Align price with use
Reducing up-front barriers with usage-based pricing

A pattern study from the Center for the Edge’s Patterns of Disruption series
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Overview

In the report *Patterns of disruption: Anticipating disruptive strategies in a world of unicorns, black swans, and exponentials*, we explored, from an established incumbent’s point of view, the factors that turn a new technology or new approach into something cataclysmic to the marketplace—and to incumbents’ businesses. In doing so, we identified nine distinct patterns of disruption: recognizable configurations of marketplace conditions and new entrants’ approaches that can pose a disruptive threat to incumbents. Here, we take a deep dive into one of these nine patterns of disruption: **align price with use**.

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**Align price with use**

**Reducing up-front barriers with usage-based pricing**

*Def. Shift from fixed, up-front pricing to usage-based pricing.*

Alternative access models that align pricing with usage are increasingly viable for a wider range of products and services, both physical and digital. Technological advances—particularly related to ubiquitous sensors, Internet speed, and cloud computing capacity—facilitate tracking, billing, and, in some cases, delivery for much smaller and more dynamic increments of use across a variety of customer contexts. Aligning product pricing with use can unlock latent demand by reducing the up-front cost associated with physical assets for lower-use customers, expanding the market of customers who can afford to use the product. In addition, shortened product lifespans further drive demand for flexible, scalable, and lower risk options to traditional ownership.
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**Arenas**

- Automotive manufacturers
- Financial services and insurance
- High-end fashion

- Consumer electronics
- Airplane manufacturers
- Real estate

**Figure 1. Pattern snapshot**

Reducing up-front barriers with usage-based pricing
Aligning price with use can radically transform industry structures and organizations’ go-to-market strategies as existing and potential customers reevaluate when, where, and how a product is used. When products are available on demand in smaller increments, and without a large up-front investment, more potential users will be willing and able to try them.

For business customers, that means products designed to be purchased as vital infrastructure assets are reoriented as services—for example, rather than purchase the stove, freezers, and other equipment needed for a code-compliant commercial kitchen, a mail-order food entrepreneur might buy a membership and pay by use in a shared commercial kitchen. A family periodically in need of a second vehicle might get a membership with a car-share company rather than purchase another car. Access to scalable, high-quality resources without large capital investment allows numerous smaller entities to form competitive businesses that are changing the dynamics of a range of industries; many of today’s high-valuation start-ups exemplify just how quickly companies can grow by accessing and scaling resources as needed rather than investing in fixed assets. Meanwhile, the new entrants that serve this growing segment of small- and medium-sized customers with usage-based models can build scale and potentially take significant market share from the incumbents that continue to focus only on selling assets.

Whether for reasons of flexibility, cash flow, affordability, or the desire to avoid the burden of ownership, some customers prefer access models. Historically, however, only a narrow range of products offered access models (for example, timeshares, rentals, subscriptions), and the usage increments tended to be large and fixed (for example, monthly rentals or yearly leases) based on expected need rather than aligned to actual use. Until recently, the sensors and ancillary technology required to support usage-based pricing in smaller or more dynamic increments were prohibitively expensive in many markets and contexts. Now, high-speed connectivity, low-cost sensors, and cloud computing make it possible to economically allocate, track, and charge for smaller units of products and services.

Customers who use a product infrequently, or unpredictably, benefit from alignment of price and use. For example, using a small wireless device plugged into a car’s diagnostic port, companies like MetroMile now allow consumers to pay for car insurance on a per-mile basis, making it economical for low-frequency drivers to be fully insured without subsidizing customers who drive more. Such models also enable increasingly well-informed choices as customers can test a product and get a sense of their likely product use patterns without having to pay a large up-front price.

Perhaps most importantly, aligning price with use supports customers’ needs for

“With traditional IT, it would take weeks or months to contend with hardware lead times to add more capacity. Using AWS, we can look at user metrics weekly or daily and react with new capacity in 30 seconds.”

—Richard Crowley, Slack
affordable flexibility based on high growth, volatility, or other unpredictability in their own businesses. In many cases, accommodating these widely variable needs would be cost-prohibitive for customers if they had to purchase the infrastructure to meet their peak needs. Consider, for example, the European Space Agency’s (ESA) Gaia project: Designed to make the largest, most precise 3D map of the galaxy, the project required processing satellite observations of more than a billion stars. The estimated cost for building in-house data processing was approximately €1.5 million, but that level of processing was only needed for two weeks every six months. Instead, the agency will pay less than half of that to process the six-year, 1-billion-star data set on Amazon Web Services (AWS). Customers can use the assets they need, when they need them, and do not have to pay for downtime of valuable assets. Customers can scale their usage up or down, dynamically, to fit uncertain future needs and circumstances, such as financial standing, demand preferences, environmental conditions, and other ecosystem considerations. As customers realize benefits from this model, they may become increasingly comfortable with extending the model into other business and personal products.

Without the burden of ownership, customers can focus more time and resources on using products effectively, rather than on installation, maintenance, and upgrades. Customers also can access and begin using products very quickly, as current distribution channels become faster and, in many cases, digital. Although not confined to models that align price with use, digital distribution, often from the cloud, means suppliers can update and upgrade the product for clients across the system from the back end without disrupting the customer experience. Additionally, the reduced investment lowers switching costs, opening the door for more flexibility in future purchasing decisions as customer business needs grow and evolve. This is particularly prevalent for software products sold “as-a-service,” where pricing aligned with use is prevalent.

Moving forward, robust connectivity via the Internet of Things (IoT) and potentially smaller and smaller viable transaction sizes enabled by blockchain will increase the feasibility and desirability of usage-based models in markets where products or services can be dispatched quickly to customers. Increased connectivity and integrated data analysis also allow the company to potentially gain much richer insight into how, where, and when customers are using the product and use those insights to create even more valuable products or services for the customer. In turn, customers benefit from more responsive and tailored experiences with the products.

This pattern can be challenging for incumbents to respond to because it erodes significant up-front revenue streams and challenges core assumptions about what customers value and how that value can be delivered. Incumbents will likely struggle to justify adopting a usage-based model because doing so would cannibalize the significant revenue derived from the up-front purchases of their product. The sales, support, and distribution resources are also optimized for large up-front purchases. In addition, adopting a dynamic, usage-based model could jeopardize relationships with existing customers who typically purchase the product up-front. For incumbents grounded in selling expensive products to a smaller market, this pattern also challenges core assumptions regarding who their customers are and what they desire. If past success came from selling expensive, complex products to large customers that prefer ownership, how can firms survive selling smaller increments less predictably to smaller customers? It is a difficult transition even though the core product remains largely the same. But, with dynamic usage-based models offered for more types of products than ever before, customers—large and small—are increasingly beginning to expect it across a wider range of offerings.
This pattern will most likely be relevant to products with a high up-front purchase cost in markets where customer use is volatile or unpredictable, as well as for expensive products that are based on technology or preferences that change rapidly and have cyclical and uneven utilization. Markets such as automotive manufacturing, insurance, and high-end fashion may see the emergence of on-demand services, infrastructure, or lower-commitment products. In the not-too-distant future, customers might purchase miles instead of cars, activity-based insurance instead of yearly policies, and dresses for the night, rather than a lifetime. Business customers are already relying on cloud-based products to support growth and variable demand. Lower-cost physical goods with steady demand could be more resistant. For example, high-end running shoes will likely continue to be purchased up-front because of the difficulty in dispatching them on-demand conveniently for frequent consumer use, the rapid deterioration of the product with use, and the lack of acceptance for shared use.

While usage-based pricing may play out in many industries, it may not always be disruptive. The jet engine industry, for example, transitioned to a form of usage-based pricing without disruption, largely because high barriers to entry for both customers and suppliers of jet engines prevented new entrants.

Key stats

• Netflix, which uses infrastructure-as-a-service (IaaS), accounted for 37 percent of North American fixed-access Internet traffic during peak evening hours.⁶

• A project (to identify a compound to build a new generation of solar panels) that required 264 compute-years and would have cost an estimated $68 million to build or acquire the necessary resources, ran in 18 hours at a cost of $33,000 on Amazon Web Services.⁷

• Most private data centers use between 5 percent and 20 percent of their total computing capacity.

• Rent the Runway dispatches more than 90,000 items every day to its network of 5 million members nationwide.⁸ The average dress on Rent the Runway is worn by 30 different customers.⁹
Is this just a pricing strategy?

The pricing component of aligning pricing with use removes barriers to use and expands the possible market. However, this pattern is disruptive because it also facilitates new ways of doing business. One of the interesting new ways of doing business is that as a company implements the technology to facilitate a model that aligns price with use, they also gain much greater visibility into how their customers use the product. This in turn can generate greater insight into how they can provide even more value to the customer. These insights can potentially be used to improve the offering across a broad customer base, affecting businesses across a range of industries.

Usage-based pricing isn’t new; why is it disruptive now?

While the concept of aligning price with use is not new, platforms and exponential technologies present unprecedented opportunities for connecting customers and suppliers on an on-demand basis. The IoT and embedded data analysis provide increasingly sophisticated insights into how and when products are used, enabling more accurate forecasting and, in some cases, modifying product development to better suit customer needs.

However, the degree to which aligning price with use displaces market leaders depends on market conditions such as the relative cost of the product, purchase cycles, existing and potential customer pool, and switching costs. For example, in the mid-1980s, Rolls Royce, followed by GE, introduced “Power by the Hour” in the jet engine market. With Power by the Hour, customers (airlines or aircraft operators) paid for uptime and availability of jet engines. While not strictly a usage-based model, it did bring pricing more in alignment with use compared to selling engines for an up-front fee. While the market was susceptible to this pattern, Power by the Hour was not disruptive because most of the market leaders were able to adopt the model themselves. The concentrated customer pool and lack of an underserved market allowed incumbents time to adopt the new model. Pricing aligned with use tends to be disruptive in markets where it can drastically expand the customer base, and the airline industry, with its regulations and other relatively high barriers to entry, doesn’t grow as fast as other larger industries with more players and lower barriers to entry.
Pioneering a new strategy based on the ability to deliver software quickly and reliably over the Internet, Salesforce offered customers a more affordable and flexible option when it entered the customer relationship management (CRM) software market in 1999. This model ultimately proved more practicable and accessible for many businesses than on-premise CRM solutions and popularized the software-as-a-service (SaaS) business model.

CRM is a technology solution that helps a business manage interactions with its customers. Before SaaS, software companies sold on-premise solutions to large enterprises averaging 1,000 seats per customer. The product was relatively expensive, required a long, multimonth implementation, and typically involved additional maintenance, upgrade, and consulting costs. These factors made CRM software solutions too expensive for small and medium-sized businesses (SMBs) and too much of a commitment for some businesses experiencing rapid growth and constant change.

Salesforce viewed SaaS as a solution to many of these complications. With SaaS, customers paid by user and feature for a solution with a setup time of weeks rather than months. Salesforce was responsible for maintenance and security, and the customer had access to CRM capabilities without a high up-front cost. SaaS solutions were estimated to cost less than one-third of their on-premise counterparts in total costs for the first five years. In addition, customers, especially SMBs, benefitted from the ability to quickly scale their CRM solution as they grew. As a result, Salesforce attracted many SMB customers that were hesitant to purchase on-premise solutions.

Building on the momentum from their mostly SMB customer base, Salesforce eventually moved up-market to compete directly with incumbents for large enterprise customers. By 2012, Salesforce was the revenue market leader in CRM software (see figure 2).

As Salesforce gained popularity, the SaaS model posed a challenge for incumbents. Incumbents considering adoption of SaaS...
faced significant erosion of the existing revenue stream from up-front software sales. For instance, in 2000, Siebel, which relied heavily on up-front sales, reported that 63 percent of its total revenue came from software licensing itself.24

For Siebel’s MidMarket Edition aimed at SMBs, software licenses cost an average of $995 per user in 2004,25 and a 2004 Gartner survey indicated average first-year costs to implement Siebel totaled over $12,000 per user. Salesforce Enterprise Edition, targeted at the same potential customer base, was reported to cost less than 10 percent of the price of Siebel.26 Although Salesforce offered more expensive options as time went on,27 the up-front cost disparity was a hurdle for incumbents to either replicate or compete against.

The SaaS model also challenged incumbent assumptions regarding the boundaries of the potential customer pool and what customers valued. Many large customers continued to purchase on-premise software, and incumbents continued to compete with each other for these highly profitable customers.28 They touted their industry expertise29 and the ability to integrate their software with other enterprise products.30 However, in the process, they missed SMBs, some on their way to becoming large enterprises, as well as individual departments within larger organizations that were increasingly in need of and willing to adopt CRM solutions outside the purview of their IT departments. When incumbents did begin to offer SaaS, they continued to offer on-premise options as well; maintaining two radically different models was more complex and expensive operationally and financially—a difficult challenge.31

By 2014, 47 percent of total CRM software revenue was earned by SaaS, and Salesforce claimed 18 percent of the total market.32 The approach of providing an offering “as a service” began to spill into other areas of technology.
Infrastructure-as-a-service (IaaS) offerings are putting pressure on the traditional suppliers of branded infrastructure products and value-added services in the data center server market. These original equipment manufacturers (OEMs) face increasing competition from outside design manufacturers (ODMs) as their customers’ business needs and preferences change. Traditionally, OEMs sold systems that included ODM components to data centers, and ODMs provided design and manufacturing services to OEMs. Now, as businesses seek flexibility and lower up-front costs through on-demand computing solutions, IaaS providers are investing in extremely large, “hyperscale,” data centers. These IaaS data centers have different infrastructure requirements than private corporate data centers—traditionally served by OEMs—and ODMs are capitalizing on it.

IaaS data centers serve the highly variable, on-demand computing needs of a large number of external customers. Unlike a private data center, which might have a few dozen branded servers of varying form factors, a hyperscale data center might house over 50,000 servers, sometimes over a million. As a result, even small cost and efficiency advantages for components can yield massive savings. Perhaps the most substantial cost advantages have resulted from the refinement of highly uniform modular servers.

The versatility and efficiency of modular servers make them well suited for the usage-based pricing model embedded in IaaS. Their simplified infrastructure makes them easier to deploy quickly from one customer to another based on need. It also reduces power and cooling expenses, making them cheaper to operate. With a shared chassis and uniform architecture, modular servers also have an average selling price roughly 38 percent lower than that of the rack-optimized servers plus ancillary equipment previously required. At scale, they work in parallel to enable easier automation, agility, and scalability.

For all of these reasons, modular servers have become the predominant form-factor for hyperscale data centers, and ODMs are increasingly supplying this market directly. ODMs have gained control of 54 percent of the US modular server market, the largest and fastest growing segment in the industry between 2010 and 2015.

The capital and technical capabilities required to develop and run a hyperscale data center are a barrier to smaller players, and IaaS providers like Google and Amazon Web Services are capitalizing on it, investing over $180 billion in data centers since 2005. Although there are relatively few hyperscale data centers, their size concentrates data center server purchasing power among a small group of companies focused on customizability and costs. This case focuses on the US market only, which comprised 57 percent of server spending for large data centers and housed over 50 percent of the world’s 1,223 large data centers in 2014.

What is driving IaaS growth?
IaaS is both driven by and supporting the increasingly technology-based small and medium-sized businesses. The past decade has seen a dramatic increase in the number of start-ups and other companies requiring scalable data center capabilities, and much faster Internet speeds now allow for highly complex and large-scale infrastructure solutions to be delivered reliably by the Internet. For these rapidly growing companies, constant changes in technology, uncertain or volatile future needs for computing capacity, and lean
“It’s now about $90 an hour to rent 10,000 computers (the equivalent of a giant machine that would cost $4.4 million).”
—Jason Stowe, CEO of Cycle Computing, in 2013

Budgets make expensive hardware investments less attractive, and in some cases out of reach. In addition, the installation, integration, and maintenance of computing hardware can draw time and energy away from the business, especially for smaller businesses that might not have the resources to maintain crucial systems. IaaS grew out of an opportunity to address those needs. It is now also being adopted by some large enterprise customers for at least a portion of their data center needs.

Demand for IaaS is growing rapidly in the United States, with forecasts for the industry to be worth $20 billion by 2018, up from $4 billion in 2013. To meet that demand, Gartner expects a 32 percent increase in the number of domestic large data centers between 2010 and 2018. At the same time, large data centers are expected to get larger, housing 22 percent more servers per site. All other data center size categories are expected to decrease by 2018 (Figure 3).

Figure 3. Growing demand for IaaS is driving investment in large data centers

Growth of modular servers

Hyperscale data centers are driving server demand, and their investment in modular servers are at the expense of servers of other form factors. US modular server shipments increased 212 percent from 2010 to 2014 (figure 4), while the overall industry grew at only 14 percent.50 Every other form factor of servers experienced reductions in shipments of 20 percent or more. As the entire industry shifts toward integrating servers, storage, networking, and software,51 hyperscale customers of modular servers are the prominent driver of industry demand.52

Figure 4. Demand for modular servers outpaces that for other server form factors53


Not only do these IaaS providers favor a different type of server better suited to the usage-based, on-demand model, they also don’t rely as much on the other value-added services (for example, education, integration, and customer relationship management) that OEMs typically provide. Instead, given the size of the hyperscale data centers, it is more efficient to insource planning and support. As a result, hyperscale data center operators are bypassing
OEMs to leverage their concentrated purchasing power and contract directly with ODMs for customizable modular servers at lower costs. ODMs are experts in efficient design, low-cost production, supply chain management, manufacturing, and assembly and can offer cost savings of 15–25 percent relative to OEMs.

For now, ODM sales are largely contained within the hyperscale segment, where they control 80 percent of server sales. But the limited customer pool does not translate to limited sales given the large numbers of servers these customers purchase and the trend toward even larger data centers noted above. As of Q3 2015, ODMs sold 54 percent of the modular servers in the US market. At 2014 growth rates, ODMs will sell more servers in the United States than OEMs within five years (figure 5); data available through the third quarter of 2015 suggest that the pace of growth for both ODMs and modular servers is actually accelerating.

The OEMs largely have not replicated the low-cost, stripped modular server offering. For OEMs, growth has historically come from selling on-premise data centers and ancillary education, support, and other value-added services to large enterprise clients. Sales and support teams, once a key differentiator and asset, are focused on a dwindling customer base. With the market shifting toward larger data centers full of modular servers, the server industry is becoming more cost competitive, greatly reducing OEM margins. Some have been forced to reduce operating costs or vacate whole server markets.

**Figure 5. Extrapolations of 2014 US growth rates for OEMs and ODMs through 2020**

ODMs could displace OEMs within five years.

Short story

**High-end rentals (Rent the Runway, Le Tote, The Ms. Collection) and the fashion industry**

Apparel and accessories in the high-end fashion market generally have short life cycles, varying season by season, and customers tend to have cyclical demand. For designers, premium prices and high margins compensate for low inventory turnover. At the same time, the high prices combined with low expected use make these items out of reach or undesirable for many potential customers.

To capture some of this unaddressed demand, companies like Rent the Runway, Le Tote, and The Ms. Collection provide variable access in a market that has traditionally been sold in whole units. Rent the Runway, for example, allows its more than 5 million members to rent high-end clothing and accessories for a few days at a time, as close to usage-based pricing as possible, given current distribution capabilities. The company provides access to more than 65,000 dresses and 25,000 accessories for a fraction of retail prices, and handles all of the dry-cleaning, repair, and maintenance of items. The model has drastically increased utilization, with garments averaging 30 uses, and 60 percent of dresses turned back around to customers the same day they arrive at the company. Dresses rent for roughly 5–15 percent of the retail price, which indicates that, before shipping and dry-cleaning costs, Rent the Runway can earn 3x the value of the dress. Rent the Runway is forecast to earn $100 million in revenue in 2015, still a very small portion of the highly fragmented $270 billion fashion design industry where no individual company controls more than 5 percent of the market.

The effect on incumbents is unclear, although it is unlikely to be positive. By capturing latent demand from the large portions of the market previously either unable, or unwilling, to purchase high-end items destined for limited use, these companies are increasing the number of consumers of high-end garments and accessories. However, the new customers are unlikely to significantly increase sales for designers and incumbent sales may decrease if existing customers who would have purchased items outright also choose to rent for a fraction of the price.

For incumbents, adopting a rental model in response might cannibalize sales from customers who may have purchased the garment outright. In addition, the model might render at least some of an incumbent’s brick-and-mortar assets obsolete and require significantly different operational support. It would also challenge an organization’s core assumptions regarding its customer base: who they are, what they value, and how to reach them.

While companies like these may expand the consumer base and brand presence for high-fashion designers, designers are unlikely to capture more value.
Is my market vulnerable?

Is the product expensive and is there a large and/or growing potential customer base currently priced out of the market?

When expensive assets are sold in smaller increments, market participation is more affordable. Customers with significant growth prospects generally feel more comfortable with flexible agreements that allow more dynamic scaling and pricing that aligns with use.

Is product utilization low or demand volatile?

Customers do not want to pay for more than what they use; if customers are purchasing costly items with variable or unpredictable use, including snowboards, cars, or data centers, they may prefer paying per use.

Can your product or service be provisioned in smaller increments than currently allowed?

This is an important distinction between large fixed assets with elastic supply like computational capacity, and large fixed assets with inelastic supply like elevators. Elevators, for example, cannot be provisioned in increments less than one, and consequently the industry, despite meeting many of the market conditions, is not vulnerable to this pattern.

Are product life cycles short or shortening?

Customers may be hesitant to enter into long-term contracts or purchases when the product industry is dynamic and fast-paced. In these circumstances, customers may tend to prefer more flexible access, over shorter timeframes, to hedge against being locked into expensive, obsolete products.
Endnotes

9. Ibid.
14. Seats per customer refer to the number of users that are authorized to use the software simultaneously. If 10 employees are able to use the software at the same time, the company has purchased 10 seats.
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Acknowledgements

This research would not have been possible without generous contributions and valuable feedback from numerous individuals. The authors would like to thank:

Philippe Beaudette  Jon Pittman  Blythe Aronowitz
Andrew Blau  Janet Renteria  Jodi Gray
Peter Fusheng Chen  Peter Schwartz  Carrie Howell
Jack Corsello  Dan Simpson  Junko Kaji
Larry Keeley  Vivian Tan  Duleesha Kulasooriya
Eamonn Kelly  Lawrence Wilkinson  Kevin Weier
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About the research team

This report and the Pattern write-up series would not have been possible without the hard work of our research team—colleagues who tracked down case studies and cheerfully dug for data and more data on the way to proving and debunking countless possible patterns.

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About the Center for the Edge

The Deloitte Center for the Edge conducts original research and develops substantive points of view for new corporate growth. The center, anchored in Silicon Valley with teams in Europe and Australia, helps senior executives make sense of and profit from emerging opportunities on the edge of business and technology. Center leaders believe that what is created on the edge of the competitive landscape—in terms of technology, geography, demographics, markets—inevitably strikes at the very heart of a business. The Center for the Edge's mission is to identify and explore emerging opportunities related to big shifts that are not yet on the senior management agenda, but ought to be. While Center leaders are focused on long-term trends and opportunities, they are equally focused on implications for near-term action, the day-to-day environment of executives.

Below the surface of current events, buried amid the latest headlines and competitive moves, executives are beginning to see the outlines of a new business landscape. Performance pressures are mounting. The old ways of doing things are generating diminishing returns. Companies are having a harder time making money—and increasingly, their very survival is challenged. Executives must learn ways not only to do their jobs differently, but also to do them better. That, in part, requires understanding the broader changes to the operating environment:

- What is really driving intensifying competitive pressures?
- What long-term opportunities are available?
- What needs to be done today to change course?

Decoding the deep structure of this economic shift will allow executives to thrive in the face of intensifying competition and growing economic pressure. The good news is that the actions needed to address short-term economic conditions are also the best long-term measures to take advantage of the opportunities these challenges create.

For more information about the Center's unique perspective on these challenges, visit www.deloitte.com/centerforedge.
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