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As federal regulations take shape and companies rush to find new ways to take their business to the skies, the drone industry is ready to take wing.

Although recent news stories have often characterized drones as menacing, privacy-invading dangers from above, responsible drone operators are looking at ways to apply this emerging technology for greater business use.

Farmers are already using these flying machines to help determine when best to fertilize their crops, the movie industry has held its first drone film festival, and heavy industry has found prime uses for these vehicles in inspecting equipment and infrastructure.

The retail and transportation industries haven't yet launched megasize drone operations, but the testing has begun. In February, Chinese e-commerce giant Alibaba ran a small test using drones to deliver tea around Beijing, and before that, Amazon had launched a well-publicized Black Friday PR stunt announcing a desire to deliver its wares via drones.

Luckily, aviation-governing bodies around the world are working to define appropriate and safe use of drones for commercial use. Last year, the European Commission announced its intent to make Europe a leader in the remotely piloted aircraft systems industry. And earlier this year, the U.S. Federal Aviation Administration moved a step further in drone regulation with a proposed rule for the use of unmanned aircraft weighing less than 55 pounds.

What this all means is that a technology once relegated to hobbyists and militaries is primed for growth. Overall, the global commercial drone industry stands to grow from about $60.5 million last year to $1.1 billion by 2023, according to Phil Finnegan, an analyst at aerospace research firm Teal Group.

Although drones have been in existence for some time — Australia was one of the first countries to introduce legislation regarding these unmanned vehicles in 2002 — public and regulators' concerns about safety, security and privacy remain as one drag on their greater adoption, with cybersecurity being a second area causing turbulence.

Regulating flight

"Industry has been working on these issues for more than 15 years, which is how the recent FAA recommendation came out," says Rose Mooney, director of the Mid-Atlantic Aviation Partnership, which operates the FAA-designated Unmanned Aircraft Systems Test Site at Virginia Tech. "The challenge is safely integrating unmanned aircraft into the airspace without making the regulations so onerous that they kill the industry."

Regulations may be restricting some industries from full-scale use; however, others have been investigating how they can use drones now. "Anytime you have extended infrastructure, especially on a large scale, drones become very useful," says Dan Munyan, product manager for IoT location services in CSC's Emerging Business Group. "Heavy industry has been asking us to help them determine how they can best use drones to manage their monitoring operations."

Oil and gas organizations, for example, by law must monitor their pipelines frequently, and that means monitoring hundreds of thousands of miles of infrastructure. Before aerial drones, these industries used small aircraft or satellites, each of which has drawbacks, including pilot safety concerns and low-quality images. With drones, organizations can see real-time information. They can use various types of environment-sensing equipment, focus on a particular area and direct the drones to fly low enough to capture high-resolution images and other on-the-spot data.

Disrupting industry

Drones promise to be disruptive, and it will be up for grabs which organizations take best advantage of the opportunities these disruptions offer. Besides the more obvious potential cases in retail — where drone delivery services close that last gap between the distribution center and customer, offer same-day delivery, and shift the balance between online and traditional retailers — take as an example another industry, oil.

If an oil company is "the first in its industry to build a drone-based pipeline-monitoring system capability with half the current latency, it could drive regulations rather than respond to them, which is a competitive advantage," says Munyan. "It could also advertise that it's the safe company that monitors its pipelines day after day."

The public and regulators like safety. Although drones can take the place of humans and enhance safety, their mobility also creates cybersecurity challenges. Unlike other mobile devices that the security industry has been able to secure, drones travel in uncontrollable environments where there might also be other moving devices.

"The magic is figuring out how to secure a drone, which is nothing more than a computer with an engine on it," says John Osterholz, CSC Global Cybersecurity senior principal. "Facing an unknown environment and being able to manage that risk is really the key to having an effective drone solution."

Mastering risk before integration

Securing the drone itself, as much as securing the organization, is key to protecting the enterprise, Osterholz says. "If I want to inject a virus or malware into your system and your drones aren't secure, you just have to pass overhead, and I can inject the malware that way," he says. "This drives a great increase in vulnerability. At the end of the day we have to master the risk involved with the drones themselves before integrating them into an enterprise."

Besides using drones to breach an organization's system and cause damage, if drones are left unprotected, criminals can also steal the data the drones are gathering. This data could be valuable intellectual property, if an organization is using the drone to evaluate potential new oil fields, for example, or the data could be valuable to criminals wanting to damage critical infrastructure, such as power or rail lines.

"This has happened in the military, where insurgents using a commercial device would capture the video coming off a drone and then set ambushes," says Osterholz.

Osterholz, who worked on drone projects early in their development, adds that in the commercial world, where budgets are tight, it will be some time before manufacturers offer inexpensive, industrial-grade, secure, off-the-shelf drone solutions. This doesn't mean that organizations should sit back and wait to see whether these unmanned aerial vehicles will offer solutions to existing, or yet-to-be-discovered, challenges.

"We didn't know what we'd do with cameras on phones or social media before they appeared," says Munyan. "Nothing in society is ready for drones either, but they're here." ∎

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