

Version: 1.0

April 2007



# Managing Changes in the Application Lifecycle

Whitepaper

Active Global Support  
SAP AG



## Table of Content

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Management Summary .....</b>   | <b>3</b>  |
| <b>2</b> | <b>SAP Standards for E2E Solution Operations.....</b>                                     | <b>4</b>  |
| <b>3</b> | <b>Managing Changes in the Application Lifecycle at a Glance .....</b>                    | <b>7</b>  |
| <b>4</b> | <b>What is the Basic Concept of Change Management in the Application Lifecycle? .....</b> | <b>9</b>  |
| 4.1      | Architecture and Process Flow.....  | 9         |
| 4.2      | Initiate Change Request.....  | 10        |
| 4.3      | Plan Change Request .....   | 11        |
| 4.4      | Execute Change Request.....   | 11        |
| 4.5      | Change Diagnostics .....  | 13        |
| <b>5</b> | <b>How to Implement Change Management in the Application Lifecycle?.....</b>              | <b>15</b> |
| 5.1      | Methodology .....   | 15        |
| 5.2      | Services .....  | 15        |
| 5.3      | People .....  | 16        |
| <b>6</b> | <b>How to Measure the Success of the Implementation?.....</b>                             | <b>18</b> |



## 1 Management Summary

Application lifecycle describes the various phases through which an application travels from the point at which it is conceived until the point at which it is formally retired. These phases include the traditional application development and the solution operations, combined into a single lifecycle. Managing complexity, risk, costs as well as skills and resources within this life cycle is at the heart of implementing mission critical support for SAP-centric solutions. The complexity rises even further with the trend of outtasking and outsourcing of process components. To help customers manage their SAP-centric solutions, SAP provides a comprehensive set of standards for solution operations.

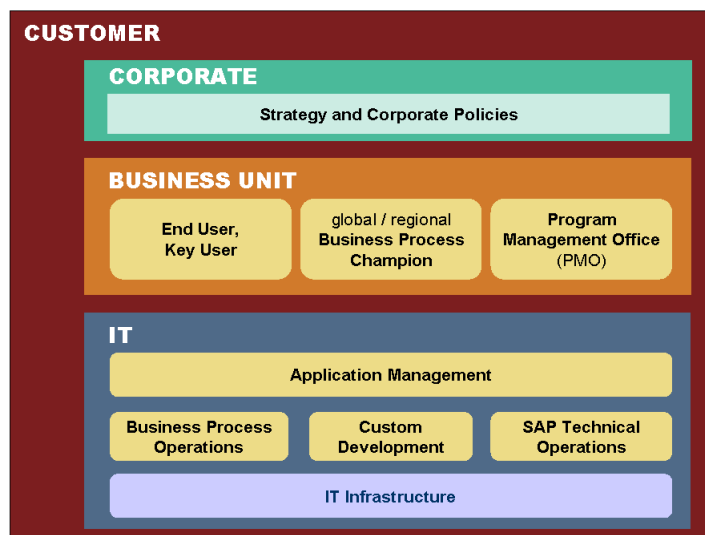
Out of this set of standards, the change request management and change control management standards describe the processes for managing software and configuration changes without disrupting the ongoing business. Change request management helps customers to improve the software maintenance processes, to minimize the impact of change-related incidents on service quality, and to provide tracking and transparency of changes. Change control management enables customers to standardize and optimize the solution configuration.

This document provides details regarding the change request management and change control management standards. It explains the basic concept of the standards, describes the different steps within the process flows, and provides details on the implementation of the standards. This includes a description of the implementation methodology, information regarding the Software Change Management service offered by SAP, and details regarding the content of corresponding training courses. Finally, a list of key performance indicators helps customers to set up a reporting to measure the success of the implementation of the processes.

## 2 SAP Standards for E2E Solution Operations

Mission-critical operations is a challenge. While the flexibility of SAP-centric solutions rises, customers have to manage complexity, risks, costs, as well as skills and resources efficiently. Customers have to run and incrementally improve the IT solution to ensure stable operation of the solution landscape. This includes the management of availability, performance, process and data transparency, data consistency, IT process compliance, and other tasks.

Typically, multiple teams in the customer organization are involved in the fulfillment of these requirements. They belong to the key organizational areas Business Unit and IT. While the names of the organizations may differ from company to company, their function is roughly the same. They run their activities in accordance with the corporate strategy, corporate policies (for example, corporate governance, compliance and security), and the goals of their organizations.



The different teams specialize in the execution of certain tasks: On the business side, **end users** use the implemented functionality to run their daily business. **Key users** provide first-level support for their colleagues. **Business process champions** define how business processes are to be executed. A **program management office** communicates these requirements to the IT organization, decides on the financing of development and operations, and ensures that the requirements are implemented.

On the technical side, the **application management** team is in direct contact with the business units. It is responsible for implementing the business requirements and providing support for end users. **Business process operations** covers the monitoring and support of the business applications, their integration, and the automation of jobs. **Custom development** takes care of adjusting the solution to customer-specific requirements and developments. **SAP technical operations** is responsible for the general administration of systems and de-

tailed system diagnostics. And the **IT infrastructure** organization provides the underlying IT infrastructure (network, databases, ...). Further specialization is possible within these organizations as well. For example, there may be individual experts for different applications within SAP technical operations.

Efficient collaboration between these teams is required to optimize the operation of SAP-centric solutions. This becomes even more important if customers engage service providers to execute some of the tasks or even complete processes. Customers have to closely integrate the providers of outtasking and outsourcing services into the operation of their solutions.

Key prerequisite for efficient collaboration of the involved groups is the clear definition of processes, responsibilities, service level agreements (SLAs), and key performance indicators (KPIs) to measure the fulfillment of the service levels. Based on the experiences gained by SAP Active Global Support while serving more than 36,000 customers, SAP has defined process standards and best practices, which help customers to set up and run End-to-End (E2E) Solution Operations for their SAP-centric solutions. This covers not only applications from SAP but also applications from ISVs, OEMs, and custom code applications integrated into the customer solution.

There are 16 standards for solution operations defined by SAP:

- **Incident Management** describes the process of incident resolution
- **Exception Handling** explains how to define a model and procedures to manage exceptions and error situations during daily business operations
- **Data Integrity** avoids data inconsistencies in end-to-end solution landscapes
- **Change Request Management** enables efficient and punctual implementation of changes with minimal risks
- **Upgrade** guides customers and technology partners through upgrade projects
- **eSOA Readiness** covers both technical and organizational readiness for enterprise service-oriented architectures (eSOA)
- **Root Cause Analysis** defines how to perform root cause analysis end-to-end across different support levels and different technologies
- **Change Control Management** covers the deployment and the analysis of changes
- **Minimum Documentation** defines the required documentation and reporting regarding the customer solution
- **Remote Supportability** contains five basic requirements that have to be met to optimize the supportability of customer solutions
- **Business Process and Interface Monitoring** describes the monitoring and supervision of the mission critical business processes
- **Data Volume Management** defines how to manage data growth
- **Job Scheduling Management** explains how to manage the planning, scheduling, and monitoring of background jobs



- **Transactional Consistency** safeguards data synchronization across applications in distributed system landscapes
- **System Administration** describes how to administer SAP technology in order to run a customer solution efficiently
- **System Monitoring** covers monitoring and reporting of the technical status of IT solutions

Out of this list, this white paper describes the change request management standard and the change control management standard.

## 3 Managing Changes in the Application Lifecycle at a Glance

It is essential that changes of the solution landscape are managed carefully to ensure for transparency of the changes. The change request management standard ensures that standardized methods and procedures are used for efficient and prompt handling of all changes. Complementary to change request management, the deployment and the analysis of changes need to be addressed, in order to ensure that changes are executed without disruption of the ongoing business. This is the focus of the **change control management standard**. The standard covers two major areas of change control: change deployment and change diagnostics.

**Change deployment** takes a holistic view of an application change in a solution to ensure that all components involved in an application change are tested and released together, even if they are based on different technologies. This can be achieved by one standard procedure and tool set for the technical distribution and import of application changes along the software logistics route. Change deployment controls not only changes as part of customer projects but also the download of software patches and updates for all software components from SAP and from partners. Test management rounds up the scope by facilitating an integrated approach linking the project structure to test plans, to test packages, and to the test itself. In addition, the integration with the change request management standard aligns the exact content, test and deployment for the change.

**Change diagnostics** supports customers in identifying, controlling, maintaining and verifying the versions of configurations and the values of parameters of the solution landscape components. Accurate information on configurations and their documentation is necessary to support both auditing requirements and other solution operations processes. To track changes, the configuration information is regularly recorded inside the components and collected centrally in the SAP Solution Manger database. The configuration can be compared with a template or master configuration to analyze changes. The reporting includes all current and historical configuration data throughout the application life cycle. Integrated with change request management and change deployment, change diagnostics supports the transition from project to operations and the management of code and configuration freeze phases.

The **change control management** standard is owned by the application management organization. Several roles participate in this fundamental standard. End users, process champions and the program management office use change request management as their primary means to initiate approve and monitor a change within the landscape. As the primary receiver of change requests, application management receives the change requests and uses the defined processes and tools to manage the implementation of changes.

Customers benefit from change control management through increased quality and availability of their IT solution and through avoidance of costs for error handling.

It is important that changes of the solution landscape are managed carefully to provide transparency of the changes and to ensure that they are executed without disrupting the on-going business. The goal of the **change request management standard** is to efficiently and punc-



tually implement changes to SAP applications with minimal risks using standardized methods and procedures.

The program management office is responsible for managing all types of application change requests initiated by business process champions and/or end users or key users. These change requests originate from business process changes, implementation- and upgrade projects, periodic maintenance and urgent corrections. These different change requests can affect one system and/or several systems within a SAP solution landscape. Therefore, dependencies between multiple systems have to be considered.

The change request management standard provides transparency of the software and customizing changes, the project history, and the involved roles and departments. Both the Business Units and the IT organization are involved in change request management. It is the main communication channel between the program management office and the application management organization.

The following scenario outlines a typical setup and involved roles for the change request management process: An End-User or Key User uses the service desk to create a service message. This service message triggers a corresponding change request. The change request may affect different cross-components. After the program management office approves the change request, the application management organization performs related activities to realize the change request, for example, developing, testing and roll out.

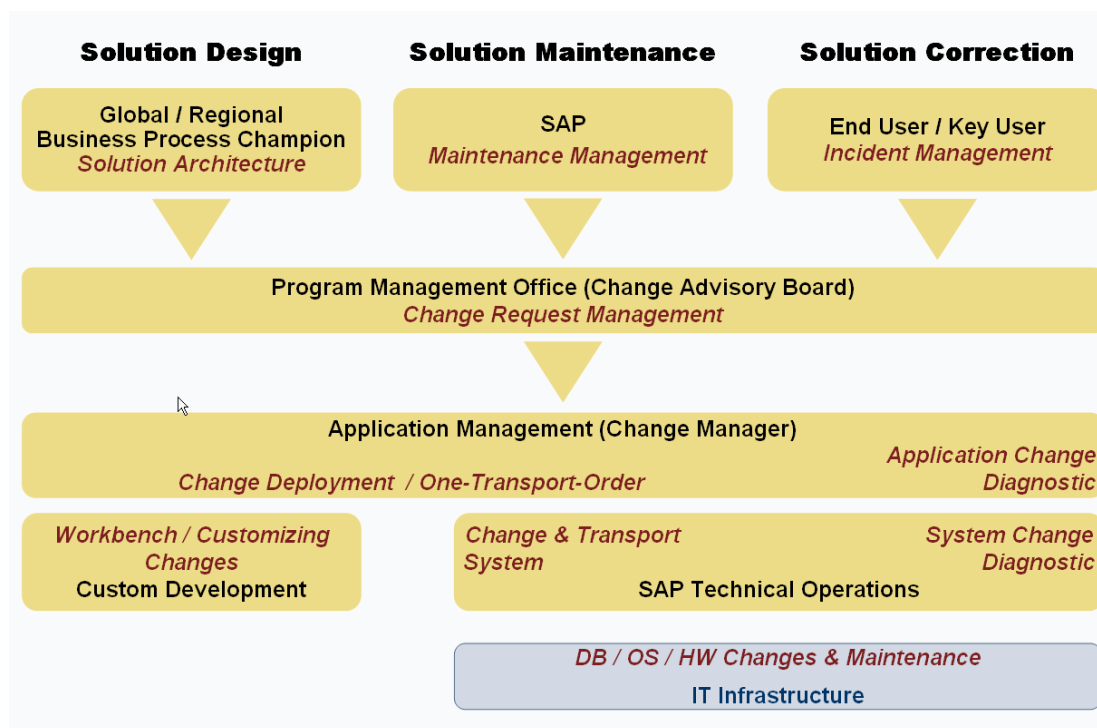
Technically, these changes are transported through the whole solution landscape and allow for auditability. Therefore, change request management is closely related to the change control management standard owned by the application management organization.

The change request management standard helps customers to minimize the impact of change-related incidents on service quality, and to consequently improve their day-to-day operations.

## 4 What is the Basic Concept of Change Management in the Application Lifecycle?

### 4.1 Architecture and Process Flow

The control of changes over the whole application lifecycle requires a close cooperation between different teams and an aligned schedule for the different purpose of changes whether they are new functions, maintenance, or issue resolution. Figure 4.1 shows at the top the three main initiators for changes: global or regional business process champions request the adaptation to the targeted solution design; SAP provides releases, support packages and patches to maintain the solution; and end user ask for avoidance of incidents.



**Figure 4.1:** Control Changes During the Whole Application Life Cycle

The program management office is responsible for planning and scheduling of the requested changes. To fulfill this task the program management office should govern the change request management process.

The execution of the change request is mainly in the application management, custom development and SAP technical operations team. The One-Transport-Order builds the foundation

on how to control software logistics end-to-end beyond ABAP and so finally the change deployment phase.

The application and systems diagnostics of changes supports customers in identifying, controlling, maintaining and verifying the important technical configurations, application configurations (e.g. customizing requests) and coding (e.g. ABAP Workbench Requests).

## 4.2 Initiate Change Request

There are several reasons in a customer's business unit which lead to a change request:

- If a disturbance in the production environment occurs, an end user or key user reports the incident. It is then processed in the service desk and can be transferred to a change request to provide a solution. Please refer to the incident management standard for details on this process.
- Global or regional business process champions set up a project to upgrade or maintain the business processes. You can plan any changes that are to be implemented over a certain period and monitor their implementation. Your organization can record and plan all the changes that need to be implemented in a project in a cProjects project plan.
- A change request can be created directly from the maintenance optimizer in SAP Solution Manager. The maintenance optimizer guides you through the procedure of planning, downloading and implementing Support Packages and patches for your systems.

The maintenance optimizer is integrated with the SAP Solution Manager. When you start a new product maintenance procedure, the maintenance optimizer reads the data from your solution, and based on this information proposes corresponding product versions and systems for maintenance.

The maintenance optimizer

- Is integrated with the SAP Support Portal
- Provides a guided procedure for maintenance planning and implementation
- Combines all necessary information in one procedure, including involved users, the product to be maintained, the affected systems and the assigned Support Packages
- Links directly to the appropriate download area of the SAP Software Distribution Center for the product you have chosen to maintain
- Approves items in the download basket of the SAP Software Distribution Center
- Displays an overview of all open and completed maintenance procedures
- Provides a reporting function so that you may search for and view all maintenance procedures in your SAP Solution Manager system

## 4.3 Plan Change Request

The program management office is the central group in the customer business unit that is responsible for the overall planning, implementation and continuous improvement of the business processes in the solution landscape. All requests for changes (solution design, solution maintenance, solution correction) flow through this office and need to be integrated into a schedule of changes to the landscape. As such, change request management takes up the greater part of activities for the program management office. This office is responsible for managing everything from only day-to-day changes and adaptations to all release planning and major infrastructure technology shifts. Moreover, these activities must be aligned with all stakeholders.

Within a given project, you can plan any changes that are to be implemented over a certain period and monitor their implementation. You can also document and resolve changes efficiently that are not part of a project plan but call for swift attention (urgent corrections), for instance, if an error occurs that could jeopardize a production environment.

## 4.4 Execute Change Request

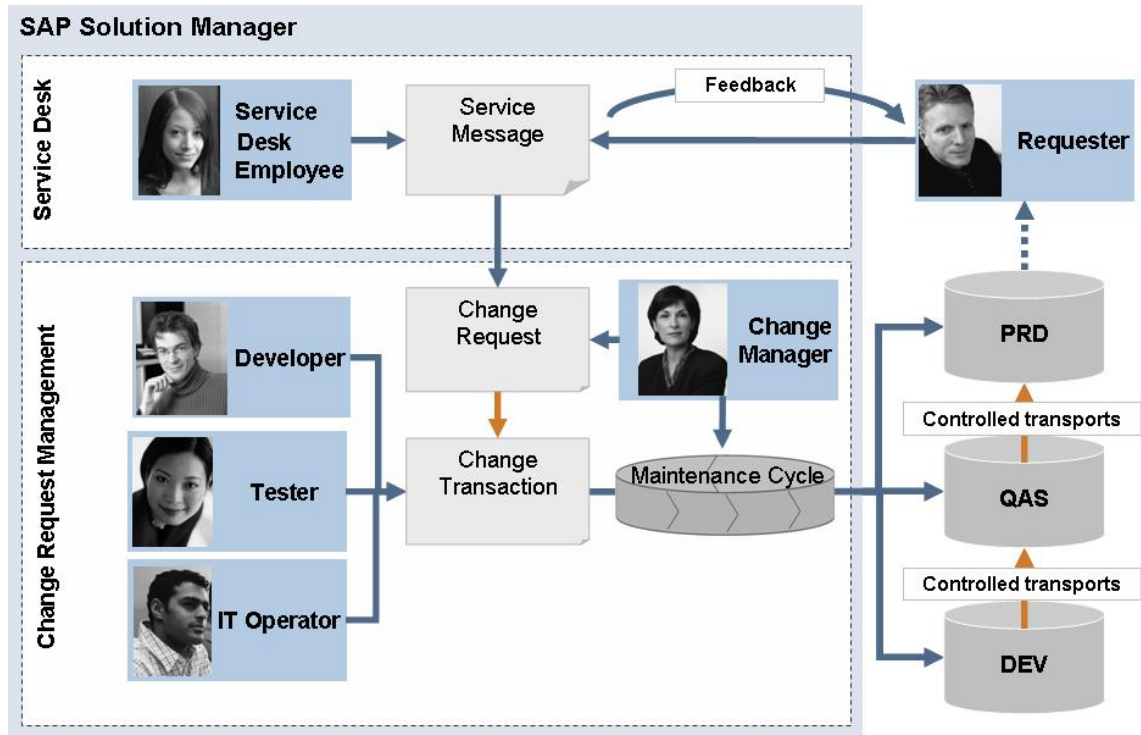
We will describe the process for solution correction in detail. The other processes are similar but have a different originator of the change request.

A user detects missing functions in a system. The user can report the fault directly from the relevant transaction by sending a support message to SAP Solution Manager. The message contains all the relevant system data and describes the request.

The service desk employee processing the support message finds that the request requires a change request. He then chooses the *Create Change Document* action to create a change request in the service desk.

The change request appears in the change manager's worklist. The change manager – possibly with the help of the change advisory board – classifies the request, specifies how it is to be handled (normal correction or urgent correction), and finally approves or rejects it. The priority of the change request is an important factor here.

If the change request is approved as a normal correction, SAP Solution Manager automatically generates a change transaction of type normal correction, the change request and correction are linked by the document flow, and the relationship is always transparent.



**Figure 4.2:** Sample Process Flow

## Development Phase

The change transaction is the functional basis for developers, testers, and system administrators. First, the developer is notified that a new correction needs processing. The developer works on the correction and selects the appropriate action to set the status to 'In development'.

The developer creates a transport request for the development system in SAP Solution Manager, logs on to the development system directly, and when the correction is ready, releases the transport tasks in the development system's Change and Transport System (CTS). When using change request management, transport requests can be released from the change requests only. When the change transaction has been completed and all the corresponding transport requests released, the developer sets the status to 'Development completed'. All the activities described can be executed directly from the change transaction via actions.

## Test Phase

On the basis of the task list, the newly developed function is imported into a test system during one of the regular imports of the project buffer. It undergoes unit testing or may be included directly in integration testing. A tester checks the change and can access all the necessary functions in one place, such as system logon and the complete change history for the

change transaction. The change request management supports the principle of dual control, enabling you to specify that the developer and tester must not be the same person.

After testing, a tester sets the status of the change transaction to *'Tested successfully'* to indicate that the new function has been tested and can be imported into the production system.

## **Deploy Phase: SAP Solution Manager manages changes and controls software logistics end-to-end beyond ABAP**

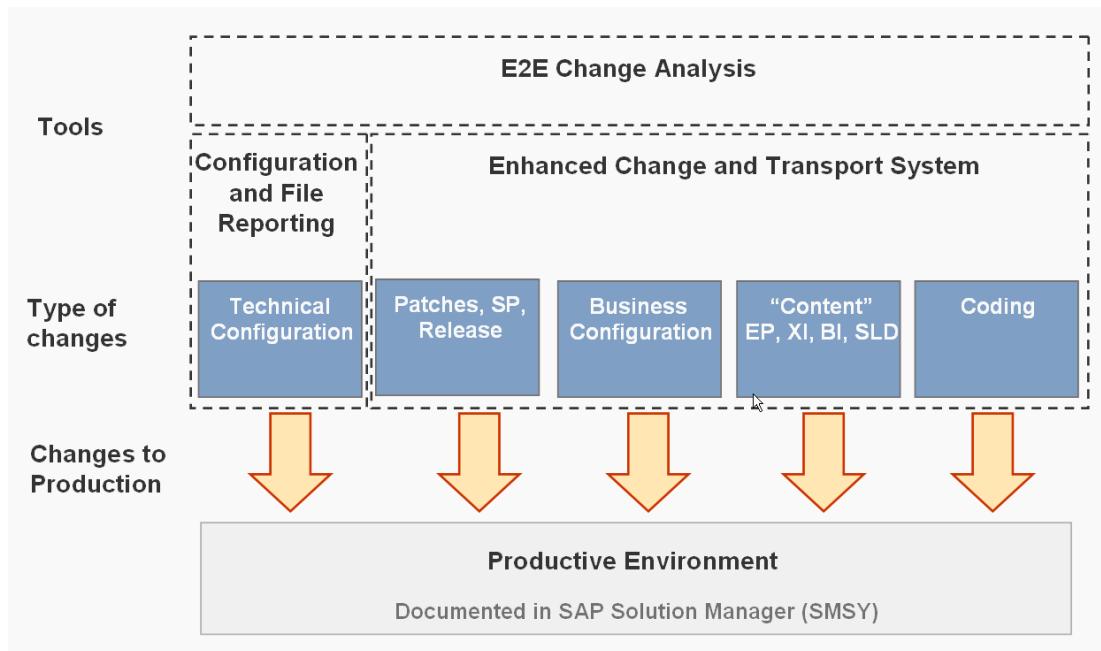
Eventually, the entire transport buffer for the CTS project is imported into the production systems in the order of the releases. Transport requests cannot be created or released during this phase. Following the import to the production system environment, no open transport requests remain and the transport buffer is empty.

As change request management is based on the standard SAP software logistics, it benefits directly from the enhancements in CTS which allow to transport non-ABAP software as well. Therefore, SAP Solution Manager change request management synchronizes changes between various transport tracks in ABAP and non-ABAP systems on project level. This means, you have only one tool for change management in heterogeneous system landscapes and the same standard process for all types of changes.

## **4.5 Change Diagnostics**

Change Diagnostics is the central entry point for analyzing changes in a solution. The tools support customers in identifying, controlling, maintaining and verifying the important technical configurations, application configurations (e.g. customizing requests) and coding (e.g. ABAP Workbench requests). The following diagram shows the different tools in the change diagnostics.

- The **Solution Manager System Landscape (SMSY)** documents characteristic information of the solution landscape by components like server, databases, systems, system components. It provides automatic data read as well as Manual data capture.
- **Configuration and File Reporting** extracts configuration parameter from Java or ABAP based systems and displays the parameter and their history in Solution Manager Diagnostics
- The **Change and Transport System** records changes to Business Configuration (Customizing Requests) and Coding (Workbench Requests). With the One-Transport-Order the Change and Transport System is enhanced to transport also Non-ABAP objects like Java archives.
- **E2E Change Analysis** provides a BI based reporting on the history and frequency of changes in a solution. It aggregates statistics from the technical configuration and the Change and Transport System



**Figure 4.3:** Overview of E2E Change Diagnostics

## 5 How to Implement Change Management in the Application Lifecycle?

### 5.1 Methodology

To establish a change management for the application lifecycle, it is necessary that internal change processes in the company be defined and mapped transparently. Additionally the concept of the change control infrastructure is that all required information is available in a central system. This standard provides transparency of the software and customizing changes, the software deployment, the project history, and the involved roles and departments.

To implement this standard SAP recommends the following steps:

1. The first step is to start with the topic of change diagnostics. This theme supports customers in identifying, controlling, maintaining and verifying the versions of configurations of the system landscape components. This builds the foundation for a change management for the application lifecycle.
2. Afterwards, the change deployment offers a holistic view of an application change in a solution and should ensure that all involved components (ABAP and Non-ABAP) of an application change are tested and released together.
3. Finally, you can set change request management on top to realize the efficient and punctual implementation of SAP software changes with minimal risks using standardized methods and procedures.

The SAP Solution Manager provides a preconfigured solution that is optimized for SAP specific changes.

### 5.2 Services

To help you in establishing change management for the application lifecycle, the Software Change Management Service is available. This service enables you to manage software changes at the lowest possible risk and being cost effective considering the recommendations of the post service action plan. This service is available in different facets:

- Change diagnostics
- Change request management
- Change deployment
- Maintenance
- Test management

## 5.3 People

The following training courses are available:

**E2E200** – E2E change control management

Course Content:

- Change diagnostics
  - Transparency and documentation of current system configuration and business processes
  - Introduction of SAP Solution Manager and SAP System Landscape Directory as configuration management and documentation tools
  - Control dashboard to control parameter settings across the solution
  - Transparency on past and planned changes
  - IT reporting for change control
  - Transparency on downtimes, service outages and service degradations
- Change deployment
  - Focus on automation of the change deployment process in order to reduce manual effort as well as to increase process reliability
  - SAP NetWeaver development environments for ABAP, NWDI, SAP EP, SAP XI
  - Transport of non-ABAP objects via enhanced change and transport system
  - SAP best practices for transport landscape topologies and release strategies
- Change request management
  - Approval process including demand consolidation, prioritization, categorization and scheduling of changes
  - Introduction of the change request management business process in SAP Solution Manager
  - Demonstration of SAP's best practices in transport management which are implemented in the SAP Solution Manager
- Maintenance management
  - SAP's best practices for regular maintenance of SAP software
  - Support Package stack strategy and side effect reporting
  - Support Package content analysis
  - Proactive implementation of SAP Notes
  - Maintenance Optimizer and HotNews Inbox in SAP Solution Manager

- Test Management
  - Test organization with SAP Solution Manager and HP Quality Center
  - Test automation with eCATT and SAP Code Inspector
  - Creation of test data in the quality assurance system

**SMO155:** SAP Solution Manager 4.0: change request management

Course Content:

- SAP Solution Manager – overview
- SAP Solution Manager change request management – basics
- Project- and phase-management
- Change request
- Regular correction
- Urgent correction
- Administration- and test messages
- Security concept and object locks
- Customizing of change requests
- Reporting
- Error analysis
- Outlook

## 6 How to Measure the Success of the Implementation?

To measure the success of change management for the application lifecycle, you can analyze the efficiency with the Solution Quality Reporting KPIs:

### Change diagnostics

- Number of changes in the parameter configuration per time unit
- Inconsistencies in the parameter configuration within the transport landscape and within the productive environment
- Completeness of landscape description in SAP Solution Manager

### Deployment

- Number of transports in the system per time unit
- Number of errors during the transports per time unit
- Modification level of the systems
- Consistency of the transport landscape

### Change request management

- Number of change requests per time unit and status
- Approval/realization time of change requests per priority and category
- Number of urgent corrections compared with normal corrections
- Number of rejected and approved change requests

### Maintenance

- Comparison of the customer releases and support package level with SAP guideline
- Same maintenance level in the transport landscape through the technology stack
- Frequency of planned maintenance

### Test Management

- Number of available test cases
- Number of failed and succeeded test cases in a test cycle
- Retention time of transport requests in the test system
- Number of incidents after a Go-Live of a change



## Copyright 2007 SAP AG. All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Excel, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, OS/2, Parallel Sysplex, MVS/ESA, AIX, S/390, AS/400, OS/390, OS/400, iSeries, pSeries, xSeries, zSeries, System i, System i5, System p, System p5, System x, System z, System z9, z/OS, AFP, Intelligent Miner, WebSphere, Netfinity, Tivoli, Informix, i5/OS, POWER, POWER5, POWER5+, OpenPower and PowerPC are trademarks or registered trademarks of IBM Corporation.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademark of Oracle Corporation.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Java is a registered trademark of Sun Microsystems, Inc.

JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

MaxDB is a trademark of MySQL AB, Sweden.

SAP, R/3, mySAP, mySAP.com, xApps, xApp, SAP NetWeaver, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG in Germany and in several other countries all over the world. All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary.

The information in this document is proprietary to SAP. No part of this document may be reproduced, copied, or transmitted in any form or for any purpose without the express prior written permission of SAP AG.

This document is a preliminary version and not subject to your license agreement or any other agreement with SAP. This document contains only intended strategies, developments, and functionalities of the SAP® product and is not intended to be binding upon SAP to any particular course of business, product strategy, and/or development. Please note that this document is subject to change and may be changed by SAP at any time without notice.

SAP assumes no responsibility for errors or omissions in this document. SAP does not warrant the accuracy or completeness of the information, text, graphics, links, or other items contained within this material. This document is provided without a warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose, or non-infringement.

SAP shall have no liability for damages of any kind including without limitation direct, special, indirect, or consequential damages that may result from the use of these materials. This limitation shall not apply in cases of intent or gross negligence.

The statutory liability for personal injury and defective products is not affected. SAP has no control over the information that you may access through the use of hot links contained in these materials and does not endorse your use of third-party Web pages nor provide any warranty whatsoever relating to third-party Web pages.