



Transforming Storage Operations from Entrepreneurial to Predictive

Why dynamically changing companies must
adopt this new paradigm
—and guidelines for getting started

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Entrepreneurial vs. predictive—the new IT paradigm

Most CIOs today are subject to common pressures to meet service level commitments while reducing operational and physical costs, increase operational efficiencies, and mitigate risk—to name just a few.

Successfully addressing these imperatives requires a clear understanding of the processes, procedures, and people that are involved, how long it takes and how much it costs to get something done, and the ability to predict and manage the day-to-day impact of any initiative on the organization. Unfortunately, many IT organizations still operate in a reactive, catch-up (“entrepreneurial”) mode. The consequences of continuing in this mode, however, will only result in increasing the risk and costs of meeting critical imperatives.

This executive white paper is intended to help you identify operational and physical barriers that may be preventing your IT operations from achieving operational excellence, visualize an ideal end state, and understand how to begin the task of transitioning your organization from an entrepreneurial to a predictive organization. Future documents will expand upon specific components of this transformation in greater detail.

Which model does your organization follow—and why does it matter?

An IT organization operating in entrepreneurial mode typically meets its commitments, but lacks formality in how the work gets done. Whatever processes, procedures, and policies do exist are not well documented. Forecasts and plans are based on conjecture and lagging indicators—not leading indicators and fact. Lack of documented processes and procedures and a concrete understanding of how the organization operates make it difficult to accurately quantify, monitor, and predict performance—as well as to defend critical business decisions.

Companies with static or limited growth can likely continue to operate in this mode; the effort to transition to a predictive mode of operation may not be warranted. For dynamically changing organizations, however, operating in an entrepreneurial mode makes it increasingly difficult for senior IT management to contain costs and defensibly predict the capabilities and resources that will be required to meet the needs of individual business units. The result—significantly increased risk to service levels and business continuity due to arbitrary decisions and operating in a continuously catch-up, reactive mode.

Such organizations should strongly consider undertaking initiatives that will evolve their current IT model to a predictive model, as characterized in the following chart.

Key indicators of an entrepreneurial vs. predictive IT organization

| Entrepreneurial characteristics | Predictive characteristics |
|--|---|
| Reactive service delivery is the norm. | Service level forecasts are at least 80% accurate on an annual basis, and more than 90% accurate within six months. |
| Visibility is limited as to how well resources and assets are being utilized. | Processes and procedures are in place to give management visibility to service/resource-impacting events or conditions at least two quarters into the future. |
| Senior management spends a greater percentage of its time on daily operational issues as opposed to overall organizational performance, governance, and strategic planning. | Streamlined, automated procedures exist to give IT management early warning that service levels which are critical to ongoing business operations are at risk (e.g., if core business operations are running on backup systems). |
| Practices and procedures for measuring, managing, and predicting operational performance and capabilities are informal, based only on lagging indicators, and are not consistently employed; senior management finds it increasingly difficult to effectively monitor/predict overall performance, forecast demand, defend the cost of services, or defend the need for new investments. | Timely, accurate reports are produced on actual-to-goal service levels and trends, operational performance metrics (i.e., service provisioning cycle times), service level forecasts, and actual-to-goal status of strategic initiatives. Reports are generated automatically and systematically with little or no human intervention. |
| Resource allocation, project prioritization, and assessments of the overall impact of changes are done on a “best guess” basis. | Ongoing assessments/automation of workflows, policies, and rules are performed to minimize the number of manual tasks and to eliminate gaps, overlaps, or conflicts between functions or processes. |
| Keeping systems and infrastructure up and running—and recovering from severity level 1 problems—are almost entirely dependent on the experience and knowledge of a relatively small number of IT personnel. | Process, procedures, and policies are in place and at a level of granularity that personnel with limited experience can effectively sustain/regain service levels. |
| “Run books” detailing processes, procedures, and policies either do not exist or are out of date; no systemic “decision support” systems are in place. | An online, always-current run book exists, detailing processes, procedures, policies, and practices for ongoing maintenance, provisioning of services, backup and recovery, etc.; biannual audits are conducted to 1) ensure that the run book is current, 2) ensure compliance with the run book, and 3) ensure the continuity of operations in the event that key personnel are incapacitated or leave. |

The benefits of operating in a predictive mode

IT management of a predictive organization stands to realize significant benefits in the following key areas:

Cost—Conflicting measurements or priorities across functions or with overall IT performance goals (the byproduct of an entrepreneurial operation) lead to unnecessary projects or work that drive up personnel costs, capital expenditures, or both. Predictive organizations, conversely, are able to effectively justify spending in terms of the impact on the overall performance goals of storage operations and the IT organization as whole—which is key to controlling and accurately predicting cost levels. Key measures include reductions in labor, capital expenditures, and/or third-party spending.

Efficiency—A predictive organization avoids adding and can actually eliminate manual tasks that could negatively impact performance levels by increasing already heavy workloads or adding complexity. Predictive operations help detect and eliminate efficiency-robbing gaps, overlaps, and conflicts between policies, goals, responsibilities, processes, and practices within storage operations and interfaces with other IT functional units. Key measures include reductions in process cycle times and the ratio of FTEs-to-assets managed.

Integrity/accuracy of performance data—A predictive organization is able to determine and establish the best data capture points, times, and frequency to ensure a consistent stream of high-quality (defensible) operational performance data. Predictive operations help ensure that the data being used to make decisions represent actual conditions by minimizing the amount of human filtering and conjecture. Key measures include increases in asset/resource utilization levels and ROA.

Complexity—A predictive organization is able to identify and eliminate cost-driving stovepipes and bottlenecks by tracking/trending actual-to-goal process cycle times, service levels, and asset utilization levels. Key measures include a reduction in asset levels or footprint needed to meet existing/projected user needs.

Proactive vs. reactive decision making—Decision makers in a predictive organization have more timely and accurate information available to them, which gives them more time to assess conditions, determine the most effective options/strategies, and initiate timely action. The processes and methodologies for capturing, analyzing, and assessing critical intelligence on performance-impacting conditions are the key to making this happen. Specifically, closed-loop processes and communication flows across management tiers to ensure a consistent, measurable, and observable means for making and tracking changes, monitoring actual-to-goal performance levels, and ensuring early warning notification of potential problems. Key measures include a reduction in errors, problems, and surprises, as well as improvement in the accuracy and timeliness of growth/cost predictions—enabling more defensible budget requests and overall project cost estimates.

Considerations for starting the transformation

Standardized, consistent processes, procedures, and best practices should be employed to ensure optimum results in creating a predictive operating model. The IT Infrastructure Library (ITIL) is the de facto standard for IT operations. Primarily a set of management practices, ITIL is intended to help IT management more effectively and efficiently deliver IT services and manage operations. ITIL focuses on 11 core functions involved in the support and delivery of IT services.

- Service support functions—Service Desk, Incident Management, Problem Management, Configuration Management, Change Management, Release Management
- Service delivery functions—Service Level Management, Capacity Management, Availability Management, Continuity Management, Financial Management

For each function, ITIL addresses the overarching goal of that function, key activities (practices), management reports, and the potential impact on operations (results and benefits).¹

Although ITIL is considered the industry standard, it is not necessary to implement every practice for all processes when making the transition to a predictive operating model. Furthermore, (although this paper focuses on ITIL), there are other IT best practices specific to particular IT functions (i.e., security) or business models that may warrant consideration. For example, an organization that can live with 99 percent uptime may choose to implement less costly backup and recovery practices than those required by an organization that could potentially lose millions of dollars for every minute an application is not available.²

Getting started

The transformation from an entrepreneurial to a predictive IT operation must be predicated on a baseline view of your storage operations that addresses current process maturity levels, performance metrics, governing policies/practices, degree of alignment across functions, and management automation tools being employed. The key steps to establishing this baseline are:

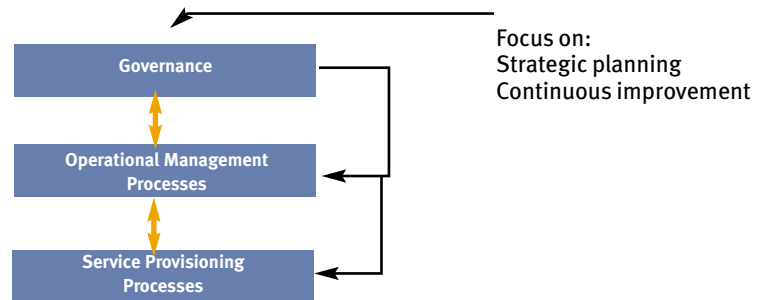
1. Compare the operating characteristics of your current environment with those of a predictive operational environment.
2. Compare current processes and practices within and across management tiers and between storage operations and other functional units with best practices (e.g., ITIL).
3. Compare the maturity level of current processes relative to Capability Maturity Model (CMM) standards.
4. Determine how well aligned your storage operational goals are with your key performance categories/drivers (used by the CIO).
5. Develop a comprehensive plan for transitioning your current storage operation from entrepreneurial to predictive.

¹Note that while the ITIL practices are organized by service categories, there is a logical flow (and interdependency) between categories and activities.

²ITIL is not intended to be an organizational model for IT operations. Although some changes in roles and responsibilities may be appropriate to effectively employ ITIL practices, substantial changes in IT organizational structure should not be necessary

Creating the optimal operating model for the predictive organization

Best practices have the greatest impact on operations when they are employed across a three-tier operating model such as the following:



Most organizations employ this model to some degree—although often without the rigor, processes, and practices necessary to sustain service levels at the lowest cost, or in a way to achieve optimum operational efficiency, and ensure maximum asset utilization levels. Specifically:

- An effective closed loop flow of information and monitoring capability on performance levels, policies, processes, practices, and continuous improvement initiatives should be implemented across management tiers.
- Data needed for leading performance indicators should be incorporated into and captured within the process workflows and data flows.
- Process and practice management should be automated as much as possible using workflow and infrastructure management applications and technologies (e.g., applications that automate the monitoring and reporting of asset levels and performance, and workflow automation tools to help monitor process cycle times and compliance with policies, procedures, and reporting).
- Processes should be at a minimum CMM level three (“Defined”—processes are standardized, synchronized, and tailorable across functions.), and preferably level four (“Managed”—management is able to quantitatively measure efficiency and effectiveness in delivering services).
- Practices, processes, and data models should be synchronized to minimize gaps, overlaps, or conflicts—within and across functions and management tiers.
- Function-specific practices, processes, and performance metrics should be aligned with and managed to ensure the overarching goals and performance metrics for the IT organization to achieve committed services levels (sample metrics include Provisioning Cycle Times, Availability and Uptime SLAs, Capacity to Forecasted Usage, Cost of Service, Ratio of FTE to Assets Managed, Customer Satisfaction Ratings).
- Features and functionality specifications for IT assets (data and telephony) should be aligned with the operational requirements of the company; furthermore, maintaining this alignment is a core activity in the “Governance” tier of the model.
- Compliance with both internal and external data retention policies should be dynamically monitored and managed.

Aligning storage and operational goals

To give senior management the ability to clearly and defensibly align and track the initiatives and performance measures, it is essential that the operational goals of all IT functions be clearly aligned with—and enable—the overall operational goals of the IT organization as a whole. Management can effectively achieve this alignment using the following methodology:

1. Determine the key performance categories the CIO will use for the IT organization as a whole (e.g., cost reduction or containment, complexity reduction, service levels, and data retention policies).
2. Determine the drivers and measurements for each category.
3. List the goal-achieving initiatives and performance measures for storage operations.
4. Map the initiatives/achievement measures for storage operations to each of the drivers/measurements in each goal category.
5. Determine and eliminate any gaps or conflicts between the storage initiatives/measurements and the individual drivers.
6. Continually monitor the progress of storage initiatives and actual-to-goal performance against the alignment map.

Summary and tips

The ability of an IT organization to successfully meet CIO imperatives requires a clear understanding of processes, procedures, and operational requirements. This information is fundamental to senior management's ability to effectively and accurately monitor/predict performance, forecast demand, and defend the cost, staffing, and new investments required for service delivery.

Dynamically changing organizations that continue to operate without formal, documented processes, procedures, and policies (i.e., entrepreneurial mode) should establish a plan for and begin the transformation to a predictive operating model to avoid risk to service levels and business continuity. This document provides fundamental guidelines and identifies best practices for making this transition.

Keep in mind that best practices cannot, by themselves, ensure operational improvements. Rather, best practices must be implemented in conjunction with streamlined and synchronized processes, policies, and cross-functional responsibilities—all aligned with explicit performance improvement targets, meaningful performance measurements, and the operational needs of the business.

Some tips for success:

- A formalized, three-tiered operational model, including a proactive and effective governance tier, is required to sustain optimum cross-functional efficiency and effectiveness over time.
- The use of process automation tools that have been configured, synchronized, employed, and monitored to deliver expected performance improvements, will substantially improve the level and consistency of results.
- Processes, policies, performance metrics, responsibilities, and technologies must stay synchronized within and across management tiers—regardless of the number of changes or initiatives.
- Actual-to-goal performance metrics must be continuously monitored, measured, analyzed, and managed.

Finally, knowledge and commitment are key to achieving optimal results. The transition process should ideally be led by individuals who have prior experience in defining and synchronizing processes, applying best practices, and executing performance metrics. And of course, the commitment by management to achieve and sustain the characteristics of an optimized (predictive) model will substantially increase your chances for success.

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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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