

Point of View

Internet of Things

Turn your data into accessible, actionable insights for maximum business value



Executive Summary

Use a connected IoT ecosystem to create new levels of business value

The Internet of Things (IoT) can help you improve efficiency, enable innovation and spur your transformations into digital businesses—if it's implemented appropriately. That requires much more than IoT devices and extracting data. If your IoT solution merely collects reams of operational data from the IoT devices, it's likely to cause more harm than good for your business, as you're left staring at a "pile of big data." With so many devices, so much data, so many opinions and so many possible decisions, determining how to move forward can be difficult.

To succeed with IoT, you need to consider how to use your complete ecosystem to create new levels of business value. Consider how integrating data from sensors and other operational technology can be combined with relevant information technologies—and with future technologies, such as the next generation of unmanned aerial vehicles (UAVs), driverless cars and wearables.

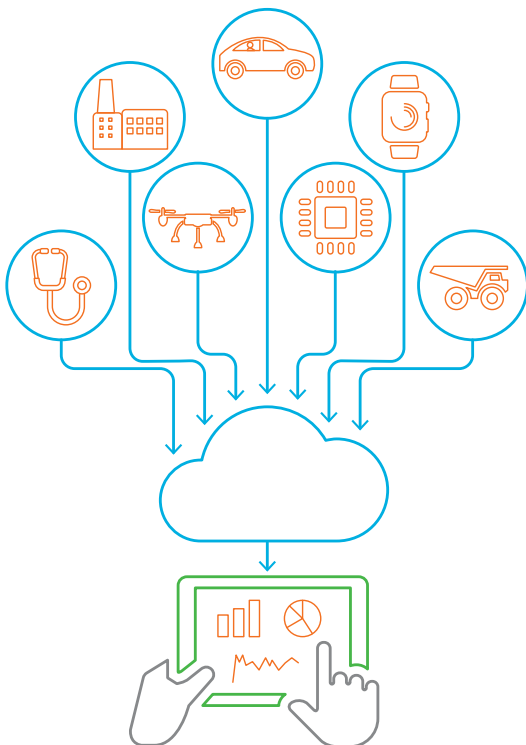
To create a connected IoT ecosystem that maximizes business value, you need to connect all the right pieces: technologies, data, process, insight, action and people.

Avanade's IoT vision centers on a "connected IoT ecosystem": combining IoT operational technologies with business information technologies and next-generation technologies. But it's not just about the technologies; this connected IoT ecosystem combines technologies, data, process, insight, action and people. It generates maximum business value by making context-aware and relevant data **accessible**. Turning the resulting into enterprise-grade, tangible, business insights that are **actionable**.

Putting this intuitive information in the hands of the people who need it enables them to see their business in ways they never imagined. And it empowers new ways of working and digital disruption that will help determine market winners and losers in the years to come.

The promise of IoT

A variety of trends point toward IoT. The lines of separation between the digital and physical worlds continue to blur. Devices of all types—cars, manufacturing equipment, pipelines and more—have become smarter, opening up the potential for their interaction with the internet. One estimate of the impact of this industrial internet is US\$14.2 trillion in cumulative GDP contributions by 2030.¹



Needed: An enterprise-grade IoT platform

The cloud brings needed agility, scalability, global reach and reliability to an IoT platform. But not all clouds are alike, especially when it comes to hosting IoT. Enterprises need an IoT platform that provides enterprise-grade services. Microsoft Azure IoT Suite meet that need. Here's what it includes:

- **Azure IoT Hubs**—a scalable service for data ingestion from LOB assets and sensors and device management.
- **Azure DocumentDB**—a NoSQL document database-as-a-service that helps enable fast deployment of IoT applications that are flexible and scalable, handle a diversity of data, and run in a trusted cloud environment.
- **Azure Stream Analytics**—a real-time distributed stream computation service that provides low-latency, scalable processing of streaming data in the cloud with an enterprise-grade service-level agreement.
- **Azure Notification Hubs**—a scalable, mobile-push notification engine for quickly sending millions of messages to iOS, Android, and Windows devices.
- **Azure Machine Learning**—a way to harness machine-generated data with powerful, cloud-based predictive analytics.
- **Azure HDInsight**—a Hadoop distribution powered by the cloud to process unstructured or semi-structured data from web clickstreams, social media, server logs, devices and sensors, and more.
- **Microsoft Power BI**—a self-service analytics and data visualization tool for all of an enterprise's data.

Technology and economic trends—take the global marketplace, for example—result in increased competition. And increased competition puts pressure on margins. Businesses have several ways to respond: with greater operational efficiencies, greater scale (which brings incremental revenue gains), and entirely new, and often highly unconventional, revenue streams.

IoT can help you implement all of these options and spur your transformation into a digital business. That's because IoT, with its roots in the physical world, gives you the device data you need for the digital capabilities you want. For example, IoT enables new capabilities in asset management and predictive maintenance that can be the basis of increased efficiency, or monetized as new or incremental revenues—or both.

IoT isn't enough – connecting all the right pieces

But device data alone is not enough to achieve this vision. The true value of IoT is not in the connected devices themselves; the value lies in making context-aware and relevant data and turning the result into enterprise-grade, tangible, “actionable” business insights.

To create a connected IoT ecosystem that maximizes business value, you need to connect: technologies, data, process, insight, action and people. Successful implementation is all about well-informed problem solving. That's true regardless of whether you are looking to increase operational efficiency, gain incremental revenue on existing products or services, or enable new revenue channels with disruptive business or operating models such as product-as-a-service.

Starting with a business problem statement is key. Ask yourself “what data do I have that can help me solve this problem?” You may find that there is already a large amount of data available. You may also realize that you can easily acquire the information you need by adding sensors to existing things.

Once you define the problem and obtain the data you need, you can begin to mine it. Your goal is to get the most out of your IoT, in your context. Even if you are convinced of the value of IoT, the best first step typically is to pilot your approach. This ensures that you have the right tools to analyze the data and make it accessible, intuitive and actionable to the people who need it. This approach helps to make the business case for your IoT project. When the pilot succeeds you can easily scale up quickly.

Connecting all the right pieces of your ecosystem transforms the “Internet of Things” into the “Internet of Your Things.” This is not isolated to any particular process or industry; this connected ecosystem approach can help create value across business and consumer scenarios in multiple industries. Here are a few examples of how a connected IoT ecosystem approach can help:

- **Industrial automation:** Enables industrial and process-oriented enterprises to collect device data. This improves decision support and drive analytics for predictive maintenance, operational improvements and visibility.
- **Vehicles:** Retrieves data from in-vehicle sensors and shares/ displays data to both on-board systems and the cloud. The data can then aid consumers in their travel as well as feed external parties, such as smart cities and insurers.
- **Transportation:** Enables the management and operations of large-scale transportation systems including vehicles, stations and, most importantly, people.
- **Retail and hospitality:** Transforms the in-store and onsite experiences by combining smart sensors and tags with the cloud and the consumer's mobile device.
- **Products:** Turns products into smart products that track data and offer additional services to improve the customer experience.

They're doing it now.

The goal of a connected IoT ecosystem is to get the most out of the Internet of Your Things in Your Context. Innovative organizations are starting to put this to use today—with Avanade's help. Here are key examples:



Turning IoT data into accessible, actionable business insights enables new revenue, greater efficiency and lower costs:

One of the world's top makers of construction and mining equipment uses a solution including sensors and telematics to enable advanced connected-equipment services. Its customers can monitor their equipment in real time and make required repairs or replace parts more quickly. This reduces downtime and boosts asset optimization. They can also gain new revenues from predictive monitoring services, incremental revenue from spare-parts sales, and savings from lower warranty costs.



Analyzing micro-interactions of data from a variety of equipment provides insight into the business in ways never before imagined:

An international mining company sought to optimize its pit operational efficiency by putting near real-time, actionable data on the mobile devices of its mining supervisors. The solution collects telemetry data from the mining equipment, as well as site dispatch data and monthly forecast data. The data is pushed to Azure IoT Services for analysis. The solution then delivers the results to mining supervisors via a cross-platform, tablet-based dashboard as well as real-time SMS alerts.



Taking a new, non-traditional approach to analyzing and acting on information to build intelligent systems for greater energy efficiency and safety:

A major university wanted to refine lighting controls to enhance safety, decrease energy use and improve reliability. The solution gathers data from electrical meters and uses Azure Machine Learning to identify electrical signatures from a range of devices. The data is disaggregated to isolate lighting devices, with the data presented through dashboards powered by Microsoft Power BI. The university gains a better understanding of lighting usage patterns and can manage lighting to achieve greater efficiencies and safety levels.

What's needed is a comprehensive vision that includes, but goes beyond IoT: Avanade's vision is the "connected IoT ecosystem."

The secret to success is in the formula

The key to deliver improved operational efficiency, enable innovation and digitally transform one's business is to make context-aware and relevant data accessible and turn the result into enterprise-grade, tangible business insights. What's needed is a comprehensive vision that includes, but goes beyond IoT. Avanade's vision of the "connected IoT ecosystem" includes:

- **Operating technology (OT)**, which generates and manages production systems data whether at an airport, in a parking garage, a factory, a mine, a wind farm, a space station or elsewhere.
- **Information technology (IT)**, which manages information in CRM, ERP and other enterprise systems. It provides new capabilities like machine-learning, predictive analytics and workplace systems.
- **Future technology (FT)**, which will likely include advances in robotics, UAVs (on land, in sea and air), wearable technology and video analytics. For example, an agriculture company has started to use unmanned aerial vehicles for data collection to monitor and identify water requirements across thousands of acres.

The approach combines your OT data with your relevant IT data and even data from future technologies (FT). Collecting the data is only the start. Maximum business value of a connected IoT ecosystem is derived from analyzing the micro-interactions of the relevant data and placing the resulting information in the hands of the people who need it, in a way they easily understand. With this comprehensive connected IoT ecosystem

vision, innovative solutions can be created that result in tremendous business value (BV). To express this empirically:

$$OT/IT + FT = BV$$

Key considerations for success

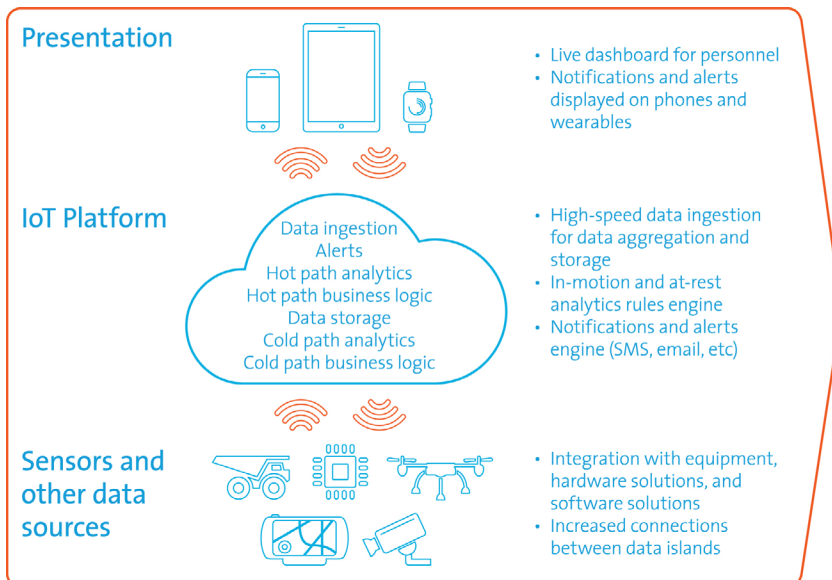
If you want to boost competitive advantage and further your transformation to a digital business, you should consider adopting a connected IoT ecosystem vision. But how can you ensure that your implementation will be successful?

One of the most important considerations is where to begin. Don't think of IoT as a major revolution requiring massive investment, technology makeovers and years-long schedules. Instead, think small, and think "evolution," rather than "revolution." What sensors or other data-capture devices are already in place and collecting information that goes unused because it is inaccessible? Start your pilot here.

This approach delivers accessible, actionable results relatively quickly. The typical timeline for a pilot should be a few months. By hosting the IoT platform in the cloud you can quickly scale the solution following a successful pilot.

You need to consider how your IoT projects can deliver business value, and then build the potential for that return into your projects. Look for projects with the potential to increase operational efficiency or incremental revenue, or to support new revenue streams.

A fully enabled Connected IoT Ecosystem



Regardless of where you are in your IoT journey, Avanade can help you develop a connected IoT ecosystem strategy that fits your needs.

What about the resources?

You should also consider your enterprise resources. Expertise in operating technology is different from expertise in information technology—which is different from expertise in future technologies that are currently in the emerging stages, at best.

Avanade has this expertise. Take innovation: It's built into our DNA, from our Chief Technology Innovation Officer to the Digital Strategists who populate our teams in more than 70 locations in more than 20 countries. Innovation is built into our approach to client engagements, so it becomes a typical result of those engagements. For example, in designing a client engagement, we use a holistic approach that considers the people, processes and technologies both inside and outside the client's organization. Casting this wide net helps ensure that all options are considered and optimal results are realized.

That's just one aspect of Avanade's expertise. There's also our breadth in enterprise projects, from strategy development through implementation and ongoing managed services. Of keen importance is our global leadership in Microsoft Azure and related Microsoft technologies for data analytics. This expertise helps to ensure that a connected IoT ecosystem project is done right and done fast.

The next step

Regardless of where you are in your IoT journey, Avanade can help you develop a connected IoT ecosystem strategy that fits your needs. To learn more about how Avanade can help transform your business by turning your data into accessible, actionable insights, visit www.avanade.com/iot.



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About Avanade

Avanade is the leading provider of innovative digital and cloud-enabling services, business solutions and design-led experiences, delivered through the power of people and the Microsoft ecosystem. Majority owned by Accenture, Avanade was founded in 2000 by Accenture LLP and Microsoft Corporation and has 29,000 professionals in 23 countries. Visit us at www.avanade.com

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