CLOUD FORM

CLOUD COMPUTING AND THE FUTURE OF RETAIL

by **Martin** Vilaboy

Partly because of the inherent complexities and partly due to overzealous marketing, any discussion of "the cloud" should probably start with a clarification of what exactly "cloud computing" means to technology decision makers. Some have said the cloud is simply a euphemism for the Internet. Others argue that it's really nothing new but rather just a return to "centralized" versus "distributed" computing, made accessible now by the ubiquity of high-speed data networks.

As much truth as there may or may not be in these oversimplifications, neither should be used as an excuse to disregard the importance of what the cloud is and can do, particularly when it comes to the retail business. As it turns out, many of the benefits wrought by moving IT components to the cloud directly address the daunting challenges and macro trends facing retail IT departments today. In fact, it's even possible that the retail segment, at least in the short term, has more to gain from the cloud trend currently sweeping the IT world than most any other industry vertical. Indeed, many retail analysts and experts believe that a transition to the cloud could prove necessary to individual retailer's survival long term.

Getting back to the beginning, The National Institute of Standards and Technology, for its part, defines cloud computing as, "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

NIST's definition may or may not clear things up. If not, most specialty retailers can think of cloud computing as a model by which computing and IT services and capabilities can be accessed anywhere, on any device, through the Internet. That differs from the traditional IT delivery model, whereby hardware, such as servers and storage devices, as well as software purchased through a license, would reside at the physical location at which they are being used. In the cloud, on the other hand, equipment and business applications are housed on servers in large data centers where a paid or "for-free" provider hosts

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and manages the solutions, as well as the user's experience with them. Cloud services ranging from raw infrastructure to complete business processes (email, accounting, CRM, scheduling, forecasting, as examples) are purchased and accessed through Web interfaces.

That might sound a lot like how we've come to know and use the Internet, you might say. In many ways, this is precisely how routed networks based on Internet protocol (IP) work, and the pervasiveness of high-speed access is largely what makes cloud computing so powerful. But before you start cringing over the idea of placing your customer data or communications services on the wild and open Internet, it's first important to have an understanding of the differences between the "public cloud" and a "private cloud."

According to executives at IBM, the infrastructure in a public cloud is owned and managed by an organization selling cloud services and is made available to the general public. In this model, computing capabilities typically are accessed by multiple subscribing clients on a flexible, pay-per-use basis.

Most people associate the public cloud with "community-based" offerings accessed over the public Internet, such as Google Apps, explains Joe Corvaia, vice president of solution engineering at cloud services provider Broadview Networks.

The infrastructure in a private cloud, on the other hand, is operated solely for a particular user organization. This organization can either own the private cloud or engage a third-party provider to host and manage it – either on site or off. A private cloud provides restricted access to the computing capabilities and resources to be shared only by employees or external partners, such as distributors and manufacturers.

Most retailer deployments up to this point, suggest findings from Accenture, involve either a private cloud or some type of "hybrid model," the managed combination of both private and public clouds.

"So, for example, low level data and access may well be suitable to go onto a public cloud infrastructure service with simple password access, whereas ultra secure data may require dedicated secure servers housed in ultra-secure data centers with strong authentication required for access," explain Accenture analysts.

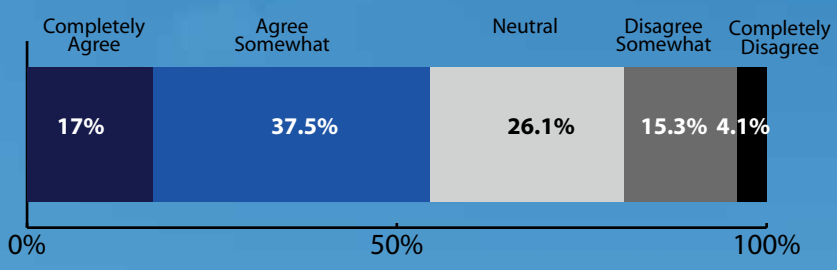
Cloud computing also differs somewhat from the purely "centralized computing" model in that pieces and parts of an application and its associated data can reside anywhere, explain analysts at Retail Systems Research, with the user having no knowledge or concern of where any individual piece resides.

"This is different than a simple hosted application accessed remotely," says RSR. "Parts could well reside on a local device. It's completely location agnostic."

CUT AND PASTE

The primary promises of the cloud include enhanced flexibility and speed at significantly lower costs, and few vertical markets need to drive such advantages out of their IT infrastructures during the next several years more than retail/wholesale.

The shopper is better connected to consumer information than store associates.
(Percentage of responding retail employees)



Source: Motorola Solutions

For starters, the retail industry doesn't like to spend a lot on technology. Retail IT operating budgets, as a percentage of revenue, are typically among the lowest of all the major industries, and we don't expect that many retail CFOs are anxious to shake this dubious distinction. By moving IT resources to the cloud, retail IT departments can

continue to do more with less by all but eliminating the cost of servers, software licenses, maintenance fees, IT labor and data center space and the electricity to power and cool them. IT cloud solutions, rather, can be purchased on-demand, only as needed, replacing large upfront investments with a monthly recurring cost or a pay-per-use operating expense.

"The no-obligation, month-to-month subscription allows retailers to fine tune their IT spend," says Jim Safran, president of GreenAppX, a Charlotte, N.C.-based reseller of cloud-based communications and business services.

And replacing opex for capex is just the beginning. According to one IBM study, 70 percent of retail IT budgets, on average, is spent maintaining current infrastructures, with annual operational costs (such as power, cooling and management) of distributed systems and networking often exceeding double their acquisition costs. What's more, these costs continue to increase.

In the cloud computing model, however, the management, maintenance, housing of equipment, software updates and system upgrades all are handled by the cloud provider as part of the service at a flat or per-use fee. In addition to eliminating variable support cost, this also allows the retailer to focus on its core business while maintaining minimal in-house staff and expertise.

Then there's the issue of utilization. Studies by IBM suggest that utilization rates of commodity servers, for example, hover around 5 percent to 15 percent. In other words, "as much as 85 percent of retail computing capacity sits idle in distributed environments," argues Vish Ganapathy, solutions architect for the retail industry at IBM.

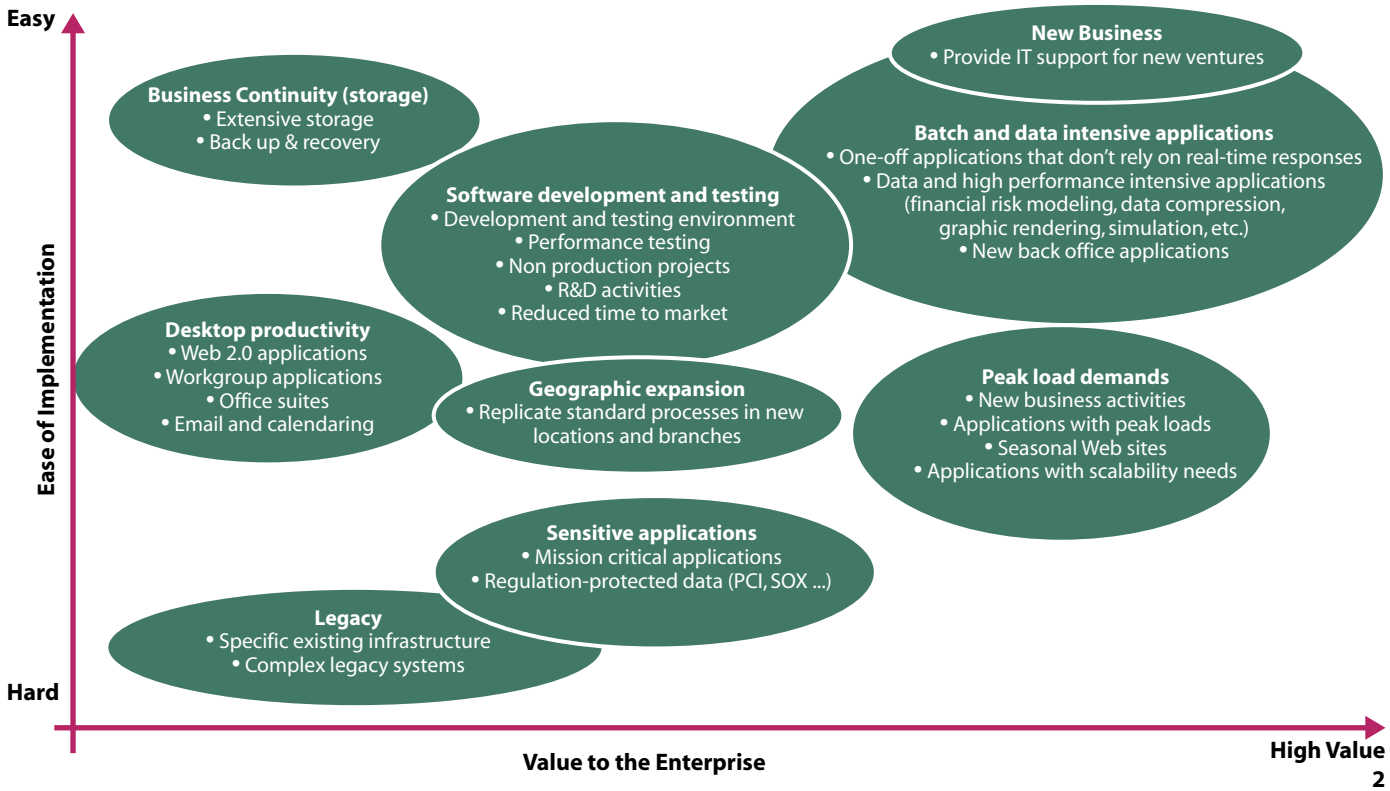
This is one area in particular that retailers are attacking early on through a cloud strategy, says Don Douglas, president and CEO of Liquid Networx, a San Antonio, Texas-based provider of network managed services and IT lifecycle management.

"We see retailers using the cloud to minimize footprint at remote locations, which reduces costs, provides flexibility, speeds advances to market and usually enhances security," says Douglas.

"These benefits can be achieved fairly quickly by implementing a private cloud that is supported at headquarters and by having the different locations utilize those resources."

As Douglas suggests, arguably as important as the IT cost savings are the elements of "speed" and "flexibility." While retail is not the first and only industry to feel the disruption of the digital revolution, few verticals face the types of transformational shifts that retailers face in terms of changing consumer behaviors and expectations. From smartphone-enabled shoppers, mobile wallets and geo-location campaigns to Groupon and social networking to QR codes and RFID to localized assortments and personalized promotions, the move online has come to represent lots more than a new sales channel. Indeed, a pervasive Internet and its "anytime, anywhere, any device" digital technologies have ramped up the level of competition for everyone, subsequently squeezing margins and forcing retailers to re-evaluate every aspect of their businesses. Success moving forward, at least

Initial Opportunities for Using the Cloud



Source: Accenture Technology Labs

as far as any trend- or fashion-based retail goes, likely will require shorter cycle times, more specialized inventory, tighter supply chain integration, faster and more effective execution of sales and marketing and more efficient resource planning.

"Business conditions and cycles have sped up dramatically," warn analysts at Retail Systems Research, "the consumer is stunningly technologically savvy, and business departments, most especially marketing, must respond."

"In general, total disclosure is available to anyone, anywhere from any device," says Safran. "Retailers need to use the same tools that the smart consumers use to improve infrastructure, delivery and support of their products."

Unfortunately, the IT infrastructures of most outdoor stores, and across the greater specialty retail market, simply aren't ready to take advantage of the opportunities, and those that aren't will find it increasingly difficult to compete in the consumer driven reality of omni-channel commerce and fulfillment.

"IT can no longer dictate the pace," say RSR researchers, "and so it has no choice but to move faster."

When asked to name the impediments to improving IT effectiveness, retail IT decision makers repeatedly cite slow and outdated infrastructures that aren't able to keep up with consumer capabilities and emerging business needs, show surveys by RSR. The top technical inhibitor is ongoing maintenance of legacy infrastructures, named among the top three by 64 percent of respondents. Retail IT directors also say they must spend less time on "catch up" investments, more time differentiating with IT-enabled capabilities and need more speed to shorten the lead time to customer demand fulfillment.

"We see retailers constantly exploring new business models and adding new capabilities to their application portfolios, which in turn increases the complexity of IT infrastructure and volume of data and demands more computing power," says Ganapathy. But through the efficiencies of shared resources, automation, on-demand scalability and by leaving the development, service delivering and maintenance of solutions to the IT and communications experts, "cloud computing can reduce the IT costs of managing existing and new systems," he continues.

Components of the Cloud

Although cloud computing is still an emerging model with many of the rules yet to be written, the general consensus within the IT industry is that there are three primary categories of cloud services. Below we provide a brief description of each one and how retailers can benefit from each, courtesy of IBM.

SOFTWARE AS A SERVICE

Software as a service (SaaS) is the distribution of software hosted by a provider in a central and remote location and made available to consumers over a network. SaaS uses a pay-as-you-go pricing model, which decreases or increases the number of software licenses based on need, without having to procure, install or maintain software or hardware or incur ongoing maintenance costs. When retailers use the SaaS delivery model, they can access business applications, such as accounts payable and customer loyalty, virtually.

PLATFORM AS A SERVICE

With platform as a service (PaaS), the complete application development and deployment platform (both hardware and software) can be delivered as a service, typically over the Internet. Developers can create, test, deploy and host applications quickly without having to bear the cost and complexity of buying and managing the underlying software and hardware. PaaS is often referred to as "cloudware." In some cases, Web services, Web 2.0 capabilities and middleware are offered as an integrated platform on which applications can be built, assembled and run.

INFRASTRUCTURE AS A SERVICE

Infrastructure as a service (IaaS) provides hardware components such as servers, network equipment, memory, CPUs and disk space. With IaaS, a retailer could run all operations without installing and maintaining in-house data centers. The approach to the delivery of these services varies from provider to provider.

"Cloud computing opens the door to new capabilities including new business processes and new application solutions that are retail industry specific at a price point that is remarkably lower than traditional solutions implemented only one to two years ago," Accenture analysts concur.

Whereas the development or expansion of services and applications traditionally required large upfront investments in hardware and in-house expertise, cloud customers can purchase only what they need and pay only while they need it. A company can utilize a dozen servers on Monday and a hundred on Tuesday, for example, or take advantage of a cloud provider's free or low-cost development tools. Capabilities such as scenario modeling, forecasting, pricing optimization and real-time inventory management – which tend to be "lumpy," time-consuming and data-intensive processes – therefore can be done more quickly and cost-effectively, say cloud proponents. At the same time, software solutions that are bought on a pay-per-use basis can be quickly and easily integrated into existing IP platforms.

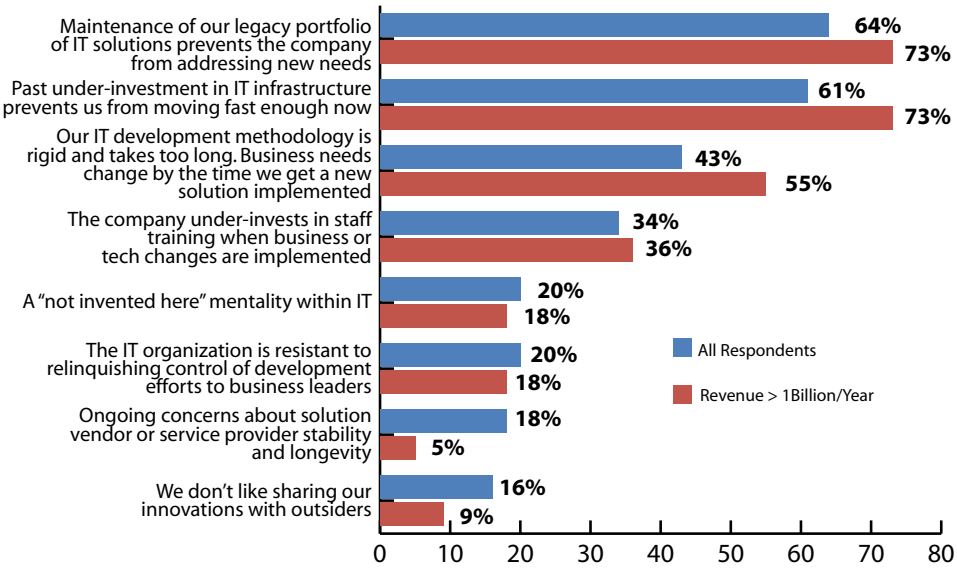
"A wide variety of business applications, with unified sales, support, transaction and provisioning, can be accessed under one secure single login," says Safran. "From this Web-based dashboard, a small business can order product, initiate a support ticket, collaborate with colleagues, lock down and protect all of their computers, back up critical data, and even manage their customer relationships all from the cloud. That type of tight technology integration ultimately increases efficiency, reduces redundancy and lowers the cost of sales."

"Think about the Y2K conundrum and how much work businesses had to do to update their systems," says Douglas. "If those businesses were properly utilizing the cloud at that time, the scope of their projects could have been significantly reduced to the point that it may have been just a service migration project."

One area where the cloud is particularly efficient is in the handling of data. Every retailer knows that POS systems and loyalty programs generate massive volumes of customer data, and the management of that data, currently vastly underutilized, will be increasingly crucial to delivering personalized service. Of course, real-time and actionable analyses of customer data can require lots of time and huge capital and operating expenditures, often unaffordable to retailers.

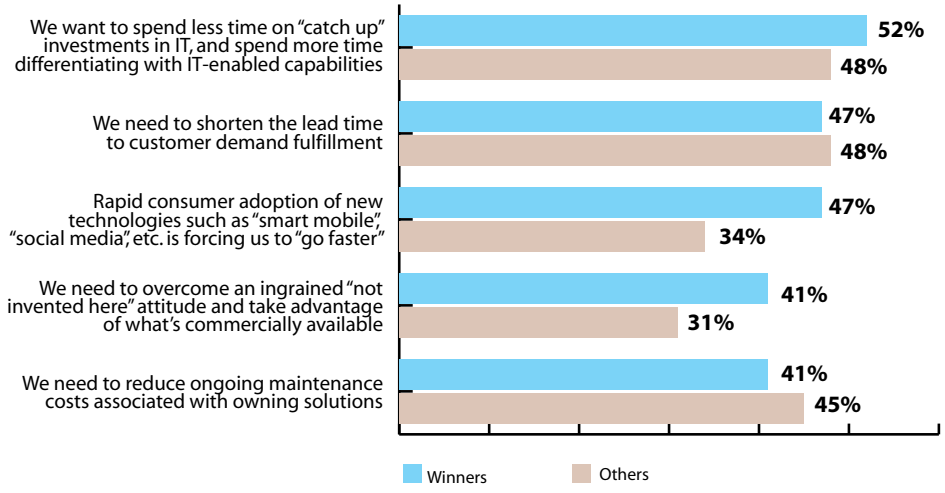
Cloud providers, on the other hand, possess the massive computational power and statistical modeling tools that make it more timely and affordable to capture and utilize customer data. Many retail-specific cloud providers also will have the ability to track performance of products and brands in comparison to previous time periods, identify trends and seasonality components, monitor performance and provide analytical results to the retailer, improving their ability to forecast customer behavior. And since the data is centralized and accessible by the ubiquitous Internet, data can

Top Three Technical Inhibitors to Improving IT Effectiveness and Responsiveness



Source: RSR Research

How much do each of the following factors influence how your company's technology portfolio will change?



Source: RSR Research

be more easily shared among internal departments, as well as external partners and suppliers, thereby improving inventory management.

Meanwhile, cloud computing helps retailer better manage the peaks and valleys of seasonal and unexpected demand.

"In a typical IT environment, retailers need to scale fixed datacenter resources in advance of demand spikes," says Fred Bentfeld, general manager of U.S. distribution and services sector at Microsoft. "This leads to wasted capacity and increased costs."

Even worse, it can mean an under supply. But by taking advantage of cloud computing, retailers can dynamically adjust to the very dynamic nature of demand, says Bentfeld. "Retailers only have to pay for the level of service they need, without the costs of unused capacity or under-supply of capacity."

Likewise, emerging technology platforms such as social media, e-commerce engines, search optimization and mobility solutions already exist "in the cloud," so this emerging IT model "can enable a retailer to engage with its customers in unique and novel ways without the level of capital investment typically required to build and support a new channel," say Accenture analysts.

In short, cloud computing provides retailers with a cost-effective and infinitely scalable path to launching new capabilities and rebuilding architectures at a time when existing systems are becoming dangerously obsolete.

Of course, moving to the cloud doesn't have to be an all or nothing affair. IT systems and capabilities can be cherry picked for cloud adoption in order to allow existing investments to adequately run their course. Similarly, it's understandable that retailers would be reluctant to hand over confidential customer data or POS systems to a third-party provider.

With that in mind, cloud proponents and consultants recommend retailers start by migrating low-hanging fruit, such as workgroup applications or non-mission-critical, non-integrated applications. Then be ready to scale once the benefits are proven and concerns alleviated.

Not that it will be easy. Ongoing integration with existing systems has proven a sticking point for some, as has security. As with most technology, overcoming these hurdles will require the expertise of a trusted advisor.

"Any retailer that uses cloud-based services needs to make sure that all their vendors follow strict and contractual guidelines on privacy policy, use a secure SSL to safely access their services through public networks and have a firm policy about data ownership," Safran warns. "If a provider of cloud-based services is fuzzy about who owns the data and how it can be affordably moved to another vendor, move on and find another."

"The more sensitive the data, the more important it will be to validate where the data resides and how it is being protected," Douglas concurs. "Transparency, vendor management programs and strong service level agreements (SLAs) will be paramount."