SAP Standard for Change Control Management
SAP Solution Manager 7.2

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DOCUMENT HISTORY

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<tr>
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<td>First version created</td>
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<tr>
<td><strong>EXAMPLE</strong></td>
<td>Emphasized words or expressions.</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>Technical names of system objects. These include report names, program names, transaction codes, table names, and key concepts of a programming language when they are surrounded by body text, for example, SELECT and INCLUDE.</td>
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<td><strong>Example</strong></td>
<td>Output on the screen. This includes file and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools.</td>
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<td><strong>Example</strong></td>
<td>Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.</td>
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<td><code>&lt;Example&gt;</code></td>
<td>Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system.</td>
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<td><code>EXAMPLE</code></td>
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1 SAP STANDARDS FOR END-TO-END SOLUTION OPERATIONS

IT organizations face new challenges every day as they attempt to remain effective and future safe while also keeping costs for day-to-day operations as low as possible. They are also being challenged more than ever to demonstrate their value to the business. Therefore, it is important to optimize the day-to-day tasks that appear to have less obvious business value and to use KPI and benchmark-based reporting to make IT processes more visible, demonstrating the real value that IT can provide.

In order to minimize the costs of IT, it is necessary to standardize and automate the end-to-end IT processes without reducing the SLAs required by the business, such as stability, availability, performance, process and data transparency, data consistency, IT process compliance, and so on.

Based on the experience gained by SAP Digital Business Services (DBS) while serving more than 36,000 customers, SAP has defined process standards and best practices to help customers set up and run end-to-end solution operations for their SAP-centric solutions.

The Build phase of SAP best practices supports a Build SAP Like a Factory approach, consisting of the following processes:

- Custom code management
- Change, test, and release management
- Incident, problem, and request management
- Solution Documentation

During the Run phase of a solution, adapting your IT infrastructure to a Run SAP Like a Factory operation impacts both application operations and business process operations. Therefore, operations processes, such as end-to-end root-cause analysis, system monitoring, system administration, and data volume management need to be optimized to achieve state-of-the-art application operations. In business process operations, the same applies to business process and interface monitoring (including performance optimization), data consistency management, and job management.

Quality management processes and tasks need to be established throughout the lifecycle to guarantee continuous improvement of the end-to-end solution operations processes while simultaneously ensuring the flexibility needed to react to changing requirements.
Figure 1: Organizational model for solution operations

Figure 1 shows an organizational model for solution operations that aligns SAP best practice topics and SAP standards for End-to-End Solution Operations with SAP’s control center approach. The Operations Control Center executes and controls the Run SAP Like a Factory processes, while the Innovation Control Center ensures optimal custom code management and a smooth transition to production with integration validation procedures. SAP connects to these control centers from the Mission Control Center to ensure that professional support is available to the customer. The following Application Lifecycle Management (ALM) functions are not provided directly in one of the control centers because they must be handled across different areas:

- Change, test, and release management
- Incident, problem, and request management
- Solution Documentation

The quality management methodologies are an essential part of SAP's Advanced Customer Center of Expertise (Advanced CCoE) concept and ensure that the KPI-driven processes are continuously improved across all processes and teams. In addition, the quality manager roles ensure consistent and value-centric reporting to the business and management. This unified reporting platform is known as the Single Source of Truth.
1.1 Control Center Approach

The control center approach consists of three components:

- Mission Control Center (MCC)
- Innovation Control Center (ICC)
- Operations Control Center (OCC)

Both the ICC and OCC are made available at your IT facility, while the MCC is located at regional SAP sites. All three approaches are linked together through the SAP Solution Manager application management solution.

Mission Control Center (MCC)

The purpose of SAP Mission Control Centers (MCCs) is to support the ICCs and OCCs at customer locations, enabling proactive identification and fast resolution on critical issues operating the SAP solutions and helping to apply standard SAP software functionality that addresses business requirements. The MCCs are serving as the central inbound channels for all complex and business critical request of our customers. MCCs connecting customers to experts from SAP that are ready to provide support across all solution areas and phases of the application lifecycle.

SAP MCCs are located on North America, Latin America, Europe and Asia regions. All MCC’s are networked, use a common infrastructure and service management system, providing 24x7 year around coverage for critical customer situations.
Innovation Control Center (ICC)

SAP’s Innovation Control Center (ICC) is the delivery framework to deliver mid to long term innovation programs. The ICC combines a set of experts, services, tools and templates and represents a lean front office at the customer location that is connected to all offerings of a very strong back office, called the Mission Control Center (MCC). This ensures access to the expertise of the entire SAP ecosystem in a structured way.

The Innovation Framework is the foundation of an ICC and is led by a certified ICC Lead. The Lead delivers against a long-term, value based roadmap, sets-up collaboration tools and dashboards for the connection to the MCC and creates innovation service plans for the underlying projects. ICC services are available for all phase of innovation projects

- Discover/Prepare: e.g. Prototyping
- Explore/Design: e.g. Gap Validation or Design Review
- Realization/Deploy: e.g. Integration Validation (Safeguarding)
- Run: Transition to Operations

The overall concept of ICC/MCC establish a long-term relationship to SAP and helps saving implementation costs and time for our customers.

Operations Control Center (OCC)

The Operations Control Center (OCC) is the physical manifestation of the Run SAP Like a Factory philosophy. The Operation Control Center (OCC) is a service of an IT organization that

- creates the relevant transparency to business and other stakeholders along the IT aspects of the seamless execution of E2E critical or core business processes
- provides the relevant transparency on health of the end to end IT landscape and underlying software components
- manages critical exceptions and continuous improvement on the above aspects based on data driven insights
- is supported by standardized IT processes
An Operation Control Center is sitting as a layer across / above typical IT departments (who are responsible for the day to day IT operations). It is the job of the OCC to immerse itself in the landscape and processes to fully understand the operational challenges facing the business. Centralized tools and standardized monitoring procedures provide much-needed transparency into these challenges. Meanwhile, a focus on continuous improvement and optimization can improve operations over the long term. As a result, IT departments can realize reduced costs and better capitalize on new opportunities for innovation. To achieve these goals, the OCC relies on a close interaction with both the Innovation Control Center (ICC) and the SAP Mission Control Center (MCC).

The OCC is typically equipped with large screens that display the status of business processes, IT landscape components, as well as exceptions and alerts. If problems occur, a video link can be used to obtain live support from SAP and partners. The customer is responsible for managing the OCC.

The OCC is most effective when closely integrated with other IT processes, such as IT Service Management (ITSM) and Change Management. Central monitors and dashboards based on application and business process operations display the current status of business and IT-related processes. This data can also be used to drive continuous improvement.

An effective system monitoring and alerting infrastructure is fundamental to the success of an OCC and feeding the OCC. The OCC is safeguarding all relevant IT aspects, and the execution of the end to end business processes in scope. The OCC reacts and manages on exception along this critical business processes according to predefined error-resolution activities. The OCC manages follow-up activities for error handling if the relevant tasks are not completed within a certain timeframe.
2 OVERVIEW OF THE SAP STANDARD FOR CHANGE CONTROL MANAGEMENT

Change Management has a central role for running stable system environments, independent whether they are On-Premise, Cloud or in Hybrid Scenarios with a mixture of both. It enables companies to build, test and deploy applications following a reliable change process ensuring security for an ongoing business. Especially in complex system environments it is important to have transparency across all changes within the lifecycle of project and maintenance, having the possibility to perform risk assessments in a proactive manner to ensure stability of your applications. Tools should help customers to constantly evaluate their current change processes to achieve an improvement.

In this chapter, we will give an overview about Change Control Management in SAP Solution Manager providing some more details about special functionalities that support the previously described challenges.

2.1 Change Control Options

The change control pyramid shows how the different functions of SAP Solution Manager help to support the change control management process. This section provides a brief overview of how these tools and features can be used to implement effective change control management processes. For more information on how they can be used to support Application Lifecycle Management, see Change Management and Application Lifecycle Management Process.

The Change Request Management can be seamlessly integrated into the change processes on any managed systems. In SAP Solution Manager, transport requests can be centrally created, released and imported into subsystems. For all changes to ABAP stacks, it is possible to integrate the systems into the Change and Transport System (CTS). For changes in Java-stack systems such as SAP Portal and dual-stack systems such as SAP Netweaver PI, it is required to configure the Enhanced Change and Transport System (CTS+) in the managed system landscape. Change Request Management also interacts with this infrastructure.
New with SAP Solution Manager 7.2 are the 3 cycle types customers can use to reflect their change and release management strategy:

Continual Deployment means that all changes are imported bundled or individually, this could happen on demand or at a well-defined point. There is no specific test phase for these changes. If customers are importing their changes bundled at a defined point the phase-driven deployment is the right choice and is usually used in a project or wave-based development approach. Based on the ITIL-definition of Release Planning an additional option is the Release Management. In a calendar view the Major and Minor releases can be defined with relationships between them.

2.1.1 Blocks of the Change Control Pyramid

In this section, we are going to explain you the different elements of the Change Control Pyramid which can be used partly also encapsulated.

Change and Transport System (SAP/Non-SAP)

The Change and Transport System (CTS) is a single tool for managing customizing and workbench changes. The changes are stored in transport requests on the development environment which are used to transport the changes to the subsequent systems in the system landscape. This procedure is also valid for SAP S/4 HANA systems. HANA native content is transported with SAP HANA Transport for ABAP (HTA). The objects from the HANA repository can then be synchronized to the HTA repository in the ABAP-system where they can be put to a transport request. SAP HTA is usually used when HANA objects are logically linked to ABAP objects which require a consolidated transport. As an enhancement to CTS SAP has developed the Enhanced Change and Transport System (CTS+) to control transports for Non-ABAP-Systems. The enhancement enables the Transport Organizer and the Transport Management System for Non-ABAP-objects. It can be also used for the SAP HANA Cloud Platform (HCP) which customers can use to extend Cloud and On-Premise Software. With CTS and CTS+, the following SAP HCP objects can be transported:

- SAP HANA
- HTML5/SAP Fiori
- Java

In addition, CTS+ can be also used for Non-SAP-software to harmonize transport activities for Java, .NET or any other applications.
Transport Analytics

The Transport Execution Analysis (TEA) report is one of SAP provided Guided Self Services that customers can execute on their own in SAP Solution Manager. Guided Self Services are offered to improve the most common areas, e.g. Data Volume Management, System Performance or Change Management.

The TEA is divided into two parts: The TEA for measuring key performance indicators for the quality of customer's transport processes in productive environments (reactive checks) and the TEA for Projects that analyzes a bunch of transport requests before they are transported into a target system (proactive checks).

Reactive checks are e.g.:
- Transport Frequency
- Transport Errors
- Average testing time
- Amount of direct changes in Quality or Production System
- Ratio of urgent and normal changes
- Number of modifications

Proactive checks are e.g.:
- Estimated import time
- Transport Sequence Check
- Reference Checks inside and outside the release

As a result, the TEA customers receive a comprehensive report containing the analysis and recommendations based on SAP Best Practices.

Change Diagnostics

Change Diagnostics can be divided into 3 main elements: End-to-End Change Analysis, Change Reporting and Configuration Validation. All 3 are based on the information stored in the Configuration and Change Database (CCDB). Prerequisite for the usage of Change Diagnostics is the execution of the Managed System Setup which means the connection of your whole landscape to SAP Solution Manager. All technical changes performed on the managed systems are collected by SAP Solution Manager. The procedure can be explained in 3 short steps:

1. The configuration data of the managed system is saved in the configuration repository on the managed system.
2. The configuration repository is collected by the Extractor Framework daily and uploads it into SAP Solution Manager’s CCDB.
3. All Reporting and Analyze-Functionalities are based on the CCDB.

Change Reporting contains a predefined set of reports containing information about executed changes in your landscape. In combination with historical data like software changes or parameter changes it allows customers a strong governance and traceability of their performed changes.

End-to-End Change Analysis is part of the Root Cause Analysis of SAP Solution Manager and accesses the information from the SAP Business Warehouse and displays it in SAP BW. The shown figures are the amount of changes per system, the change category and the change date. All system elements are covered, like OS-changes, SAP HANA, ABAP parameters, Support Packages or transport requests. It is a powerful tool especially if questions like "Why is our Production System slower than yesterday" or similar arise.
Configuration Validation compares the configuration of your systems in a landscape whether they are consistent or not. You can also compare it with a predefined target system. The target system is a snapshot of a system which meets all requirements and acts as a reference system for the comparison. With the comparison, you can evaluate e.g. whether all your systems have the minimum database or software version, a recent kernel version or security standards.

Central Transport Management

With SAP Solution Manager 7.1 SP10 and upwards SAP introduced the central Change and Transport System (cCTS) infrastructure. With this new feature, customers can bundle cross-application-changes which are related from a business perspective to ensure that these changes are deployed simultaneously. In addition, it delivers enhanced functionalities to increase the flexibility of Change Request and Quality Gate Management. These additional features are:

- Reassign of Changes with modifiable and released transport to another CTS-Project
- Register external transports and control them with ChaRM or QGM
- Avoid conflicts between transports controlled by ChaRM/QGM and local transports

Retrofit (Dual-Landscape-Synchronization)

In addition to classical 3 or 4 system landscapes customers have the possibility to separate project developments from the maintenance landscape to enhance the stability of the production track. In such dual-landscapes a key success factor is the permanent synchronization from maintenance to project landscape to avoid the overwriting of maintenance changes when the project is transported to Production Track. However, customers are often afraid of a dual-landscape, as this synchronization costs a lot of time and effort. This is where Retrofit provides the ability to ensure the success of synchronization of a dual landscape. Retrofit supports this activity by automating this process as much as possible. All changes that are executed in the maintenance landscape are recorded and are transferred to the development system of the project landscape. The tool differs between 4 retrofit categories:

Auto Import
No conflicts between both development systems. Customer figures show that this category is the most likely, usually between 75 and 90%.

Automated Synchronization with the SAP Correction Workbench
There is a conflict between both development systems which could be solved by the tool.

Semi-Automated Synchronization with Business Configuration Sets
Similar to the automated synchronization with SAP CWB, but used for customizing.

Manual Retrofit
If none of the 3 previous options is fitting or the Retrofit tool cannot calculate the retrofit for the affected object, it will appear for manual synchronization. Usually only a small figure (< 2%) of transport objects appear in this category.

The classification of the objects takes place automatically and individually, which means that a transport request can contain Auto-Import, Semiautomatic and/or Manual Objects. The classification information is based on the Cross System Object Lock Functionality of SAP Solution Manager, which is explained in section 2.1.2 Downgrade Protection.

To utilize Retrofit, there is a basic configuration of the Transport Management Infrastructure of SAP Solution Manager required. Retrofit can be used as part of Change Request Management or Quality Gate Management or even as a standalone version.
Quality Gate Management

Quality Gate Management (QGM) is a basic SAP tool to control transports in various system landscapes that are functionally related to each other. It combines the management of releases with the possibility to control the phases of a release with the underlying technical activities while ensuring full security. It's easy to set up as no process definition is required; instead the focus is on the Transport Management itself. QGM has 4 main parts:

Scenario

The scenario is the main entity for all transports and change control-relevant functions. The scenario doesn't follow a strict regulation for the task, instead customers can adapt it according to their planned activities. The regulation of a major release with defined milestones or an agile development with several sprints is possible with the QGM-scenario.

Changes

A change is an entity that bundles transport requests in one or several landscapes. A change can act as a representative of a functional unit like a requirement, there is no workflow involved and also only a few attributes like Description, Status and Owner are assigned.

Transports

Every change has one or more transports. The transports can exist in any system which has been assigned to the scenario. QGM ensures that all transports, which belong to one change, are logically grouped and transported simultaneously.

Quality Gates

A quality gate secures specific parts of the landscape, e.g. the production system. Only if the Q-Gate "Production" has been opened it is possible to transport changes to the production environment. As the name Quality Gate Management implies, to work with QGM you need to define Q-gates which will be reached during your project or release. Q-gates usually have also a technical dependency, but it is also possible to create Q-gates where a special attention to the results of the previous phase has to take place. The decision about the passing of a Q-gate is performed by the Quality Manager and Quality Advisory Board which have been assigned to the scenario. They are responsible for validating the outcome of the phases and passing the gate, providing additional and traceable information about their decision.

QGM offers various transport management functions of the central Change and Transport Management infrastructure such as the management of transports (create, release, import) and security functions (Cross System Object Lock, Downgrade Protection).

Change Request Management

SAP Solution Manager offers a set of preconfigured change management processes that can be set up with the help of a guided configuration procedure. Based on this ready-to-use configuration, which have the ability to adjust tools to meet individual business requirements. It is possible to adapt workflow settings, service organization, user roles, automatic email notifications, UI adoptions, and reporting capabilities. In addition, SAP Solution Manager offers many features as standard, for example, authorization management, different inbound and outbound channels, a notification framework, and an enhancement workbench for making adjustments to individual fields without the need for manual coding. One of the major benefits of Solution Manager is that you can integrate it into the SAP environment and use it with deployment tools to help automate change processes across your SAP Landscape. Due to its open interfaces, it is possible to integrate Change Request Management also into non-SAP technologies.
The following table contains an overview of the main tasks related to Change Request Management and the features provided by SAP Solution Manager to support these tasks:

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Create, process, and review requests for change</td>
<td>• Sophisticated approval management</td>
</tr>
<tr>
<td>• Assess, evaluate, and authorize changes</td>
<td>• Clearly defined responsibilities for each change phase</td>
</tr>
<tr>
<td>• Authorize and coordinate creation, testing, and implementation of changes</td>
<td>• Close integration with release and deployment management</td>
</tr>
<tr>
<td>• Review and confirm changes</td>
<td>• Ability to create Request for Changes as follow-up documents from individual incidents and problems</td>
</tr>
<tr>
<td></td>
<td>• Integration with SAP Project and Portfolio Management (PPM) and Test Management</td>
</tr>
<tr>
<td></td>
<td>• Billing and chargeback based on actual effort</td>
</tr>
</tbody>
</table>

Change Request Management uses the following types of transaction:

**Requests for Change**

Requests for change are created to request changes for both SAP and Non-SAP changes. For example, end users and key users create requests for change to fulfill completely new requirements. If a change is necessary due to an incident or problem, service desk employees can also create requests for change. When creating the request for change, the requester provides information about the change, for example, impact, urgency and priority, category, required end date, and the affected systems. Change requests are reviewed by the Change Manager and/or the Change Advisory Board (CAB). Each change request is evaluated based on predetermined criteria and guidelines as laid out by the CAB. Change requests are then approved or rejected or put on hold based on upon the evaluation.

**Change Documents**

After change approval, the Solution Manager automatically creates a change document, which documents the activities of the users that are involved in the change process, for example, developers, testers, and system administrators. Everyone involved in the process is assigned a specific key task. The following table shows a list of roles and their key tasks:

<table>
<thead>
<tr>
<th>Role</th>
<th>Key Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Managers</td>
<td>Oversee the process</td>
</tr>
<tr>
<td>Developers</td>
<td>Implement the change</td>
</tr>
<tr>
<td>Testers</td>
<td>Verify the change</td>
</tr>
<tr>
<td>System administrators</td>
<td>Transport the change into the production environment</td>
</tr>
</tbody>
</table>

As Change Request Management is so closely connected to backend systems, SAP Solution Manager triggers some processes automatically.

In general, the process for Change Request Management is as follows:

1. The developer creates the transport request in the development system.
2. The change is handed over to the tester or a test team.
3. In the background, the change is transported to the quality assurance system.
4. After successful verification, the change can be transported to the production system by the system administrator.
Types of Change

Depends on the type of change to be implemented, will determine the deployment of a change. ITIL defines the following types of change:

<table>
<thead>
<tr>
<th>Change Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preapproved changes</td>
<td>Standardized changes that occur regularly with limited risks and defined impacts. They are executed based on simplified guidelines and workflows and can go live whenever they are ready.</td>
</tr>
<tr>
<td>Normal changes</td>
<td>Changes that are not too complex or urgent. They require good coordination and appropriate approval steps before they can be transported to the productive environment. Different normal changes are combined in a single release, which needs to pass several testing levels before it is imported into the production system at a well-defined point in time to decrease the impact on end users.</td>
</tr>
<tr>
<td>Emergency changes</td>
<td>Highly urgent changes to resolve serious issues that affect a high number of users or important service processes. You execute this type a change according to shortened workflows combined with high-level management supervision.</td>
</tr>
</tbody>
</table>

Workflow in Change Request Management is based upon procedures described by ITIL as shown in Figure 3. In addition to the workflow supporting the execution of a change request, there are other types of workflow associated with the different routing from that of Figure 3. These changes can include the followings:

- Emergency changes in SAP systems
- Periodic changes in SAP systems
- Administrative changes
- General changes
- Troubleshooting during integration testing

Figure 8: Interaction between Requests for Change and Change Documents
Release Management

With a well-defined Release Management Strategy, risks can be mitigated during the deployment / go-live phase. This becomes critical for major upgrades and implementations, especially those implementations that have complex integrated applications such as SAP S/4 HANA. The Release Management for such projects helps you to only transport these changes to your production environment which have passed all validation steps such as unit and integration tests as part of a consistent package.

The following table contains an overview of the main tasks related to the Release Management and the features provided by SAP Solution Manager to support these tasks:

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Create and process change documents</td>
<td>• Advanced CTS functionalities, such as Transport of Copies, which minimizes the number of transport requests, or Transport Collection, which groups together all changes belonging to one request for change</td>
</tr>
<tr>
<td>• Control your project phases, such as development and go-live, by using a task list</td>
<td>• Integration with SAP Project and Portfolio Management (PPM)</td>
</tr>
<tr>
<td>• Update the status of previous records, such as requests for change, problems, or incidents, following a successful change</td>
<td>• Integration with Test Management (assigning test plans or test packages)</td>
</tr>
<tr>
<td>• Deploy SAP-based changes (ABAP, Java) across your SAP landscape by using the Change and Transport System (CTS, cCTS, and CTS+)</td>
<td>• Solution Manager Requirements and Release Management (for SAP MaxAttention customers only)</td>
</tr>
</tbody>
</table>

Defining a Release Strategy

Technology and innovation along with compliance requirements result in companies needing to become more agile in their approach to make changes. Such changes may cause interruptions in applications and business processes that may not be foreseen within a heterogeneous and complex system landscape. The Release Management Strategy is defined to mitigate risks across the landscape when changes occur to production systems and to minimize costs.

Disruption to the business can be costly, and they are most often the result of insufficient planning or testing across the development lifecycle.

It is possible that Release Management teams manage complex landscapes resulting in a high number of changes. It is critical that in order to avoid conflicts between releases, that a release schedule is defined and communicated to the organization. A release schedule should be integrated with all IT operations, especially for interfaces to other systems (such as SAP S/4 HANA and SAP BW). The Release Manager role is responsible for the defining the schedule with other parts of the IT organization, along with defining the required milestones for the different phases of each release.

Regarding the Release types, we differentiate between two types of Releases:

<table>
<thead>
<tr>
<th>Release type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Release</td>
<td>A major release takes three to six months. In a year, customers develop between two and four major releases. These releases include all types of changes, even those that affect core business processes. Therefore, a major release requires complete regression testing that goes above and beyond normal release testing.</td>
</tr>
<tr>
<td>Minor Release</td>
<td>A minor release has a substantially shorter duration of between one to four weeks. The goal of minor releases is to bundle bug fixes and minor enhancements, then move them to the production system at short-notice. For a minor release, testing is limited to the core business processes and the extensions provided.</td>
</tr>
</tbody>
</table>
By following SAP’s release management recommendations, you can achieve the following benefits:

- The frequency of changes in the production system is reduced.
- Imports into the production system occur at a predefined point in time.
- End user satisfaction is increased due to early communication and training.
- Each change is tested appropriately.
- Daily changes are restricted to emergency fixes.
- The risk of inconsistencies due to missing transports or transports imported with sequence violations is reduced.

The administrative effort for transports is reduced when you import changes using SAP Solution Manager.

Release Management in SAP Solution Manager 7.2 provides synchronization across projects, providing enhanced control, with the ability to perform joint integration across test phases before a go-live, providing tighter controls, reducing risks, decreasing test efforts and simplifying the go-live process.

The following 3 steps are required to handle releases in SAP Solution Manager 7.2:

1. Define your release track
2. Create your release schedule
3. Manage the release

The releases track is usually a subset of the complete IT solution with systems which have logical and functional dependencies like SAP S/4 HANA and SAP HCP. Both systems are part of one release track, while other systems like SAP PI or SAP CRM could be part of another release track. In the next step, define the amount and the duration of major and minor releases. Once this step has been completed, the individual planning of each release takes place. There are typical 3 key phases – End of deployment, End of testing and Go-live. The Release Management will set the appropriate dates for each phase. It is important that the Release Management team has the capabilities to support the productive solution during a period of time after Go-live – this is sometimes referred to as “Hypercare” or the stabilization period.

2.1.2 Functions for Increasing Business Flexibility

Change Request Management offers many different ways of checking requests for change and change documents across various system landscapes. Different workflows provide the ability to fix bugs quickly and efficiently in production landscapes or to develop completely new features in a release project.

SAP Solution Manager provides several functions that allow flexibility when dealing with changes.

Downgrade Protection

Caution

Before implementing any other tools mentioned in this section, you must have set up downgrade protection to ensure that your system is not accidentally downgraded.

When working in a flexible and changing environment, changes often appear in different projects with different levels of urgency. The downgrade protection function tracks objects in transport requests, and reports conflicts in five scenarios when an object that is saved in two or more transport requests is released, reassigned, or imported. This applies to all managed development systems and clients for which the cross system object lock is active, and the Change and Transport System plug-in is installed.
Downgrade protection ensures that the target system is not downgraded. Downgrade protection ensures that the relevant test and production systems remain consistent. When working with flexible release management, release packages and the subsequent deployment stay consistent. This ensures a more stable production environment. In combination with a cross-system object lock, downgrade protection provides protection at every stage of a technical change.

Preliminary Import
In certain situations, there is a need to process a change prior to the determined go-live. Preliminary Import is a process to import changes individually, irrespective of the full release. This is accessed from the process flow of a normal change. The normal change is treated in the same way as an urgent correction. It is first imported separately from the other developments and the relevant transport requests are then kept in the import buffer of the production system and then run a consolidated import at the time of release.

Selective Import
Instead of performing an IMPORT_PROJECT_ALL when administrators are executing the import in a Quality Assurance or Production System from the tasklist, SAP is offering additional import methods as part of a flexible ChaRM-solution. The selective import was introduced with SP10 of SAP Solution Manager 7.1. When the action for the import is executed, a popup appears with the list of all transport requests that are in the import buffer of the system. Now it can be freely selected which transports should go to the system. This functionality should only be used in combination with Downgrade Protection to avoid transports moving out of sequence and downgrades!

Status-driven Import
Status-driven import has been available since SAP Solution Manager 7.1 SP05. SAP has introduced the possibility of importing only transport requests, where corresponding change documents have a minimum status value. Usually all transport requests, which belong to a Normal Change with the status "Successfully Tested", can be imported to Production. If customers are introducing an additional approval status, e.g. "Approved for Production" after "Successfully Tested", this status can be set as minimum status for the production import. All Transport Requests where the Normal Change does not have the new status, are ignored during the import, although the transport requests are in the import buffer of the production system and technically ready to import. This functionality should only be used with Downgrade Protection!

Reassignment of Change Documents
The situation may arise where a change cannot be completed during the lifecycle of a specific project. Checks are required to prevent a project from being completed until all transports have been implemented. Since the introduction of SAP Solution Manager SP05, it is possible to delay the project, undo or reassign a change document from one project to another. During reassignment of a change document it is possible to review the target project and ensure the landscape is the same as the original. With SAP Solution Manager 7.1 SP05 to SP09, change documents can only be reassigned with released transport requests utilizing the central Change and Transport System (cCTS).

Decoupling and Coupling Transport Requests
When working in project cycles that have different phases, it may be necessary to remove a specific transport request from the cycle or reassign transports to new change documents because of changing parameters from the business processes or incomplete developments. Change Request Management provides features to change the assignment of transports before the project is released, providing maximum flexibility with releases, and allowing detailed checks on transport requests to be performed.
2.2 Integration with Application Lifecycle Management

Change Request Management can be integrated across a broad range of features and systems. Change Request Management comprises all the integration scenarios shown in the following figure:

Figure 9: Change Request Management Integration Scenario

The following example outlines the interaction between IT Service Management (including Change Management) and Application Lifecycle Management.

Example

1. SAP Solution Manager monitors a company’s business processes and its entire system infrastructure. Configure SAP Solution Manager to automatically generate an alert if a particular KPI has reached a predefined threshold (Event Management).
2. The alert generates a dedicated incident record with the integration to IT Service Management (ITSM).
3. In SAP Solution Manager, a service desk agent uses ITSM to process this incident record and performs a detailed root cause analysis with the help of other SAP Solution Manager applications and functions such as trace, change, or exception analyses. Relevance to other objects can then be considered (Impact Analysis).
4. To examine the cause of the alert in more detail, the service desk employee creates a problem record from the incident record. This is created as a follow-up document.
5. This problem is forwarded to the Problem Management team, who are trained to further investigate the problem.
6. The Problem Management process is integrated into SAP support message processing (SAP Collaboration). From here, it is possible to request support from SAP.
7. SAP provides an SAP Note as a solution for reported issue, which is ready to be implemented with the help of SAP Note Assistant. However, as this leads to a change in the production system, it is necessary to create a request for change via the problem record (Change Management).
8. After the change has been approved, it is implemented in the development system and transferred to the production system (Deployment Management).

9. The incident record states which business process is affected by the change. This information is used to identify an appropriate test case utilizing Solution Documentation.

10. The business process that is affected by the change either manually or automatically (Test Management).

11. The problem and incident records are closed and a knowledge article is generated. Knowledge articles to document the solution method for the problem. If the same problem occurs in another system, the knowledge article can be accessed, and the issue can be fixed in a timely and efficient manner. (Knowledge Management).

---

**Figure 10: Interaction between ITSM into ALM**
3 IMPLEMENTATION OF CHANGE MANAGEMENT – PORTFOLIO TO DEPLOY

The implementation of Change Management is a complex project that affects many stakeholders. It is important that all stakeholders are involved with the project. This chapter shows the different phases of the implementation of Change Management and gives information how to setup Change Control Management if SAP Solution Manager is the chosen tool. The following describes the integration model when utilizing SAP Solution Manager. This information provides an understanding of phases and the related tasks:

Figure 11: Integration Model SAP Solution Manager

3.1 Portfolio to Project

The phase "Portfolio to Project" includes the activities which are required to initiate an implementation of change management processes. The portfolio in these circumstances defines the different business initiatives that are planned to increase the value to the business and to stay ahead of competitors. For each business initiative, it is necessary to plan the required capacity, skills and effort. Based on these figures an estimation of the return on investment can be created and can be compared with other projects planned. The project(s) with the best balance will be agreed for investment and are aligned in the overall project calendar.
3.2 Requirements to Deploy

The objective for implementing Change Management needs to be clarified. The requires and evaluation of the “As-is” situation. It is important to obtain information from the business, such as pain points and suggestions for improvement, which will represent the “To-be” situation.

3.2.1 Requirements Phase - Project-Related Aspects

The scope of the project needs to be clearly defined, including which change management processes and functions should be deployed. An evaluation of which processes and tools with specific functions is required with a possible phased approach for implementation, with well-defined milestones or rapid deployment with sprint for pilots / proof of concept. It is important to understand the approach and how it will affect any subsequent activities.

Priority-based work packages need to be defined and time frames need to be determined. In addition the calculation of effort and planning of assets according to resources and capabilities needs to be taken into consideration. The following table lists examples of these factors:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Resources   | • Available staff  
              • Budget  
              • Current or planned infrastructure  
              • Access to information  
              • Existing applications |
| Capabilities | • Organizational structure  
                • Management responsibility  
                • Current documented processes and knowledge |

It is necessary to evaluate how much of the IT landscape will be utilized with Change Control Management. Decisions need to be made whether to include non-SAP applications. The major difficulties are organizing and standardizing current live processes and ensuring cooperation between all stakeholders.

The following is a high-level list of work packages to be considered:

- Analysis of functional and organizational requirements
- Blueprinting and preparation of functional specifications
- Hardware setup
- Implementation (prerequisites, basic configurations, customizing, and migration)
- Preparation of master data (users, organizational units, technical systems, and authorizations)
- Preparation of documentation (configuration documentation, user manuals, and test cases)
- User and administration training courses
- Testing (functional tests, integration and acceptance tests)
- Bug-fixing
- Planning and preparation for go-live
- Performing go-live
- Project management
3.2.2 Requirements Phase - Organizational Aspects

In addition to the project-related aspects, it is necessary to examine any organizational aspects. It is important to identify critical functions, roles, and responsibilities. This should be documented in a responsibility assignment (RACI) matrix and a communication plan should then be prepared. Once this is completed, the necessary contact details should be in place for the project. Resources should be assigned to the change management project ensuring availability for the duration of the project.

First, you need to make sure that all project resources have a general understanding of Change Control Management. All resources performing tasks should have the required skills, through any necessary training activities. SAP offers several training courses and knowledge sources for this purpose. For more information, see Training and More Information. Additional support and information for organizational activities such as IT governance, roles and skills can come from the SAP Customer Center of Expertise (CCoE).

The CCoE improves transparency and quality management, aiming to resolve critical challenges across SAP Solutions organization and operations. The CCoE program provides information, methodologies, and tools to help improving quality and continuously improvement on SAP Solution Operations. It verifies the processes that customers implement to perform these activities and ensures that the process is compliant with the SAP Standards for End To End Solution Operations.

Be aware of potential conflicts across the various teams in the organization regarding changes. In order to be successful, it is critical to have the acceptance and support of management, process owners and stakeholders.

Consideration for work spaces, access (on site and remote) for external resources is required for projects.

3.2.3 Requirements Phase - Technical Aspects

When planning an implementation of Change Management, the following technical aspects should be considered:

Hardware Sizing

When sizing hardware for Change Control Management, consider the following KPIs:

- Number of documents (request for change, change documents) created per day
- Number of low activity users (10 dialog steps per hour or less)
- Number of medium activity users (2 dialog steps per minute, approximately)
- Number of high activity users (10 dialog steps per minute or more)
- Workdays per year, according to company policy

When scaling your dedicated hardware, you need to consider the following KPIs:

- Average number of concurrent users during peak times
- Average number of queries per user in one hour
- Average number of high and medium connectors per query
- Total number of files to be loaded
- Total number of business objects to be loaded
- Number business objects increase per year

For more information for SAP Solution Manager 7.2 sizing, go to the Quick Sizer at service.sap.com/Quicksizer
3.2.4 Requirements Phase - Change Management Processes

As with all projects, Change Management processes require specific planning and design activities prior to an implementation.

Existing Processes

A review for all process documentation, such as process flow diagrams and other documents directly related to the change management process should take place, and modification requirements should be documented. Use this documentation as a basis for the implementation. The definition of process changes and descriptions should be reviewed with the project team and stakeholders. In addition, ensure all stakeholders are included in the RACI matrix and communication plan.

Functions

It is important to identify specific functional requirements are covered by SAP Change Control Management. You might find it helpful to build a requirement matrix to analyze whether key features are covered fully, partly, or not at all. You can also easily document necessary developments here. Later, you need to track any effort spent implementing key functionalities, such as customizing or development, in the project plan.

It is important to identify the functional requirements, for each step of the process, document those requirements, and review which of the requirements are covered fully, partially or not at all within the SAP Change Control Management. Any necessary development / customizing should also be documented in the project plan to track cost and resources.

The following core features need to be analyzed:
- Automatic email notifications in case of status changes
- Multilevel categorization
- Organizational Structure

Support Organization

SAP Solution Manager provides the capability to create a structure for the support organization. This structure is flexible to allow for varying types of organizational structures. Once the structure is designed, roles can be assigned to team members, for example, change manager, requestor, tester, developer, system administrator. Having a defined structure then provides the ability to utilize several features in Change Request Management, such as the ability to create emails that can be automatically dispatched to a specific group and using the search filter capability to view change records for the assigned group.

Authorization Concept

It is necessary to identify all user groups within Change Control Management, and define the related authorization roles. Documenting and setting an authorization concept is not simple and must be carefully considered. SAP Solution Manager allows for the definition of many authorization objects, for example, to view and use different UI components, set the visibility of text types, apply specific workflow statuses, or create and modify requests for change and change records.
3.2.5  **SAP Solution Manager Configuration**

Before starting Change Management implementation utilizing SAP Solution Manager, there are prerequisite steps that need to be undertaken.

- Basic Configuration
- Managed System Configuration
- SAP Solution Manager Configuration for ChaRM

**Master Correction Note and Change Request Management Master Note**

Make sure that the latest version of the Master Correction Note is implemented according to the current SAP Solution Manager support package stack level. Check for updates regularly to ensure that bug-fixes are implemented.

For every support package, there is also a Change Request Management Master Note which contains known bug-fixes and the corresponding SAP Notes that solve this issue. It is good practice to schedule regular reviews for updating SAP Notes.

**System Access**

System access, including Internet access and internal network, is required for team members involved with the configuration in both SAP Solution Manager and the managed systems. It is important to remember that SAP Solution Manager access requires users to be set up independently from the managed system (Single Sign On can still be utilized). IF SAP staff are involved in the implementation, it is crucial to enable the remote SAP R/3 and HTTP connection from the SAP Service Marketplace to SAP Solution Manager.

**Change Control Management Process**

Implementing and customizing actions are stored in dedicated transport requests as workbench and customizing requests. Therefore, you need to think about your Change Control Management process for the implementation project. SAP recommends that all related Change Control Management transports are bundled into one CTS project.

**SAP Connect**

Configuration of SAP Connect (transaction SCOT) is required to send emails according to defined email actions within IT Service Management.

**Full Text Search**

To enable full-text searches within request for change and change documents, there is an option to run SAP Solution Manager system on a HANA Database. As an alternative with AnyDB, you need to set up the Text Retrieval and information Extraction (TREX) search engine.

3.2.6  **Build Phase**

Once the planning phase is complete, the next step for implementation can commence. Finance, IT and other relevant resources will need to be available at the start of the “Build Phase”.

It is necessary to have at a minimum, two systems in the landscape for Change Control Management. Typically, there is a Development and Production system set up. In some cases, such as a proof of concept, a sandbox environment can be used, and then it can be copied to construct a maintenance landscape. After preparing the system and performing a basic configuration of SAP Solution Manager, there are steps for completing the configuration for the managed systems. The following section provides guidance on how to implement the change management process.
3.2.7  Build Phase - Solution Manager Landscape

SAP recommends a three-tier system landscape with a development, quality assurance, and production system. The change management implementation begins on the development system. Once the implementation is complete in the development system, the changes are transported to the Quality Assurance system. This is where the test cases are run. After a successful test, the transports are moved to the production system, and are activated. Continuous improvements, for example, developments, implementing new features, bug fixing, and upgrades, should only be introduced in the development system. This protects the production environment against any unconfirmed and unsuccessfully tested changes.

If for any reason, a three-tier landscape is not possible, the minimum of a two-tier landscape for SAP Solution Manager is required. In this scenario, the non-productive system is used for both the pilot project implementation and for testing.

Figure 12: Recommended Three-Tier System Landscape

Figure 13: Two-Tier System Landscape
RFC Connection

The non-productive SAP Solution Manager systems and all relevant managed systems are required to be connected to the productive SAP Solution Manager system. The following connection types can be used:
- Connection via trusted RFC between productive and non-productive SAP Solution Manager systems
- Connection via trusted RFC between productive SAP Solution Manager system and managed systems
- TMW and READ RFC between productive SAP Solution Manager system and managed systems

Test Environment

It is essential that an environment to create transport requests is setup in order to evaluate the change processes. The following examples are typical options used by customers:
- Separate Clients on Solution Manager Development or Quality Assurance System

![Figure 14: Example Environment Option 1](image)

The three clients represent a classic three-tier system transport landscape. With these additional clients it is possible to simulate the change processes by using customizing changes.
Separate Clients on Managed System

The three clients in this scenario also represent a classic three-system transport landscape. With these additional clients, it is possible to simulate the change processes by using customizing changes. The advantage compared to option 1 are the RFC connections throughout the system between SAP Solution Manager and the managed system.

3.2.8 Build Phase - Functional Implementation

The starting point for the Change Control Management implementation is the Change Request Management scenario of SAP Solution Manager Configuration (transaction SOLMAN SETUP). This includes a guided configuration procedure containing everything needed to complete the setup of Change Request Management.

In addition to SAP Solution Manager Configuration, Advanced implementation activities and documentation can be found in the SAP Solution Manager Implementation Guide. To find this, in SAP Customizing, execute Project (transaction SPRO) choose SAP Reference IMG → SAP Solution Manager Implementation Guide → SAP Solution Manager → Capabilities (Optional) → Change Request Management.
Adapting Change Management Workflows

Once the Change Request Management basic configuration is completed, the workflow for requests for change and change documents can be adapted according to the business needs through customizing dedicated transaction type profiles. SAP provides BAdIs that can be used to enhance processes. The web-based user interface can be adjusted using the Web UI configuration mode or the Application Enhancement Tool.

Master Data

Prior to the creating / changing of records, master data is required. The master data contains the following objects:

- System User
- Business Partner
- Organization
- IBase-Components
- Multi-Level Categorization
- Logical Components

Business Partners

In SAP Solution Manager, business partners guarantee effective and easy communication between all employees involved in change processes. All relevant information relating to business partner can be accessed from a central location.

It is possible to create individual business partners manually in SAP Solution Manager, utilizing the relevant business role, such as SOLMANPRO.

In general, however, business partners are migrated from connected SAP systems with background processing. The report copies all or selected users (including their email addresses) from other systems and generates all the necessary business partner functions in SAP Solution Manager, for example, contact, employee, or general. In addition, an SAP Solution Manager Login User can be generated and assigned a template authorization role to that user. The relevant settings are made in the implementation guide for SAP Solution Manager.

Which part of a process the business partners are involved in does not matter. For example, a single employee can function as both a requester and tester. Therefore, SAP Solution Manager can be used to assign business partner roles and relationships to other business partners.

In the standard configuration shipped by SAP, some partner functions have already been defined. The following table shows examples of some predefined business partners and their functions:

<table>
<thead>
<tr>
<th>Role</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requester</td>
<td>Creates the request for change</td>
</tr>
<tr>
<td>Change Manager</td>
<td>Approves or rejects the request for change</td>
</tr>
<tr>
<td></td>
<td>Gives the authorization for production import of urgent changes</td>
</tr>
<tr>
<td>Developer</td>
<td>Implements the change</td>
</tr>
<tr>
<td>Tester</td>
<td>Verifies the provided solution on quality assurance system</td>
</tr>
<tr>
<td>Current Processor</td>
<td>Is the employee currently responsible for the change document</td>
</tr>
<tr>
<td>IT Administrator</td>
<td>Triggers the import into subsequent systems.</td>
</tr>
</tbody>
</table>
The organizational schema in General Attribute Change tool (transaction PPOMA_CRM), must be up to
date and accurately display the organization of the change department.
This tool is used to define the various levels and assign employees to the various groups of experts. This
is a prerequisite for activating automatic rule determination that finds a responsible group within the
change organization based on document characteristics, for example, document category.

IBase, Logical Component Group and Logical Component
To use Change Control Management scenarios in SAP Solution Manager, the installation (IBase) must
first be defined. An IBase component must be created for each component system used during the
change process. Therefore, IBase components represent managed systems in the landscape.
In a standard system, IBase components in SAP Solution Manager are managed in the
SOL_MAN_DATA_REP installation IBase structure (installation 1) and are updated automatically when
changes are made in the Landscape Management Database (transaction LMDB).
A logical component is an administrative entity, which assigns logical systems to the system roles or
phases in a cycle, system landscape, and across branches. Logical component groups bundle all logical
components which are related to the same product version. The following graphic shows the
relationships:

![Logical Component Groups](image)

Figure 3: Logical Component Groups

System Settings and Transport Routes
In addition to the connections between SAP Solution Manager and the managed systems, the following
tasks are required to be performed on the managed systems using STMS (Transport Management
System):

- Activation of Extended Transport Control
- Activation of TMS Trusted Services
- Set up a single transport and no delivery after confirmation transport strategy.
The following transport routes are required to be set up:

<table>
<thead>
<tr>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport layer</td>
<td>Create a transport layer for your development client. A transport layer is assigned to each development class and to all objects in that class. The transport layer determines in which SAP system developments or changes to repository objects are made and where these objects are transported.</td>
</tr>
<tr>
<td>Delivery route</td>
<td>Create a delivery route from your quality assurance client to your production client.</td>
</tr>
</tbody>
</table>

The new Branch Concept

With SAP Solution Manager 7.2 the new Branch concept was introduced. Projects and Solutions as specified in Version 7.1 are completely replaced. Instead customers now usually have only one solution (except for VAR-customers) with versioning based on Branches. One solution always has a production branch, representing all process documentations and systems which are currently live. A solution also always has a maintenance branch, where the productive processes and systems can be changed. In the branches, the affected systems are assigned via the Logical Component Groups. When the change cycle is created, the systems of the assigned logical components are displayed and can be chosen. The selected systems are then the systems, for which changes are controlled via ChaRM.

Figure 17: ChaRM Architecture
3.2.9  **Build Phase - Authorization Concept**

The authorization concept for the Change Control Management Solution is set up in the Plan Phase. During the Build phase, the user profiles for the dedicated change management user groups are created. SAP provides predefined authorization composite-roles for each user group, which include individual roles for the entire change management process and each feature. For more information about implementing an ALM authorization scenario, see the Security Guide for SAP Solution Manager on the Service Marketplace at [http://service.sap.com/instguides/ → SAP Components → SAP Solution Manager → Release 7.2 → Operation](http://service.sap.com/instguides/ → SAP Components → SAP Solution Manager → Release 7.2 → Operation).

3.2.10  **Test Phase**

Test packages with test plans must be available to perform an integration test that covers the entire change process together with other integration scenarios and systems. SAP provides tools for test management processes. These tools assist with the storing of test sources for central access. For more information, see the [SAP Standard for Test Management](http://service.sap.com/instguides/ → SAP Components → SAP Solution Manager → Release 7.2 → Operation).

Any issues are then sent to the relevant Change Request Management expert for correction. Bug fixing and retesting activities usually require a lot of time so careful planning is advised. In addition to testing activities performed on the demo landscape, a non-critical test should be performed on the production landscape, such as ERP, if at all possible. The following tasks should be carried out:

- Set up RFC-connections and logical components
- Apply the necessary system settings on the landscape
- Create a Solution Manager project on the productive SAP Solution Manager system
- Execute any non-critical changes to verify that the change workflows also work in a true-to-life environment.

3.2.11  **Deploy Phase**

Changes which have been tested successfully can be moved into production by using Change Request Management functions. A task list provides various functions for verifying and moving a project through the system landscape to the final production system. Importing a project into the production system ensures data consistency and guarantees that changes belonging to the same project are made consistently.

Transport management can be used to manage changes in complex system landscapes that use a different technological basis. CTS+, for example, allows for non ABAP changes, such as Java or .NET. Data consistency is a major topic across all ALM phases. Complex system landscapes and different activities in multiple projects, which might be performed in parallel, require strict control and documentation. The concept of release management along with various functions in Change Request Management can achieve this. After successfully deploying the change, it becomes part of the live IT landscape.
3.3 Enhancements

The following section provides a method for identifying and applying aspects of the current Change Request Management implementation that could be improved. SAP Solution Manager provides features to assist with this activity.

3.3.1 Method

An ideal method for implementing Change Request Management is the Deming cycle. This is also called a Plan–Do–Check–Act (PDCA) cycle. It is an iterative four-step management method used in business to check and continuously improve processes and products. The following table describes the aims of each step of the cycle:

<table>
<thead>
<tr>
<th>Step</th>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>Prepare a project plan and a functional specification to establish the objectives and processes necessary to deliver results in accordance with the expected output.</td>
</tr>
<tr>
<td>Do</td>
<td>Execute the activities defined in the project plan and functional specification, and implement Change Request Management.</td>
</tr>
<tr>
<td>Check</td>
<td>Testing the implementation by executing your prepared test cases. Study the results and compare them to the expected results in the functional specification.</td>
</tr>
<tr>
<td>Act</td>
<td>Make corrective actions, for example, bug-fixing, where required, and highlight and eliminate significant differences between the implementation and the functional specification. Adapting new requirements, if necessary.</td>
</tr>
</tbody>
</table>

After the Change Request Management implementation is complete, it reaches a level of stability called the baseline. This stable working configuration is then the starting point for the next iteration of the cycle. Repeating the cycle provides insight about the implementation, and the ability to make further improvements.

![Figure 18: Deming Cycle](image-url)
The following activities should be considered when defining a starting point for the next plan phase:

- Implementing SAP Notes
- Implementing a new version of the central correction note
- Updating to a new support package stack level
- Implementing new features
- Meeting new requirements
- Automating manual activities
- ITSM monitoring and reporting

### 3.3.2 Monitoring and Reporting

SAP Solution Manager offers various reporting and monitoring capabilities, which help improve the change management processes.

#### 3.3.2.1 Web UI Online Monitoring

The Web UI Online Monitoring provides the ability to create snapshots of current change management records. An end user can define custom searches based on the concatenation of multiple parameters. These searches can be stored for later usage and shared with a broad range of users. The results list can be exported as an Excel spreadsheet and perform an advanced analysis of the data.

A variety of filters can be applied to your analysis. The following parameters are the most useful for improving change management processes:

<table>
<thead>
<tr>
<th>Filter</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category Text</td>
<td>Filtering by category can be a useful way of measuring the effectiveness of your categories. If you find that people are assigning categories to changes, then your organization is using them effectively. If you find many records with non-specific or no categories, you may need to redefine your categorization schema. If users are not using categories effectively, it is more difficult and less beneficial to process new documents and search for previous solutions</td>
</tr>
<tr>
<td>Ratio of Normal and Emergency Changes</td>
<td>Filtering by ratios of changes can be a useful way of measuring the effectiveness of your application as a whole. A large number of emergency changes implies that your change management team has to continually apply quick changes in order to restore working systems. If you find that there are more emergency changes, you need to make appropriate adjustments to ensure that downtime is minimized.</td>
</tr>
</tbody>
</table>

These two categories are examples, there are many filters available to assist with outcomes. However, further investigation is often required to get to the root of the issue.

1. **Note**

   Concatenating multiple filter criteria provides valuable information for your specific scenario.
3.3.2.2  ITSM Business Warehouse Reporting

ITSM BW Reporting is used to analyze historical data. The responsible analyst can select any period of time for reporting purposes. The results can be exported in the form of an Excel spreadsheet. With ITSM BW Reporting, the following KPIs can be tracked:

- Average processing time
- Time recording analysis
- Workload
- Total amount
- New documents
- Status iteration analysis

![Figure 4: Historical Data Analysis with BW Reporting](image)

3.4 Error Fixes

Different IT services ensure that business operation is not disrupted or that impact is minimized when changes need to be performed to the live landscape.

It is important to recognize that any change in the Run phase is managed the same as a project. A request for change defines the change, for example, as a hot fix or planned maintenance. This request for change is then assigned to a project. Maintenance projects are used to manage changes. These act as a baseline for Change Request Management support during the Run phase.

A request for change contains all of the information required to approve a change. When approval is given, Change documents are used to create any follow-up processes. This is then used as a basis for making the change.

It is important to define the type of change. The emergency change type is particularly important during this phase. As all changes are managed like a project, they have to follow a project timeline. The emergency change process allows for a change to be created and transported to the production system ahead of normal changes, resulting in urgent fixes being moved to the production system quickly, whilst still following the appropriate Change Request Management guidelines.

Monitoring and reporting functions help to identify and manage requests for change. Requests for change can be created directly or, more likely, as a follow-up process to an incident or service request made in ITSM.
4 DRIVING CONTINUOUS IMPROVEMENT

4.1 Quality Assurance Tasks

A clearly defined quality assurance procedure is required to allow for continuous improvement of the solution. When developing procedures, the following tasks should be considered:

- Track the number of closed changes (periodically), changes executed as planned, and the number of failed transports
- Track Change Advisory Board (CAB) approval trends
- Ensure transport requests can be mapped to change requests
- Review the quality of change process, including documentation, and the success of Incident Management and Transport Management integration
- Ensure the documentation, including the Operations Handbook, is updated following changes
- Analyze emergency changes to assess their urgency
- Determine the risk of emergency changes (sharpen Business awareness)
- Select suitable test cases (Change Impact Analysis)
- Include business-related operations personnel in test execution and signoff
- Report on management decisions to skip quality gates (correlate with occurring issues)

4.2 Quality Targets and KPIs

To assess the quality of the Change Control Management process, clearly defined parameters and measurable objectives need to be set up. Key parameters should be collated and evaluated with regular reporting. The historical data that is created in this way can be used to identify trends and develop ways to improve the application.

The following targets are important to ensure the maturity of the control management process and drive value recognition:

- Speed up responsiveness to business requirements
- Improve transparency and auditability for business compliance
- Reduce poorly controlled emergency changes to increase business continuity
- Reduce change-related effort by automating tasks and improving performance
The following table describes the main challenges for each of these quality targets and which KPIs can be used to measure them:

<table>
<thead>
<tr>
<th>Target</th>
<th>Challenges</th>
<th>KPIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed up responsiveness to business requirements</td>
<td>• Speed up change request procedure</td>
<td>• Average time spent for approval (classified by priorities)</td>
</tr>
<tr>
<td></td>
<td>• Ensure sufficient information is provided</td>
<td>• Number of delayed change approvals per quarter (classified by priorities)</td>
</tr>
<tr>
<td></td>
<td>• Predict the impact of business requests on systems</td>
<td>• Percentage of requests for change confirmed or accepted by your organization</td>
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<tr>
<td></td>
<td></td>
<td>• Average time from request for change to implementation (classified by priorities)</td>
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<tr>
<td></td>
<td></td>
<td>• Number of routing activities between your organization and the IT department before requests for change are accepted</td>
</tr>
<tr>
<td>Improved transparency and auditability for compliance</td>
<td>• Make legal and regulatory requirements transparent and auditable</td>
<td>• Percentage of unauthorized implemented changes</td>
</tr>
<tr>
<td></td>
<td>• Set up Change Control Management processes and a central overview of processes, approvals and dependencies appropriately</td>
<td>• Percentage of implemented changes without impact analysis</td>
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<tr>
<td></td>
<td></td>
<td>• Number of incidents related to transport errors, for example, missing transports or sequence errors</td>
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<tr>
<td></td>
<td></td>
<td>• Trend measured by time and effort for audit preparation</td>
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<td></td>
<td></td>
<td>• Trend in numbers, for re-work items due to objections raised by auditor</td>
</tr>
<tr>
<td>Increased business continuity by improving emergency changes</td>
<td>• Synchronizing and checking changes across platforms based on different types of technology</td>
<td>• Percentage of changes that cause incidents</td>
</tr>
<tr>
<td></td>
<td>• Ensure that changes do not conflict with each other in projects of maintenance activities</td>
<td>• Number of emergency changes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Percentage of unplanned outage or unavailability due to changes</td>
</tr>
<tr>
<td>Target</td>
<td>Challenges</td>
<td>KPIs</td>
</tr>
<tr>
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</tr>
</tbody>
</table>
|        | • Avoid disrupting ongoing business  
         • Reduce the number of emergency and failed changes |      |
| Reduced effort by automation and better performance | • Deal with high manual effort when transporting to ABAP or a Java stack  
         • Apply expert knowledge  
         • Test systems manually and thoroughly | • Effort for testing measured in percentage. Effort should decrease, while the number of changes should be reduced.  
         • Costs for change adoption in percentage.  
         • Trend in time spent for error analysis and production down situations  
         • FTE involvement in transports  
         • Percentage of unplanned outage/unavailability due to changes  
         • Percentage of effort to administer |
5 TRAINING

For implementing Change Control Management, SAP offers the following training courses:

E2E200 – E2E Change Control Management

This course introduces you to change control concepts, which coordinate and optimize how changes are introduced into a software landscape. By ensuring that changes do not conflict with each other, and do not disrupt ongoing business, you ensure improved quality of the software landscape and higher availability of IT solutions. End-to-end change control management training provides you with the know-how to efficiently handle changes to solutions, which is vital to achieving operational excellence in your business and cutting TCO significantly.

SM255 – Change Request Management Configuration

This course covers the following topics:

- Describe the various elements of SAP Solution Manager Change Request Management
- Basic setup steps for Change Request Management
- Master data
- Releases in Change Request Management
- The Change Request Management processes
- Retrofit
- Monitoring
- CTS+ for Change Request Management

Expert Guided Implementation Sessions

For Enterprise Support Customers, SAP offers Expert Guided Implementation Sessions (EGI). Expert Guided Implementation (EGI) sessions are a combination of remote training, live configuration, and on-demand expertise, which allow you to perform complex activities with the help of experienced SAP support engineers. The instructor will demonstrate what to do step by step. Afterwards, you can perform the relevant steps in your own version of SAP Solution Manager. If you have any questions, you can then contact an SAP expert via phone or e-mail.

For Change Management the following EGIs are available:

- CTS+ (4 days)
- Quality Gate Management (4 days)
- Change Request Management Basic (4 days)
- Enhanced Change Request Management (4 days)

More information regarding the content of the EGIs and time schedule can be found at the EGI calendar at http://www.service.sap.com/~sapidb/011000358700001780312008E
Setup Support by SAP

To assist customers in implementing the change processes, SAP offers MaxAttention, Safeguarding, and PSLE customers the Rapid Deployment Solution service for change control management. This RDS service is divided into four parts: basic setup, Retrofit setup, enhanced flexibility setup, and reporting and analysis empowering.

![Change Control Management Service Packages](http://wiki.sdn.sap.com/wiki/display/SAPITSM)

**Figure 205: Change Control Management Service Packages**
