How the Cloud, Mobile Devices Affect Application Strategy

The forcast is cloudy with a likelihood of mobile

Kim S. Nash (CIO (US)) | **31 August, 2010 07:25**

Look at where technology is going, or where it's dragging us, and you see two unstoppable forces that, if mismanaged, will send problems rippling through corporate IT infrastructure for years: Cloud and mobile computing.

Joshua Jewett, CIO of the nearly $8 billion Family Dollar Stores chain, sees what's at stake. He is investigating cloud services for possible use in application development and testing. Meanwhile, the mobile pressure builds. Jewett says employees check work e-mail on personal devices they bring to the office and most customers of Family Dollar's 7,000 stores carry cell phones.

"Either you're consciously building cloud and mobile systems or you're reacting to forces of the world pushing you down that path," he says. "It's always better to be conscious."

Jewett jokes, but his point is this: You need to make careful enterprise architecture decisions that encompass technology and services that, whether or not they live inside the corporate walls, will incorporate themselves into your business strategy.

Gartner predicts that within two years, up to 20 percent of companies will own no IT assets at all, their CIOs having hired outsourcers, cloud providers and software-as-a-service hosts to do their computing work for them. Many other CIOs will be responsible for a mishmash of internal and external IT resources that employees and customers use with a plethora of devices. While iPhone users can't yet pinch and flick their way through transactions on a corporate-grade ERP suite running in the cloud, give Apple and SAP time, says Michael Capone, CIO of Automatic Data Processing, the $8.8 billion payroll services firm. That's where we're headed[1].

No longer can we pick a hardware platform and expect to live with it exclusively, or even for very long. IT leaders must conceive a technology architecture flexible enough to deliver enterprise applications-sometimes even the same single application-in several ways, says Filippo Passerini, CIO of Procter and Gamble. That includes running apps in others' data centers and in the palms of people's hands.

CIOs, therefore, must work closely with enterprise architects to lay down a framework for delivering applications on multiple platforms. Some view enterprise architecture as a theoretical exercise or a noble endeavor to try when there's time. But today's technology shifts make good enterprise architecture a practical necessity. No one can be certain how mobile and cloud technology will develop or which vendors will dominate.

Get ahead of the angst, says Srini Cherukuri, senior director of IT operations at Matson Navigation[2]. "That's the key: starting early on from an architecture standpoint as opposed to retrofitting something after it's been built."

Cloudy With a Likelihood of Mobile Cell phone vendors are on track to sell 1.4 billion devices this year, after selling more than 2.4 billion in 2008 and 2009, according to Gartner. Within four years, predicts Morgan Stanley investment guru Mary Meeker, more people will get on the Internet via mobile devices than PCs. And that's not just consumers. At P and G, for instance, mobile computing is no longer just for road warriors; it's a platform for the enterprise. More than 12,000 P and G employees use Apple iPads and various smartphones for everyday work at the office, prompting the company to work with Xerox to develop technology to let these workers print documents from the devices.

The Pew Research Center, meanwhile, recently asked 895 Internet experts and technology industry executives for views on how computing will evolve. The big prediction: By 2020, most people will access software and information online-meaning somewhere on the Internet, rather than using tools and data stored on their PCs or in a company data center.

Today, CIOs see a clear line between on-premise and cloud computing, between the safety and confidence of controlling one's systems and the anxiety that comes with working in the cloud. But in 10 years, the Pew report concludes, there will be no line. "People will generally not be able to distinguish the difference between when they are working within their local device and when they are accessing the cloud," Pew says. Security and accountability issues that vex CIOs today will be resolved.

Between now and then, a disciplined enterprise architecture can help CIOs manage the ambiguity that cloud and mobile bring, says

Leon Kappelman, a professor of information systems at the University of North Texas and founding chair of the Society for Information Management's enterprise architecture group. Creating an enterprise architecture means not only laying out which technologies a company will use but also the relationships and intersections between the business processes they support.

But most companies do only half the job[3], Kappelman says. Often, they stop at the technology map because it is simpler to figure out than how business processes relate to each other.

Service-oriented architecture (SOA) gets at some of these challenges, Kappelman says, but doesn't provide a complete solution-at least not the way most people practice it. SOA addresses the design and implementation phase of projects, with the goal of later reusing individual components. Many SOA adopters map a discrete business task, such as recording customer contact information, to specific technology, such as a Web form. But SOA usually isn't used to understand and record an entire process, such as end-to-end customer service, he says.

Especially when urgent projects arise, pausing to consider the larger context can feel as if it slows progress, says John Ericksen, chief operating officer and leader of technology and corporate services at PNC Financial Services Group. But in this time of technology flux, as cloud and mobile computing flower into enterprise-ready technologies, IT leaders must understand how business processes relate, Ericksen says. "When you ask about mobile, everybody wants everything. But the real challenge I have is [determining] what business need you are solving." He advises: "Take time to figure this out."

Otherwise, Kappelman adds, you will design systems wedded to particular technologies that contribute little to making the company as a whole more efficient. "Even if we perfect the technology architecture and engineer our systems into reusable, interoperable, and therefore flexible components, we cannot stay aligned unless we can also maintain our knowledge of the business and its processes, objectives, rules and timing."

That, Ericksen says, is what PNC is striving to do.

A Business-Focused Blueprint PNC, a $16.2 billion consumer-banking company, employs 35 to 40 enterprise architects. Some are technology-focused-planning, for instance, optimal server configurations. Others work within company units to understand business requirements. As a whole, the enterprise architecture group aims to understand PNC's business goals, such as acquiring new kinds of customers or expanding in a given geography.

There's also a group that researches new technology concepts to identify ways they may fit into PNC's future, Ericksen says. This stretch-thinking team helps guide adoption of strategic technology, he says, by determining where and how new technologies, such as mobile and cloud computing, can work at PNC.

For example, PNC bought the bank National City in 2008 for $5 billion. PNC's enterprise architects are using the integration project to bring private cloud and virtualized systems to the three data centers being consolidated and re-equipped. The bank wouldn't have been able to do that if the architecture group hadn't already explored the technologies by, for example, running test cases in mock setups of virtualized servers.

"We've taken a step forward to create a nimble operating environment that allows us a lot of choices," he says. The newly re-architected "intelligent data centers," as he calls them, will house private clouds with server capacity able to scale up or down in response to demand levels from the users of PNC's applications. That wasn't possible with PNC's and National City's legacy systems, he says.

In the mobile realm, PNC tailors mobile access to bank accounts to various customer segments that, according to the company's research, tend to prefer different devices. College kids skew to the iPhone[4] while Baby Boomers, who are often using phones issued by their employers, are more likely to carry BlackBerrys.

To accommodate these different platforms, PNC decided to develop a code base for general mobile access and, where needed, to customize the user interface for each kind of device. Eventually, PNC will move more toward slimmed-down Web applications accessible by mobile Internet devices. The idea is to avoid as much as possible building entire applications specific to each platform, says Ericksen. That saves development time and avoids generating islands of code to maintain.

Ideally, he says, architects are visionary, but with a practical bent. (See " Head What CIOs Look for in an Enterprise Architect[5].") "It doesn't make sense to say, 'I want a vacation house on Mars,' if you have no clue how to get there," he says.

Architecture Activism Transportation services company Matson Navigation is adjusting its enterprise architecture to incorporate mobile computing. For several years, Matson has used protected websites to provide transportation and logistics schedules to its customers, such as manufacturers and big retailers.

Now Matson lets customers use mobile devices to access that data, which is collected from queries written by the IT group against existing systems. Customers can also set up text alerts to be notified when particular containers move.

Not forcing customers to use a laptop or desktop machine to see what's happening with their goods lets them make decisions faster,

Cherukuri says. "We are a segment in their supply chain," he says. "For us to be able to provide that information to our customers is of high competitive value."

Like its customers, Matson's employees want mobile access to such critical applications as vessel scheduling, he says. But before the IT group provides such access, Cherukuri is having the architecture team research features and sketch out how mobile will work internally. He wants to do less retrofitting of existing applications and instead deliver re-architected versions.

Matson's original enterprise architecture, laid out in 2004, didn't account for general mobile access to corporate systems. Mobile wasn't much of a factor in enterprise computing then. Even if it had been, Cherukuri notes, mobile technology has advanced so much in the past five years that any blueprints would be obsolete. So now Matson is redesigning the user interface layer of the vessel scheduling application to work well on the small screens of smartphones. If the IT group simply created small, static charts of vessel schedules so that mobile users could get immediate access to such data, they'd soon be dissatisfied, Cherukuri predicts. "We want to have high user satisfaction, which you won't get if you retrofit rather than architect it properly for performance," he says. " We want to get it right[6]." He expects to release a mobile version of the vessel scheduling application this year.

Customers should get data anywhere they want, says ADP's Capone, a philosophy the company's enterprise architecture tries to reflect. For example, the architecture group at the company has, like PNC, defined several basic mobile applications. ADP's are for such tasks as viewing aggregated data about HR or payroll transactions. The architects studied which data was being accessed most frequently at ADP's secure customer websites and used that information to design the capabilities they should provide in new mobile applications. Decisions about who builds an application flows from choices the architecture group makes. For example, ADP had its own developers build the basic functionality of its mobile applications but hired specialized firms to tailor the interface to different mobile operating systems. Its platform now supports the BlackBerry and iPhone, and the company will likely add support for Droid devices, Capone says.

"We'll control the functionality and user experience," he says. "But the nuances of what it takes to work on a BlackBerry versus iPhone are best left to the experts."

At Family Dollar[7], Jewett and his team designed an enterprise architecture that reflects the company's low tolerance for risk. In choosing technologies, for example, he favors a Noah's Ark approach: two technology options for every key system. That way, the company doesn't get locked in. Databases come from Oracle and Microsoft, for example. Servers and desktops run Linux and Windows operating systems. Developers use Java and Microsoft programming tools. Plus, Jewett says, "you can't be a purist and get anything done."

More generally, the enterprise architecture demands more buying than building of systems. Jewett believes IT is only as good as the business value it brings, so he wants the flexibility to stop using a system if it doesn't pay off fast enough or fails to achieve business goals. Therefore, he prefers deploying SaaS solutions.

When you build your own software, you have to pay for the hardware, development, deployment and support. "You're risking capital and hoping you get business value," he explains. "If you've written a check, you're going to ride that depreciation for a long time, whether you're getting business value or not."

But with SaaS and, he predicts, when Family Dollar starts using cloud computing, the risk to precious investment dollars can be lower. Provided your agreements with vendors are structured properly, Jewett says, "you can walk away if you're not getting business value."

Applications Everywhere A well-developed enterprise architecture reflects the integration, or lack thereof, between IT and business goals, says Betsy Burton, an analyst at Gartner[8]. The architects can become a conduit between the technology group and business managers, she says. In so doing, a good architecture team will transcend a technology-focused mission, she says.

"You want the team to evolve the business to the future, which is more than setting down vendor standards," she says. "Organizations that do not drive all architectural decisions off of a clear understanding of business context and the future state of the company have an extremely difficult time demonstrating and delivering business value."

Smooth delivery of applications in new modes such as cloud and mobile serves as a proof point of the value of good enterprise architecture, says Matson's Cherukuri. "Enterprise architectures define technology and what the business does and how it does it," he says. "They also define our thought process about technology."

Burton agrees. Today, 60 percent to 70 percent of enterprise architecture chiefs report to the CIO. But she predicts that as architecture groups evolve to emphasize business-process expertise, they will become accountable to the chief operating officer.

Kappelman, the IT professor, expects a greater evolution. The big thoughts about the creative use of technology in a business context won't stay confined to IT or enterprise architecture, he says. He likens the change to the way " scientific management[9]" emerged in the late 1800s. Then, efficiency experts were charged with making shop floors run better. Soon, precepts developed by those scientists proliferated, influencing the work habits of all employees, Kappelman says. Everyone strove for efficiency. Likewise, he predicts, "what we now call enterprise architecture will become part of how everyone functions."

Meanwhile, CIOs can leverage a strong enterprise architecture group to keep ahead of business demands by identifying application delivery needs. Ericksen embedded architects in each line of business, such as asset management, to absorb the nuances of shifting strategies and goals. These architects bring what they know of technology and what they learn about the business back to the development team to ensure applications are built and delivered in ways that best serve PNC as a whole.

The enterprise architecture team, he says, "has to be very rooted in business outcomes."

Read more about software as a service (saas)[10] in CIO's Software as a Service (SaaS) Drilldown.

References

%20http://advice.cio.com/saas_solutions_make_customer_service_the_other_r_d
%20http://www.cio.com/cio100/2009/3
%20http://www.cio.com/article/472429/The_Case_for_Enterprise_Architects
%20http://www.cio.com/cio100/detail/2074
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