

Change, Configuration, and Release: What's Really Driving Top Performance?

7 groups of best practices predict
top levels of performance at 341 IT organizations



Advancing the Science
of IT Management

IT Process Institute
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Executive Summary

Many IT organizations turn to industry-recognized best practices frameworks such as the IT Infrastructure Library (ITIL) to standardize their most important IT service management processes. Of those processes, change, configuration, and release are crucial operating practices that enable a stable and secure computing environment.

The IT Process Institute conducted a survey of 341 IT organizations to determine which of 57 recognized change, configuration, and release practices best predict top levels of performance.

The survey revealed 30 individual practices—grouped into seven sets of practices that are commonly implemented together—that best predict performance variation among top-, medium-, and low-performing IT organizations in the study. The findings also show that five sets of common practices do not predict performance variation.

Broad adoption of these key performance drivers can lead to consistently high and predictable levels of performance across locations and business units. IT organizations can leverage the study findings to focus their ITIL implementation and process standardization and improvement efforts on these key performance drivers that will help them attain top levels of performance.

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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 prescriptive guidance. Our vision is to bridge industry and university-based researchers to identify and study top-performing IT organizations and enhance the efficiency and effectiveness of the industry.

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Introduction

Data center consolidation and platform virtualization are widely deployed strategies for reducing complexity and improving the utilization of computing resources. Yet increased reliance on IT capabilities means that the stakes are higher for managing enterprise IT systems to achieve optimal performance.

Many IT organizations turn to industry frameworks such as the IT Infrastructure Library (ITIL) to standardize and fine-tune the operational processes used to manage the systems that matter most to business success. In fact, industry experts often suggest that IT organizations start with change, configuration, and release management processes to build and protect a capable, predictable, and secure computing environment.

However, most organizations pick and choose specific practices on the basis of their unique business priorities and operating challenges, and usually start process improvement efforts in a few primary high-impact areas. It is difficult to sort out which of the hundreds of activities that are deemed “best practice” by industry-insider consensus actually improve performance.

Making changes to major operating processes is hard work. Where should IT management focus its process standardization and improvement efforts to ensure achievement of the desired results? What data is available to predict the performance improvement potential for initial efforts?

A recent study conducted by the IT Process Institute set out to determine which change, configuration, and release practices actually drive top levels of performance.

We started by interviewing IT executives at 11 companies that are recognized for their performance excellence to determine which practices they have in common. We then developed a survey and collected data from 341 IT organizations about 57 best practices as well as important process and management enablers, 15 performance measures, and 15 demographic markers.

We used standard statistical analysis techniques to identify sets of best practices that were commonly implemented in the study sample and to determine which of the best practices predicted higher levels of performance across top-, medium-, and low-performing organizations in the study. Some of the findings confirm widely held beliefs. Other findings may surprise organizations that are implementing ITIL best practice processes in these areas, and may help redirect efforts to those areas shown to improve performance.

Which of the hundreds of recognized change, configuration, and release best practices actually improve performance?

Identifying Key Performance Drivers

The study revealed twelve sets of best practices that the organizations in the study commonly implemented together. Seven sets best practices predict top levels of performance, while five sets do not predict performance variation.

These seven sets of practices which we call key performance drivers, include thirty individual practices that predict top levels of performance. They are listed from highest to lowest impact:

- **Release scheduling and rollback**—In this set of practices, IT organizations develop and maintain a fine-tuned cycle of build and test, and then release only during maintenance windows with tested rollback plans. Data about the root causes of release exceptions is fed back to systematically improve the process.
- **Process culture**—IT executives demonstrate that following a specific process is “how we do things here.” The company’s hiring, reward, and promotion policies reinforce the basic job expectation that people will follow documented processes and procedures.
- **Pre-release testing**—Before release, changes are tested in a pre-production environment that is maintained to be sufficiently similar to the production environment.
- **Process exception management**—In this set of practices, IT organizations place significant focus on eliminating process variation, including identifying exceptions, diagnosing root cause, and implementing fixes. Executives participate in monitoring exception rates and improvements.
- **Standardized configuration strategy**—Configurations are standardized with golden builds and production systems are updated from an approved standard. IT personnel receive information about target and actual configuration. Systems are regularly monitored for unapproved changes or configuration drift.
- **Change linkage**—Change requests are linked to both infrastructure components and business service or business need. Support personnel are given access to change history to aid incident and problem management.
- **Controlled production access**—In this set of practices, IT organizations remove developer access to production; maintain well-defined roles; separate development, test, and release duties; and match users to appropriate system access permissions.

The survey population’s use of the following five sets of common practices, which include twenty seven individual best practices, did not predict performance variation:

- **Change process routing**—Standard and emergency change requests are routed, tracked, and approved on the basis of predefined criteria.
- **Multi-function phase gate**—Checkpoints are clearly identified throughout the process, and multiple functional groups within IT can include their requirements at the appropriate checkpoint.
- **Change oversight**—A review committee or change manager reviews all change requests categorized by level of potential risk, ensuring that requirements are met prior to release.
- **Development integration**—An end-to-end lifecycle integrates development activities into the change and release processes. The causes of release exceptions are fed back to development to help improve the process.
- **CMDB**—A configuration management database (CMDB) describes the relationships and dependencies between configuration items (infrastructure components), and the change tracking system identifies upstream and downstream dependent systems that may be affected by a change request.

Summary of Analysis

Analysis of common practices that do and do not impact performance reveals five primary findings.

Release should be destination. Rigorous build, test, and rollback practices for releases have broad impact on individual performance measures and overall performance. Change tracking and change oversight practices are necessary but not sufficient on their own to help an IT organization achieve performance improvement.

Change management is often identified as a logical starting point for ITIL implementations. However, release management should be the destination for those organizations wanting to achieve performance gain from standardizing on ITIL change and release practices.

Widespread use of release practices is the top predictor of the highest levels of performance across 8 of the 15 performance measures in this study.

Process discipline matters. There are no change, configuration, and release silver bullets. IT organizations that actively encourage compliance with documented processes and procedures and that manage process variation achieve higher levels of performance. ITIL change, configuration, and release best practices are not likely to deliver expected results when applied to an organization that does not have a culture or history of following documented processes and procedures.

Building a process-focused culture and managing process exceptions 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 in these areas.

Standardized configuration works. Practices related to using only approved production system configurations, providing IT personnel information about the approved and current configuration, and detecting configuration changes are primary predictors of a stable and secure computing environment. System-to-system variations grow exponentially if specific controls and practices are not implemented to reduce variation and prevent configuration drift.

Following a simple set of controlled configuration practices is an effective way to stabilize and secure a complex and dynamic computing environment.

Controlled production access improves performance. The combination of defined roles and responsibilities, clear separation of duties, and reduced access to the production environment predicts higher levels of performance. Integrating development and having cross-functional phase gates are more aspirational practices in the industry. Some of the leading-edge companies we interviewed highlighted integrated development efforts, but these are not as widely practiced in the greater survey population.

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However, release management should be the destination for those organizations wanting to achieve performance gain from standardizing on ITIL change and release practices.

Limiting access to production systems and clearly separating development, test and build, and release activities are effective ways to reduce process variability and configuration drift, and to increase the security posture of the organization.

CMDB enables powerful practices. The use of a CMDB is not yet widespread. Only 19% of survey respondents have a CMDB broadly in use. However, CMDB-enabled change linkage practices predict higher levels of performance. Only 47% of top performers in the study have CMDB-enabled change practices, such as linking change requests to infrastructure, business need, and incident tickets. Yet these practices are a statistically significant predictor of top levels of performance.

Linking change requests to a system-level and business-level context is a powerful way to reduce release rollback rate, reduce configuration drift, and improve incident response.

Top Performer Profile

The study findings show that top-performing IT organizations clearly control and reduce risk in their production environment by following a set of common practices.

They maintain production systems in a known, tested, risk-reduced state. They standardize configurations to reduce complexity and improve scalability and supportability. They update production systems from golden-build configurations to minimize risk. And, they monitor for configuration drift and unauthorized changes to keep systems in a known state.

They minimize access to production systems. They recognize that small changes have a big potential impact, and they remove development access to the production environment. They clearly define roles and responsibilities and separate the duties of develop, test and build, and production release.

They allow modifications to the production environment only through a carefully controlled process. Every production modification is recognized as an availability and security risk. Each release meets build requirements, including documentation and support instructions. Releases are tested. Backout plans are tested. Releases are scheduled during maintenance windows and considered a failure if they do not exactly follow release instructions or are not completed on time. Release failures and process exceptions undergo root cause analysis to identify improvements that reduce process variation.

They use executive influence and human-resources practices to build a culture where following documented processes and procedures is recognized as a basic job expectation. They focus on process exceptions as a way to identify the cause of variance and to identify process improvement efforts.

Overall, these practices contribute to a systematic way to achieve the highest levels of performance. In top-performing IT organizations, consistently high and predictable performance is not dependent on individual preference or skills, and can be achieved across location and business unit.

Performance Improvement Potential

This study reveals that seven key performance drivers best predict top levels of performance as measured by 15 performance measures. Highlights of the striking performance differentials for top performers in some of the most important measures include:

- **Downtime minutes per month**—The pre-release testing and process culture key performance drivers impact this measure. Top performers average 30 minutes, which is 60% lower than medium performers and 67% lower than low performers.
- **Security breaches automatically detected**—The standardized configuration strategy and controlled production access key performance drivers impact this measure. Top performers auto-detect an average of 91% of security breaches, which is 40% higher than medium performers and 51% higher than low performers.
- **Release rollback rate**—The pre-release testing and change linkage key performance drivers impact this measure. Top performers have an average 0.7% rollback rate, compared to 3.2% for medium performers and 11.4% for low performers.
- **Incidents fixed within SLA limits**—The process culture and change linkage key performance drivers impact this measure. Top performers fix 93% of incidents within service level agreement (SLA) limits, which is 16% higher than medium performers and 43% higher than low performers.

Research Report and Benchmark

This Executive Snapshot is a summary of the 60-page ITPI Change, Configuration, and Release Performance Study that provides extensive analysis and detail about specific change, configuration, and release practices that best predict top levels of performance across the 341 IT organizations studied. The report links 30 individual best practices grouped into seven key performance drivers to 15 specific performance measures. It also details the performance improvement potential for organizations that want to improve performance based on the study findings.

The research results are also combined into the Change, Configuration, and Release Performance Benchmark, which is a powerful online benchmarking tool. The output is a simple and compelling 16-page report that provides a color-coded comparison of your practices and performance to the population of the 341 North American IT organizations studied. Once you submit your answers, you will have immediate online access to a customized report that includes a color-coded practice and performance dashboard, a detailed comparison of your use of seven key performance drivers and 57 individual practices, 15 performance measures, and 15 demographic and size comparison markers. A summary table allows you to easily identify gaps that you can address to improve individual performance measures.

The research report and benchmark tool are especially useful for organizations standardizing on ITIL best practices, or for IT decision makers looking for empirical evidence about where to focus efforts based on what is proven to work at a broad sample of IT organizations.

The full research report and online benchmark tool are available for purchase at www.itpi.org.