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Research

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Achieving Agility: The Data Center Is the Foundation

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The Agility Angle: Operational efficiency and overall cost reduction are important factors in today's data center. However, as the world becomes more connected (vendors to customer, partners to each other, information workers to each other and so on), the ability to react with speed and flexibility is growing in importance.

Key Findings

- Agile data centers will: manage the balance between speed and operational efficiency; understand their enterprise and its requirements; become agile where the enterprise requires it; measure agility improvements; and focus on agility through changes in technology, process and people.

Predictions

- Agility elements will become measured critical success factors for the majority of large data centers by 2010 (0.8 probability).

Recommendations

- It is critical for IS organizations to understand the current and future needs of their customers, anticipate them wherever possible and design IT infrastructures with change in mind, to ensure they can handle the unexpected. IS organizations should have strategic plans in place that include agility improvements — which also means that agility should be measured. IT customers need to be involved in this process. Ultimately, agility requirements are determined — and valued — by the enterprise.

ANALYSIS

Agility is the ability of an organization to sense environmental change and respond efficiently and effectively to that change. However, no organization will be agile if its data center and infrastructure aren't. Gartner's real-time infrastructure vision sees future infrastructure shared across customers, business units or applications, where business policies and service-level agreements drive dynamic and automatic optimization of the IT infrastructure, reducing costs while increasing agility and quality of service.

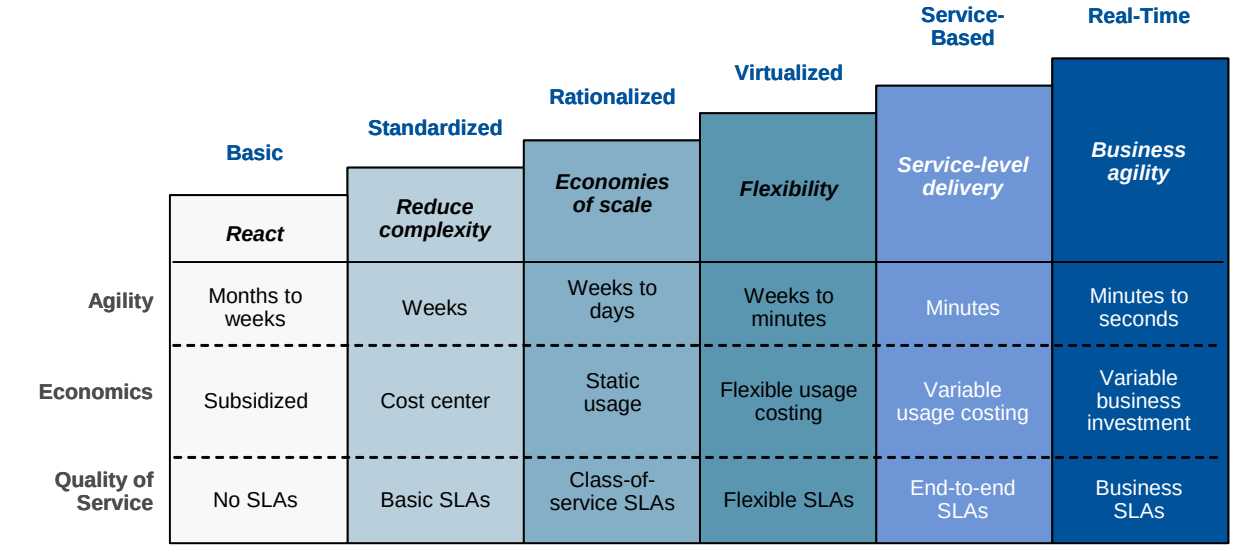
Speed and agility are not the same thing. Reacting with speed may solve a tactical problem, but it may also cause strategic efficiency issues (for example, the dot-com bubble followed by the bust). *Speed* and *operational efficiency* are often at odds with each other. An operationally efficient data center will standardize and eliminate exceptions; uncontrolled speed creates exceptions. Agility is the right strategic balance between speed and operational efficiency. An agile data center is designed to handle exceptions effectively, but also to learn from exceptions to improve standards and processes. A successful IS organization will be able to manage the balance between speed (which the business needs and which helps the business grow) and operational efficiency.

To achieve that balance, there must be a full understanding of the enterprise and the market/competition/trends that affect the enterprise, now and in the future. An IS organization that does not understand the enterprise will naturally gravitate toward operational efficiency. An IS organization that understands the enterprise will focus on agility where agility is needed. Not all areas of IT may need to be agile — agility investments should only be made in areas that make business sense. The IS organization and the enterprise should be aligned on where those agility investments should be made.

The Infrastructure Maturity Model

Improving agility (to the level required by the enterprise) should be a measurable goal of an infrastructure strategy. Gartner's infrastructure maturity model, shown in Figure 1, provides a blueprint for a strategic plan that delivers specific agility benefits at each stage.

Figure 1. Gartner's Infrastructure Maturity Model



SLA = service-level agreement

Source: Gartner (April 2006)

Standardized. In a standardized structure, asset ownership is centralized, and infrastructure life cycle standards are in place (there is a management process for data center assets from procurement to retirement). Processes are shared throughout the IS organization. The process for acquisitions and deployments is faster and more streamlined, and the IS organization can respond more quickly to business requirements.

Rationalized. In this structure, locations, assets and workloads are rationalized to a pragmatically manageable number. Consolidation occurs where it improves operational efficiency and flexibility. It is possible to reallocate assets without physically moving them (between data centers), and there is improved flexibility to roll out changes rapidly.

Virtualized. Here, asset capacity is pooled, and service-level agreements and chargeback are flexible and can be changed dynamically. It allows the IS organization to manage physical capacity independently from immediate enterprise needs — for example, deployment of a virtual server running a new application can take days, rather than the weeks or months required to acquire and certify a new physical server. Physical capacity can be added asynchronously for immediate user needs. In other words, capacity planning is holistic, as opposed to one application at a time. Virtualization creates a new opportunity for the business — to use (and pay for) IT assets on a variable and much more agile basis.

Service-Based. In this structure, business services are managed and charged holistically. When the enterprise requires a change in service levels, the IS organization can respond much more quickly. While a virtualized data center is a pool of flexible resources, a service-based data center can effectively manage how specific services use that pool, and ensure that the enterprise is charged-back for that dynamic capacity.

Real-Time. In addition to being service-based, resources are balanced between services on a dynamic basis, based on business policies and priorities. If business priorities change quickly, a policy-based infrastructure can respond by automatically moving resources from less-critical business services.

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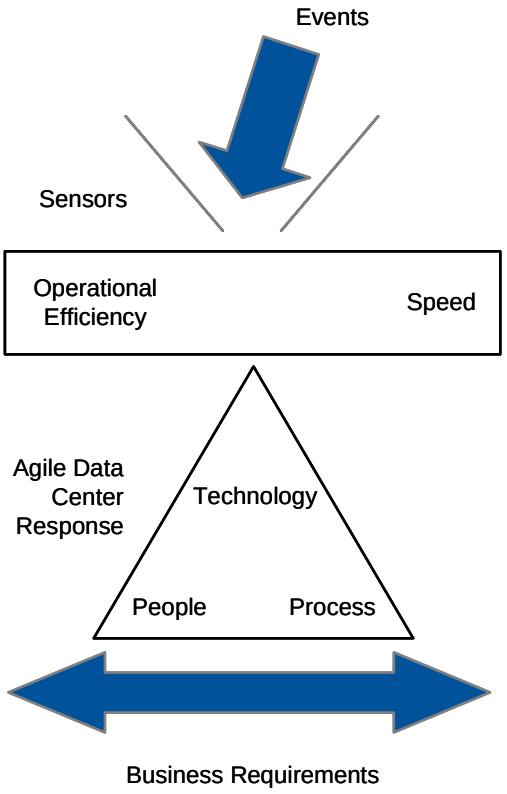
The Agile Data Center

But how should agility be measured? Ultimately, it should be measured in a way that makes sense to the business — time and cost to deploy a new service, to roll out a new capability, to eliminate an old service or to react to changing business requirements. These kinds of measurements need buy-in from the enterprise as well as the IS organization. Within the data center, each of these business-related measurements should be broken down to internally meaningful measurements — for example, the time and cost to deploy new servers, to install new software or to fix a problem. This requires process definitions, process standardization, process measurements and monitoring, so that you can continuously improve processes and become more agile (see "Achieving Agility: The View Through a Conceptual Framework").

Agility is not just about responding to change efficiently and with speed — it is also about sensing that change (see Figure 2). From a speed perspective, the ultimate goal is to reduce the response time to near zero. The most efficient way to do that might be through an event-handling script, or it might be through effectively sensing precursor events before the event occurs. At the macro-level, this means staying in touch with the enterprise environment (knowing, for example, that a major sales event is about to take place, or that competitive pressure may change technology use — see "Achieving Agility: Information Access Essential to Understanding Your Business"). At a micro level, this means identifying precursor events (before a hardware failure, for example). Improving agility requires asking the questions: could this have been predicted, and what can I change next time to sense this kind of event before it occurs? Improving data center agility requires a combined effort in three areas: technology, process and people (see Figure 3).

Figure 2. The Agile Data Center



Source: Gartner (April 2006)

Technologies. Virtualization is a key technology in servers, storage and networking that gives the IS organization much more control over how resources are allocated. Automation and resource governance tools — and ultimately, service governance technologies — provide automated response capability to change (using virtualized resources effectively). There are a number of industry technology initiatives to improve the intelligence and self-management of IT (such as IBM's Autonomic Computing and On Demand, Hewlett-Packard's Adaptive Enterprise and Microsoft's Dynamic Systems). However, many of these technologies are still at the drawing board, or very immature, and will be evolving over the next 10 years. IS organizations should monitor technology developments closely, and use those technologies that can prove a rapid return on investment. Most importantly, having and maintaining a strategic plan for infrastructure technology is critical. Technologies are rapidly evolving, and successful IS organizations will ride the wave — they won't be left behind, and they won't crash ahead of the leading edge.

Processes. Operational frameworks like IT Infrastructure Library (ITIL) provide the backbone for operational efficiency. The starting point for IS organizations is process definitions and standardization. But an agile process culture is critical. Agility requires that processes be designed for change. Every time an exception is handled, the process should be examined — could the event have been sensed earlier? Were there any steps in the process that could have been streamlined or eliminated? Should a new process be created? An agile data center requires more than just standard and efficient processes; it requires agile and evolving processes.

People. While technologies and processes can create the foundation for a more agile data center, ultimately it is the people, culture and organization that will make it work, and those that handle the more strategic and critical exceptions and events. Important factors include awareness of everyone's role in delivering agility to the enterprise, buy-in, feedback, career growth and involvement in the process. While operational efficiency is ultimately about cost reduction, agility is about increasing the value of IT, which should also mean increasing the value of IT personnel to the enterprise.

Figure 3. Transforming Infrastructure With the Infrastructure Maturity Model

	People	Process	Technology
Standardized	• IT owns assets • Processes and tools are shared	• Infrastructure life cycle standards • Basic SLAs • Event management	• Standard configurations • Tools to monitor assets
Rationalized	• Organization structure and ownership rationalized across IT	• Mature and integrated systems management processes	• Integrated systems management tools • Consolidated assets
Virtualized	• Organization aligned to holistic asset usage	• Holistic capacity management • Flexible chargeback	• Servers, storage and network capacity is virtualized
Service-Based	• IT organization aligned to service delivery	• Measure, report and guarantee end-to-end services	• Service management tools manage end-to-end
Real-Time	• IT proactively influences use of technology to drive business	• End-to-end services are centrally managed and balanced	• The business has direct interface to service prioritization

SLA = service-level agreement

Source: Gartner (April 2006)

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Bottom Line

Agility is a critical success factor for data centers, and is becoming more important as agility grows as an overarching business requirement. Data center agility requires a successful balance between operational efficiency and speed — determined by business needs, and constantly evolving to deal with change. When considering agility, the following key points should be borne in mind:

1. **Align with the business**. Where is agility needed; and where is it not needed? Stay in touch, and sense business changes early that may affect IT, or where IT can make a difference.
2. **Build a strategic plan that includes agility improvements**. Gartner's Infrastructure Maturity Model provides a blueprint. Agility improvement is a combined effort in technology, process and people.
3. **Measure agility improvements**. Do this in a way that makes sense to the business, but can also be broken down into meaningful IS activities.
4. **Agility should be built into the IT architecture**. This should be built in from the top to the bottom — including the concept of sensing change/exceptions as early as possible.
5. **Technologies are rapidly evolving**. Successful IS organizations will ride the wave appropriately.
6. **Processes must be agile.** Process definitions and standardization are the starting points, but processes must also be designed to evolve.
7. **Don't forget the people side**. Buy-in, awareness, feedback, involvement and career enhancement are all critical. Ultimately, agility in IT enhances the value of IT — and IT professionals — to the business.

This research is part of a set of related research pieces. See "Defining, Cultivating and Measuring Enterprise Agility" for an overview.

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