

Tools for Change
A five-step framework to align IT with business goals

BOCADA[®]

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Retooling Your IT Image: Are You Running Defense or Offense?

Availability. Performance. Rapid recovery from unplanned outages. According to surveys of customer satisfaction,¹ the success of an IT organization at accomplishing these three goals directly impacts how favorably IT is perceived by a company's executives and leadership.

The truth is, no CIO wants the spotlight on his or her IT group's operations only when critical company data goes missing. Likewise, no IT management team wants to explain to the rest of the organization why a data restore exercise failed or took significantly longer than anticipated.

Common Defensive Maneuvers

Today, many IT managers are plagued relentlessly by complex issues that keep them and their organizations in constant fire fighting mode. They often find themselves using precious staff resources to correct ongoing availability or restore problems that are highly visible to the organization, yet relatively unimportant in the larger scheme of managing IT systems. In the face of exponential data growth, IT outsourcing, server consolidation, flattened IT budgets, and company reorganizations, IT managers and their staff often seem to be put on the defense, with most under the gun to simply ensure basic services delivery.

In response to a recent study by UK analyst firm CSC that showed only 7 percent of companies questioned claimed to have a technology plan properly aligned with their corporate strategy², Meta Group analyst Brian Burke said he was not surprised. "Many IT management groups are simply victims. They allow themselves to be manipulated, they are victims to the vendor's hype, and they are victims to the business. Clearly when you are a victim and being manipulated by all these forces you are not going to act strategically. Occasionally, you'll get lucky and do the right thing but there is no guarantee of that," said Burke³.

Burke claimed that many IT departments don't do the basics right and don't provide an adequate level of service to the rest of the company. This has an impact on the way they are perceived, reducing their credibility to the point that they lose their place on the panel or board where the strategic decisions are made.⁴

IT infrastructures have also become increasingly complex, with corporate acquisitions fueling a dispersion of assets across widening geographic locations. Most robust, enterprise infrastructures have become a patchwork of "heterogeneous" components – systems and software based on a variety of platforms, operating systems and vendors. Backup windows and allowable downtime are becoming virtually nonexistent as business is now conducted round the clock from multiple offices located across the globe.

In the area of backup and recovery alone, one poll⁵ revealed that 36 percent of IT respondents considered their biggest backup problem to be not knowing if they were backing up all of the company data that they should be. Another 24 percent indicated their biggest concern was whether or not they would be able to recover any data if they needed to do so.

There appears to be good reason for IT professionals to be concerned. Research from an industry analyst firm confirms IT's worst fears about its ability to recover critical data in the event of an emergency. According to the same source as the above poll,⁶ the Enterprise Storage Group believes that as much as 60 percent of all backups performed in today's network environments are not successfully completed.

¹ See 'Highlights' section, "Service-Level Management - Best Practices," http://www.nextslm.org/bestprac_slm.html.

² See "Utility computing: Just because you can, should you?" by Andrew Donoghue, ZDNet UK, <http://comment.zdnet.co.uk/andrewdonoghue/0,39027004,39159260,00.htm>

³ Ibid

⁴ Ibid

⁵ See "IT's Dirty Little Secret," by Heidi Biggar, InfoStor magazine, http://is.pennnet.com/Articles/Article_Display.cfm?Section=Articles&Subsection=Display&ARTICLE_ID=152968&KEYWORD=IT%27s%20dirty%20little%20secret.

⁶ Ibid.

A New Breed of IT: Turning Defense into Offense

More than ever, CIOs and their staff are being pressed to account for new projects and demonstrate real results of their ongoing investments in infrastructure and processes. Yet in the face of these mounting challenges, Bocada is witnessing the emergence of a new breed of IT manager -- individuals actively choosing to move beyond fire fighting mode, and lead their organizations in support of their company's evolving corporate strategies.

In rising to the challenge, these leaders are proactively embracing opportunities to reshape their company's perceptions of the IT organization. Bocada has seen these individuals move beyond reactive mode, and regain control and confidence in their organization's abilities to address the business needs of its internal and external customers.

By borrowing key concepts from external service providers, IT leaders have begun to view the success of their IT organization from a more customer-centric paradigm where they can proactively forecast future needs of the organization and be ready to take on challenges when they appear.

Among other things, this paradigm shift has allowed them to redefine IT success based on two types of criteria:

- The quality and value of the services they offer; and,
- How well their IT services align with the current and future business objectives of their customers.

Data Protection Visibility: IT's 'Secret Weapon' to Reconnect with Business Needs

As part of forward-thinking efforts, IT leaders are using a simple, but largely misunderstood IT function to gain positive visibility across the enterprise, and to demonstrate their organization's effectiveness at meeting the needs of the business. Readers might be surprised to learn that this opportunity for IT to redefine itself centers on the hidden "backroom" data protection and recovery efforts already underway across the enterprise.

According to Bocada field research, an IT group's current data protection efforts present a rich landscape of opportunity for IT to demonstrate excellence and tight alignment with business goals.

Later in this document, we will outline five simple steps to help you ensure your IT organization's performance aligns with the needs of the business itself. Bocada has developed this multi-step framework based on the best practices we've seen in use by many of today's IT groups. These are the organizations that have been able to successfully migrate from defense to offense from a position that reacts to the latest fires to one that proactively plans and manages operations, allowing them to forecast resources more effectively.

By following the key steps in this framework, we've seen IT managers realign their data protection efforts to the current and future needs of the business. We've also seen them start to reap significant return on their efforts starting with a renewed confidence in their organization's ability to meet and *exceed* the quality of service expectations held by various internal and external customers. Along the way, these groups have also vastly reshaped the image of their team within the organization, moving from "department" to "quality service provider." Meta Group's Burke sums it up this way: "You have to get the basics right to begin with to establish a certain level of credibility in terms of providing services and projects on time and to budget. When you have that credibility then you can start to enter into strategic dialogue," he said.⁷

Interestingly enough, the steps in this simple framework do more than demonstrate IT's alignment with business goals. Organizations that follow these steps achieve significant improvements in their data recoverability rates. They minimize their operating costs. And, they achieve dramatic improvements in the utilization and efficiency of their existing IT assets and staff. By aligning the services they deliver with the unique needs of their customers and the business as a whole, they are saving money, delivering better services, improving asset utilization, proving performance against compliance objectives and improving communications along the way.

⁷ See "Utility computing: Just because you can, should you?" by Andrew Donoghue, ZDNet UK, <http://comment.zdnet.co.uk/andrewdonoghue/0,39027004,39159260,00.htm>

Bocada believes any IT organization can reap these same benefits within just a few months of implementing the five-step framework. It's that simple. The only question remaining is: Are you up for the challenge?

CMM, SLM and SLAs: Connecting Data Protection Efforts to Larger IT Initiatives

Before exploring the five-step framework, it is important to describe a few of the initiatives currently in use to help IT organizations measure their success in the specific areas of data protection and recovery. These are core initiatives endorsed by some of today's most influential IT leaders.

Key aspects of these initiatives tend to be reflected in the mindset of many of today's most successful CIOs and IT managers. Likewise, many of the foundational principles and goals outlined in these initiatives are also reflected in the Bocada five-step framework to realign IT to the goals of the business.

These initiatives include:

- The Capability Maturity Model (CMM), as applied to an organization's backup/recovery efforts
- Key aspects of Service Level Management (SLM), including the concept of service level agreements (SLAs)
- Renewed emphasis on customer-centric communication.

CMM: Assessing the "Maturity" of Your Organization's Backup and Restore Efforts

Many IT professionals are already familiar with the tenets of the Software Engineering Institute's Capability Maturity Model (CMM). Although originally designed to ensure that software products were developed to high standards, the model's tenets have since been applied to many other areas of IT.

The model describes five levels of maturity that an organization can attain. Organizations residing at the lowest level (1 or 2) tend to react more to events and may incorporate little process or documentation in their efforts. As the organization moves up the ladder to higher levels (3, 4 or 5), you begin to see more proactive behavior, more control of current processes, more communication both within the group and to the group's customers, and a better connection between the IT group's efforts and the goals of the business.

So, how does this model relate to your organization's backup/restore efforts? Based on his firm's experience in assessing storage operations at several Fortune 1000/Global 2000 companies, GlassHouse Technologies Cofounder and Senior Vice President Richard Scannell has adapted the Capability Maturity Model to measure an organization's success at backup/restore operations.⁸ Here are a few highlights from Scannell's model:

CMM Level	Maturity	Sampling of Key Indicators
5	Linked	Recovery strategy aligned with data value
4	Optimized	Quality charts, efficiency management
3	Proactive	LAN free backups, restore testing, Operations policies and procedures
2	Reactive	Backups impact LAN services, multiple point solutions, success/failure reporting
1	Unmanaged	Failing backups, no documentation

Table 1. Backup/Restore Maturity Levels

As noted earlier in this paper, the high percentage of backup failures and fire fighting efforts found in most organizations places many IT groups within Levels 1 and 2.

As organizations progress to Levels 3 and 4, they become more aware of how well their systems are working and can begin to take proactive steps that improve on current backup/restore operations. These may include modifying aspects of the backup infrastructure to reduce any bottlenecks to backup throughput and improve their

⁸ Model highlights reproduced courtesy of GlassHouse Technologies, Inc., <http://www.glasshouse.com/>.
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Bocada, Inc.

total asset utilization. They also start actively documenting their current policies and procedures, including baseline performance objectives they should strive to achieve. This often takes the form of establishing Service Level Agreements (SLAs), which is discussed further in the following section.

The Bocada five-step framework provides a practical roadmap for IT organizations to naturally evolve their operations to higher levels in the CMM. By following these steps, many of today's IT organizations actively migrate their operations from reactive providers to proactive service delivery organizations that are business-aligned and value driven.

SLM: Applying Service-Level Management Principles to Backup and Restore

One of the best ways today's IT leaders have found to ensure that a company recognizes and values IT's strategic importance is by demonstrating how closely IT aligns its own efforts with the specific needs and goals of the business. Service Level Management (SLM) defines a successful IT organization as offering a set of IT services that are inextricably linked to the goals and processes of the business.

John Hagel, a consultant, best-selling author and recognized leader in e-business principles, sums up this shift in IT focus as follows:

"No sooner have we started to become comfortable with an 'n-tier' architecture than we find that **a new architecture is emerging** to respond to these new business needs. This new architecture – **a distributed service-oriented architecture** - is only in its earliest stages of development. Companies are finding that flexibility and efficiency both require that IT resources be made available as services – accessible anywhere whether these resources are local, in distant reaches of the enterprise, in business partners or located in specialized third party service providers."⁹

This shift toward better aligned IT service delivery is also echoed in an article¹⁰ summing up key findings from CIO interviews conducted by IT executive counselor Bruce Rogow for his "Odyssey" project. According to Rogow, the one thing he heard from CIOs that surprised him the most was the fact that they rarely talked about cutting-edge technologies. In fact, he said, most CIOs categorically rejected the habit of vendors throwing new products and technologies at them as a means to solve their current problems. The article went on to state, "Instead, what these CIOs tell Rogow is that they seek the best ways to align the technologies they already have in place with their companies' business goals."

In terms of backup/restore procedures, Bocada has seen IT leaders at the forefront of service level management begin to define their success with internal or external customers in terms of how well their organizations are meeting certain predefined backup/restore service levels or qualities of service (QoS). Such predefined service levels form the basis of either informal or formalized service level agreements (SLAs) agreed upon by both IT management and key company leaders who hold a vested interest in the data and systems under IT domain.

The Bocada five-step framework is based on strong service level management principles. Using the framework, IT organizations can logically progress, step-by-step, through the process of identifying core service level expectations of IT customers, determining how best to position IT to deliver expected service levels, and ways to validate, publicize and improve on IT performance against service level goals. The Bocada framework also prescribes key SLA criteria, external benchmarks and best practices currently in use by some of today's top IT organizations to measure the success of their data protection activities.

Customer-Centric Communication: The Foundation for Alignment

Time and again, Bocada has witnessed one fundamental difference that separates IT organizations that succeed at business realignment from those that fail: communication.

⁹ "Managing for Business Results: Harnessing the Power of IT Management Systems," by John Hagel, April 7, 2003, at <http://www.agilebrain.com/hagel.html>.

¹⁰ "The Odyssey: Sit-Downs with CIOs Yield Insights," by Eric Chabrow, June 14, 2004, Information Week, at <http://www.informationweek.com/showArticle.jhtml?articleID=21700365>.

The successful organizations consistently reinforce and recognize the importance of customer-centric communication as the core of service excellence.

Whether they follow tenets of the CMM, SLM or the Bocada five-step framework, these organizations have made it a priority to communicate on an ongoing basis the goals, objectives, status and progress they have identified and hope to achieve in order to better align themselves with customer needs. Regardless of where they started out in the process of alignment and developing maturity, these organizations have repeatedly emphasized communication at each step in the process.

Communication can take many forms and may start by sharing initial performance information and findings internally within the team and with other IT staff in order to develop baselines. In the early phases, communication also extends to informal fact-finding interviews with customers, end users, executives and any other parties who have a vested interest in how much data protection services IT offers. In these interviews, IT leaders can hear directly from customers about their needs and expectations. They can also educate customers about some of the issues impacting their ability to provide certain expected levels of service.

As IT organizations progress toward better alignment and higher levels of maturity, their communication progresses to providing validation and ongoing confirmation that IT is aware of business and customer expectations surrounding its data protection services, and is actively working to meet or exceed these objectives.

Exploratory discussions with key IT customers and executives should cover expectations about how IT will communicate its progress, success or failure at meeting objectives. These can include topics such as:

- *Reporting/Accountability/Audit Expectations.* (How would the customer like to be updated about IT's progress in meeting the various objectives agreed upon in the interview? For example, would the customer like to be e-mailed some type of high-level, aggregated report that indicates percentage of backups successfully completed for the customer's organization on a weekly basis? What formats, what types of data and how often does the customer prefer to be kept informed about IT's success at achieving predefined service levels?)
- *Issue Communication, Resolution, Debits and Incentives.* (In the event of a challenge with IT's ability to meet certain service objectives, how does the customer expect IT to respond? This discussion should include any potential concessions or customer credits that IT may need to make when the customer's service expectations can't be met. Likewise, discuss any potential IT management incentives or bonuses they may want to consider in the event that IT consistently meets or exceeds targeted service levels.)

This commitment toward both inward- and outward-facing communication has played an integral role in IT's success at reshaping and defining the image it presents to customers as proactive, progressive and closely aligned.

Closing the Gap: The Five-Step Framework to Realign IT with the Business

The Bocada five-step framework is designed to help IT organizations achieve service excellence in their data protection efforts. It is also meant to be used as a springboard to reinforce IT's renewed alignment with the needs of the business. In effect, this framework is a model of the best practices and approaches to improve data protection that Bocada has witnessed in operation at many of the most successful Fortune 1000 and Global 2000 corporations. These are IT organizations that have been able to rise above an ongoing fire fighting and defensive posture as they respond to the most pressing backup and restore issues.

Instead, these organizations have begun to successfully transform themselves into proactive, customer-facing groups who actively provide robust data protection services to a host of IT customers and who seek to meet or exceed customer expectations about their quality of service.

The following diagram outlines the five key steps in this framework.

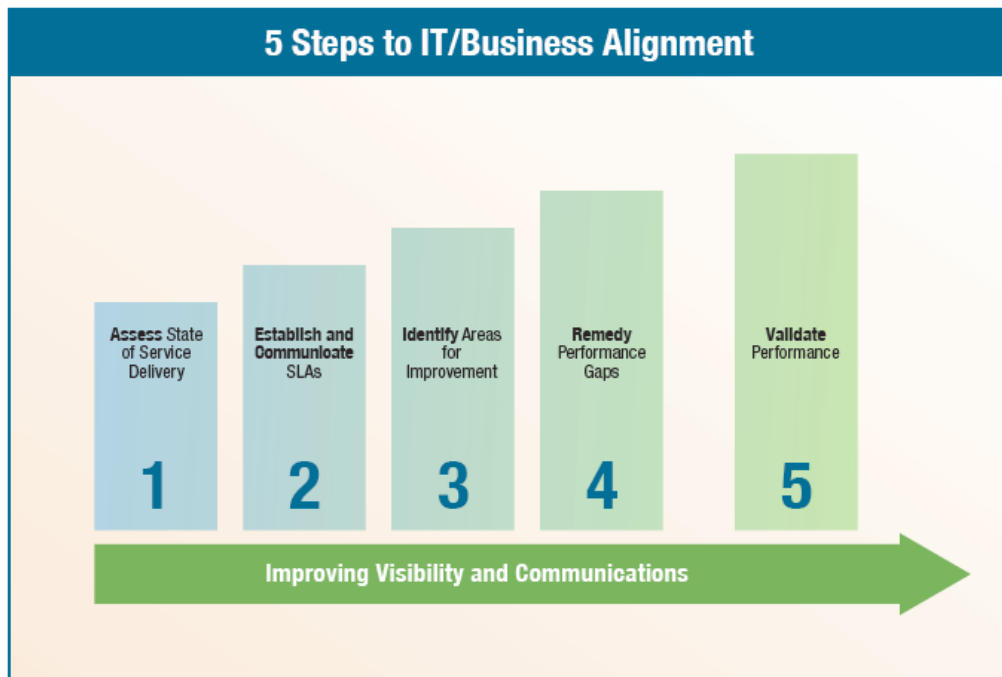


Figure 1. The Bocada Five-Step Framework to Realign IT with Business Needs

Step 1. Assess State of Service Delivery

Regardless of the metrics you use to define your data protection service levels, efforts to improve service delivery must begin with an understanding of the current levels and qualities of service delivered. The goal of the first step in the framework is to assess where your current IT backup/restore performance is now. In effect, you are auditing your current state of service delivery.

Most of the information about how well your organization is currently doing backup/restore operations is available from analyzing the empirical data you collect about enterprise-wide backup/restore activities. This may include aggregated reports on the current successes or failures of your backup jobs across the enterprise, current backup throughputs or loads, any bottlenecks you identify to backup or restore performance, and past statistics about data availability or restore incidents.

At this step, you need vital visibility into the specifics of how well your IT organization is executing on the myriad backup/restore processes it undertakes. While this step may sound simple, the process involved in collecting, sifting and analyzing the related empirical data across the enterprise can prove daunting for many IT organizations.

For this reason, Bocada offers a few considerations to keep in mind when embarking on your own IT assessment of backup/restore services.

Assessment Considerations

The scope and detail involved in your own assessment of the state of your current IT backup/restore services is up to you. This section summarizes feedback collected from Bocada customers on the merits of various assessment approaches. It also offers some general guidelines about the types of data you'll want to collect and some questions you'll want to ask yourself as you prepare for the assessment process.

Do you want to perform manual vs. automated discovery/reporting? Unless you have a small volume of backup log files and IT staff with extra time on their hands to devote to manually reviewing and collating all related backup log data, you may want to look at ways to automate the collection of empirical data that can aid in your

assessment of the current state of your data protection services. With many IT organizations operating multiple backup applications, and processing hundreds-to-thousands of backup jobs, customers often tell Bocada that it is physically impossible for them to manually assess backup performance across their entire enterprise.

For automated discovery, should you use commercial backup reporting tools or build your own tools? To assist them in performing assessments of backup operations, some organizations have chosen to take advantage of commercial backup reporting tools like BackupReport® that quickly aggregate and present backup data, including successes and failures, from across the enterprise. While a few organizations may look into developing their own reporting tools or point solutions to perform this type of assessment, Bocada believes this to be a short-term solution with significant risk. While homegrown tools can start collecting some empirical backup data, aggregating the data necessary to understand true system performance requires a robust, enterprise application. Likewise, companies who embark on building their own tools can expose themselves to additional risk -- in the form of excessive costs of maintenance and support, version control, troubleshooting time and, worst of all, the inability to gather and process the huge amounts of raw data necessary to deliver true business insights.¹¹

To obtain enough information to effectively establish and benchmark your organization's current levels of backup/restore services, look for reporting tools that allow you to:

- Understand backup success trends over time.
- Drill down to a very granular level of reporting on specific backup success/failures, as well as higher-level summary reports on your backup success levels.
- Identify the success or failure of backups performed for key data owners or groups, backups associated with specific backup jobs, and backups performed on specific servers, file directories or clients.
- Specify different classes or categories of data and identify backup success or failure for each class of data. According to Fred Moore, president of Horison Information Strategies, and a sought-after storage industry consultant and speaker, one way to categorize your data is as follows: mission-critical, vital, sensitive or non-critical.¹² Bocada has also seen customers identify and report on performance as it relates to specific types or locations of data -- based on lines of business, specific zones or data owners, such as "Marketing Dept," "Transportation Division," "London Office," etc.
- Identify common categories of backup errors that may be causing bottlenecks at either the file level, at the tape drive, somewhere else in the network or within the backup software application itself.
- Identify specific "orphan" clients: servers or files that have been inadvertently omitted from the backup process.
- Locate the backup jobs or data owners who tend to consume the most backup resources over time.
- Learn how your backup operations are changing from week-to-week (this data allows you to gain a clearer picture of typical loads and processes, versus unusual spikes in backup activity).
- Learn how current backup-related assets are being used across the enterprise, such as typical utilization rates on all of your organization's tape libraries and tape drives.

Should you extrapolate assessment results based on snapshots or random samplings of performance data or based on a comprehensive view of all performance data? Some companies may choose to perform their assessment by taking "snapshots" of how well they are doing at backing up or restoring data associated with only a small number of key servers. These servers might comprise 10 percent of their total backup environment. From there, they attempt to extrapolate current, enterprise-wide backup/restore performance and state of services delivery based on the data collected and analyzed from their sampling. Based on the experience Bocada has had with customers that do an initial assessment, we do not endorse the snapshot approach as a means for IT organizations to adequately assess their current performance. To ensure that adequate protection and recovery capabilities are in place for all of a company's key data, Bocada believes it is imperative for IT organizations to

¹¹ For more information about the features you should look for in either commercial backup reporting packages or in developing your own custom reporting tool, see 'Implementing Storage Intelligence,' on page 7, in the Bocada whitepaper, "Storage Intelligence: Ensuring Storage Operations Meet Enterprise Objectives," <http://www.bocada.com/products/br/whitepapers.htm>.

¹² "Storage and Security Report," by Fred Moore, NewsFactor's Data-Storage Today, May 4, 2004, <http://data-storage-today.newsfactor.com/story.xhtml?story_title=Storage-and-Security&story_id=23944#story-start>.

first identify anywhere valuable data resides across the enterprise, and then assess how well they are doing at backing up the data. This involves performing a widespread assessment of backup performance enterprise-wide. Only by seeing this bigger picture can they learn of key company data that has been inadvertently omitted from current backup procedures.

How do you define a backup failure? As you conduct the assessment process, you'll need to decide what constitutes a failure. For instance, does it only constitute a failure when a backup job fails to complete properly? Bocada believes customers must establish their own definitions according to policy; however, the concept of backup failure must include unprotected assets—those with no backup activity planned or scheduled.

How should you prioritize different types of assets and their related need for backup? Not all data is critical --and proper weight must be placed first on assets that house critical company data. A typical IT organization may be responsible for backing up numerous back-end servers on the network and all data residing in the data center. It may also be responsible for backing up client machines, and even laptops. There may be remote offices that have a local backup procedure. Larger companies may also have geographically dispersed data centers requiring multi-tiered backup procedures. All of these need to be considered when conducting an assessment, and service priority given to those containing the company's most critical data.

Step 2. Establish and Communicate Service Level Criteria

The second step in the framework is a fact-finding mission conducted by IT. During this step, IT managers or staff members schedule and conduct interviews with all of their key customers and spend time gathering data on industry standards for assessing system performance and cost of service.

There are several purposes behind this second step:

- 1. Demonstrate IT's renewed, customer-centric focus.** This can serve as an excellent public relations campaign on the part of IT. It demonstrates that IT management is open and interested in learning about the specific needs and goals of different leaders in the business and how those goals relate to customer expectations for accessing, protecting and restoring their application data. This exercise presents an opportunity for IT to learn about any current or past concerns customers may have with their services. It's also a chance for IT to express some of its own challenges to data owners and identify some common ground and expectations on which to base an ongoing, service-oriented relationship.
- 2. Document specific customer service needs.** The outcome of these fact-finding missions should be a set of working documents that define the customers' criteria and expectations of IT services that include backing up and restoring their data. These working documents will change as you go through the framework, but should ultimately be the basis of either formal or informal service level agreements (SLAs) that will allow IT to quantify how well it's doing at meeting customer needs and providing these types of IT services.
- 3. Establish definitive benchmarks to define success.** Beyond receiving input from customers, this second step also allows IT to establish its own backup/restore success criteria based on the best practices and common service level measurements taken from other industry sources. By doing the research up-front to learn how other IT organizations gauge their success and then basing much of your SLA criteria on this, the IT group can save significant time and develop instant, third-party credibility for its efforts. Some of the outside sources who can help you obtain this type of aggregated information include companies like Bocada who aggregate best-in-class benchmarks from customers about the elements of effective SLAs. You can also rely on other partners or service providers to tell you the common measurements and parameters they use to determine backup/restore success. These outside sources can prove invaluable when it comes to gaining better understanding about the goals of the business and how those translate into a more strategic, cost-centered IT perspective.

External Benchmarks for Backup/Restore-related SLAs

In terms of data protection, Bocada has seen IT leaders at the forefront of service level management first begin with a definition of success consisting of predefined backup/restore service levels or qualities of service (QoS). These predefined backup/restore benchmarks can consist of multiple elements, such as:

- The percentage of "uptime" they promise an application and its data will be available for use (85% availability, 99.99% availability for critical systems, etc.).

- The promised time to restore applications/data in the event of disaster or failure (hours, days, etc.).
- The amount of data to be backed up or restored (number of gigabytes, etc.).
- Backup frequencies (every day, every week, every month, every quarter), and the types of backup to be performed at the frequency (incrementals, full backups, etc.). Example: Some companies promise a full backup only every other day.
- Service levels based on unique data owner profiles that spell out customer information such as the specific department, platform (Windows, Unix, etc.), by geographic region, etc. These allow IT to offer service levels to each type of data owner, and to bill according to their ability to meet and prove SLA compliance for that business owner.
- Accountability/validation reporting -- Some sites even go so far as to identify how and when they will report their progress at achieving these service levels to key data owners in the organizations (daily, weekly, monthly, quarterly; via e-mail, an internal website, hard copies of reports).
- Time windows during which backups will occur (many companies backup only during non-business hours -- nights and weekends -- and jobs that do not backup in those timeframes are considered errors).
- The types of backup errors considered "acceptable" or "unacceptable" and the prescribed time needed for IT to investigate and fix the error.
- Chargeback expectations -- Some IT organizations have implemented a more formalized internal services provider model where customers will be charged for the IT services they use. Chargeback criteria should be spelled out in an SLA, including the cost involved in IT backing up X number of gigabytes of customer data at whatever backup frequency the customer requires. Other costs to identify may include the cost of guaranteeing customers higher levels of data availability and recoverability -- such as 99.99% availability versus 88% availability.
- Minimum and target service levels -- While some customers insist on a certain basic level of performance, availability backups and recoverability, this "minimum" standard may be different from their optimal scenario. (Some IT organizations use SLAs to define two different levels of service they should try to attain.)
- Compliance-related backup/restore standards -- Many IT organizations are required to comply with a variety of internal or external regulations (HIPAA, SEC 17a-4, Sarbanes Oxley, FDA 21 CFR Part 11, etc.). These regulations often dictate data retention timeframes that prescribe how long the organization should continue to back up and store certain types of company data. For instance, some data is not supposed to be kept for more than 30 days, while other has to be held onto for seven years or more. Some IT organizations also go one step further and set SLAs based on company-internal retention rules that are unique to each data owner (Example: Finance data might need to be kept longer than Marketing data).

Such external benchmarks and predefined service levels often form the basis of either informal or formalized service level agreements (SLAs) agreed upon by both IT management and key company leaders who hold a vested interest in the data and systems under IT domain.

Step 3. Identify Areas for Improvement

In effect, this step is the reality check that allows you to understand the gaps or shortfalls in your IT performance, based on the assessment conducted in Step 1 and the desired benchmarks and service levels identified in Step 2.

When you identify areas for improvement in your backup/restore performance, you are looking at the difference between:

- The *current* quality of service you offer to customers in the area of backup/restores; and,
- The *desired* quality of service you should be offering customers in these areas.

Step 3 also involves:

- Understanding if you are delivering required services at the lowest possible cost.

You should be looking carefully at ways you can optimize the delivery of backup/restore services by offering acceptable quality of service levels to customers at the lowest cost to the company. Here, you should be able to identify ways to lower costs involved in your current backup and restore procedures. One obvious opportunity to do this will come in terms of improving on how you utilize current backup-related assets and hardware.

During this step, one Bocada customer realized their backups were only about 60 percent successful. By analyzing the data more carefully, they discovered that certain network errors were preventing backup jobs from completing successfully. They also identified key information about when certain backup jobs were running and the loads at different times of day on the various backup servers, tape drives and libraries. Based on this information, they identified a few key ways the backup schedule could be restructured to improve on performance. Once they instituted these scheduling changes and corrections, their backup success rates jumped to well over 85 percent.

Cost-Effective Service Delivery

Step 3 involves assessing backup trend data, and any reports related to the current utilization of certain backup resources, such as backup media, tape drives and their associated libraries. You may also want to take a closer look at reports that identify backup loads on the system at different times of day, and any backup jobs that occur outside of your predefined backup window.

This step is opportunistic in nature, requiring IT management and staff to be constantly searching for ways to work smarter and improve on the use of current processes and resources. This is where IT can use its predefined priorities and make it a goal to exceed current SLA expectations on the part of some of its most business-critical customers.

This step may involve identifying areas where higher standards of availability, performance, recoverability or utilization could be reached. Here, IT managers actively discover new ways to cut or contain operating costs and consolidate performance. Some organizations may find that certain tape drives are overloaded while others are underutilized. A few load balancing shifts can make significant differences in overall performance.

During this step, one IT organization using BackupReport discovered that one of its internal customer groups, located on another continent, was unnecessarily storing 213 backup tapes off-site, even though the tapes had exceeded the required retention period. At a cost of \$76 per tape, plus the added cost of off-site storage, this expense added considerably to the IT budget.

The same IT group also learned that as much as 10 percent of the 1.2 petabytes of data backed up over the past month consisted of bad data – roughly 100 terabytes of “failed volume” data that the organization had been keeping on tape for 7 years. IT management estimated its cost to back up and store this 10 percent of bad data was equivalent to \$600,000 per year.

Step 4. Remedy Performance Gaps

Step 4 is one of the most critical steps in the Bocada framework to help you realign your IT organization with the goals of the business. By acting upon the knowledge gained in the first three steps, you can prioritize and fix backup/restore issues identified during the analysis of your environment.

At the end of this step, you should be able to achieve significant capacity or operational gains in productivity, process operations or asset utilization.

The Remedy for Chronic Errors

Based on the priorities you've set, you can now actively troubleshoot and remedy chronic sources of backup error. You will also need to correct any glaring bottlenecks to backup/restore performance and where you start backing up any critical “orphan” clients, servers, directories or files that you've previously discovered were not part of the backup routines.

In Step 3, if you identified certain levels of backup or restore that you know your current systems cannot achieve, you need to start modifying systems to satisfy customer resource requirements. In some cases, this may involve acquiring new systems or software to accommodate the higher levels of service you need to achieve.

(At this step, some IT organizations find it helpful to enlist the help of an independent consulting organization with strong experience in streamlining IT backup/restore operations. Experienced consultants can often find creative ways to help you achieve your desired quality of service levels with your existing assets.)

During this step, one Bocada customer learned about the existence of nine Microsoft Exchange servers on the network that had never been backed up. Another Fortune 1000 customer discovered that the volume of their backup jobs had tripled recently. By looking at reports on their activities, they learned that they were backing up 9,000 jobs per day on the master server, as opposed to their normal 3,000-job volume. In the process, they were wasting an extra 2-5 minutes per backup job. This analysis led them to discover the source of the increase was due to a bug in their backup software that caused backup jobs to cease and restart 2-3 times before completion.

At the end of the repair phase, you will have placed your IT organization in position to confidently offer a high quality of service to customers in the area of data protection, data backups and restores. You will also have taken the first formalized step to report back to customers on how well your IT services are aligned with their own goals.

At the end of this step, your IT organization should have instituted a set of formalized reports and communications to internal/external customers. For example, some Bocada customers automatically post reports to a Web-based intranet site, accessible at any time by the key data owners and customers in the company. Others send automatic e-mails that report on the ongoing backup/restore performance related to the customer's data. In either case, these reports serve to communicate and remind data owners of IT's success at delivering quality services to meet the needs of the business.

Step 5. Validate Performance

The final step in the Bocada framework is the "prove it" step. This is where IT organizations really have a chance to publicize their efforts to align themselves with the needs of the business. Validating performance at this step means offering independent reports about how successful you are at achieving the SLA criteria set for your internal or external customers. Ongoing, automated reports easily demonstrate how well your organization is doing at complying with all of the predefined SLA criteria.

If you've achieved significant gains in performance or have been able to dramatically lower cost of operations, this is also where you can publicize your progress to customers, executives and upper level management. This helps raise confidence levels in IT's ability to contain costs and operate efficiently.

If you are in a regulated industry, you will report on how well your organization is complying with regulations that prescribe certain data retention rules.

If you are asking customers to pay for the data protection services you provide, you will start instituting chargeback procedures with your customers.

If IT organizations have successfully completed the prior steps in this framework, Step 5 is a natural progression that allows them to further communicate how well they are doing at meeting *or exceeding* their company's quality of service expectations in the area of data protection.

The end result of this step is a closely aligned, enlightened IT organization that is capable of responding to the unique needs of the business.

Beyond Step 5. Iteration Toward a Mature IT Model

IT organizations who are dedicated to ongoing growth in the area of data protection should recognize that completing one five-step framework will not ensure continued progress. For this reason, the Bocada framework is not intended as a linear progression with one starting and ending point, but as an iterative process that is ongoing within an IT organization. As soon as organizations complete Step 5 in the framework, they should start planning to undertake Step 1 again at some point in the future.

IT organizations who consistently assess where they are, work with customers to identify where they need to be, and who actively work to close performance gaps truly set themselves apart from their peers. These are the

organizations that are constantly seeking ways to optimize their service delivery and gain the best possible use of existing assets. Due to such ongoing efforts, these groups are also presented with multiple opportunities to communicate and report on their progress toward goals and their success at continuous realignment to business needs.

By performing a repetitive iteration of the foregoing five steps, today's CIOs and IT leaders can continue to transform themselves and their organizations from tactical to strategic, from a position of reaction to one of anticipative leadership.

This emphasis on continuous process improvement will succeed in continuing to raise the bar for IT excellence in today's organizations.

Conclusion

Organizations that follow the basic steps outlined in this framework will be able to produce dramatic results in a relatively short period. Organizations that drive their data protection efforts from reactive, fire fighting mode into proactive planning and capacity utilization efforts can focus on delivering quality service at the lowest possible cost. In the process, these IT groups transform the image they present to their company at large. Where once they may have been considered a significant cost center and just another department, many of these IT groups have been able to reshape their image to one of a quality service provider offering the best services to customers at the lowest possible cost.

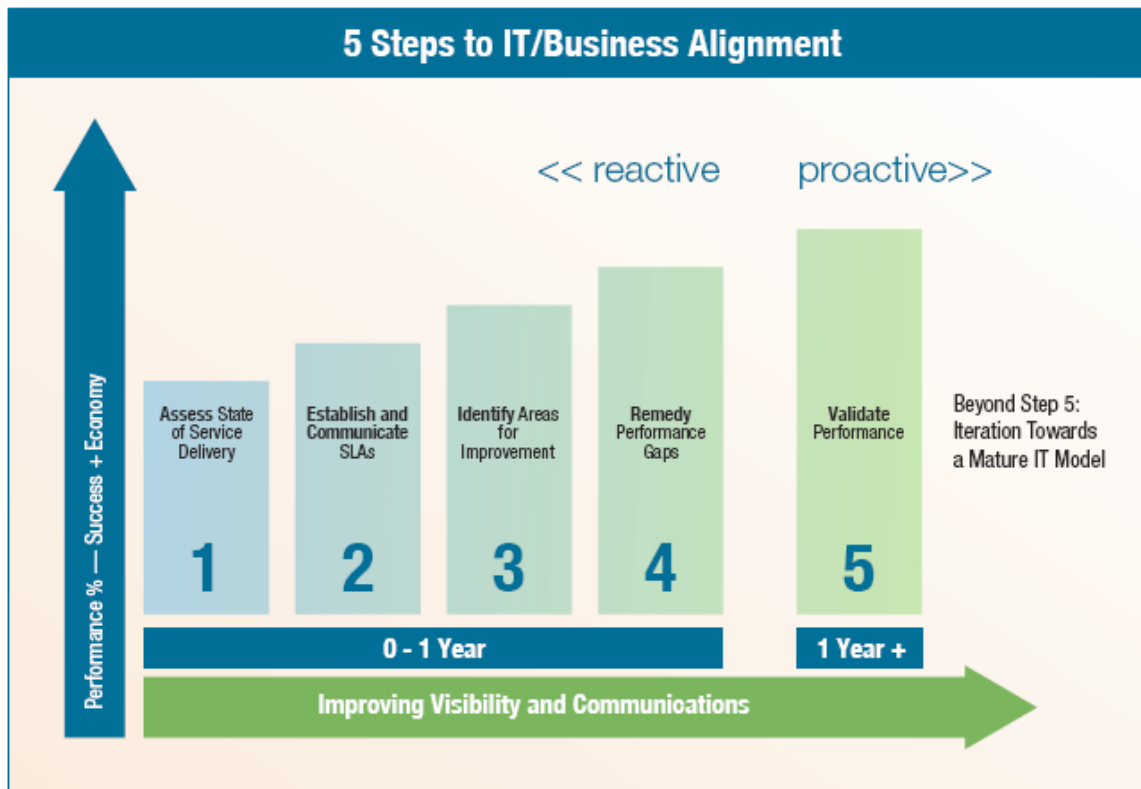


Figure 2. Expected Implementation Timelines and Performance Gains

Their efforts to align to the needs of their customers produce significant gains in their ability to recover data. We have seen IT groups who institute these steps improve their enterprise-wide backup success rates as much as 20 percentage points or more, with the assistance of BackupReport. These organizations also achieve dramatic reductions in operating costs, by identifying ways they can improve on current backup schedules and the ways they use current assets, such as servers and tape drives.

Based on key concepts in the most progressive IT management initiatives -- including the capability maturity model and the tenets of service level management -- this five-step framework has proven itself time and again as a means to demonstrate an IT organization's ability to understand and meet the larger goals of the business. Similarly to the capability maturity model, the steps in this framework naturally move an IT organization from a position of reaction and limited visibility on current backup successes or failures -- to one that proactively communicates backup/restore performance, reports on QoS performance against SLA criteria, documents overall backup policies, and performs ongoing assessments to discover ways to improve on the use of assets and to project and forecast future growth needs.

Progress through the steps will lead naturally from tactical maneuvers to more strategic efforts in data protection. In the process, organizations will become more and more proactive in the tasks they perform and how those tasks impact the needs of the business.

Within just a few months of implementing this framework, we believe any IT organization can achieve similar success at realigning its data protection/recovery efforts to meet the needs of the business. Based on field experience, Bocada estimates that the average IT organization can complete the steps of this framework in anywhere from a few months up to one year (see Figure 2).

The end result will be an IT organization that understands and meets customer needs and the larger initiatives of the business. This IT organization will be able to proactively communicate on an ongoing basis with customers about progress as well as issues related to their application data.

About Bocada

Founded in 1999, Bocada pioneered development of software that validates data protection system performance against business goals. Our flagship product, BackupReport, provides objective insight on service level delivery and performance, helping companies to reduce their exposure to unrecoverable data, increase the utilization and performance of their infrastructures, reduce the cost of their service delivery, and communicate results. Bocada is trusted by more than 135 brand-name customers and partners worldwide, including Amgen, Cap Gemini Ernst & Young, Dell, SBC, Sprint, Deutsche Bank, Microsoft, Unilever, and Xerox. Bocada is a private company funded by leading northwest venture investors and headquartered in Bellevue, Washington.

For more information about Bocada and BackupReport, please contact us, or visit our web site.

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