

Government Matters

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GIS for State and Local Government

Powering Up Your Enterprise GIS

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One of the greatest challenges faced by GIS managers is minimizing or controlling costs while increasing GIS use within the organization. However, this goes against common IT logic that posits increasing applications, and users will increase the IT infrastructure and support costs.

However, GIS managers are a fearless group. To increase the cost/benefit of GIS technology, they relentlessly pursue lower costs. Because IT infrastructure and support can represent one-third of a GIS organization's budget, reducing and controlling this cost component is strategically important.

Understand Cost Drivers

Before discussing how to minimize costs, GIS managers should review what causes IT costs to increase. Understanding these cost drivers will help identify the most effective cost saving strategies. Common GIS drivers include

- Lack of standards for the GIS system and supporting infrastructure
- Increases in the number of ambitious users accessing the GIS system
- Increases in the number of applications supported by the GIS system
- Increases in complexity of the spatial processing performed by the GIS system
- Increasingly complex system environment for enterprise GIS (four-tier architecture)
- More large databases that manage vector, orthophoto, GPS, DBMS, ArcSDE, and other data
- Changes in hardware platform, either devices and/or architecture
- Changes in software products and platforms
- Integrating GIS with other business systems

- Maintaining legacy systems
- Maintaining multiple GIS products and versions
- System security considerations (i.e., viruses, firewall attacks, and hackers)

These cost drivers increase the number of servers, add complexity to the system, add software license costs, and require expert (expensive) system support. GIS managers must make a continuous effort to investigate ways to mitigate these budget ballooning effects.

Reducing or Controlling IT Expenditures

Creative GIS managers have found ways to optimize system configurations and control IT expenditures. In the budgeting process, whether for commercial or government organizations, capital expenditures for IT are expensive and difficult to fund annually. Even armed with metrics that justify these budget increases, no GIS manager wants to constantly explain increases to the budget and finance director. The following strategies can help manage GIS IT budgets.

Establish and Manage Standards

This applies to software, hardware, GPS equipment, and any other GIS component. Managing and supporting different GIS software systems on different hardware will add complexity, increase system support, and slow applications development.

Simplify GIS Software Architecture

The GIS vendor's job is to make new software and versions, but maintaining and supporting multiple versions of a software product or multiple software products that do the same thing is very costly. Consolidating an organization's

GIS software products will reduce software maintenance costs and, more important, the time required to manage these products.

Time the Purchase of New Servers

Servers should be on a regular four-year replacement cycle. Additional capacity should be added only when system performance is poor. Be sure the implementation of new GIS applications does not lag behind hardware purchases. When many servers are replaced, consider phasing purchases across two budget cycles to limit the impact on any single year.

Require User Departments to Purchase Servers

If new GIS applications serve a specific departmental business purpose, request that the department put the capital expenditure in its budget rather than the GIS budget. Departments can also proportionally share the costs of a new server, which will lower their cost while increasing GIS capacity for their department.

Instead of Purchasing, Lease Equipment

It seems like a never ending story—purchasing servers, then replacing them four years later. New versions of operating system and application software drive hardware upgrades and replacements. Leasing is one strategy that avoids the budget spikes caused by capital expenditure for servers. Vendors typically require from 3 to 50 percent above the purchase price for a three- to four-year lease. These rates should be negotiated with competing vendors. Planning and budgeting for an annual lease is easier and results in a lower yearly expenditure for hardware.

Use an ASP for Public Web Sites

Because it is often difficult to predict usage, managing public Web sites can be challenging. A popular application may consistently have a high level of use or may be used seasonally. Public Web sites are prone to hackers and viruses, which increase system support costs. For Web sites that do not access a large, internal, enterprise database, consider hosting the application at an Application Service Provider (ASP) rather than purchasing more servers, equipment, and support for public services. There are GIS knowledgeable ASPs that charge rates based on the level of use. This strategy saves staff support time, lowers hardware and software costs, and provides flexible capacity that would be difficult to purchase.

Negotiate Master Purchase Agreements

To save time and avoid yearly arguments with

software vendors, consider negotiating a master purchase agreement for GIS software that addresses new software products and yearly software maintenance on existing products.

Implement Server Consolidation

Address all cost drivers at the same time with server consolidation. Server consolidation reduces the number of devices while increasing capacity and reducing complexity. This can be accomplished using the new blade technology from vendors such as IBM and HP. Each blade has two CPUs and each machine has seven blades for a total of 14 CPUs per machine. Compared to an eight-way server configuration, the blades are scalable and more flexible.

Summary

There is more to managing GIS infrastructure costs than just keeping costs as low as possible.

For budget directors, the goal is predictable costs over time that can be justified by the good use of technology. To end users, the goal is lower costs with the highest level of system availability (i.e., processing capacity). These strategies can help a GIS manager keep costs in control, establish a predictable yearly cost without budget spikes, and provide processing capacity at the lowest cost. These approaches can be applied to a small and growing GIS or a large enterprise GIS. Take the time to understand what is driving hardware costs and implement strategies that will provide better budget management.

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