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INTERACTIVE SESSION: ORGANIZATIONS

IS IT TIME FOR CLOUD COMPUTING?

Cloud computing is taking off. The biggest players in the cloud computing marketplace include Amazon Web Services division (AWS), Microsoft, and Google. These companies have streamlined cloud computing and made it an affordable and sensible option for companies ranging from tiny Internet startups to established companies like FedEx.

For example, AWS provides subscribing companies with flexible computing power and data storage, as well as data management, messaging, payment, and other services that can be used together or individually as the business requires. Anyone with an Internet connection and a little bit of money can harness the same computing systems that Amazon itself uses to run its retail business. If customers provide the amount of server space, bandwidth, storage, and any other services they require, AWS can automatically allocate those resources. Amazon's sales pitch is that you don't pay a monthly or yearly fee to use their computing resources – instead, you pay for exactly what you use.

This appeals to many businesses because it allows Amazon to handle all of the maintenance and upkeep of IT infrastructures, leaving businesses to spend more time on higher-value work. For example, using AWS helped Merrifield Garden Center reduce costs, improve the stability and security of its applications and data, and eliminate the burden of managing IT infrastructure hardware so it can focus on new customer-facing initiatives to grow the business.

Startup companies and smaller companies are finding that they no longer need to build their own data center. With cloud infrastructures like Amazon's readily available, they have access to technical capability that was formerly available to only much larger businesses. San Francisco-based Socialcam provides a popular mobile social video application currently installed on over 20 million iPhone and Android smartphones. The Socialcam application makes it easy to take a video of any size, post it online, and share with friends. Socialcam became so popular that the company's engineers couldn't install hardware fast enough to keep up with demand. By moving to the AWS Cloud, Socialcam can quickly add or remove capacity to meet demand. Netco Sports produces the Canal+ Football app that enables viewers to replay any move from any camera angle, on any device, within 3 minutes after it happens. By using AWS, Netco Sports can scale 100 servers in under 10 minutes to support streaming for 500,000 viewers.

Until recently, banks have been reluctant to use public cloud services due to security and regulatory concerns, but shrinking profits are encouraging them to take a second look. In the meantime, some banks are using private clouds for their sensitive financial transactions. National Australia Bank (NAB), with $793 billion in assets, uses an internal private cloud based on IBM's infrastructure on demand. IBM had already been managing the bank's IT infrastructure under a seven-year contract signed in 2010. The private cloud hosts the bank's main production environment, including a new Oracle banking system, and will support short-term computing-intense projects such as marketing campaigns. NAB pays only for what it uses so that it doesn't have to make large IT capital expenditures. The equipment is all hosted in NAB's data centers, which is unusual for on-demand environments.

Although low overhead and infrastructure management costs make public cloud computing especially attractive to startups, the financial benefits of cloud computing for large and midsized organizations are less apparent. Cliff Olson, director of infrastructure systems at FP International, Inc., a Fremont, California-based packaging company, notes that paying a public cloud provider a monthly service fee for 10,000 or more employees will probably be more expensive than having the company maintain its own IT infrastructure and staff. Companies also worry about unexpected "runaway costs" from using a pay-per-use model. Integrating cloud services with existing IT infrastructures, errors, mismanagement, or unusually high volumes of Web traffic will run up the bill for cloud service users.

Gartner Inc. technology consultants advises clients contemplating public cloud services to take into account the number of machines an organization will run; the number of hours per day or per week they'll run; and the amount of storage their data will require. Additional costs include licenses that need to be paid for on a recurring basis; the rate of change for the data; and how much new data the business is expected to generate. A very large company may find it cheaper to own and manage its own data center or private cloud. But as public

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clouds become more efficient and secure and the technology grows cheaper, large companies will start using more cloud resources.

A major barrier to widespread cloud adoption is concern about cloud reliability and security. Amazon's cloud experienced significant outages in April and August 2011; on June 14 and 29, 2012; on December 24, 2012; on January 31, 2013; and on August 25, 2013. Normally, cloud networks are very reliable, and often more so than private networks operated by individual companies. But when a cloud of significant size like Amazon's goes down, it sends ripples across the entire Web. The August 2013 outage was caused by a hardware failure lasting 49 minutes at Amazon's U.S.-East data center in North Virginia. It led to spiraling problems at a host of well-trafficked online services, including Instagram, Vine, AirBnB, and the mobile magazine app Flipboard. Amazon attributed the outage to glitches with a single networking device that resulted in data loss.

The outages have been proof that the vision of a cloud with 100 percent uptime is still far from reality. Nevertheless, some large cloud users such as Netflix believe that overall cloud service availability and reliability have steadily improved. A number of experts recommend that companies for whom an outage would be a major risk consider using another computing service as a backup.

Most midsized and large companies will gravitate toward a hybrid approach. For example, InterContinental Hotels revamped its IT infrastructure to include both private and public cloud usage. To improve response time for customers, InterContinental moved its core room reservation transaction system onto a private cloud within its own data center, but it moved room availability and pricing Web site applications onto public cloud data centers on the East and West coasts. Customers receive data faster if the data are located on a server that is physically close to them, and cloud computing helps InterContinental to take advantage of this.

Sources: Beth Pariseau, "Enterprises Hit Tipping Point in AWS Cloud vs. Private Cloud Costs," searchAWS.com, April 17, 2014; Penny Crosman, "Banks Pushed Toward Cloud Computing by Cost Pressures," Information Management, March 11, 2014; "Customer Success. Powered by the AWS Cloud," www.aws.com, accessed April 1, 2014; Brad Stone, "Another Amazon Outage Exposes the Cloud's Dark Lining," Bloomberg Business Week, August 26, 2013; Charles Babcock, "Cloud Implementation Costs, Complexity Surprise Companies," *Information Week*, February 6, 2013; and Penny Crossman, "How New Core, Cloud Computing Are Transforming an Aussie Bank," Information Management, January 2, 2013.

CASE STUDY QUESTIONS

1. What business benefits do cloud computing services provide? What problems do they solve?
2. What are the disadvantages of cloud computing?
3. How do the concepts of capacity planning, scalability, and TCO apply to this case? Apply these concepts both to Amazon and to subscribers of its services.
4. What kinds of businesses are most likely to benefit from using cloud computing? Why?

them strategic advantages. The cost savings from switching to cloud services are not always easy to determine for large companies that already have their own IT infrastructures in place. Corporate data centers typically work with an IT budget that accounts for a mix of operational and capital expenses. Pricing for cloud services is usually based on a per-hour or other per-use charge. Even if a company can approximate the hardware and software costs to run a specific computing task on premises, it still needs to figure in how much of the firm's network management, storage management, system administration, electricity, and real estate costs should be allocated to a single on-premises IT service. An information systems department may not have the right information to analyze those factors on a service-by-service basis.