

The Internet of Things: Moving from cost savings to revenue generation

We've all read plenty about the rise of the Internet of Things (IoT), including its exponential growth. The number of connected devices alone is expected to explode in the next few years, with forecasts for new devices by 2020 ranging from 20 billion to more than 200 billion.¹ Analysts predict that IoT technology will support \$273 billion in spending on services alone in 2017, mostly on professional services to design, install, and operate systems.²

With all that growth and spending, many companies are struggling to settle on the right IoT application or justify the capital investment that the technology may require. In many cases, this difficulty is due to the fact that, while it may be clear how connected technology can save money—by, for instance, making operations more efficient or allowing workers to do more³—it's often less obvious how IoT applications might generate new revenue.⁴

Indeed, for many executives, the idea of locating value in the combination of physical and digital information is still new. In this issue of *CFO Insights*, we look specifically at monetizing IoT technology, exploring strategies common in the software world—where information has long generated value—and how those strategies may apply to other industry sectors.

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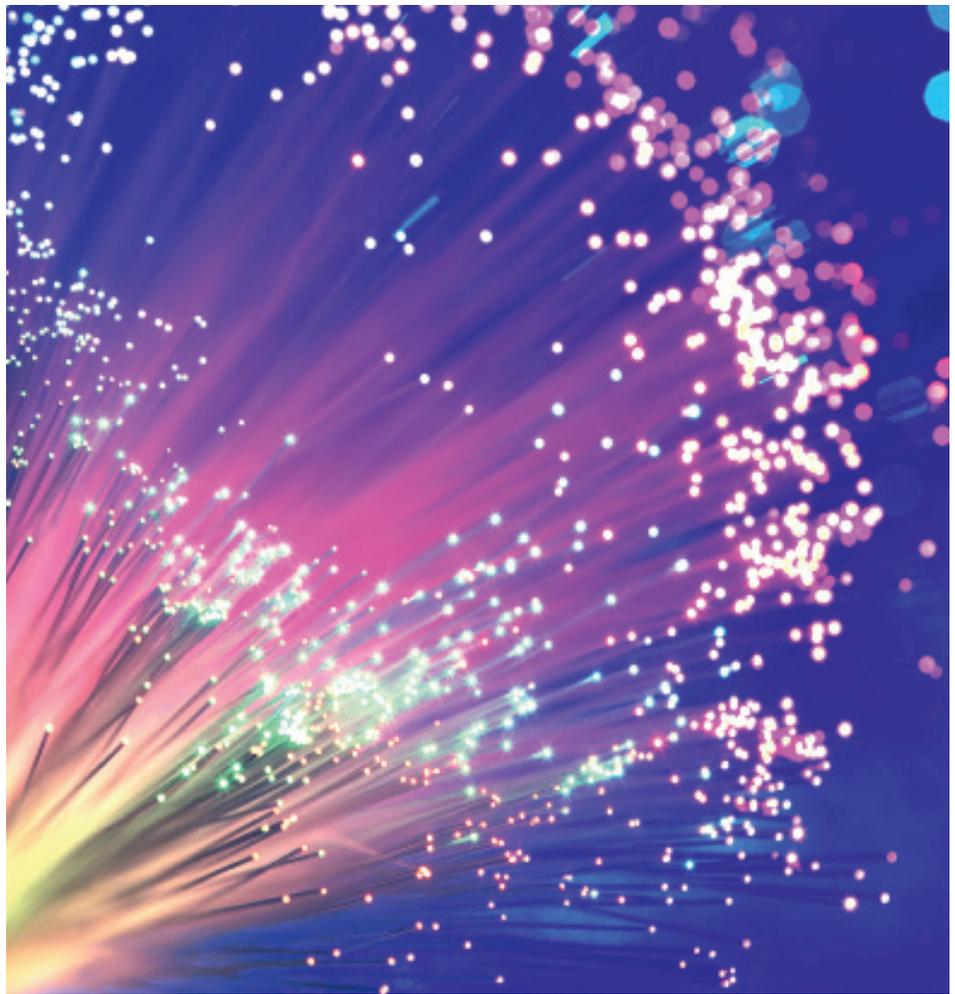
Making the value connection

In the simplest form, IoT technology takes inputs from the physical world, uses digital technologies to derive insights from those inputs, and then makes outputs available for use back in the world. In linking the physical and digital world, the IoT has another impact as well. Traditional physical products create value for customers only by virtue of their performance: A standard lightbulb is valuable based on its brightness, efficiency, and lifespan. With connected objects, information also becomes a key determinant of value: A smart lightbulb is valuable not just because it can brighten a room, but because it can enable automation, scheduling, remote controlling, and other abilities.⁵

Yet, due to possible unfamiliarity with the potential market opportunities, many leaders are taking a wait-and-see attitude toward IoT technology. A recent MIT and Deloitte survey of IT executives revealed that most of their companies intend to leverage IoT-generated data to pursue only small-scope applications aimed at efficiency improvement.⁶ While it is certainly prudent to start small and scale applications as they succeed, thinking big is also a benefit. And for businesses that need to rationalize initial tech investments, using IoT technology to generate revenue may be the key.

Turning IoT data into money is not necessarily a straightforward process, however: It requires knowledge of customers, and the governance capabilities to take advantage of that knowledge, to be able to offer the right item to the right customer in the right way. To develop these data governance capabilities, IoT players can learn from an industry in which information has long been a primary source of value—software—and explore the monetization drivers that leading firms are leveraging.

Selling technology in the software world has evolved from selling packaged software to selling services, building relationships focused on driving value to customers, and meeting customers' expectations for flexibility in consumption.⁷ And from a



monetization perspective, this means that new business models are expanding and becoming the norm. For instance, some content management services leverage the “freemium” model: A free service includes a personal account with limited storage and file size, while the premium service allows more storage, bigger file size, more users, enhanced collaboration, etc.⁸ Other models in the software sector employ pay-per-use (also known as utility) models, monthly subscription plans, and outcome-based models focused on the business value that the product or service delivers.⁹

All of these techniques can be grouped into three key monetization drivers—*usage intelligence*, *feature-based packaging*, and *flexible consumption*—that form the foundational pillars of top software firms' monetization strategy (see Figure 1: What drives software monetization?). Executives in other industries can look to these

pillars in developing strategies of their own. After all, many companies have little direct experience deriving revenue from customer-generated data, and effectively packaging and pricing products and services can prove challenging.¹⁰

Usage intelligence

Usage intelligence refers to the capability to collect, analyze, and report data about how the customer uses an intelligent, connected device; this capability helps in generating actionable data-based insights. In the software world, *usage intelligence* has a specific meaning: It generally refers to the intelligence regarding which product features a customer uses, and how often. In an IoT context, it takes on a broader meaning and includes a range of behavioral information on how a customer uses a product, including structured and unstructured data on the relationship between the customer, the product, and the broader ecosystem.

To software customers, usage intelligence provides greater visibility into their licenses, entitlements, and consumption patterns, enabling them to make informed choices about their usage of a product. For IoT players, intelligence-generated information can help to generate revenue throughout the develop-to-cash life cycle. In the development phase, the data can help improve the next version by prioritizing the features that consumers value most. In the sales-related phases, the data can help uncover potential sell, upsell, and cross-sell leads. In the support phase, this data further provides insights for customer service and support and predictive maintenance, creating numerous opportunities to differentiate the product.

As companies look at the option of deploying usage intelligence, they need to ensure availability of the following supporting capabilities:

- Connectivity to send information to devices and back office via networking protocols;
- Management of all sources of relevant structured and unstructured usage data;
- Reporting and visualization to report on usage to customers and business through user-friendly interfaces;
- Advanced analytics to mine data in real time and predict future behavior based on past usage patterns.

Feature-based packaging

Feature-based packaging refers to companies’ ability to provide flexible offerings by allowing customers to configure their products, enabling or disabling features as desired. With IoT applications, this becomes particularly important because companies are no longer locked into selling a single product but, rather, can sell that same product in several different ways based on the combination of features offered. In fact, those product features can even change over time through over-the-air updates or purchases. By offering many different versions at different price points, a company can capture a greater share of the market—and therefore increase revenues.¹¹

While feature-based packaging has traditionally been highly popular in the virtual goods market, it has started gaining traction among industrial machinery and durable goods companies as well. For example, one manufacturer of electric vehicles is now able to send over-the-air software updates that add new features to its cars, and allows customers to purchase software-based upgrades to unlock some of the functionalities already available. For \$8,500 above the purchase price, customers can choose an upgraded version, which can travel about 40 more miles per charge without the need of changing hardware or even taking the car to the service center.¹²

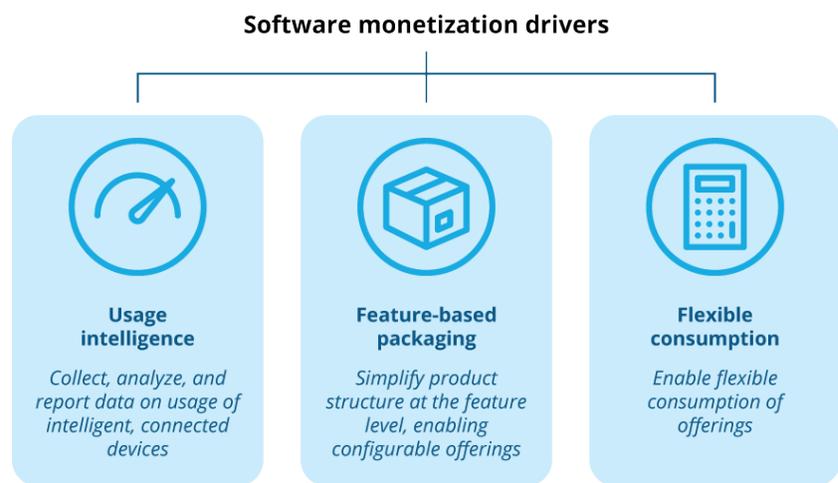
Feature-based packaging offers customers the flexibility to configure and personalize services, and enables companies to diversify offerings, helping improve monetization potential. At the heart of feature-based packaging sits entitlement and license capabilities that enforce and adapt the usage policies appropriate to each user. In particular, entitlement management automatically creates and manages electronic records for each user’s

entitlements to certain features, while license management locks or unlocks features per entitlements to enforce usage compliance.¹³ An additional capability needed to enable feature-based packaging is product configuration that provides the ability to customize offerings by configuring at the lowest level of service or features.

Flexible consumption

The third driver, flexible consumption, refers to customers’ ability to consume and pay for a service or product based on need and usage. Flexible consumption uses the same data on product usage as usage intelligence, but rather than using that information to improve the next iteration, flexible consumption offers customers the option to pay for only what they have used. Pricing can be strictly usage-based, such as subscriptions or pay-as-you-go, or outcome-based, in which customers pay based on performance. Outcome-based pricing is especially applicable in industrial scenarios, where IoT products are priced based on the operational efficiency improvements that the end user realizes.

Figure 1: What drives software monetization?



Source: Deloitte analysis.

Flexible consumption models enable recurring revenue streams and help align business needs with customer preferences. Similarly, when customers desire a new function or capability, they need not go back to the open market to find a new product—they can simply upgrade their existing product. To offer such a model, companies will need to improve some of their core business functions to ensure that they are capable of supporting flexible pricing of software and service to customers:

- Order management and customer care functions should be able to manage orders under flexible models throughout the customer life cycle.
- Pricing and deal analytics capabilities should be developed to prioritize deal variables and design pricing models.
- Billing policies and infrastructure should be upgraded to support invoicing and billing for subscription and pay-per-use consumption.
- Revenue allocation function should be able to recognize and allocate revenue based on flexible and recurring schedules.

Driving to monetization

IoT technology is forcing many older companies into unfamiliar places, and one of the least comfortable is the idea that user-generated data—and the software necessary to process it—may be key to future business plans.

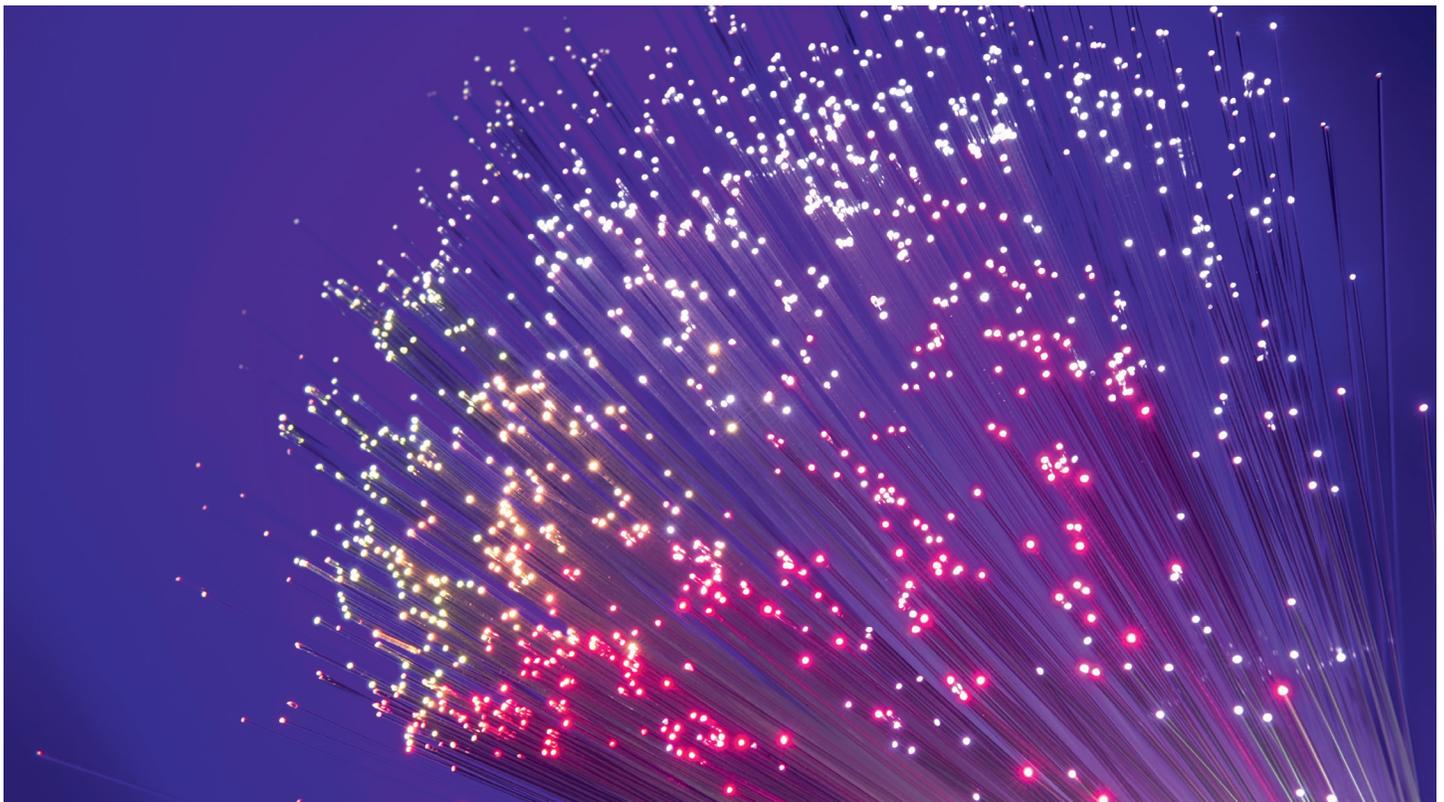
But while many new IoT players are adjusting to a world in which information creates value, leading software companies have been living in this world for years. Today, they are leveraging usage intelligence, feature-based packaging, and flexible consumption as part of their monetization strategies to use information to generate more revenue. Given the information-centric nature of connected problems, IoT players can realize the monetization potential of their offerings by investigating these drivers. Whether adopting one, two, or all three of these drivers, an integrated approach to looking at these strategies could help companies maximize their value capture from their IoT offerings and build a sustainable competitive advantage.

So how can companies determine which strategies are right for them?

- As a first step, IoT players should develop business use cases for each monetization driver for every stage of the development-to-cash life cycle.
- Companies can then evaluate use cases based on their potential revenue impact and investment requirement.
- Finally, companies should also analyze the process and policy impact of the identified use cases to uncover potentially hidden costs or risks before beginning implementation.

With these relatively simple steps, IoT players can advance confidently into the previously unfamiliar ground of information-based monetization strategies so far found more typically in the software world. And armed with these strategies, IoT players can begin to use connected technology not just to save money, but to generate new value for customers and new revenue for companies.

Excerpted from "Turning value into revenue: What IoT players can learn from software monetization," Deloitte University Press, November 16, 2016.



Tax implications of the Internet of Things

As the Internet of Things (IoT) blurs the line between products and services, taxation may have a bigger impact than many expect.

“The little-discussed consequences of such business model transformations are taxation issues, which have the potential to blindside companies that are unprepared,” says Paul Sallomi, vice chairman and global Technology, Media and Telecommunications industry leader, Deloitte LLP. Indeed, companies are taxed differently depending on whether they sell a product or service, and taxed as a regulated utility if what they sell is deemed “telecommunications.”

Services versus products

Companies regularly invent new ways to add value to traditional products, including enhancing connectivity. This type of business model transformation often makes product companies look more like service providers. Consider a company that manufactures Internet-enabled routers, which often are equipped with communications, video and audio-conferencing capabilities, as well as security protocols and commercial applications. In the past, the company sold a piece of tangible personal property for a fixed price. Today, that company sells monthly connectivity services either bundled or separately—which might, but not always, include the router cost.

“As these types of services become an increasingly important value-add element to the equipment, manufacturers could find themselves in a different type of business,” says Jim Nason, US Tax Telecommunications sector leader, Deloitte Tax LLP. “The organization may have transformed convincingly into a service business—or more specifically into a telecommunications business. These are the kinds of determinations regulatory and taxing authorities will make when auditing companies that generate increased revenue streams from service and communications-type offerings,” observes Nason.

From a global perspective, economies have become increasingly service-based, and taxation has become considerably more complicated, especially when those services are delivered via the Internet. For example, services are generally taxed where they are provided, which is a simple determination if the business is, say, a dry cleaner. But the service could be a streaming music station that the customer consumes on a road trip across the US. Further, it might be a service that needs to accommodate a consumption-based model, similar to the “pay for what you use” model used by utilities.

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Even answering the question “what is the service?” may be less than straightforward, particularly when multiple value propositions are packaged into a single offering. “That’s an important question to answer because taxing authorities across the US are in the process of rethinking their tax rules to ensure they are receiving a fair share of the revenues from bundled, technologically advanced services,” says Sallomi.

Crossing into telecom-related taxes

One of the hallmarks of the IoT is taking “dumb” products and turning them into devices with interconnected, thinking capabilities that have the ability to communicate. In the case of monthly subscription plans, the service can start to sound similar to what phone companies offer, which can present challenges. For example, there are significant administrative and technology-related costs associated with calculating, tracking, and collecting telecom-related taxes, fees, and surcharges. Some non-telecom companies may be ill-equipped to perform these activities, and may not recognize the potential tax issues.

“This is murky territory. In the US, for instance, some states are still unsure of when companies that offer connectivity-based applications cross the line into providing telecommunications services,” says Nason. Further, what constitutes telecommunications in one state may pass as a more basic service in another, and often sorting out such issues requires litigation to finalize the treatment.

To address IoT-related tax challenges effectively, an organization’s tax leader should have an understanding of the new products and services being brought to market and consider joining the development process early. “If a company designs its offerings with tax in mind, it will have a far better understanding of the tax consequences of its actions and be more likely to reap the benefits of a business model that is built around the IoT,” says Sallomi.

Endnotes

1. Amy Collins, et. al., "United States: The Internet of Things Part 2: The Old Problem Squared," Morrison & Foerster LLP, 2014; and Peter Middleton, Peter Kjeldsen, Jim Tully, "Forecast: The Internet of Things, Worldwide, 2013," Gartner whitepaper, November 18, 2013.
2. *Gartner says 8.4 billion connected "things" will be in use in 2017, up 31 percent from 2016*, Gartner press release, February 17, 2017 <http://www.gartner.com/newsroom/id/3598917>.
3. By implementing an IoT solution to track and efficiently route trucks, the Port of Hamburg was able to reduce wait times for every trip of every truck by five minutes. That comes out to more than 5,000 hours saved per day. For more information about this example of efficiency and how IoT can help, see: Lacey et al. *Shipping Smarter: IoT Opportunities in Transport and Logistics*, Deloitte University Press, September 15, 2015 <https://dupress.deloitte.com/dup-us-en/focus/internet-of-things/iot-in-shipping-industry.html>.
4. In a recent survey, 34% of companies said they anticipated gains in efficiency from IoT, the top response. On the other hand, only 6% anticipated realizing new revenue thanks to IoT, by far the lowest response. For more information, see: Jessica Groopman and Nicolas Jeambon, *The Internet of Things: A research report on the evolving challenges and opportunities underlying business adoption of the Internet of Things*; survey conducted by Harbor Research, October 5, 2016.
5. Michael E. Raynor, Mark Cotteleer, "The more things change: Value creation, value capture, and the Internet of Things," Deloitte Review Issue, July 17, 2015.
6. Author's analysis of the raw data from Kane et al. *Aligning the Organization for its Digital Future*. MIT Sloane Management Review, July 26, 2016.
7. Michael Cusumano, *The Changing Software Business: Moving from Products to Services*, Computer Volume: 41, Issue: 1, January 2008.
8. Victoria Barrett, *Box Shows How the Freemium Model is Growing Up*, Forbes, March 29, 2012.
9. Risto Rajala, Matti Rossi, and Virpi Kristiina Tuunainen. *A Framework for Analyzing Software Business Models. Proceedings of the 11th European Conference on Information Systems, ECIS 2003, Naples, Italy, 16-21 June 2003*.
10. Jill Dyché and Evan Levy, *Customer Data Integration: Reaching a Single Version of the Truth*, John Wiley and Sons, Hoboken, New Jersey, 2006.
11. Edward Fetzinger and Hau L. Lee. *Mass Customization at Hewlett-Packard: The Power of Postponement*. Harvard Business Review, 1996.
12. David Ingold, *Tesla's Betting You'll Pay \$9,000 for a Software Upgrade*. Bloomberg. June 10, 2016 <http://www.bloomberg.com/graphics/2016-tesla-model-s/>.
13. *Licensing and Entitlement Management Is One of the Keys to Monetizing the Internet of Things*. Gartner Newsroom. April 4, 2014.

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