Marc O. Schäfer and Dr. Matthias Melich

SAP® Solution Manager

- Provides a complete overview of the solution for the management of business applications
- Explains the processes and functions in release 7.1 clearly
- Shows all tools in day-to-day use
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Dear Reader,

To be bold, we think that this third edition of our comprehensive book on SAP Solution Manager is something special! However, you may be thinking “It’s just a book about a piece of software, so what?” To answer your question, this comprehensive book explains the software that provides functionality, scaling from solution design to the technical system monitoring, user support, and extending to the landscape transformation in a thorough and easy-to-follow process.

You’ll find that this completely redesigned edition will provide you with the valuable information you need to plan, design, implement, and manage your SAP Solution Manager project. Combined with real-world scenarios and the accumulated knowledge and experience of nearly 40 experts from SAP, I’m confident that you’ll find a trustworthy and essential companion on your journey with the newest release of SAP Solution Manager.

However, make sure to also share your thoughts on this book. Your comments and suggestions are the most useful tools to help us improve our books for you, the reader. Visit our website at www.sap-press.com to leave a review, or send me an email directly.

Thank you for purchasing a book from SAP PRESS!

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You can use the key figures and data collected from the live solution to reduce expenditures or boost performance. The important thing is that you can retrace any changes made in the solution. This chapter explains the change control management process. It also explains in detail how Change Request Management, Quality Gate Management, retrofit, and the supporting services work.

8 Change Control Management

The change control management process ensures that changes are planned and made in a consistent manner. The important thing is that all changes are traceable in the solution and the risk they pose in relation to stability and security can be checked at any time.

SAP Solution Manager supports you with a range of functions. ITIL-certified Change Request Management enables the highest integration into your change management process. Quality Gate Management also provides an additional quality inspection for projects and ensures changes are transported correctly to the production systems. In the upgrade environment, global rollouts or functional enhancements, risks, and efforts arise in the synchronization of developments. You use the Retrofit function to completely synchronize dual landscapes with minimal manual effort. To keep an overview of all the changes in the landscape, the change analysis provides information about the current status and history of changes. It records changes to the configuration of a system from the operating system, database, application server parameters, transport requests, to notes and support packages (SPs). You can use configuration validation to compare configuration settings and thus ensure, for example, the homogeneity of the configuration within the solution landscape. Based on SAP Support experience, the guided self-service Transport Execution Analysis provides a best practice recommendation from SAP that is adjusted to your transport environment. You can use this to derive a corresponding action plan for you that can contain organizational-, process-, or plant-specific aspects.
8.1 Quality Gate Management

For end-to-end solution landscapes, Quality Gate Management ensures that the areas of design and development as well as the implementation of a new service are efficiently and effectively embedded in projects. The aim is to establish an integrated and consistent quality process in the company and to integrate all departments involved.

Quality Gate Management supports release management for customer implementation and maintenance projects. A distinction is frequently made between two types of releases:

- **Major release**
  A major release is marked by a three- to six-month term. Customers develop two to four releases over a year. Such a release includes all types of changes, including those that significantly impact core business processes. Hence, a major release requires a complete regression test.

- **Minor release**
  A minor release is marked by a significantly shorter runtime of one to four weeks. The objective of such a release is to bundle error corrections and minor functional enhancements and make them available. Here, test coverage can be limited to core business processes and the enhancements provided.

The procedure has the following advantages:

- It reduces the frequency of changes in the production system.
- Changes happen at clearly defined points in time.
- End users are happier thanks to timely communication and training.
- A suitable test method is available for each change.
- Daily changes are reduced to emergency corrections.
- Reduced risk of inconsistencies due to missing transports or transports imported in the wrong order.
- Reduced workload for transport management thanks to bundling.

Figure 8.1 provides an overview of release management (minor and major release) and transport management; that is, import into the following systems.
## Change Control Management

### 8.1 Quality Gate Management

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**Collaboration with release management**

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- Reduced workload for transport management thanks to bundling.

**Figure 8.1** Release and Deployment Management

### 8.1.1 “Change Management” Work Center

The Change Management work center in SAP Solution Manager represents the central access point for creating and administering projects for Quality Gate Management. The display enables the user to obtain a quick overview of the different software development projects and their statuses. Quality Gate Management supports both implementation and maintenance projects.

In the overview, you see which tasks have to be performed or in which projects you are involved, and which role you are assigned. You can directly process the tasks to be completed by you. The automatic update ensures that you always work with the latest dataset. You can use favorites to summarize several projects and display them user specifically. The projects view enables you to visualize a range of information. Various tabs are available in the projects view (Figure 8.2).
You can use the Calendar View tab to use the quality gate (Q-Gate) calendar to display all currently created or active projects as well as their active phase. In addition, the overview visualizes both the Q-Gates and the milestones. With the multiple selection of projects, the calendar view makes it possible to visualize the project terms and their current statuses. This view makes it possible to detect possible time conflicts at an early stage and to initiate corresponding actions.

Procedure

To use a project in Quality Gate Management, certain requirements must be met. You have to create a Solution Manager project (Transaction SOLAR_PROJECT_ADMIN) and then record the system landscape in Transaction SMSY (see Chapter 5, Section 5.3.1). This can be a maintenance or an implementation project. Only then can you see the project in the selection box. After you have selected the desired project, you can use the menu option SET UP • QUALITY GATE MANAGEMENT to make outstanding configurations. After clicking the menu item, a wizard opens. In the first step, you can specify the start times of the individual phases. The standard contains the following four phases with corresponding Q-Gates:

- Scope
- Build
- Test
- Deploy
A quality gate (Q-Gate) is a special milestone in a project. Q-Gates come between the phases in the project that are especially dependent on the results of the preceding phase or in which special attention must be paid to technical dependencies. A Q-Gate involves checking the results of the preceding phase. You can upload the necessary result types and requirements placed on these phases in the form of checklists for a Q-Gate. The check is performed by those responsible for the project and experts on the particular phases during a session. Depending on the outcome, the project may continue as planned or be canceled or delayed. If you use Quality Gate Management, it’s not possible to import transports in follow-on systems without a Q-Gate having been processed successfully. This import lock enables a high level of control over your projects and the transport system. It is only after a successful Q-Gate check that the import lock on the following system is lifted.

Figure 8.3 shows an example of the Quality Gate Management process flow.
In addition to the existing Q-Gates, you can create milestones that represent a particular point in time in your project. A milestone is an event with special significance. In project management, these events are usually interim goals or stopovers in a project. These goals are connected to the completion of an important project result. To emphasize the importance of a milestone, you can also add a Q-Gate to it.

In the second step, you define the quality manager and the quality advisory board. This establishes a principle of dual control in the project and the process (segregation of duties). The import lock for the system assigned to the Q-Gate is only lifted if both persons or groups confirm that the Q-Gate has been passed successfully. It is then possible to import into the system. You can import transports with different developments into the system by using transport management.

In the third step, the logical component that you previously created in system landscape maintenance (Transaction SMSY) is displayed with the systems defined therein and verified against the transport route configuration.

In another step, you then assign the individual Q-Gate to the phases and system roles. This flexible assignment of Q-Gates makes it possible, for example, to not set a Q-Gate between the development system and the quality assurance (QA) system. This enables iterative testing while protecting the production system.

After the configuration is finished, the wizard displays the project landscape with the individual phases, systems, and Q-Gates (see Figure 8.4).

After you have saved the configuration, the different milestones and Q-Gates appear in a Q-Gate calendar. With different filter options, you can user-specifically adjust the view on projects. Click the processed Q-Gate to see the results and requirements that are fixed in the form of checklists and documents (see Figure 8.5).
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The quality manager is responsible for the transition between the individual project phases (Scope, Build, Test, and Deploy). The check is performed by those responsible for the project and experts on the
particular phases during a session. You also have a variety of information and views at your disposal for your software development projects. You can always keep an overview using the tabs in the work center (see Figure 8.6).

By clicking the respective project, the quality manager can access general and detailed information on various tabs. This includes, for example, defined project phases, number of changes and transport requests belonging to the project, and information about the persons responsible for the project (see Figure 8.7).

An action or application log logs all activities with a timestamp and user to ensure auditing acceptability.
8.1.2 Central Transport Management with Quality Gate Management

In today’s heterogeneous, distributed customer solutions, it’s necessary to ensure that a new service can be implemented efficiently and effectively where end-to-end solution landscapes are concerned. While the main focus used to be on the dependencies of objects in a system landscape, it is now on the dependencies of objects in a solution landscape. This means systems that are completely independent in a technical sense are becoming more and more functionally dependent on each other. The aim must be to establish central transport management for the entire solution landscape.

With Quality Gate Management, SAP Solution Manager provides the administration interface for central transport management (see Figure 8.8) in the Change Management work center.

By clicking the SYSTEM LANDSCAPE GRAPHIC tab after selecting the project, the person responsible for the transport can see the defined solution landscape graphically and in detail (see Figure 8.9). The solution landscape mirrors the customer-specific transport configuration and its transport routes. A wizard enables you to set up the solution landscape for a project quickly, easily, and based on SAP
Solution Manager projects (see Section 8.1.1). The visualization shows the phase of the project that is currently active and the Q-Gates that have been passed and those that are still pending. In addition, possible transport risks are highlighted in color in the system graphic.

![System Landscape Graphic](image)

**Figure 8.9 System Landscape Graphic**

The transport risks of the corresponding system are also made available in table form on the Risks tab (see Figure 8.10). The system automatically collects the risks. This way, the quality manager can assess before each phase or phase completion, which transports have been released or are still awaiting release. He can also see whether all transports were imported correctly into the system. Based on this information, he can decide which measures are required.

Examples of risks include the following:

- Transport error (return code 8)
- Missing transport requests in the systems
- Transports that are logically interdependent and have not been imported completely
- Open transport requests that are awaiting release in the development system

This way, the quality manager can effectively counteract critical situations with the corresponding activities and assess the risk of the project.
Change Control Management

Solution Manager projects (see Section 8.1.1). The visualization shows the phase of the project that is currently active and the Q-Gates that have been passed and those that are still pending. In addition, possible transport risks are highlighted in color in the system graphic.

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Figure 8.9 System Landscape Graphic

Figure 8.10 Transport Risks in Solution Landscapes

Based on the selection of a project, the CHANGES tab displays the project-specific changes as well as the number of transport requests contained therein. Any number of changes can be created for a project. You can create the individual changes for the respective project on the CHANGES tab. After creating a change, you can assign any number of transport requests (WORKBENCH REQUEST/CUSTOMIZING REQUEST) to it. You can create transport requests using the MANAGE TRANSPORTS pushbutton on the CHANGES tab. Alternatively, you can use the CREATE button on the TRANSPORTS tab. The changes form a reference unit for the transport requests that are assigned to them. Change and Transport System (CTS) projects form the basis for this.

You can also create the changes and transport requests for a project discussed in Section 8.1.1 using Change Request Management. You can then display them in Quality Gate Management (see Figure 8.11; see Section 8.2.9).

This concept makes it possible to logically group related transport requests and those that are dependent on each other specific to the system or solution. Depending on the current phase, you can import entire projects or individual changes in one or more transport requests into downstream systems. In the Test phase, the administrator can, after consulting with the quality manager and other experts, assign transport requests to other projects and their changes. In the
Test phase of the software development project, the quality manager can consolidate the project before the last phase of the project is activated. In the Deploy phase, the entire project with all its transport requests can be imported using the tried and tested SAP approach (SAP Best Practices). This ensures that all transport requests in a project are imported into the production systems completely and in the right order at a defined time. If a project import (IMPORT ALL) cannot be executed, the import of individual changes is also available for the Deploy phase. With this functionality, you can synchronously change business processes in ABAP and non-ABAP across solution landscapes.

![SAP Solution Manager](image)

**Figure 8.11** Overview of Transport Requests Assigned to a Project

### 8.1.3 SAP Best Practices in the Transport Area

To support you with your changes as best as possible, Quality Gate Management was developed under consideration of the SAP Best Practices in the transport area. These are based on experience from numerous customer projects:

- **Transport of copies**
  
  This function makes it possible to block an original transport request and the objects contained therein in the development system until the developed functionality has been successfully tested in the QA system. It is only then that the final release of the original transport request takes place. Hence, the developer uses the transport of copies as long as possible.
This procedure has two main advantages. On the one hand, it reduces the number of transport requests that are imported into the production system. Because the original transport only contains the final version of the changed object and not the previously developed versions, this reduces the number of object versions in the production system as well as the import time for the transport requests.

The second advantage is that the transport of copies significantly reduces the overshooting risk because the developed objects remain locked in the development system as long as possible. You can thus prevent version conflicts.

- **Cross-system object lock**
  You can use the cross-system object lock to operate several implementation or maintenance projects in the same system landscape. If a developer changes an object in a project, this object can no longer be changed by any other developers. This applies to this and other projects in the same system landscape if the developer uses the cross-system object lock. Depending on the settings of this lock, changes can be made after the final release of the transport request at the earliest. This prevents version conflicts at an early stage. This function is available for ABAP Workbench objects as well as Customizing settings.

- **Urgent corrections**
  An urgent correction makes it possible to implement a correction in the production system as quickly as possible by using a preliminary transport. Thanks to the assignment to a project, the transport order and the consistency of the production system are retained.

For more details on SAP Best Practices in the transport area, see Section 8.3.

## 8.2 Change Request Management

The ability to trace changes is one of the most important factors for guaranteeing quality and transparency in a software solution while ensuring that IT standards are met. This applies in particular to changes to actual software components and changes to the configuration. This section illustrates how SAP Solution Manager helps you...
implement changes to software components or the configuration with clearly regulated process flows and seamless documentation. It thus enables you to manage your changes and transports centrally.

Changes in a company tend to originate from a user department. The reasons for these changes are either that innovation is needed to ensure growth or the company is evolving in a constantly changing market environment. Other reasons for changes are disruptions or technical problems occurring in daily operation, which can only be resolved by making a change to the system or replacing an IT component.

Requests for change

In Change Request Management, all of these requests end up in requests for change. Change Request Management offers functions for managing, executing, and documenting all these changes, requirements, and requests for change. It not only provides status tracing but also improves integration between user departments and IT in this process. The application supports changes from the initial request until final deployment in the system. The prerequisite for this is a close integration between SAP Solution Manager and the managed systems as well as a close integration between Change Request Management and the SAP transport system. This integration starts at the business and change process level and extends to the technical level of transports and development objects.

Major and minor releases

SAP distinguishes between different types of changes. Based on the time that is required for making and implementing the changes, these are divided into different types of releases. As discussed earlier in this chapter, the larger category is major releases, which have a term of three to six months and have changes that influence the core business processes over the long term. The minor releases have a much shorter term and are primarily used to make error corrections available, as well as to meet lesser requirements.

Implementation or maintenance project

Within the IT organization, these changes or releases are either implemented directly in an implementation project or through a maintenance project, which enables ongoing changes to the system. The projects are always split into phases to support project management and release control. For a detailed depiction of the phases used in Change Request Management, see Section 8.2.3.
Change Request Management can also be used in combination with the Quality Gate Management of SAP Solution Manager to check the different phases and sections of an implementation project. This integration enables you to ensure that quality criteria and project standards are observed before a phase of a project can be completed. For more information about the integration of Change Request Management and Quality Gate Management, see Section 8.2.9 at the end of this chapter.

As already mentioned, both applications are closely integrated into the SAP transport infrastructure, which makes it possible to trace changes from the request in the user department to the implementation in IT. Here, Change Request Management centrally manages the transports, and manual activities are reduced to a minimum.

### 8.2.1 Change Request Management in Detail

Change Request Management is a flexible tool that helps you check developments and changes to your entire system landscape centrally in SAP Solution Manager. Change Request Management offers a range of functions for this purpose.

The concept on which the processes are based consists of two types of documents: the request for change and the change transaction.

The request for change is the initial document in which the requirement or change to be made is documented and described for the first time. It also documents the approval or approval procedure of the request.

As soon as you have approved a request for change, one or more change transactions are generated as follow-on documents with direct reference to the original request. Change transactions distinguish between different types of changes. This depends on whether a change is a change to a system or an IT component and the urgency of the change. In the change transaction, you can document and execute all activities that are necessary for making this change.

You can see at any time where an actual change originated, who approved it, who implemented it, and who imported it into the production system. One of the main benefits of this transparency is that...
all this information is available at a central point, SAP Solution Manager, where you can access it at any time.

Example scenario

A brief example (see Figure 8.12) of a typical change process with Change Request Management illustrates this approach: A processor in the business department discovers a change requirement in a transaction that he uses. The user can enter a Service Desk message directly from the transaction in question, describing the context and requesting a change. The message appears in the worklist of a Service Desk employee, who processes the message and generates a change request, if appropriate (see Section 8.2.4). Next, the system forwards the change request to the central person in the scenario, the change manager. The change manager is responsible for assessing, categorizing, and approving or rejecting the request. If he approves the request, a change transaction is generated, which forms the functional basis in subsequent stages for developers, testers, and IT administrators. The Change Manager comes back into play after the processes described next have been completed and concludes the request for change.

Figure 8.12 Overview of the Standard Change Request Management Process
The Change transaction appears in the worklist of a developer, who implements the change and releases it for testing. At this point, it is transferred to a tester. The change cannot be transported into the production system until it has been tested successfully.

You can use the Change Request Management functions to manage releases and projects in a number of ways. 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 changes), for instance, if an error occurs that could jeopardize a production environment.

Another option for managing releases using Change Request Management is the integration with SAP cProjects, the SAP project planning tool. Your organization can record and plan all the changes that need to be implemented in a project in a cProjects project plan. You can plan resources and also establish a connection to the backend, for example, to the Cross-Application Time Sheet (CATS) component for recording tasks. Requests for change that have undergone the approval procedure can be scheduled here. The project plan is integrated in the project in SAP Solution Manager, which passes through several phases in what is known as a project cycle. The phases are controlled centrally from SAP Solution Manager and set forth basic conditions that cannot be sidestepped.

In this regard, SAP Solution Manager closes a gap that exists in many change management solutions: When databases or lists, for example, are used to depict change management processes and log requests for change and approvals, manual intervention becomes absolutely necessary when a transport request needs to be created or imported. The transport request number has to be copied to the database by hand, which is a potential source of errors. A typo or mistake when copying invalidates the entire process. With Change Request Management, transport requests are generated centrally from SAP Solution Manager. A reference to the corresponding request for change is created automatically (with the ID and description copied to the transport request’s name), enabling a clear relationship to be identified at any time. The Change Request Management scenario lets you track all transports relating to a specific project, enabling you to check where they were created and in which systems they have been
imported. From SAP Solution Manager, you can navigate to the transport logs and import queue, as well as to the SAP Solution Manager maintenance project, the project plan, and the connected systems. Each change transaction provides an overview of all transports and transport tasks created for it. From there, you can monitor the status of transports at any time and also branch directly into the log file.

You can also record changes in Change Request Management that do not require a transport connection. As with all other changes, you produce a request for change that goes through all the approval steps. You document the required steps in the request for change itself. SAP Solution Manager therefore advances SAP’s vision of application management and IT governance by providing enterprises with indispensable functions for implementing and running solutions transparently. This forms the basis for many statutory requirements: It supplies answers to the question of who did what when, and who checked and approved the measures.

For an organization to run a system landscape smoothly in the face of constantly changing requirements, it must take into account the following aspects:

- Request for changes, whether resulting from error messages or from idea management processes, must be classified and approved centrally.

- When a request has been approved, reliable procedures must be followed to apply the change, transport it to follow-on systems (QA and production), and conduct tests. These procedures should be complemented by meticulous documentation containing all change-related information and data on all persons involved in the process.

- The status of a request for change must be traceable at all times.

Equally important is the integration of people within the organization, whereby SAP Solution Manager’s focus on processes is instrumental in enabling communication between business departments and IT administrators. Everyone involved in implementing a change can always access all the relevant information, such as requirements, specifications, documentation, test cases, test results, and status analyses, which
are organized using the business process hierarchy in SAP Solution Manager and stored centrally.

This offering from SAP is designed in line with the processes in the IT Infrastructure Library (ITIL). ITIL defines the objective of change management as ensuring that changes are made economically and promptly with minimum risk. Change Request Management includes the following processes: change request management, project management, and change logistics.

In addition, Change Request Management enables your company to use these processes in a very easy way by offering predefined processes. It also helps you meet audit requirements—for example, for SOX (Sarbanes Oxley Act)—by forcing all users to make the changes centrally using the defined change management processes using SAP Solution Manager.

A major advantage of Change Request Management is, as already mentioned, that standard processes and functions are supplied and can be used quickly.

SAP Solution Manager is supplied with preconfigured workflows for the request for change and change execution (change transactions). These workflows are based on SAP’s experience with change management and transport management influenced by numerous customer projects. The following change types are predefined:

- **Normal change**
  Normal changes refer to requests for regular system maintenance activities, such as requests for SPs or SAP Notes to be imported.

- **Error correction**
  An error correction reports errors that are discovered during testing to the development team. The developer can then also correct the error at a later date using this document, even though it is not possible to create a new normal change during the Test phase.

- **Urgent change**
  An urgent change enables you to react quickly and flexibly if a malfunction threatens to disrupt the operation of your solution. This enables you to import changes from urgent changes into production systems before importing the normal change in the Go-Live phase of the maintenance cycle.
Change Control Management

- **Administrative change**
  An administration change concerns changes that do not require transporting, such as changes to number ranges.

- **General change**
  A general change concerns changes that do not require a transport connection and that are not related to an SAP or IT system, for example, changes to IT components such as printers or mobile devices.

To make it possible to get started with Change Request Management quickly and smoothly, SAP also provides a range of predefined roles and authorization profiles. These roles and processes can initially be used to create a feasibility report using Change Request Management. Later on, they can serve as the basis for adjusting Change Request Management to the individual requirements or change management processes of your company.

### 8.2.2 Architecture

To understand the architecture of Change Request Management in SAP Solution Manager, you need to know how the individual entities interact.

The basis of Change Request Management is the Solution Manager project (see Section 8.1.1). A project contains the following information:

- **Logical components**
  A logical component contains all systems that supply a production system (e.g., a production client). The assigned systems are usually connected to each other through transport routes.

- **IMG project**
  From project administration in SAP Solution Manager (Transaction SOLAR_PROJECT_ADMIN), you create an IMG project in managed systems to group settings made in the SAP Implementation Guide (IMG) for a Solution Manager project in one system.

- **CTS project**
  A container in a logical system (system/client combination) that bundles transport requests that belong to one IMG project.
Change Request Management supports the implementation, upgrade, template, and maintenance project types.

Depending on the type of change transaction the change manager assigns in the request for change before approval, two types of Change Request Management cycles are possible: project cycle and maintenance cycle. Designed to meet different requirements, the cycles differ in scope and are therefore explained in Section 8.2.3.

The task list in Change Request Management provides system administrators with an overview of implemented and scheduled actions. It summarizes all the systems and necessary tasks and displays them in the correct sequence. Any tasks that you execute by performing actions on the corrections or project cycle user interfaces in SAP Solution Manager (such as system logon, create transport request, or import transport request) are defined in the task list. For more information on the task list, see Section 8.3.1, subsection "Central Transport Management."

### 8.2.3 Project Cycle and Maintenance Cycle

We have already mentioned implementation and maintenance projects several times. This section explains the concepts and differences between the two project types in more detail.

To support implementation, upgrade, and template projects in the Change Request Management scenario, SAP Solution Manager offers the project cycle.

The project cycle (depicted in Figure 8.13) is a preconfigured service process (transaction type SMDV) that allows you to control the following activities over the course of a project:

- Requests for change and the resulting changes in systems used in your project
- Transport requests required to transport changes to follow-on systems
- Complete change logistics, that is, when certain transports can be imported into follow-on systems

Structured as a series of phases, the project cycle provides a functional supplement to the project plan. A single project cycle has the following phases:
You close the project cycle after going live. The maintenance cycle is a special type of project cycle in which it is possible to run through the phases several times (as explained later in this section).

In the Development without Release phase, a transport request can be created but not released. This phase can thus be defined also as the initial specification phase or planning phase. We do not recommend using this phase with normal changes (transaction type SMMJ) because it is not possible to generate test transports during this phase. Transport requests cannot be released until the Development with Release phase. It is initiated by a central body (Change Advisory Board or a change manager) and permits transports to be released and imported into the test environment for unit tests. After project
changes have been imported into the test environment, the Test phase can be opened so that integration testing can begin. New requests for change can no longer be created for this project; only bugs that are discovered during testing are fixed. The preparation for the Go-Live phase enables users with appropriate authorization to make other necessary changes before the changes are imported into the production environment in the Go-Live phase. However, you cannot import any changes that do not have the status TESTED SUCCESSFULLY.

Consistent with the lifecycle model, you use an implementation project in SAP Solution Manager to implement a solution. You conclude the implementation project successfully and the solution goes live. During this process, you copy the project data into a solution (see Section 8.1.1). To keep the solution current, you assign it a maintenance project with a maintenance cycle.

A maintenance cycle is a project cycle that has been adapted to meet the special requirements of maintenance projects. A maintenance project does have a defined start time. However, in contrast to a development project, it is a continuous, ongoing process. The individual phases of the maintenance cycle will continue to run.

The maintenance cycle has the same phases as the project cycle but with certain additional features. First, the maintenance cycle has an extra correction type (urgent changes), which gives you the flexibility to make urgent corrections at short notice (see Section 8.2.5). Second, if you work with maintenance cycles, we advise adopting a different approach that meets the requirements posed by maintaining a solution.

We recommend that you assign a maintenance project to a solution, lasting for the same amount of time as you intend to run the solution. Within the maintenance project, any necessary corrections are effected in a series of maintenance cycles. The change manager defines the duration of a maintenance cycle, for example, one month. During this period, the project runs through all the phases in the cycle, from In Development without Release to Go-Live. At the end of the Go-Live phase, you do not close the cycle. It is checked for open and incomplete business transactions and transport requests. Documents that have not been closed are then carried over when a new maintenance cycle is created.
From a technical point of view, it is possible not to close the maintenance cycle but to reset its phase to In Development without Release and to run through the same cycle again. However, closing and recreating the maintenance cycle facilitates and guarantees clearer and more traceable reporting, which is why we recommend it.

Example

The following example shows the benefits of this approach. You have defined the scope of your maintenance cycle by assessing and approving submitted requests for change. Ten normal changes have been approved for the current maintenance cycle (e.g., October). During the development phase, you find that one of the normal changes, change number nine, cannot be realized in the time allotted to the phase.

As project manager, you have two options for dealing with the delay. You can increase the amount of time available for this correction so that it can be realized in the current maintenance cycle. Or, if the change is not critical and has no dependencies with the other changes, you can decide to complete it in the next maintenance cycle—November. In this case, the status of the change remains IN DEVELOPMENT. The other nine changes go through the Test and Go-Live phases and are imported into the production systems. Now you close the October cycle, and the open change is ready to be carried over into the new cycle. When the November cycle is created, the change is automatically carried over to this cycle and processed together with the new changes in this cycle.

In this regard, this approach differs from that of the project cycle. If normal changes with a status other than TESTED SUCCESSFULLY still exist when you move from the Development with Release phase of the maintenance cycle to the Test phase, the system only issues a warning message. These corrections are excluded from integration tests and cannot be released.

During maintenance, errors that demand a swift resolution can be reported at any time, for example, if production systems are likely to be jeopardized. A normal change does not allow you to respond to such problems quickly enough because it is dependent on the maintenance cycle phase. If the maintenance cycle is in the Test phase, you cannot enter new changes for this cycle. That is why Change Request Management offers the urgent change, which is explained in more detail in Section 8.2.5.
8.2.4 Request for Change

You can assign any number of requests for change to a project or maintenance cycle. Like a Service Desk message, a request for change, (transaction type SMCR; see Figure 8.14) is a preconfigured service process, which contains all of the following data relevant to the change:

- Persons involved (ordering party, requester, change manager, Change Advisory Board)
- System affected by the change (installed base/component)
- Corresponding Solution Manager project
- Priority
- Effect
- Urgency
- Risk

Figure 8.14 The Request for Change in the New Web Client Interface
Scope of the change

- Texts that safeguard communication (e.g., description of change, reason for change, implications for business partners, implications for systems, etc.)

Change Request Management therefore covers the complete lifecycle, from gathering requirements to implementing, testing, running, and continuously improving a solution. It is integrated in SAP Solution Manager's extensive range of functions, which include incident management, E-Learning Management, and upgrade support.

Scope of the change

In the assignment block Scope of the Change Request (see Figure 8.15), you can define which type of change you are dealing with and in which system/component this change is supposed to be made.

Types of change

Depending on which change category you choose, the system creates other follow-on activities when the change is released for development. A project cycle supports four types of change, enabling the change manager to classify requests for change:

- Normal change
- Error correction
- Administrative change
- General change

In contrast to the previous version of Change Request Management, you can now combine different types of changes within a request for change. For each new change transaction, the change manager can create a new entry in the table of the assignment block Scope of the Change Request. In general, you can combine any types of changes. The available systems or components also have a relation to the Solution Manager project that has been assigned to the document in the Details assignment block. You can only select components that are part of the system landscape of this project. General changes are an exception to this. Because this change type is to be viewed indepen-
dently of an SAP or IT system, there is no dependency on components that can be selected.

You can assign an approval transaction to the request for change. This transaction must then be processed before the request receives the status APPROVED.

An approval transaction is an approval process that consists of a defined sequence of approval steps (see Figure 8.16). For each approval transaction, you can define in Customizing which approval steps must be completed. In doing so, you can choose which steps can run in parallel and which steps are interdependent.

For each approval step, you can define which business partner role is responsible for executing it. If you later select the approval transaction in the request for change, you have to assign a concrete business partner to each step. Each business partner can be informed through a workflow item or email from the SAP Business Workflow, if he needs to make a decision.

To execute the approval, you can choose from three options: APPROVED, REJECTED, and NOT RELEVANT. In addition, the approver can enter a comment for each approval step when executing this step. All this information is also recorded in the change log and can be called up at any time.

You can define any number of approval transactions in Customizing. You can assign these to a request in line with the change type. In addition, you can also use a set of rules to define your own rules. These rules can, for example, assign a certain approval transaction on the basis of field values (e.g., if the urgency and priority of the change are very high, a different approval transaction is to be used than for a normal change).
In the standard system, SAP provides a simple approval transaction that consists of just one approval step for the change manager. You can adjust and enhance this as required.

The change request process starts with the creation of the request by the requester. This requester is either a Service Desk employee or, in the case of a new requirement, a member of the business department. It describes the required change and provides all other necessary information, for example, specifications or screenshots. Following that, the change manager accepts the document and changes its status from CREATED to REVIEW. In this review step, the change manager completes the request for change with other relevant information and answers, among others, the following questions:

- Which system and which change type are required (definition of the change scope)?
- Which SAP Solution Manager project is supposed to be used?
- Which solution and business process are affected?
- Which approval transaction is supposed to be used?
- How high is the risk for this change?
- Which effect and urgency has the change, and which priority should it be given?

Figure 8.17 outlines the change request process.

![Figure 8.17 Overview of the Process for a Change Request](image)

After all these questions have been answered and the information has been gathered and entered in the request, the change manager submits the request for approval. The assigned approval transaction now starts. In addition, the change manager has the option to reject
the request for change if it cannot be implemented or if a similar request already exists.

If all approval steps have been processed successfully and the result of the approval transaction is positive, the status of the request is set to APPROVED. The change manager can now release the request for development or implementation. With this release, the change transactions defined in the change scope are created, and the status of the request is changed to CURRENT IMPLEMENTATION.

After all assigned change transactions have reached their final status, the status of the request automatically changes to IMPLEMENTED. As the last step, the change manager can now check the request and implementation once more before setting the status to CONFIRMED after consulting the requester.

Another new feature in the change request process using the new SAP Solution Manager is the option to extend the scope of the change during implementation. You can use the EXTEND SCOPE action to extend the defined scope of the request for change and add additional change transactions. This means you keep an overview of all connected changes, even if they are added subsequently.

### 8.2.5 Change Types in Change Request Management in Detail

In Change Request Management, you distinguish between a range of change types as discussed briefly in the preceding section. This section covers the individual change types in more detail and describes the use case, process, and particularities of the different change types in more detail.

#### Normal Change

A normal change (transaction type SMMJ) represents the corrections or changes made in a project and has the following status profile:

- Created
- In Development
- To Be Tested
- Successfully Tested
The workflow for a normal change is explained in detail next.

**Process description**

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

The Service Desk employee processing the message finds that the request requires a request for change. This employee then chooses the **Create Follow-up Activity** action to create a request for change in incident management.

The request for change appears in the change manager’s worklist. The change manager classifies the request, specifies how it is to be handled (normal correction), and finally approves or rejects it. The priority of the request for change is an important factor here. For details on the process for the change request, see Section 8.2.4.

If the request for change is approved as a normal change, SAP Solution Manager automatically generates a change transaction of the normal change type as soon as the request is released for development. The request for change and the change transaction are linked by the document flow, and the assignment is always visible.

The change transaction is the functional basis for developers, testers, and system administrators. First, the developer is notified that a new change 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 in the development system, logs on to the development system directly, and when the correction is ready, releases the transport tasks in the development system (Transaction SE09). When development is completed, the developer generates a test transport by means of an action in the change transaction, which is then imported into the test system. The developer then tests the new development. If this test is successful, the developer sets the status to **To Be Tested**. This has the effect that, if not already arranged by the developer, the system generates a transport of copies, which can be imported into the test system. On the basis of a scheduled job (in the managed system), the newly
developed function is imported into a test system during one of the regular imports of the project buffer. It undergoes another function test there first. The tester can access all of the necessary functions in one place, for example, system logon, and the complete change history for the change transaction. The Change Request Management scenario supports the principle of dual control, enabling you to specify that the developer and tester must not be the same person.

If this test was successful, the tester uses an action to change the status of the change to TESTED SUCCESSFULLY. The request from the development system is now exported to the test system. All of the activities described can be executed directly from the change transaction using actions.

The normal change ends with this step. From now on, it only contains descriptive status values but is handed over to the project cycle from a technical perspective and pursued further by it.

The following prerequisites must be met before changes can be imported into production systems:

- The system administrator cannot import a change into the production system unless the corresponding project cycle is in the Go-Live phase.
- The status cannot be set to IMPORTED INTO PRODUCTION unless all normal changes for the project have been imported successfully into the production systems. You can set this status for all imported normal corrections at the end of a project cycle by scheduling job CRM_SOCM_SERVICE_REPORT.

Normal changes whose status is still IN DEVELOPMENT trigger a warning in the corresponding project cycle if the status is set during the Test phase.

**Urgent Change**

Urgent changes (transaction type SMHF) have their own task list. They can be transported regardless of the phase of the assigned maintenance cycle. This enables you to import changes from urgent changes into production systems before importing the normal change in the Go-Live phase of the maintenance cycle. Urgent changes can only be created in connection with a maintenance project and are not available for implementation projects.
Transport control

The `IMPORT_SUBSET` transport method is used in this case. That is, transport requests generated from an urgent correction are written to the transport buffer and imported into the follow-on systems. They remain in the buffer after the import. With regular imports based on the task list for the maintenance cycle, the entire transport buffer for the project is consolidated and imported using the `Import_Project_All` method. That is to say, the urgent changes are imported a second time to ensure data consistency.

Status profile

Urgent changes have the following status profile:

- Created
- In Development
- To Be Tested
- Successfully Tested
- Release for Production
- Imported into Production
- Confirmed
- Completed
- Withdrawn

In the standard release, SAP Solution Manager automatically imports transport requests relating to an urgent change into the test system when you set the status to `To Be Tested`. This setting is intended to accelerate the process further, but you can change it in Customizing if necessary.

Administration Change

An administration change (transaction type SMAD) lets you keep a complete change history for changes that do not require transporting, such as changes to number ranges or user data. It provides access to the task list as well as to activities such as system logon. It has the following status profile:

Status profile

- Created
- In Process
- Completed
- Confirmed
- Withdrawn
General Change

A general change (transaction type SMCG) is designed for mapping changes to objects not relevant in the system, which do not require any transports and can be independent of Solution Manager projects. These can be, for example, changes to a mobile device or printer.

For this purpose, the general change offers an abstract status profile, which you can adapt to your requirements at any time:

- Created
- In Process
- To Be Tested
- Change Documentation
- Change Report
- Failed
- Restore Original
- Confirmed
- Canceled
- Withdrawn

The processing of a general change, like the other changes, starts when the person who makes the change sets the corresponding status. After successful testing, the change might have to be documented and evaluated again. If this evaluation is successful, the change can be confirmed. However, it can also be necessary to reverse the change if implementing it as-is would result in a deterioration of the situation.

Error Correction

You can only create error corrections (transaction type SMTM) during the Test phase of the project or maintenance cycle. Because a test message is used for integration testing, which applies to the entire project (all changes), it does not refer to one single change or request for change. You use test messages to report errors found during testing to the development team so that the relevant developer can fix the problem by creating a transport request. Because the project scope has been approved on the basis of the requests for change, an
error correction does not require any approval steps. It has the following status profile:

- Created
- In Correction
- For Retesting
- Confirmed
- Withdrawn

Error corrections are vital because you cannot create new normal changes in the Test phase. Doing so would distort the project’s defined and approved scope.

A tester creates an error correction and describes the symptoms. A developer processes the message, creates one or more transport requests, and fixes the bug in the development system. To submit the change for retesting, the developer sets the status to FOR RETESTING. After the re-import of the transport buffer into the test system, the tester checks the functions and confirms successful testing by setting the status to CONFIRMED. During the project import in the Go-Live phase, all changes and error corrections are imported into the production system together.

### 8.2.6 Change Management Using Change Request Management

All Change Request Management functions that have been described so far are very flexible and can be adapted to individual company requirements. This starts with the implementation of different technologies and system landscapes and ends with the design and modeling of complex workflows and individual processes.

Change Request Management is as flexible as your business and supports many different system landscapes. In addition to a three-system system landscape, you can also manage significantly more complex landscapes with Change Request Management.

In addition to the different sequential types of system landscapes, Change Request Management is also able to manage other types of landscapes. For example, it can manage dual landscapes, that is, supplying parallel test systems or synchronizing parallel development and maintenance landscapes (see Section 8.3.2). You can also inte-
grate independent sandbox systems into the process and supply them adequately with transports. Change Request Management supports all landscapes that can be mapped using SAP’s transport management system (TMS).

Change Request Management can not only be used to manage changes to SAP landscapes, but also integration with the enhanced Change and Transport System (CTS+) enables you to manage non-ABAP and even non-SAP technologies such as Java, C++, or Microsoft .NET with Change Request Management change transactions.

Within a change transaction, you can display the complete system landscape or the transport path, including the system roles generated by Change Request Management at any time.

The System Landscape assignment block shows an overview table of the individual systems that have been assigned to the current project using logical components. In the Actions column, you can log on to the system directly to make a change there or test a changed function. Hence, the assignment block in the standard release only shows the currently relevant system. This is determined using the current status of the change transaction. For example, if the change transaction is in the status In Development, the relevant system is the development system.

As already defined, each type of change transaction follows its own predefined workflow, which makes it easy to use these functions immediately.

However, many companies already have an established change management process and do not want to change this just because they are introducing a new application. Hence, all Change Request Management processes are very flexible and can be adjusted to your individual requirements.

This starts with the definition of the approval transactions and finishes with the definition and modeling of the different process steps in detail. You can also copy existing change transactions to edit existing actions and their conditions, or you can define completely new actions and conditions.
Multilevel categorization enables you to categories every document in Change Request Management and SAP IT service management in detail. The standard provides four category levels for this. These levels are set up in a tree structure and are interdependent.

For more information on this function, see Chapter 9, Section 9.1.7, subsection "Multilevel Categorization."

The integration of Change Request Management and the transport system becomes apparent in particular in the Transport Management assignment block of a change transaction (see Figure 8.18). The assignment block is assigned to the following transaction types: normal change, urgent change, and error correction.

**Figure 8.18** Transport Management Assignment Block

In addition to an overview of all relevant transport requests and transport tasks of a request for change, the assignment block provides a central point of access for all transport-relevant actions and functions.

You can use buttons to create new transport requests or transport tasks, release requests, and approve critical objects. A table lists all transports and additional detailed information, including the owner of the transport, type of request, status, and number of transport tasks. Just one click suffices to access the transport logs or bill of materials (BOM) of the transport request.

If copies of a transport have already been created, this is also displayed. A dialog box shows you how often a copy transport has been generated and what the current copy transport is. In addition, other
multilevel categorization

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Transport management in Change Request Management

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If copies of a transport have already been created, this is also displayed. A dialog box shows you how often a copy transport has been generated and what the current copy transport is. In addition, other columns of the table show whether the transport contains critical objects or whether conflicts with other transports have been detected.

8.2.7 Central Change Control

One of the objectives of Change Request Management is to provide a control mechanism for ensuring a safe and smooth software deployment process. To achieve this, Change Request Management uses a range of functions that can help you keep your changes consistent and minimize the number of malfunctions and problems during process execution in various situations.

The most important thing in change management is to maintain an overview of which changes are installed in the production environment and which transports may be transported from the development system to the production system via the test system. Of course, the integrity of the individual systems must not be put at risk at any time.

Change Request Management has built-in transport Best Practices from SAP, which facilitate working with changes and help you avoid errors. An example if this is the use of transport copies.

For more information on this, see also Section 8.3, which deals specifically with the subject of transport management.

Day-to-day activities will make it necessary to combine normal and urgent changes in the same system landscape, even if regular maintenance is still in process. If an object is changed that is also affected by the new development, this can lead to problems if you do not import the transports in the right order. Change Request Management has a built-in safety function for ensuring the safe processing of normal and urgent changes and importing them in the right order.

For transport control, Change Request Management uses transport method IMPORT_PROJECT_ALL. The advantage of this is that you can work on specific projects and import the transport requests into the follow-on systems at the end of the cycle phases, harmonized, consolidated, and in the sequence in which they were released. This approach minimizes the risk of overshooters in the transport system. At the end of the project, you can import all of the changes into the production systems and close the project. During the project import,
this means that all urgent changes are taken into account and once again imported in the right order to make sure there are no inconsistencies.

Cross-system object lock

Imagine different implementation and maintenance projects that take place in your system landscape at the same time. Some of these projects even work in the same system landscape. If a developer changes an object, which is subsequently changed by another developer, all of the changes that the first developer made are lost. This problem can be prevented by using the cross-system object lock. The cross-system object lock ensures that when an object is changed in a managed system, a lock entry is created for this object in the central SAP Solution Manager system. Depending on the configuration of the object lock, this entry then prevents any other change to the same object being made in any other transport request. The cross-system object lock can not only protect ABAP but also Customizing objects. Using it minimizes the risk of a downgrade due to different go-live times of changes from projects running in parallel. For details, see Section 8.3.1.

Critical objects

For sensitive or critical objects, that is, objects that directly affect the core business, you can activate a check that is executed before a transport request is exported. Transport requests that contain critical objects must be approved separately.

You can activate the check at the system-specific or client-specific level. If a transport request is exported, the system calculates the target client and the target system. If the check for critical objects has been activated for the respective target client or target system, the system checks whether the request contains critical objects or subobjects. If that is the case, the export is not executed.

To execute the transport nonetheless, a responsible person has to approve the object and release it for export. This is a very easy way to get additional protection for your applications.

Project Phase Management

The built-in phase control in Change Request Management ensures that only the right and approved transport actions can be executed. If you are managing and checking the phases of the maintenance and
implementation projects, you can, for example, ensure that the status of your test system remains constant during the Test phase. This also means that no new changes can be imported, which could then enter the production system without being tested (see Figure 8.19).

Phase control is integrated with different change types to ensure that only the correct change transactions are used in certain phases, such as error corrections in the Test phase. This enables you to centrally check all your maintenance and implementation projects in SAP Solution Manager.

Here is a brief example to explain the project cycle concept: The project manager creates a project in SAP Solution Manager (implementation, upgrade, or template project) and generates IMG and CTS projects, as well as a project cycle for the project. The system administrator activates the project cycle in the document (transaction type SMMN) using the corresponding action. You can now begin creating,
classifying, and approving requests for change. You therefore already specify the project scope in this phase.

After changes are approved, SAP Solution Manager assigns the resulting change transactions to the project cycle. If you have several projects open at the same time, there will be more than one project cycle. In this case, you already assign a project to the request for change in advance and thus specify which cycle is used.

The change manager sets the project cycle status to In Development without Release. With this status, developers can work on changes in the system. They can create transport requests and tasks but cannot release or export them. This phase can thus be defined also as the initial specification phase or planning phase. We do not recommend using this phase with normal changes (transaction type SMMJ) because it is not possible to generate test transports during this phase.

When the change manager changes the project cycle status from In Development without Release to In Development with Release, developers can generate transports of copies of the changes they have made, which are imported into the test system for test purposes. Ideally, scheduled jobs perform this job, but the system administrator can also perform it manually in the task list.

In many cases, development systems do not contain the master or transaction data that would enable developers to test their changes. Such data is often only available in test systems. This is why you have the option of scheduling unit tests in this phase of the project cycle, that is, before integration testing. This gives developers time to test their corrections after they have been imported to the test systems and to set their status to To Be Tested. This is followed by another transport of copies into the test system. The tester then sees the change to be tested in the worklist in the work center or SAP Web Client and can perform the test. If the test was successful, the tester sets the status of the correction to Tested Successfully, triggering the correction to be exported from the development system in the background.

After moving to the Test phase, transport requests of all changes that do not yet have the status To Be Tested can no longer be exported. Users are warned of this when they switch phases in the document
(transaction type SMMN), as recommended by SAP. This freezes the code from the beginning of the Test phase. Urgent changes are not affected by this behavior and can still be used.

During the Test phase, testers can check that corrections are acceptable in terms of functionality and business relevance. If they discover a mistake, they can document it in an error correction document (transaction type SMTM) and notify the relevant developer. After receiving this error correction, the developer can create a new transport request in the development system and fix the bug. The Test phase is complete when all changes and error corrections have the status TESTED SUCCESSFULLY. Changes that do not have this status cannot be excluded from testing. That is, they must either be tested successfully or be withdrawn.

If you need to make other changes after the Test phase is complete, you can create, release, and move transport requests and tasks during the emergency correction phase. However, you can only do so using the task list for the project cycle and with the appropriate authorizations. Urgent changes are not affected by this and can still be used.

In the Go-Live phase, 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. It is not possible to use urgent changes either. Following the import to the production system environment, no open transport requests remain, and the transport buffer is empty. You can now close the project cycle by setting the status to CONFIRMED. The project is then considered to be complete.

The project phase should be moved on only using the appropriate action in the document (transaction type SMMN). In a three-system landscape, for example, you will find all transport requests for urgent changes with the To Be Tested status in the import buffer of the production system. If the phase cannot be switched using the document but only using the task list, the user is not warned of this. Urgent corrections are therefore imported untested. When the phase is switched using the SMMN document, tests are performed so that the user is warned and can react accordingly.
8.2.8 Transparency of Change Processes

Change Request Management is not just a tool for checking and managing your changes. It also enables you to get detailed information about the status of the overall change management process at any time. The following sections provide a short overview of the different monitoring and reporting functions.

Monitoring Functions

The new Change Request Management interface offers numerous options for processing and for monitoring the status of the individual requests for change and change transaction. All of these enable you to get an overview of the overall status of change management.

In the Administration of Change Requests area in the SAP IT service management user role, you can use a range of preconfigured search screens to search for change transactions. The search screens are divided into the Change Request, Change Transaction, and Project Cycle areas (see Figure 8.20).

Saved search

Each page offers a range of search criteria that can be combined in any way. This gives you the option to create individual search queries. Every user can therefore generate a personalized worklist because each combination can be saved as a saved search.

You can select the saved searches centrally in the top part of the user interface and call them at any time, irrespective of the current position in the application.

The results of the search are neatly displayed in a table, whereby you can sort and filter each table column any way you like. Every user can use the personalization functions to determine which table columns are relevant, in which order they should be displayed, and which information should be hidden.

In addition to the display in table form, the search result can also be displayed graphically, as an interactive pie or bar chart. A click on a certain segment causes the system to filter the search results automatically. For further processing, the search results can also be exported into a table-processing program.
Change Request Management

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You can use the Change Request Management reporting functions without much set-up effort. They are thus also available out-of-the-box. All query options and results lists are already predefined and ready to use. In addition, a range of filter and setting options are available.

Change Request Management events, such as changing a DDIC (Data Dictionary) object in a development system or implementing an SAP Note, are always executed in the context of Solution Manager projects or solutions. The events that are executed when processing a change transaction are distributed across the system landscape. They require authorizations and a clear assignment of tasks.

The reporting function of Change Request Management analyzes these transactions and the corresponding events. It then consolidates them and displays them in an overview. You do not need to provide a separate SAP NetWeaver Business Warehouse (BW) because you...
can use the BW system integrated into SAP Solution Manager. A reporting service running in the background automatically collects the data from SAP Solution Manager as well as from the managed systems.

**Recorded entities**

The reporting transaction (Transaction /N/TMWFLOW/REPORTINGN) enables the display and selection using the following entities:

- Change transactions and requests for change
- SAP Solution Manager solutions and projects
- Change Request Management task lists
- Systems
- Support packages
- SAP Notes
- Transport requests
- Transport objects

Users can decide freely which data they need and can also specify additional filter criteria. The result appears in an overview that offers many additional functions and branches (e.g., into the change transaction, task list, etc.).

As with the monitoring functions, you can export all this data into a table-processing program for further processing.

**Tracking changes**

In addition to reporting, Change Request Management also offers tracking functions (Transaction /TMWFLOW/TRMO). A special overview contains a range of information and allows an in-depth analysis.

For example, you can track the following information:

- The source system in which a certain transport request was generated
- The target system into which a certain transport request was transported
- The number of transport requests exported from the target system
- The number of transport requests that have been created but have not been released yet
- The number of transport requests that have generated an import error
- Whether changes have been imported into the target system in the right order or whether there are inconsistencies between the source and target system with regard to the exporting and importing of changes

Another function of Change Request Management tracking is to compare two systems to find out whether all transport requests have been exported and imported correctly, or whether there are differences. You can first display all objects per system on a split screen. For example, if you want to find out what differences exist, you can click to activate a filter that displays the result in an easy-to-read form.

8.2.9 Integration of Change Request Management with Other Application Lifecycle Management Functions

Change Request Management is not only integrated with the transport system. It is also integrated with many other processes and applications of SAP Solution Manager (see Figure 8.21) and can be used together with these. This section provides an overview of the different integration aspects of Change Request Management, which now exist in addition to the integration into the technical infrastructure.

Figure 8.21 Overview of the Integrations of Change Request Management
By using the same basic technologies, it is possible to operate Quality Gate Management and Change Request Management in integrated form and in the same landscape for several different project types in parallel.

For example, you can use Change Request Management for a maintenance project and Quality Gate Management for an implementation project. A maintenance project is typically based on individual changes that must be approved and documented. An implementation or release project, in contrast, covers a defined scope that is first approved and then implemented. Consequently, implementing SAP Best Practices for transport protects both projects from inconsistencies and overshooters (see Section 8.1.3).

You can also integrate the two tools. You can easily activate this integration by defining Q-Gates in a Solution Manager project defined for Change Request Management. Hence, users can operate Quality Gate Management integrated with Change Request Management.

In this scenario, Change Request Management controls the entire change process. This process includes the creation, approval, and documentation of all changes as well the creation, release, and import of all transport requests belonging to the project. Quality Gate Management controls the phases and visualizes the contents of the Change Request Management project. Quality Gate Management thus displays the Q-Gate calendar, the change transactions, transport requests, and the risks of the Change Request Management project. In this role, it acts as a type of change management dashboard that enables the project management team to provide useful information to detect and eliminate potential risks at an early stage. For more information on the functions of Quality Gate Management, see Section 8.1.

As already mentioned, Change Request Management is strongly based on the specifications of the IT Infrastructure Library (ITIL). Hence, the other IT service management areas of SAP Solution Manager are integrated: If you have an incident or problem in your Service Desk, you can directly create a request for change as a follow-on document. Important information such as texts and the assigned component are automatically transferred to the request for change, and a relationship is established between the two documents. Hence, you can trace the request for change back to its origin at any time.
You can configure Change Request Management so that when a request for change is completed, that is, as soon as the change has been made successfully and confirmed, the corresponding incident or problem is closed automatically.

All of the changes you make with Change Request Management are always based on a Solution Manager project. You can also use the information in these projects in Change Request Management and assign it to change transactions. This enables you to classify and categorize your change transactions and requests for change.

In the SOLUTION and PROJECT assignment blocks, you can assign information such as business process scenarios, business processes, or business process steps. Change Request Management reporting supports this assignment. In reporting, you therefore also have the option to display only change transactions that are related to a certain business process.

You can reference the underlying documents of the project or solution, such as test case descriptions or specifications in the DOCUMENTS assignment block.

If you assign a solution to a change transaction, and this solution is connected to maintenance object used, you can also use the Check-In/Check-Out function. As soon as you have activated this function, it is no longer possible to edit the content and structure of the solution directly. Instead, you can check out parts of the solution that have to be changed into the maintenance project by using the change transaction. There, you can update the documents and processes in line with the corresponding software or configuration change that is made simultaneously using the change transaction. Following that, you can check the structure back in as soon as the change is complete.

As a result, you not only get a change configuration at the technical level but also changed or updated documentation of your business process. This is particularly important if you want to use other functions of SAP Solution Manager that require correct solution documentation (e.g., Business Process Monitoring).

Test management is a subject that is closely related to changes and change management. In SAP Solution Manager, there are numerous functions and applications for checking and administering test transac-
tions and test processes in the customer landscape. These functions are also integrated with Change Request Management. For requests for change or change transactions, you therefore establish a relationship between these and entities from test management (see Chapter 7).

The Test Management assignment block enables you to assign test plans or test packages from SAP Solution Manager to a Change Request Management document. This enables a change manager or test coordinator, for example, to assign in advance a change to a test plan that contains test cases that are supposed to be used for testing the planned change.

In another step, you can also configure Change Request Management by implementing your own condition so that the process control is dependent on the successful execution of the assigned test packages or test plans. This makes it possible to implement a change that, for example, enables the status to be changed from TO BE TESTED to TESTED SUCCESSFULLY only if the assigned test cases have been tested positively. This adds further stability to your software and minimizes the risk of errors in the production system.

Maintaining an SAP landscape is also closely related to change management. The System Recommendations function is a part of the maintenance management process. Here, the system suggests SAP Notes for implementation in your system landscape (e.g., SAP Notes relevant for security or performance, etc.).

If you decide to implement such an SAP Note, or your company uses the Change Request Management process and you want to trigger an implementation via a change request, you can create a request for change directly from the System Recommendations application. This already contains all of the required information about the SAP Note to be implemented.

For more information on the System Recommendations function, see Chapter 12.

Job Scheduling Management deals with the numerous background applications and batch processing programs that are scheduled in an SAP system. If the system landscape gets more complex and the number of these jobs increases massively, it is difficult to keep track. Job scheduling management enables you to centrally manage the scheduling and execution of such applications.
Thanks to the integration with Change Request Management, you can also map the scheduling of such a background application using a change management process. Change Request Management provides a special assignment block for this purpose.

For more information on job scheduling management, see Chapter 11.

8.3 Transport Management

In integrated system landscapes, it is important to manage all changes in a central system. This is the only way to synchronously execute changes that affect more than one production system, such as simultaneous changes in the SAP NetWeaver Portal and in the SAP ERP backend system. SAP Solution Manager also provides central transport functions for the entire system landscape, such as the synchronization of development systems or the cross-system object lock.

8.3.1 SAP Change and Transport System (CTS)

SAP Change and Transport System (CTS) is the central tool for managing changes made to Customizing and repository data in the IMG and the ABAP Workbench. CTS automatically collects all changes and records them in transport requests. Logically related and interdependent changes can be recorded in the same transport request. Members of a team can use one common transport request. In the documentation for the transport request, the recorded changes can be described in greater detail. This makes it possible to trace which user changed what data and for which purpose.

You release the transport request after work in the IMG or ABAP Workbench has been completed or an interim status has been reached. The transport request is now used to copy the changes from the clients where they were implemented to other clients or systems automatically. This automatic transfer is referred to as a transport. CTS therefore provides the opportunity to make changes in a separate development environment, test them in a test environment, and adopt them in production operations after they have been tested suc-
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