Guest Column

Drones: A New Revolution in E-commerce & Agriculture

By Nija Nair

We are, undoubtedly, living in the golden age of technological advancement. From the internet to electric vehicles, new developments have been witnessed in various industries and the world of unmanned aerial vehicles (UAVs) or drones is no exception. In recent times, the importance of consumer and commercial drones has grown exponentially. It has become extremely crucial for sectors such as e-commerce and agriculture.

E-Commerce

Over the last few years, e-commerce or e-markets have been giving tremendous competition to stores, shopping centers etc. The latest innovation which is going to be a game changer for the Ecommerce industry is the deployment of drones for delivery.

In order to leverage the drone technology, the e-commerce business should have the essential infrastructure such as:

a) Integration of the customer ordering system with the warehouse ERP
b) Integration of ERP & drone
c) External notifications with the server

The technology works as the customer places an order on the website & it is transferred to the main server and ERP system. The order is packed and dispatched through the drone. This is executed manually with help of the drone system and server integration system. The ERM system sends this information through the platform to the buyer as the order status. As the GPS & flight computers are installed in Drone's software, the drone communicates its location to the server with a timestamp. The external notification system gets the information from the server & sends the updates to the customers who will get to know about the exact location of the delivery.

Some of the advantages of drone-based delivery are as follows:

- Drones can deliver products quickly, from hours to minutes based on the origin and destination.
- Drones do not need roads & can go anywhere (over mountains, across water, in a park, top of the buildings) with the right coordinates.
- Drones are very economical compared to delivery vehicles and also save a lot of labor cost.
- Drones enable real-time tracking for both customers and merchants.
- Drones can safely deliver perishable foods or medical supplies. Drones could disrupt food delivery services such as Uber Eats, DoorDash, as well as local couriers.
- Drones leave a tiny carbon footprint compared to a vehicle.
- Drone deliveries lessen overall traffic as there are less delivery vehicles on the road.

Some of the challenges associated with the drones are as follows:

- Drone delivery is not legalized in all places & requires universal approval for mass adoption
- Drone delivery is limited to relatively smaller products. For example, drone delivery of televisions, large cupboards etc. are ruled out
- Drone deliveries are not feasible in bad weather like storms, rain, snow etc.
- Drones can fail if hit by a bird
- Drone deliveries are vulnerable to theft as criminals down the units to steal the products
- Drones can be delivered only over small areas and have distance limitations

- Drones can be very expensive when it comes to building a fleet of deliveries and only large players will be able to afford it while smaller and mid-sized retailers get priced out of the market

At this point of time, drone-based delivery is still at a nascent stage. The current global market size for drones is about USD $14 Billion & is expected to grow to USD $43 Billion by 2024. The major chunk of this growth is going to be from commercial deliveries. In the US alone, there are more than one million registered drones. The major players across the world for drone-based delivery are Amazon, UPS, FedEx, Domino's Pizza, Ukraine Postal Service, Flirtey, Workhorse, Zomato & Alibaba. The drones provide online retailers a fast, affordable, and simple delivery solution which also benefits customers. Also, they are expected to increase eCommerce revenue by almost 25% over the next decade and save online retailers some US $50 million in delivery costs indeed. Also, organizations are trying for a complete automated drone-based delivery which is absolute human intervention free.

In India, the regulations related to drone flying shaped during the year 2018 only four years after it imposed a ban on the same in 2014 based on an incident from Mumbai. The DGCA (Director general of Civil Aviation) have come up with a set of guidelines which are very slow in getting implemented.

The retail landscape changes very fast & E-commerce is going to be one major industry which could revolutionize with the help of drones in future.

Agriculture

The agriculture industry is adopting efficient practices and also implementing latest technologies and innovation driven by growing population and climate change. This will wipe out all assumptions in modern farming and enable maximum yields for farmers. It seems that drones are embraced very well by the farming community as advanced drones allow farmers and the drone pilots to increase efficiency in certain aspects of the farming process. This includes crop monitoring to planting, livestock management, crop spraying, irrigation mapping, etc and much more.

The components of the drones look like the following: form factors viz. multi rotor or fixed wing, sensors (cameras, video, multispectral, Lidar, Hyperspectral, thermal etc), software. The average price of the drone will be USD $1500 to USD $20,000 depending upon the type of applications. The selection of the drone depends on the type of applications like drones wanting to map small fields or large fields, drones used in cold & wet areas etc.

The parameters to be considered are: flight time along with sensor payloads, Range (physical & wireless), payload capacity, cruise speed etc.

Several time consuming and difficult tasks can be successfully implemented using the drone technology while reducing the total cost. Following are some of the important applications of agricultural drones:

- Soil and Field Analysis: Generation of 3D maps of soil to determine soil quality, nutrients availability & dead zones. This will enable better patterns for planting, effectively utilize water resources, and excellent management of crops.
- Planting seeds: Custom drone systems have the ability to shoot seed pods into prepared soil. They can help in reducing the need of on-the-ground planting which is otherwise an expensive and stressful exercise.
- Crop spraying: Drones can be outfitted with reservoirs, which can be filled with fertilizers, herbicides, or pesticides. The drones for crop spraying are much safer and cost-effective. Also, they can be completely functioned autonomously and programmed to run on specific schedules and routes. The spot spraying to treat the weeds spread can be made optimal using drones in terms of cost and performance.
- Mapping & survey: The large scale crop and acreage can be supervised very easily and effectively. The information related to overall crop and plant health, land distribution for the particular crops, life cycle of crops etc can be well obtained along with detailed GPS maps of crop area. Earlier, satellite or plane imagery was used which were very expensive and lacked precision.
- Irrigation management: The drones that are equipped with thermal cameras can help to spot irrigation issues, or areas that are receiving too little or excessive moisture. The crops can be better laid out to maximize drainage, adhere to natural land runoff, and avoid water pooling which can harm sensitive crops with this information. ■

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