

# Monetizing the Internet of Things: Extracting Value from the Connectivity Opportunity



# Why is it So Hard to Monetize the Internet of Things?

“

*Cisco estimates that IoT has the potential to generate about \$19 trillion of value over the coming years...*”

Connectivity is not something that is confined to humans. In fact, the number of connected devices has long surpassed the number of humans on the planet. And this machine-to-machine connectivity is not limited to a select group of super-smart devices. Every-day objects now have sensors whose capabilities might vary. This fundamental shift

is leading to an Internet that is far grander in scale and opportunity than we previously imagined. In fact, Cisco has estimated that this Internet of Things (IoT) has the potential to generate about \$19 trillion of value over the coming years<sup>1</sup>.

The staggering potential size-of-the-prize has certainly caught the attention of the world's business community. In a recent survey of senior business leaders around the globe, 96% said their companies would be using IoT in some way within the next 3 years, while 68% said their companies are already investing budgets in IoT<sup>2</sup>. However, there is a catch to all of this – most organizations are yet to derive significant commercial value from IoT. Our recent research shows that 70% of organizations do not generate service revenues from their IoT solutions (see our report “The Internet of Things: Are Organizations Ready for a Multi-Trillion Dollar Prize?”, 2014)<sup>3</sup>.

We have looked at why organizations are falling short in monetizing the IoT, and see a combination of external and internal challenges (see Figure 1).

“

*... But there is a catch. Over 70% of organizations do not generate service revenues from their IoT solutions.*

”

Figure 1: Monetization Challenges for the IoT



Source: Capgemini Consulting analysis

### **Security and Privacy Concerns Hinder Consumer Adoption**

The IoT creates an intertwined mesh of systems and devices, which hugely complicates issues of information security. “Hacks” or attacks can happen at multiple levels. They might be targeted at the device itself, or they can be carried out over the communication network over which the data is transferred. The recent example of a “hacked refrigerator” highlights both the nascent nature of this sphere of technology and the significant security issues. As part of a large-scale hack attack over a number of weeks, more than 750,000 malicious emails were sent from more than 100,000 everyday consumer devices, including – astonishingly – one report of a refrigerator<sup>4</sup>. Customers today are increasingly aware of these sorts of dangers. A recent survey showed that 69% of respondents were concerned that a connected appliance could result in data breach of sensitive information<sup>5</sup>. These issues are a significant challenge to the consumer adoption of IoT offerings.

“  
*A recent survey indicated that 69% of respondents were concerned that a connected appliance could result in data breach of sensitive information.*

”

### **Lack of Standards Limits Revenue Potential**

IoT solutions deliver the most value when they are connected to a web of interlinked services. For instance, a smart home solution can deliver significant value only when it integrates the electrical, safety and surveillance systems. However, our research indicates that only 13% of organizations offer IoT solutions that integrate with third-party products and services (see our report “The Internet of Things: Are Organizations Ready for a Multi-Trillion Dollar Prize?”, 2014)<sup>6</sup>. This prevents companies from tapping into a larger ecosystem of products and services, and significantly limits revenue enhancement opportunities. Unless standards are agreed upon – spanning industries, vendors and products – the potential of the IoT will remain under-exploited.

### **Successful Monetization Demands Significant Investments in Acquiring New Capabilities, Often without Clear Returns**

Most product-centric organizations need to make significant investments in acquiring new functional capabilities, before they can sell IoT-based services. For instance, organizations need to augment their product management capabilities with the skills needed to develop and market services. Moreover, since connectivity reduces the time lag between the occurrence of an event and the time taken for information to reach the support center, customers are also likely to expect faster response times. As such, specialized customer support teams need to be set up to respond rapidly to customer queries in real-time. Acquiring and building these additional capabilities entail significant effort and

investment, often without a clear return on investment in the short-term. These factors delay monetization efforts.

“  
*96% of companies will be using IoT in some way within the next three years.*”

It is pertinent to note that these are very early days in what is still a very fast-developing and immature marketplace. We have tried to capture some initial observations on monetization in the coming sections.

“  
*Only 13% of organizations offer IoT solutions that integrate with third-party products and services.*

”

# How Can Organizations Profit from the IoT?

On the conventional Internet, many of the current leading players have seen two broad phases – phase 1 where they focused on traction, and a second phase where they focused on monetization. On the Internet of Things though, most startups and incumbents are actively looking at monetization models right from the start. While these are still early days, there are four distinct models that are emerging (see Figure 2).

## Product Selling is an Organization's Entry into the IoT World

“Hardware Premium” is the most basic form of monetization model. Here, organizations add connectivity options to an existing or new product and offer

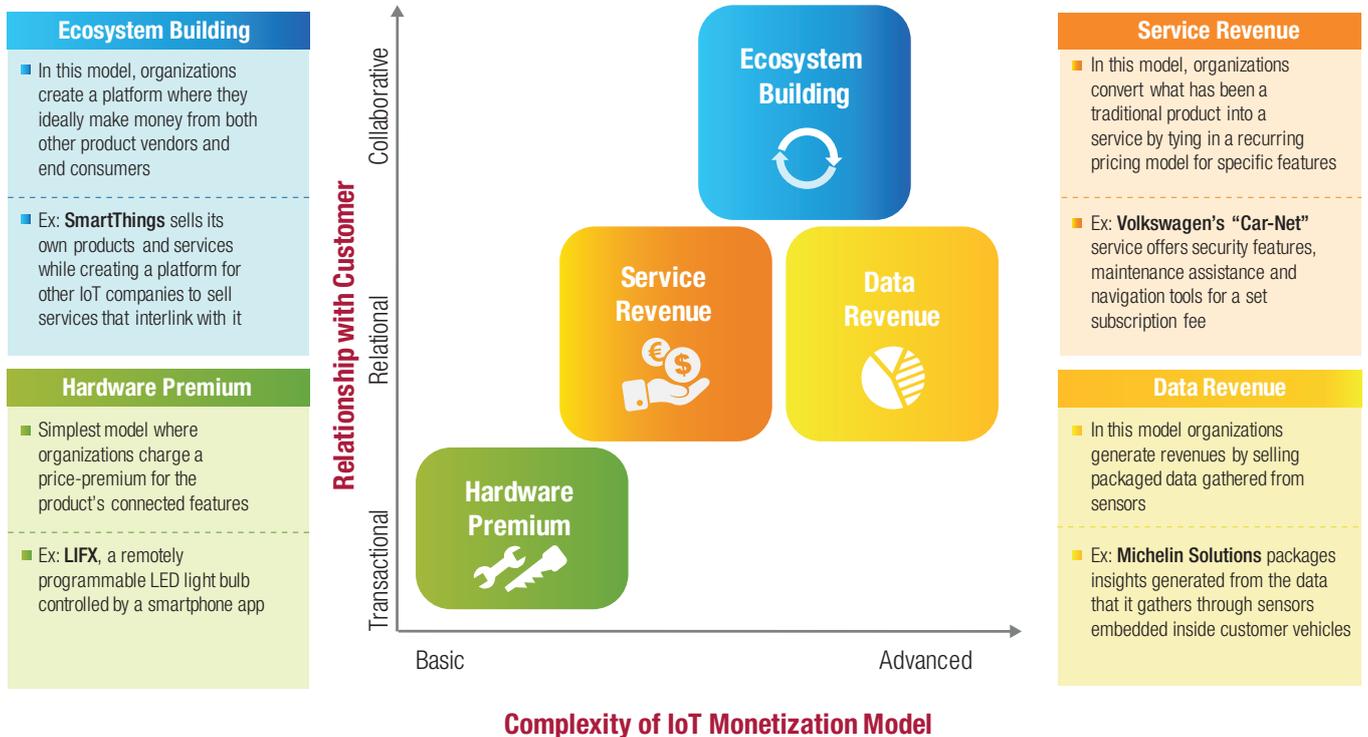
remote device management in the form of mobile apps. This basic level of connectivity and control enables organizations to charge a premium for their product.

An example of this model is LIFX (see Figure 3), which produces remotely programmable LED light bulbs that can be controlled through a smart-phone app. These bulbs are sold at a premium, and are priced around 10 times higher than a compact fluorescent bulb<sup>7</sup>.

From a consumer perspective, a key driver for buying hardware premium products is the novelty factor involved in controlling hitherto standalone devices.

“*Product selling is an organization's entry into the IoT world.*”

Figure 2: Monetization Models for the IoT



Source: Capgemini Consulting analysis

**Figure 3: LIFX Bulb and Smartphone App**



Source: Apple App Store listing of LIFX app

**Figure 4: Volkswagen's Car-Net Service**



Source: Company website

**Service Bundling Generates Recurring Revenues through Long-Term Customer Relationships**

The service model offers a recurring revenue stream and, more importantly, creates a relationship with the customer long after they have purchased a product.

For example, Volkswagen's "Car-Net" service offers security features, maintenance assistance, and navigation tools for its customers for a subscription fee of \$17.99/month and \$199/year (see Figure 4). Customers can also select from several features – for example, automatic crash notifications can be sent to chosen contacts when airbags are deployed in the vehicle<sup>8</sup>.

Similarly, in the B2B segment, smart thermostat manufacturer Nest is using its Learning Thermostat – a home automation and energy management product – as a platform to offer energy management services to utilities. Nest charges utilities \$30 to \$50 per thermostat annually for its service. As part of the service, Nest helps utilities better understand their customers' energy usage. Nest automatically reschedules usage of equipment with high electricity consumption such as air conditioners. By doing so, it has been able to reduce overall electricity requirement by as much as 50% in peak times thus saving significant money for utilities. Nest is currently installed in over 1 million homes and close to 20 utilities have signed up for the service<sup>9</sup>.

**“  
Service bundling enables organizations to create long-term relationships with the customer.  
”**

## Building a Smart Home, using the Ecosystem Model – SmartThings



Source: Company website

SmartThings is an Internet of Things startup that offers a centralized hub and an assortment of both in-house and third-party IoT products. The company was launched in 2012 and raised over \$1.2 million on Kickstarter (a crowdfunding platform) within 18 months. The company has a smartphone app that is used to control its hub and all of its connected devices. It offers broad guidance to developers who want to make products for its platforms offering them design guidelines. The hub is priced at \$99. Various products that the company sells as part of the platform include locks, switches, environment sensors, alarms among others. SmartThings works with partners such as Belkin, Sonos, and Philips, and on operating systems such as Android and iOS. Over 1,000 devices and 8,000 applications have been made till August 2014 when the company was acquired by Samsung Electronics for approximately \$200 million.

Source: CNET, "Samsung snaps up SmartThings, embracing Internet of Things", August 2014

### Data Generated in the IoT Offers a Monetization Model

IoT devices generate large volumes of sensor data. For many organizations, the ability to capture, package and sell this data offers a potential monetization model. Once this data has been aggregated and anonymized, organizations can choose to sell it raw, package insights from it or monetize it using advertising.

For instance, Michelin, through its Michelin Solutions unit, packages insights generated from the data that it gathers through sensors embedded inside customer vehicles. Customers pay Michelin on a per-vehicle, per-year basis. These insights help its customers achieve a variety of goals including reducing costs, carbon footprint, among others<sup>10</sup>.

### Ecosystem Building Allows Monetization from Dual-Sided Markets

The IoT thrives in a connected ecosystem – the bigger the ecosystem, the greater is the value generated for all stakeholders. In an ecosystem, the focus is not on selling a product or a service, but on providing a shared platform to other players in the ecosystem – hardware manufacturers, software developers, service providers and the like. In such a model, the platform promoter ideally makes money from both end customers as well as other platform users. Platform users pay the promoter for listing and the promoter also gets a share whenever a product is sold to the end customer on the platform. A shared platform brings multiple benefits to participants. For instance,

with the APIs provided by the platform provider, independent companies that have IoT products/services can develop custom applications. SmartThings is an example of a company that has taken the ecosystem building approach towards a monetization model (see insert).

“  
**An Ecosystem model allows organizations to generate value for multiple stakeholders – customers and other platform partners.**  
”

## Multiple Pricing Models Enable Companies to Realize the Full Benefits of IoT Monetization

Pricing Model	Example	Monetization Model
<b>One-time Charges:</b> Customer pays a one-time price for purchasing the offering	Sells health-tracking wearable devices for one-time cost 	<b>Hardware Premium + Service/Data Revenue</b>
<b>Pay-For-Results:</b> Allows customers to pay only for realized results from the IoT offering	Recovers payments as percentage of savings obtained from service 	
<b>Freemium:</b> Allows organizations to attract customers that are not convinced of the value of the offering	Uses a freemium model for industrial IoT services 	
<b>Subscription:</b> Offers customers the flexibility to customize service options and duration of the service	Monthly subscription for remote security and energy management 	<b>Service/Data Revenue</b>
<b>Pay-As-You-Go:</b> Allows customers to pay according to the actual usage of the service	Sells pay-per-mile auto insurance 	

Source: Capgemini Consulting analysis

For each IoT monetization model, we see a variety of pricing models that can be adopted.

### Pricing Models for Products and Services

For **One-Time Charges**, the customer pays a one-time price for purchasing the offering. This model is largely used with products, though it can be used with services too. A **Subscription Model** offers customers the flexibility to customize service options and the duration of the service. A **Pay-As-You-Go Model** allows the customer to pay according to the actual usage of the service. The **Pay-for-Results Model** allows customers to pay only for realized results from the IoT offering – a strong value-based model where the customer can see the RoI directly. For instance, IoT startup Enlighted builds devices that can detect heat, light, and motion, and pairs them with a software system that can control lighting, heating and cooling based on the data these sensors collect. Customers pay Enlighted a percentage of the money the technology saves them each month, without paying anything up-front. **Freemium Models** allow organizations to attract customers that are not convinced of the value of the offering.

### Pricing Models for Ecosystems

Ecosystem pricing models typically tend to be different from those of product and service models. A **Fixed Fee Model** is one where customers pay a fixed fee for using the platform. A **Transaction-Based Fee** is charged by the platform provider for every transaction carried out over the platform. In a **Revenue Share Model**, customers pay a share of their revenues to the platform provider in exchange for using the platform services.

Source: Wired, "The Startup That Lowers Your Energy Bills by Paying for Upgrades", August 2014

# One Size Does Not Fit All – Which Monetization Model Works, And For Whom?

There is no neat one-size-fits-all monetization model for the IoT, not least because the needs of different companies vary hugely. Here, we look at various business scenarios and recommend the monetization model suitable for each (see Figure 5).

“  
*Adding connectivity and sensors to existing products is a quick way for organizations to partake in the benefits of the IoT opportunity.*  
 ”

**A “Hardware Premium” Model is Ideal for Companies that Want to Differentiate Themselves from their “Disconnected” Competition**

The IoT enables organizations to add connectivity and remote device management to traditional products. For traditional manufacturers, a quick way of partaking in the IoT opportunity is to add sensors and software to their traditional products, increasing their overall value to consumers.

For instance, Philips Hue light series are an expensive set of connected bulbs for the home. The starter kit costs \$200 for three bulbs and a hub. These lights can change colors in real-time and be programmed directly through a smartphone application<sup>11</sup>. The success of this model hinges on how much value organizations can add over and above a traditional product. Customers need to see the value in the premium that an organization charges. A typical way of ensuring that is to make connectivity features accessible through a variety of platforms including web and mobile, as we have seen in the case of the LIFX bulbs.

**Products that Have High Customer Engagement are Good Targets for a “Service Bundling” Model to Unlock New Revenue Opportunities**

Products that have high customer engagement, such as cars with infotainment features and smartphones, can be used to establish a recurring revenue stream by adopting a service bundling model. A straightforward way to establish these streams is to offer basic services free of cost (adopting a “freemium” model). This helps build familiarity and provides inputs for improving and customizing the service. The advanced

functionalities can then be made available for a price. It is also important to create differentiated offerings based on functionality and price; this gives customers the flexibility to choose the offering best suited for them.

Existing examples of this monetization model include On Star Corporation and Volkswagen Car-Net. These offerings provide a range of services comprising security features, maintenance assistance, and navigation tools. A key success factor for bundles is to ensure that organizations constantly improve their service portfolio, in order to keep pace with more advanced services that competitors might offer.

“  
*The success of the “Hardware Premium” model hinges on how much value organizations can add over and above a traditional product.*  
 ”

**Figure 5: Monetization Models and Their Applicability**

Monetization Model	Target Companies	Critical Success Factors
Hardware Premium	Hardware companies that want to differentiate themselves	Enhanced value delivered over traditional product
Service Revenue	Companies having products with high customer engagement	Having multiple subscription options at varying price points, including free
Data Revenue	Companies that are in a position to collect significant data from their customers	Managing customer privacy and staying compliant to regulations
Ecosystem	Companies that have a wide range of IoT products	Ensuring the platform is equitable to all stakeholders and not just platform promoters

Source: Capgemini Consulting analysis

**Organizations that are in Possession of Significant Customer Data Stand to Benefit from a “Data Revenues” Model**

The data revenue model is ideally suited for organizations that have built a large customer base and are in a position to use sensors to collect significant customer data. The idea is that organizations need not necessarily offer a product or a service to generate revenues from the IoT. They can sell the data by packaging it or by adding a layer of advertising on top. A critical challenge with this model revolves around customer privacy and the need to obtain prior consent before using the data and abiding to local regulations.

**Companies that have a Diverse Portfolio of Products Should Adopt an “Ecosystem Building” Model**

Organizations that have a wide range of products that will collectively benefit from the IoT should create scalable and easy-to-use platforms. These platforms in turn will enable other organizations to leverage “hardware premium” and “service bundling” monetization models for IoT-enabled offerings. The core premise for the model is that by creating a platform, the company can unlock synergy

possibilities that were previously hidden. For instance, SmartThings built the tools that will make it easier for developers to integrate their devices with its platform. It also offered ongoing support and comprehensive documentation to encourage developer adoption. The result - SmartThings has been able to create a community of 5,000 developers that use its open platform<sup>12</sup>. Consequently, 1,900 new devices and 2,300 new apps featured on its platform in a span of 90 days<sup>13</sup>.

As the number of partnering organizations increases, these platforms evolve into ecosystems and foster collaboration among partners. These ecosystems are also a source of valuable data regarding customer preferences, which can then be further monetized. Success in this model is contingent on a clear and strong value proposition for all stakeholders, and not just the platform owner.

The Internet of Things is a hugely exciting phenomenon. It has the potential to create a world where everything is connected – a new age of connectivity. While there are numerous agile start-ups emerging from this fertile ground, the IoT offers an unprecedented opportunity for traditional organizations as well. Clearly, we are at the phase where successful monetization is still a challenge for many. However,

once organizations do arrive at a recipe for extracting profitable value from the IoT, the rewards of a connected world will certainly be worth the wait.



---

## References

- 1 Washington Post, "Cisco CEO at CES 2014: Internet of Things is a \$19 trillion opportunity", January 2014
  - 2 PSFK, "A Brief History Of The Internet Of Things", March 2014
  - 3 Capgemini Consulting, "The Internet of Things: Are Organizations Ready for a Multi-trillion Dollar Prize?", 2014
  - 4 Proofpoint, "Proofpoint Uncovers Internet of Things (IoT) Cyberattack", January 2014
  - 5 Fortinet, "Connected Home Survey", June 2014
  - 6 Capgemini Consulting, "The Internet of Things: Are Organizations Ready for a Multi-trillion Dollar Prize?", 2014
  - 7 Wired, "App-controlled LIFX bulbs reinvent the humble household light", September 2012
  - 8 Company website
  - 9 EDF, "Nest's Promising Results for Reducing Peak Electricity Demand", May 2014
  - 10 Company website
  - 11 Company website
  - 12 Forbes.com, "SmartThings Wants To Eviscerate The Home Insurance Industry", July 2014
  - 13 Yahoo Finance, "SmartThings Sweetens its Hub for Consumers and Developers in a Bid to Own the Smart Home", May 2014
-

## Authors

### Didier Bonnet

Senior Vice President  
[didier.bonnet@capgemini.com](mailto:didier.bonnet@capgemini.com)

### Jerome Buvat

Head of Digital Transformation  
Research Institute  
[jerome.buvat@capgemini.com](mailto:jerome.buvat@capgemini.com)

### Subrahmanyam KVJ

Manager, Digital Transformation  
Research Institute  
[subrahmanyam.kvj@capgemini.com](mailto:subrahmanyam.kvj@capgemini.com)

Digital Transformation  
Research Institute  
[dtri.in@capgemini.com](mailto:dtri.in@capgemini.com)



The authors would also like to acknowledge the contributions of **Menno Van Doorn**, Research Director VINT, Sogeti Netherlands, **Jaap Bloem**, Research Principal VINT, Sogeti Netherlands, and **Rick Bouter** from Sogeti Netherlands.

---

## For more information contact

Germany/Austria/Switzerland  
**Guido Kamann**  
[guido.kamann@capgemini.com](mailto:guido.kamann@capgemini.com)

France  
**Cyril Francois**  
[cyril.francois@capgemini.com](mailto:cyril.francois@capgemini.com)

Netherlands  
**Albert Wiggers**  
[albert.wiggers@capgemini.com](mailto:albert.wiggers@capgemini.com)

Spain  
**Christophe Jean Marc Mario**  
[christophe.mario@capgemini.com](mailto:christophe.mario@capgemini.com)

Sweden/Finland  
**Karl Bjurstrom**  
[karl.bjurstrom@capgemini.com](mailto:karl.bjurstrom@capgemini.com)

United States  
**Stephen Pumphrey**  
[stephen.pumphrey@capgemini.com](mailto:stephen.pumphrey@capgemini.com)

United States  
**Jeffery T Hunter**  
[jeffrey.hunter@capgemini.com](mailto:jeffrey.hunter@capgemini.com)



Capgemini Consulting is the global strategy and transformation consulting organization of the Capgemini Group, specializing in advising and supporting enterprises in significant transformation, from innovative strategy to execution and with an unstinting focus on results. With the new digital economy creating significant disruptions and opportunities, our global team of over 3,600 talented individuals work with leading companies and governments to master Digital Transformation, drawing on our understanding of the digital economy and our leadership in business transformation and organizational change.

Find out more at: [www.capgemini-consulting.com](http://www.capgemini-consulting.com)

Rightshore® is a trademark belonging to Capgemini



### About Capgemini and the Collaborative Business Experience

With more than 130,000 people in over 40 countries, Capgemini is one of the world's foremost providers of consulting, technology and outsourcing services. The Group reported 2013 global revenues of EUR 10.1 billion. Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

Learn more about us at [www.capgemini.com](http://www.capgemini.com)