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IoT Benefits Build on Existing Infrastructure
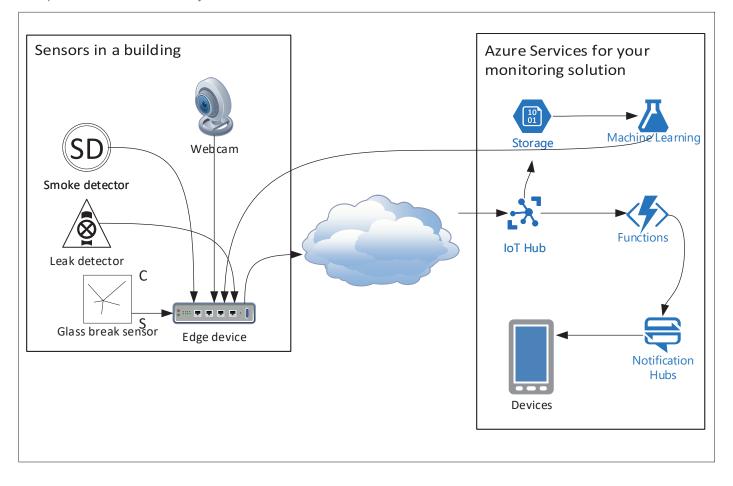
By Nick Leimer

No one would live in a house or apartment without a smoke detector. No one would work in an office or stay in a hotel without a sprinkler system. No one would feel completely safe in a mid-western town that did not have a tornado siren. Basic safety and risk mitigation equipment are not new. They have been with us for decades. The next step is to connect sensors and warning devices to systems that can act based on the instrument readings. To this end, we can couple the Internet of Things (IoT) with infrastructure to capture and process a wide range of sensor data. We are now set to transform the data into operations and actions that changes outcomes.

For instance, home smoke detectors, located throughout the house and connected to each other, can report the presence of smoke and identify where the smoke is. To report this information outside of the building, we would use an "edge" device—a computer or other smart machine that receives the sensor data, and processes it though an AI program loaded on the device. In this example, when smoke is detected, the data first arrives on the edge device. Then the device processes data from all inputs (other sensors) using the loaded AI application to rule out false alarms. Finally, the device generates alerts that are sent to all interested parties: all residents of the home, the insurance agent and the local fire department. This can mitigate the possibility of total loss of property and life. In an extension of this example, other forms of catastrophic risk can be mitigated with a localized notification. Residents' phones

Figure 1
Components of Home Security

start ringing, while speakers loudly begin evacuation warnings or other emergency alerts for the household.

Less dramatic events can impact personal safety and property, and IoT sensors can help mitigate these as well. For property and casualty insurers, water damage is the second most expensive cause of loss behind fire damage. Connected water detection sensors could notify the homeowner or maintenance company of a leak, and its location. When paired with an auto water shut-off valve, the sensor can trigger automation to turn the water off and prevent further water damage. For personal safety, IoT sensors mean home security devices. Such systems, with cameras and entry point detectors, mitigate burglary attempts by identifying the exact point of entry, turning on lights inside the home, and informing the homeowner and home monitoring company of the intrusion with texts and/or calls.

The technology to make these integrated systems real exists today. Figure 1 is an illustration of the components that can go into a home setting: smoke, water, and intrusion sensors all talk to an IoT edge device. This device then analyzes data locally and transmits information to a cloud provider like Azure. Within Azure, the system sends notifications as needed, stores data, and builds new models to better learn behavior patterns for the house.

In life insurance, we see companies using wearable devices to encourage healthier behavior and enhancing risk selection. Insurance industry, John Hancock, uses wearable devices connected to an application called Vitality. John Hancock then offers discounts on life insurance policies based on the policy holder's activity which is tracked by a Fitbit or Apple Watch. Vitality is also part of a health and wellness program with information on nutrition and active lifestyle choices. It is used by all John Hancock employees to promote the benefits of increased physical activity which includes things like net increases in productivity, employee satisfaction and improved general health (with fewer sick days!). The use of products like Vitality is quickly becoming the norm for major employers as they offer incentives to policy holders based on healthful activity—from cash rewards to special recognition.

Another benefit comes from processing the data from the devices with additional data sources, to build better risk models. Better models lead to a greater understanding of customer risk profile, and more accurately priced solutions. The increased understanding also helps spot gaps in coverage and to identify upsell opportunities. Artificial intelligence (AI) and big data are the technologies that drive this new model creation.

The number of IoT devices is now exceeding the number of cellphones. Insurance companies need to move forward and leverage existing sensors and data. The first step is to collect

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and process data as close to the source as possible, pushing only the preprocessed data to the cloud. Edge devices can be programmed with machine learning algorithms to understand and act on the data coming from a wide range of IoT devices. The device uses the intelligence (supplied by the algorithm) to determine what should be shared to the cloud. This division of duties is a work saver and it ultimately saves the time and bandwidth of moving unnecessary data back and forth from the cloud. From a data security standpoint, it also provides a security layer to encrypt all data.

Non-connected warning devices and sensors have been part of our lives for decades, and the natural evolution to connected devices reduces overall risk and mitigation claim events. The addition of a wide range of new sensors, combined with edge devices, further expands the benefits. P&C companies are seeing the benefits in commercial property and with homeowners that have adopted IoT devices. Life insurance companies are refining their models and seeing benefits from self-selection as healthier customers are more likely to actively use Fitbits and other devices. With more data from a wider range of customers, better models can be built, benefiting more groups in the industry.

Many insurance companies are making progress or have already started to realize the benefits of IoT being built on their existing infrastructures. Below are the two explicit examples noted earlier.

- State Farm has implemented water leak detectors into home owner's products (State Farm).

- John Hancock, Vitality: Life insurance that saves you money and rewards healthy living. (Vitality)

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