Smart ideas for cutting infrastructure costs

To improve IT's performance, paring the costs of managing the infrastructure is only the first step—but it's worth doing thoroughly.

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In most companies, the IT infrastructure has become as expensive as it is indispensable. For more than a decade, large companies have typically expanded their IT infrastructure to keep up with changes in technology and the business. As companies raced to add new channels and products, enter new markets, acquire new businesses, reinvent processes, build new capabilities, the company's underlying IT infrastructure grew in size and complexity to support the changes. Today's infrastructure includes such underlying technology platforms as the data center, network connectivity, transaction processing, database management, and IT productivity applications and tools. (*See* "The pieces of the puzzle".)

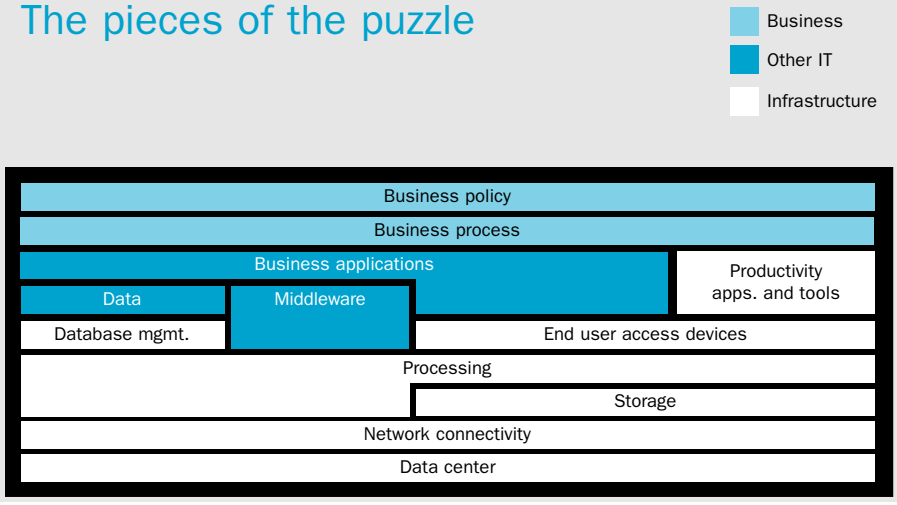
The demands that business units place on the infrastructure also have increased. Along with the volumes of transactions and data churned by business users, businesses' expectations for service levels have soared.

Thus, at most companies, infrastructure has become the single largest component of enterprise IT costs (total IT expenditures across the company), representing 40 to 60 percent of an IT function's expenditures.

More recently, in these tighter times, companies have been laboring to pare IT infrastructure costs. Even as they do so, they expect to maintain or improve service quality. As companies improve the performance of their infrastructure, we've observed them go through four phases:

1. Companies identify large, near-term tactical improvements in efficiency. They make improvements that can be implemented within six months and require only small investments except for severance payments to redundant employees.

The pieces of the puzzle



2. They set an infrastructure strategy, which typically starts with consolidating and standardizing technologies and includes implementation of a coherent supporting organization, process, vendor, and governance models. Deploying a sound infrastructure strategy often takes 12 to 24 months and requires substantial investments in new technologies and organizational change.
3. To maintain the cost savings captured in the first two stages, companies establish an ongoing set of capabilities for managing volumes and service levels.
4. They use outsourcing to leverage scale and outside expertise.

This article focuses on the first of these phases—tactical improvements. Smart improvements in the efficiency of infrastructure management yield big returns fast, and good decisions at this stage can lay a solid foundation for greater gains at the other three stages. Tactical efficiency improvements provide insight into current infrastructure requirements and capabilities, simplify the environment, and build credibility with business users and senior management. In our experience, almost every company has made some smart efficiency improvements in this area, but few have done all they can. Most companies have captured only 40 to 60 percent of the overall opportunity. By not systematically going after tactical efficiency opportunities, companies leave large savings on the table—and undermine opportunities to gain additional savings at later stages.

When approached systematically and aggressively, tactical cost-reduction programs yield 5 to 15 percent run-rate reductions in total spending and eliminate one-fourth of the infrastructure's severe faults. However, some companies have achieved tactical cost reductions as large as 25 percent, depending on how aggressively the company pursues opportunities to manage business-user demand.

How we got here

Traditionally, many infrastructure organizations managed relatively straightforward infrastructure platforms. There could be significant variation among individual environments (for example, from logical partition to logical partition on a mainframe). But the number of technology stacks that a given infrastructure organization might manage was limited by the number of standards that could support enterprise applications and by the custom, in many companies, of having business units manage their own PC-based applications.

During the 1990s, a number of converging trends made infrastructure functions far more complex to manage. New technical and application architectures emerged—first client-server, then Web-based computing. Business units often demanded that new architectures be deployed rapidly and before they could be fully sorted out or integrated with existing platforms. In many organizations, mergers resulted in one set of architectures being piled on top of another. Finally, the consolidation of technology functions transferred responsibility for shadow IT infrastructure—infrastructure managed in business units by informal or duplicative IT organizations—from the business units to a central function.

This complexity had several consequences. It exacerbated disconnections between the IT infrastructure function and the business. Opportunities to improve efficiency were ignored in the rush to do everything else, so costs (including development expenditures and other costs stemming from architectural complexity) rose dramatically. Along with the organizational headaches came fragmented spending, broken processes, and inadequately gated user demand, meaning that what users asked for they got, without comparison to rigorous policies or assessment of true business need.

Because the array of these problems is so broad, many companies have picked their battles, looking for opportunities where cuts are most obvious and face the least opposition. For example, some infrastructure functions improve productivity but cannot engage with

business users to rationalize volumes and service levels. Others push vendors aggressively but resist making even short-term improvements to the technology or process. The upshot is that many enterprises fail to take advantage of all the cost improvement levers available. In addition, this selective approach limits synergies across initiatives. For example, data collected for a vendor-management effort could provide critical insights into ways to rationalize demand.

Companies reducing infrastructure costs can capture greater value by more systematically making improvements across five key areas of opportunity: technology simplification and rationalization, organizational consolidation, vendor optimization, process streamlining and automation, and demand management. Most companies are pursuing improvements in some of these areas, and a number of innovative ideas for targeting costs have emerged in all five. But best-practice infrastructure organizations will focus on systematically reaping gains across the board. In other words, they will stop picking their battles and focus on winning the war. (*See* "Where are the improvement levers?").

Making real, substantial improvements in architecture is a multiyear process requiring clear strategic direction, material investments, and extensive participation by business units.

Where are the improvement levers?

Timing	Architecture	Organization	Inputs	Processes	Demand
Short term (<6 months)		Eliminate non-value-added activities (e.g., low value reporting) Use benchmarks to "level-up" performance expectations across groups	Launch competitive bids for commodity contracts, even if existing contracts have not expired Renegotiate noncommodity contracts Switch to lower-cost telecom products (e.g., reservation-less conferencing) Audit telecom bills	Improve scheduling and resource utilization Improve project-management discipline Implement statistical quality control	Eliminate infrastructure projects without clear business cases Rationalize specifications for new projects Change user policies (personal printers, personal storage) Revise service levels. Re-purpose spare inventory Eliminate spare network capacity
Medium term (6–12 months)	Consolidate low-utilization servers Migrate Web and application servers to Linux	Consolidate duplicate organizations Eliminate subscale server centers Flatten management hierarchy	Replace contractors with employees Use third-party vendor maintenance Contract out moves, adds, and changes	Improve escalation for problem resolution Improve service-quality metrics and reporting Deploy knowledge-management tools to support staff	Purge unneeded data from disk Eliminate underutilized services Adjust coverage and service levels for vendor maintenance Expand user self-service Tune applications to reduce processing demand

Most companies are getting some near-term hits today by consolidating and sharing platform elements more thoroughly and, where possible, using lower-cost technologies.

When consolidating platform elements, innovative companies are looking not only at their traditional data centers but also at decentralized servers operating in office facilities across the enterprise. For example, after a series of mergers, an integrated financial-services institution had amassed more than 120 data centers, the overwhelming majority of which were converted office facilities (such as closets or conference rooms) housing servers. Clearly, these facilities were subscale and hemorrhaging cost, and they were also wholly inadequate to

house critical technology professionally. As the company shrank the office space it needed, it consolidated servers into large, more professionally run server centers, which were then shared across business units. In turn, this gave back space to the company. The space was then re-purposed for offices, eliminating the need to rent new space.

Another improvement may come from analyzing consolidation opportunities with applications in mind. A high-tech organization, noting that its production servers were extraordinarily underutilized, decided to stack multiple applications on individual servers. After determining that about a quarter of all applications could run on shared servers, the provider launched a program to eliminate several thousand servers, projecting savings of tens of million of dollars.

New, lower-cost technologies also promise to deliver near-term savings. While Linux is still in its early days as an enterprise platform, a number of companies, mostly in high tech and financial services, are starting to take advantage of the technology, which costs about 75 percent less than traditional UNIX platforms. Given the cost of recompiling traditional client-server applications and architectural inefficiencies for Linux/Intel servers with more than about eight processors, the companies first converted Web and utility servers to Linux and then began converting relatively simple applications, particularly those written in platform-neutral languages like Java. For example, an Internet service provider launched a program to migrate 25 percent of its installed base to Linux for a total planned cost savings of $70 million.

At the moment, mission-critical transaction-processing applications and enterprise databases are being kept on UNIX platforms.

Consolidating the organization

Through the 1990s, the number of personnel devoted to supporting IT infrastructure grew rapidly as companies deployed new applications and platforms. When companies later began to cut personnel, they often started in application development as they canceled or reduced the scope of investments in new application functionality. Companies sometimes delayed reductions in infrastructure personnel because management could see no obvious way to reduce personnel while maintaining technologies and avoiding service risks. Innovative companies are reorganizing and reducing their infrastructure staff by "zero-basing" them. This means they start with the organization's needs, rather than the existing staff. They determine the activities the infrastructure organization must support: desktops and servers supported; applications deployed; moves, additions, and changes made. They identify internal and external benchmarks like servers per full-time equivalent support staff. Based on the needs and benchmarks, the companies build up to an optimal organizational size.

Designing an infrastructure organization is not a purely mathematical calculation, however. Benchmarks can be used only in the context of a particular business, including the challenges of its IT architecture, management's expectations for service level, and other business requirements. But in spite of the challenges, building an organization from the bottom up creates real opportunities for improvement.

The company can consolidate IT infrastructure functions, reduce management layers, eliminate activities that do not add value, make more efficient use of labor, rebalance internal and external activities (for example, replacing contractors with employees or outsourcing noncore activities like moves, additions, and changes), and establish a performance ethic. Using this type of approach, a media organization reduced its infrastructure labor costs by 15 percent, with minimal investments within one fiscal year. Likewise, a boutique investment bank reduced its infrastructure head count by 20 percent, also in one year with little investment.

Bargain hunting

An infrastructure function is a prodigious engine for procuring outside goods and services. The very scale and scope of most companies' external spending make capturing the full opportunity difficult. Companies realizing the largest gains in this area conduct top-to-bottom reviews of their IT sourcing expenditures, addressing every material line item to minimize cost per unit, ensure compliance with sourcing policies, and optimize product selection.

Launching competitive bids for commodity contracts can yield savings of 20 to 30 percent. For many products and services, such as desktops, staff supplementation, telecom services, and Intel servers, switching costs are low and infrastructure functions can select from several viable providers. For noncommodity purchases, such as databases, UNIX servers, and management tools, buyers have less flexibility. Even so, infrastructure functions can save 10 to 20 percent by renegotiating vendor contracts. Contract changes may include sequencing purchases to help vendors make quarterly targets (in return for price breaks) or making agreements on how to direct future expenditures.

To get the most value from contract negotiations, companies must aggressively manage compliance with procurement policies. Savings opportunities created by best-in-class prices can be frittered away if employees engage in off-contract purchasing and inappropriate acquisitions. Many companies have created formal vendor-management capabilities to set procurement policies (for getting the most from vendors) and ensure that standards are followed. Companies can achieve additional savings by switching to lower-cost products, even from the same vendor. While telecom prices, for example, have broadly declined, buyers are still finding opportunities for cost breaks. One integrated financial-services institution saved five cents per minute by switching from reservation-based to reservation-less conference calling. It saved another six to seven cents per minute by adopting VPN for remote access.

These tactics can be applied to complex and sometimes overlooked areas like vendor maintenance, which can consume as much as 10 percent of infrastructure spending. Aggressive companies are contracting maintenance of such assets as routers, high-priced servers, and PBXs to third-party firms. In some instances, third-party firms can provide this service for less than the original vendor will. Even where third-party maintenance is not viable, companies can reduce annual costs by threatening to channel future spending elsewhere if the vendor is not cooperative. For all vendors, companies can often reduce spending by optimizing the selection of services—for example, selecting "next-day parts and labor" over "24/7" offerings for applications that are not mission critical.

Smooth processes

Managing an enterprise's infrastructure platform involves a rich, complex set of core processes. New capabilities like Linux, Wi-Fi, and VoIP must be identified, investigated, designed, tested, and revised. New capacity in the form of servers, desktops, disk storage, and network circuits must be ordered, configured, tested, and introduced into the product environment to support new users, new applications, and expanded business volumes. Daily operations must schedule and execute production activities like backups while monitoring for faults. Finally, problems must be identified, diagnosed, resolved, reported, and prevented. Unified, consistent, and streamlined processes are often impractical because of architectural and organizational fragmentation. As a result, companies must combine end-to-end process transformation with strategic improvements across the infrastructure function. In the short term, however, companies have two ways to streamline processes: by increasing process definition and rigor and by eliminating the root causes of process breaks.

In many cases, the scale of infrastructure operations has outgrown informal and ad hoc processes used to execute core

responsibilities like increasing capacity or resolving faults. An organization can therefore achieve large efficiency improvements by developing standard processes and syndicating them throughout the organization. For example, an Internet service provider reduced the time required to install a new server from 45 days to 15 days. It did so by eliminating obvious process breaks, like unclear data requirements and diffuse responsibilities.

In other cases, defined processes exist, but faults and breaks are common. Statistical quality control provides a tool set for identifying and eliminating the root causes of process imperfections. A financial institution identified platforms suffering from the most faults (for example, its e-commerce platform) and eliminated underlying causes (most commonly insufficient adherence to change-management and testing policies). This effort reduced severe faults by 25 percent within one quarter and saved approximately $5 million with limited investment.

Managing demand

Demand management is one of the largest opportunities for cost management available to infrastructure functions. It often has a rapid impact, though capturing value requires focused, fact-based discussions with business users to determine which demand adjustments can be implemented without harm to the business. Some companies have made near-term tactical improvements by rationalizing projects and specifications, revising policies to limit volumes, and changing service levels to align them better with true business needs.

For example, by eliminating or delaying noncritical projects—such as Web-based file access, enhanced disaster recovery for non-mission-critical data, and delays in network diversity enhancements—an Internet service provider reduced capital expenditures on internal computing infrastructure by 15 percent. A retail bank scrutinized the specs of infrastructure projects and found areas where they could change those specs to cut costs. Savings on individual projects ranged from 15 to 75 percent.

An integrated financial-services institution saved more than $5 million a year by reducing the number of Centrex lines per employee from 2.0:1 to 1.2:1. The same institution also saved several million dollars by limiting trader turrets to traders (rather than senior managers).

A cable operator revised its standards for service levels in order to reduce help-desk costs. The multisystem operator (MSO) deferred resolution of low-priority calls from mornings to afternoons, when volumes were lower. The change improved utilization of staff and cut costs by 25 percent.

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Given the amount companies can save by taking a more systematic approach to cutting IT infrastructure costs, CIOs have good reason to focus more attention on this opportunity. By reaping greater savings at this stage of their journey toward performance improvement, they are well positioned when they need to justify the investments required to consolidate technology stacks.

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