Defining the Battlegrounds of the Internet of Things

Executives looking for a foothold can define the landscape in terms of key battlegrounds to help them form their Internet of Things strategy.

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The Internet of Things—a huge network of sensors and smart devices, combined with advanced analytics and cloud services to make sense of all the data—promises to augment and disrupt products and services across industries. Expectations grow more spectacular every day: Forecasters predict up to 20 billion[1] Internet of Things devices within a few years, generating 5 trillion[2] gigabytes of data every year and creating more than $300 billion in opportunities for tech vendors, telcos and device makers by 2020.

Feeling overwhelmed yet? You're not alone.

Executives across industries know they need to understand where the Internet of Things will affect their industry, where value comes from in their industry, where their companies can enter and play, and what capabilities they need to win. But many tell us they are finding it difficult to get a foothold and develop a strategy. Many are already investing significantly, but few have a clear roadmap. Customers are very interested, but complete solutions are still in their infancy.

The Internet of Things is not one market but a set of overlapping markets with strong connections to the data center and analytics.

Before technology executives can form their strategies, they need to see that the Internet of Things is not one market but a set of overlapping markets with strong connections to the data center and analytics. Understanding where battlegrounds are emerging, how platform dynamics will shape competition and profitability, and what barriers exist to adoption (for example, security and interoperability) will help companies determine where to invest and what capabilities are required to win.

Emerging battlegrounds

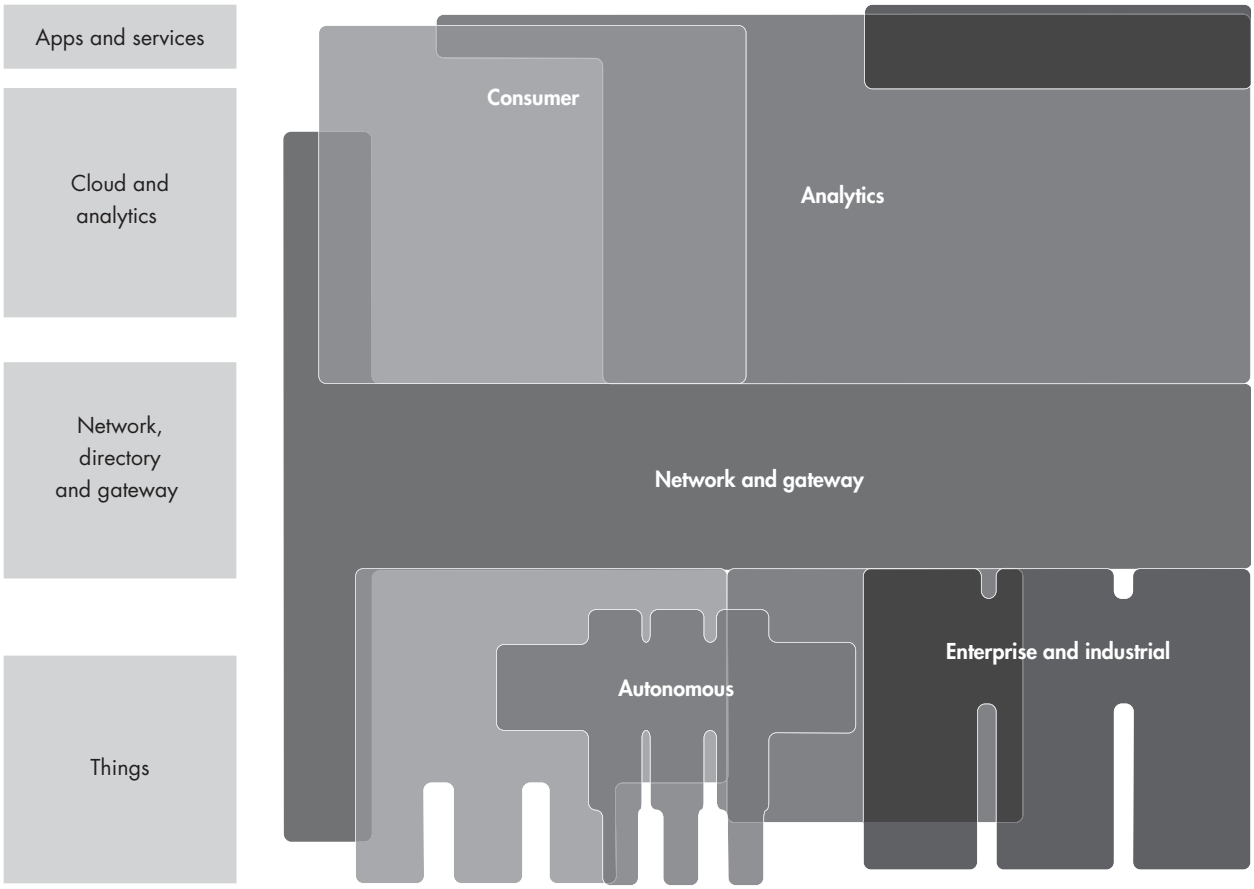
When we look across consumer, enterprise, industrial and public sectors, we see a few major battlegrounds emerging, each with unique platform dynamics and growth opportunities.

- **Consumer.** As leading mobile platform providers (Apple, Google and Samsung) extend their reach into wearables, smart homes, cars and other aspects of consumers' lives, many software and hardware makers will find their place in these ecosystems. Successful players will invest in learning which platforms offer the best opportunities, depending on their region, target market and capabilities. Expect fierce competition among this small set of platform providers, using scale, developer communities, device partnerships and businesses subsidized by data. Creating platform stickiness and bridging customers across industry segments will be the keys to success.

- **Enterprise and industrial.** As industrial and enterprise equipment and devices get connected, incumbents focused on specific industries are building on their domain expertise and customer relationships by expanding into broader offerings. Many will form partnerships, either to improve their capabilities (especially in analytics and security) or to acquire expertise in adjacent industries. Those that can build scale and make partnerships work can shape platform standards. Given the diversity of industries, expect a wide range of vendor platforms that may share common features but are tailored for particular uses.

- **Network and gateway.** Connecting devices through the network provides opportunities for new products and services. Edge analytics and real-time (or low-latency) services will become increasingly important, close to sources of data

Figure 1: The Internet of Things is not a single market but a collection of overlapping ecosystems



Consumer **Enterprise and industrial**

Personal *(wearables, AR/VR)*

Automotive *(infotainment, automated driving)*

Transportation *(logistics, rail, drones)*

Retail *(point of sale, digital signage)*

Building *(office and building automation)*

Home *(smart TV, appliances, security)*

Healthcare *(remote patient monitoring, hospital)*

Financial services *(banking, insurance)*

Industrial *(smart factories, and worksites)*

Infrastructure *(parking, traffic management, smart grid)*

To get a better understanding of the different ecosystems at play in the Internet of Things, we analyzed potential products and services across 10 industry sectors and through the technology stack, from hardware and communications on up to applications and services. We also considered the current or likely participants in each vertical and horizontal use case and where their efforts would reach up or down the stack or across verticals. Our findings yield a map of the battlegrounds where players will vie to participate within the dominant ecosystems of the emerging Internet of Things—a dynamic representation that is sure to evolve with the technologies and markets represented.

Note: AR/VR=augmented reality/virtual reality
Source: Bain & Company

rather than in the data center. Examples include patient monitoring in hospitals, quality control in factories and better customer experiences in stores. Therefore, many businesses will look to their long-standing relationships with network equipment makers (such as Cisco, Ericsson, Huawei and Nokia) and telecom service providers to capitalize on the opportunities. Telcos will aim to capitalize on the proliferation of devices and apps in several ways. They will improve connections with better directory services to locate, authenticate and connect remote devices. And they will offer life-cycle management services to maintain, upgrade, secure and provision the complex device and sensor networks—which others will compete to offer, too.

- **Analytics.** Analytics will emerge as a critical platform battleground, given their importance for creating value from Internet of Things data. Traditional analytics vendors (for example, IBM, SAP and Microsoft), cloud service providers (such as Amazon Web Services and Alibaba) and system integrators could successfully extend their customer relationships and scale into tailored products and services, especially in instances in which Internet of Things data is critical but only one of many data sources contributing to insights and decisions. By contrast, new pure play vendors will offer custom analytic solutions in which limited integration with broader data sources is needed. For both horizontal and pure play vendors, partnerships with industry incumbents will be important—for example, IBM's work with Medtronic on diabetes management, Amazon Web Services' work with John Deere in agriculture or SAP's partnership with Siemens on smart manufacturing solutions.

- **Autonomous.** Robotics, drones and autonomous driving are among the most greenfield of all these applications. They differ in that most sensor information is collected locally and processed on board, with less (though not zero) connectivity back to the cloud, creating different demands on local vs. remote data storage and processing than other Internet of Things applications. Start-ups and incumbents are moving quickly to get in on the ground floor where current industry leadership and capabilities matter less than in other areas. For example, cars have long been sold on the driving experience, but that may be less important than reliability and safety for selling autonomous cars. Real-time capabilities and technologies such as computer vision and machine learning will be important differentiators for success.

Robotics, drones and autonomous driving are among the most greenfield of all these applications, and an area where current industry leadership and capabilities matter less than in others.

A company's position and the dynamics in each battleground provide guardrails for an Internet of Things strategy. Executives can design their strategy by considering a few questions.

- What segments should we prioritize? Where can we generate revenue and profits?
- What do our customers need? Who will we compete against, and how can we differentiate ourselves?
- What parts of a solution should we deliver on our own, and where will we need partners? What standards should we support?
- What capabilities will we need? Where should we invest?
- What are the risks of not acting?

Answering these questions to form a strategy in the context of the Internet of Things battlegrounds will be critical for executives to position their companies for leadership. Mobilizing now is essential as the Internet of Things gains traction and begins to influence most industries over the next three to five years.

This is the first in a planned series of Bain briefs providing our perspective on the Internet of Things.

1 Gartner Forecast Analysis: Internet of Things—Endpoints, Worldwide, 2015 Update

2 IDC: The Digital Universe of Opportunities: Rich Data and the Increasing Value of the Internet of Things, April 2014

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