By the editors of **Internet Retailer**

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CLOUD NOW

5 reasons why retailers are turning to cloud technology today

Why the cloud now?

The answer to that question comes down to the convergence of two trends: the increasing complexity of retailing and the maturing of cloud-based services.

Retailers today have to serve consumers as they shop online, in stores, on smartphones and tablets, via social networks and through new channels opening up every day. For example, Facebook is now making it possible to sell through its popular Messenger service, and Amazon.com through its Alexa voice-activated home-shopping device. Pretty soon retailers will have to be able to communicate with refrigerators and cars that will be placing orders as the Internet of Things matures.

For a retailer to gather data from all these customer touchpoints, make them available throughout the company and connect to external data sources and sales channels becomes a daunting task. Technology and consumer preferences are moving too fast for many retailers to keep up.

That's making cloud technology increasingly attractive. What do we mean by "cloud"? Basically, the cloud is made up of computers connected to the Internet. That doesn't sound like a big deal. It wasn't until 2006 when Amazon Web Services started offering its cloud storage for rent to other companies. And pretty soon AWS was a big and profitable business.

Other technology companies noticed. Big companies, like Google, Microsoft, IBM and Oracle. And the race was on. Amazon remains in the lead in terms of revenue, according to a recent analysis by Forrester Research. But retailers may well also be among the winners, as they gain access to sophisticated technology that few, if any, could afford to build on their own.

In this report we'll give examples of some of the services retailers are taking advantage of. What it boils down to is that the cloud provides retailers and other organizations a centralized, secure location where they can store data and use it to analyze trends, craft offers and connect to consumer touchpoints of every description.

As we'll explain, a crucial component is the role of cloud providers in developing and maintaining links to data sources and sales channels—in the form of application programming interfaces, or APIs. Those cloud technology companies can afford to keep up with every change, whether it's a new sales feature on Pinterest or a technology advance in the Android mobile operating system. By working through these cloud providers a retailer can be shielded from the complexity of the constant advance of technology and focus on what it does best: selecting merchandise its customers will want and presenting it to them in an appealing way.

The advance of cloud technology has accelerated in recent years, as the big cloud providers have invested heavily in developing new systems and a growing number of companies have decided they can now put their faith in "public clouds," these Internet-based services open to all. Even a company as estimable as General Electric has declared its intent to move most of its applications to the public cloud, recognizing that operating a global computer network is not its core competency.

Nor is it for many retailers. All indications are they will increasingly take advantage of the impressive advances in cloud technology to get out of the IT business so they can focus on the considerable challenges of modern retailing.

Don Davis, editor in chief
Internet Retailer

‘Big Content’ wins the battle for online sales across channels

Shop Direct, a U.K.-based online retailer, faced a serious content challenge. The company, which operates multiple branded online stores, needed to deliver a premium shopping experience to its 1 million daily visitors across those stores. That’s no small feat for a retailer that carries more than 1,100 brands.

Shop Direct needed to keep existing content fresh, respond to new product releases and support ongoing promotions. And it needed to reuse content across stores with customized URLs for each of its brands.

Shop Direct is not alone. “With growing competition and more ways that consumers can engage, retailers must up their content game,” says James Brooke, CEO of Amplience, a content-as-a-service provider for digital content and media production. “Consumers use many devices to make purchase decisions online and in stores.”

According to Brooke, retailers spend countless hours managing diverse content across channels. Teams inside and outside the organization must manage various tools that are disconnected.

“It’s essential for retailers to provide rich content to create compelling omnichannel shopping experiences,” Brooke said. “Older content management systems and digital asset management technologies don’t scale, can’t integrate content with commerce, and can’t change quickly enough to keep up with sophisticated consumers.”

A single cloud-based platform—which can replace varied single-purpose systems that stymie innovation, collaboration and agile syndication—may be the answer. Retailers can streamline the path from content creation to deployment. Content presentation across devices and channels no longer needs significant customization, and adding new features no longer requires expensive design and development.

Brooke said e-retailers need a variety of content, including rich product media such as video, image zoom and 360-degree rotation, social media and guided selling, such as “recommended products,” as well as editorial and user-generated content. According to Brooke, it’s not easily accomplished with separate content systems.

“Over the past few years, customers’ purchase path has changed. It’s now a multi-touchpoint, omnichannel journey.” Brooke said. “A lack of content, commerce integration and fragmented systems results in poor content consistency across markets.”

For retailers, the opportunities are enormous. “Being able to improve the reach and quality of content through agile workflows and syndication can position retailers to compete well online and offline,” Brooke said.

Brooke said a single content platform makes it easier for retailers to improve the reach and quality of their content. It can also improve innovation. The economy of scale cloud-based systems afford make it easy for providers to deliver regular improvements.

“We release new capabilities to clients about every two weeks with no upgrade process required.” Brooke said. “This constant stream of innovation ensures that retailers can keep up with their customers.”

Shop Direct turned to the Amplience Big Content Cloud, a content-as-a-service platform for digital content and media production, to help it enhance its digital presence. This cloud-based platform enables the retailer to streamline workflows for flexible content creation and asset management across its stores. Brand managers control all digital assets, and they can manage images from one point across its branded stores with custom URLs that can improve search engine optimization.

“Since deploying [the tool], we’ve seen distinct improvements in speed and agility in content sharing across our brands,” says Sam Barton, head of user experience at Shop Direct.

The Amplience technology allows Shop Direct to create, manage and deploy features such as zoom, 360-degree rotation, and in-video purchasing. These features were labor-intensive and required extensive customization across devices with the retailer’s previous system.

“Tools and capabilities like these,” Brooke says, “are dramatically re-engineering the economics and quality of online merchandising and marketing content for global brands.”

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Amplience

5 reasons why retailers are turning to cloud technology

With so many sources of data, and so many ways to sell, increasingly retailers are concluding they can't do it all on-premise.

By Sandra Guy and Don Davis

Cloud technology gives Nike Inc. the flexibility to develop as many as 10 versions of a hot new shoe and keep sneakerheads—athletic footwear fanatics—updated on the latest release.

Online snack food brand NatureBox scaled up quickly by relying heavily on cloud-based systems, allowing it to sell more than $50 million online last year in just its third year of business.

Dutch men's suit e-retailer Suitsupply tripled sales through its customer service center in the past 12 months since implementing a system through the cloud that consolidates customer data onto a single screen so service representatives can respond quickly.

What is it about the cloud—the networks of computers, servers and databases that run retailers' websites, applications and services—that enables these innovations?

The simple answer is that cloud technology has developed rapidly over the past decade so that today it offers retailers and other organizations, small or large, access to sophisticated software and hardware that few companies would be able to buy, develop and maintain on their own. A retailer can leverage cloud-based resources with little more effort than a consumer flipping a switch as she walks into a room. There's massive investment and sophisticated technology behind that light switch, but the consumer doesn't have to know a thing about electricity generation or transmission to turn on the lights in her living room. It's almost that easy for retailers to access state-of-the-art systems through the cloud.

That's a big change. In the early days of e-commerce, an online retailer would have to buy its own web servers, license or develop software to run on those servers, integrate that technology with outside firms such as email service providers, and employ qualified IT personnel to keep all that working. Today, an e-retailer can rent website hardware and software from a cloud provider and use that infrastructure to run software it licenses or builds, or applications that software companies host themselves and that the retailer accesses via a web connection—a subset of cloud technology known as software as a service, or SaaS.

For a growing number of retailers, especially start-ups, it's an easy choice. "The reality is, if you're starting an e-commerce site today you'd be thinking about cloud-based from day one," says Guatam Gupta, CEO of online retailer NatureBox.

NatureBox relies on technology from the Amazon Web Services, an Amazon.com company, which is regarded as the leader among the growing number of big technology companies that offer so-called "public cloud" services. That means that any company can access the computing capacity, data storage and other servers that these companies offer, and that those resources are shared among clients. ("Private clouds" offer similar web-based services, but they're limited to a single client.) Forrester Research lists Amazon Web Services as the leading public cloud provider by revenue, followed by Microsoft Corp., Salesforce.com Inc., IBM Corp., Google Inc. and Oracle.

Many companies and other organizations, including the U.S. government, are turning to public cloud providers instead of maintaining their own hardware and software. The public cloud software market will grow at 18% per year to $113 billion by 2019, far faster than the projected 2.9% growth in on-premise software sales, says IDC, a technology research firm. Spending on public cloud services worldwide will grow 16.5% to $204 billion this year from $175 billion, predicts research firm Gartner.

A big reason for the shift is the growing complexity of doing business online as well as through traditional channels. "This strong growth continues to reflect a shift away from legacy IT services to cloud-based services, due to the increased trend of organizations pursuing a digital business strategy," says Sid Nag, a research director at Gartner.

The growing demand for cloud services has fueled an arms race among the leading providers—particularly, Amazon Web Services, Microsoft and Google. They have been dramatically lowering prices. "AWS has announced more than 51 price reductions since 2006 and other vendors have (lowered prices) to stay competitive," Forrester Research analysts wrote in a May 2016 report.

These big providers are also competing by adding new services that retailers can take advantage of. AWS, for example, introduced 722 new features in 2015 and 516 the year before.

Amazon—and its competitors—can afford to invest heavily in new cloud services because of the nature of the cloud business. Once a big company has built huge data centers and hired many IT staffers economies of scale kick in, and the business becomes very profitable once a provider covers its big fixed costs.

Amazon, which launched AWS in 2006 initially as a service that let clients store data on its servers, began breaking out the results of AWS in its quarterly earnings releases last year because of AWS's significant growth and expectations of future growth as a share of Amazon's revenue and profit. In its most recent quarter, for example, the AWS operating income of $604 million represented 57% of Amazon's total operating income of $1.071 billion.

While many companies just a few years ago were leery of trusting their data to cloud-based providers, increasingly IT executives realize that these big cloud companies have built systems that few other organizations can match. "People today understand how secure these things are," says Fred Bailey, chief information officer at Paper Source, a stationery retailer that sells both through stores and online. "They have economies of scale and dedicated resources. I'm not going to keep up to date like they would." That led Bailey, who joined Paper Source last year, to begin a project that will run into 2017 to move the retailer's business and e-commerce software to AWS.

Many other retailers are making a similar decision to move to the cloud. Here are five of the reasons why:

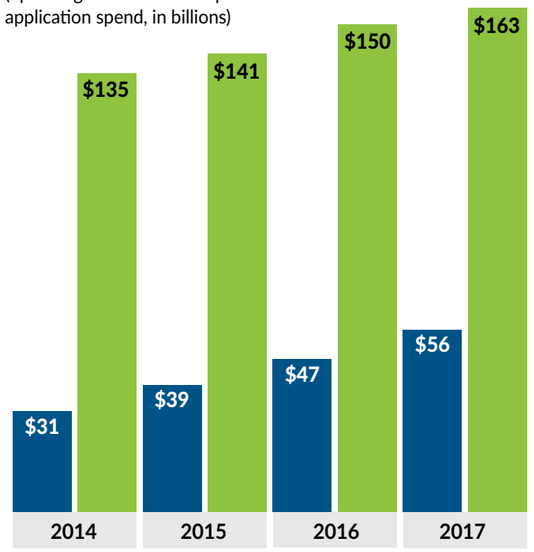
It makes it easier to focus on your business

Retailers explaining their decision to outsource e-commerce functions to cloud providers invariably emphasize that their core business is not technology: It's finding products consumers want and serving shoppers effectively.

"We're not technologists at heart but in today's environment, we have to leverage technology the

Cloud's growing share of U.S. business application spending

(Spending on cloud subscription fees and total application spend, in billions)



Source: Forrester Research Inc.

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Retailers can future-proof their business with cloud-based commerce technology

Kawasaki Motor Corp.—a successful motorcycle manufacturer and dealer—is committed to its customers. As a way to better serve existing customers and attract new ones, the company wanted to make it easier for them to buy and receive products online. But it needed more flexible retail technology to accomplish that.

"A lot of retailers made big investments in on-premise software years ago. Often they had invested in large data centers and IT departments to support extension and customizations to that technology," explains Jennifer Sherman, senior vice president, product and strategy, at Kibo, a provider of end-to-end commerce technology. "When those retailers don't understand how the cloud could really change things for them, they miss out on opportunities for growth."

Kawasaki recognized the advantages of a cloud-based platform. Through Kibo's software, the company gives its more than 25,000 monthly customers the option of having purchased Kawasaki accessories, apparel and gifts shipped directly to a local dealer or to a personal address.

"Consumer retail has evolved considerably in recent years. Online e-commerce dominates the marketplace, and is an integral part of today's business," says Holly Hagerman, Kawasaki Accessories marketing and sales manager. "The introduction of the e-commerce platform on Kawasaki.com allows the company to introduce customers to the dealers while also increasing customer satisfaction. "

According to Sherman, as consumer expectations rise, retailers must add services to meet those rising expectations—at least as fast as competitors do. "Retailers need software that can keep up with that pace of change, and they need to respond by adopting software at that pace of change," she says.

With on-premise e-commerce platforms, that task becomes exceptionally challenging, according to Sherman. "On-premise upgrades tend to be expensive, time-consuming and risky processes because—if that software is thoroughly integrated—it has the potential to bring down the entire IT ecosystem," she says. "Cloud allows retailers to essentially future-proof their business and know that they will always be on the leading edge of the retail technology offering."

Sherman points out two key benefits to cloud-based e-commerce technology. First, it offers a lower cost of ownership because retailers no longer have to manage data centers and support a large IT department to maintain on-premise systems. Second, as the retail industry continues to evolve, cloud technology allows for immediate upgrades to the most recent technology available to meet and exceed the demands of customers and keep up with rivals.

"That ability to remain relevant because you know that you'll always be offering the features that the leading retailers are going to offer is what's key to maintaining market share," Sherman says.

According to Sherman, there are three key attributes of a robust cloud-based retail technology package: an easy-to-upgrade e-commerce platform that gives a merchant the flexibility to offer personalized merchandizing and relevant content, an omnichannel order management system with robust back-end fulfillment capabilities, and a mobile point of sale platform that facilitates an exemplary in-store experience.

"All three products—which are incorporated into Kibo's software—are really about delivering consistent, best-in-class user experiences and leveraging all the data that we know about that consumer—and doing it quickly and easily," Sherman says.

Kawasaki's new cloud-based platform is already paying off. "One of the most compelling statistics in integrating the Kibo service was the amount of traffic that it brought to dealers," Hagerman says. "The ability to bring more customers into the dealerships is critical, as additional in-store purchases are made over 40% of the time."

Sherman says retailers need to be focused on the future of their business and setting in place the tools that will enable them to quickly adapt to the changing e-commerce landscape. "Retail is hard enough. There are no crystal balls," she says. "It will take agility and quick reflexes to determine what's really going to resonate with consumers."

best way possible. We're in the business of providing amazing digital experiences for our customers and selling products as a relevant brand," says Scott Lux, vice president of digital and e-commerce at U.K.-based menswear retailer John Varvatos, which operates 18 boutiques and relaunched its website on cloud technology in June 2014.

Two of its key cloud-based technologies are its e-commerce software from Demandware Inc. and digital content management software from Amplience. The retailer engaged systems integrator Media Hive to link the two systems so that the retailer could deliver an online experience that works seamlessly across all devices.

That allows John Varvatos to bring in images and other content from all kinds of sources, internal creative and from partners to consumers' posts on online social networks. "We can flow in content to the website in real time from our content sources, deliver a unified brand story and have it fully optimized across all of our channels quicker and less expensively than if we owned and ran our own software and servers," Lux says.

Gupta of NatureBox emphasizes that using well-established cloud services lets him and his colleagues concentrate on winning and retaining customers, not technology. "Being cloud-oriented allows us to focus our bandwidth and investments in the places that matter the most," he says. "That's mainly customer-facing technologies, things that allow us to scale the business faster rather than back-end operations that are necessary but don't contribute to revenue growth or scale the way a new feature on the website or product offering might."

NatureBox hasn't outsourced everything to the cloud: The e-retailer built its own e-commerce platform using Magento open source technology because, Gupta says, there was no off-the-shelf system that met the needs of a company developing its own line of healthy snacks.

But NatureBox hosts its Magento software in the cloud, on AWS, and also uses many other cloud-based services: seven from AWS and five from other cloud-based technology providers, such as Heap for analytics and New Relic for application monitoring. "We are a cloud shop as much as possible," Gupta says. "We try not to reinvent the wheel. If there is an existing software or service or architecture we try to take advantage of that."

Being cloud-oriented allows us to focus our bandwidth and investments in the places that matter the most."

—GUATAM GUPTA, Chief Executive Officer, NatureBox

Dollars and cents

For NatureBox, cloud services also made launching its business in early 2012 much less expensive than if the startup had to build its own data center, equip it with hardware, deploy and customize software and hire IT professionals to manage all that. Gupta estimates going with cloud providers was three to four times less expensive than it would have been to do all that on his own.

And, he says, he got state-of-the art technology from a big provider, in his case, Amazon Web Services. "The reason to use cloud for a company like us is to access enterprise-grade technology at startup costs and investment," he says.

What's more, cloud costs aren't fixed. Most cloud providers charge based on what a retailer uses. As NatureBox grew—the e-retailer's sales grew 30% in 2015 to $57.5 million—it's been able to add capacity from AWS and other cloud-based suppliers. But it didn't have to make an investment before it needed the capacity, as companies do when they buy their own servers.

"The amount of data storage and compute power we need has grown exponentially compared to three years ago," Gupta says. "To keep up with that growth in the on-premise world we would have had to make significant investments both in people and equipment. In the cloud we can scale as we need it instead of having to scale before we need it."

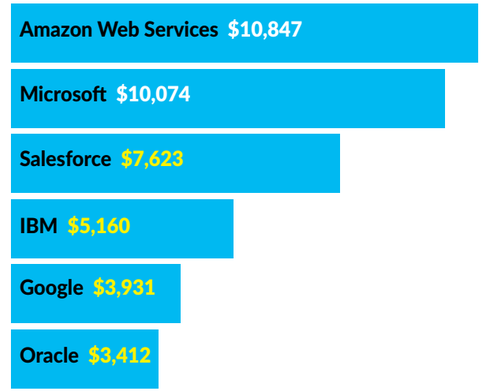
And cloud services typically reduce their price per minute or hour as a client uses more capacity. For example, Google's Google Cloud Platform automatically reduces a client's rate when it uses a resource for more than 25% of any month, according to a recent report on cloud pricing by Forrester Research analysts Dave Bartoletti and Sophia I. Vargas. "Discounts increase for every additional 25% of usage, resulting in 40%, 60% and 80% discounts off per-unit rates—so the more you use an instance within a month, the cheaper it gets," they write. Other major cloud providers also offer volume discounts, the Forrester analysts say, but not necessarily automatically the way Google does.

They offer one caution for IT executives used to budgeting for relatively predictable on-premise costs: It's harder to accurately predict cloud costs because they will vary with the resources a company uses during any period.

For Bailey of Paper Source it wasn't so much of the cloud being cheaper than on-premise, as his doubting the feasibility of his 5-person IT team deploying the kind of commerce platform he sought that would unify stores and the web. "What I would have to hire to maintain and update the hardware, the patching we would have to do, for a company our size it would be prohibitive, and I don't think it would be done as well," he says. Instead, Paper Source is working with cloud-based commerce technology provider Aptos Inc. to build a new platform on AWS.

Leading cloud vendors

(Projected 2016 revenue, in billions)



Source: Forrester Research Inc.

Capacity when you need it

A big advantage of cloud services is that companies the size of Amazon, Microsoft and Google have massive computing capacity, and their public clouds allow a retailer to quickly handle big spikes in web traffic during peak periods.

That's vital for Nike, as sneaker fanatics drive up web traffic by several orders of magnitude when Nike introduces a new version of a popular athletic shoe and they race to buy it, Wilf Russell, vice president of development at Nike's consumer technology unit, told an AWS developer conference last year. Using the AWS cloud, Nike doesn't have to maintain servers it doesn't need during slower periods, nor worry that a traffic spike will disrupt the online business, he said.

Nike uses AWS' Auto Scaling service in which a client projects anticipated traffic and the AWS cloud ensures the capacity is available, according to the AWS website.

AWS and Webscale, which specializes in deploying e-commerce applications in the cloud, helped GeekNet Inc. keep its website running smoothly when it hit over 3,500 checkouts in an hour during its biggest promotion of 2015—a custom, limited-edition video game controller, says Anthony Salinas, senior director of operations and development for the web-only retailer of gadgets and clothing aimed at videogame and computer enthusiasts. The retailer, whose main e-commerce site is ThinkGeek.com, was acquired last year by GameStop Corp., a retailer of video and computer games.

"We sold out within 15 minutes after hitting a peak of 10 checkouts per second. That's 600 orders a minute," Salinas says. "We didn't expect it to sell out that quickly. You don't always know what's going to be a hit. It was a huge hit in this case."

GeekNet moved to AWS two and a half years ago with the help of Webscale. Webscale reacted to the volume surge by adding enough server capacity to handle the volume without the site slowing down, Salinas says. "Webscale has automated the process so we just request new servers, and it spins up servers and copies all application files across servers," Salinas says. "The auto-scaling and simplicity of syncing a

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Warehouse management in the cloud pours out benefits for a wine retailer

Effective warehouse management and fulfillment are crucial for online retailers, as filling an order correctly and promptly could mean the difference between a satisfied customer and a lost one. And this challenge is exacerbated for retailers working with older, legacy systems that can't keep up with evolving consumer demand or work well with emerging technology.

Historically, warehouse management systems (WMS) have been notorious for being slow to implement and requiring enormous amounts of time and resources to manage—not to mention expensive to deploy and maintain. But cloud-based technology is changing all that, according to Chris Anton, executive vice president, head of business development and sales operations for North America at Snapfulfil, a cloud WMS software provider. And that's good news for retailers that want state-of-the-art warehouse software that is fast and inexpensive.

"Many retailers assume implementing a new WMS today means extensive resources, time and money," Anton says. "But with cloud-based technology, companies can deploy a new, more efficient and effective WMS in a fraction of the time and at a fraction of the cost of traditional WMS solutions—and they won't need massive internal resources to do it."

Club W, which recently changed its name to Winc, is one example of a retailer that moved from legacy warehouse technology to capitalize on the efficiency a cloud-based system. For years, the online wine retailer had been using a paper-based WMS. As the company grew, that older system couldn't handle order demands—leading to high levels of inaccuracy in both inventory and fulfillment operations, as well as backups in its distribution center.

According to Kjiel Carlson, Winc's vice president of operations, the company wanted a cloud-based, software-as-a-service WMS that was inexpensive and allowed for real-time management of everything from inventory to order fulfillment. And it wanted to work with an established WMS provider it could trust. Club W turned to Snapfulfil.

"We needed a leader in the WMS solution space to drive our fulfillment operations for the future," Carlson says. "We needed a partner and not just a vendor to help guide our business with best practices and recommendations for improving our operational processes, supported by a best-of-breed, tier 1 WMS which can scale to meet our projected growth. Snapfulfil is not a vendor of ours—they're a partner and that's the best way I can sum it up."

After implementing the cloud WMS in 2014, Winc has grown by 800%. Additionally, cost per order has reduced by 5 cents and error rates have dropped by 5%. And because of the efficiencies it has achieved with the new WMS, the company estimates it has saved about $150,000.

Anton emphasizes two main advantages to a cloud-based WMS, as opposed to one installed on-premise and maintained by the retailer. First, it's quick to implement. "Where traditional WMS solutions can take months to more than a year to implement, a cloud-based WMS can take as little as 30 to 45 days," he explains.

Second, retailers don't require an internal IT team to keep it up and running. "We work with a lot of small companies and they don't have resources to allocate toward temporary or permanent IT positions within their operation," Anton says. "Being able to deploy a cloud-based WMS solution very quickly and cost effectively that doesn't require a dedicated IT team is a huge win."

According to Anton, regardless of a retailer's size, a cost-effective WMS is within reach. "An inexpensive turnkey WMS solution—that doesn't require the typical overhead—that will enable retailers to not only scale their operations efficiently, but also help them grow, is available now," he says.

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complex e-commerce application across servers is a massive time-saver."

"With the cloud service, we are able to run more application servers that cost less than dedicated hardware," he says. "Before, we had one really expensive server running all our web stores—a single point of failure. We are now able to get more through-put for the e-commerce store and use cost-effective hardware more intelligently."

> *"AWS was a super on-ramp for us. It gives us a ridiculous amount of flexibility."*
>
> —JOSH BYRD, Manager of Data Architecture & Operations, GoPro

"On a slow day, we might need one to two servers, not 10 to 15," he says. "That's the flexibility we need to run our business efficiently, knowing we have the capacity for a big promotion that is planned or even unplanned. It doesn't cost much money to add more servers for a promotion, when you consider the downside of degradation in site performance or even a crash." Salinas declined to estimate his cost savings.

It's not just promotions that can cause a strain on a retailer's data center. Jobs that require crunching a lot of data can also outstrip the capacity of on-premise servers. GoPro Inc. faced that problem in the last two years as it built a team of data scientists to better understand and sell to the consumers who use its cameras designed for recording pictures and video while engaged in sports like skiing and surfing.

GoPro worked with Cloudera, which specializes in Hadoop technology for analyzing large datasets, to use Cloudera's platform on AWS. Despite its name Cloudera is not itself a cloud-based system—it can be deployed on-premise or in the cloud—but in the last few years a growing number of clients are choosing the cloud option, says David Tishgart, director of product marketing at Cloudera.

GoPro uses the Cloudera/AWS system when it needs to analyze a large amount of data. For example, the company wanted to understand the kind of customers that would share their pictures or videos on social media. Do they own one or more cameras? Do they take long or short videos? Use high or low-resolution? Understanding that is important because when other consumers see that footage "they get excited and are more likely to buy cameras themselves," says Josh Byrd, manager of data architecture and operations at GoPro.

That kind of analysis required pulling in data from disparate sources and lots of computing power, he says. He knows from prior experience with on-premise data centers that it's easy to underestimate the resources needed for a big job, and that often jobs like that get delayed because other teams need the same IT resources. "AWS was a super on-ramp for us," he says. "It gives us a ridiculous amount of flexibility."

A cloud-based Hadoop deployment is ideal for jobs like this that require a lot of resources for a short period of time, perhaps a few hours, Tishgart says. Another advantage of the cloud in such Big Data projects is that the retailer or brand does not have to limit the amount of data it analyzes because of constraints on computing resources. "You don't have to just look at the last six months of data, or one or two years, you can go back eight or nine years, or as long as necessary," he says. The virtually unlimited computing resources of major cloud providers can process jobs that few retailer's data centers can handle.

Tishgart notes another advantage of cloud providers: They often have data centers around the world, including in regions like the European Union or Russia that have strict rules about the handling of data about their citizens. While some major international cloud providers may comply with those data-handling rules, there are also local cloud providers that retailers can engage to ensure they don't violate local law. "We see a lot of smaller cloud providers popping up in the EU," he says. "They don't go out of the region. In some cases they just service one country."

Take advantage of the latest technology

Because of the fierce competition among cloud providers they keep adding to their cloud-based services, and that enables retailers to access cutting-edge technology they could never afford to build themselves.

One recent example is a service called GWYN introduced in April 2016 by 1-800-Flowers.com Inc., which allows a consumer seeking a gift from one of the retailer's nine gift-oriented brands to get advice from software based on the IBM Watson artificial intelligence technology. The tool asks a shopper some questions, such as the occasion, product preferences and delivery location and GWYN returns results, with each one flagged by how well Watson believes it meets the criteria. The consumer can keep going back and forth until she is satisfied with a recommendation.

Chris McCann, CEO of 1-800-Flowers, call this conversational commerce, in which a website begins to mimic the kind of exchange a shopper might have with a store employee. "This is a combination of where the consumer is and where the technology is going," McCann says.

The GWYN system uses digital design agency Fluid Inc.'s cloud-based Expert Personal Shopper software, which connects with Watson through the IBM cloud. Being able to pay for just the Watson resources it needs makes it possible for a relatively small software company like Fluid to build an application like GWYN, says Fluid president Neil Patil.

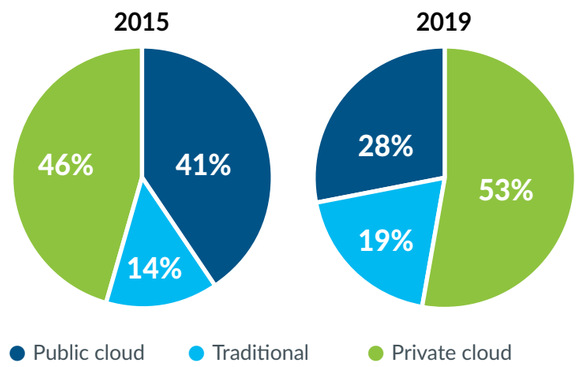
"If I had to buy their supercomputers and the entire set of code from Watson I couldn't afford it," Patil says. "It would cost tens of millions in capital just to get the infrastructure to develop on Watson."

Another example of a new service from a big cloud provider is Microsoft's Cortana Intelligence Suite, which lets companies feed in data from a variety of Cloud and on premise sources, and then generate insights by using data science models to make sense out of the vast amounts of Internet of Things data being shared by shoppers from their mobile devices and captured by inventory systems like RFID sensors. The huge streams of IoT data can be used to take immediate actions such as presenting personalized offers to customers on their mobile devices while they shop in stores, much the way "born in the cloud" retailers do online. Introduced in July 2015, Cortana Intelligence Suite and Azure IoT Suite are available for a monthly subscription fee. Microsoft would not disclose the fee, but says some parts of the Cortana suite are available for a free trial.

Orckestra, which developed a software layer to run on the Microsoft Azure cloud so that client companies can connect disparate systems to cloud-based resources, employed Cortana for an unnamed grocery retailer to build an online product recommendation application. The system took in information about the customer's history, product attributes and other data. After 18,000 website visits in one month the tool increased the average basket size by 14% for consumers who saw recommendations versus those that did not and consumers who saw recommendations came back 14% more often than those that did not, Orckestra says.

Cortana applies machine learning to make the recommendations increasingly accurate as time goes by, and that illustrates the advantage of using technology provided by a big cloud company like Microsoft, says Gary Guy, chief marketing officer at Montreal-based Orckestra and managing director for the U.S. Instead of having to create and maintain a new interface with another firm that employs machine learning to make product recommendations Orckestra can leverage its interface with Microsoft Azure to take advantage of the Cortana technology, he says.

More of the work migrates to public clouds



Source: Cisco Global Cloud Index, October 2015

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Cloud-based platforms move beyond the limits of SaaS applications

Elaine Turner, a small luxury fashion design brand, was dealing with growing pains, and its e-commerce platform wasn't able to adequately respond to its needs.

"We had a very stale environment," says Carrie Leader, director of e-commerce at Elaine Turner. "The [e-commerce platform vendor] wasn't coming out with new versions of the product. There were a lot of feature and functionality limitations."

It's a common problem, according to Katrina Gosek, director of product strategy at Oracle. "Smaller retailers don't have the in-house resources to customize their e-commerce platforms. They try to piece together various SaaS solutions to take advantage of the growth in e-commerce."

According to Gosek, cloud-based e-commerce platforms are maturing in ways that provide the flexibility necessary to help most retailers take advantage of growth. "The common thread is that retailers' existing platforms are either cost-prohibitive or feature-prohibitive to continue that growth," she says.

According to Gosek, studies show retailers have to invest a lot when they develop software applications in-house. These costs include license fees, support, maintenance, hosting, and IT resources—mainly scarce IT talent—required to update applications and execute new projects.

"Many SaaS solutions only provide pieces of retailers' overall e-commerce platform needs," Gosek says. "The lack of integration between those pieces is an obstacle to growth."

Additionally, many older cloud-based e-commerce platforms didn't have the flexibility to allow retailers to extensively customize their storefronts, resulting in "cookie-cutter sites," she says.

But cloud-based, e-commerce platforms are coming onto the market that may help retailers that struggle with platform-based growing pains. These platforms not only provide SaaS-style, cloud-based applications, but also provide the connectivity that allows retailers to easily send and receive data from legacy systems and external sources.

"Oracle Cloud Platform as a Service (PaaS) helps enterprise IT and independent software developers rapidly build and deploy rich applications—or extend Oracle Cloud SaaS apps," Gosek says.

"You can customize the storefront to your heart's desire."

Elaine Turner took advantage of that flexibility when it moved to Oracle's Commerce Cloud in fall 2015. "Oracle has helped us integrate all of our systems." Leader says. "[Oracle Commerce Cloud] allowed us to automate our processes. And that's a really big deal because information is now flowing through automatically from when a customer places an order to going through our order management system and then out to our warehouse."

According to Leader, Oracle Commerce Cloud now connects Elaine Turner's order management system with data from its bricks-and-mortar stores, allowing online customers to see if an item is available at a nearby store.

Leader also says the platform lets her team customize the brand's e-commerce site, ElaineTurner.com, so that it doesn't look just like competing fashion sites.

Since moving to Oracle Commerce Cloud, Elaine Turner has seen a 60% increase in web traffic, a 40% jump in online engagement, and 45% higher order volume year over year.

According to Gosek, Oracle Commerce Cloud allows businesses to take advantage of Oracle's applications, as well as connect to external and legacy systems, to let retailers mix-and-match the software they choose.

"Typical e-commerce deployments have anywhere between 10 and 50 integrations," Gosek explains. "Platforms that let retailers integrate on-premise, cloud and third-party solutions are very important. We try to match the customer's strategy for technology, whatever that may be, to make it easy to buy deploy, and use the capabilities they want."

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Data flows wherever it needs to go

One of the biggest reasons retailers are moving to the cloud is to effectively serve consumers in a world in which they shop so many ways.

When a retailer only operated bricks-and-mortar stores, even if it had a lot of them, it was not that complicated to create a single system to store all data about the inventory available in the stores and customer activity. When the web came along it forced retailers to create a second system for web transactions, and, as e-commerce grew, to marry that with store data. More complex, but doable.

But today retailers have to be able to engage consumers in so many ways. They have to be able to keep track of consumer activity on social media, not only what they say but the growing number of ways shoppers can purchase directly from social networks like Facebook and Pinterest. Merchants must track contact center, live chat and email interactions. And they have to be able to engage consumers effectively through whatever web-connected device the shopper is using, whether that's a PC, mobile phone, tablet, gaming console, even a device like Amazon's Alexa that lets a consumer make a purchase by saying what she wants to buy.

Retailers and other organizations enable data to flow between applications and touchpoints with a technology called application programming interfaces, or APIs, which are simply agreed-on ways to exchange data between two systems. But while an API itself may not be complex, maintaining it can be a chore because the applications on either end of an API may be constantly changing. For example, if Facebook changes the way a retailer can promote a product through its Messenger instant-messaging service, the API likely will have to be updated. And with all the touchpoints to manage, managing APIs can become a major burden.

That's where the cloud comes in. When a technology vendor maintains the APIs the retailer only needs to maintain its link to the vendor's cloud-based service. Orckestra, for example, maintains a layer of software that runs on the Microsoft Azure cloud and leverages the connections Microsoft builds with emerging sales channels, such as Facebook Messenger. "As a Microsoft partner we'll stay current with all the available technologies, hence our clients will stay current with their advances," says Guy, the Orckestra chief marketing officer.

Fluid plays a similar role for its clients, says Patil, the company's president. 1-800-Flowers, for example, was among the first to sell through the Facebook Messenger when Facebook announced in April 2016 it would allow retailers and brands to create chat bots to take orders and handle customer service inquiries via Messenger. In fact, Facebook CEO used the online flower retailer as an example to illustrate how a consumer could place an order through Messenger. As Zuckerberg put it in a presentation to Facebook's annual F8 developer conference, "To orders from 1-800-Flowers, you never have to call 1-800-Flowers again."

And later that same month 1-800-Flowers became among the first retailers to leverage Amazon's Alexa voice-recognition device as a sales channel. To order, all a shopper needs to say is, ""Alexa, tell 1-800-Flowers I want to send flowers to Lindsey on May 28th,"

For this to work, a retailer like 1-800-Flowers has to have a communication channel—an API—to Alexa or to Facebook Messenger so that it can make its product catalog available and receive orders. A retailer doing this work on-premise could easily fall behind in keeping up every API, given the pace at which potential partners introduce new features.

But, Patil says, a vendor like Fluid that serves many retailer clients can afford to keep its cloud-based APIs up to date, ensuring that retailer clients can connect to Messenger, Alexa and whatever comes next.

"A vendor that's in the cloud like Fluid, we're always updating our software. It's one codebase and it's always up to date," Patil says. "Whether a retailer uses all the features or not, that's fine. But as soon as they want a feature they can turn it on. They don't have to check whether an integration with Facebook is going to work. We make sure the APIs are always going to work. The ability for a retailer to quickly and easily get new features to consumers, that's the benefit of this combination of cloud and APIs."

Making a similar argument is Jennifer Sherman, senior vice president of product and strategy at Kibo, the company that resulted from the merger of retail e-commerce vendors Shopatron, MarketLive and FiveRun. "As Kibo software is natively built for the cloud, customers are always on the latest version at no additional cost to them," Sherman says. "The customer never has to do a return-on-investment analysis to see if it's worth upgrading to the latest functionality."

For Locally.com, a website that informs consumers where they can get products they want at local retailers, cloud-based Shotfarm provides a surefire way to obtain product images from 2,500 manufacturers. Shotfarm maintains the connections to the brands, and Locally.com only needs to connect to Shotfarm to obtain the images it needs.

Other retailers say they have been able to get a comprehensive views of customers by moving data from disparate internal systems to a single cloud-based vendor, as Dutch menswear retailer Suitsupply did by migrating to Salesforce's Service Cloud. The retailer of fashionable men's suits operates 63 stores in 15 countries, including 18 in the United States, and generates 30% of its sales online.

Having a customer's complete shopping history makes a big difference when consumers call for services, says marketing director Martijn van der Zee, who oversaw the move to Salesforce in 2015. "Before the cloud transition, we had only a telephone number for a customer. Now, the customer service representative can say, 'Oh, I saw you bought something in Miami but you live in NewYork,'" van der Zee says.

"If a customer calls or sends us a message asking to be reminded of a particular suit he was looking at, our customer service representatives can instantly say, 'That was the Sienna,' or, if it's a question about suit size, we can tell the customer it was a size 50 and that it differs than the same size from Armani," van der Zee says. "We don't have to ask stupid questions like, 'Are you a new customer?' People really appreciate it."

Providers of cloud services foresee many more ways retailers will be able to deliver highly targeted offers by tying together many sources of data.

For example, a retailer using a public cloud such as Microsoft's Azure could pull data from in-store beacons that interact with customers' smartphones, internal databases that store customers' preferences and buying histories, and mash that together with data available from the U.S. Census Bureau as well as weather conditions, ZIP code demographics, Bing and Google search data and social-media postings, says Brendan O'Meara, global business lead for Microsoft Corp.'s retail and consumer goods businesses.

> *"The ability for a retailer to quickly and easily get new features to consumers, that's the benefit of this combination of cloud and APIs."*
>
> —NEIL PATIL, President, Fluid

McDonald's Corp., for example, would be able to see that a customer who has downloaded the fast-food giant's app to his smartphone has arrived 20 minutes later than normal at his usual train stop, he says. "McDonald's can start to get intelligent and say, 'Hey, you're probably running late for work. It's raining. I'll offer you through the app a high-margin product—the yogurt cup with fruit—as breakfast on the run.'"

As another example, he says, a retailer could stream data from stores and websites to a cloud-based analytics system programmed with expected sales targets for seasonal items. If sales are slower than expected and the end of season is approaching the system could signal both stores and web properties when to lower prices to avoid carrying over excess inventory.

There are so many data sources that could impact retail sales that few retailers have the in-house resources to maintain relations with all of them. Merchants that rely on cloud-based providers to maintain the connections and computing capacity will be able to focus on using the rich, up-to-the-second data cloud systems can provide to craft offers so perfectly targeted that consumers, like the late-arriving commuter getting the McDonald's offer, may well wonder, "How did they know I wanted that right now?" ●