

Build Confidence by Developing IT Operational Excellence

Top ten proven IT management principles inspired by Deming and the Toyota Way

In an environment where business is dependant on IT agility more than ever before, IT operational excellence is a baseline requirement for meeting the changing needs of the business. The IT Process Institute studied the common practices of 1000s of top-performing IT organizations to create a basic set of IT management principles inspired by Deming and the Toyota Way. These principles are designed to cut through the theories about what should work, to highlight what has been proven to work. IT organizations can leverage these principles to achieve operational excellence and build confidence that IT can optimize business value.

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**Advancing the Science
of IT Management**

Executive Summary

In an environment where business is dependant on IT more than ever before, operational excellence is critical in order to achieve consistent results. It is not enough to know what IT must do to optimize business value. IT organizations must also be able to consistently deliver at a level of predictable performance that allows the business to achieve strategic objectives. IT organizations are increasingly looking to proven approaches to create a deterministic and repeatable pathway to introduce changes to applications that enable critical business process, and the thousands of servers in the production environment that support those applications. It is the combination of a focus on business needs, and a baseline of operational excellence -- that builds IT and business executive confidence that IT can support the changing needs of the business.

Comprehensive IT frameworks certainly help, but a set of more focused management principles can provide a powerful playbook of proven practices for both managers and employees. To that end, the IT Process Institute used its years of research on top-performing IT organizations to create a basic set of operating principles inspired by Deming's management principles and the 14 management principles of the Toyota Way.

These principles are designed to cut through the theories about what should work to focus on what is proven to work. Analysis of data from more than 1,000 global organizations studied in 2006 and 2007 formed the basis for these IT management principles. These baseline principles apply across industries, work for medium-to-large and global enterprises, and should be followed by IT organizations responsible for the proper operation, security and regulatory compliance of business-critical IT systems.

These simple principles are designed to provide general operating guidelines that complement your IT organization's vision and mission. You can also use them to benchmark your organization's practices and build consensus about focus areas needed to achieve higher levels of performance. In addition, these principles can help you achieve performance excellence that inspires confidence in IT's ability to meet the changing needs of the business.

BladeLogic helped sponsor IT Process Institute (ITPI) independent research that has identified practices that differentiate top performers. The ITPI also looked at the practices of some leading BladeLogic customers to discover any correlation with the principles outlined here. As part of the research and analysis, we found that these organizations have used BladeLogic's data center automation solutions to implement many of the IT management principles and achieved impressive results. Highlights from those stories help illustrate the principles in this paper.

About the IT Process Institute

The IT Process Institute is an independent research organization that exists to support the membership of IT operations, security, and audit professionals. Our mission is to advance IT management science through independent research, benchmarking, and the development of prescriptive guidance. Our purpose is to identify and study top-performing IT organizations and identify proven practices to enhance the efficiency and effectiveness of the industry.
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Introduction

Increasingly, IT executives are focusing on how IT can be flexible and responsive to customer needs. In an environment where business is dependant on IT more than ever before, operational excellence is critical in order to achieve consistent and predictable performance in a dynamic environment. IT and business executives don't like customer facing surprises caused by IT systems. It is not enough to know what IT must do to optimize business value. IT organizations must also be able to effectively and predictably implement an endless stream of application and infrastructure changes that can impact business-critical systems. It is the combination of a focus on business needs, and a foundation of operational excellence -- that builds IT and business executive confidence that IT can support the changing needs of the business.

Best-practice and control frameworks—such as ITIL V2 and V3, COBIT 4.0, and ISO 17799— are being adopted to improve execution. But these sets of practices seem to get bigger with each release. These frameworks do provide critical guidance, but their extensive nature makes it difficult for IT organizations rally behind a few key areas of focus.

To help IT organizations focus on a small set of proven practices, the IT Process Institute interviewed hundreds of senior IT managers and executives and collected hard data from more than 1,000 IT organizations that have globally dispersed operations. What we've found is that companies with the highest levels of performance have a lot in common. Many use the same basic practices to manage the evolution of business-critical IT systems. Our belief is that the proven practices of top performing IT organizations can boost performance and build confidence at any IT organization.

As the IT industry matures, shouldn't we be converging on a core set of proven IT management principles?

Based on the common attributes of top-performing organizations and inspired by W. Edwards Deming and the 14 management principles of the Toyota Way, the IT Process Institute developed a basic set of IT management principles. We used a combination of webcasts, trade show presentations, and executive interviews to identify common themes. We then leveraged hard data from performance-focused research studies to reveal common practices that predict the highest levels of performance across IT organizations.

From that research, we have developed this set of baseline principles that are designed to work across industry and organizational size, and that highlight core activities needed to effectively manage business-critical IT systems. Some of the principles involve basic practices, such as controlling system access and carefully managing all modifications to production systems. Others go beyond production operations to include cross-functional integration of development and security practices. The list rounds out with practices related to building a process culture, relying on data-driven improvement and decision making, and understanding what the business needs from IT.

These IT management principles are designed to be used as organizations define their mission, vision, and operating procedures, and are based on averages—not absolutes. The list is designed to be simple enough to display in the break area or hang in each IT employee's office. The needs of your organization should determine the order and degree of focus on these principles. But they should be used as a high-level checklist to help everyone focus on a key few areas of activity that can boost performance and build confidence in IT's ability to deliver.

Principle 1. Know what the organization needs from IT

Communication. It is the single most important management principle for IT organizations. To optimize the application of IT resources you must improve communication between IT and the business. A wide range of barriers can prevent IT from effectively aligning its efforts with key business success factors. Communication, however, is a single overarching solution that works to overcome those barriers and build confidence that IT can deliver.

The IT organization should understand how IT enables strategic advantage. That value-add should be clearly communicated in IT strategic and operational plans. Business decision makers should help set and communicate IT strategy and resource priorities. Business and IT executives should jointly understand, agree upon, and clearly communicate how IT enables competitive advantage. However, IT should also make connections and be involved with the business not only at the level where business strategy and plans are formed, but also at the business process and business manager level where IT resources can broadly engage and support critical processes.

To keep IT resources focused on business priorities, rewards should be tied to business objectives when possible—whether those are cost reduction, customer experience, or revenue growth. Knowing how IT adds value to the business is critical to both effective resource and project prioritization, and communication of IT success is critical for building credibility and trust at the executive level.

IT Process Institute (ITPI) studies indicate that three distinct IT value archetypes focus on service efficiency, process optimization, and product and service enablement. Pervasive understanding of business needs is the single strongest predictor of top levels of performance for all three.

Proof in practice: Understanding business needs is pervasive at all levels of the IT organization.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	87 %	69%	20%

Principle 2. Balance controls with efficiency and agility

Managing business-critical IT resources is a balancing act. When you have competing priorities, you can end up with too much of a good thing. You might increase the rigor of IT controls to meet regulatory requirements at the expense of operating efficiency. You might streamline development to optimize business agility and overwhelm production resources who want to maintain stability to ensure service quality. You might improve production efficiency and utilize architecture standards that end up hampering IT's ability to respond to the changing needs of the business.

Using a top-down approach to risk and security can help you achieve the balance you need. Such an approach starts with a clear understanding of business priorities. It allows scarce IT resources to focus on what matters most to the business. A bottom-up approach, often a technology-focused approach, means that scarce resources must consider every potential threat, regardless of business risk, and therefore must focus on virtually everything. Don't be tempted to take a bottom-up approach to security.

ITPI studies indicate that top-performing IT organizations include business-linked performance measures as part of objective and incentive measures.

Proof in practice: The organization has a balanced set of IT performance metrics that include business-linked measures, such as business process efficiency, market share gains, and revenue growth.

% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	72%	44%	21%

E*TRADE: Ensuring Compliance while improving efficiency and agility

E*TRADE started as a Web-based brokerage for self-directed investors. Through rapid expansion, it has become a full-service online banking and brokerage firm. The growth of more complex financial services has led to greater complexity and interdependence between machines, operating systems, and applications.

To achieve a transaction response time that is rated in the top three in the industry, E*TRADE tunes application performance as they go through development, test, QA, and into production. That means the configuration changes must follow application changes from development and test into production, in order to maintain performance gains.

In addition, external and internal audit activities have grown to dozens of audits per year. For each audit, E*TRADE IT resources were manually pulling server level information to verify security, configuration and change compliance. IT executives were regularly involved in audit activities to explain their configuration baselines and how their processes worked.

E*TRADE turned to BladeLogic to automate and control the end-to-end development to production change and release process, so IT could optimize its performance and reduce ongoing audit and compliance costs. E*TRADE uses BladeLogic Operations Manager to manage 2,600 development and production systems at multiple global data centers. E*TRADE can scale development activities horizontally to propagate both application code and configuration changes through multiple identical environments.

E*TRADE now automates code and configuration provisioning as changes move from QA to preproduction and to production nodes, with complete visibility and control of critical dependencies between system configurations, application configurations, and application code. At each step, BladeLogic Operations Manager validates that configurations are identical and that each can be referenced to a baseline configuration. Finally, E*TRADE uses BladeLogic Operations Manager to streamline audit activities. Now staff can quickly and easily pull data to show the change and configuration process activities are compliant.

Benefits Experienced:

- Improved performance—reduced the number of times that slow machines were found to be different configuration from the rest.
- Audit cost reduction— reduced time required to pull audit data on a specific server from three days to less than an hour - - saving thousands of man hours per year.

IT Management Principles Applied:

- Balance controls with efficiency and agility
- Standardize configurations and minimize drift

Principle 3. Create well-defined roles and responsibilities for all IT personnel

Key processes don't function as designed unless process participants know what to do, when to do it, specific policies to use, and what they can expect from others. Having well-defined roles and responsibilities is a prerequisite for having segregation of duties, which is required for compliance with many regulations and provides a foundation for access management. Equally important, workflow and automation cannot be implemented where roles are ambiguous. It is difficult to ramp up new resources unless what they do is well defined.

When access to the production environment is reduced based on functional roles, organizations need to clearly identify who is responsible for what and when, so that throughput is maintained and people are not tempted to skirt the change and release process. Separating responsibilities requires that everyone know what to expect from others (inputs, outputs, handoffs) and that everyone share responsibility for measuring and optimizing the end-to-end process.

ITPI studies have shown that top-performing IT organizations improve their security posture, minimize process variability, and reduce their emergency change rate when they clearly separate the roles and responsibilities for development, test and quality assurance (QA), and production release and support.

Proof in practice: IT personnel have well-defined roles and responsibilities.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	93%	72%	66%

Principle 4. Control access to computing environments

Are IT professionals in your organization sharing passwords? How many people have administrative-level rights to production systems? Test systems? QA systems? Development and source code?

Controlling system access is absolutely critical for creating a stable and secure production environment. Access to different systems should be granted according to the job function and responsibility of each individual, and restricted for everyone else. Overall, ensuring that only certain people access systems as new services move through the development-to-production lifecycle minimizes mistakes, optimizes performance, and enhances the security profile of critical business systems.

Many reasons might compel you to create a strict control environment for system access. Various laws require a separation of duties. Such separation complicates any attempts to commit deliberate fraud, because fraudulent actions would need the collusion of two or more individuals or parties. Audit requirements include the tracking of access to key systems, so that you have an audit trail as changes are made. More importantly, the use of strict access controls can help distinguish normal from abnormal activity.

Access should be controlled to prevent out-of-process modifications to key systems. Developers shouldn't have access to production systems. Production shouldn't have access to source code. However, to facilitate second- and third-level troubleshooting, many organizations have a "break glass" process to grant temporary development access to production systems. The duration of access should be limited, privileges should be limited if necessary, and modifications to production systems should be monitored and documented.

ITPI studies show that top-performing IT organizations limit developer access to production systems more than their lower-performing peers.

Proof in practice: Developers are never given root access to production environments, but may get limited access to help support production.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	74%	47%	47%

Principle 5. Build a process culture and manage process exceptions

There are no silver bullets. If an organization does not have a culture or history of following documented processes and procedures, then applying best practices is not likely to achieve the desired results. Managing business-critical IT systems requires consistency. Keep in mind that not all IT processes are key processes. But for those that matter most, if you have identified a preferred way of completing high-risk, high-impact procedures, and not everyone in the organization follows the procedures, then a wide range of unpredictable results are likely.

To stabilize and optimize resource utilization and system performance, IT needs to develop a culture of following standard procedures. Make sure executives communicate that “process is how we do things here.” Apply both the so-called carrot and stick in an organization-appropriate way to engineer behavioral change and ongoing results. Executives should be involved in communicating and executing consequences for not following procedures. And bonuses and promotions should go to those who systematically follow procedures and prevent fires, instead of those who apply heroic measures to put out fires.

Identifying and responding to key process exceptions are the marks of organizations that have the highest level of maturity and operational efficiency. The exceptions are what introduce risk, performance issues, and inefficiencies. Know what to do when exceptions occur. Establish a procedure for responding to exceptions—a procedure that includes root cause analysis and identification of sources of process variation. Such organizations use exceptions as a way to fix systemic issues instead of responding to symptoms. Focus your best resources on managing exceptions, and focus your experts-in-training on running business as usual. Dedicate resources to implementing fixes to improve the process, and finally, leverage automation to hard-code processes and eliminate or codify exceptions.

ITPI studies have shown that IT organizations that actively encourage compliance by using documented processes and procedures achieve higher levels of performance. Building a process-focused culture predicts top levels of performance across measures such as downtime, configuration drift, process variability, release impact rate, and change success rate—more than many of the industry-recognized best practices.

Proof in practice: It is widely understood that people in the organization are expected to follow documented processes and procedures as a normal way of doing things, and that not following documented procedures is the exception.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	88%	66%	57%

ITPI studies have shown that IT organizations that actively correcting the root-cause of process exceptions predicts the highest levels of performance.

Proof in practice: An organization has a defined procedure to analyze and diagnose the root cause of process exceptions.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	63%	37%	34%

Principle 6. Make data-driven decisions

You can't manage what you can't measure. This management adage applies to IT as well. Every organization has competing goals related to agility, efficiency, and control. Many process measures focus on control. However, using thoughtful measures and hard data to set goals, measure results, and course correct as needed is the key to evaluating alternatives and measuring tradeoffs that might optimize one goal at the expense of another.

If you know the cost and measure the benefit of major operational initiatives, you can make go-forward and go-back decisions on the basis of hard data. If you justify the cost of a new tool, process, or procedure on the basis of expected operational or revenue improvements and the gains don't materialize, do you roll back to the old way of doing things?

Use a balanced mix of internal operational measures, key performance indicators (KPIs), and customer-facing measures to gauge progress toward your goals. Document cost and benefit assumptions and identify measures to track and verify your assumptions over time. Then follow up after projects are completed or operational changes are in practice, so you can verify whether cost and benefit assumptions were met.

ITPI studies indicate that top-performing IT organizations verify assumptions about resource allocation costs and benefits, so they can improve their planning and resource allocation process and skills.

Proof in practice: An organization conducts regular resource allocation post-mortems to identify improvements on its IT strategy process.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	65%	47%	21%

Principle 7. Standardize configurations and minimize drift

“Trust but verify” is an adage from the audit community. It is a simple but powerful principle related to configuration management as well.

If production systems are not in a common state because different developers and administrators apply their personal preferences during setup and configuration, then system-to-system variation can cause an unknown level of risk and increase the effort required to manage each server. Testing, rollback plans, and explicit release procedures are not cost effective if every server is slightly different. Minor configuration variations can cause unpredictable performance variation or, worse, complete shutdown of functionality. But most importantly, variations cause significant resource inefficiencies as release, administration, and support personnel can't count on similar systems being exactly the same, and therefore must spend time determining the “lay of the land” on each system before they can begin work.

Even when business-critical systems are released with a baseline configuration, you must monitor them for configuration drift and unauthorized changes. When IT executives first start monitoring systems, they are often surprised by the amount of unauthorized or out-of-process activity that occurs on systems they thought were locked up and stable. Some IT executives ITPI has interviewed believe that configuration drift is the single most important operational measure because it significantly impacts production and security risk. If a system is in an unapproved and unknown state, the level of security and operational risk is also unknown.

To establish a common state for your business-critical systems, first reduce the number of approved configurations to minimum feasible level and remove personal preference from configurations. Then standardize configurations to reduce complexity and improve scalability and supportability. Use golden build or approved configurations as policies, and update production systems only from policies. Use automation and tools so that machines build machines, eliminating human preference and error. Also, monitor for configuration drift to keep systems in a known state and to achieve continuous compliance. Monitor and detect unauthorized changes and treat configuration drift as a security incident unless proven otherwise. Automating configuration drift and change detection can reduce variance, improve security, and enable security and configuration compliance.

ITPI studies have shown that standardized configuration practices are a proven, effective way to minimize configuration drift and security risks. This approach also enables automation, streamlines testing, and ensures that release procedures work.

Proof in practice: The organization has identified an approved configuration or golden build, and updates production systems only from that approved build.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	56%	50%	40%

ITPI studies have shown that controlling and protecting the state of production systems is a key driver of top levels of performance.

Proof in practice: The organization monitors systems for unauthorized changes and unintended configuration drift.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	67%	46%	45%

Priceline.com: Lowering the Unit Cost of Managing a Server

Priceline.com CIO Ron Rose's IT staff had its work cut out for it. With 400 Web servers supporting Priceline.com's e-commerce Web site, provisioning and updating used to be a time-consuming and, often, less-than-accurate task.

Most of the time, the bulk of the provisioning, updating, and patching work went well but, also most of the time, each server was slightly different from its neighbor. In terms of the resources required to manually roll out changes, the differences meant that the IT staff had to analyze and assess each server to determine the nuances of the machine before changes could be made. In terms of availability, troubleshooting, and performance, the differences meant that when something went wrong, each server involved in the snafu required forensic troubleshooting to find out what went wrong before IT fixed the problem manually. The one-off nature of a staffer making changes or applying fixes to each server individually meant that each server was still configured slightly differently and the whole cycle began again.

Post-mortem analysis identified automation as a way to control configurations and avoid repeated problems. Automation of software releases and updates would streamline a largely manual process and also ensure that people didn't introduce system-to-system variations that lead to unpredictable results.

Since deploying BladeLogic's Operations Manager software, all the Web servers are configured automatically, exactly the same way every time. System-to-system performance variations have been eliminated. Provisioning, updating, patching, and troubleshooting are much less time-consuming. For Priceline.com, whose only product is tied directly to the performance of its Web servers, the high availability and lack of surprises with customer-facing systems is crucial to the company's success.

Benefits Experienced:

- Reduced downtime— reduced customer-facing performance surprises
- Better staff utilization— increased efficiency of rollouts and patches
- Better staff utilization—reduced forensic analysis of system-to-system variations

IT Management Principles Applied:

- Standardize configurations and minimize drift

Ron Rose, CIO, Priceline.com

“Through automation we have achieved consistency of infrastructure, and consistency of infrastructure means I have less variability. I have fewer problems in production, I have less wasted time chasing problems throughout the infrastructure, and I have less wasted manpower doing things manually that really shouldn't be done manually.”

Principle 8. Follow a common development-to-release lifecycle

What should development, QA, and test do to meet production release requirements? How does security apply its controls to the activities of different functional groups?

With rapid development, service-oriented architectures, and dispersed development groups creating business-critical applications that production must maintain and support, it is critical for an IT organization to define an overall development to production release process.

An integrated and shared process allows different groups to define their requirements, focus on their key activities, and know what they can count on others to deliver. Development practices affect security and availability. Production needs a way to implement process improvements upstream in the development cycle. Quality and security remediation needs a feedback loop. If you don't have a way to define and communicate what different groups need from each other, then performance and your process improvement efforts will be suboptimal at best. At worst, different groups will systematically undo each others' work.

Developers must be agile and fast so they can meet business needs. Production must be efficient and cost effective while creating a stable environment. When a defined and measured end-to-end cycle is in place, production can tell developers what they need to ensure stability and efficiency. Developers can quickly move projects into production service. Together they should measure cycle speed, effectiveness, and quality.

ITPI studies have shown that top-performing IT organizations purposefully define and integrate development, test, quality assurance, and production activities into a common development and production release cycle.

Proof in practice: The organization had defined an end-to-end lifecycle that integrates development activities into the production release processes.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	58%	38%	36%

Principle 9. Link change requests to underlying systems and business service

Business-critical systems rely on a multilayered interdependent set of applications, operating systems, servers, middleware, and databases. To assess the potential risk of a requested change and to communicate with system owners and business users who might be affected by each change, you need a detailed understanding of how changes link to the underlying systems and overarching business processes that rely on those systems.

Linking change requests to underlying systems and business processes requires a detailed bottom-up mapping of the interdependencies among applications and underlying systems. It also requires a top-down mapping of business processes to applications. ITPI studies have shown that linking change requests to infrastructure and business processes reduces the number of releases that are rolled back and minimizes configuration drift.

Proof in practice: The organization has identified configuration items and the business need for each change request to automate communications and optimize risk assessment.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	43%	27%	28%

ADP: Expediting App Releases While Reducing Defect Rates

Service-oriented architecture (SOA) has been a huge time-saver for Automatic Data Processing (ADP) as it expands into markets beyond its flagship payroll services business. Software components offered to customers as Web services are what power ADP's time and labor management, human resources, and benefit administration solutions.

But SOA has the potential to introduce problems to the production environment as developers quickly conceive, code, test, provision, and deploy new SOA-based programs. At ADP, those problems were multiplied because different development groups in the company use their own tools and methods to create new customer-facing services. Achieving process consistency to ensure that distributed development teams meet common production release requirements became a major challenge with the SOA-based solutions.

ADP implemented a workflow, provisioning, and deployment system that standardizes and streamlines the entire software lifecycle. The system, based on BladeLogic's data center automation software, manages access rights and handoffs among groups, synchronizes test and development environment configurations, and automatically delivers software at different stages of the lifecycle.

Role-based access controls in the system identify where one step in the workflow ends and another begins on the 1,200 Windows and Unix servers ADP uses to develop and test applications. The system defines actions that some 2,000 developers, testers, and operations personnel can and cannot perform on the software at specific times as software evolves from creation through deployment. Automating these processes has streamlined development activities, and also provides consistent test and production environments. The system optimizes hardware and human resource utilization, and provides an audit trail that tracks the entire lifecycle of product delivery.

Benefits Experienced:

- Controlled process—optimized process using workflow and role-based access controls.
- Audit trail—improved control of key process and segregation of duties makes regulatory compliance as simple as a check box.
- Streamlined upgrades—work that previously took weeks is now performed in a single maintenance window.

IT Management Principles Applied:

- Balance controls with efficiency and agility
- Create well-defined roles and responsibilities
- Strictly control access to computing environments
- Follow a common development-to-release lifecycle

Bob Bongiorno, CIO of Employer Services, ADP

ADP has automated our system that synchronizes software development, testing, and deployment. This system is the glue that allows us to take all these different software groups and bring them together to deliver the quality and availability our customers expect.

Principle 10. All production changes follow a rigorous process

Every production modification is an availability and security risk. Period. IT needs a deterministic and repeatable pathway to introduce changes to applications and thousands of servers in the production environment that enable business-critical functions. The need to carefully control change is not based on mistrust of key IT personnel. Rather, it is based on the recognition that most system failures are the result of something changing, not a hardware or disk crash or a network failure. Well-intentioned and well-informed people make mistakes. Individuals involved in developing and testing a change may not effectively consider the complex risks associated with their modifications without the help of other people to think through potential risks and walk through possible issues related to a change.

All production changes should have oversight and should follow a predefined and monitored process. Only approved changes should be implemented. Each production release should meet build-policy requirements, including documentation and support instructions. Segregation of duties and clear roles and responsibilities ensure that the person who develops the change is different from the person who tests and documents that change and is different from the person who actually implements the change.

A preproduction test environment should be maintained in a configuration similar to production, so that you can ensure modifications have been tested and back-out plans will work. Maintaining an exact replica of the production environment also minimizes the chances of an error in the production version.

Your IT organization should make changes only during maintenance windows. Know when your back-out procedure should begin, so that you can restore service before the end of the maintenance window and minimize the impact to service level agreements (SLAs). Your back-out procedure must include a selective rollback capability to ensure that only the relevant changes are backed out—no more or less. This capability ensures that you truly achieve the previous stable state.

By the time a production system is ready for modification, there should be no surprises. Baseline and target configurations should be verified. Explicit step-wise procedures should be developed and followed. Verify that release procedures are actually followed. If something happens during the production release that deviates from the plan, those implementing the release should be empowered to stop and back out the change so that previous state and service can be restored before the end of the maintenance window.

ITPI studies have shown that change and release processes, and pre-production test procedures have a broader impact on uptime, performance, security, and customer SLAs than any other set of best practices studied.

Proof in practice: A wide range of change and release procedures and controls are used to ensure that people are sufficiently careful when updating production systems.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	74%	65%	54%

Proof in practice: Changes are thoroughly tested before release in a sufficiently similar pre-production test environment.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	75%	60%	57%

ITPI studies have shown that top-performing IT organizations test rollback plans before starting modifications to the production environment.

Proof in practice: Rollback plans are tested before release to the production environment.			
% of organizations that use this practice	High Performers	Medium Performers	Low Performers
	72%	58%	45%

Capgemini: Reducing Risk of Change

Capgemini is one of the world's foremost providers of consulting, technology, and outsourcing services. More than 500 companies globally have chosen Capgemini for outsourced hosting to improve cost structures and optimize service levels. The company support a wide range of client server environments from small Windows servers to Sun E10000 servers including operating systems such as HP-UX, AIX, Solaris, Linux, and Red Hat as well as Windows. Some clients have only 5 servers while others have 1,500.

This diversity makes change control and compliance management a challenge. Capgemini holds a daily change board meeting to review every change made to the hosted infrastructure. However, every customer has its own change window, its own change request systems, and its own process for application and infrastructure changes.

Capgemini chose BladeLogic to better control the configuration, change, and access management of this complex environment. With BladeLogic Operations Manager suite, Capgemini can control configurations and changes on any server in real time. When Capgemini builds new servers for its clients, they build a gold standard on one server and replicate this baseline configuration and subsequent changes across multiple environments. Capgemini can also easily identify drift from configuration baseline to ensure compliance.

BladeLogic solutions also give Capgemini the ability to lock down access rights on client servers. Using its configuration level role-based access control capability, access rights can be restricted for both the Capgemini team and customers on any server—even if only a single task needs to be performed. Clients can be certain that no one has the rights to use a root password to change anything on their server, ensuring continual compliance.

Because Capgemini's data centers are now automated, weekly reports are generated for every system containing BladeLogic agents. The reports show what has changed since the week before for individual client accounts or across the entire environment. The reports can confirm that the administration teams are following documented procedures and that customers' employees are following their own change procedures as well.

Benefits Experienced:

- Resource reallocation—saved 75% to 80% on people-related costs and released more than 50 consultants into fee-paying roles.
- Immediate provisioning—pick and mix pre-built objects allowed then to deploy 47 new environments in just 51 minutes.
- Rollback—use rollback capabilities to see exactly where a system was previously.

IT Management Principles Applied:

- Strictly control access to different computing environments
- Standardize configurations and minimize drift
- Ensure all production changes follow a rigorous process

Conclusion

ITPI research indicates that those responsible for managing business-critical IT systems may be converging on common practices that drive top levels of performance. As industry best practice and control frameworks seem to become more complex with every release, this condensed list of IT management principles can help IT organizations focus efforts to achieve operational excellence and build confidence in IT's ability to deliver. If you have not yet implemented the practices that support these IT management principles, other industry frameworks can provide more detailed information about how to implement each practice. After conducting a series of detailed performance studies, we believe most IT organizations can use this set of IT management principles to optimize IT organization performance.

IT Process Institute Study Demographics

Data that supports the identification of the 10 IT management principles was collected from more than 1,000 North American companies that have global operations and geographically distributed data centers during four IT Process Institute research studies in 2006 and 2007:

- IT Controls Performance Study—Data collected from 96 companies in 2006.
- IT Controls Performance Study II—Data collected from 330 companies in 2006 and 2007.
- Change, Configuration and Release Study—Data collected from 341 companies in 2007.
- IT Business Alignment Performance Study—Data collected from 269 companies in 2007.

The performance of each company is determined by their relative score on individual performance measures used in each study. The high performers are identified as the top 15th percentile of overall performance in each study. Statistical analysis revealed practices that best predict top levels of performance in each study. The percent of top, medium, and low performers who have each practice in use are shown in tables throughout this paper.

