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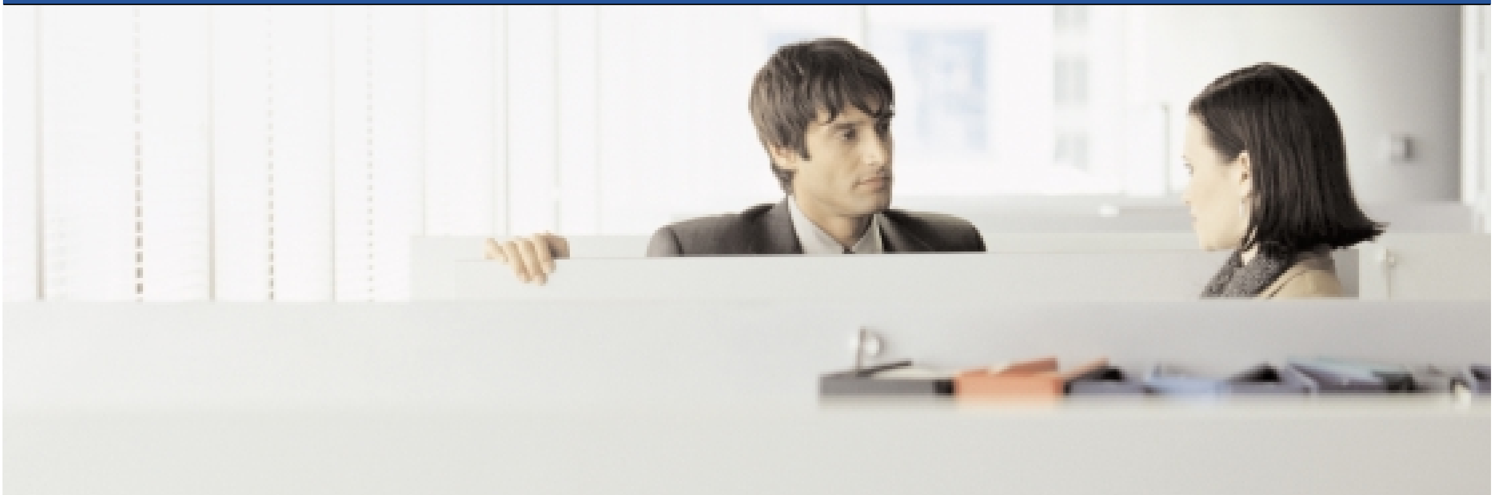


Storage Management Strategies and Software for Maximizing Business Impact and ROI

By Dr. James Ambrose

"By achieving this goal, what capability will you have that you do not have now?"

Introduction

A well-planned technology deployment can deliver measurable benefits to storage management operations through the automation of reporting, forecasting, inventory management, and provisioning procedures. Other IT functions stand to benefit as well, as storage management technology can also help contain overall infrastructure costs, improve capacity-to-footprint ratios, and better ensure business continuity.

However, deployment alone does not deliver the full benefits of the new technology. Operational changes—mapped closely to benefits desired—must be identified up front and the technology deployed so as to effect these changes. Many deployment plans, however, do not address operational changes or effectively align them with the technology. As a result, the business impact and ROI expected by management are either not realized or diminished.

This document provides information and proven guidelines/methodologies on framing business impact goals, establishing meaningful and quantifiable measurement criteria, mapping operational changes to technology, and planning, project, and change management requirements—information that can help IT management not only achieve desired results, but reduce the time-to-benefits as well.

Establishing Measurable Improvement Goals

A successful storage management technology deployment must begin with the creation of clearly defined business impact goals and meaningful, quantifiable measurement criteria.

For maximum business benefit, measurable improvement goals must relate to the capabilities you wish to create and not the means used to create them. For example, instead of "consolidate storage assets" [the means], a more appropriate goal is "create the capability to grow storage capacity within the same footprint." Goals should be explicit both as to what they're intended to accomplish and their scope—for example, "minimize RPO and RTO requirements [intent] without adding additional cost for all business-critical applications and data stores [scope]."

Both intent and scope are needed for establishing meaningful and quantifiable measurement criteria for each goal—conditions/success metrics that are used to gauge whether or not a goal has been/is being met. Measurement criteria are what enable you to accurately determine what operational changes will be needed and how the technology will enable those changes. It is important to address all measurement criteria needed to effect the intended outcome and scope of a goal (e.g., if your goal is to "grow the capacity of the storage infrastructure within the same footprint," both human and facilities criteria must be considered). Additionally:

- All criteria must have a specific time frame.
- Each criterion must include the quantified measure of change expected.
- The amount of change expected must be reasonable, given mostly likely conditions and resources.

Establishing a Business Case

Goals and measurements must be tied together into a sound business case to justify making the desired storage management technology investment. The business case should include anticipated business benefits, problem statements, and a vision for the future, as well as the consequences of not making the proposed investment. Figure 1 shows a sample framework for a high-level business case.[1]

Figure 1. Sample High-Level Business Case Template

Problem Statement: (Describe the current "as is" state and the root problem that the business needs to solve.) There is a substantial amount of manual labor involved in managing the storage infrastructure and resources are stretched to limit.	**Consequence: (Describe the consequences of not changing the "as is" state or not solving the problem.)** Ability to meet project growth and service level requirements with current headcount will not be possible within 12 months. Possible increased risk to system .availability and quality of service. Increased expenses relating to third party management software (i.e., BMC licenses and maintenance)

Business Vision: (Describe the "to be" vision for the business in terms of additional capabilities, process improvements, or increased effectiveness.) Employ technology to automate manual procedures, help streamline cross functional interfacing, and reduce dependency on more expensive monitoring, reporting, or management products

	Business Benefits	*Measure of Success*
Strategic *CEO-Level*	**(List benefits associated with supporting overall corporate strategy (at CEO level), or required for regulatory compliance.)** • Improved capability to grow capacity and capability within the same footprint or with minimal growth. • Maximize ROI on IT assets, resources, and investments	**(List the measurements that will be used to determine if the objective has been met.)** • Ratio of people and systems to capacity level and facilities • Existing ROI measures
Hard *Quantifiable & Committed*	**(List benefits that are directly quantifiable and have direct financial impact (e.g., increased revenues or decreased costs).** Initial benefits should be estimates (ranges). Finalized hard benefits (from a full business case) will require the functional business unit's commitment to budget or headcount adjustments.) • Savings from efficiency improvements=70 man weeks, 1.35 FTE, $135,000 • Savings from reduction in more expensive management software=$125,000 annually • Consolidation of storage devices without reducing overall capacity=$350,000 annually	**(List the measurements that will be used to track financial performance.)** • Ratio of FTE to capacity • Reduction in license and maintenance fees • Number of storage devices to overall capacity
Soft *Non-Quantifiable*	**(List benefits that are difficult to quantify (i.e., productivity and efficiencies) or that the business unit is not willing to commit to as hard benefits.)** • Quality of Service—Faster execution of requests, more proactive maintenance and repair, more resilient infrastructure • System Availability—Bring uptime closer to "utility" performance level, reduce opportunity for failure • Greater Efficiency – More flexible allocation of resources	**(List how each benefit will be tracked and how the impact will be reported.)** • Increase in response time to significant performance/cost issues • Reduced risk to business continuity

Approach: (List "next steps." These may vary based on the project scope and scale. For example, larger projects may require vendor analysis or the development of a full business case as a next step; smaller CI/enhancements the next steps may entail outlining "Estimated Development Days" or "Estimated Days for Scope/Requirements" as a means to compare and prioritize initiatives within PDTs.)

Accelerate and extend current ECC deployment efforts to include additional cites. In parallel alignment and streamline cross-functional roles, responsibilities, workflows, policies, and systems.

1 A business case will usually include more detail in each section and may also contain an overall financial model that includes Total Cost of Ownership, Cash Flows, or even Balance Sheet and Income Statement data. Additional supporting material may include Process Analysis, High-Level Architecture, Risks and Dependencies, Assumptions, Vendor Comparison, and Critical Success Factors.

Ensuring Cross-functional Agreement

Effective storage management and provisioning involves multiple IT functions—e.g., storage, server, database, network management, applications development, facilities management, development, and business liaisons, among others. Each function has its own projects and goals and its own policies, processes, and management tools for achieving those goals. A cross-functional plan must be created and agreed upon that clearly specifies what storage management software will benefit these functions, and how. This plan is necessary to ensure that all functional heads clearly understand the impact of the software on their organizations and can therefore agree to make the necessary operational changes or change over from the tools they're already using.

All functions must also agree on, and set priorities about the specific capabilities within those functions. Figure 2 illustrates examples of capabilities that a software management system can help create.

Figure 2. Software Management Capabilities

Assets to be Managed

Storage • Platforms • Hosts • Fabrics • Databases

Storage Management Software Functionality

Monitor Alert & Alert Response • Capture Performance/Utilization Statistics • Reporting/Trending • Allocating • Managing

Management Function

Monitoring, Alerts, and Alert Response

Capabilities

- Proactively monitor break/fix
- Minimize response time
- Preempt problems
- Employ auto-fixes

Infrastructure Management

Capabilities

- Automated inventory tracking
- Automated capacity tracking
- Automate utilization tracking
- Automate host/storage relationship and tracking
- Create highly accurate forecasts
- Minimize provisioning lead times
- Consistently meet SLA requirements
- More effective reporting
- Achieve ITIL levels of centralized storage management for:
  - Incident/problem management
  - Configuration management
  - Change management
  - Release management
  - Service level management
  - Availability management
  - Capacity management
  - Continuity management
  - Performance management
  - Financial management

Infrastructure Optimization

Capabilities

- Grow within the same footprint
- Maximize infrastructure
- Flexibility
- Scalability
- Serviceability
- Integrated management
- Minimize risk to business continuity
- Minimize RPO/RTO
- Maximize infrastructure-wide service levels

When the capabilities have been selected and prioritized, the program manager in charge of deployment can determine how to best utilize the functionality of the storage management software with each asset to be managed—and create an efficient and effective deployment plan. This deployment plan should precede the creation of a detailed project plan or change management plan because:

1. The deployment of storage management software may affect the resources, processes, procedures, and management tools of the cross-functional stakeholders who need to understand and must agree to any changes.

2. Issues invariably arise at this stage that may require changes in the scope, focus, priorities, timetable, or expected benefits. These issues need to be addressed before detailed project plans are laid out and resources assigned.

At a minimum, the deployment plan should address the following:

- Which objects (devices) will be targeted for each phase of the deployment
- What agents will be deployed
- What initial threshold limits will be
- Which alerts will be used
- Which filters will be used
- What dependent management applications/tools will be impacted
- What statistics will be collected
- What reports will be created

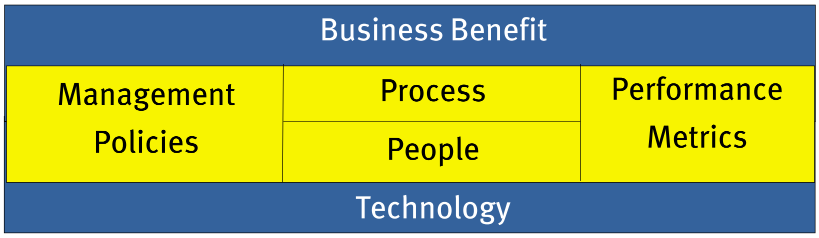
The following operational issues should also be addressed:

- Which of the existing policies and procedures need to be modified or eliminated
- How the policies or procedures need to be modified
- Which workflows need to be modified and how
- How cross-functional workflows will be resynchronized and tested
- Which responsibilities, cross-functionally, need to be resynchronized, redefined, or reassigned
- Who is responsible, on an ongoing basis, for ensuring:
    - Cross-functional processes, policies, and assignments stay aligned
    - Monitoring performance, analyzing results, and determining improvement options
    - Assessing the impact of changes, implementing changes
    - Tracking revision levels for all storage management software components, across all locations and managed objects

Understanding Operational Change and Enabling Technology

There are four key operational factors (see Figure 3) that must be considered to determine the impact technology will have in enabling the capabilities selected earlier. By considering what changes to these four factors (if any) will be necessary to achieve the new capabilities, and then determining how the enabling technology will help to effect these changes, the deployment manager creates a bridge between outcomes (new capabilities) and technology's role in effecting these outcomes.

Figure 3. Operational Change Factors



Management Policies and Performance Metrics

Policies represent predefined rules for how things should work. From a storage management perspective, policies determine which agents will be deployed, and how; what threshold and alert parameters will be set; what user permissions will be granted; and what the structure of storage pools should look like. Policy statements, like rules, usually link an action to a condition (i.e., if›then).

Performance metrics relate to policies by establishing one or more measurements to gauge how the action is carried out. In the IT world, for example, Service Level Agreements (SLAs)[2] represent documented performance metrics assigned to the provisioning of an IT service. Some SLA measures will measure the time to complete the service or provisioning project. Others address cost, or risk. Usually, however, there are combinations assigned to an action.

How well policies and performance metrics are crafted and monitored is crucial, as they govern what work gets done, how procedures will be executed, and how work (i.e., process) will flow. They must be relevant and explicitly impact of measure specific outcomes (as measured by a “yes” answer to the question, “If these policies are followed and these performance metrics achieve the outcome (capability) we want will be realized.”)

Once policies and performance metrics are agreed to, the deployment manager can determine how and where technology will be used to help ensure the performance metrics are achieved.

Processes and People

An operational process comprises a logical progression of procedures. Procedures are used to standardize how work gets done within the process or across dependent processes. Theoretically, the more procedures that can be automated, the less complexity there will be in the process—thus the efficiency of the process will increase, as will individual productivity. In reality, however, many have found this to not be true—as evidenced by the many ERP and CRM projects that have reported marginal results at best. The following example illustrates the need for a clear definition of the benefits desired and the changes needed to realize them. Only then can a defensible case be made on how the technology will be used to enable the changes that will affect those benefits.

2. Unfortunately, SLAs are not always explicit enough, enforced, or properly aligned across procedures, tasks, processes, or decision-making levels. When such gaps exist, they usually manifest themselves as contention between functions or groups, extended cycle times, and lost productivity.

A software manufacturer had spent two million dollars on CRM software, and two years later it still had not been implemented. An assessment uncovered the following:

1. There had never been any agreement between cross-functional managers on exactly how the software would be used to help them achieve their goals. Consequently, they were reluctant to make any changes that could negatively affect their performance or limit their flexibility to meet changing business conditions.

2. Current workflows, policies, and performance metrics had not been documented. Consequently, no defensible change impact assessments were completed.

3. Reporting, forecasting, and opportunity qualification procedures were different for marketing, business development, and sales. Though the software could accommodate these differences (within limits), no one had thought to first look at how to improve operations across the entire demand chain—not just for individual functions. For example, synchronizing work, and normalizing policies and qualification criteria to reduce cycle times, improving productivity, and most importantly, substantially increasing the time sales reps spent in front of qualified prospects. As a result, when senior management started asking questions why it had been two years and they still were not seeing the promised results, there was a lot of finger pointing but no answers.

4. The data definitions, policies, and controls embedded in the software, in many cases, were different than those used by the individual functions. For example, what sales called a "lead," the software referred to as an "incident". Further, the software used embedded routing and reporting criteria that differed from the way sales management wanted things done—and was not easily changed. As a result, sales said no to using the software.

Having a clear understanding of what procedures the software executes, and how, will accelerate the process of making these determinations. Remember that it's also necessary to understand the boundaries and the interfaces between what the technology will do, what other technology will do, and what will be done manually. This means synchronizing the policies, controls, and routing across the streamlined workflows.

Keeping Focus On "Capability" Outcomes throughout the Project

Validating the Changes and Continued Agreement

Once the operational changes needed to achieve the new management capabilities have been finalized, they need to be incorporated into the project plan and project review meetings. From this point on, both the technology deployment manager and functional managers can ensure that change activities stay aligned with expected outcomes by regularly going through the following "alignment checklist":

Goals and ROI

- Have there been changes to the goals or the measurements for the goals?

- Are the changes originally thought necessary to realize measurements and goals still appropriate? Have any been added?

- Are there any changes to the map showing where and how the new technology will be used?

- Have there been any changes that would affect expected ROI measures?

People

- Do the people who do the work, and their management, agree with their assigned responsibilities in the revised workflows or procedures?

- Is additional training needed, and if so, is it coordinated with the rollout plan?

- Is qualified help in place and readily available during rollout?

- Have project management and members been trained on these validation procedures and on how to use them throughout the project?

Policies and Rules

- If there are to be changes in policy, responsibilities, or accountability, have they been documented and agreed to? (This includes policies and rules governing both workflows and procedures.)

- Has the impact assessment been completed?

Performance Measures

- Have performance measures (i.e., service level agreements) for the people, functions, processes, and software been made, documented, and agreed to?

- Have performance measures been reviewed to ensure that there are no conflicts, overlaps, or gaps that would compromise results?

Cross-Functional Workflows

- Do the revised workflows show the boundaries and the interfaces between what the management software will do, what other technology will do, and what will be done manually—on a procedure-by-procedure basis?

- Have the policies, controls, and routing used by the software in the execution of procedures been synchronized with those in dependent applications, and those governing procedures done manually?

Documentation

- Has all of the above has been documented in manner that it can be easily updated and used to execute and track the adoption of the changes?

- Have documentation control, updating policies, and procedures been put in place to ensure that the documentation remains current?

Ongoing Process Management, Monitoring, and Analysis

- Have management, monitoring, and analysis policies been defined for routine reviews to ensure adoption of the changes, make modifications if necessary, and sustain alignment between the work being done and the strategic, hard, and soft benefits expected?

- Have sustaining policies and procedures been documented and accountability assigned to ensure that they are followed?

Rollout, Technology Qualification, and Project Plans

Once the validation has been completed, the means must be put in place to ensure that goal and ROI alignment are maintained throughout the project. This is a critical but often forgotten step in many projects. The following checklist can help ensure that the project proceeds according to plan:

- Has a rollout plan describing the rollout strategy and the timetable of activity prioritized on a function-by-function basis been created and agreed to?

- Have appropriate technology-qualifying documents needed by the vendor to configure the technology been completed?

- Has a project plan been created that includes testing criteria to ensure that goal, measurement, and ROI alignment are maintained throughout the project?

- Will project status reports be able to effectively validate that goal, measurement, and ROI alignment have been maintained?

In short, it is important to maintain alignment across all levels of planning and project management documents.

Change Management

An effective change plan can be pivotal to the extent and timing of the benefits realized. Without the commitment of all the stakeholders to make the operational changes necessary and to use the enabling technology, there is a very high risk of failure. Resistance should be expected and planned for. At a minimum, change plans should include:

- The overall change strategy

- Activities to preempt resistance and gain acceptance on a function-by-function basis

- A synchronized timetable of changes across all functions

- Roles and responsibilities for making the changes on a function-by-function basis

- Training schedules and estimated learning curves

- Specific cutover dates

- The name of the senior manager responsible for the successful, on-time completion and adoption of all changes

It is highly recommended that the stakeholders affected by the changes, both directly and indirectly, be involved early in the process. This includes getting their inputs on what changes could help them be more effective and productive. The final list of changes should then be presented to everyone involved and discussed openly. Even if the change is not what was expected, or there is some disagreement, the fact that these individuals have been involved will go a long way toward mitigating contention or outright resistance.

Note: To address the natural concerns about the personal impact of change, change plans should be as specific as possible regarding changes to roles, responsibilities, and performance metrics, including what changes will be made, why, and what the expected impact will be to individuals affected by the change.

Summary

There are three key critical success factors for streamlining storage management processes and maximizing productivity: 1) determining explicit and measurable cross-functional process performance targets and measurements, 2) understanding the boundaries of the management software that will be used help achieve those performance targets, and 3) establishing and integrating performance-governing policies and performance metrics with cross-functional process models, tasks, and procedures.

Once these tasks have been completed, both the technology deployment manager and functional stakeholders need to continually check to ensure that the work being done and the changes being made are aligned with desired outcomes. The templates, checklists, and steps discussed in this paper will help ensure that all the "bases" are covered so the outcomes expected are the ones that are realized.

About the Author

Dr. Jim Ambrose has over 30 years of diverse business and IT experience including management and professional positions in sales, marketing, operations, professional services, and consulting. An employee of EMC since 2002, Jim specializes in helping clients align their strategic business and ROI goals with their business and IT infrastructures; developing strategic and operational ROI goals and metrics; building communication, leadership, and problem-solving skills; and defining, designing, and implementing integrated, highly optimized IT and business infrastructures. Prior to EMC, Jim was Managing Partner of Harrington & James Associates, a business and IT infrastructure consulting company. He previously held Director and managerial positions in IT business and professional service consulting organizations.

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