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The IT Budget Comes of Age

By Gene Kern
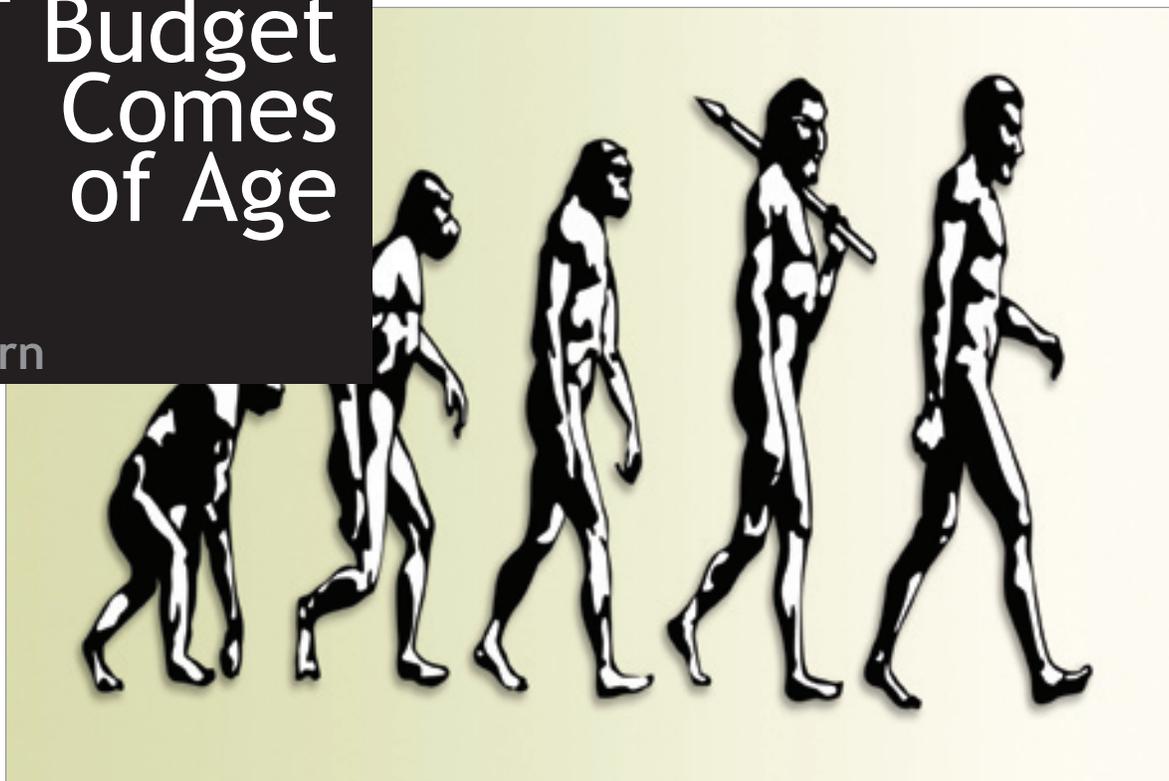
As the role of the IT department continues its evolution into that of a true business unit with high visibility and bottom-line responsibilities, the IT budget process needs to evolve as well. No longer is it acceptable for the IT budget to simply keep the lights on. The data center manager needs to be a planner, forecaster and a prominent contributor to the company's long range planning process.

NOT long ago, the IT budget was a single number born from a black box, out of sight and out of reach from business management. The fact is, even today, many companies still do not properly plan IT budgets, especially for required data center upgrades.

As the role of the IT department continues its evolution into that of a true business unit with high visibility and bottom-line responsibilities, the IT budget process needs to evolve as well. CIOs are required to make certain that the infrastructure can always deliver on the service level agreements (SLAs) demanded of the data center's users. In this pursuit, three requirements are of prime concern: availability (what level of downtime is tolerable); data center density (proper power is delivered to the proper area at the proper time); and business objectives (SLAs in the short-term, growth and expansion goals long term).

The ability to deliver on agreed on SLAs has become a competitive differentiator for many companies. As a result, data center performance is now at the forefront in overall strategic planning. To be successful, data center managers require a new skill set. No longer is it acceptable for the IT budget to simply keep the lights on. The data center manager needs to be a planner, forecaster and a prominent contributor to the company's long-range planning process.

As Gartner suggests, the time is now for black box IT spending to advance to a higher level of sophistication that enables the IT budget to provide oversight, transparency and direction for the information services department. As defined by Gartner, oversight is the supervision of the budget; transparency is how much budget information is communicated to the business managers, and direc-

tion encompasses control (what is allocated where?) and expectation (what needs to be accomplished?).

Hurdles to Clear, Barriers to Move

Numerous, varied challenges face the data center manager in pursuit of the creation of a budget that addresses short-term operating expenses and long-range capital expenditures. Many can be traced to past practices that have been made obsolete by technological advances. Others are the result of insufficient skill sets. And still others continue to surface as the role of the data center focuses more on contributing to the company's overall profit picture.

Focus on the Big Picture

IT management has conventionally budgeted for the short-term, giving emphasis to items like applications and patches. Anything longer term such as server replacement, the introduction of new technologies or density demands on the data center are given far less consideration until they become a problem. While maintenance costs are normally accounted for in the annual budget, little or no emphasis is placed on the far bigger issue of TCO, which would prompt a buy/no-buy decision on the purchase price, plus take into consideration the cost of installing, maintaining, powering and operating the equipment component.

The Devil is in the Details

One trait these single-number budgets have in common is lack of sufficient detail, or granularity. Contributing to this failing are widely diverse lifecycles of the numerous components that comprise today's data center infrastructure. Likewise, consulting engagements and service and maintenance contracts also exhibit lifecycles that need to be determined and factored into the budget.

Extensive Underutilization

And then there is the hard fact that most data centers were grossly oversized at the design stage. This practice has commonly resulted in a 50 percent or less utilization of the physical plant and power infrastructure. The result is a surplus of both capital and operating costs that the data center must absorb. The data center manager needs to factor this existing excess capacity into future planned expansion, which

adds more complexity to the budgeting and forecasting exercise.

Underutilization in the data center does not end there. It has been estimated that the typical server operates between 5 percent and 30 percent capacity. This results from the common practice of running only one application per server. Data centers have become server farms that place a wasteful burden on the power and cooling density, floor space, cabinets, enclosure, racks and trays, as well as maintenance contracts, cost of software distribution, patches and upgrades.

Fortunately, technological advances in server consolidation practices, including virtualization, allow for the replacement of hundreds of these commodity servers with one or two high-capacity enterprise servers. To achieve optimum cost-effectiveness, the IT manager needs to budget for the implementation of these practices to eradicate the costly effects of server sprawl.

Support of Business Objectives

The overriding purpose of the data center is to serve all stakeholders, both internal and external. This requires that the capacity and availability of the data center's infrastructure operate at a level sufficient to meet those all-important SLAs. Differing component lifecycles, again, add to the complexity of creating the IT budget.

Regulatory Acts

With few exceptions, government regulations placed on corporate America impact the IT department and data center. The need for real-time retrieval of information, from new or greatly expanded databases that seem to grow exponentially, place tremendous burdens on IT management and staff. Consider just two such enactments: the Sarbanes-Oxley Act and the Health Insurance Portability and Accountability Act (HIPAA). It's not too difficult to imagine the impact each has had on the necessary acquisition of new storage equipment, servers, increased network security, power, maintenance, staff and floor space. IT budgets need to include the required resources to accommodate such enactments as they come along.

Budgeting for the Data Center and IT Department: Best Practices

In the short- and long-term, data center expenses need to be allocated to three basic categories: the facility, the technology infrastructure, and manpower (staff and/or outsourcing).

The Facility: Plant and Supporting Services

Planned expansion to support normal growth will require adequate space requirements that include a sufficient, conditioned computer-grade environment to house all of the IT platforms necessary to meet future SLAs. This exercise depends on fairly accurate estimates of the varying lifecycles of the plant's power components, since replacement costs for these are often large and part of the capital budget. While buildings are normally built to last 30 years, HVAC systems could require major overhaul, if not replacement, between 20 and 30 years. Data centers are designed for about half that time before reaching obsolescence.

The Technology Infrastructure

When determining the expected lifecycle of infrastructure components, the issue becomes more complicated. Technological advances often shorten the life of servers, storage equipment, routers and the like. For instance, when a piece of equipment costs more to maintain and power than the cost of replacing it with a more efficient machine, the budget needs to have room for such contingencies.

Server operating system licenses, application software licenses, and the series of patches, service packs, interim fixes and maintenance contracts need to be addressed in the budget. The company-wide distribution of new software or upgrades to existing software presents a logistics nightmare if not planned for properly in the budget. Outsourcing such a task could make more economic sense than allocating staff. The more options that need to be considered, the more granular the budget needs to be.

Manpower

Although data centers are required to deliver more services, staffing requirements do not necessarily increase. In fact, advances in both server and server

management technologies, known as auto-nomics, have yielded server capabilities, including predictive health monitoring and self-healing of the server environment. This technology actually allows more systems to be managed by smaller staff. On the flip side, the rapid evolution of data center responsibilities have blindsided many IT managers who find themselves inadequately trained to perform their new duties. A one-stop gap solution is to budget for outsourcing engagements to consulting firms with vast experience in their particular area of expertise.

Business Objectives and Service Level Agreements

Of paramount importance to the budget process is consideration of the level of services the data center will be required to deliver to help achieve the company's business objectives. Which processes are mission critical? How much downtime can be tolerated? What level of redundancy or backup will be necessary? These are the issues that the data center manager needs to address. Answers to these questions will profoundly impact the budget. Key attributes of the infrastructure components that will need addressing include reliability, availability, scalability and serviceability.

Reliability refers to the ability of infrastructure components to deliver the level of service on a consistent basis for which it was designed. While business managers and users often request or even expect 24/7 availability, the very steep cost curve associated with delivering high availability mandates a realistic assessment of a more reasonable availability rate. Anticipated planned downtime for scheduled maintenance plus contingencies for system failures impacts this assessment.

Redundancy is a strategy that will

prevent, or at least mitigate, the effects of unplanned outages. Budgeting for the purchase of backup equipment along with installation and maintenance is required. And once again, a lifecycle analysis of equipment that will be, for the most part, offline much of its life makes the budgeting process a little more problematic. An extension of the availability assessment is planning for disaster recovery and business continuance in the event of a catastrophic event. Major initiatives that often include offsite, remote redundancy of backup equipment will greatly impact budgetary requirements and spawn yet another round of lifecycle analyses.

Scalability pertains to the capability of the data center to increase output to accommodate increases in SLAs without major equipment replacement (unless technological advances make that option cost-effective). Increasing output can be accomplished by a scale-out or scale-up strategy. Scaling out simply involves the coding of applications to run across more 1U pizza box servers.

Scaling up requires the addition of more processing power to existing symmetric multi-processing servers. Of course, this could only be an option if previous budgeting and lifecycle analysis determined that a few powerful enterprise-class servers were more cost-effective than a data center full of commodity servers. Whether scaling up or out, a comprehensive strat-

egy is required that involves detailed cost and lifecycle analyses, forecasting adjustments to power and cooling levels, all while containing costs.

Serviceability simply measures the ease by which equipment can be maintained and put back into service should a failure occur.

A final attribute that should be a goal of every IT manager is simplicity. The benefits of keeping it simple are significant. Equipment failures resulting from human errors, the most common cause of unplanned downtime, will be minimized. Simplicity also reduces implementation costs and allows for easy monitoring, manageability and maintainability of hardware and software.
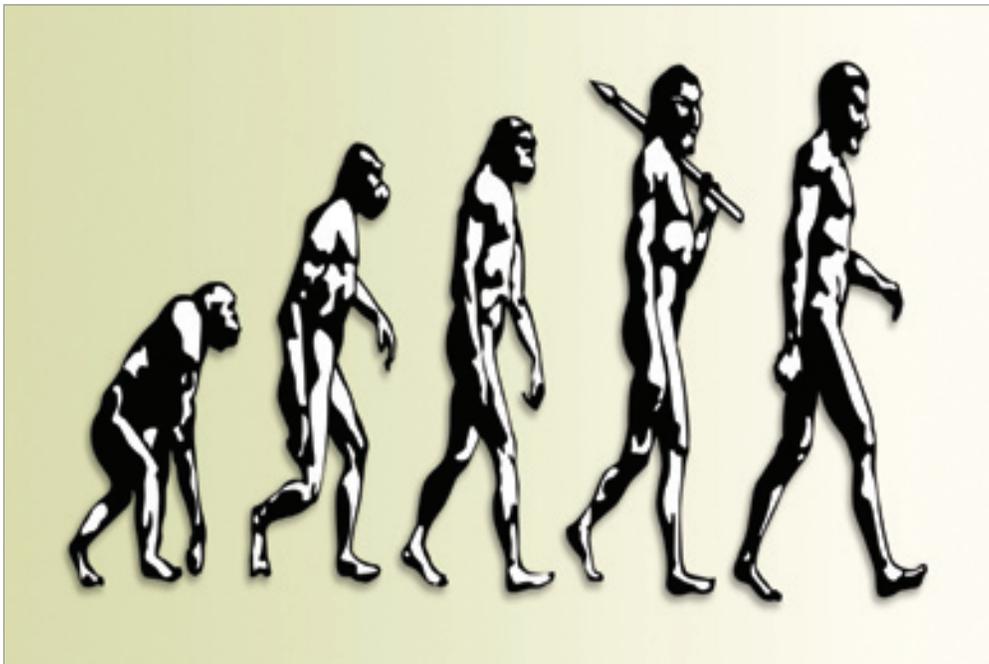
Core Competencies Required for Effective IT Budgeting
To properly forecast the necessary resources for short-term operations, as well as for long-range forecasting of data center performance, a diverse skill set is required, including but not limited to:

• Project Management
• IT Assessment and Remediation
• Business Continuity Planning
• Disaster Avoidance/Disaster Recovery Planning
• Technology Design and Implementation
• RFP Development and Vendor Selection

IT managers have the option of staffing up to obtain these capabilities, or they can outsource to a provider experienced in projects encompassing the required skills.

Effective IT budgeting needs to have a two-fold focus:
1. To align IT spending with the overall business strategy

"THE RAPID EVOLUTION OF DATA CENTER RESPONSIBILITIES HAVE BLINDSIDED MANY IT MANAGERS"

2. Prioritize IT investments in conjunction with, and compatible to, the company's business goals.

Budgeting for the short-term (the next fiscal year), as well as keeping an eye on technological advances that could influence the operation and efficiency of data centers of the future are essential. A direct effect of technology breakthroughs is the need to quickly upgrade major systems well before reaching the upper end of normal lifecycle terms.

The remainder of the IT budgeting effort is not unlike any other department's budgeting process; IT personnel take inventory of existing systems, factor in the growth projections, evaluate required equipment and services upgrades, purchases, improvements and corresponding lifecycles, identify any financial limitations, and finally correlate if IT will be in a position to support the business strategy, help achieve business objectives, and meet or exceed SLAs.

Data center managers need to adopt a commitment to maximizing ROI, which requires a thorough understanding of true lifecycle costs (See Figure 1). Ultimately, the new role of the data center manager requires the ability to identify the components of lifecycle costs and have access to the proper tools to improve the accuracy of these estimates. While climbing the learning curve of budgeting for ROI, outsourcing much of this process is a viable and often cost-effective option.

Resources:
2006 Gartner, Inc., "New Math for the IS," CIO Signature Series, June 2006.

2003 American Power Conversion, White Paper #37, Rev. 4, "Avoiding Costs from Oversizing Data Center and Network Room Infrastructure."

"Tie Your IT Budget to Business Strategy," Gomolski, B. *ComputerWorld*, August 21, 2006

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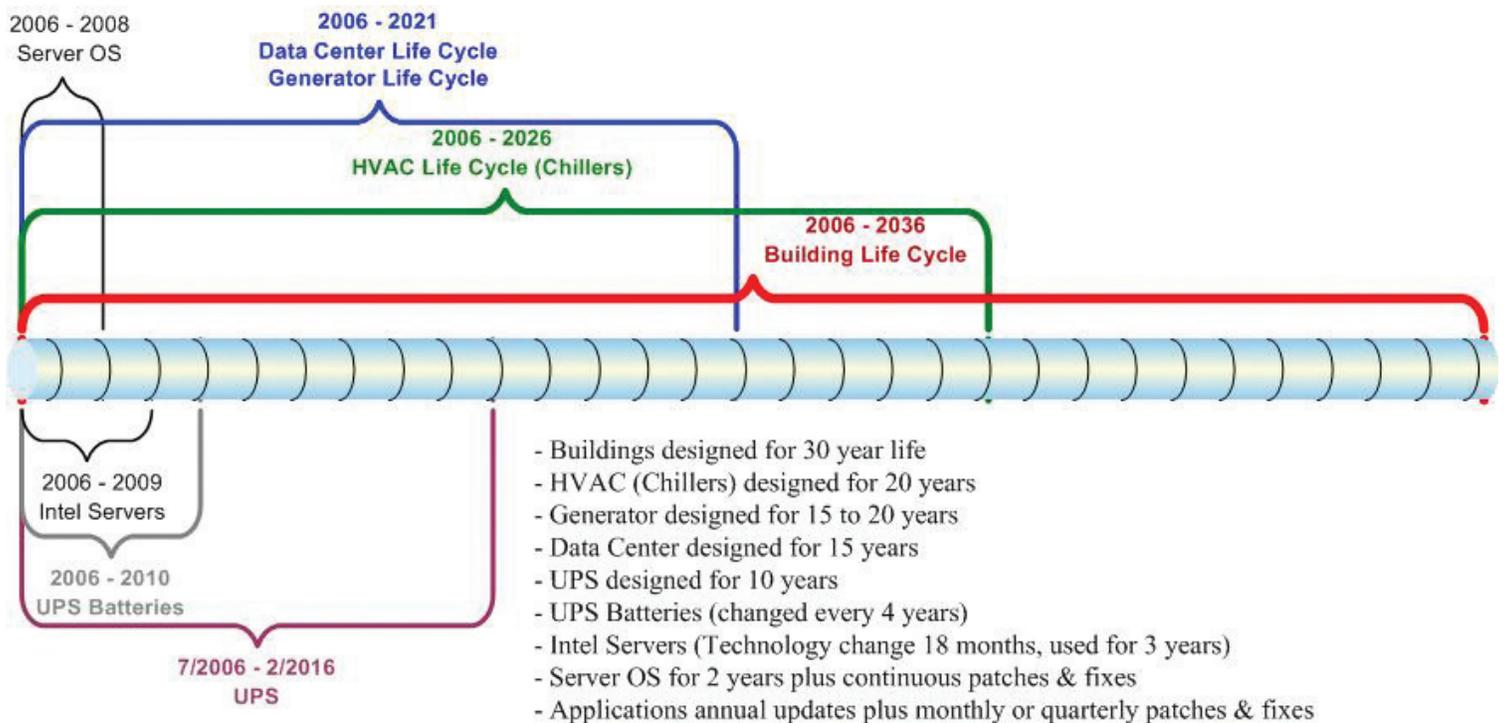

Figure 1. Data Center Facility, Infrastructure Lifecycles