

30. **Payload:** The weight of the equipment, such as cameras or sensors, that the drone carries.

Industry-Specific Terms

- 31. **Aerial Photography:** Using drones to capture images or videos from the air.
- 32. **Surveying and Mapping:** Using drones to collect data for creating maps and models.
- 33. **Agricultural Drones:** Drones used for monitoring crops, spraying pesticides, and assessing field conditions.
- 34. **Delivery Drones:** Drones used for transporting goods.
- 35. **Inspection Drones:** Drones used for inspecting infrastructure, such as bridges, power lines, and pipelines.

1.3 HISTORY OF DRONES:

- With the maturing and miniaturization of applicable technologies in the 1980s and 1990s, interest in UAVs grew U.S. military. In the 1990s, the U.S. DoD gave a contract to AAI Corporation along with Israeli company Malat. The U.S. Navy bought the AAI Pioneer UAV that AAI and Malat developed jointly. Many of these UAVs saw service in the 1991 Gulf War. UAVs demonstrated the possibility of cheaper, more capable fighting machines, deployable without risk to aircrews. Initial generations primarily involved surveillance aircraft, but some carried armaments, such as the General Atomics MQ-1 Predator, that launched AGM-114 Hellfire air-to-ground missiles.
- CAPECON was a European Union project to develop UAVs, running from 1 May 2002 to 31 December 2005.
- As of 2012, the USAF employed 7,494 UAVs – almost one in three USAF aircraft. The Central Intelligence Agency also operated UAVs. By 2013 at least 50 countries used UAVs. China, Iran, Israel, Pakistan, Turkey, and others designed and built their own varieties. The use of drones has continued to increase. Due to their wide proliferation, no comprehensive list of UAV systems exists.
- The development of smart technologies and improved electrical power systems led to a parallel increase in the use of drones for consumer and general aviation activities.
- As of 2021, quadcopter drones exemplify the widespread popularity of hobby radio-controlled aircraft and toys, however the use of UAVs in commercial and general aviation is limited by a lack of autonomy and new regulatory environments which require line-of-sight contact with the pilot.

1.4 TYPES OF CURRENT GENERATION OF DRONES BASED ON THEIR METHOD OF PROPULSION:

The current generation of drones, also known as Unmanned Aerial Vehicles (UAVs), can be categorized based on their method of propulsion. Here are the main types:

1. Fixed-Wing Drones

- **Description:** These drones resemble traditional airplanes with a fixed wing structure.
- **Propulsion Method:** They usually rely on one or more propellers powered by internal combustion engines or electric motors.
- **Advantages:** Efficient for long-distance flights and can cover large areas.
- **Examples:** SenseFly eBee, Parrot Disco.



2. Multi-Rotor Drones

- **Description:** These drones have multiple rotors, with the most common configurations being quadcopters (4 rotors), hexacopters (6 rotors), and octocopters (8 rotors).
- **Propulsion Method:** Each rotor is powered by its own electric motor.
- **Advantages:** Highly maneuverable, capable of vertical takeoff and landing (VTOL), and stable hovering.
- **Examples:** DJI Phantom, Yuneec Typhoon.



3. Single-Rotor Helicopters

- **Description:** These drones operate similarly to traditional helicopters, with one main rotor and a smaller tail rotor for stability.
- **Propulsion Method:** Powered by either internal combustion engines or electric motors.

- **Advantages:** Longer flight times and the ability to carry heavier payloads compared to multi-rotor drones.
- **Examples:** Align T-Rex, DJI Ace One.



4. Hybrid VTOL Drones

- **Description:** These drones combine the features of fixed-wing and multi-rotor drones, allowing for vertical takeoff and landing as well as efficient forward flight.
- **Propulsion Method:** Typically equipped with both rotors and fixed wings, with rotors providing lift for takeoff and landing and fixed wings for forward flight.
- **Advantages:** Versatility in various flight conditions and missions.
- **Examples:** Quantum Systems Trinity F90+, WingtraOne.



5. Ducted Fan Drones

- **Description:** These drones use ducted fans, which are propellers enclosed within a cylindrical duct.
- **Propulsion Method:** The ducted fans are usually powered by electric motors.
- **Advantages:** Enhanced safety and efficiency, reduced noise, and better performance in confined spaces.
- **Examples:** Teal One, Vayu UAV.



6. Tethered Drones

- **Description:** These drones are connected to the ground via a physical tether.
- **Propulsion Method:** Powered through the tether, which supplies continuous power from the ground.
- **Advantages:** Extended flight times as they are not limited by battery life, and stable positioning due to the tether.
- **Examples:** Elistair Safe-T, Hoverfly LiveSky.



1.5 DRONE BUSINESS THROUGH ENTREPRENEURSHIP:

Starting a drone business as an entrepreneur involves leveraging drone technology to provide various services across different industries. Here's a comprehensive guide to help you navigate the process:

Steps to Start a Drone Business:

1. Market Research and Planning

- **Identify Niche:** Determine which industry or industries you want to target (e.g., agriculture, real estate, construction, etc.).
- **Analyze Competitors:** Research existing drone service providers to understand their offerings, pricing, and market presence.

- **Business Plan:** Develop a detailed business plan outlining your business model, target market, services, pricing strategy, marketing plan, and financial projections.
- 2. **Legal Requirements and Certifications**
 - **Regulations:** Understand and comply with local, state, and federal regulations regarding drone operations. This often includes registering your drones and obtaining necessary permits.
 - **Certifications:** Obtain the required certifications, such as the FAA Part 107 certification in the United States, which allows you to operate drones commercially.
- 3. **Acquire Equipment**
 - **Drones:** Purchase drones that suit your business needs. Consider factors like flight time, camera quality, payload capacity, and durability.
 - **Accessories:** Invest in additional batteries, propellers, carrying cases, and any other accessories that enhance your operations.
 - **Software:** Use software for flight planning, data analysis, and post-processing. Popular options include DroneDeploy, Pix4D, and DJI Ground Station.
- 4. **Insurance**
 - **Liability Insurance:** Obtain liability insurance to cover potential damages or accidents during drone operations.
 - **Equipment Insurance:** Insure your drones and equipment against theft, damage, and loss.
- 5. **Training and Skill Development**
 - **Pilot Training:** Ensure that you and any other operators are well-trained in drone piloting, maintenance, and safety protocols.
 - **Industry-Specific Skills:** Acquire skills relevant to your chosen niche, such as aerial photography, mapping, surveying, or data analysis.
- 6. **Marketing and Networking**
 - **Website and Online Presence:** Create a professional website showcasing your services, portfolio, and contact information. Utilize social media platforms to reach a broader audience.
 - **Networking:** Join industry groups, attend trade shows, and connect with potential clients and partners.
 - **Advertising:** Use online advertising, local media, and industry-specific publications to promote your services.
- 7. **Service Offerings**
 - **Aerial Photography and Videography:** Provide high-quality images and videos for real estate, events, marketing, and media production.
 - **Surveying and Mapping:** Offer services for construction, agriculture, mining, and environmental monitoring using photogrammetry and LiDAR technology.