

# The IoT and the Economics of Data

## Are You Ready?

*The media is filled with statistics about the exponential growth of the Internet of Things – how many devices, by what year and who is using them. But, for executives, focusing on the “things” themselves misses the point. The real value of the Internet of Things for businesses lies in the enormous volume of data and insights generated by the billions of devices. Harness the power of that data, and your company will take a leadership role in today’s information-driven world.*

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If you follow the business media, it’s hard to ignore the constant buzz about the Internet of Things (IoT). There is a seemingly endless stream of stories and statistics about how quickly electronic devices proliferate, and how growth is likely to impact us in our professional lives. Examples include the value created by increased employee productivity, the introduction of automation and robotics, and the opportunities to introduce new, smarter versions of existing products.

But the business media seldom focuses on the most valuable benefit of the IoT: the invisible mountain of data and user insights generated by the billions of devices in use around the world today. By mining this data, companies can optimize their decisions. For example, consumer products companies and retailers can learn where people are shopping, gauge the effects of promotions and generate more-customized assortments. Industrial products manufacturers can gather field data to build more-durable equipment and perform predictive maintenance and repair. Physicians and medical service companies can monitor patients’ well-being on an ongoing basis and provide personalized treatment to deliver better outcomes for the patients, insurance companies and the medical industry.

The possibilities are endless. The vast amount of real-time information that the IoT generates has the power to change corporate destinies and level the playing field between industry leaders and niche players. Yet to date, companies seem to focus on getting the infrastructure, security and foundations laid, while the data is underutilized as a source of strategic advantage.

## Rethinking Traditional Business Models

With so much at stake, why are most companies under-leveraging the big data available to them today? The answer is actually simple: The typical business is not organized or equipped to change the way it makes decisions or becomes fundamentally data-driven.

While many businesses have begun to collect and store data, they lack the technology, the systems and the algorithms to

unlock its potential. Executives pick their battles and focus on the short-term questions with immediate financial value. For example, they look at historic sales to create a forward-looking sales forecast for the next several months. They write a purchase order for products or materials based on last year's consumption patterns.



These are certainly valuable applications for data, but they don't impact the long-term future of the business. Executives need to frame larger, more-strategic questions — such as “What are the emerging unmet needs of our customers?” — and then mine the data they already have to seize a sustainable competitive advantage, for example by using data more effectively than competitors, gaining market share and continually improving their use of data.

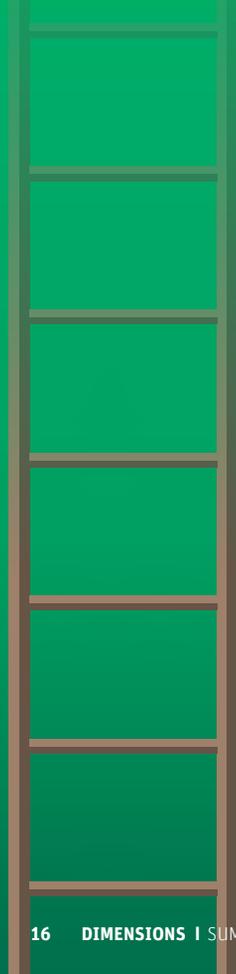
Many companies have tried to solve this problem by investing in larger IT departments with faster processors and bigger databases, but capitalizing on big data is not a technology problem. Turning data into a strategic weapon means creating new business models that bring strategic analysis to the forefront — and also anticipating where new competitors might emerge in a shifting landscape, where competing firms may gain a strategic advantage when they are able to better monetize data they create. New staffing capabilities and departments must be created that combine technical expertise in data management with the business expertise needed to interpret and apply that information strategically.

This is a new set of skills that is hard to find today, as academic programs tend to focus on “technical track” versus “management track” — failing to produce graduates with the flexible, diverse skill sets needed to understand both IT and business. This problem should eventually be addressed, as business schools are already refining their curricula to increase the focus on technology and big data, but in the short-to-medium term it will remain a challenge.

## The Need for New Analytic Tools

In addition to creating new business models and internal competencies, executives need to rethink their foundational toolkit for managing data. Just as ANSYS simulation software helps to solve large, computationally intensive problems via automation and iterative solving, similar tools might be developed and applied to sift through large datasets and identify the truly meaningful insights that can alter the future of the business. Through simulation and scenario modeling, business problems might eventually be addressed in a virtual space via the application of data, just as ANSYS solves engineering problems.

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Where will these tools come from? It’s hard to predict, but technology pioneers like Microsoft and HP are working on developing standard, general-purpose data analytics that can be customized to different industries. Google and Amazon already have distribution systems in place to deploy new, industry-targeted software solutions.

Some larger manufacturing companies, including GE, have already developed internal analytics tools. They could eventually commercialize these solutions and sell them in other industries; GE is headed in that direction with its Predix digital industrial software solutions and services.

And, of course, one strategy already in play is building an internal analytics department from the ground up — though most companies lack both the resolve and the resources to accomplish this.

### **The Biggest Risk: A Failure to Act**

There is so much uncertainty about big data that most companies have become risk-averse — so afraid to make a mistake that they fail to do anything at all. This is the single greatest error executives can make. Whatever their industry or business focus, companies must take action to better manage and apply data, or they will be left behind as the explosion of the IoT creates more and more information every day.

Small, entrepreneurial businesses actually are taking a leadership role today in embracing and leveraging the power of big data. These companies are recruiting new employees with the right mix of expertise and investing in internal analytics capabilities. Why are they on the forefront? Because start-up companies are characterized by a risk-taking, “fail fast and fail often” mentality that is lacking in larger, more-established companies. They recognize the value of trial and error, and they embrace change.

Whether you are ready or not, the rise of the IoT and the explosion of big data are going to impact your business model, your products and services, and your customers in ways you can’t imagine yet. You need to start thinking about the most critical questions your business needs to answer, and begin devising a practical strategy for mining your available data to get accurate answers. The solution is not going to emerge overnight, and it’s not going to be perfect — but you need to start attacking the problem of big data management and mining now to avoid getting left behind. 



### **About the Author**

Susan Athey received a Ph.D. in economics from Stanford and a B.A. in economics, computer science and mathematics from Duke University. Before joining the faculty at the Stanford Graduate School of Business, she taught in the economics departments at MIT, Stanford and Harvard. Her current research focuses on the economics of the internet, marketplace design auction theory, the statistical analysis of auction data, and the intersection of econometrics and machine learning.

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