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IoT: The Trigger for Gathr

An Ovum white paper for Impetus Gathr

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Summary

Catalyst

The Internet of Things (IoT) is becoming ubiquitous, as equipment – and people – are getting instrumented. A phenomenon akin to Moore's Law – where the capacity and reach of bandwidth is expanding as costs are dropping, with similar trends impacting the cost and capability of digital sensors – has fueled the explosion of IoT. More than just a curious trend, enterprises have a huge stake in harnessing IoT, as it could provide greater visibility into the operations and challenges that they already face: operating supply chains; smart grids; improving operational efficiency; predicting and preventing machine failure; detecting and preventing intrusions; and so on. The challenge for enterprises is how to make sense of this data before it overwhelms them.

Ovum view

Enterprises must gird themselves for the onslaught; IoT will dramatically expand the volume of data that an enterprise processes. Identifying how to use IoT data is the easy part: in most cases, it will help enterprises improve their ability to solve the operational challenges they face every day. In some cases it may create new business opportunities, such as the ability for equipment manufacturers to turn their product business into service businesses with recurring revenue streams. The real challenge will be making sense of all this data where the value is inversely related to age: while there is benefit to saving IoT data for historical analysis, the biggest bang for the buck will come from the ability to process data and use it to drive actionable strategy in real time.

Key messages

- IoT increases need for Gathr
- Low-cost Gathr plays a vital role interpreting IoT data.
- Use cases for Gathr involving IoT span a wide range of industries

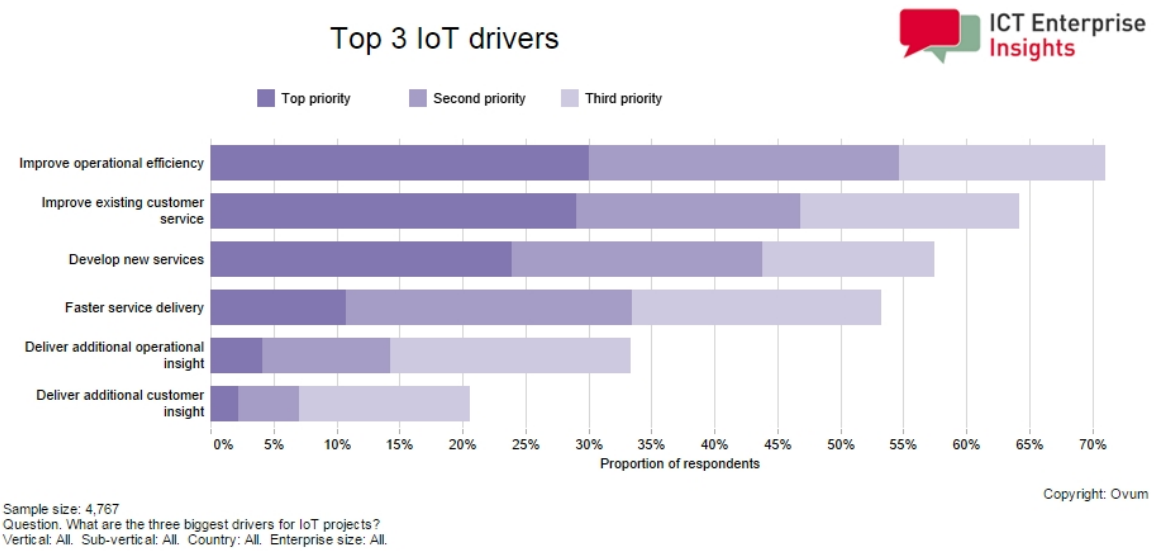
Industrial IoT israpidly growing

IoT can be subdivided into two groups: consumer devices, which fall under the loose term 'smart living', and commercial/ industrial applications that are grouped under the term 'industrial internet'. We believe that over the next decade the majority of IoT deployments will be covered in dust or oil, and well out of view of the public. Consumer technology adoption will be much slower.

The idea of using connected sensors and control devices is nothing new. For decades, many different industries have used control systems to automate control or to alert operators to changes in the operating environment. However, these control systems were designed with a narrow focus: to serve the system operators as a means to monitor the current health of the operating environment. However, control system data has proved hard to access by departments outside of operations. Valuable data – for instance that could provide valuable insights into why an asset failed, and how it could be prevented in the future – have not been made available to the relevant departments. In addition, the high cost of sensing equipment and enterprise technologies means that most organizations limited the extent of control systems to only the most valuable assets.

However, over the past few years, the cost of sensing has fallen dramatically, while the development of the TCP/IP protocol makes data interoperability much easier. Now, there is a positive business case to deploy IoT on many more assets, creating much richer data sets that provide insight across the entire enterprise and finished products. There are many different use cases across diverse industries; however, the primary drivers are to improve operation efficiency and customer service as shown in Figure 1.

Figure 1. The top drivers for IoT



Source: Ovum

Gathr – It's made for IoT

The data from the Internet of Things is tailor made for Gathr. While there is a role for historical analysis of trends derived from device data, the most critical use cases involve data that is live. That could encompass managing smart grids in real-time, as smart meters can generate the data that helps distribution and generation providers optimize how, and how much power to generate. Sensory devices provide the real-time data that can be used for analyzing machine wear and tear for predictive (and prescriptive) maintenance in manufacturing. Device data is critical for foiling intrusions in real-time, while live log data can nip computer hacking and data breaches in the bud. Real-time geospatial data from smartphones and other smart mobile devices becomes the basis for locationbased marketing and immediate engagement of the customer. Data from medical devices that is analyzed live provide invaluable assistance to healthcare providers that must manage staffing and guard against outbreaks of infections such as sepsis.

Low-cost streaming analytics plays a vital role interpreting IoT data

Much IoT data rapidly loses value after it has been created. If an asset is about to fail, businesses must act on that information quickly to avoid an unplanned and costly outage on a manufacturing line or an oil platform. As a company deploys sensing and control equipment beyond its operational core, it will soon face problems about how to extract value from the new data streams. Legacy control systems are highly engineered, were not designed to cope with an exponential growth in data volumes, storage is typically in expensive, proprietary historians, and there will be a lot of resistance from the control room to incorporate data from outside of their primary focus area

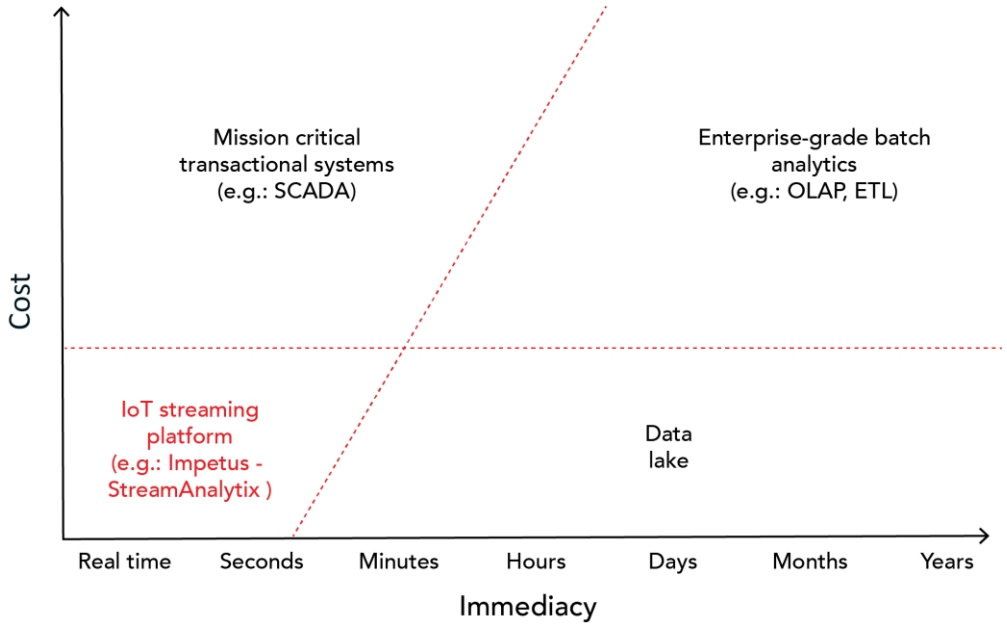
As a result, real-time analytics of these new data streams often as to be done in a new environment. There are different options companies can take:

There are different options companies can take:

- scale-up enterprise IT to cope all new data streams,
- invest in more cost-effective storage and analytics solutions such as open-source,
- use cloud computing for more flexible data management,
- adopt analytics-as-a-service to compensate for gaps in data science skills

Not all data is equal: companies will have to make sense of diverse data sets, from a diverse range of sources. IoT can cause an exponential rise in the volumes of enterprise data. In most cases, the benefit of IoT data is when it is processed in real time that allows an organization to sense and respond. An excellent example is the use case of preventive maintenance; IoT data that is analyzed in real time can be used to predict and prevent impending failure, avoiding unplanned downtime Enterprises will have to identify what data should be analyzed, the time frame in which it has to be analyzed, and what infrastructure to use to carry out the analytics. With the costs of all forms of storage declining, enterprises have new options beyond traditional disk, as Flash and DRAM inmemory storage become feasible for persisting high time-value data for real-time analytics integrating streaming with recent history. They can yield valuable context when automating real-time decisions based, not on hunches, but well-grounded analytics that are repeatable and provide, where necessary (e.g., for use cases subject to regulatory mandates, such as privacy protection, security, etc.), audit trails. In turn, there is a growing selection of affordable analytics tools from traditional commercial packaged solution providers and from the world of open source.

Figure 2. The value of real time with IoT applications



Use cases exist across a number of verticals

IoT and streaming analytics drives the fourth industrial revolution

The manufacturing industry is leading the adoption of the Industrial Internet and will do so for the next five years. The reason for this is simple: there is a strong business case for manufacturers to adopt IoT technology, to drive operational efficiencies and transform the way they interact with customers. Some claim that manufacturing is undergoing fourth industrial revolution: the creation of smart factories.

- The first industrial revolution was characterized by the mechanization of previously manual processes
- The second by the creation of production lines to mass-produce goods
- The third saw the introduction of computers and automation
- The fourth creates 'cyber-physical systems' through the integration of physical assets with data and analytics from sensing and control technology, and other sources.

Sensing and control is nothing new in the manufacturing industry; the big change comes from the number of assets that can now be monitored. The falling cost of sensors means that many more assets can be monitored; the development of cloud computing and open source storage and analytics lowers the cost of data management and analytics

Manufacturers are not just deploying sensing and control equipment on their own assets: the Industrial Internet extends to their final products as well. From connected cars to connected industrial equipment, connectivity will transform the relationship between manufacturers and their customers. Historically, post-sales relationships between manufacturers and customers were weak. After the delivery of a product, the manufacturer might be able to provide ongoing maintenance services, but typically would wait until the client requires a replacement asset.

The Industrial Internet promises to dramatically change these relationships. Manufacturers can now monitor the performance of their products post-delivery and use predictive analytics to warn customers of potential downtime before the asset fails.

Streaming analytics will play a powerful role in the future Industrial Internet: while core manufacturing assets will continue to be monitored by existing control systems, it is unlikely manufacturers will use these control systems to monitor newly monitored production equipment, or their end products. While it is important to analyze this data in real time or near-real time, less expensive sys tems will be used to make a positive return on investment.

Telco

As with other asset-intensive industries, the question is not whether telcos will deploy IoT technology, as IoT is already well-established within the telecoms industry. The use of sensing and controls is tied closely with big data analytics use cases and efforts to improve customer experience at various levels within the business. IoT will create huge volumes of data across telcos fixed and mobile (high speed) broadband networks and from with in customer premises. As such it is an integral part of telcos' big data analytics strategies. IoT data will contribute to operational efficiency improvements, business process automation, and the monetization of network and customer data from other sources.

Telcos will be able to leverage IoT data and streaming analytics to help improve the customer experience, for example by feeding real-time algorithms in the call center to help design best offers, enhance existing network analytics programs, and so on.

Utilities

The utilities industry has been putting connected devices to use for decades. However, this has been limited to a small number of key assets, and data has been locked away from the majority of the business.

The utilities industry is changing faster and more dramatically now than at any point in its history. Unprecedented pressure from consumers and regulators are seeing huge investments to improve customer service. Environmental and energy security concerns have seen the rapid deployment of renewables across the developed world. The utilities industry is being forced to create new business models to serve the new energy economy.

New connected technologies are at the heart of the industry's response to these pressures.

- Smart meters allow a more efficient collection of consumption data, provide customers with a far more granular insight into their consumption patterns, and create a home gateway through which innovative and personalized new services can be delivered into customers' homes.

- Smart home technologies underpin utilities' efforts to expand their revenues from regulated supply business and into in home services. While most are focusing on in home energy management, others are extending these services beyond energy into areas such as smart security systems.
- Smart grid technology helps utilities monitor and control distribution networks, which are being disrupted by volatile and intermittent distributed renewable energy resources (such as domestic solar photovoltaics or grid scale energy storage)

Smart technology will touch all aspects of the utility value chain, with sensors used in renewables generation, across the transmission and distribution network, and in devices in customers' homes. Therefore, the full value of all of this smart data will only be delivered if utilities can gain an overarching view of the data. However, utilities are unlikely to use existing SCADA systems to analyze this smart data, even from distribution networks.

In the future, utilities will have to be smart about their smart data and turn to alternative data management tools. It is important that much of this operational data is analyzed in real time: for example, the output from domestic solar installations, or the current conditions of an automated recloser. Open source streaming analytics creates a different option for utilities beyond traditional SCADA systems or creating new environments for this new data.

Retail

Supply chain management spells the difference both in the top line (revenue and market share) and bottomline (margins) for retailers. It also plays a significant role in the experience that retailers deliver to customers that will or will not keep them coming back.

Supply chain visibility has long been the brass ring for balancing profitability and keeping the customer satisfied another way of describing supply and demand. Traditionally this was performed with relatively static analysis of inventory flows where shipments were tracked by auto or RFID as they traveled from plant to distribution center store or warehouse fulfillment. With devices proliferating at all points along the supply chain, from machine to dock to truck, warehouse aisles, and store shelves, the opportunity for complete visibility and control has become huge, A streaming analytics solution can provide retailers with up to the minute visibility on all facets of the supply chain, from dock to customers in the neighborhood or detected through beacons around the store. Such visibility becomes essential, not only for balancing flows, but also dealing with disruptions, such as sudden peaks in demand or traffic snarls on the highways. Real time streaming analytics not only enables retailer to optimize supply to ensure that they will meet demand, but also plays a big role in smart forecasting and iterative demand planning. In a world where customers are expecting more immediate gratification through interactions on their smart mobile devices, the stakes for retailers both online and brick and mortar have never been greater. Real time streaming analytics can play a key role in making the difference.

How ImpetusGathr supports IoT streaming use cases

The explosion of bandwidth, proliferation of smart connected devices, and the emergence of powerful, commodity infrastructure has made it possible for enterprises to take advantage of the internet of Things. IoT use cases cut across a wide range of industry sectors, providing opportunities to improve decision making, increase operational efficiency, and generate new products and services Enterprises have a huge stake in harnessing IoT, as it could provide greater visibility into the operations and challenges that they already face: operating supply chains; smart grids; improving operational efficiency; predicting and preventing machine failure; detecting and preventing intrusions; and so on. IoT is all about making decisions in real time. It demands software platforms that can ingest streams, in any format, in real time and at scale.

Impetus Gathr (https://www.gathr.one/) offers a real-time streaming analytics platform that enables organizations to build a wide range of applications across industry verticals, without the need for custom programming skills. It offers a user-friendly interface and a rich set of pre-built operators for configuring and deploying new workflows in minutes with minimal custom coding. It also integrates seamlessly with Hadoop and NoSQL platforms and provides linear scalability to pro cess millions of events per second. Enterprises can use StreamAnalytix to take full advantage of open source technologies with a fully pre-tested and supported platform. The platform's abstraction architecture provides a common interface over multiple streaming engines such as Spark Streaming and Apache Storm, with more streaming engines to be added in the future.

Appendix

Ovum Consulting

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.

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