



Next-Generation Enterprise IT Infrastructure

Five Ways to Maximize the Business Value of Future IT Investments

Executive Summary

In anticipation of the widespread adoption of new technologies – from virtualization to low powered, multi-core 32-bit/64-bit platforms – today’s enterprise infrastructures are undergoing a significant transformation. Where yesterday’s enterprise infrastructure accommodated a large number of servers, filled with home-grown and commercial applications in a fairly complex computing environment, Next Generation Enterprise Infrastructures will be forced to meet the increasing user demand for applications driven by Service-Oriented Architecture (SOA) models and Web Services technologies while simultaneously attempting to do more with less.

Transforming your existing infrastructure to a next generation model will require careful planning and a thoughtful, strategic approach. That includes a detailed analysis of the “five strategies” most important for maximizing the business value of IT investments:

- 1. Recognize that it’s not enough to have the fastest and most robust hardware. The software applications that you use to run your business and interface with your customers generate the most value for your organization.*
- 2. Make a distinction between revenue-generating and administrative support applications. Back-end applications and administrative tools may be important to keeping operations running smoothly, but it is the commerce functions and customer support systems that determine your ability to collect revenues.*
- 3. Set a plan for critical path monitoring to identify which applications should be keeping you up at night. Legacy monitoring systems can’t distinguish between mission critical and non-essential applications. Organizations need monitoring solutions that alert IT managers only to serious problems impacting performance of customer-facing and operations applications.*
- 4. Align system and application performance metrics with business metrics – and get everyone from IT to line of business managers on the same scorecard.*
- 5. Establish a plan to guard against security threats and generate audit trails to meet regulatory requirements. Capturing comprehensive application metrics for analysis now or later are keys to managing the infrastructure securely.*



Introduction

Technology changes – this is a given in the business world. It changes how we measure our work, it changes the way we look at our work, it changes the ways we work. These changes accelerate over time, since newer technologies always promise to make enterprise organizations faster, more nimble, and more efficient to operate. And yet, upgrades in IT infrastructure often fall far short of their initial promise.

For example, enterprise ITs at many businesses have already become costly to manage and overly complex when it comes to documenting regulatory compliance. New technologies such as virtualization and Service-Oriented Architecture (SOA) will soon force businesses to upgrade their enterprise IT infrastructures yet again if they hope to remain competitive. Without the means to truly understand where past upgrades fell short, many organizations will spend tremendous sums of money only to have expected benefits elude them.

Fortunately, technology and business processes exist to help businesses achieve the advantages they need in an environment of continual change. This paper provides a brief guide for organizations seeking to maximize their investments in next-generation enterprise technologies and other IT infrastructure.

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Mastering Change While Still Continuing to Deliver Business Value

Clearly, everyone wants a productive, cost-efficient IT infrastructure that transparently supports the organization without interfering with the processes employees use to conduct their normal daily operations. It is therefore essential to base new technology decisions on how well a product or service can improve overall business productivity, not just whether the new system is better/faster/cheaper than the old one. Likewise, IT decision-makers must take steps to make sure that the company's technology needs are well-aligned with the goals of senior management. In short, it is necessary to synchronize the pressures driving today's IT and business operations:

Business Drivers

- Regulatory and financial pressures to align and document IT performance with overall business goals
- Cost pressure to optimize the performance of each dollar invested in hardware, software and services
- Customer, partner and employee pressure to make computing and telecommunications transparent to normal daily business processes (e.g., No one wants to have to relearn how to work just because a new system has been installed.)

Technology Drivers

- Virtualization of applications, networks, systems and processors
- Migration from 32-bit to 64-bit computing, even on entry-level PCs
- Emergence of robust, reliable, high-performance SOA and Web Services business models
- Real-time or on-demand information delivery – automatically customized for individual needs and job responsibilities

The challenge, of course, is to synchronize these drivers into a single strategic plan without forcing senior managers to master the intricacies of IT, or forcing IT staff to learn the high-level business skills of the boardroom.



Typical N Tier Infrastructure

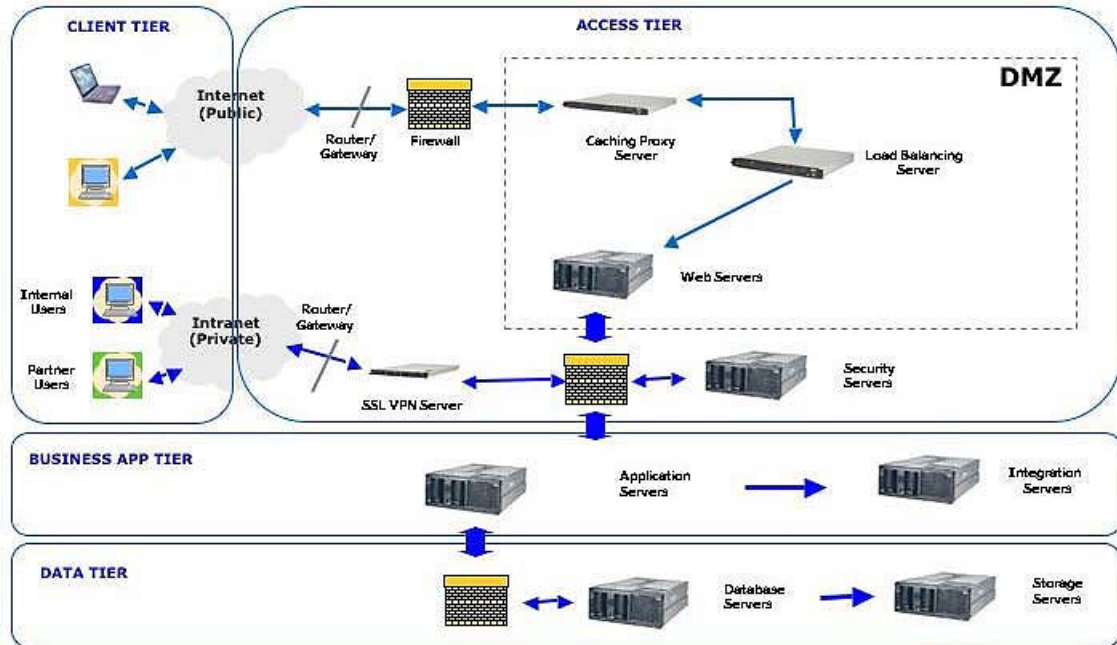


Figure 1 Complex enterprise IT infrastructure requires an integrated, strategic approach to maximize the return on IT investment.

Five Strategies to Maximize Business Value of IT

The following details five key lessons every company needs to internalize in order to master the accelerating rates of change within its enterprise IT infrastructure:

1. Focus on application performance, which is key to productivity – not just speed and robustness

There’s an old maxim that all computers wait for input at exactly the same speed. Too many organizations base their productivity plans on upgrading hardware, with insufficient attention to how applications are being used and managed, which has at least equal importance in terms of overall productivity.

According to an article on InformationWeek.com, a typical IT organization allocates 70-80 percent of its budget for managing existing systems and applications – and a large portion of this expense goes towards maintaining underutilized servers within the enterprise IT infrastructure. What this statistic means is that if a business already has excess capacity, then bigger, faster machines will simply spend more idle time awaiting instruction.



Most productivity gains come from improvements in how users actually interact with interfaces and applications. A well-designed application or service is intuitive and easy to adopt, as well as fast. It leaves a solid first impression – and becomes increasingly valuable to the user over time. Systems that clearly connect applications to people and the real-world processes they need to do their jobs deliver a strong, very direct boost to productivity.

2. *Invest in revenue-generation applications critical to business profitability*

Back-end applications and administrative tools are essential to running an enterprise organization. At the same time, these infrastructure elements do not directly drive commerce functions or support customer needs – which mean they only indirectly contribute to the bottom line. The most productive part of the enterprise infrastructure, therefore, should be the applications that generate the most significant amounts of revenue.

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It would appear that this lesson works at cross purposes. On the one hand, businesses need to invest in new technology to maximize revenue. On the other, most organizations are well aware that their enterprise IT already contains tremendous amounts of unused capacity – or that their legacy systems are perfectly capable of handling ongoing internal transaction processing and other back-office functions, provided they can be adapted to link to the Internet or internal TCP/IP networks.

In fact, the need to keep up with new technology and the need to maximize existing systems are mutually supportive. Organizations that improve back-end and administrative operations by using paid-for hardware in new ways often free up staff and money that can be applied to new infrastructure that more directly affects the bottom line.

3. *Keep score on applications – but only for what's truly important*

Many enterprise organizations depend on performance management applications to deliver real-time insight into daily operations. However, a performance management solution is only effective if its scorecard measures the correct variables on the most appropriate systems.

Too many performance management implementations pull data from everywhere across the enterprise, instead of focusing on the truly essential databases and applications. For example, many security solutions generate alerts for every potential security incident. Multiplied by hundreds – or thousands – of sensors across the enterprise, this huge number of alerts is impossible for administrators to decipher. False alarms draw attention away from critical events, and true crises are often not recognized or investigated until well after the fact.

Successful organizations need to identify what is truly important in terms of both business indicators and IT infrastructure performance. These efforts should concentrate first and foremost on the processes and systems, networks and applications that directly impact the generation and collection of revenue.



4. *Align IT performance indicators with overall business goals*

The ability to standardize operational metrics, align them with high-level business strategy, and then distribute information on actual versus expected results is a powerful tool for improving profitability and performance over time. However, it only works when the IT group understands how interruptions in service affect the flow of performance measurement data – and how to communicate the importance of this linkage to senior management.

For example, proof of regulatory compliance has become a significant responsibility for most companies' IT groups, since IT is ideally positioned to document how data moves through the enterprise. As a result, IT now has the task of gathering critical regulatory performance information – that can also be used to improve operational efficiencies.

IT can use this knowledge of how business processes interact with the network infrastructure to discover which data resources and reporting engines can be virtualized and centralized to consolidate operations, reduce redundant infrastructure and lower expenses. At the same time, that same information can connect high-level business goals with the operational technology and processes that indicate success or failure. This information becomes the foundation for performance management for each individual, workgroup, department and line of business.

5. *Audit, document and protect*

Every enterprise already understands the need for and the complexity of guarding against security threats and generating the audit trails necessary to document regulatory compliance. These processes are well-understood at the network perimeter, where it is reasonably simple to ensure the availability of critical hosts, applications and networks.

Using these controls within the perimeter can be problematic. Most perimeter defenses do not deploy easily, or scale well, on the high-speed and highly-switched environments common inside an enterprise network. Most departments have their own programs for documenting compliance – and these efforts are rarely coordinated with similar efforts elsewhere in the enterprise.

Organizations can now build performance scorecards that measure the success of technological innovation in real-time

Organizations need to carefully coordinate a number of traditionally independent internal operations to truly secure internal online resources, and provide the documentation necessary for proof of regulatory compliance. The IT department is the logical place to centralize these efforts, since everything within an enterprise crosses the IT infrastructure.



The Virtualization Challenge – A Case In Point for IT Value Creation

Virtualization, a rapidly emerging technology, illustrates the complex nature of maximizing the value of new IT investment. At its core, virtualization refers to how one piece of hardware or software can emulate several others. For example, a server might run multiple applications, each on its own operating system, and each appears to the network as if it were running on a separate server and database platform.

The appeal of virtualization is easy to see. New applications or services can be deployed on a virtual machine running on an existing server without requiring a new piece of infrastructure to be configured, tested, hardened and deployed. Organizations can roll out new services much more nimbly and cost-effectively than would be possible using dedicated hardware and software.

The complications of virtualization, especially in the area of performance management, are often less obvious. Very few traditional performance management applications recognize the difference

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between hardware-level monitoring and performance measurement for applications running in virtualized environments. Therefore, IT staff may think that all is well because the virtualization host is working as expected – while a mission-critical virtual application running on that platform has significantly degraded or crashed. Moreover, since multiple virtual machines share the same physical resources, knowing which application is “hogging” the underlying physical resources is important to know, since one misbehaving application impacts the user experience across other applications running on that same server.

Fortunately, application-focused performance management tools that understand the unique demands of virtualization do exist. These software applications provide five essential functions:

1. Discover underutilized infrastructure components (applications, systems, networks, storage) that can be virtualized for more efficient use
2. Monitor the performance of critical business applications running on virtual machines and alert managers before performance or security issues degrade the user experience especially as it relates to the efficient utilization of shared physical resources by applications running on the virtualized layer
3. Link the efficiency of IT infrastructure at the application and virtual machine levels with overall business goals
4. Integrate the management of applications and virtual machines within broader enterprise IT, security and regulatory compliance documentation efforts
5. Understand application behavior in virtualized environments and non-virtualized environments to determine the impact of virtualization on hardware cost savings versus application performance



The careful application of these tools can deliver two very important competitive advantages to the organizations that use them. **First**, these businesses can aggressively adopt an emerging technology that delivers better quality of service at lower cost. The results are a consistently superior user experience, increased customer loyalty and long-standing, profitable customer relationships. **Second**, they can improve both IT's and senior management's ability to measure the performance of applications, processes and technology against their user and/or customer expectations. The correct application of strategy and tools means that business managers and IT staff find it easier to communicate with each other, and the entire organization benefits.

Conclusion

Many organizations already understand that the rapidly accelerating pace of technological change within their businesses must be harnessed if they are to remain competitive. However, they also recognize that previous investments have not been as productive as had been hoped. A significant reason for this disconnect has been that senior management has not understood the IT challenges behind the changes, and IT has not understood how application infrastructure can better measure and support high-level business goals.

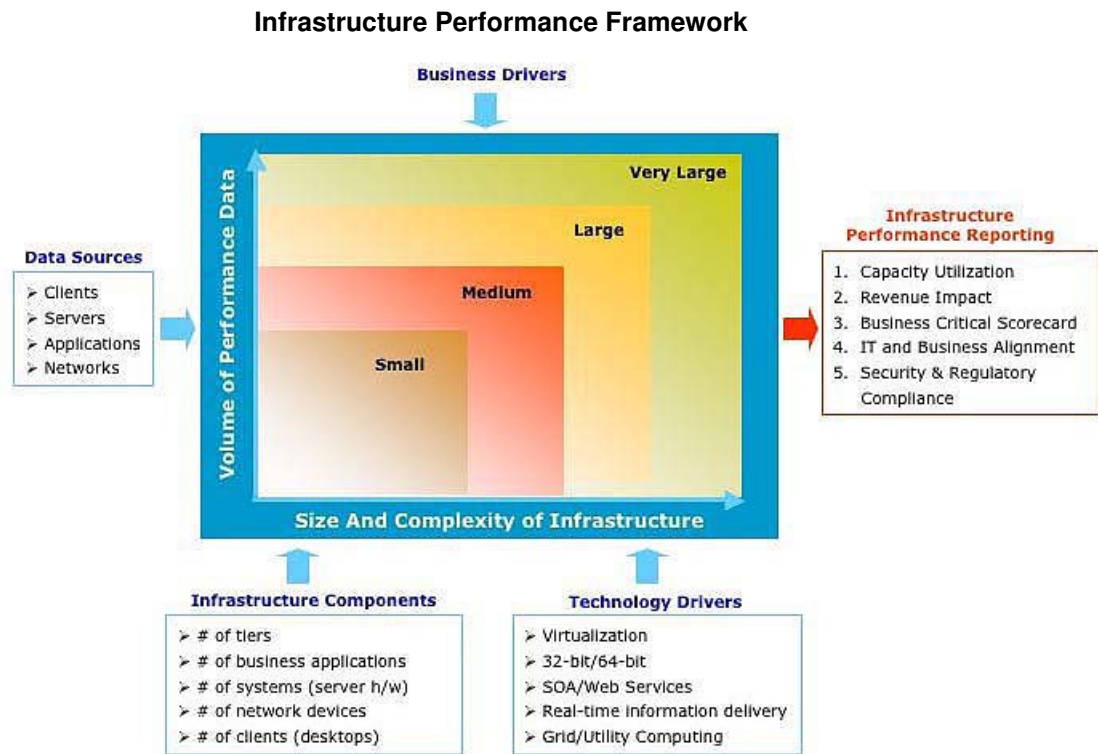


Figure 2 The larger the enterprise, the greater the complexity of the effects business and technology drivers have on maximizing ongoing IT investment.

The careful, comprehensive mapping of business needs to IT infrastructure – and more importantly, to applications – helps alleviate this bottleneck. Newly available performance management tools can help build the business processes necessary to make this transition happen. This combination means that organizations can now build performance scorecards that measure the success of technological innovation in real-time using the following criteria:

- Can we justify the cost of additional server hardware by showing current application and server hardware utilization levels?
- Do we have relevant reports that allow us to make informed business decisions about server consolidation, application utilization, threat assessment, and real-time performance of new technology deployments?
- How closely do our measurements of application performance match our Service Level Promises?
- What is the availability of our revenue-generating applications at any point in time?
- How has our investment in new technology improved end user productivity?
- What do we need to do to align IT and business performance to the goals set in our business scorecards when expectations are not being met?

The overall goal for any business is to ensure that non-IT staff has the tools and information necessary to perform their jobs with as little interference as possible from the limitations inherent in hardware and software. The way to make this happen is to align business goals with IT expenditures. The question is no longer, "Should we adopt these new technologies?" Instead, the challenge is to adopt new technology in an organized, efficient manner that does not disrupt normal business operations, while still being able to understand the impact of the new technology in a production environment. Enterprise organizations that stay in control of the process of moving to next-generation enterprise information technologies will gain the maximum value and business success from their investments.

