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The Executive Guide ™ *To*

Service Management in an Uncertain Economy

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Chapter 2: Creating a Well-Managed Data Center

I venture to say that the crux of any effective service management strategy begins in the data center. Even though your strategy extends across the enterprise and involves non-IT assets and services, you most likely have a substantial investment in your data center, and I can't think of any organization that doesn't rely to some degree on IT for daily business operations. Your challenge is to squeeze every scintilla of value from your IT infrastructure, which you can only accomplish through a well-managed data center.

The Data Center Crunch

Today, most IT managers are finding themselves in a data center crunch, subjected to all types of pressures and demands. Meeting the demands in a financially responsible yet timely manner is no easy chore.

Growing Customer Demands

Just about every modern business has incorporated the Internet in some fashion. From a simple Web site that does nothing more than advertise the company's existence to full-blown e-commerce. A side effect is that customers, and more importantly potential customers, have high expectations. Your customers have most likely visited your competitors or at the very least have Internet experience. Like it or not, technology has raised the stakes for everyone. How many of these expectations do your customers have?

- Find product or service information

- Compare products or services

- Buy products or services

- Track the purchase life cycle

- Request self-help technical support via a FAQ or forum

- Request customer service for a technical problem

- Request customer service for a billing problem

- Discover how to contact or visit you

If a customer emails a pre-sales question, they expect a prompt and complete answer. Likewise, a billing query should be dealt with in a very timely fashion without forcing the customer to jump through all sorts of hoops. This simplicity is easy to ask for but not necessarily to implement. Creating an integrated customer oriented system requires serious planning and an investment in time and material. What IT is often tasked with is integrating the customer-facing experience with the back-end systems necessary for normal business operations. The demanding customer doesn't care about the back end or your problems passing information from sales to accounts receivable. They expect a seamless, high-quality experience. For many customers, your Internet presence is your first impression.

But don't think customer demands are online-centered only. Traditional brick-and-mortar customers have equally high demands, granted sometimes unrealistic, but often based on technological assumptions. Just like the online customer, an in-person customer also expects a timely and responsive interaction with your business. How often has your organization had to meet the following expectations?

- Purchasing a product should be a simple and quick process

- Returning a product should be a simple and quick process

- Advertised inventory is available

- Product information is readily available

Again, IT is often called upon to integrate the customer side of the equation with back-end operations. Organizations that can meet this challenge and offer a pleasant customer experience will be the ones who prosper.

Growing Internal Customer Demands

Certainly someone who buys your product or service from a Web site or physical location is not the only customer. I'm sure you can identify many internal customers of IT services. Like the "real" external customer, these internal customers have high expectations. Often they may have their own pressures that are then passed on to IT. Areas controlled by regulatory requirements come to mind.

Your internal customers most likely require IT services to simply get their jobs accomplished; others require more and more from IT so that the business can successfully expand. I've been in many companies where a department needs something from IT, and they need it now. Granted, not every demand is reasonable, but more often than not, they are, and IT must be in a position to meet them. How many of these types of demands do you see from your internal customers?

- Availability of detailed sales and inventory information

- Availability of detailed Web usage statistics

- Availability of line of business applications, not to mention the need for outstanding performance

- Rapid Help desk support

- New employee provisioning (network logon, file share, telephone, email account, physical access, payroll and benefit enrollment, and more)

- Availability of detailed information for compliance and auditing requirements

- Availability of detailed customer account information

- Increased data security requirements

- More detailed information for IT service charge backs

This list is representative not exhaustive. I'm sure your industry sector or corporate culture has additional internal customer demands and requirements. It's probably not an unreasonable assumption that your internal customers want "it" fast and more of "it"—and this trend is unlikely to end any time soon.

Growing External Customer Demands

IT is also tasked with more external customer demands. This category is not referring to people who purchase your goods and services but to external people and organizations that have a relationship with your company or organization. For example, perhaps your IT area has the following types of demands:

- A joint-venture partnership requires sharing business, marketing, or product information

- A group of consultants requires network access and access to a wealth of information: to access financial and investment records going back 5 years, to comb through server event logs for the past 6 months, or to review meeting minutes, corporate bylaws, and other governance-related documents

- External auditors require access to detailed information such as financial and investment records for the past year

- Government and other regulatory bodies require access to detailed information to verify compliance, such as data verifying an organization is protecting data privacy for medical records, or to review all communication related to stock trading and investing

- Vendors or potential vendors require information on your bidding or procurement processes

As with the other customer types, these customers require IT services that are responsive, timely, and complete.

Growing Compliance and Regulatory Requirements

Depending on your industry or sector, you may have hefty compliance and regulatory requirements. It seems to me that these types of demands are only increasing. Companies are calling on IT to protect data, monitor access and usage, and secure the meta data. IT is expected to accomplish all of this transparently. The last thing an internal customer area wants is another IT obstacle. Have you been tasked with these or similar requirements?

- Provide an audit trail that shows who accessed a piece of information, from where, and for how long

- To ensure you are in license compliance, track how many users are using a line of business application

- Maintain a digital employee record

- Maintain a digital customer record

- Maintain a record of internal instant messaging communications when a particular topic is discussed

- Maintain a record of employee-customer instant message communication

- Retain all email communications for a given period of time and be able to produce messages that meet a set of given criteria

I'm sure you have a number of your own requirements, few of which are probably inexpensive or easy to implement.

Budget and Resource Constraints

The real data center crunch is that IT is expected to meet all of these demands under shrinking budgets, reduced resources, and a smaller workforce. Never mind trying to exceed a customer's expectation—for many companies, it's a challenge simply to keep the lights on and meet basic business requirements.

The "do more with less mantra" may seem cliché, but it has never been more apropos. Customer demands don't diminish just because your capital expense budget has 20% less than last year or you have five fewer developers than last month. Someone visiting your corporate Web site looking for product information is oblivious (as they should be) to your internal IT constraints. But they still need the information.

The bottom line is that IT managers are increasingly called upon to provider a richer and broader set of IT services with smaller budgets, staff, and resources. Unfortunately, this data center crunch shows no sign of ending any time soon. In fact, I believe it will be the new norm, and organizations that can best meet this challenge will not only survive but thrive.

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Reduce IT Operations Costs

One primary approach IT management will take in order to survive is to reduce IT operational costs. In the past, cost management was something companies hoped for but perhaps didn't give high priority. In today's uncertain economy, cost management is a driving force. This is now a mandate for IT and no longer a "nice to have" item.

Automate Manual Tasks

The first step any organization should undertake to reduce IT operations costs is to identify manual tasks that would benefit from automation. Automation can significantly drive down operational costs. These tasks generally fall into two categories. First, you have tasks that are long, tedious, and susceptible to user error. Building and configuring a new Web server falls into this category. You probably have a multi-page checklist or procedure that one or more IT professionals carry out. Such a process may take 8 to 10 hours, assuming an error-free procedure. Implementing an automated solution will most likely cut down this time to under an hour or less and with less risk of errors. Any commonly repeated process that can be automated ensures standards are met and eliminates the human factor and errors.

The following list highlights additional task examples that you might have in your environment, all of which lend themselves to automation:

- Preparing a file access audit trail

- Deploying a new computer to an end user

- Deploying patches, applications, or upgrades

- Deploying operating system (OS) upgrades or new installations

- Provisioning digital certificates

- Performing data backup including files and databases

- Reporting disk and other resource utilization metrics

- Defragmenting disks

- Creating a new user account

The second type of task that can benefit from automation is one that is simple but repeated often; for example, creating a mailbox for a new user. The steps are relatively uncomplicated yet require an IT professional to execute them. If this process can be automated, the IT professional resource is freed up for more meaningful and value-added productive work. Do you have tasks like these in your company?

- Creating, moving, or deleting a mailbox

- Resetting passwords

- Managing server event logs

- Verifying server and application availability

- Provisioning a new file share

Certainly some tasks may fall into both categories, in which case the argument for automation is even stronger! I'm certainly not in a position in this series to tell you how to automate these tasks. The final solution will ultimately depend on how data center automation fits into your overall service management strategy.

By the way, don't stop at the data center. I'm sure if you looked across the enterprise, you would find similar repetitive or repeated tasks that would benefit from automation. Consider the following short list of examples:

- Employee badge provisioning

- Employee benefit enrollment

- Customer-facing fulfillment

- Company phone book additions, changes, and deletions

- Record retention and removal, both physical and digital

- Physical access control for company guests and visitors

I expect that you'll find many of these processes require IT resources, so automation shouldn't be especially difficult, and in the long run, the company will be better off.

Automate Workflow and Scheduling

We can take this concept of task or process automation one step further to workflow and scheduling. As you might expect, very few tasks exist in a vacuum. Generally, a task or process is undertaken in response to an event: a user account and mailbox are created because a new employee has been hired. Another way to drive down operational costs is to identify and automate common and recurring workflow processes. Most likely, these processes are initiated in response to an event trigger. Any steps you can take to remove the human element make these processes more efficient, more cost effective, and less error-prone. Plus, you get the added bonus of available employee resources that might otherwise have been consumed by the manual workflow. Consider the following example scenarios:

- It's the beginning of a new school semester. There are 1500 new student accounts to create, including mailboxes, personal SharePoint sites, student ID badges, and appropriate group membership. Each new student also needs to receive a set of policy and usage documents.

- A new user has been hired. The user must get a network account, home drive, proper group memberships, mailbox, a telephone, a company badge, and a desk assignment. In addition, payroll needs to add the new hire and collect appropriate information such as tax withholding requirements. The new employee needs to be scheduled for orientation and be sent company documentation such as an employee handbook.

- A customer complaint is received. Email notifications must be sent to the appropriate employees and managers. The customer's record is retrieved and forwarded to the assigned customer service agent to handle.

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- A user password is reset. The information is stored in the employee record and appropriate security event log. An email is sent to the user's manager. If the number of requested resets exceeds some threshold, it may indicate the user needs additional training or remediation. The workflow can arrange for such training or information delivery.

- A new client has been acquired. A new record must be added to the customer relationship management (CRM) and accounting systems, a welcome email from the company president needs to be delivered, and an extranet account established.

These are all examples of trigger-based work flows that I feel lend themselves to automated solutions; if not for the entire process, then as much as you can incorporate.

In addition to triggered events, you likely have work flows or tasks that occur on a known or scheduled basis. Often, these are referred to as batch jobs or batch processing, but that is only one part of the picture. Instead of relying on a person to initiate a series of tasks, automated or not, find a scheduling solution. Such a solution again frees up valuable human capital, reduces errors, offers accountability, and drives down overall operational costs. I'd wager you have one or more of these situations:

- Backup operations including offsite storage—I'm sure some of this is already scheduled, but are there additional automation opportunities? What happens if a backup fails? Can the response be automated? What other workflow actions might ensue from successful and failed backups?

- End of month reporting—Different departments probably have different reporting needs. How much time is spent manually developing, delivering, and storing the reports? How much of this process could be automated and scheduled?

- Scheduled maintenance windows—What processes are now carried out to ready servers for scheduled maintenance? How many of those processes could be automated and scheduled? In fact, other than hardware maintenance, any maintenance such as disk defragmentation, updates, patching, or scheduled reboots can and should be automated. Again, you also want to automate error responses wherever possible.

- Software licensing audits—You may periodically sweep your environment for a software inventory and licensing compliance. A task like this must be automated, but what other steps in this workflow are not? Are reports generated, posted, or delivered? What happens if non-compliance is detected?

I trust you can think of a few situations of your own. Automation solutions will run the gamut of a few scripts to enterprise-wide agent-based workflow systems. It is very important to assess your current cost to accomplish a given set of tasks so that you can accurately gauge your ROI for any automation solution. One cost that can be difficult to quantify, yet nevertheless important, is lost opportunity: What is not getting done because an IT professional is occupied with a task? Human assets are the most valuable, and you want to ensure you are utilizing them to their fullest potential.

My dream infrastructure is one where I turn it on and it runs itself only requesting human intervention for situations it doesn't recognize. Daily operations should practically have a life of their own. The IT staff is free to handle the most serious situations, test new technologies, and discover additional ways to add value to the company. Enterprise automation is a critical component to make this dream become a reality.

Improve Utilization

Speaking of utilization, another approach to drive down cost is to improve utilization of your current infrastructure. If you can make better use of what you have, there is less need for additional capital expenditures. Improved utilization is a key part of the "do more with less" mantra.

Of course, you can't improve utilization if you don't know what you have currently. Performance monitoring (automated, of course) along with historical data for trending and forecasting is essential. There is now way to take advantage of this server running at 10% processor utilization if you can't measure it. Of course, you also need a way to seamlessly transfer workload to this server.

This automatic leveling or resource balancing is often referred to as a dynamic infrastructure, and that should be your goal. You want an infrastructure that is aware and responsive and can take full advantage of available resources. Let me provide a few examples.

Let's say you have a terminal server farm for your mobile workforce. At the beginning of the day, there may only be a handful of connections, which can be handled by a single server, leaving high availability out of the picture just to keep the illustration simple. By 10:00AM, there are enough remote users logging on that performance begins to degrade and another server from the farm is brought online to handle the workload. This continues throughout the day. As users log off and demand diminishes, servers can be brought offline. Such a solution ensures that you have the proper amount of computing resources to meet the demand. Each server is fully utilized before the next one is brought online. This scenario also has the added benefit of reduced utility expenses

In a similar vein, imagine you have an enterprise-wide database-driven application. As processor performance degrades, additional servers are automatically brought online and the workload redistributed. As workload decreases, servers can be removed and perhaps utilized somewhere else.

Another approach to increased utilization is consolidation. Do you really need three file servers when one could handle the workload of all three? You now have two servers available for other tasks or workloads and you didn't have to make a single capital expenditure. Or perhaps you have two applications that perform similar functions yet neither is fully utilized. By consolidating to a single application, you've increased utilization and driven down licensing costs as well.

When tackling the utilization problem, it is important to have a thorough understanding of how IT resources are used, by whom, when, and from where. Historical data is critical to proper scaling. Perhaps a legacy database server is getting used less frequently over time. This server might be a candidate for re-purposing. Once you understand what level of IT service you must provide, you'll be in a better position to assess vendor solutions that will play a critical role in developing your dynamic infrastructure.

Using Virtualization to Control Costs

Unless you've been running your IT infrastructure from Bora Bora for the past few years, you know that virtualization is the IT trend du jour. You can't open a trade journal without stumbling across virtualization, and for good reason. Virtualization can play a pivotal role in driving down IT costs while improving performance, increasing availability, and anchoring a dynamic infrastructure.

Driving Forces Behind Virtualization

So what's driving virtualization adoption? I'd say it comes down to three points that dovetail nicely with points I've already made in this chapter. If you don't recognize these needs in your enterprise, virtualization probably doesn't have much to offer, but I doubt that will be the case.

First, virtualization has the potential to greatly reduce data center operational costs. One major cost reduction you can realize almost immediately is in energy and cooling. Instead of supplying utilities to 10 physical servers, you might drop to two servers offering virtualization. I can't think of a single IT manager that wouldn't like to cut energy costs by 80%.

Second, virtualization can simplify IT administration. Virtualization lends itself handily to automation, all of which simplifies administration. Typically, simplified administration also means reduced costs in manpower and greater availability for more high-value work. A common virtualization solution is server deployment. For example, consider a virtualized Web server farm. During peak usage, additional servers are required to meet the workload. Instead of requiring an administrator to provision a new server, the dynamic infrastructure implements an automated process to bring up a new server with a fully patched and upgraded OS. The server is added to the server farm all without any human intervention.

Or imagine a situation where a new application server is required for human resources. Historically, an IT administrator may have spent 8 to 10 hours installing, configuring, and deploying a physical server. With virtualization and its associated tool set, this process can be reduced literally to minutes. Granted, this level of savings requires an upfront investment in virtualization resources such as Storage Area Networks (SANs), software, memory, processors, and administrator training. Ideally, your virtualization vendors will help you quantify your ROI, making it easier to justify the investment to executive management.

The final force behind virtualization is increased utilization. You've probably inferred this already from my previous examples, but there is another perspective. Instead of a physical server running with an underutilized processor and memory, a virtual server can be deployed that is fine-tuned for its task. Virtualization makes it much easier to make sure that a server has the resources necessary to meet its workload without worrying about over- or underutilization.

Combine all these factors, and it's difficult not to get excited about what virtualization can bring to your data center.

Challenges to Virtualization Adoption

Despite the appeal, there are some obstacles to virtualization adoption. Perhaps you've experienced some of these in your own organization. And if you are hoping to introduce virtualization into your enterprise, you need to be prepared to respond to these challenges.

Defining the value of virtualization can be difficult. The infrastructure investment required to fully take advantage of virtualization can be steep, especially if starting from ground zero. It can be difficult to assess a value on a current IT process or service and compare it with a virtualized version. To my mind, this is where solid metrics show their value. If I have five servers that consume x of utility cost and y of vendor support costs that can be reduced to a single server providing virtualization, defining the value should be relatively easy.

However, the value proposition ultimately requires a composite approach of the tactical and strategic. In the short term, how much can I save in hard costs, such as utilities and reduced administrative time? How much more productivity can I pass on to my enterprise through virtualization? Strategically, how does virtualization position my data center for the future? What types of operations might be possible, even though I may not have the time or resources to tackle them now? Personally, I can't see any other answer but that virtualization is a key component in developing a dynamic infrastructure. Ideally, your virtualization vendors will have the expertise and experience to assist you in overcoming this obstacle with facts and figures and not fantasy.

For some companies, the concept of virtualization is at odds with an organization's mindset or corporate culture. Entrenched processes and policies can be hard to overcome, especially with a technology that has the potential to threaten job stability. What IT department is going to be eager to adopt virtualization if the end result is to eliminate jobs? Although my response to this particular concern is that wise management will seize the opportunity to utilize human resources on more value-added projects and tasks. But still, introducing change can be intimidating and it's human nature to fear what one doesn't understand. I've often heard the grumbling, "We've always done it this way in the past. Why do we have to change?"

In my opinion, the best way to overcome cultural clashes is through education. The value of virtualization must be presented in a concise and non-threatening manner up and down the IT org chart. Executive management must learn what problems virtualization solves and the positive effect it will have on the bottom line. IT professionals need to learn how virtualization will improve their jobs. Certainly, the best way to approach virtualization is through a gradual transition. You don't need to drop in a 2TB SAN complete with a fibre channel switching fabric and racks of quad core servers with 256GB of RAM all at once. Although you need a plan of where you want to go with virtualization, you should be able to get there in small steps.

One final obstacle, which can be related to my previous point, is a lack of IT expertise and experience. Companies looking to add virtualization most likely have very few staff members with the requisite knowledge or skill set. Certainly, training is an option here as well as bringing in outside experts such as consultants. In today's economy, this can be a tough sell to executive management. However, raising the level of expertise is a strategic investment, and one that should be factored into any ROI calculations regarding virtualization.

Virtualization Caveats

Before you get too carried away by the virtues of virtualization, you need to be aware of a few caveats, especially when focusing on cost reduction. First off, don't forget that even though you may have taken 10 physical servers and reduced them to 1 virtual server, all you've really saved are hardware costs. Your OS licensing has actually increased by one: the 10 original servers now virtualized, plus the virtual server itself. Yes, there are some offsets with reduced administration costs and automation benefits, and I still believe you are better off in the long run, but the short term numbers might be discouraging.

Virtualization is also just a tool. I'm sure you've heard the expression, "When you have a hammer, everything looks like a nail." The same dangerous principle applies. Just because you can throw virtualization at a problem doesn't necessarily mean it's the right tool for the job. There may be some situations where you can't drive down costs with virtualization. Also recognize that virtualization may actually require more discipline and management. It can be very easy to deploy a new server, but is that the right decision? If you have a structured change management environment, virtualization poses a challenge that you must address. Finally, don't assume that because servers are virtualized that IT professionals have more time on their hands. Consolidation aside, 10 physical servers now virtualized still means 10 servers to manage, update, patch, and maintain. Fortunately, virtualization tools often makes this process easier and less time consuming, which improves productivity and offers opportunities for more valuable work.

Improve Financial Controls

One last avenue to take to a well-managed data center and a sound service management strategy is to improve financial controls. How much are your IT services worth and who is paying for them? Like cost reduction, financial controls are now essential, and any organization lacking them faces a bleak future. There are two important aspects I want to discuss.

Prioritize Projects and Applications

It is practically a mandate in today's economy to prioritize across the enterprise projects and applications that are revenue generating. I would hope it goes without saying that any project that will add revenue and value to the organization should go to the top of the list. This doesn't necessarily only mean customer-facing projects designed to increase direct sales. A project to simplify and expand remote access to a mobile workforce makes it easier for them to accomplish their jobs and be more productive.

Even non-profit organizations need to follow this prioritization. In these situations, value probably won't be monetary but some intangible amount. For example, an educational institute would prioritize a project to deploy kiosk-based computers across campus to make it easier for students to check email or perform other browser-based activity. I would argue that this adds value to the students' experience.

Prioritization also includes projects or applications that can reduce costs. Automation is a prime example. A consumable goods-tracking system for items such as printer paper, toner, or ink that includes automated ordering would be a good example. This actually adds value as well. Not only is the costly human element removed, but the workforce always has the necessary supplies.

Projects that lay the groundwork for future savings or revenue are a little harder to quantify but probably should have high priority. If you need to deploy a solution to capture usage and utilization metrics so that you can charge back for IT services, for example, this would appear to me to be a critical need worthy of funding.

If you don't have the information to make prioritization decisions, the first priority should be to implement projects or solutions that can provide it. You can't manage what you don't measure, so these systems are critical. Without actionable intelligence, as they say in the military, you will never be able to make reasonable decisions.

Modifying User Behavior

Another approach to improved financial controls is to modify user behavior. I've been in companies where employees don't think twice about printing several copies of a 300-page document that will sit in a binder on a shelf that hardly anyone will ever look at. Another common situation is the proverbial group drive; shared departmental folders that become dumping grounds with files that remain untouched and unmanaged for years. For many employees and many organizations, consumption of IT services is a given. They expect it to be there when they need it in the same way they expect soap in the restroom. What they don't realize is there is a cost involved.

The most effective way to change user behavior is through some sort of charge back system for IT services consumed. Once end users and their management realize where their IT dollars are being spent and why, usage patterns typically change. These consumers are forced to be more efficient and precise, which hopefully corresponds to an increase in productivity.

What sort of IT services can you charge back? Just about anything you can measure and associate with an identity.

- File storage

- Data backup and recovery

- Database storage

- Database transactions and queries

- Print, fax, and copy services

- Internet bandwidth

- Email storage

- Remote access connection time

- Software and application licenses

- Telecommunications

- Mainframe and midrange usage

I'm the first to admit that many of these tasks are a basic part of any employee's daily workload, and you don't want to stifle your workforce because they are afraid of incurring an expense. Instead, these cost controls are meant to provide a management mechanism so that you can identify what services and resources are important and how they are being used. Low revenue-generating services, as I'm discussing here, might be candidates for decommissioning or alternatives. Of course, a charge back mechanism will discourage waste and abuse.

The only way you can achieve effective behavior change is through detailed reporting. You can't simply present a department manager with a bill for $1,234.56 at the end of the month for IT services. It needs to be as detailed as possible and easy to read, ideally with drill downs. If I, as the manager, have a $400 charge for print services, I need to be able to see what was printed, when, and by whom so that I can better manage my group.

The change in behavior can also work "up" the organization chart. Suppose I'm the CIO of a midsize company and I'm reviewing the charged costs for email services. With this information, I might decide it is more cost effective to move to a hosted email solution. Or it could easily go the other way. Perhaps email services are outsourced now but trending and forecasting suggest it may be more cost effective to bring this service in-house. Without detailed usage and accounting information, it's impossible to make reasonable business decisions.

Towards a Well-Managed Data Center

Your overall goal is to develop an effective service management strategy, despite rough and tumble economic times. I firmly believe that a well-managed data center is the core component. If your IT infrastructure is in disarray and poorly managed, then you'll never be able to integrate IT with the rest of the enterprise in any meaningful fashion. It is imperative that you get your own house in order first. This process alone will produce measurable results that should have a positive impact on the bottom line. Let me offer goals that, once met, should take you very far towards a well-managed data center.

Reduce Licensing Costs

Cost, cost, cost! Obviously, everyone with a fiduciary responsibility in your organization is concerned about cost. Certainly, some expenditure can't be avoided. If you have 20 Windows-based servers and 250 Windows 7 desktops, there is a licensing fee you can't avoid. But your first goal should be to examine license expenses across the entire enterprise, seeking out ways to trim costs.

You'll need a thorough audit and inventory of all software and applications installed and in use in your network. You'll then need to compare these numbers with the licenses you currently own. The first question is, "Am I fully compliant?" Do I have enough licenses for all the software my company needs to run its business? If you are lacking, hold off a moment before you rush out to buy more.

I would then prioritize the software and applications in order of business criticality. You can use any scale or metric. I might use the following "buckets." If you have a recent business impact assessment (BIA), it should help you classify your IT assets:

- *Business Critical*—The company can't operate without it, we'll be out of compliance without it, or the company will lose revenue without it. OS ERP licenses are a few examples.

- *Business Essential*—These are applications or software that add value to the organization or improve productivity. Microsoft Office is a good example.

- *Business Beneficial*—Applications that may not necessarily be used on a daily basis or those that while useful wouldn't have a negative impact if unavailable for a short period of time. Some examples include Adobe Acrobat, anti-spyware and antivirus products, and any legacy software or applications still in use.

- *Business Non-Essential*—Software and applications that offer no added value to the organization, offer marginal to no productivity gains, or otherwise are simply taking up space are non-essential. I would hope you don't have many items in this category, including games, screensavers, MP3 managers, or any alternatives to your corporate standards.

The low-hanging fruit are the non-essential applications, especially those with an associated license cost. How you manage everything else will vary. If I was sitting in the CIO chair, I would want to know:

- Who is using the application, and are they the "right" users?

- At the peak, how many simultaneous users?

- What is the current licensing scheme?

- Is there an alternative licensing scheme that makes better economic sense given current usage?

- Is there an alternative application that has a more favorable licensing arrangement?

It is not uncommon for an organization to bring in software or an application under one licensing arrangement only to find that a few years later the situation has changed and now a different arrangement makes better financial sense. Perhaps you now have enough users to qualify for a bulk discount or a site license is more cost effective.

I'll be the first to admit that Microsoft licensing is notoriously difficult to understand, yet your account rep should be able to connect you with licensing experts to sort out the best option. With all vendors, I would discuss ways to reduce licensing costs. Remember the tough economy is affecting them as well. If you are a valuable customer, you might get some accommodation. It costs you nothing to ask.

One brief word about application alternatives: Although at first glance you may achieve a savings through reduced or zero licensing costs, if you go with an open source solution, those savings could be quickly eaten away. For example, suppose that instead of paying upgrade costs to move to Microsoft Office 2010, you decide to go open source and deploy Open Office. You have to recognize these hidden costs:

- How much end user training will be required?

- How much lost productivity as employees transition to the new software or deal with compatibility issues?

- Does IT have the expertise or experience to deploy, maintain, and support this product?

I'm not saying don't consider alternatives, but recognize the true cost.

License management and compliance reporting can be a tedious task, especially if done manually. I've see administrators struggle with scripts and spreadsheets to track this information, but any time a process requires human intervention, there is the risk of error. Has everything been accounted for? Did I mistakenly count something more than once?

The best approach will be some type of license management solution that you can deploy across the enterprise. If your organization has dedicated security, compliance, audit, or privacy offices, they may have tools or practices you can leverage. Yes, this might involve an expense, but the ROI can be based on these benefits:

- A complete and thorough inventory process

- Automated process that requires fewer IT resources compared with a manual process

- Detailed reporting that can be used for better budget planning, vendor negotiations, and charge back

- Utilization tracking and monitoring

Finally, very few enterprises are 100% homogenous, so make sure you find a tool that will work across all platforms. You don't want a licensing tool for Microsoft and another one for Solaris.

Reduce Labor Costs

You can't have a well-managed data center with high labor costs; at least you can't today. This is where automation comes to the rescue. Here's my suggested action plan:

- Identify routine IT tasks that are currently done manually and find an automated solution. For example, desktop OS upgrades.

- Identify IT-centered workflows or processes that currently require employee intervention. Find solutions to automate the human element and ideally the entire process. This should be like a row of dominos. For example, a new hire is entered into a provisioning system. That's the first domino which in turn triggers additional actions: Add the user to Active Directory (AD), create a secure home directory, create a personal SharePoint site, create an email address and mailbox, add the user to the appropriate groups, and assign a telephone number.

- Identify IT management and reporting tasks that require manual intervention. Find an automated solution and especially one that supports scheduling or event triggers. For example, preparing a weekly storage utilization report.

As with license management, you ideally want a multi-platform solution to manage all your automation needs.

I'm probably being disingenuous on this topic. Theoretically, automation could allow you to accomplish the same amount of work with fewer resources (that is, bodies). Short-sighted companies might even trim headcounts accordingly. But I'd say they are missing the point. The goal here is not to reduce labor costs by getting rid of labor, but to trim the labor costs from business operations. This is a subtle but critical distinction. If I'm the CIO, I don't want my expensive IT resources spending valuable time setting up a new version of Microsoft Office. I want them configuring our email system to integrate with a number of mobile devices.

Improved Operational Efficiency

The point I just made brings me to this goal: improve operational efficiency. Starting in the data center and working your way out across the enterprise, determine what business operations are tedious or time consuming. Can you identify operations or processes susceptible to bottlenecks? Are there operations that require too much manual intervention? Let me expand on a scenario I mentioned earlier as an example.

In your enterprise, you have a number of printers. Currently, an administrative assistant periodically checks ink and toner levels. When they run low, a replacement is installed and new supplies ordered, which requires filling out a purchase request that then must be processed and approved. There are several places where this process can get tied up. A better, more efficient solution would involve a monitoring mechanism that would automatically order replacement supplies when a particular threshold was met. The purchasing workflow would be completely automated and pre-approved. When the replacement arrives and is received by the shipping department, a notification is sent out to the administrative assistant to perform the replacement. The only human requirement now is the installation, and the printer is always assured of having the necessary amount of ink or toner.

As another example of an inefficient process and perhaps one you face, consider the case of support for remote servers in branch offices requires travel by IT support staff. For the sake of discussion, let's put some numbers with this scenario (see Table 2.1).

Location	Mileage RT	Travel Time RT (hrs)	# Trips/Year	Annual Mileage	Annual Travel Time (hrs)
Branch #1	5	0.3	15	75	4.5
Branch #2	10	0.5	9	90	4.5
Branch #3	30	1	18	540	18
Branch #4	50	1.5	12	600	18
Branch #5	74	1.75	10	740	17.5

		Total Mileage		
Total Mileage	2045	Cost	$	1,124.75
Total Travel Time	62.5	Total Travel Cost	$	2,187.50
			$	3,312.25
			$	
		Cost over 3 yrs	9936.755	

Table 2.1: Example of an inefficient process.

This is a very modest example and prices the employees time at $35/hour. Based on these figures, a single IT professional is spending more than 60 hours a year on the road, which is essentially non-productive time. A more efficient alternative would be to implement the necessary remote management technologies to eliminate these costs or at least significantly reduce them. I've said this before and I'm sure I'll say it again—just because something used to be done a certain way doesn't mean it needs to continue that way.

I'm sure you can easily recognize processes that would benefit from automation or even minor adjustments that remove bottlenecks or other operational impediments. Other efficiency gains may require some creative thinking. In any event, to truly achieve operational efficiency, you need to re-evaluate *everything*.

Integrated End-to-End Solutions

My last goal for you is to seek out integrated, end-to-end and cross-platform solutions. Very few organizations are 100% homogenous, especially as they grow in size. You can't achieve efficiency and cost savings if you have half a dozen solutions that do essentially the same thing. Granted, a truly integrated solution might be a little more expensive to begin with, but over time, it should offer a respectable ROI. I always look to vendors to assist in calculating these types of figures. If they can't, they most likely lack the expertise or sophistication I require.

Summary

Achieving a well-managed data center will not happen in a short timeframe and will require an investment of time and resources. You will need to identify areas that will benefit from automation and tasks that can be made more efficient and get a handle on where you are spending your IT dollars and Euros today. But most importantly, recognize that your data center and IT infrastructure is not static. You need tools and practices in place that will let you assess the current state of the enterprise and provide the information to make meaningful decisions and adjustments.

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