had been invented, the effort to fly them unmanned for military purposes was not far behind.

Father of Drones:

Abraham Karem is an aerospace engineer who is a pionner in unmanned aerial vehicle (UAV) technology.

1. Introduction

Drones are formally known as unmanned aerial vehicle which is essentially a flying robot. It can be controlled by either pilot from the ground or it can be autonomous. The drones which are used for agriculture purpose are called as agriculture drone. In current scenario it is also being used for surveillance, traffic monitoring, weather monitoring.

Drones are the future of farming. With greater refinements in drone technology and implementation we will see the agricultural drone sector take off. According to Global Markets Insights, Inc. the Agriculture **Drones Market will be valued at $1 billion by 2025.**

Agriculture spraying drone can replace the traditional pesticide sprayer and its speed is 40 times of the traditional sprayer. It will save 90% water and 30%-40% pesticide. Small droplet diameter makes the pesticide more well-distribute and improve the effect. At the same time, it will make the people far away from the pesticide and reduce the pesticide remain of the crop.

Agricultural drone technology has been improving in the last few years, and the benefits of drones in agriculture are becoming more apparent to farmers. Drone applications in agriculture range from mapping and surveying to crop-dusting and spraying. On the surface, agricultural drones are no different than other types of drones. The application of the UAV simply changes to fit the needs of the farmer.

2. Types of Drones

Depending on the application and usage :

Drones are 4 types :

1.Multi rotor

2.Fixed wing

3.V-TOL drone

4.Hybrid Drones (engine based)

1. Multirotor:

Multirotor drones are the most popular types of drones that are used by hobbyists and professionals. Common applications of multirotor are varied, but include aerial photography, video surveillance and surveying.

If you are looking to get a small camera in the air for a relatively short period of time, then a multirotor is the way to go. They give you much more control over positioning and framing the camera to get you that perfect aerial photo shot.

The financial barrier to entry in the multirotor market is low thanks to the advancement of cell phone technology that has allowed the price of drone components to become ignorantly smaller and cheaper. Out of the four types of drones that are available, multirotor are the easiest to manufacture, and the most economical to fly.

Multirotor can be further classified based on the number of rotors on the aerial platform. Tricopters have 3 rotors, quadcopters have 4 rotors, hexacopters have 6 rotors and octocopters have 8 rotors. Quadcopters are the most popular and widely used.

Multirotors do have their downsides. The major constraint is the limited flying time, reduced endurance, and speed. They are not suited for long distance surveying applications, mapping, or inspection. The main issue here is that most of the energy, usually from a battery source, is used to maintain the drone in a stable flying position. Currently multi rotors are only capable of maximum flying times of 20 to 30 minutes with a minimal payload.

2. Fixed wing

Fixed wing drones are one of the types of drones that use the same principle that airplanes use to generate lift using a wing instead of vertical thrust generating
Rotors. The vertical lift is generated as a consequence of the forward motion of the wing through the air, making this a more efficient way of generating vertical lift.

Fixed wing drones are able to traverse long distances, map wider areas, and stay within close proximity over points of interest. Along with the greater thrust generating efficiency, fixed wing drones are able to use gasoline powered engines. Due to the energy density of this type of fuel, gas powered drones are able to stay in the air for over 15 hours.

The main drawback of fixed wing aircraft is their inability to loiter over one point of interest, which rules them out for taking aerial photos and videos. Launching

and landing fixed wing drones can also be problematic. To get them in the air, you need a runway or a catapult. To recover the drone, you will need a runway, parachute, or net to recover them safely. Only very small drones are suitable for launching by hand, or belly landing in an open field.

Fixed wing drones are costlier to fly, and more difficult to learn how to fly. Multi rotors have become widespread because they are easier to acquire, and easier to learn how to fly. This is not the case for fixed wing drones. You will need to have a basic understanding of flight dynamics to take off, fly to the designated waypoints, and then land safely.

3.V-TOL Drone

Multirotor UAVs (Unmanned Aerial Vehicles) and VTOL (Vertical Take-Off and Landing) unmanned aircraft have the ability to take off, fly and land vertically as well as hover in place. A typical VTOL UAV may be based around a helicopter design or may feature a multirotor design that incorporates four or more propellers.

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4. Hybrids Drones

This are hybrid versions combining the benefits of fixed wing models (higher flying time) with that of rotor based models (hover). This concept has been tested from around 1960's without much success. However, with the advent of new generation sensors (gyros and accelerometers), this concept has got some new life and direction.

Fixed Wing Hybrids:

A new category of hybrid drones that can take off and land vertically are being developed. These merge the benefits of fixed wing UAVs with the ability to hover.

Some of these hybrid drone concepts are essentially fixed wing designs with a vertical lift motor. Other designs are tail sitting aircraft that point vertical for take-off before pitching over to fly horizontally. Further designs feature the rotor or the entire wing with propellers can point upwards for take-off, and horizontally for forward flight.

Some of these design configurations were tried in the 1950s and 1960s for manned aircraft, but were deemed too complex and difficult to fly. Many of the test flight ended in disastrous results. The advancement of modern flight computers, and

advanced sensors, the task of flying these types of drones can be taken on by the computer.

Currently, there are only a handful of hybrid fixed wings available on the market. However, you can expect to see more of these types of designs as the technology gets advanced. One example of this type of design is Amazon's Prime Air delivery drone.

TYPE OF DRONES DEPENDING ON SIZE:

Drone are classified according to their size

1. Very small Drones
2. Mini Drones
3. Medium Drones
4. Large Drones

Very small Drones

Very small drones are basically drones which are pf sizing ranging from that of larger insects to 50cm long. Very small drones can be usually found in two form Nano or Drones and Mini Drones. The Nano drone are mainly shaped and designed in the form of insects. These usually have very small rotary or flapping wings.

Mini Drones

Mini drones are mainly drones that are bit bigger than the micro drones. They have at least one side bigger than 50 cm but altogether, they cannot be bigger than 2 m most of the small size drone have fixed wings. There are also some drones having the designs based on rotary wings.

Medium Drones

These are the drones that are quite bigger and heavier than the small ones, but are still smaller than lighter aircraft. Because of their weight and sizes. They are quite big, having an average wingspan of 5-10 m and powerful enough to carry weights of up to 200kgs

Large Drones

These drones are basically of the size of small aircraft .they are mostly found in military facilities. These can be used for surveillance purpose of active areas.

Civil RPA Is Categorized In Accordance With MTOW (Including Payload) As Indicated Below:

Nano	**Less than or equal to 250grams**
Micro	**Greater than 250 grams and less than or equal to 2 kg**
Small	**Greater than 2 kg and less than or equal to 25 kg**
Medium	**Greater than 25 kg and less than or equal to 150kg**
Large	**Greater than 150kg**

Sub Classification of multirotor

1. **Bi copter**
2. **Tri copter**
3. **Quadcopter**
    - Quad H
    - Quad X
    - Quad +
4. **Hexa copter**
    - Hexa X
    - Hexa +
5. **Octa copter**
    - Octa X

QUARD COPTER:

The most popular model on the market, the quadcopter uses 4 rotors positioned at the ends of a square on the drone body. This design is used to create toy drones as well as bigger, worker drones.