

# Managing the IoT Data Explosion

Effectively mobilizing data in the age of IoT

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The background features several decorative elements: a large circle with a smaller diamond-shaped circle inside it, located in the upper left; a thick, wavy line that curves downwards from the center towards the right; and several other smaller circles and lines scattered in the lower right quadrant.

# Welcome to the connected world

Data is the new oil, or so they say. It's highly valuable, essential for thriving in the modern world, and abundant. And any opportunity to gather, analyze, and mobilize more of it can be the difference between dominating an entire market or being relegated to "also ran" status.

By 2020, over 20 billion devices will connect to the Internet and with each other<sup>1</sup>. Everything from smart watches, baby monitors, and home appliances to standalone vending machines, autonomous vehicles, manufacturing equipment sensors, and yet-to-be-invented technologies will produce exponentially greater volumes of data as the Internet of Things (IoT) finally begins to fulfill its promise to the world as the next big meta trend.

Yet, despite the pending wealth of data that awaits global businesses, many will struggle to take full advantage of the opportunity IoT brings to gain more granular insights and intelligence. Very real challenges exist for businesses to not only handle but to access the velocity and variety of data coming their way.

This guide highlights the critical steps and considerations organizations of any size will need to navigate the IoT age and gain a strategic competitive advantage.

**The global IoT market will grow to \$457 billion by 2020.<sup>2</sup>**

<sup>1</sup>Hung, Mark. "Leading the IoT: Gartner Insights on How to Lead in a Connected World." Gartner, Inc. 2017.

<sup>2</sup>Market Pulse Report, Internet of Things: Discover Key Trends and Insights on Disruptive Technologies and IoT Innovations. GrowthEnabler. April 2017.

# Massive data volume means more headaches

There's never been a shortage of interest in using data for business success. Whether it's something as simple as calculating three-month averages for forecasting future sales or more complex applications for controlling medical devices.

But that was how data was used before the emergence of IoT. Now, data is less siloed, more intricately connected, more readily available, and comes in many different forms and formats. By 2025, some reports project that connected devices will produce over 95% of the 160 zettabytes the world creates each year — more than 10 times the present levels<sup>3</sup> — and the installed base of IoT devices will be over 75 billion devices<sup>4</sup>.

The level of growth in data and devices is nearly unfathomable. And companies now face a number of challenges in corralling, analyzing, and capitalizing on their data:

## Lack of IoT expertise

Many companies can get by with their existing IT team to handle everyday needs around hardware, security, and configurations. But IoT adds layers of complexity which require specific skills to understand and manage. Without true IoT expertise on staff, companies may struggle to identify and plan for new sources of data, let alone successfully orchestrate and integrate all those data sources into a single functioning system.

## Limited IT capacity

Even if a company is lucky enough to have the right level of IoT know-how on staff, most of those resources are already tied up in performing their day-to-day jobs. There simply isn't available capacity to take on the additional work and responsibilities necessary to fully embrace IoT.

## Restricted resources

Many companies still collect, store, and manage data in-house. But any substantial uptick in data means investing more time, money, and effort into the process. And integrating new data sources by hand, on-premise, is only a viable option for the largest, most well-funded organizations. Other enterprises may be too understaffed, underfunded, and inexperienced in the IoT space to take this approach.

## Increased liability and security issues

Each new connected device, data source, and endpoint introduces additional security and compliance concerns. In fact, IoT is giving 52% of security leaders high anxiety, according to a recent survey, and 76% are re-assessing how they secure their networks for IoT<sup>5</sup>. At a time when data hacks and network breaches are hitting a peak, few companies can afford the financial, regulatory, and market impact of any security incident.

## Five Top Challenges in Analyzing IoT Data.<sup>6</sup>

- Deceptive simplicity
- Determining the proper frequency of sensor readings
- Identifying complex patterns over time
- Figuring out how to handle interactions
- Accounting for errors and mixed readings

<sup>3</sup> Wilkes, Steve. "Addressing the fundamental challenges to IoT data management." IoT Agenda by TechTarget. January 4, 2018.

<sup>4</sup> Internet of Things (IoT) connected devices installed base worldwide from 2015 to 2025 (in billions). Statista.

<sup>5</sup> IoT and OT Security Research Exposes Hidden Business Challenges. Forrester, ForeScout. 2017.

<sup>6</sup> Franks, Bill. "Five challenges of analyzing Internet of Things (IoT) data." International Institute for Analytics. August 10, 2017.

# Prepping for a powerful future

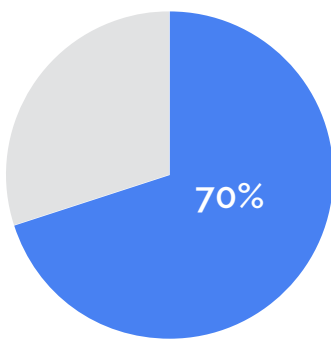
If decision makers expect a magic wand to transform enormous amounts of data into something useful and meaningful without adjusting budgets, processes, or company culture, they may be in for a long wait. Unless a company's infrastructure was built specifically to run in the cloud or was an early adopter of cloud technologies, nearly every organization has to enact strategic changes to make way for, and keep up with, the new data demands.

There is good news, though: a recent survey of C-Suite leaders found that 94% believe investing in IoT, data, and connectivity will save their company more than \$50 million over the

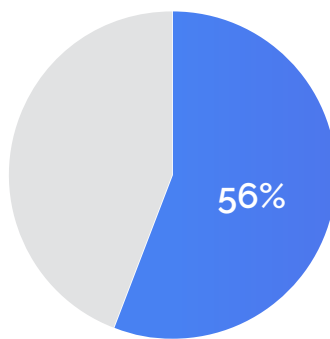
next five years.<sup>7</sup> This suggests that where there is initiative, major potential for success follows. The only considerations that remain are: how smoothly companies can transition into IoT and how effectively they can extract, integrate, manage, and use their data going forward to see real business value.

By employing common-sense planning and leveraging various data management tools, companies can get a handle on their current data, better prepare for an influx of new data, and move it all to the cloud so that it can work together and provide coherent, actionable insights.

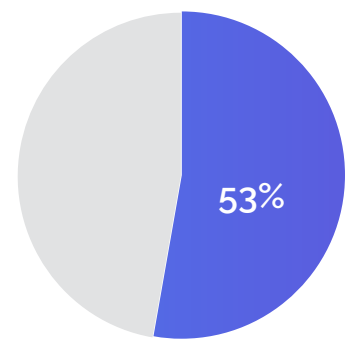
## How Enterprises are Using IoT-Generated Data Today<sup>8</sup>



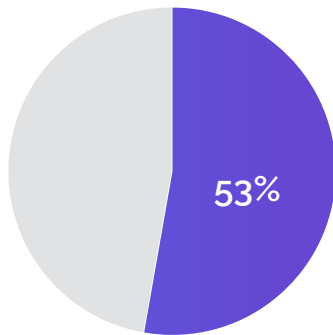
70% Improving customer experience



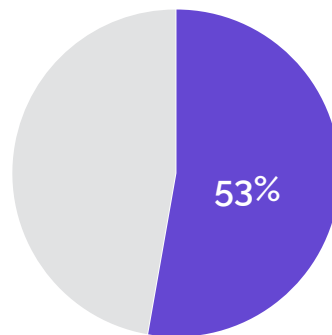
56% Improving safety



53% Gaining cost efficiencies



53% Improving organizational capabilities



53% Gaining supply-chain visibility

<sup>7</sup> Nair, Jayraj. "Investing in Digital Transformation: Gaining Value through IoT." Wipro Digital. October 13, 2017.

<sup>8</sup> Columbus, Louis. "70% of enterprises invest in IoT to improve customer experiences." Forbes. November 4, 2017.

# Six steps to incorporating cloud-based tools and IoT data for greater agility and efficiency:

## 1 Take a data source census or inventory

Data comes from everywhere inside and outside an organization — every web click, customer interaction, sale, download, measurement, and device. It's critical for companies to take an inventory of all data sources by surveying each team and department to get a comprehensive view of the organization's information landscape.

## 2 Identify the most relevant sources of potential new data

Understanding the various business cases is the first step in prioritizing IoT data sources. Companies can start by determining specific business objectives upfront — improving functionality or safety, reducing prices, protecting data, influencing human interactions, predicting human behavior, or something else. Then, identify specific sources of new data that can be incorporated into the information already being gathered.

## 3 Evaluate analytics tools

Many companies are already using a variety of business intelligence tools to gain actionable insights, but IoT data may require more robust applications. For example, solutions like artificial intelligence can process very large datasets, which is especially useful as a company scales its operations. Open-source, cloud-based analytics software provides reliability, customization, and flexibility while complex event processing (CEP) analytics tools can process data in real time to enable fast decisions and actions. It may also be necessary for companies to replace some existing analytics tools with systems that better align with organizational goals and data governance policies.

## 4 Highlight new security vulnerabilities or compliance issues

Security is a top priority for every digital business. And each new data source — device, system, or user — brings with it a potential security threat. More than just exposing personal information, IoT can pose risks that reach beyond bank accounts into people's actual health and well-being. Understanding the impact of each new data source and weighing the risks vs. the reward of collecting it is paramount to maintaining security and compliance while modernizing and advancing the business.

## 5 Devise a data integration plan

By its very nature, IoT data doesn't exist in a separate silo, but it does need to be integrated with all other enterprise data to provide true value and enable decision making. Yet many companies lack the expertise and functional ability to effectively combine all their data sources — a dilemma that third-party solutions are purpose-built to address. In addition to purchasing a cloud-based data warehouse, companies can select automated data integration and transformation tools, such as data pipelines and ETL (extract, load, transform) tools, for optimal streaming, storage, and analytics capabilities.

## 6 Define analytics goals and objectives

How well a company's data performs depends on how well it can be analyzed. Companies should aim to create algorithms that reduce or eliminate false positives or negatives, enable analysis of both structured and unstructured data, and deliver insights in real time rather than conventional batch processing. Together, those processes will help ensure data accuracy, usefulness, and shorter time-to-insight.

# Embracing the big opportunity

There is little doubt that IoT represents a potent opportunity for businesses to better understand their processes, customers, and market trajectories so they can take decisive action. Indeed, to avoid IoT is to leave revenue, innovation, and competitive edge on the table. But the veritable flood of data that comes with IoT also presents a host of challenges that can leave companies without a clear plan of attack or adequate resources.

Alooma is the enterprise data platform built for the cloud, with an automated data pipeline and ETL solution purpose-built for companies looking to mobilize their data and implement an IoT strategy using the latest cloud technologies. Alooma helps companies get data from any of hundreds of disparate sources, and stream, transform, enrich, cleanse, and secure it before loading into any of the leading data warehouses on the market and making it available for real-time analysis.

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To learn more about data management for the IoT age, [contact Alooma](#) for a free consultation and product demo.