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Drones in Business

Matthew N. O. Sadiku
Department of Electrical & Computer Engineering, Prairie View A&M University, Prairie View, TX USA

Uwakwe C. Chukwu
Department of Engineering Technology, South Carolina State University, Orangeburg, SC, USA

Janet O. Sadiku
Juliana King University, Houston, TX, USA

Abstract: A drone, also known as Unmanned Aerial Vehicle (UAV), is an aircraft without a human pilot aboard. Drones are robots typically remotely controlled by a pilot and with the ability to fly or move. It seems that drones are breaking into every industry. Drones can serve as a platform on different applications and business models. In many business activities, drones can replace traditional methods of operation. This paper introduces readers to drone and their various applications in the business world.

Keywords: business, drones, drones in business, drone applications.

INTRODUCTION

Technology has had a huge influence on workplace productivity. Drones are no exception. Drones provide aerial data that can help automate many tedious tasks.

They play a part in the digital transformation. There is no denying that drones are the hot topic of technology these days, with many people eager to get their hands on one for personal or commercial use. Drones (or unmanned aerial vehicles (UAVs)) are quickly gaining traction among both individuals and major companies. Drones can vary in shape and size, but the main core elements (battery, microcontroller, motor, sensors) essentially remain the same. With less human operation and no safety infrastructure, drones can reduce time and costs. Drones are being used to gather information for businesses and support commerce. They are commonly used in healthcare, agriculture, military, insurance, delivery, etc. [1,2].

OVERVIEW ON DRONES

Drones are autonomous robots that fly in the sky. They may also be regarded as pilotless aircrafts that were initially used by the military but are now used for scientific and commercial purposes. The word "drone" was coined due to the similarity of its sound to a male bee. Drones are pilotless aircraft and are formally known as either unmanned aerial vehicles (UAVs) or unmanned aircraft systems (UAS). Drones are also called "remotely piloted vehicle" or "unmanned aerial systems." Drones were first used in the 1990s by military organizations. The notion of drones began around 1918 when the US Navy commissioned Charles Kettering built a militarized unmanned aerial vehicle (UAV). Their original use

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was to take strategic pictures for the military. From the beginning of the 21st Century, civil activities started to get more attention.

Drones are classified in different ways, according to their size, weight, flight time, commercial or military, and cost. The US Federal Aviation Administration (FAA) defines consumer and commercial drones as those that weigh less < 1.0 lb (0.45kg) with approximately a maximum 500 m altitude and 2km range from the base operator.

A drone is a pilotless aircraft that operates through a combination of technologies, including computer vision, artificial intelligence, object avoidance tech, automation, robotics, and miniaturization.

Drones have been used for blood delivery, food delivery, and package delivery. They are now used in different fields including transportation, healthcare, news media, commerce, safety and security, disaster management, rescue operations, crop monitoring, weather tracking, environmental protection, intelligence gathering, surveillance, aerial photography, express shipping, recreation, agriculture, wildlife, military, law enforcement, home, cemetery management, power, infrastructure,, telecom sectors, marine, weather forecasting, sports, space, insurance, hotels, journalism/news coverage, and logistics [3,4]. Drones have been used by the military in combat and for humanitarian aid. Drones have emerged as interaction devices in home and research applications. A drone can be used as companion, personal drone, agent, sensing tool, delivery tool, ambulance drone, etc. Drones are commonly used by hobbyists just for the fun of it. Healthcare is benefitting from this disruptive technology. Thus, we have different kinds of drones: military or armed drones, healthcare drones, medical drones, biomedical drones, smart drones, humanitarian drones, collaborative drone, ambulance drones, courier drones, nano or micro or mini drones, etc.

The technology involved in drone construction is impressive. Modern drones are empowered by sensor technology. Accelerometers are often used to determine position and orientation of the drone in flight. Inertial measurement units combined with global positioning systems (GPS) are critical for maintaining direction and flight paths [5]. Drones have to provide a reliable connection regarding tracking as well as remote control purposes and communicate these with users. They can maneuver unobtrusively above the ground towards a target user without disturbing human movement on the ground.

APPLICATIONS

From package delivery to sporting events, drones play major roles in everyday life. Many industries have found ways to use drones to benefit their business. Drones continue to grow in popularity as entrepreneurs discover more and more applications for them. Industries that commonly use drones for business include the following [6,7]:

- *Agriculture*: Drones can be an exciting means of merging technology with agriculture. Many countries are large exporters of food. The high demand for food gives drones an opportunity to be used for a variety of tasks. There are drones that can deliver water, pesticides, or herbicides. Drones can assist both large and small farming operations with disease management services. There are also drones that provide the farmers with crucial information about the weather and on how crops are doing. Figure 1 shows how drones are used in agriculture [8].
- *Restaurants:* Fast food chains and other restaurants use drones for aerial traffic studies. For example, Chick-fil-A has been hiring drone pilots to perform their aerial traffic studies. Dominos delivery drone is still very much in test phase.
- *Real Estate:* Many real estate professionals are now using drones to help with their marketing efforts. Most drones have cameras that give real estate companies an opportunity to capture photos and videos

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of their properties. You can use a drone in advertising to offer your customers innovative campaign options. Most homebuyers begin their search online where they expect to find photos and videos of different homes. A real estate drone is shown in Figure 2 [9].

- *Insurance:* Insurance companies were among the first to adopt drones. Many insurers are leaping into technological advances by using drones in different ways. Drones can be used to gather data before a risk is insured and to assess damage after an event. They have proved to be useful for insurance companies after events like natural disasters.
- *Construction:* Drones are being used in a variety of ways and are changing the way the construction industry works. They have helped revolutionize the entire construction project life cycle from beginning to end. Construction companies use drone to help keep clients up-to-date on the progress of their work. Drones are used for reducing labor times for surveying land, improving infrastructure, providing more accurate surveillance, and adding efficiency to inspections. Drones are also used in the inspections of bridges. A typical use of construction in construction is shown in Figure 3 [10]
- *Photography:* Most businesses use drones for video and photography. Drone photography is the ability to capture both still images and video by using a drone. Drones ensure wedding couples have interesting and different photographic shots from various angles and heights. Drones can both fly in the sky and dive into the ocean. One profitable way to make money with drones is to become a wedding photographer and videographer.
- *Package Delivery:* Drones are being used for package delivery. Amazon, Walmart, and UPS are currently delivering packages by drones. Traditional postal service providers such as USPS, UPS, and FedEx have been using drones for shipping and handling for major online retailers. They are looking to save money with drones. The package delivery is usually done in rural and remote areas. Amazon Prime Air is a drone delivery system that anticipates package deliveries in 30 minutes or less. A typical package delivery is shown in Figure 4 [7].
- *Security:* Drones and robotics are among the most exciting and transformational emerging technologies in the security industry, and they are solutions that practitioners are more and more eager to deploy.

Other applications include governments, aerial surveying, sports video, drone videography, drone advertising and marketing, filmmaking, maintenance, disaster relief, safety inspection, data monitoring, police and fire departments, military, security surveillance services, power industry, telecom industry, entertainment industry, warehousing and inventory industry, engineering industry, underwater inspections, mapping and surveying, etc. These various applications have allowed drone pilots as well as drone manufacturers to capitalize on the new technology.

BENEFITS

Drones have recently become widely used for both recreational and commercial purposes. Drones are a versatile technology that many companies have started to use. Drones are saving companies time and money. The economic impacts associated with drone integration consist of job creation and billion-dollar growth.

CHALLENGES

While the financial implications of drone use are robust and obvious, numerous consumers, states, and regulators believe sanctioned UAV use to be detrimental. Many have voiced concerns about instances where their use could be harmful. Privacy and security concerns are key issues for those nervous about data collection. Without human monitoring, a drone is unable to ensure seamless deliveries.

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Drones have got a bad reputation. Most people associate them with expensive military aircrafts or small consumer toys. Rushing to implement drone technology without adequate preparation can lead to a legal and financial disaster.

Although the economic impact of drones is robust, the Federal Aviation Administration's (FAA) regulations in conjunction with privacy and safety concerns have delayed the full operation of commercial drone services. Thus, FAA regulations is biggest obstacles for commercial drone usage. Companies like Amazon, Walmart, and Facebook are facing regulation and approval challenges from the US FAA.

CONCLUSION

If you are interested in drones, be sure to consider the available options. To fly a drone professionally means that you can legally operate a drone for business purposes and get paid for the service. Flying drones commercially in the US requires passing a test and obtaining a Remote Pilot Certificate from the FAA. After getting the certificate, you also need to register your drones with the FAA. For drone operating in urban areas, drone insurance is a must. Once you become a drone pilot, you will get requests for all kinds of different drone jobs such as real-estate, construction, photography, advertising, land mapping, etc. [11].

The future of drones being used commercially by businesses has already begun. Drones are here to stay and will soon become mainstream. More information about drones in business can be found in the books in [12-15].

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ABOUT THE AUTHORS

Matthew N. O. Sadiku is a professor emeritus in the Department of Electrical and Computer Engineering at Prairie View A&M University, Prairie View, Texas. He is the author of several books and papers. His areas of research interest include computational electromagnetics and computer networks. He is a life fellow of IEEE.

Uwakwe C. Chukwu is an associate professor in the Department of Industrial & Electrical Engineering Technology of South Carolina State University. He has published several books and papers. His research interests are power systems, smart grid, V2G, energy scavenging, renewable energies, and microgrids.

Janet O. Sadiku holds bachelor degree in Nursing Science in 1980 at the University of Ife, now known as Obafemi Awolowo University, Nigeria and Master's degree from Juliana King University, Houston, TX in December 2022. She has worked as a nurse, educator, and church ministries in Nigeria, United Kingdom, Canada, and United States. She is a co-author of some papers and books.

Figure 1 How drones are used in agriculture [8].

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Figure 2 A real estate drone [9].

Figure 3 A typical use of drone in construction [10].

Figure 4 A typical package delivery [7].

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