
USA HEADQUARTERS

275 Market St, Suite 535
Minneapolis, MN 55405

+1.612.353.2161

TAIWAN OFFICE

WenXin Road, Section 4
#955, 15F-5
Taichung, 406 Taiwan

+886.4.2247.1623

MONETIZATION STRATEGIES FOR CONNECTED PRODUCTS



WHITE PAPER

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1. Introduction

The Internet of Things (IoT) movement is upon us. Devices all around us from the home to the factory are becoming connected to the Internet. For durable goods manufacturers, opportunities abound to create new sources of revenue, reduce expenses, and better engage with customers who are increasingly hungry for quantitative information about the devices and environments around them. For enterprises this is both an exciting and terrifying time, as the opportunity to monetize the value of data has never been greater and the threat of new market entrants has never been higher.

For companies looking to create a business model for a connected product offering, it is important to examine the comprehensive impact to topline revenue, investment and ongoing expenses on the bottom line, and competitive positioning in the marketplace. For example, when considering impact to the topline, original equipment manufacturers (OEMs) often suffer from a one-dimensional approach that focuses solely on the possibility of driving recurring revenue subscriptions from end customers. Although there are indeed situations where the end customer will pay for a subscription service (e.g., high-value industrial assets, home security systems, multimedia streaming services), there are also many situations in which they will not (e.g., thermostats, door locks, smoke detectors, and many wearables). However, the latter types can still drive substantial increases to the topline – the increase just may not come exclusively, or at all, from subscription revenue.

If enterprises focus only on recurring subscription revenue from end customers, they may limit the true potential for creating economic value in the marketplace, leading to naive product feature choices, misaligned product development teams, faulty business models, and ultimately a weak bottom line. Some of the most powerful economic value that can be created is when expenses are reduced, safety is increased, or customer loyalty deepens, all of which are not mutually exclusive.

To drive maximum revenue for connected product deployments, it is critical to be laser-focused on value creation. Where there is value, there is a business model to be had. Pursuing topline growth rather than value creation is a single-minded approach to a multi-dimensional opportunity.

“PURSUING TOPLINE GROWTH RATHER THAN VALUE CREATION IS A SINGLE-MINDED APPROACH TO A MULTI-DIMENSIONAL OPPORTUNITY.”

This document explores monetization strategies for connected product fleets that are hyper-centered on value creation. Towards that end, this white paper identifies nine categories for connected product value creation, provides a methodology for modeling that value and creating a business case, and presents a forward-

looking point of view that encourages OEMs to make informed investments now that build a foundation for future data-driven connected product and service offerings that are robust, trustworthy, and relevant.

2. Market & Organizational Forces

In order to understand IoT monetization strategies in detail, it is important to first understand the foundational market forces and organizational inertia elements that underlie the entire value-creation journey. These include:

1. *Embracing the new connected normal* to create data-driven value with durable goods.
2. *Aligning organizational arrows* to design, deploy, and support connected products.
3. *Capitalizing on the value of data* to drive innovative products.

2.1 EMBRACING THE NEW CONNECTED NORMAL

Traditionally, creating value with durable goods meant identifying lasting customer needs and providing a quality service or product to meet those needs. As a technology stabilized, new market entrants established a foothold, consumers became savvier, price wars became commonplace, and the race to the bottom began. Since the beginning of the Industrial Revolution, this trend has repeated itself over and over.

However, the new connected device economy has begun to change this model. With the ability to deliver new features in real time over the air, isolate new features and functionality as premium services, and track, monitor, and control devices remotely, OEMs are facing a much more complicated marketplace. Despite this complexity, connected products are quickly becoming the new table stakes for many industries. Customers that have become accustomed to the connectivity of smart home appliances, smart phones, and tablets in their personal lives are the same people that make choices in the workplace about what office furniture to buy, technology to invest in, equipment to purchase, efficiencies to realize, and risks to reduce.

Some industries are already more mature in terms of their move towards connectivity, like the thermostat industry, which was disrupted by the Nest Learning Thermostat in 2011 that showed us that consumers were willing to pay significantly more money for a connected product. Some less mature industries, like connected compressors, HVAC, flow sensing, and remote motor control, will soon feature connected product versions that will dislodge current market leaders and meet consumer demands for connected control, monitoring, and predictive maintenance. In order to remain successful, OEMs must be prepared to embrace the new connected normal in their future product offerings.

For more information on the market forces in place that are setting the stage for the new connected device economy, see

Exosite's [The Five Phases of IoT white paper](#).¹

2.2 ALIGNING ORGANIZATIONAL ARROWS

Connected product fleets are a new endeavor for many enterprises. While designing a connected product offering is hard enough, preparing an entire organization to market, sell, and support it is even harder. Many organizations face similar challenges, including:

- How the product (or services derived from that product) should be marketed to other businesses or end consumers and what value propositions it should promise.
- How the sales team should sell a connected product. Training on new features and modifications to the sales process may be necessary.
- How support teams answer questions if something goes wrong with a connected product, including remotely diagnosing issues, resetting a device, or changing ownership of the device and/or data associated with it.
- How IT operations teams deploy software updates, handle rogue devices, or prepare for and respond to security incidents.
- How the R&D and product-marketing teams access data streams to fine-tune future versions of the product or optimize data rates and measurement points.
- How the product management team thinks about return on investment (ROI), builds business models that may be service-based or hybrid product/service-based, and successfully retires devices at the end of the product lifecycle.

Based on these challenges, it is clear that preparing an organization to support connected product fleets is no small task. However, by aligning organizational arrows on value creation, enterprises can change industries by being agile as opposed to merely being big.

For more information on organizational readiness for IoT solution deployments, see Exosite's [Security in IoT Systems white paper](#).¹

2.3 CAPITALIZING ON THE VALUE OF DATA

Connecting products is the first step in a sequence of a maturity that ends with intelligent control and decision-making support. Although the near-term focus may be on connecting the first product family to meet the expectations of a particular ROI model, it is laying the foundation for future connected products and initiating data collection that can ultimately be turned into actionable insights.

Making the transition to a data-driven company, however, requires a long-term view. Instead of looking at problems from a monthly or quarterly basis, organizations must think about what they will become in the marketplace over the next five-to-ten years. Companies must also be prepared to make on-going investments in technology, people, and process improvements that align with a centralized organizational strategy, as the business software, skills, and processes needed to manage durable goods manufacturing differ from those needed to manage connected consumer product experiences.

“...THE BUSINESS SOFTWARE, SKILLS, AND PROCESSES NEEDED TO MANAGE DURABLE GOODS MANUFACTURING DIFFER FROM THOSE NEEDED TO MANAGE CONNECTED CONSUMER PRODUCT EXPERIENCES.”

With the mass collection of data from products and consumer behavior, the ability to automate and assist intelligent decision-making processes carries the promise of transforming businesses, industries, and lives. Embrace the journey of creating value with data, and it will pay dividends for the next generation of business.

3. Identifying & Creating Value

ROI business models for IoT are fundamentally centered on creating value within the context of data-driven experiences. Where there is value, someone is willing to pay for it. In the new world of connected products and data, there is an entirely new landscape of value that can be created to drive revenue, reduce expenses, or capture market share.

When identifying value propositions for a new connected product offering, consider the following questions:

- How can I make my supply chain more efficient with this product offering?
- How will added product features increase brand loyalty?
- How can customer service become more relevant?
- How can this product improve safety?
- How can this product help customers reduce risk?
- How can this product streamline jobs?
- What and where are the pain points in the existing product or process?
- What and where are the opportunities to make the product experience more fun?
- Where can this product save time?
- How can this product serve new markets?

The answers to these questions and others will help an organization identify *why* it is building a connected product family before it becomes preoccupied with *how* to make it happen. Understanding the *why* allows an organization to select a business model that more accurately aligns with the value-creation goals of a connected product deployment, a move that plays an integral role in its success.

Exosite has helped medium- and large-sized customers deploy a variety of connected products in diverse industries. Through this experience, Exosite has seen hundreds of business models and monetization strategies based on different types of value

¹ <http://exosite.com/whitepapers/>

creation, the most successful of which are included below and described in more detail in the following sections.

1. New revenue streams
2. Lean operational efficiencies
3. Strong competitive positioning
4. Sticky brand loyalty
5. Measured risk reduction
6. Streamlined regulatory compliance
7. Faster time to market
8. Quantifiable product quality
9. Relevant customer service and insight

“ROI BUSINESS MODELS FOR IOT ARE FUNDAMENTALLY CENTERED ON CREATING VALUE WITHIN THE CONTEXT OF DATA-DRIVEN EXPERIENCES.”

3.1 NEW REVENUE STREAMS

The first and most obvious type of value creation is revenue generation from the end customer or business that is the target of the product offering. At the highest level, revenue is typically collected at product purchase (pre-paid) or on an on-going basis (recurring), although a number of hybrid models also exist. A full list of the available revenue stream models is outside the scope of this white paper, but some examples include:

- **Pre-paid.** Connected features and services are available for a period of time (or indefinitely), and the user pays for these services by purchasing a product at a higher price point.
- **Pay-per-use.** A consumer is only charged for features or resources that they use. A variant of this model is to charge market rates for the resource or feature, which may fluctuate over time.
- **Pay-for-privacy.** A user's data defaults to public availability, and the consumer is then charged to make their data private or to use tailored privacy controls.
- **Ad supported.** Connected product options are free in exchange for receiving targeted advertisements.
- **Add-on capabilities.** Additional add-on features are available as for-pay packages or modules.
- **Service subscription.** A consumer is charged a fee for use of connected product features, which they can access as long as they continue to pay.
- **Automated accessory replenishment.** A device determines when an accessory needs to be replaced and automatically ships and bills a customer for it.
- **Lending/leasing/renting.** A user is given exclusive right to a connected product for a defined period of time. An example of this is home medical equipment like oxygen concentrators.
- **Digital/physical freemium hybrid.** A physical device and online services are combined in a package that is free to start, but requires payment to unlock premium features.

The revenue-generating business models above can be applied at any step in the product's value chain. For example, an OEM that makes lawn care equipment may charge distributors a pay-per-use fee for leasing equipment. The distributor in turn may charge end users a subscription fee for access to Internet-enabled product features. In this way, monetization of the product offering may actually be a chain of business models linked together.

For a more comprehensive list of revenue-generating IoT business model options and a facilitated business model innovation session, [contact Exosite²](#) for additional information about the Exosite IoT Strategy Workshop.

3.2 LEAN OPERATIONAL EFFICIENCIES

Particularly in industrial equipment and service-delivery applications, reduction of expenses is one of the biggest opportunities to create value and monetize a connected product fleet. Expense reduction through lean operational efficiencies can be accomplished in a variety of areas, including:

- **Supply chains.** Monitoring inventory levels and assets can significantly improve supply chains by minimizing loss and waste and optimizing demand- and capacity-planning activities.
- **Truck rolls.** Connected products that dispatch just-in-time truck rolls can save on labor and fuel costs, while also providing more proactive and agile customer service.
- **Energy usage.** Performance measurement against historical averages, similar installations, seasonal variants, and environmental pressures can help reduce energy usage (utilities, buildings, and facilities).
- **Downtime.** Predictive maintenance that monitors and anticipates when issues are likely to occur can significantly reduce costly downtime.
- **Bad devices.** Identification of rogue or mal-performing devices can curb revenue loss, inefficiencies, legal risk, or blind spots in environmental monitoring applications.
- **Asset utilization.** Remote monitoring of sensors, devices, assets, asset groups, and fleet performance by dimensional categories like region, user, or application can maximize asset utilization that saves time and money.

When generating a business model, especially for industrial applications that involve remote machine monitoring or service delivery process optimization, lean operational efficiencies are an important aspect of the value creation process and, hence, a valuable monetization strategy.

3.3 STRONG COMPETITIVE POSITIONING

Although the IoT landscape is fragmented and confusing today, connected technology is becoming easier to integrate and deploy. As a result, the threat of new market entrants has never been higher, and consumers have never had more choices. This requires business leaders not only to build strong businesses, but also to defend their position in the marketplace. In the past, large companies could outdo small ones simply based on their size. In the future, however, agility will determine success, with responsive companies outdoing those that are slow to change.

² <http://exosite.com>

Connected products provide an opportunity for organizations to become more agile and create a strong competitive position by connecting with users in as many facets of their life and work patterns as possible. By connecting sensors to devices and making that data available for users to monitor, control, and optimize in concert with their environments, companies can make a wide economic moat that, if done right, can be difficult for competitors to cross. Using a connected product to develop a strong competitive position is all about agility, features, and the ability to deliver value to users in a relevant way. At a high level, this can be monetized as offensive tactics or as defensive tactics.

OFFENSIVE TACTICS

A competitive position created by connected product offerings can bring offensive benefits, each of which carry monetary gain:

- **Awareness.** By securing a critical first-mover advantage in the market, the connected product brand can achieve top-of-mind awareness with consumers. As a result, consumers are more likely to choose this connected product than a lesser-known, lagging competitor. From an ROI point of view, this translates to a % increase in sales depending on the product, industry, and the product's ability to meet consumer needs.
- **Preemption.** By entering the market with a connected product fleet first, a company can preemptively prevent competitors from making a big market splash. From an ROI perspective, this translates to additional market share.

DEFENSIVE TACTICS

Conversely, a strong market position fueled by connected product fleets can have defensive benefits as well:

- **Barriers.** A connected product fleet launched as the first of its kind in an industry creates instant market share and establishes an incumbency that is difficult to unseat. This phenomenon creates a natural barrier for subsequent market entrants that translates to a larger and more elongated revenue arc.
- **Diplomacy.** A connected product fleet opens new doors for partnership offerings that are difficult to compete with. A connected bed, for example, is more valuable if it cooperates with connected lights. In competitive market dynamics, these partnership opportunities can be used as diplomatic entrees to co-marketing and technology integrations that benefit consumers, while driving sales and brand value.

3.4 STICKY BRAND LOYALTY

An Exosite customer that is a Fortune 500 company in the industrial market found that after a mass connected product deployment with Exosite, end customers spent 20% more on replacement parts and accessories than those with non-connected varieties. The same end customers were also 25% more likely to purchase follow-on connected products from the same brand family. Connected products allow brands to reach further into the consumer experience and create deep connection points that are valuable and sticky.

The stickiness of a connected product brand is a combination of user experience (UX) relevance and the degree to which the product garners trust. As such, the product design process should carefully consider the UX to ensure that product features and

usage modes are relevant, easy to understand, and enjoyable to use. In addition, the product must communicate an intrinsic promise of security, safety, and reliability, especially for industrial brands and those that handle private data.

“THE STICKINESS OF A CONNECTED PRODUCT IS A COMBINATION OF UX RELEVANCE AND THE DEGREE TO WHICH THE PRODUCT GARNERS TRUST.”

3.5 MEASURED RISK REDUCTION

For some applications, the reduction of risk is a key value proposition of a connected product offering. Risk can be reduced in a variety of areas, including:

- **Personal injury.** By monitoring equipment usage and performance trends, misbehaving machines or users can be identified early so that corrective actions can be taken before a catastrophic event occurs. For example, safety equipment in a manufacturing environment that requires the operator be in a certain position before a machine can operate is a key component of jobsite safety. However, the misuse or misapplication of the safety equipment can lead to higher rates of personal injury or machine damage. Connecting such safety equipment can provide insight into widespread misuse that can be turned into actionable change.
- **Asset downtime.** Failure prediction, which has long been possible with closed-loop systems, enables preventative maintenance to be scheduled for high-value industrial assets that can lead to reduced downtime. However, connected products and sensors can take this ability one step further, correlating equipment issues in the surrounding environment to make highly intelligent decisions to shut down critical systems or prevent costly downtime in a way that was not possible in the past.
- **Theft.** Connecting and monitoring mobile equipment can reduce risk by alerting operators when product theft occurs in environments like construction sites or maintenance shops. Theft data can be used to identify individual offenders, understand theft rates, and identify the environments that are conducive to high rates of theft events.
- **Mal-usage of devices or data.** Intelligent analytics based on connected devices and sensors creates a new set of possibilities to detect equipment abuse. For example, machines that are overworked often have a lower life expectancy. Garbage trucks that run non-optimal routes at certain times of the day may lead to a lower-than-average fuel economy. By remotely connecting equipment, usage patterns can be optimized to extend the life of equipment and increase operating margins in a significant way.
- **Consumer behavior.** In many industries, connected products can provide insight into behavior that can be factored into risk-reduction offerings. For example, by monitoring automobile driver behavior on the road, insurance agencies can offer optimized insurance policies to better compete in the marketplace. In buildings, water leak or structural damage detection provides insight into risk profiles and can ultimately lead to better insurance policies that are more relevant to consumers and more profitable for insurance companies.
- **Energy costs.** Connected products can monitor machines and energy consumption (e.g., gas, water, heat, electricity, solar) to

detect trends that are anomalous and wasteful so action can be taken. In addition, by monitoring energy usage, machine cycles, and usage patterns, activities can be optimized to reduce energy usage and delivery comparable or better service more efficiently.

Although not exhaustive, these examples prove that risk can be reduced by connecting durable goods to the Internet, opening the door to better and more cost-effective decision-making capabilities through data analytics.

3.6 STREAMLINED REGULATORY COMPLIANCE

Adhering to regulatory requirements, like those created by the FDA, can be onerous. However, connected devices can create value by streamlining the compliance and reporting process in many cases. For example, remotely monitoring the temperature and environment of food as it is transported from the farm, to the grocery store, and ultimately to refrigeration cases can be used to:

- Provide records for FDA reporting in the case of a food-borne illness event. Information like the temperature and location of the food within the cold chain can provide insight to regulators and defensive proof for suppliers.
- Proactively notify operators when unsafe food conditions are about to occur so food can be transferred or discarded before sold to consumers.
- More easily comply with regulatory requirements. For instance, by monitoring and responding quickly to rodent evidence, suppliers can be certain that pest issues have not interfered with the integrity of the food under its supervision.

3.7 FASTER TIME TO MARKET

The time it takes to get a product to market is crucial to a product's financial success. If time to market can be reduced, the product will have more exposure to the market, which leads to higher sales. A fast time to market can also establish a firm competitive foundation by securing the critical first or second mover advantage. Connected products enable enterprises to create value by shortening product time to market in a number of ways, including:

- **Future feature rollout.** Connected products make it possible to release new firmware after an initial product launch. As opposed to holding up a product launch because advanced features are not ready, the product can be released and the advanced features rolled out when they are complete.
- **Longer product quality cycles.** Software quality assurance is often the last activity to be completed before a product can be launched. With connected products, it becomes possible to extend software quality assurance cycles past the date of initial product launch. Although it is always advisable to perform critical software testing before a product is launched, certain advanced or deep-testing aspects can be completed after the device is in the field. This is only possible if a rock-solid method for in-field software updates is in place, as well as a platform through which to deploy the updates.
- **Increased potential for feature reuse.** The dawn of connected products means that more feature sets can be provided in the cloud as opposed to being limited to the confines of the device.

For example, simple sensors on wearable devices can detect body motion and report to the cloud. However, the cloud provides comprehensive analytics, events and alerts, and user interfaces to interact with that data. Enterprises can store more device-independent features in the cloud, creating a major opportunity for feature reuse and a correspondingly faster time to market for current and future products.

- **Simpler physical devices.** The same trend that makes software reuse more readily available also makes physical devices simpler, easier to develop and manufacture, and faster to launch. Complicated hardware requires more schematic design, more extensive printed circuit board (PCB) layout with long turnaround times, and more software development, all of which can be reduced by pushing more features into the cloud and making the physical devices simpler.
- **Faster time to market for second generation connected products.** By instrumenting devices to measure user behavior and device behavior, captured data can be used to tailor second-generation products to consumers in granular ways that were previously coarse. Time to market may not be shortened for an initial connected product release, but may be significantly reduced for future product launches.

3.8 QUANTIFIABLE PRODUCT QUALITY

For many industrial applications, like engine designs for mobile landscaping or street sweeping equipment, enterprises often have limited knowledge about product quality outside of product returns and consumer reviews. Remotely monitoring devices and equipment provides an opportunity to create value by understanding product quality at a deeper level, including:

- **Improved product quality insights.** Traditionally, software quality metrics are determined prior to product launch and are then combined with failure rates in the field using metrics such as mean time between failure (MTBF) measurements, product return rates, and industry/consumer reviews. By implementing remote device health and performance monitoring, it is possible to better characterize and understand product defect arrival patterns and causes through the collection and analysis of data. Remote firmware upgrades can then be rolled out as needed to address any issues.
- **Deeper product performance insights.** If a product fails but is not returned, or a user experience is poor but not poor enough to elicit a public review, customers may switch to competing products without the OEM knowing. Adding low-cost sensors or measurement points to a connected product offering can help OEMs understand at a deep level how the product is operating and where product defects or performance degradations may be occurring in the field.
- **Better intelligence about UX performance issues.** Product features for connected products extend beyond the physical devices, with complex user interfaces and interaction patterns. The ability to measure and report what the customer journey looks like across an entire product fleet can lead to product quality insights about how to make the product function more reliably and in a way that is most relevant to the user.
- **Extended software quality assurance lifecycle.** Traditional software verification and validation activities follow either a "V" model, where testing is primarily conducted at the end of product development, or a "test-driven" model, where tests are written near the beginning of product development and matured through product launch. Connected product fleets allow testing to be extended be-

yond the development process into the product lifecycle, where it is in service and being used by real users.

- **Improved software quality assurance on next-generation designs.** Detailed measurements on the performance of connected products and services can help improve not only the current product fleet but also future ones. The collection of highly accurate product performance and user experience data can be gold mines for product design teams working on the next best thing.

Quality has a direct effect on brand trust, customer loyalty, and ultimately the ability to monetize a product offering. With traditional durable goods, product quality was nearly 100% based on how well and how long the physical product performed. In the new connected device economy, mobile user interfaces, interconnected products, and novel usage modes all have the ability to directly affect the financial performance of the product offering and should be included in business modeling activities for connected product fleets.

3.9 RELEVANT CUSTOMER SERVICE & INSIGHT

Customer service teams are finding themselves right in the middle of the connected product movement. In addition to augmenting support staff with the new skills, processes, and documentation necessary to support connected products, it is also important to recognize the opportunity to create value by delivering better customer service that is more relevant and efficient.

For example, it is possible to remotely troubleshoot not only the performance of a connected pressure regulator, but also the network connectivity between the regulator, gateway collection point, cellular network, cloud environment, and mobile user interface. If a support desk professional can access this data prior to talking to a customer, they can improve the customer service experience, reduce time on the phone, and minimize product return rates.

4. Modeling Value

Once value has been identified, it is important to build a realistic model that shows how that value is quantified and captured. The following sections describe an approach to quantify and optimize for value within the context of a connected product device deployment.

4.1 QUANTIFYING VALUE

Quantifying value is a critical part of building a business case. The goal is to take the value statements in Section 3 and create derivative quantitative statements that can be validated, perhaps theoretically at first, but empirically over time.

For instance, brand loyalty – the degree to which customers give good reviews of a product and/or purchase additional products from the same brand – is influenced by a multitude of psychological factors like how frequently the customer interacts with the product. Generally speaking, customers that have repetitive

encounters with a product experience systematically biased habitual responses that lead to an increased likelihood of a repeat purchase. Connected products offer more opportunities for users to connect with the product and, therefore, improve brand loyalty. This might be quantified as: *Customers are X% more likely to repeat purchase connected products, leading to an average of \$Y additional total customer value (TCV).*

Building these quantitative value statements that are applied across the life of the product at a certain rate (e.g., constant, linear, logarithmic, polynomial), an estimated offset from the beginning of the product lifecycle, and a confidence interval will begin to build the business case for a connected product opportunity.

A full treatment of value quantification is beyond the scope of this white paper, but the Exosite Professional Services team is well versed in helping customers navigate these tricky modeling problems. Additionally, Exosite offers an IoT Strategy Workshop to assist with business model opportunities and decisions. [Contact Exosite](#) for additional details.

4.2 OPTIMIZING FOR VALUE

With a clear understanding of how a connected product offering adds value to the marketplace and end users, as well as a solid model for quantifying what that value represents, an OEM can then organizationally align to optimize for value.

For example, if an OEM creates a connected pressure regulator, the connectivity features may enable better insight into system usage patterns (Section 3.9: Relevant Customer Service and Insight) and enable predictive failure analytics (Section 3.5: Measured Risk Reduction). If these connected product features enable higher product margins and/or higher sales volume, the OEM can optimize for those value points by doubling down on investments in customer service desk integrations and by promoting a more fine-tuned brand image that communicates risk reduction and trust.

5. Capturing Value

As if creating value with a connected product offering is not difficult enough, capturing value is yet another science to conquer. Pricing models, bundling options, and partnership strategies are all part of the effort to capture value. An in-depth discussion of pricing strategy is outside the scope of this white paper, but it is useful to understand a few reasons why it can be a difficult exercise:

- **New standards of operation.** Connected products are increasingly becoming the new normal. This trend often requires companies to operate in a space outside their comfort zone and consider models and strategies they are not necessarily used to or do not fully understand.
- **Lack of buyer precedent.** In many industries, connected products are a relatively new exploit, and there is often no precedent about what customers will actually buy, making it difficult to understand how connected product features will affect sales volume.

- **Hidden value chains.** When looking at the value chain for connected products, there is often more value to be found in the middle than there is revenue to be had from the end user. Unraveling and identifying value points in the supply chain, as discussed in Section 3, is a difficult, but key aspect of a successful connected product deployment.

For companies launching their first connected product fleet, there is significant infrastructure and organizational alignment that must be achieved in order to design, development, launch, and support it. Much of this alignment can be leveraged for future connected product offerings and so represents more of a foundational shift for an organization to invest in. If not addressed properly, the business case for a connected product fleet can accidentally conflate business-wide concerns and product-specific concerns, which ideally would be modeled independently. For example, in a multi-divisional company, launching a connected furnace requires not only engineering, marketing, and sales to collaborate on the furnace product, but may also require investing in a common cloud-based data platform that is leveraged by the furnace product and is also available for future products, like a connected air conditioning unit. Connecting and monetizing the furnace product carries a different ROI time scale than the data platform it connects to. Misunderstanding the furnace product plus data platform ROI as a simple sum of the parts is missing the point that investing in a lasting data platform is a long-term investment and should be modeled as such.

The following strategies can be used to ensure an organization is focusing on value capture as opposed to merely going through a simple pricing exercise in which margin is added to a base cost:

IDENTIFY THE PAYER

Determine who will pay for the device. It may be necessary to consider different models than those typically leveraged by the organization, like the two-sided market model in which customer access is free or reduced while a third party (perhaps an advertiser) pays for access to customer analytics.

IDENTIFY THE PRICE CARRIER

The price carrier is the thing that you attach money to. Choosing the right price carrier can make a significant impact on how much value can be captured. Below are two examples to illustrate:

- **Price carrier as recurring metered utility billing service.** Agricultural grain bin monitoring is seasonal, so charging for metered usage of cloud-based services can be an effective price carrier since the customer most values the service for the periods of time they need it (right after fall harvest). For the grain bin monitoring system OEM, it costs money to install the sensors and equipment and also costs money to run the cloud service that monitors and controls it. However, by identifying the price carrier that matters most to the consumer (risk reduction on grain storage post harvest), value capture can be maximized.
- **Price carrier as pre-paid core product sales with bundled features included.** Residential thermostats in certain climates can also be seasonal. However, most consumers do not want to be bothered by another small subscription service fee. Instead, it has been shown that consumers will gladly pay a higher fee up front for a thermostat that has remote monitoring and control features included "for free." In this case, although it costs the OEM money for the thermostat and also costs to run the cloud services at-

tached to it, the price carrier is the thermostat and is treated as a bundled offering that includes the cloud services. This arrangement, which fits more closely to what the consumer values, has a better chance of maximizing overall value capture for the OEM.

IDENTIFY THE TIMING

In the razor blade or printer cartridge model, the cost of the base unit is reduced in exchange for more expensive accessories. This effectively shifts the timing of when money is transacted, lowering the barrier to adoption and increasing overall profitability.

6. Foundation for a Data-driven Future

Building connected product fleets to fulfill real-world needs is exciting and powerful, not just for the value it brings today, but also for the value it promises in the future. Making an investment in a connected product offering is just that: an investment for the future. In order to make initial connected product offerings successful, it is important to intertwine individual product performance with a long-term objective to revolutionize the company and the industry based on data analytics.

Data analytics progresses in four stages of maturity, each building on the one before it:

1. **Descriptive analytics.** What happened?
2. **Diagnostic analytics.** Why did it happen?
3. **Predictive analytics.** What will happen?
4. **Prescriptive analytics.** What should I do?

In order for any of these levels of analytics to be possible, devices must first be connected, which starts with a connected product strategy foundation that is valuable in and of itself. But that strategy must also pave the way for a future of data-driven analytics that can revolutionize the way users engage with products and brands.

7. Conclusion

The new world of connected product opportunities is an exciting and terrifying place to be. The chance to better connect with consumers, build deeper brand loyalty, and increase insight into how products and features are used has never been greater. At the same time, the threat of new market entrants and disruptive product offerings has never been more near. The time to act is now.

With a carefully crafted understanding of connected product value creation, a solid model to turn that value into near-term profitability, and a long-term perspective on the importance of data, organizations can not only create products that connect with customers, but build a foundation to lead their market into decades of future growth.



Exosite's cloud-based services provide companies with the technology needed to build and deploy next-generation IoT applications that leverage the expanding world of connected devices. Customers all over the world use Exosite to build custom remote monitoring and control solutions that meet the demands of their connected products, which in turn improves uptime, reduces maintenance costs, and increases value-added service offerings.