The Next Big Thing: Autonomous Drones

by Debra McCown Thomas

Now that mining companies have discovered how they can benefit from smart technology, the timeline is speeding up.

Just a couple of short years ago, we were writing about drones at mine sites as the product of dedicated hobbyists: individuals who, with the blessing of their employers, put in hours of tinkering to apply their specialized skills and expertise to use drones at work.

But the accomplishments of those early adopters were just the beginning of a trend that's taking off on a broader scale. Now it's possible to buy drones that can be easily programmed for mining-specific functions and then operate on their own, around the clock, without human intervention.

"I think that 5-10 years from now you're going to drive a highway and [whenever] you see a utility or mining company, you'll see drones flying around," says Ariel Avitan *(right)*, co-founder and chief commercial officer of Percepto, whose Drone-in-a-Box automated industrial drone solutions are now operating at sites around the world. "We are very close to that kind of reality."

Percepto is an Israel-based company formed in 2014, which Avitan says is now the biggest Drone-in-a-Box provider in the world. It serves primarily heavy industrial sites like utilities, mining, oil, and gas.

Here's how it works: When a Drone-in-a-Box drone is purchased, the company is provided training on how to program its missions. Once put in place, the drone stays in its enclosure until it's time to perform an assigned task, which it does completely on its own. After each mission, it puts itself back in the box and e-mails the relevant data to its human users.

Avitan says his company's drones serve three primary functions: security (they can spot intruders day or night), safety (they can detect problems like a gas leak or fire and safely assess the situation), and inspection (they have countless data-gathering uses). On mine sites, they're often used for pile inspection.

"[They have] the ability to inspect piles on a continuous basis, create 3D models…and provide measurement," Avitan says. "It's a simple application, but it's an application that touches a lot of points of savings and efficiency within the whole value chain."

"Mining is one of the most advanced industries in this..."

Another popular use for the drones on mine sites is blast analysis, he says: a drone can assess a site before and after a blast and can also verify that workers are clear before the blast occurs. They can be used to inspect haul roads, keep an eye on automated equipment, assess damage following a storm or natural disaster, and help with mapping mine sites.

With user-friendly technologies like Drone-in-a-Box making drone use more accessible even for smaller companies, Avitan says, it's helping to drive technology adoption more broadly in mining: When a company has success using drones to assess ore piles, for example, there's a ripple effect that means a likelihood to adopt other next-generation technologies going forward.

While the mining industry as a whole tends to get a bad rap for its slowness to adopt new technologies, Avitan says the opposite is true in this case: so much value is gained by using drones that it's really catching on.

"Mining is one of the most advanced industries in this," he says. "Because of their use of unmanned vehicles and because of the vast spaces they need to inspect, they're using drones a lot, and we're finding the people that we work with within the mining industry are very knowledgeable about the systems and what they can use the drones for, and they know exactly what they need."

And the more this kind of automation boosts efficiency and profitability, the more motivation there is to explore other automated technologies. In the future, Avitan says, a lot of mines will be completely automated – and automated drones will be an important part of making everything run smoothly.

"I think that you'll have a very nice building in Perth [Australia] that has control centers all over: Every control center is a mine, but at the end there's no one in the mine; they're doing everything from aerial robots or monitoring the actual trucks [and equipment] – everything is controlled remotely, and if there's a problem they'll send someone in," he says.

"Every single company has that vision. Some are faster, some are slower, but everybody has that kind of vision, and I think on top of that there's a growing trend that is consolidation of data and, as a sub-trend of that, it's consolidation of visual data. So, how can you monetize visual data that you're currently collecting from different sites and learn from different sites based on it?"

Drone-in-a-Box technology is based on a simple concept, and it represents a leap that's already taken place in the market for drones: All of the functions that drones can perform can be done more cheaply, more timely, and more dependably when they're performed with an autonomous drone than with a human drone operator.

"You're in the business of mining, not flying drones," Avitan says. "By having an autonomous drone that is pre-programmed to do missions... you are ending the dependency on the capabilities of humans." MINING