The Internet of Things becomes enterprise-grade

Reaping benefits beyond regulatory compliance

Regulatory compliance remains a driving factor behind enterprise IoT adoption.

In the pharmaceutical industry, for example, drug manufacturers have until November 2017 to mark packages with a product identifier, serial number, lot number and expiration date—plus have the capability to electronically store and transfer all transaction histories, including shipment information, across their distribution supply chain. The US Drug Supply Chain Security Act is designed to thwart counterfeit drugs, which cost the industry anywhere from $75 billion to $200 billion annually and can make up half of all drugs sold in some low-income countries[8].

Yet increasingly, enterprises are reaping IoT benefits beyond compliance capabilities. More connectivity options, efficiency increases, better customer relationships and business growth are just a few.

> According to Verizon's survey, customer service (33%), management of assets (26%), and production and delivery capabilities (25%) are among the top IoT deployment objectives in their businesses[2].

Consider the case of the global pharmaceutical company that manufactures pain medication and is shipping a $100 million order to a regional distribution center. Sensors in the containers monitor location, temperature and geo-fencing parameters on the shipment. When a major accident occurs, the driver is forced to take an alternate route. This triggers an alert, notifying the manufacturer that the geo-fencing parameter has been violated. In turn, the dispatch contacts the driver, confirms the situation and pinpoints the shipment using GPS.

This near-real-time data will allow the company to reset expectations for delivery, thus preserving the customer relationship and protecting the brand by accurately tracking shipments, and providing updates regarding location and temperature during transit.

In the energy sector, what began in 2007 as a nationwide effort to monitor energy consumption under the Energy Independence and Security Act has evolved to an installed base of hundreds of millions of digital meters supported by remote reading and other smart grid apps.

But enterprises are already leveraging IoT data about grid capacity, demand and usage to more efficiently manage the energy grid and provide more value-added services to consumers.

The emergence of intelligent energy platforms, such as Verizon's Grid Wide Utility Solutions, provide utility companies with an easy on-ramp to smart grid modernization. Dakota Valley Electric Cooperative and Peninsula Light Company are two of a growing number of utility companies leveraging this secure platform-as-a-service to achieve better operational visibility. Grid Wide enables them to better monitor consumption, manage remote disconnections and detect outages more quickly. The result: lower service restoration times and increased customer satisfaction.

Clear skies for commercial drones

Enterprises are taking flight

By far, the biggest regulatory news in the last year is the Federal Aviation Administration's (FAA) easing of rules surrounding the operation of unmanned aerial vehicles (UAVs) or drones. To fly a commercial drone, operators now need to pass an aeronautical knowledge test rather than earn a more expensive pilot's license. After making this regulatory change in August 2016, the FAA predicted a dramatic increase in drone usage, with 600,000 commercial drones in the air by the end of 2017, up from the 2016 figure of 20,000[9].

In short, the new regulations greatly simplify access to air space. However, the on-ramp can be complex—everything from securing airspace to insurance requirements, equipment maintenance and crew management. To date, drones have been deployed primarily in military and public safety scenarios. Going forward, analysts expect enterprise and commercial use cases to expand exponentially. Companies like Skyward, a Verizon company, have worked to simplify drone operations.

> Revenues from drone sales will reach $12 billion in 2021, up from $8.5 billion in 2016[10].

With the evolution of regulations, analysts at Goldman Sachs also see drones "headed for new heights in the business world," adding up to a $100 billion market opportunity over the next five years. Even that figure is "just the tip of the iceberg," according to Goldman Sachs Research[11].

Drones equipped with cameras and sensors can stream near real- time data about the health of crops in the field, or maintenance conditions of hard-to-reach pipelines, communication towers and raw material stockpiles. This will be enabled by advancements in network connectivity through Verizon's Airborne LTE Operations (ALO) initiative, allowing drones to stream video and transmit data to a computer or smartphone on the ground.

Pacific Gas & Electric (PG&E) is testing drones to enhance the safety and reliability of its electric and gas service. It's also exploring the use of drones to monitor hard-to-reach infrastructure and to detect methane leaks. Rather than dispatch a $2,500-an-hour helicopter crew for the job, it can use a drone.

Industry experts expect drone technology to be adopted as ubiquitously as the internet, and Verizon is now well positioned to be among the earliest providers of a full-service platform. Platform services will range from flight planning and fleet management to data collection, storage and analysis—all of which will be incorporated into Verizon's ThingSpace platform.

Case study

Based in Greeley, Colorado, Hensel Phelps Construction Co. is one of the largest general contractors and construction companies in the United States, with a diverse range of domestic and international construction projects and a drone operations program that is one of the most sophisticated in the industry. Hensel Phelps saw the potential for unmanned aviation to make its design and construction processes more efficient. It does so by working with Skyward to streamline drone operations and seamlessly incorporate it into their business, cutting costs and keeping safety top of mind.

It's now able to easily track pilot hours, flight records and maintenance for its fleet of drones and has deployed them for a variety of use cases, including building inspections, data gathering for architects, surveying, and HVAC efficiency inspections.

Top five markets for commercial drones

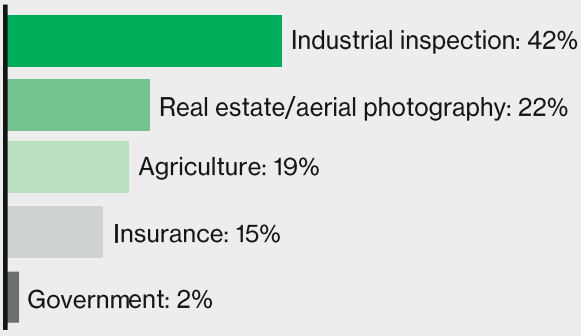


Figure 2: Use of drones, by industry[9]

9 DOT and FAA Finalize Rules for Small Unmanned Aircraft Systems, FAA press release, June 21, 2016
10 BI Intelligence, The Drones Report, March 2016
11 Drones Reporting for Work, Goldman Sachs Research, 2017

Delivering smart, sustainable energy solutions

IoT is working to reinvent the energy and utilities industry by automating and enhancing distribution grids with technology like Verizon's Grid Wide Solutions platform. Electric, gas, water and other energy providers are tapping sensors and integrated IoT energy platforms to improve water management, boost security, address compliance, and deliver new and enhanced customer services.

Smart meters and other connected equipment are streaming up-to-date information about energy consumption and operations, enabling utility enterprises to identify patterns and trends, and better manage infrastructure and operations.

Utilities can provide new and enhanced services, such as outage management and energy budgeting with smart meters. Smart meters also deliver operational savings through automated meter reading.

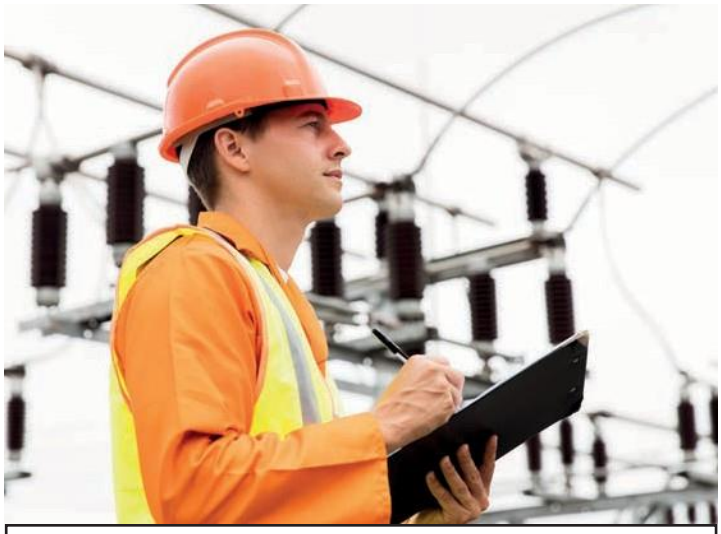
Perhaps more so than in any other industry, IoT is playing a central role in the overall modernization of the energy sector. Financial benefits for companies that do install smart energy grids could reach up to $157 billion, according to Business Intelligence[13].

Security is, of course, critical to both energy providers and customers. Verizon's Grid Wide Solutions platform addresses this key requirement by providing an integrated and secure communications network for remotely reading smart meters.

By delivering smart energy grid as a service, Grid Wide also turns each of the utility-owned meters into a power-quality sensor that provides enriched data.

The pre-configured data and analytics dashboards provide timely information regarding outages and abnormal usage patterns, while also helping utilities drive revenue.

This lets utilities understand not just the quantity, but the quality of the electricity they are delivering to customers. The utility's smart meter communicates its meter data over Verizon's wireless network, through Verizon's private network and then to Verizon's cloud environment.



Case study

An electricity distribution utility is using a smart meter and smart-grid cloud platform to detect outages, and control operational costs associated with manual readings and reactive repairs.

Smart Metering platform-as-a-service combines 4G LTE connected smart meters with Verizon's wireless and Private IP network and smart metering technologies to give the utility:

- **Meter reading and control.**
- **Outage and restoration notifications.**
- **Actionable insights.**
- **Data for future growth planning.**

With this platform, the utility better manages service and monitors consumption, and detects outages more quickly—helping to lower service restoration times and increase customer satisfaction.