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Research

IT Modernization Isn't a Choice; It's an Imperative

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Aging IT infrastructures, coupled with an increased need to be responsive to business demands, have forced many organizations to rethink traditional, incremental technology improvement programs and focus instead on a holistic IT modernization program. In addition, the increased awareness of IT's effects on the environment, and the demands to show the effects on green initiatives, has forced many CIOs and CFOs to re-evaluate performance and efficiency metrics in the IT organization, and implement continuous improvement processes.

Key Findings

- IT modernization projects that address specific technology improvements without considering the impact on the entire infrastructure are destined to fail, or deliver less-than-optimal results.

- Performing a complete infrastructure assessment, starting with the physical facility, is a core requirement before beginning IT modernization.

- IT modernization must be integrated into the overall IT organization work ethic. All future technology decisions must be considered as enhancements to the modernization process.

- Once instituted, successful modernization efforts don't end; rather, they become an integral part of future decisions, tactical and strategic.

Recommendations

- Develop a permanent role in your program management office (PMO) for IT modernization, focused on continuous optimization of the infrastructure.

- Create a cascade effect grid that links technologies, applications and processes, and how they're affected during modernization efforts.

As enterprises begin looking at the relationships between IT organizations and business processes, it's becoming clear that a key to success is a top-down focus on the interrelationships among the IT infrastructure, operations and the execution of services. The business opportunities enabled by technology advancements have shifted managers' expectations about what the IT organization should be able to deliver to support the business. Many enterprises have an IT infrastructure and application platforms built on decades of constantly shifting technologies to meet an equally diverse set of evolving business demands.

Containment of IT spending has been a major driver of many organizations for many years, and investing in an updated IT infrastructure in a planned, rational fashion is a critical requirement to enable business agility. Gartner has seen organizations undertake tactical modernization efforts during the past several years, but these efforts have been designed to leverage existing applications and expose them in new ways to new constituents to enable composite applications that meet new business needs. However, these efforts didn't require a visceral commitment to modernizing the IT infrastructure and application platforms. Gartner believes that companies must plan *now* for more-substantial modernization initiatives to provide a strong underpinning to link service-oriented architectures (SOAs) and their real-time infrastructures.

What Is Modernization?

A logical definition is that modernization is the continuous evolution of IT infrastructure and operations toward a centrally supported framework, enabling upgrades, migrations, new technology introductions and rapid adoption of change with a minimal impact on day-to-day operations and service delivery. Existing enterprise architecture (EA) is an integral part of a modernization strategy, and a continuing modernization process plays a key role in keeping EA relevant to the business. In addition, IT modernization looks at facilities' assets as well as IT organizations, ensuring that the facilities can support and grow with an evolving EA, because, without a modern facility, it's unlikely that newer IT technologies will be sustainable.

This isn't a revolutionary jump, but rather an evolutionary step toward running the IT organization like a business, with a total focus on modularizing service delivery so that it can provide sustainable levels of service performance, fully optimize and use resources through virtualization techniques, and enable the flexibly to implement innovative ideas quickly. When planning for growth or even one-off projects, designers must consider the dynamics between the business perception of the IT infrastructure (credibility) and the IT group's perception. The IT organization tends to focus on the evolution of technologies and platforms, while business focuses on the evolution of services to support the business. Aligning these camps becomes a critical success factor in any modernization effort, but, as with all facets of the IT organization, the business priorities come first because they're the fundamental drivers of IT.

Bringing Order to a Complex Technology Environment

IT modernization initiatives could lead to a more-complex hardware and software infrastructure, but it doesn't have to. The evolution of this environment into one that better enables business agility requires a shift in spending. Organizations must reallocate spending from "running the systems" to "modernizing the systems." This spending may be used for rewriting applications, implementing packages, creating a more-agile infrastructure or creating an SOA. The focus shouldn't be defined by the issues of constructing such an SOA, but rather by creating an operationally sustainable infrastructure with a high quality of service. This isn't a project-driven exercise, but rather a change in mind-set for IT architects, CIOs, applications and operations

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managers. Services are delivered to end users, partners or customers, but also are developed or provided by the IT organization. These could be server or storage provisioning services, application development (AD) or delivery, service-level agreements, management services (configuration, change, performance and problem management), network services (WAN or voice over IP) or even business continuity services.

The IT organization traditionally runs projects via a vertical approach. An IT initiative is launched and an owner is assigned to run the project (usually the busiest person in the room). The owner develops a project plan outlining the key resources needed, timelines, checkpoints, delivery dates and dependencies. A project manager rarely looks outside his or her project to see what other projects are in progress and how they might affect his or her project. In most cases, we look to the PMO for such insight, but most PMOs look at projects vertically and rarely assess what cascade effects relate to which projects. Cascade mapping is a simple exercise that all project managers should apply prior to launching a project. Simply put, it's a technique to ascertain the effects on the infrastructure of a given project. Many PMOs look at the effects if projects are delayed or fail, but they rarely do so if a project is wildly successful or far exceeds growth expectations. The secondary and tertiary effects of these can have dramatic impacts on infrastructure requirements, and also on the success of other projects.

What Needs to Be Modernized?

Modernization can be broken into major component categories, but the danger of looking at any of these separately is that changes to one category will, in most instances, have cascade effects on many other categories. Ensure that a complete dependency map has been created between categories before prioritizing where to begin. Adding IT modernization as a key component of your PMO is absolutely necessary, because this is one of the only places that can continually monitor all projects and all potential effects of a modernization effort.

Facilities

Any modernization effort must begin with the overall facility, but this hasn't been a priority among IT practitioners. The days when facilities management and IT operations were completely separate disciplines (and organizations) are coming to an end. In many organizations, this has been highlighted by the four-pronged impact of consolidation, followed by heavy virtualization, followed by installation of high-performance servers or high-density racks, and finally by the attention that green IT has focused on IT power consumption. These four actions have forced a complete reassessment of the power and cooling requirements needed in data centers.

If nothing is done, then the greatest long-term danger won't necessarily be to the core business, but rather the impact on the perception of the IT organization and its support of the business. Similar to the client/server revolution, if the IT organization doesn't respond quickly enough to business demands, then the business will find ways to continue on without it, which could cause many problems in the future.

Facilities modernization can start with something as simple as an assessment of what's available, how much actual growth is possible and how the existing environment can become more efficient. Many steps can be taken to improve the overall efficiency of facilities without incurring a large expense (see "Toolkit Best Practice: Practical Steps You Can Take Now for Power and Cooling Issues"). In the longer term, organizations are evaluating potential options, such as collocation for growth, outsourcing or building another site designed specifically for long-term growth and the highest levels of agility. Each has benefits and downsides, but each must take a very long-term view of an organization's needs and be based on very clear assessments of what's needed now.

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Applications

Organizations that have used IT for decades to support their businesses now find that this same hardware and software environment can impede growth. Whether their legacy environments are perceived as too expensive or not agile enough, companies want to move to a modern architecture. By their reckoning, "modern" means "cheaper, better and faster."

Don't underestimate the complexity of the legacy application installed base on infrastructure. Modernizing these applications often requires dramatic shifts in architectures, introducing new platforms and operating systems into the data center, retooling the operations staff, different processes, tools, support software and additional costs to operate the environment.

In addition, when moving to scale-up architectures, AD and operations organizations must consider — and logically work through — the resource requirements placed on each team, as well as concerns regarding the end-state performance and reliability of the application. Often, as operations organizations strive to leverage scale-up environments — especially during life cycle replacement of hardware resources — AD organizations may have the attitude, "If it ain't broke, then don't fix it" — that is, don't move an application from a supported, stable environment to a scaled-up environment simply to drive the savings associated with virtualization. The conflicting pressures between the organizations can easily result in stalemates to modernization. Setting clear, consistent goals across the AD and operations organizations will help avoid and/or resolve this conflict.

Networks

A historical artifact in many IT organizations is that, in many cases, the networking organization (and disciplines) were developed outside the purview of IT operations. Originally focused on voice in the early years, as networking teams built high-performance data networks and eventually converged networks, the decisions regarding how networks should be designed, integrated and optimized weren't made in IT operations per se, but they have fundamentally affected the IT organization's impact on the business. However, when IT operations begins thinking about modernization, the networking side of the equation is often left out or relegated as a side project to be performed by other teams. Don't fall into this trap. IT modernization shouldn't be bound by organizational constructs, but rather by the overall business needs. Also, if the IT organization supports the business, then the entire IT group must be on a continuous improvement cycle, including data, voice and mobile networks.

In addition, many network technologies can be used to improve overall IT performance, extend the life of existing assets and reduce overall operational costs. As more and more services are moved to the edge network (such as virtual-private-network appliances, encryption, accelerators and intrusion prevention systems/intrusion detection systems), a high-performance, agile and scalable network can become your greatest asset — or your Achilles' heel. The choice is yours.

Servers and Storage and Virtualization

Server architectures continue to change while the IT organization's need for servers continues to grow. During the past few years, consolidation efforts have highlighted server modernization issues, in which organizations realized that a high percentage of x86 servers had very low use rates (8% to 12% averages aren't uncommon). The logical solution for this problem was virtualization, and now most organizations use it as a method to push x86 server performance up toward 60% to 80% on average, and run between four and 30 virtual images per server (and sometimes higher). This trend has helped reduce the number of low-performing older servers, but also has started a trend of companies introducing higher-performance systems, which could increase the power and cooling requirements in data centers.

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By creating many virtual instances per physical server, the configuration of storage systems also has begun changing. Storage can no longer be viewed as aligned with a server/platform that happens to be supporting an application. Storage access must be dynamic enough so that, when a server workload moves from one physical device to another (for example, with VMotion), the mapping of that storage system must move with it. This has increased the number of storage area network implementations in many organizations, and caused a major rethinking of how storage and capacity management, provisioning and replication/backup are performed.

IT Operations and Management: It's No Longer "Good Enough" to Just Keep the Lights On

Most IT organizations have had the same basic charter for years and years, and they do more with the same or fewer resources. Each year, operational budgets are somewhat constrained, especially in relation to the pace of change and what business expects from the IT organization. Most CIOs' first priority each year is to optimize, economize, improve efficiencies and stretch the life of existing systems as much as possible. We've surveyed CIOs for more than 15 years, and the amount of financial resources (as a percentage of the total budget) spent on simply keeping the lights on and maintaining systems averages 72%, with the remaining 28% split between application software (new development) and noninfrastructure staff and services. Carving out additional funds for emerging technologies, learning new skills or modernizing the core environment has been almost impossible, thereby forcing most IT leaders to pick and choose the few high-visibility, high-probability technologies to test during the upcoming year. This has caused a slow, but steady, erosion of the core infrastructure, to the point where it barely supports day-to-day operations.

Alternatively, organizations have run a series of tactical projects to shore up existing vertical technologies within the infrastructure, without having the charter (or funding) to address the overall problem. This task-oriented view is, in many cases, forcing companies to implement point solutions to solve problems that were caused by the last tactical project (for example, consolidation leads to virtualization, which leads to server sprawl, which, in turn, could lead to power and cooling issues sooner than expected). IT leaders are looking to modernization as a systematic approach to improving the overall infrastructure in a logical, stepwise approach, rather than as a continuous firefighting exercise. This is *not* about implementing new technologies or rearchitecting the infrastructure, but it *is* about bringing strategic planning back into the equation for IT operations. Nothing gets done unless it fits into the strategic plan — and unless the consequences of that action (that is, the expected cascade effects) are understood and the effects are integrated into the strategy.

RECOMMENDED READING

"IT Modernization: Build Agile Data Centers While Reducing Expenses"

"Toolkit Best Practice: Practical Steps You Can Take Now for Power and Cooling Issues"

"So You Want to Consolidate Your Servers, Now What?"

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