

Enterprise computing for small and mid-size organizations



Introduction

There is little doubt that technology capacity spurred innovation, created new efficiencies, and helped drive the nation's economy to new levels of global competitiveness in the past twenty-five years. Analysts predict that this trend to continue into the foreseeable future. What began in corporate environments as opportunistic experiments in desktop computing has evolved into a more orderly and disciplined process—often referred to as “enterprise computing”—for delivering massive amounts of computing power to the desktops of nearly every knowledge worker in the country.

Two critical forces led to the development of a framework known as enterprise computing:

1. As desktop computing became critical to the daily operations of business, protecting the continuity and security of computing services became equally critical.
2. As the cost of desktop computing rose with the proliferation of desktop computers, a set of “best practices” controlling cost came into widespread acceptance.

This enterprise computing framework is now about fifteen years old and serves as a prevailing set of best practices for information technology systems. Economies of scale and the access to resources that large organizations enjoy, have made these best practices commonplace for large corporations. Small- and mid-sized businesses (SMBs)¹ which lack these resources often struggle to obtain these same benefits.

Practices protecting the continuity and security of computing services

The enterprise computing framework identifies four core values required to deliver services to knowledge workers' desktops:

- Availability—resources are available whenever—and increasingly wherever—needed by knowledge workers.
- Reliability—information resources behave in a persistent, predictable and controlled manner
- Security—the source of information is known and trusted; networks and devices are free of external intrusion or internal corruption.
- Scalability—the environment can tolerate unpredictable and often significant increases in demand for information or volume of information.

¹ The term “small- and mid-sized businesses” is used generically, and refers to a range of organizations including business, units of government, and non-profit organizations.

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Best practices for well managed environments

Technology advances continue to refine the definition of best practices for well managed environments. These best practices, both individually and in the aggregate, contribute to lowering total cost of ownership. The following table summarizes high-level best practices—each of which encompasses a number of specific best practices—and maps each to enterprise technology values and impacts.

Practice	Value	enterprise computing impact			
		avail-ability	relia-bility	secur-ity	scal-ability
Servers use current technology design and highest quality components	Improve performance, reduce cost of support	●	●		●
Server virtualization (deploying multiple logical servers to a single physical server) is widely used	Create economies of scales, reduce server operating cost	●	●		●
Network are monitored real-time (7x24), with scheduled, pro-active maintenance	Improve system uptime, support higher productivity	●	●		
Network devices are supported by comprehensive service and support agreements	Ensure continuity of services and a predictable support costs	●			
End-user devices are based on purchase standards and tightly architected configuration standards	Streamlines acquisition costs and lowers ongoing support cost	●	●	●	
Imaging and configuration technologies are used to configure or provide desktop computing	Reduce support costs / relieve performance degradation		●	●	●
Robust physical networking devices and security products are used at all locations	Ensure security as well as reduce risk of data loss	●	●	●	
Remote access is both secure and readily available to authorized users	Provide flexibility without compromising security	●		●	
Data is protected by high-speed, resilient central storage (with comprehensive off-site backup)	Ensure business continuity		●	●	
The network is engineered, documented, and maintained per explicit architectural standards	Provide strategic approach to planning and budgeting	●	●	●	●
Policies and practices clearly identify expectations for end users	Protect stability and reduce legal risk			●	
The network is protected from spam, viruses, malware and external intrusion	Reduce risk of damage or disruption to the environment	●	●	●	

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Managing the cost of enterprise environments

Organizations quickly learned that the significant cost to provide these benefits needed management. Information technology executives adopted the term “total cost of ownership” as a framework for understanding the cost of all activities required to deliver information. Components of total cost of ownership include the following:

- Total lifecycle cost of all hardware and software including acquisition, maintenance, and disposal costs for PCs, servers, printers and other peripherals, networking equipment, etc.,
- The cost of technology professionals who design and manage the networks in which PCs participate, whether employed or outsourced through service providers
- The cost of technology professionals who provide on-going services to users, including help desk staff and other related resources, whether employed or outsourced through service providers.

Gartner Research, the global leader in information technology research² has developed a long-term model identifying the total cost of ownership for enterprise PCs, that is, an environment that protects the core values of availability, reliability, security and scalability. That model, first built in the late 1990s using quantified data from a broad mix of respondents, and updated regularly since that time, has demonstrated that *information environments that are well managed and tightly controlled reduce the cost of enterprise computing by 38%*. The following chart summarizes recent findings:³

Total Annual Cost of Ownership for Enterprise PCs

	Unmanaged	Well managed
Direct expense (product acquisition and management expense)	\$1,931	\$1,722
End-user support cost	2,655	1,123
Total annual cost of ownership	\$4,586	\$2,845

Gartner’s detailed model, which includes 22 separate components of total cost of ownership, shows that *80% of the cost savings (\$1,386 in annual savings) comes from fixing things that go wrong*. In other words, optimizing technology spending calls for reducing unanticipated labor and service expense.

² Gartner Research is a publicly-traded company founded in 1979, which provides independent analysis and research to over 10,000 corporations globally. Research accounts for 75% of their \$1,000,000,000+ in 2009 sales, with consulting and education making up the remainder.

³ Gartner Core Research Note G00159622 (August 2008)

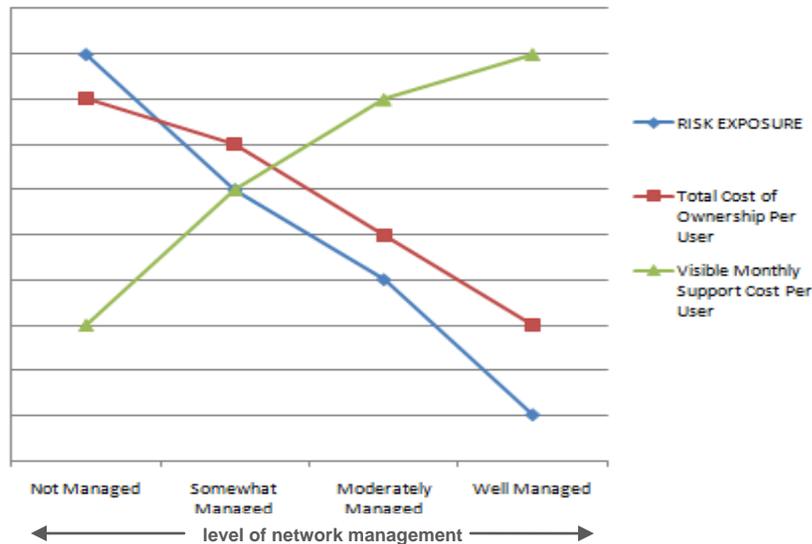
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Two important cautions apply to interpreting this data:

- Many organizations achieve a lower cost of ownership by sacrificing some or all of enterprise technology’s core values, namely availability, reliability, security, and scalability. For example, building out and managing a secure network is always more expensive than building out and supporting an unsecure network)⁴. The Gartner model assumes that achieving these four values is a business *requirement*.
- The lower overhead and simpler operating structure that characterizes SMBs (fewer than 1,000 employees) likely translates into lower cost of technology ownership. We estimate that the expense figures in the Gartner model are reduced by about 25% in smaller environments. This assumption reduces the annual savings for these enterprises—assuming a well managed environment—to approximately \$1,306 per device.

The total cost of ownership has to be clearly understood for organizations to derive the highest value from their technology investment (that is, achieving the desired outcomes while managing the overall expense). Long-term research on total cost of ownership demonstrates an interesting paradox associated with this finding: visibility of total cost is inversely related to total cost of ownership and technology-related risk. That is, understanding the total cost of ownership increases an organization’s chance of reducing its total cost of ownership as well as its operating risk related to technology. These relationships can be illustrated as follows:



⁴ Increasingly, requirements for enterprise values are mandated by the external environment as well as required for meeting internal business drivers. For example, requirements to comply with HIPAA or PCI standards can only be met using most of the criteria for what Gartner describes as “well managed” networks.

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“Cloud-based” technology models

The term “cloud computing” has recently emerged to describe internet-based computing solutions in which shared servers provide resources, software, and data to a computers and other devices on demand. Cloud computing is a natural evolution of a number of recent technologies, like virtualization, which have become commonplace in well managed information environments. Users of cloud computing are insulated from the complexity of the technology infrastructure in the internet-based “cloud” that supports them. And organizations that rely on cloud computing are also insulated from the demands of managing those resources.

While the components of cloud computing have been in place for years, the pervasive hype around cloud computing has escalated sharply in the last two years. SMBs will need to look beyond the explosion in hype that surrounds this technology to make careful decisions about the degree to which cloud computing strategies can best support their technology needs. In general, cloud computing involves two primary forces:

- **Software as a service (SaaS):** provision of software as well as its supporting infrastructure and related services by a provider which sells the right to use the software to its customers. Those customers typically pay monthly fees based on some measure of volume, such as number of users, number of transactions, volume of data stored, etc. *SalesForce.com* was an early and widely noted success story in the SaaS technology model.
- **Infrastructure as a Service:** provision of servers and physical networking by a provider which sells the right to use those devices (or virtualized devices) to its customers. Those customers typically pay monthly fees based on volume and/or usage metrics.

Outsourced cloud computing offers new opportunities for smaller organizations to gain the benefit of the more tightly controlled and well-managed environment which has been identified as the lowest-cost solution for achieving the benefits of enterprise computing:

“Smaller enterprises can have large enterprise capabilities by taking advantage of the lower financial and technical barriers to entry that the cloud offers. Smaller enterprises should take advantage of compelling opportunities in infrastructure-as-a-service. Take advantage of lower financial and technical barriers to entry to accomplish what otherwise would be cost-prohibitive. Evaluators and implementers save up front capital cost savings and rapid deployment are strong positive reasons for adopting cloud solutions.”⁵

Cloud strategies also offer profound benefits for organizations that have high need to support mobile users, or which deploy technology across multiple locations. At the same time, cloud computing places higher demands on the skills and capacity of knowledge

⁵ *Select the Right Cloud Infrastructure Service Partner*, InfoTech Research Group (June 2010)

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workers who use cloud-based technology. Organizations whose work force does not include that level of sophistication will need to consider carefully how users are supported in those environments. In such organizations, growing reliance on cloud strategies may also create new pressure on end-user support.

Impact on technology spending

As organizations become more reliant on the benefits of enterprise information values, they will inevitably make a shift from a less managed technology environment to a more managed environment. Three key shifts in spending tend to accompany this transition:

1. Both capital investments and operating expense become more predictable, regular and manageable.
2. Visible and measurable cost of ownership increases while invisible and unmeasured cost of ownership decreases.
3. Increases in controlled expense correlate to a marked increase in quality and marked decrease in risk (corollary to the second shift, above).

Conclusion: implications for SMBs

Current research shows that SMBs increasingly expect technology to fuel improved performance⁶. These organizations' dependence on information technology resources will continue to grow. However, SMBs face two significant barriers to achieving the benefits of enterprise information environments:

- their relatively smaller scale makes it difficult to achieve the economies of scale cited in best practice models (that is, models that identify how to control the cost of achieving enterprise computing values)
- their relatively smaller scale makes it difficult to fund the salary expense of internal resources to design and support well managed technology environments (even if salary requirements can be met, attracting, retaining and managing this level of information technology talent is seldom feasible for SMBs).

The persistence of these two barriers suggests two important trends for the foreseeable future

- outsourcing and reliance on third-party service providers will continue to grow
- cloud computing's service-based models, including "software as a service" (SaaS) and "infrastructure as a service" will continue to grow.

Best-performing SMBs will succeed at exploiting these trends to achieve the benefits of enterprise computing at a favorable cost.

⁶ 2009 Microsoft SMB Insight Report (March 2009), which in turn is based on market research conducted by TNS Global and AMI Partners