


Harness the Power of the Internet of Things



When you hear the term “internet of things” (IoT), the first thing that comes to mind might be smart fridges automatically connecting to your shopping list. While that certainly is an IoT use case, the broader world of internet-enabled devices has just as many benefits for businesses as it does for consumers. IoT devices for business enable enhanced connectivity, control, automation, data collection and more.

What is the Internet of Things

The internet of things is an ecosystem of web-enabled smart devices collecting, sending, analyzing and acting on information in real-time. The “in real time” aspect separates IoT from other technologies. Rather than gathering data and waiting for it to be processed and analyzed before separate action is taken, IoT devices often perform immediate, automated actions. IoT applications are rapidly expanding as edge computing expands, allowing data to be processed much quicker and closer to the source. This enables the fast processing and action required for many IoT applications.

IoT solutions have been a hot topic for several years and are now a major part of business success across industries. Microsoft’s October 2021 “IoT Signals” study found that 90 percent of organizations surveyed are IoT adopters. Of those adopters, an impressive 90 percent consider the IoT technology they use as critical

to their overall success ⁽¹⁾. The major benefits of IoT make it clear why these solutions are such important success drivers for so many organizations.

Main Components of IoT

Regardless of use case, IoT solutions consist of three main components: something to collect the data, a way to transport the data and a final destination to house and act on the data. Understanding these basic components helps you understand the overall IoT environment.

Sensors

Sensors are IoT devices that gather and ingest data, often collecting very minute data from a surrounding environment. Because IoT solutions are so varied and complex, the data they handle has an equally wide range — from simple temperature monitoring to complex live video feeds. IoT sensors are sometimes coupled with non-IoT devices. A good example is a smartphone, which has a GPS, accelerometer and camera among its many functions despite its primary purpose being communication.

Transport

Once data is collected, it needs to go somewhere. This is where the transport component of IoT comes into play. Transport is achieved through a variety of means, including cellular networks, satellite networks, Wi-Fi, Bluetooth, wide-area networks (WAN), low power wide area network and many more. Choosing the right transport option is critical, as they vary in power consumption, range and bandwidth.

Platform

IoT-collected data is transported to the platform level, where the action takes place. Cloud Orchestrators process data to surface insights, trigger automated actions or generate alerts. Portals and user interfaces for managing, analyzing and acting on IoT data are also common parts of the platform. Machine learning and AI are used extensively in IoT platforms.

Benefits of IoT

Many IoT business benefits derive from enhanced metrics leading to faster action and more accurate insight. With so many applications and benefits, 79% of organizations plan to invest significantly into at least one IoT project in the next two years ⁽²⁾.

Metrics & Analytics for Data-Driven Insights

Because IoT comprises web-enabled devices constantly gathering and analyzing data, it provides analytics and metrics businesses haven't been able to access before. These insights shine light on equipment functionality, inventory movement, transportation tracking, consumer behavior, real-time utility measurements and much more.

While IoT devices often act on data automatically, they also collect more data than ever before. This "excess" data is stored and can be further analyzed for deeper insights, expanding on the already growing field of "big data analytics." Implementing Artificial Intelligence and Machine Learning solutions helps manage the sheer volume of data and — when trained properly — pinpoints patterns, trends and insights most useful to your organization.

Accessing this level of information lets companies make granular, data-driven decisions with more insight than ever before, maximizing business goals.

Increased Efficiency

Real time data coupled with automated actions is a recipe for increased efficiency. One prime example is the early alert capabilities of many IoT solutions. Knowing about an issue (such as mechanical degradation) before it actually becomes a problem means you can address it before it breaks entirely. It also means you know exactly what's wrong instead of guessing or running complicated diagnostics.

Because IoT devices collect and act on data in real time, they also flex based on real-time need. Optimizing to actual need rather than set schedules drastically reduces wasted resources.

The ability to plan and act on real data (sometimes automatically without human intervention) lets businesses optimize operations, reduce chur, adjust to real needs and take advantage of other data-driven opportunities for increased efficiency. It's such a resounding feature of IoT that "resource optimization" is one of the top benefits named in the Microsoft study ⁽³⁾.





Cost Savings

Increased efficiency often goes hand-in-hand with cost savings. Automatically optimizing operations in real-time coupled with the ability to make higher level data-driven decisions reduces overall business costs by being generally more effective and informed.

For instance, if a system or machinery still works at peak condition despite approaching its recommended replacement date, organizations can make a confident and informed decision to delay replacement. Without this insight, businesses have no choice but to follow recommended replacement timelines, leading to costly replacements regardless of need.

Another common example of the cost saving power of IoT is equipment tagging and geo tracking. When fitted with an IoT device, you always know where expensive equipment is, preventing costly replacements.

Automating repetitive tasks and implementing technology solutions that handle vital needs like inventory, environment and equipment monitoring allows organizations to focus their most valuable resources — their employees — on the higher return tasks where they'll have the most impact.

Overall, IoT devices let companies make smarter decisions, increase efficiency and have more control (with less effort) over their business, leading to cost savings and increased revenue.

IoT Business Use Cases

There aren't many industries that don't benefit from IoT solutions. From inventory tracking to automated maintenance alerts before something breaks to real-time operations optimization, the internet of things provides a host of benefits across industries and use cases.

Maintenance Tracking & Notifications

From companies with large on-premises data centers and infrastructure to office environments with an enterprise printer, having smart devices and infrastructure makes maintaining equipment much easier. Smart devices track maintenance schedules and send automatic notifications about any potential issues.

IoT devices can also monitor the environment, not just devices. Capabilities like measuring the amount of dust in the air and alerting you if it passes a certain threshold keep spaces safe and operational.

IoT Tags for Equipment Tracking

For companies that issue laptops or other equipment, tracking who has what and where is crucial for asset management, cybersecurity and compliance. IoT tags don't magically give "dumb" devices internet connectivity, but it helps organizations track important equipment. This also applies for businesses with big ticket items they need to keep tabs on, like vehicles or medical equipment.

IoT tags for equipment tracking is a great option for companies that want to use the tracking capabilities of IoT without investing in new high value "connected" equipment and systems.

GeoFencing

From fleet management to making sure a dementia patient doesn't wander away, the ability to know where something is in relation to where it should be is a challenge businesses have long tried to solve. IoT solutions monitor and log movement, allowing for immediate alerts if something goes wrong and logs for later review. This takes care of immediate issues and lets businesses analyze data for efficiency and optimization opportunities.

Smart Cities

One of the most exciting applications for IoT is the growing "smart cities" trend. IoT solutions help municipalities with everything from optimizing traffic patterns in real-time to getting a better handle on utility use to reduce cost and optimize resource availability. IoT solutions such as cameras and lights that generate automated alerts help cities reduce crime and increase security in public places by dispatching police as needed without constant manual monitoring. Many municipalities are swapping older meters for "smart meters," another prime example of real-world IoT implementation.

Inventory Management

Inventory is a time consuming but very necessary aspect of many businesses. Specific IoT solutions help reduce manual inventory management (like counting stock or scanning barcodes) and keep better track of inventory location, movement, expiration dates and more without the risk of human error.

IoT-enabled inventory management also optimizes resources by limiting human actions to an as-needed basis. For instance, IoT dumpster monitoring lets waste management companies limit pickup to dumpsters that are 80% full, rather than running routine routes regardless of actual need.

Top Verticals for IoT

Because of the nature of IoT and the increasingly connected world we live in, almost any industry can benefit from an IoT solution. In

2017, manufacturing, transportation, utilities, healthcare and consumer electronics were leading the way in the IoT revolution (4). After reviewing the use cases outlined above, it should be obvious why these industries were eager to take advantage of the more nuanced data and automated actions provided by IoT. But they're not the only ones.

Healthcare

Healthcare organizations collect and manage an incredible amount of data on an hourly basis, much of it life or death. From ensuring a vital piece of equipment stays operational to automatic alerts about unhealthy environments, there are many areas healthcare can benefit from IoT. Being able to precisely track equipment is a huge IoT use case in healthcare. When time is of the essence, IoT monitoring is much more accurate than older RFID equipment tracking. Patient monitoring with wearable sensors, telehealth monitoring from home,





In the quick serve restaurant side of retail, IoT solutions greatly enhance food temperature and storage monitoring and alerting. IoT solutions track temperatures to identify trends (like if a certain shift routinely props a door open) and send real-time alerts if temperatures move outside the allowable range. This is critical for food safety and compliance.

Fleet Logistics

The trucking industry is massive ... and carries a lot of difficult-to-monitor regulations. IoT solutions make managing these requirements much easier and more precise, especially around mileage and time logging. All trucks driving over 150 miles per day are required by the FMCSA (Federal Motor Carrier Safety Administration) to have electronic logging installed on the vehicles. E-logging allows metrics on vehicle efficiency, miles traveled and required rest times. IoT-powered e-logging also allows for driver facing and outward facing dash cams that track driver behavior (i.e. for drowsiness and road attention) and accident avoidance.

Truck monitoring also benefits from IoT interventions, such as climate monitoring in refrigerated cars and geofencing to track precise location.

Many Others

Many other industries — such as government and public sector — share similar IoT use cases as retail, healthcare and manufacturing. When determining if IoT is the right fit for your organization, identifying potential use cases is more important than worrying about industry adoption. Odds are there is an IoT use case that fits your needs, regardless of how popular IoT currently is in your industry.

Manufacturing

Based on the use cases above, it's easy to see why manufacturing has jumped into IoT adoption, from remotely monitoring factory conditions to ensuring equipment operates at max efficiency to fleet management and inventory tracking, IoT touches just about every part of modern manufacturing. Improving operations and mitigating loss and downtime drastically improve manufacturing productivity.

Retail

Retail shares many of the same use cases as manufacturing (inventory management, warehouse monitoring and management, etc.), but the use cases extend well beyond that. From smart shelves to data-driven store layouts to hyper targeted advertising, accessing the rich data provided by IoT can be a gold mine for retail, helping them reduce waste and increase sales.

Implementing IoT

The benefits and use cases for IoT detailed in this white paper are just the tip of the IoT iceberg. The applications and benefits of connected devices are almost limitless, and are rapidly expanding as edge computing, 5G and artificial intelligence make IoT more accessible, efficient and beneficial.

Identify some of the top business challenges or metrics you wish you had access too, then consider how IoT might help address those needs. Odds are there are many areas of your business that can benefit from implementing IoT solutions. Once you have goals in mind, work with skilled providers to identify purpose-built solutions. IoT isn't a "plug and play" service. To get the full benefits, you need a tailored end-to-end solution that fits your particular needs.

⁽¹⁾ Microsoft. "IoT Signals" 2021

https://azure.microsoft.com/mediahandler/files/resourcefiles/iot-signals/loT%20Signals_Edition%203_English.pdf

⁽²⁾ IoT Analytics, 2021

<https://iot-analytics.com/iot-adoption-trends/#:-:text=After%20years%20of%20sustained%20high,expected%20to%20increase%20by%2024%25.>

⁽³⁾ Microsoft. "5 trends transforming business—2021 IoT Signals report" 2021
<https://azure.microsoft.com/en-us/blog/5-trends-transforming-business-2021-iot-signals-report/>

⁽⁴⁾ Invespro, "Customer Acquisition Vs.Retention Costs - Statistics And Trends."
<https://www.invespro.com/blog/customer-acquisition-retention/>

⁽⁵⁾ ZDNet. "The five industries leading the IoT revolution" 2017
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**Sound interesting?
Let's talk.**

Contact us today to get started!

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