

SAP Netweaver Portal 7.3 Governance and Features

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Guidelines

Degree programme

2012



Degree programme

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<p>Title of thesis SAP Netweaver Portal 7.3 Governance and Features.</p>	<p>Number of report pages and attachment pages 37 + 2</p>
<p>Thesis advisor(s) Ralf Rehn</p>	
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<p>Keywords SAP NetWeaver Portal, Portal, SAP, Governance model, NetWeaver Features, Enterprise Portal, CTS+, Integration,</p>	

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Abbreviation

SAP- System Application and Products is an application that is used for daily business processes.

SSO- Single-Sign On allows a user to be able to login to different SAP or Non-SAP applications from Portal without having another authentication.

SAP BI- Business Intelligence simplify data manipulation, allowing users to access, navigate, analyze, format, and share information across a corporate environment.

BW- Business Information Warehouse used for analytical, business intelligence and data warehousing.

KM- Knowledge Management allows the user to manage the unstructured contents such as discussion forums, news, polls and collaboration functionalities in the organization repository.

SLD- System Landscape Directory used for legacy purpose and for software lifecycle management.

LDAP- Lightweight Directory Access Protocol used for a central user management and storage.

JSPM- Java Support Package Manager is SAP business package Installation tool for Java application.

SAINT- is SAP Add-on Installation tool.

URL- uniform resource locator

BSP- Business Server Page

CTS+- Change and Transport System is a tool that controls the transport of ABAP and JAVA applications between different portal environments.

SOA- Service-oriented Architecture

NWDS- The developer studio is eclipse based development tool that is used to develop the whole life cycle of java based and multi-layered Portal applications.

NWDI- Netweaver Development Infrastructure is Netweaver development environment.

1 Introduction

The reason why I decided to choose this particular topic is mainly because while working on the Portal upgrade project I realize how important governance is for the whole Portal security and management. In this report I am planning to write the knowledge I gather in the past one year experience while working on the portal. I will explain in detail what I have observed from the case company portal governance and I will give my own suggestions on what can be improved in the system in order to reach a higher level of efficiency and usability. After reading this report it is expected for the reader to have understanding of SAP Netweaver Portal governance and security.

Imagine an IT solution that can accommodate business process needs like Financial, Logistic, Material Management, Production Planning, Human Recourse, and Controlling for multiple language and currency. All of those modules are business critical. Now imagine what will happen if we don't put in place a governance to manage the IT solution. One thing for certain is the concern for the Security Bridge and a downtime of system because of the misuse.

In case if the reader doesn't know how important SAP is and what it actually does I will give a short introduction on this topic before going directly to SAP Netweaver Portal. SAP is an application that is used for daily business processes. SAP was first developed by EX-IBM workers in Germany in 1972. The purpose of this product was to integrate the main business functions in one application. The developers were targeting on the creation of a standard product for all business processes, which could be customized by the customers in order to fit their company specific business requirements. SAP stands for System Application and Products in data processing (originally in German "Systeme, Anwendungen und Produkte in der Datenverarbeitung"). SAP application is used for different business process areas for example Finance, Controlling, Human Resource, Business warehouse and so on. The first program was created for payroll and accounting in centralized data storage and later on it expanded to material management, production planning and other areas consequently. It started as sim-

ple program and it has grown to the place it is now. SAP currently is the biggest business application in the world (Wikipedia.)

The first commercial product SAP R/1 was launched in 1972/73. Presentation, application and database layer are installed on one server. Then the mainframe version SAP R/2 lunched in 1979. Unlike the previous cases, this version had the presentation layer installed separately from application and database layers. In 1992 SAP R/3 the client/server version of SAP software was released, where all layers are installed in separate servers. The browser based SAP application mySAP.com was launched in 2001. This web enabled version of R/3 allows access to the system through internet. This e-business ability boosted the need of SAP products. From 2002 onwards the browser based application SAP NetWeaver Portal was introduced with an additional capability of mobility. Figure 1 shows SAP roadmap.

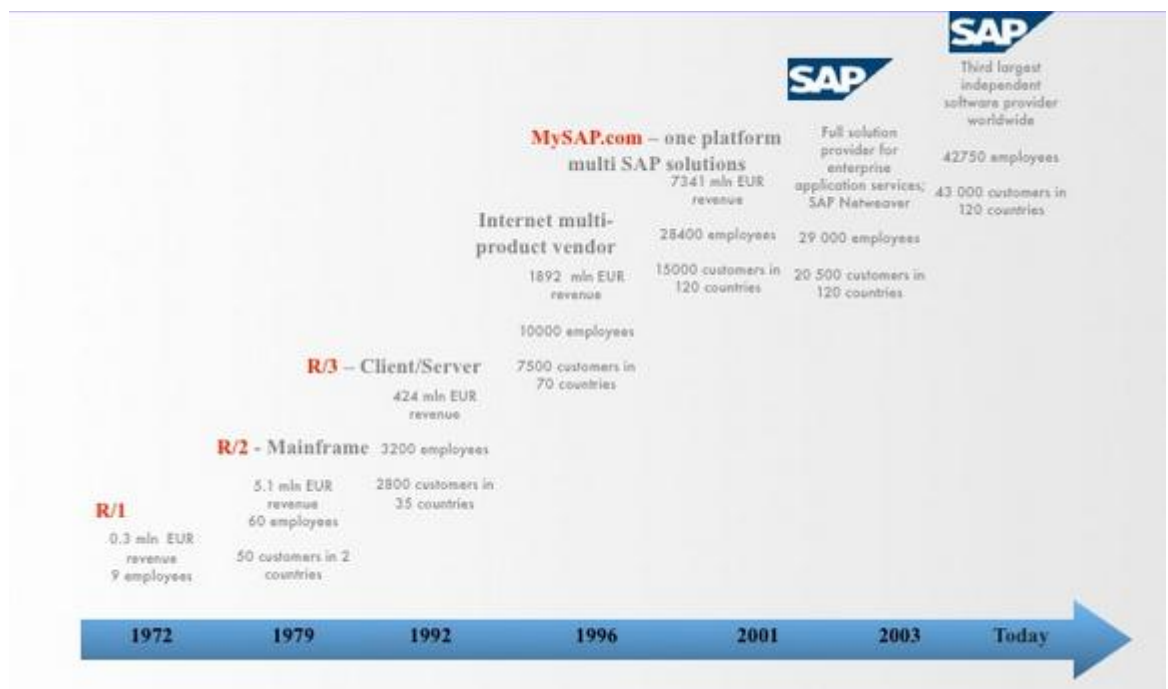


Figure 1: Revolution of SAP

1.1 Thesis objectives and Scope

The objective of this report is to give an introduction about SAP Netweaver Portal features and best practices for Portal governance. This report will also cover the introduction of SAP and SAP Netweaver Portal. I will analyze and report the AS-IS situa-

tion of the Case company that I am using for this report and write SAP best practice for the governance of SAP Netweaver Portal.

1.2 Research Method

Literature study - for this project I will mainly refer to a book by McGraw Hill SAP NetWeaver Portal Technology the Complete Reference. In addition I will use published articles from www.sdn.sap.com site and other SAP links including SAP Notes for NetWeaver.

Case study - I will analyze and reports the AS-IS situation of the Case company.

2 Introduction to SAP Netweaver Portal

One of SAP AG products is SAP Netweaver Portal. It is an integration platform and service-oriented application. It is browser based application which provides backend systems access for more usability, personalization and collaboration features. The SAP Netweaver Portal is not only a website, moreover it offers a single point of access to the SAP and Non-SAP backend systems that are integrated to systems landscape using the single-sign on (SSO). This means that the portal works as an interface and provides easy access to the different solutions in a collaborative way of working to tackle different business scenarios and personalize based on the business needs. The portal speeds up the business processes and increases productivity by providing the right information to the right person based on role assignment. It extends the reach to the SAP application to various groups. The Portal provides SSO techniques to the integrated backend systems, which allow the user to authenticate only once into the portal and don't have to authenticate again to access the backend systems. Figure 2 shows how the portal simplifies complex issues by bringing together the different SAP Systems and also the Non-SAP systems into common interface as a mash up and by providing single-sign on to the backend systems.

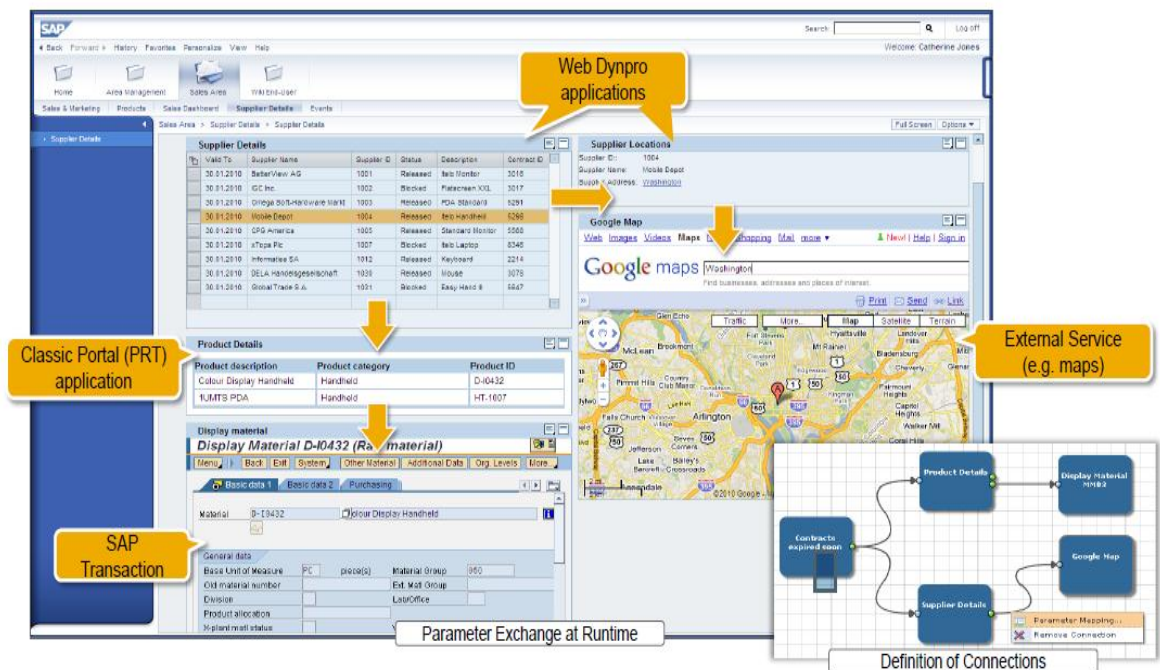


Figure 2: SAP Netweaver

Why it is important to implement SAP NW Portal? To answer this question we need to analyze deeper the benefits of the portal.

First, it increases productivity and security by providing the right information to the right person on the right time based on their Role assignment and permission. It ensures that the person can only have access to the right content by implementing specific Role with the right iView that provide correct content or process. It provided single access point to different solutions from different environment (Desktop, Mobile, Tablet ...) which will makes it fast and easy. (Jay. 2008. 3-10)

Second, it provide business packages which includes out of the box iView, Pages, worksets, and Roles to specific business process which can be used as it is or modified according to company needs. This will already give a start-up for the developer to use the out of the box business packages, or update it for specific needs. For the process that are not included in the business package iView's can be created from the portal templates or remote source (backend systems). (Jay. 2008. 3-10)

Third, the portal is built on open industry web services which are XML, SOAP, UDDI, JAAS and it is platform independent which can run on most of database and operating system. (Jay. 2008. 3-10)

Fourth, it allows customization of the portal branding for the company needs using the configured editing tools or complete development of an own page using JSP. Role based assignment will also help to create a personalize content for individual user. See Figure 2 which shows the user role assignment to specific content. For example the customer will only have access to the assigned role contents.

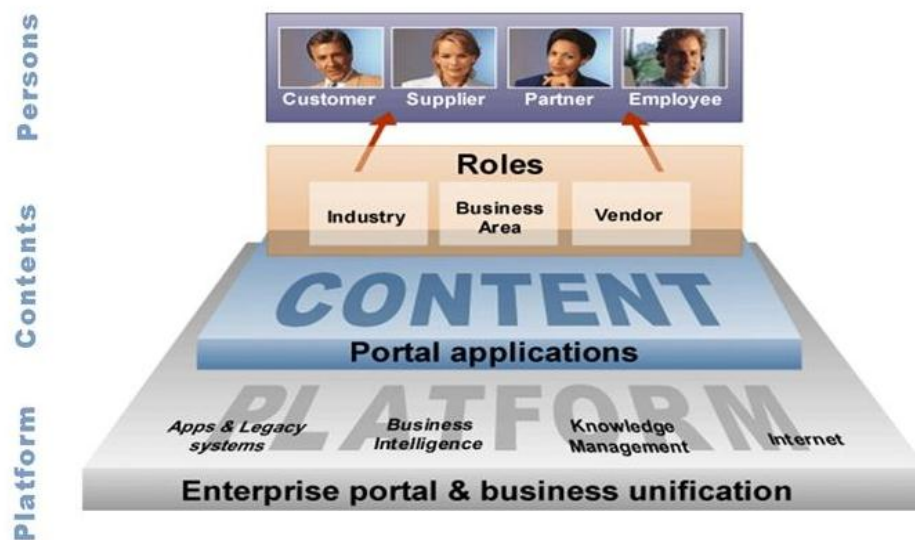


Figure 3: Role based assignment

Last but not least the benefit of implementing SAP NetWeaver portal is its efficient integration to SAP and Non-SAP backend systems. The portal makes it easy to integrate different applications with different technologies with multiple vendors: for example solutions that are developed with Java EE, .Net and IBM WebSphere can easily integrate to the landscape of the portal. This integration will help to fetch information from different backend systems, which will give us a benefit by having the collective information in one place. The SAP NetWeaver provides a unified development platform for SAP and Non-SAP systems, to integrate and develop a combined content. (Jay. 2008. 3-10)

2.1 Knowledge management and collaboration functionalities

Knowledge Management is one of out of the box tool in SAP Netweaver portal which allows the user to manage the unstructured contents such as discussion forums, news, polls and collaboration functionalities in the organization repository. It is also used to incorporate database system, file system and websites. KM is also used for structured documents such as data that are used for transaction systems, data warehouse systems, and other legacy's that the structure were enabled by Business Intelligence (BI). It is composed by two components which is Content Management and Trex (is used for searching and classifying documents). It allows navigating to the folders that are in the repository of the portal, access the documents, search for a document, create and publish documents within the repository. KM allows classifying the document based on the user authorization. (Jay. 2008. 442-771)

The collaboration functionalities of the portal is sets on the top of the KM, which provides interaction within the portal by bringing applications, information's, and users together. The tools that are used for collaboration is email, calendar, instance message, and collaboration rooms. This functionality is useful for bringing together individuals to work together. It allows the user to create, manage and delete the collaboration environment such as discussion groups, application sharing, messaging, Email, rating, and feedback. (Jay. 2008. 442-771)

2.2 Defining software component and Portal Environment

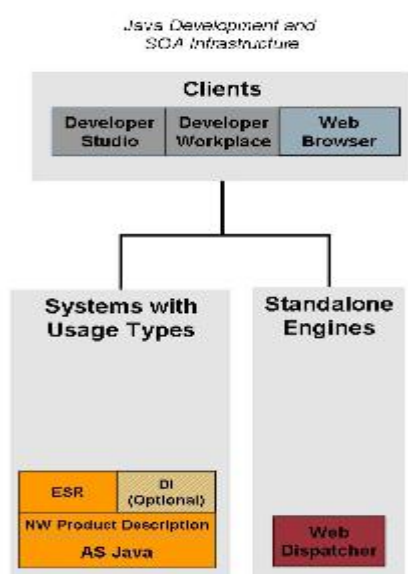


Figure 4: Java development and SAO infrastructure for SAP NW Portal (2012. Master Guide SAP NetWeaver 7.3)

Before installing the portal it is required to identify the software components and in the portal landscape. To determine which software components are needed preparing use cases might be useful.

The major software's that are required is the application server java and Enterprise portal. For each use cases there should be the necessary software installed to perform the action see Table

1 in appendix for software units with prospective use cases. (SAP AG. 2012a.)

SAP Netweaver portal allows to implement Federated network. Even though this technology is not advised by SAP due to the fact there is high maintenance and administration, The Federated portal is used to spread the load of the portal to improve performance. Federated network have Producer Portal and Consumer Portal concept as shown in Figure: 5. Producer Portal feeds information to Consumer Portal. Consumer Portal serves as central access point and gets the content from Producer Portal. There are different reasons to implement federated network, one of them can be different business units can have their own portal to manage but the same time using one general Consumer Portal for central access point. The other reason is to separate the critical application from non-critical applications. The critical application will be deployed separate Producer Portal so that it won't be affected by the down time of other Producer Portals. (Jana R. 2007. 4-11)

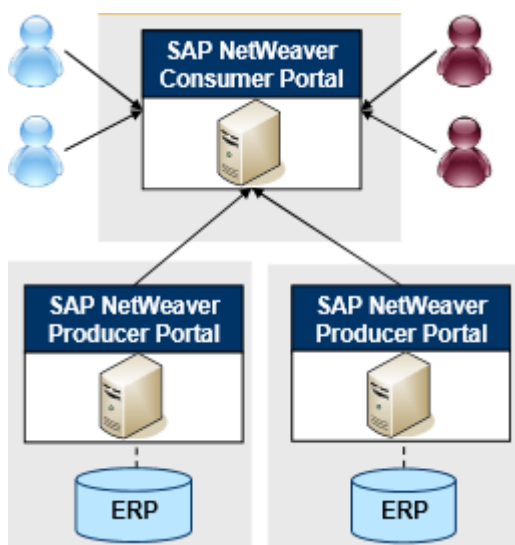


Figure 5: Federated Portal Network

The next step should be defining Portal system landscape. Ideally it is recommended to have at least 3 system landscape environments for different purpose. Figure 5 shows overview of the recommended system landscape environment which is Development, Test, and Production system environment.

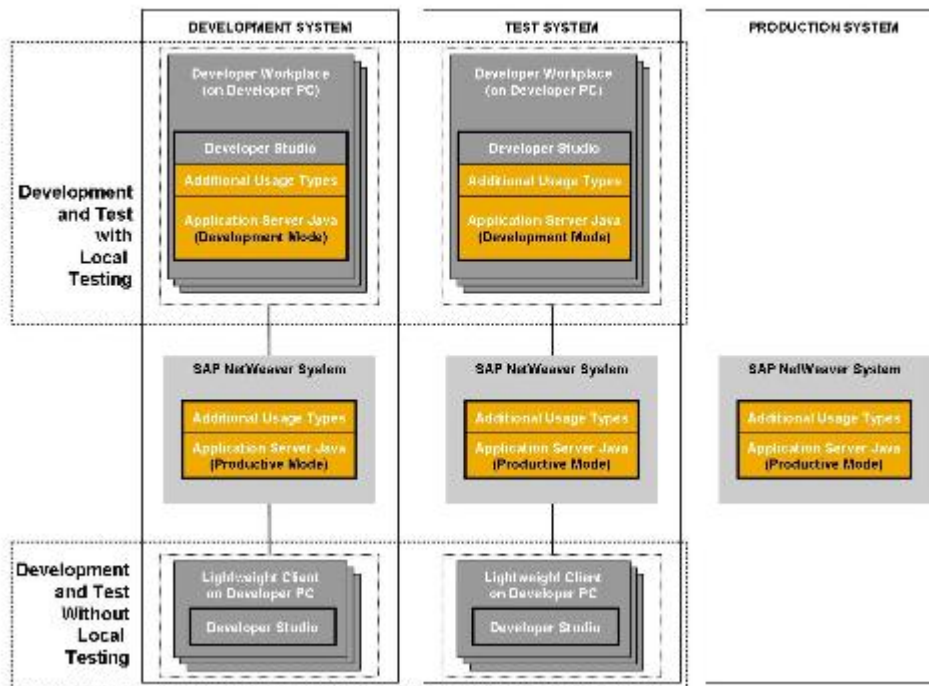


Figure 6: SAP NW System Landscape (2012. Master Guide SAP NetWeaver 7.3)

2.2.1 Development Environment

Development environment is used for any kind of development and changes. There are various development tools that are available in the portal. One of them is content administrator which will allow you to create and manage the portal contents. Roles can be created and edited in a portal content to define the navigation structure. Portal look and feel can be customized using Theme Editor and Framework page configuration. SAP NetWeaver Developer Studio also can be used to develop and deploy the application to Portal development environment. After finalizing the development the developer then makes the first test in development environment before moving it to testing environment. (SAP AG 2012a. 18-21)

2.2.2 Quality Assurance (Testing) Environment

Since the Quality assurance environment is a replica to the production at least it should be close, this is the best place to do any kind of testing that includes performance testing because production data should be available here. Before transporting any development that has been done it should have to be tested thoroughly in this environment. (SAP AG 2012a. 18-21)

2.2.3 Production Environment

This system should be separated from development and test landscape and it should be high available due to the fact that it is business critical system. What it meant by high available is the portal should be available 24/7. To achieve that SAP NetWeaver Application server should be installed in a productive mode to address additional runtime requirement such as system clustering and high memory settings. In clustered installation if one of the servers is down the other cluster server should replace it automatically. (SAP AG 2012a. 18-21)

2.3 System Landscape Directory

System Landscape Directory (SLD) contains the information of the hardware and software components that are dependent to each other. This information is collected during the installation of the SAP systems. SLD will work as central source for all system information that will be used by different SAP tools and Solution manager. The information is useful for legacy purpose and for software lifecycle management, please refers to Appendix 2 for picture. To set up SLD we first need to gathering the requirements, such as all critical applications, performance constrains, technical and legal constraints, company rules and so on... These actions will help to have the clear picture of the system landscape we want to have. The next step to configure SLD is that we need to decide on which system we want to run SLD instance, which can be ether on the chosen AS Java system or together with central shared service on existing system. There are two possibilities to configure SLD. One is we can use PI (Process Integration) together with Web Dynpro Java application. And the other option is that if we don't want to use nether of those, in this case we can use the SLD that is running in SAP Solution manager. If we want to have more than one SLD we always need to have synchronization between the systems so that we can have the correct data information on each SLD. (SAP AG. 2013b.1-13)

To configure the SLD for portal we first need to navigate to Solution manager using URL `http://<host>:<port>/sld` . Click on Technical Systems> New Technical System> choose Web AS Java to configure the portal in the SLD click next > fill out all required general information and click next> fill out Instance, Server Nodes and Port

inputs for the portal and click next>enter central instance port number this is optional then click next> select software component and products that are installed in the system and click Finish. After configuring the SLD the new Netweaver Portal system should have to be connected to that SLD. (SAP AG. 2013b.1-13)

2.4 SAP NetWeaver Administrator

NetWeaver Administrator is a tool that is used for monitoring, administrating and troubleshooting the SAP NetWeaver Portal. It unifies all those administrator tools together. Because it is web based tool you don't need local installation to manage the remote systems and it is easy to use. You can perform different administrator tasks like configuration of the portal, checking errors in log file and troubleshooting. The Start & Stop tool allows you to start and stop system instances and services. Application Manager Tool allows you to manage the installed application and functionality. To run NWA navigate to Portal URL `http://<host>:<port>/nwa` keep in mind that the proper authorization is required to access NetWeaver Administration.

2.5 Connecting to Lightweight Directory Access Protocol(LDAP)

Even though is not compulsory for portal to use LDAP as user management, this technic makes everything easy to manager all users in one central place. In this example we will use Microsoft Active Directory as LDAP for central user management and storage for the portal. Using Microsoft Active Directory as user management will give us an advantage by avoiding user management in different systems. In this case all user maintenance will be done in Active directory and it will automatically reflect on the portal users.

Prerequisites:

You are Administrator user

You have configured the UME to use an LDAP directory server as data source.

You have generated a certificate for the LDAP directory server.

Procedure for SAP NetWeaver Portal 7.3

1. Login to the Portal with the Administrator rights.
2. Go to System Administration tab
3. Select UME configuration
as shown in Figure 7:
4. Choose Data sources tab
5. Choose Modify Configuration
6. From Data Source, select the data source that best matches your LDAP directory.
For Microsoft Active Directory, choose ads_readonly_db
7. Choose the LDAP Server tab
8. Enter the required data for connection (SAP AG 2009 1-18)

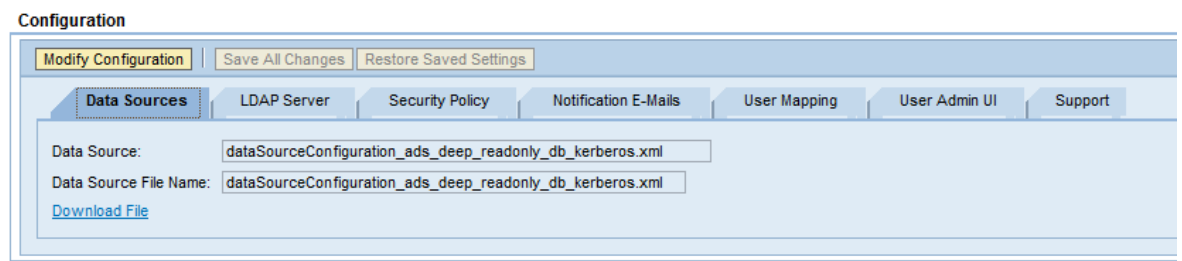


Figure 7: LDAP configuration

2.6 Setting up Single sign-on

Setting up Single sign-on in the Portal, will allow a user to be able to login to different SAP or Non-SAP applications from Portal without having another authentication. SSO only works if we followed the concept of centralized user management. Essentially the users will be authenticated in the portal using Active directory user data. Then the portal will assign logon ticket to the user ID which will allow them logon to the different SAP or Non-SAP backend applications. (Rohr, Meigen & Fischer 2007. 290-293)

2.7 Deploying business Packages and components

Business packages are a predefined content that are used to carry out specific business task. It is small unit of transaction that performs specific task which is useful to carry out tasks that are included in the package. It also plays big part on the authorization to backend system since it is possible to assign the user only the relevant content. Business packages run in the portal and directly connected to its prospective backend sys-

tems. The packages came from SAP out of the box solution SAP Business suite 7 but customers can make their modification so that it can fit to their business requirement. It provides a jumpstart on the implementation of Portal applications by providing different ready to use iView's, Pages, Worksets, and Roles. Business Packages can be downloaded from SAP service market place and it can be deployed using different tools into the Portal. (SAP AG. 2013c.1)

Before we start deploying the business packages we need an inventory of the business packages and pre-requisite software components which are really needed. This is because after deploying Business Packages it is almost impossible to get rid of the unused business packages, so we will end up with unwanted packages that might possibly affect the performance of the portal. We also need to be careful while choosing the right business packages with proper enhancement packs. Mostly it is advised not to deploy the latest enhancement pack because of all the bugs. Business package enhancement packs should also have to be compatible with the backend system version.

What are the processes of deploying and implementing business packages? As mentioned above first we need the inventory of the components. The second step is downloading the business package with the right enhancement pack from SAP service market place. For installing business packages we can use several methods or installation tools.

One of the installation tools for ABAP stack is SAP Add-on Installation tool (SAINT). The tool enables the user to deploy and upgrade add-ons to ABAP stack. Prior to installation the tool checks if the add-on is compatible to the system. This will be done on the process of import and only the compatible package can be installed. The tool will also check for pre-requisite components for the add-on. One of the best features of this tool is it provides background installation and it allows to choose the start time of the installation.

For JAVA stack deployment we can use Java Support Package Manager (JSPM) since the portal is in Java stack we can use this tool to deploy business packages into the portal. The tool checks the dependency components of the business package and also the support package level before deploying.

To preview the content of business packages we need to configure the system landscape of the backend systems into the Portal. That means we need to give it proper Alias to systems, for example for Human Resource backend application Aliases are SAP_ECC_HumanResources, SAP_ECC_TrainingManagement. System Alias is by default configured in the Business package components. When we preview the iView it will look in to the Alias of the system and automatically connected to the backend system. If the single-sign on (SSO) to the backend systems is implemented it won't ask for authentication, otherwise it will ask credential to access the backend system.

2.8 SAP Netweaver Portal Roadmap

The roadmap describes the current and feature of SAP Netweaver Portal. Based on SAP release the latest portal version is SAP NetWeaver Portal 7.3 SP8. The main planned innovations are to improve the mobile user experience and productivity. As it shows in the picture below the Roadmap including the today, planned and future directions for the Portal. (SAP AG. 2013a.1-41)

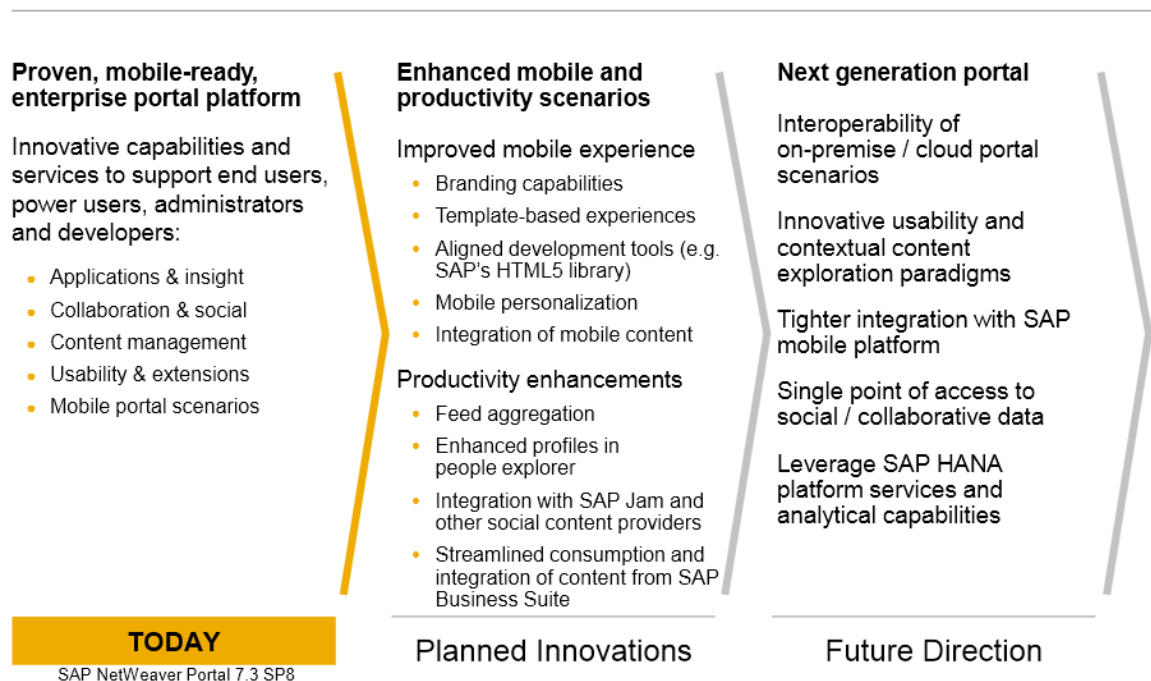


Figure 8: SAP NetWeaver Portal Roadmap

3 Company X Portal Analysis

Company X is an international company which is involved in manufacturing industry. Currently the company uses SAP Netweaver Portal for internal process only. There are 4 solutions that are running in the portal. The solutions are the Human resource (employee self-service and manager self-service), Business Intelligence, and Invoice application. Even though previously the portal is mainly used for the Business Intelligence application the current statistics shows that the HR application is taking over the majority usage of the portal. In this session I will analyse and report the current status of the portal.

3.1 AS-IS situation of case company Portal governance

Placing governance model for every solution is essential for many reasons. Having governance in place helps to clarify who is responsible for what and also shows the best practice for managing the portal contents. The company uses SAP Netweaver portal for several applications but currently there is no governance model in place which causes a lot of administrative problems. Currently anyone who has an administrator right can update the portal content without following any structure.

3.1.1 Portal user statistics

The portal is used by over 30,000 employees. Currently 4 applications are running in the portal with different functionality. Those applications are human resource (ESS (~15,000 users), MSS (~4000 users)), application for invoices (~5,500 users), and business intelligence application (~1000 users) which the portal majority used by.

3.1.2 Existing system landscape structure

System landscape covers all the systems (backend and frontend) that are connected to the portal. The portal uses the backend systems to retrieve and send data. From frontend point of view the current landscape has two levels of landscape. That is Consumer Portal (Enterprise Portal) and Producer Portal (Business Intelligence Portal (BI)).

Producer Portal is used to ease the load from consumer Portal. The two Portal landscapes is connected using Federated Portal setup, which means the roles that sit in the Producer Portal has been remotely assign to the Consumer Portal groups/users. Federated Portal is used to spread the load of the Portal. Especially BI since BI uses a couple of other interface that can slow down the performance of other Portal applications. The Producer Portal landscape includes 4 environments; which are Development environment (is used only for developers to develop their application), Quality Assurance/Acceptance environment (is used for testing purpose), Pre- Production environment (is a replica of production environment), and production environment (is the actual live environment).

Consumer Portal is also called an enterprise Portal which is used as a single entry point for all applications that are running in the Portal. Like the Producer Portal the Consumer Portal also have 4 environments; which are Development environment (is used only for developers to develop their application), Quality Assurance/Acceptance environment (is used for testing purpose), Pre- Production environment (is a replica of production environment), and production environment (is the actual live environment). But in addition one more sandbox environment which is used for training purpose and blueprint the portal. Figure 9 shows the system landscape of consumer and producer portal. As shown in the Figure each Consumer environment is linked to its prospective Producer environment via Portal Federation.

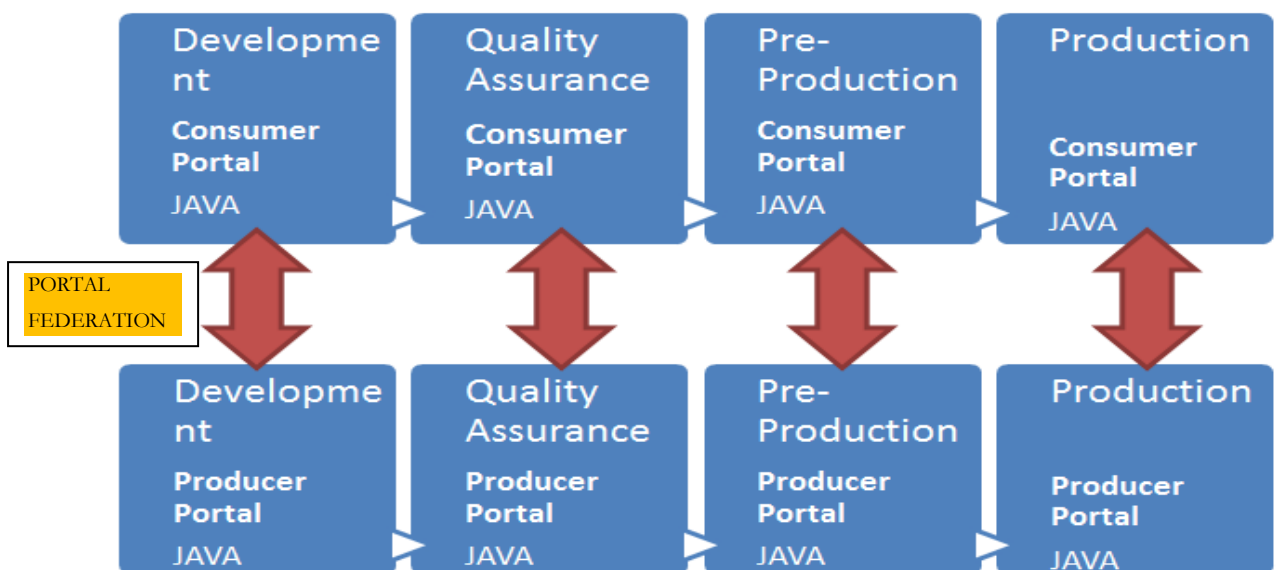


Figure 9: Portal Landscape

3.1.3 Existing Role analysis

Before I start talking about existing Roles lets have small description of portal Role in general. Roles are created to assign different portal contents to different groups/users. It is a container for specific application contents which can be assigned to groups/users based on their necessary authorization. The Role structure plays big part of the user navigation of the Portal. Role contains iView, Page, or Workset which is added as a delta link. As mention above in the Federated Portal setup the application Roles are sited on the Consumer and Producer Portal. I will talk about this in detail later on when I discuss the Portal best practice on creating Role.

Currently due to the luck of portal governance anyone who has administrator access can update/change contents in the portal. This luck of governance results the inconsistency of contents over different environments. Which means contents in Test environment may not be in Development environment. The inconsistency affects our development in the Development environment, because the Portal content in different environments is not anymore similar. Different environments are implemented for different purpose, as mention in above we create our application in the Development environment then transported them to Quality Assurance environment and run application test, after the test is successful then we can transport them to Production Environment. In the existing portal this is not followed which resulted several issues.

The other result of not having governance is mishandling of the Roles. The content of the Roles has been altered/ updated inside the Role it self which results losing the delta link between the original and corresponding content in the role (iView, Page, Workset). The altered Role will function but in case of any business package upgrade or changes that have been done in the original content will not reflect in the Role contents.

3.1.4 Existing Portal Environments content

3.1.5 Existing portal user assignment

Currently for the enterprise/ Consumer portal users in Active directory has been assign to the portal group's not active directory groups. This might have an effect from governance point of view because when users is removed from active directory it should also has to be removed from portal groups which is not the case; there are a lot of users who is removed in the active directory but still exist in the portal groups. The deleted users might not have access to the portal but it is still security risk.

On the other hand the users in Producer Portal are maintained in the backend SAP BI system not from Active directory like Consumer Portal. But then the single point entry is from Consumer portal the user assignment to the groups is done in the Consumer Portal. But then we have group assignment in the Producer Portal for developers and consultants who are doing development work in the Producer Portal.

4 SAP Netweaver Portal Best Practice

4.1 Portal Content Structure

Portal content is managed within a Content Administrator tab on the Portal content directory. Best practice for implementing the application in portal content structure is by following SAP standard chain.

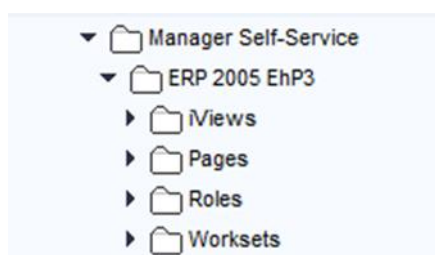


Figure 10: SAP Standard content structure

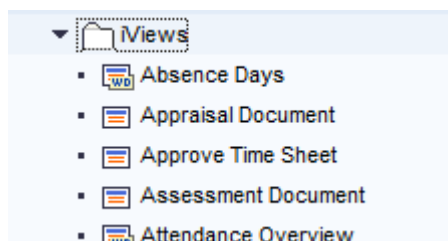
This Figure is taken as an example for standard content structure as hierarchy; I took as an example the Manager Self-Service business package that SAP provides. The structure shows that all the iView's are placed in the iView folder and all Pages are placed in the Page folder and all Roles are places in the Roles folder and the Worksets in the Workset folder. This kind of structure helps a lot to manage our application

structure. This structure may not be applicable for some application/solution but mostly for reusable component it is advised to follow this kind of structure.

SAP provides out of the box content by default. During implementation some of the content can be customized. All content within the portal can be accessed from portal content catalog in a content administration tab. SAP provided content will be found in the Content Provided by SAP folder which is found under portal content catalog. The folder contains Admin Content, End user Content, Specialist Content, Add-Ons and Business Packages, Templates and so on. In order to reuse the contents that are inside Content Provided by SAP you need first to copy the content and paste as delta link and change the namespace. (Jay. 2008. 209-226)

4.1.1 Best Practice of creating iView

iViews are the smallest screen section of the Portal that retrieve data information from backend systems or other sources like URL, BSP pages. The system information is configured within the iViews using backend system Alias.



Rule number one if we are using standard SAP iViews we should always create a copy of it in our iView folder and as shown in Figure 11 we need to change the ID to “com.’company name’ ” instead of sap given ID.

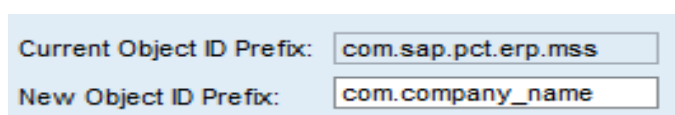


Figure 11: change the ID to “com.’company name’ ”

Rule number two iViews should never be changed/alterred inside Page, Workset, and Role. All the change should be done in the iView itself so the change will reflect into all Page, Workset, and Roles otherwise the delta link will be broken.

While creating a new iView we have possibility on choosing a different template based on SAP standard templates and also we can create new iView from remote source. There are different type of iViews such as KM iView, BSP iView, URL iView, XML iView and so much more.

In this table we will see few important properties of iView:

Property	Description
Can be Merged	This field provides with possibility of merging items with the same Merge ID. The value always should be YES by default.
Default Entry for Folder	This field determines if the iView is the entry point for the navigation.
Launch in New Window	This field allowed us to choose where to display the iView. It allows choosing to Display in Portal Content Area or other option.
Merge ID	The value in this field will be checked and merged to other identical items.
Merge Priority	This field determines the priority of the items that has the same merge id.
Pictogram	This field allows choosing picture that represents the iView. This picture can only be visible if it is used to be displayed using Workset Map iView.
System	In this property should define the backend system Alias that we wanted to connect too. The Alias should be the same as we defined it in the system landscape.

4.1.2 Best Practice of creating Page

Pages are used to group different iView's and other pages. Pages are used to organize and arrange layout of the content. We can add or remove a layouts by clicking add/remove layout button on the page properties. We have several option as a layout to choose from; like 1 Column (Full Width), 2 Columns (Equal Width), 2 Columns (Narrow: Wide), 2 Columns (Wide: Narrow), 1 Column (Full Width) and so on. Figure:

12 shows after choosing the layout we wanted then we can put the iView's in the proper column as well as in proper position by selecting the iView and move up and Down button. It is also possible to choose if the iView/ Page can be visible or not.

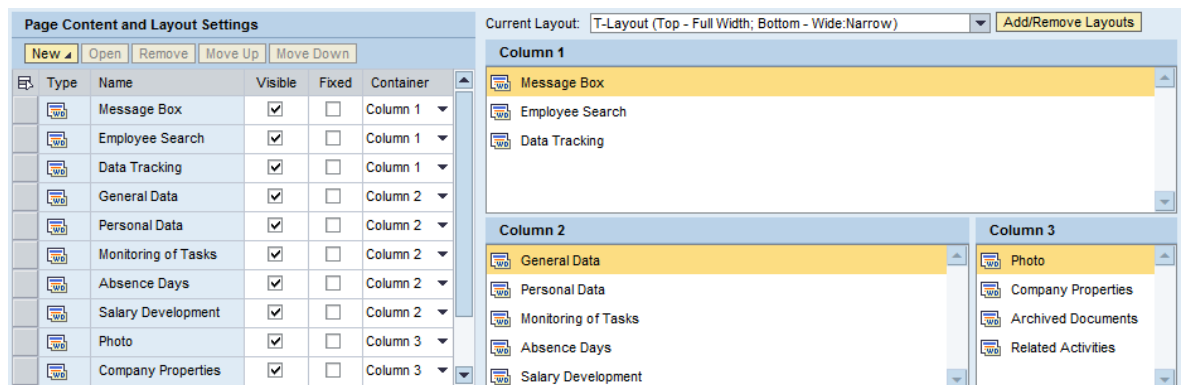


Figure 12: Page layout structure

If we are using standard SAP Pages we should always create a copy of it in our Page folder and change the ID to “com.’company name’ ” instead of sap given ID.

Don't forget to remove iViews or other pages that are not needed. When we add iView or other page to the page we should always add it as a delta link.

4.1.3 Best Practice of creating Workset

Again if we are using standard SAP Worksets we should always have to create a copy of it in our Workset folder and change the ID to “com.’company name’ ” instead of sap given ID. And we also need to remove all the content and add them again from the folder we pasted the standard SAP iView or Page. The rule of thumb for creating Worksets is that they contain the complete structure from top level navigation to the lowest level applicable for the Workset.

We should always to add iViews, Pages, other Worksets as a delta link so it will keep its original connection. Please do not forget that changes to the Page embedded in the Workset are not automatically replicated to the Page. We have to always perform the change on the Page itself and if the page has delta link to the Workset the change will be reflected on Workset embedded page. Working in this consistent way will help on

the maintenance of the applications. As shown in Figure 13 it is possible to create a Folder inside the Workset to organize the contents.

Workset Content				
New Open Remove Cut Copy Paste Move Up Move Down Reset Object Refresh Object				
Name	Entry Point	Visible	Sort Priority	Merge
▼ Team	<input type="checkbox"/>	<input checked="" type="checkbox"/>	100.0	Yes*
▪ Team	<input type="checkbox"/>	<input type="checkbox"/>	100.0	Yes*
▼ Employee Information	<input type="checkbox"/>	<input checked="" type="checkbox"/>	100.0	Yes*
▪ General Information	<input type="checkbox"/>	<input checked="" type="checkbox"/>	100.0	Yes*
▪ Compensation Information	<input type="checkbox"/>	<input checked="" type="checkbox"/>	100.0	Yes*
▪ Personnel Development	<input type="checkbox"/>	<input checked="" type="checkbox"/>	100.0	Yes*
▼ Employee Working Times	<input type="checkbox"/>	<input checked="" type="checkbox"/>	100.0	Yes*
▪ Approve Time Sheet Data	<input type="checkbox"/>	<input checked="" type="checkbox"/>	100.0	Yes*

Figure 13: Workset layout

4.1.4 Best Practice of creating Role

As mention previously the Portal navigation is based on the role structure. If a person assigned to a role he will have the access to the content of the Role. Role includes iView, Page, and Worksets.

4.2 Best Practice for Setting up system landscape

4.3 Best Practice for Portal Security and change management

The major reasons for putting in place the governance model for the portal is to protect sensitive data. Especially on applications that have client-server architecture like SAP Netweaver Portal the security risks are always high. The governance model mainly covers Authentication and Authorization within the portal. Authentication helps to identify the user credential before login to the portal. While Authorization helps to control the user's privilege to access a specific content. One of the methods that help to achieve Authorization is the portal Role assignment. The Role may contain specific content to provide specific data. The person who gets assigned to that Role can only have access to that Role content. The other methods are permission to portal content and security zone I will discuss this in detail later on.

Authentication and Authorization rules help to prevent day to day threats like violation and system penetration. To achieve the Portal security goal we need to put in place

security policies we need to follow. Before preparing the security policies we need to first prepare risk analysis by performing the following activities. First we need to gather the security requirement from different perspective like confidentiality of the data, availability of the system and integrity. Next is identifying all the treats that can affect the security and prioritize them accordingly. Next step is planning your safeguards accordingly.

4.3.1 Authorization

The Portal Authorization is implemented using three methods.

4.3.1.1 Portal Permissions

Permission helps to define user's authorization to Portal Content Directory. To set up Portal permission navigate to system Administration> Permission> Right click on the Portal content you want to put Permission rule>Open> Permissions. The permission can be carried out user based, Role based, and Group based. The permission can be assigned at all level starting from Parent Folder down to the iView, Pages, worksets, systems, and packages. There are still some limitations since it is not possible to assign permission on the Folders that only exist inside the Role.

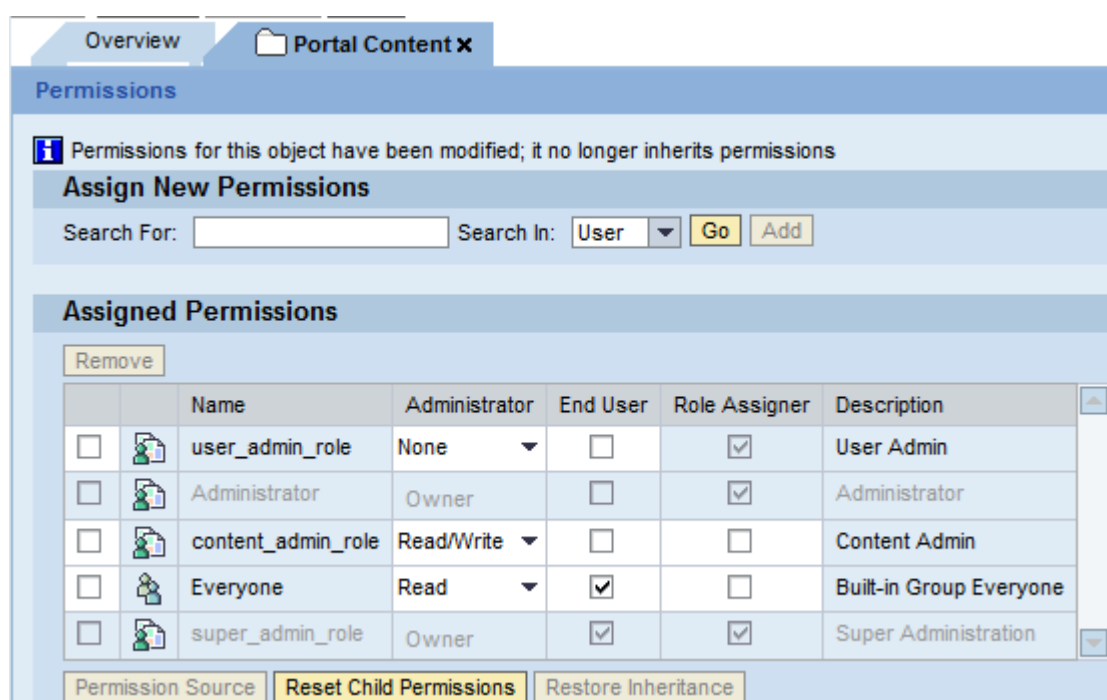


Figure 14: Portal Permission assignment

This picture shows the Portal permission assignment. First you search a User, Group, or Role to assign the permission for them. As you see in the Picture We have three level of permission for assignment. The End User level determines for the end user to have display right during the runtime. Only those objects that have end user enabled will appear in the navigation during the runtime. The Role Assigner level determines if the user have right to assign a Role or Roles within a folder to users or groups. The Administrator level determines if the user will have permission on the None, Owner, Read, Write, or Full control on the portal content. None permission means that the user that assigned to None permission don't have access to the PCD contents. The Read permission will allow the user to navigate through the PCD content and view the PCD content as Read only mode. The Write permission can only be assigned to a Folder, which allows the user to create content inside the Folder. The Read/Write permission allows the user to create and remove objects from parent object plus to edit the object properties but it doesn't allow deleting the object. The Full control permission allows the user to create, edit and delete objects. The Owner permission allows the user to assign the permission to the object. (Jay R. 2008.557-561)

There are few rules for permission assignment. If a user have multiple permissions to content then only the highest level will be effective. For example if a Role have Read/Write permission, and if the group have Full permission, then the user will have the highest level of permission which is the Full permission. Super administrators have by default Owner permission and End User permission to all Portal contents which cannot be edited. In case of mistakes only the Super administrator can repair it. (Jay R. 2008.557-561)

4.3.1.2 Identity Management/ Role assignment

4.3.1.3 Security Zones

Even though the right permission and Roles are given to a user if we don't have the right Security Zone the user can't access the content.

4.3.2 Portal Transport Management

There are few ways to manage the portal transport one of them is automated import mechanism. This method helps to automate the transport. How to setup automated import mechanism for KM document? Navigate to Portal system administration-> System configuration -> Knowledge Management -> Content Management-> Global Service-> Scheduler Tasks which will be found under Related Areas -> Import Scheduler Task. The next image shows the form for creating new scheduler. Select New and give task name and level of Priority then choose CM system, time table for the schedule, and Import mode.

Task Name: *

Priority: *

CM Systems:

<input type="checkbox"/>	System ID
<input type="checkbox"/>	<input type="text"/>

Page 1 / 1

Time Table:

<input type="checkbox"/>	ID
<input type="checkbox"/>	05MinutesAfterFullHour
<input type="checkbox"/>	10MinutesAfterFullHour
<input type="checkbox"/>	11MinutesAfterFullHour
<input type="checkbox"/>	15MinutesAfterFullHour
<input type="checkbox"/>	20MinutesAfterFullHour
<input type="checkbox"/>	25MinutesAfterFullHour
<input type="checkbox"/>	26MinutesAfterFullHour
<input type="checkbox"/>	30MinutesAfterFullHour

Page 1 / 3 [Show All Objects](#)

Description:

Import GUIDs:

Import Mode: *

Figure 15: Automated Import Mechanism

And then we have change recording mechanism which allows to record new changes for a transport. How to setup change recording? The next Image shows the steps for setting up the change recording. First navigate to Netweaver administration by putting

/nwa at the end of portal URL. Go to configuration tab-> Infrastructure-> Java System Properties->click on show advanced property->on the Details about ZATPL_AIO select service tab and filter for PCD then select PCD Generic Layer. On the extended details select Pcd.ChangeRecording.isChangeRecordingActive and modify the custom calculated value to true.

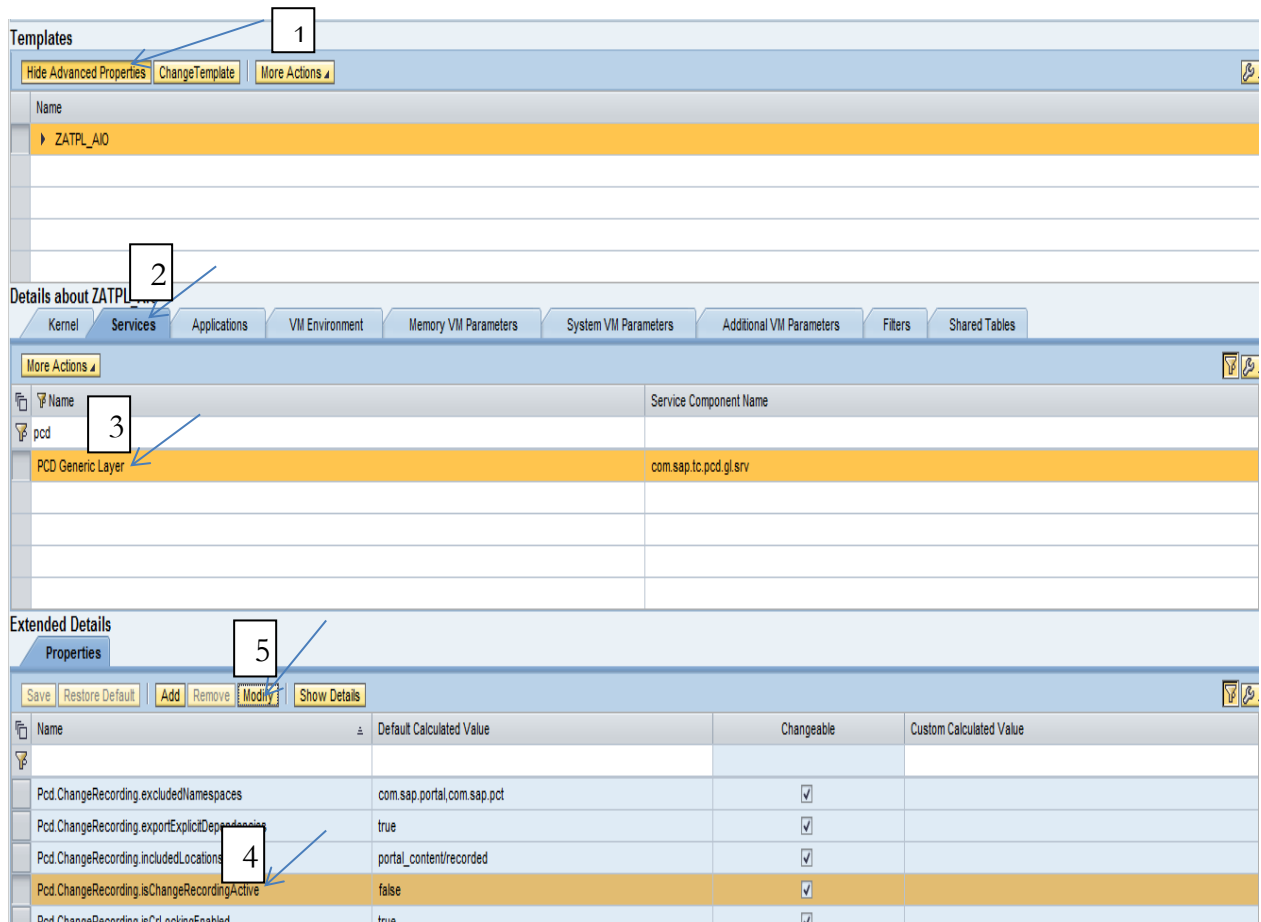


Figure 16: setup change record

After this setup go to portal->System Administration-> Transport-> Change Record Configuration-> choose the content you want to record. This mechanism records any change that happens in that content and releases the change list. The file will be attached into transport request then import transport request into the targeted portal.

4.3.3 Best Practice for setting up Change and Transport System (CTS+)

CTS+ is a tool that controls the transport of ABAP and JAVA applications between different portal environments. It helps to control if the content in all environment are align. There are two options to use CTS+ one is a Loos Coupling, in this case we need

additional tool to create transport request because there is no CTS+ integration to the system. This option required to upload the file manually to the transport request. The other option is Close Coupling which is the CTS+ is available as an additional button in the portal and the transported file is automatically attached to the transport request. Close Coupling allows creating automatic transport request and releasing the transport. How does this transport work from development environments?

There are several development tools for portal development and integration. One of those tools is Exchange Infrastructure Integration Builder which is used to design and configure Integration repository. The application can be deployed to Portal environment as TPZ file. We also have tools like Netweaver Developer Studio (NWDS) and Netweaver Development Infrastructure (NWDI) which are development tools for java application development. The applications that are developed in this tool can be deployed to the portal environment as software component archives (SCA) file. The other development tool is Portal content Administrator which will help to develop Roles and Portal contents. If we want to re-use the content in other portals it can be transported to other environment as Enterprise portal archive (EPA) files.

Now that we have application ready for transport in a Portal development environment and we want to transport it to quality environment. If we are using the Close Coupling transport method first we need to create transport package and include the file to the transport. Then select the CTS as transport method and click transport request button which will call web service UI. The web interface to transport organizer will assign the package to the transport request and release the transport request. The transport then will go to virtual Quality environment and same time will be copied to virtual Production environment. Then web service for deployment will deploy the package from virtual quality to quality environment. After testing the application and confirmed everything is working accordingly the web service for deployment will deploy the package from virtual production to production environment.

5 Portal Look and Feel customization

After the implementation of the portal the first step is to customize the portal look and feel so it meets the company branding requirement. One of the advantageous features that SAP Netweaver Portal has is allowing customers to customize the user interface that SAP Provide as a default template. The importance of user interface is that it provides the layout for navigation and portal content display with certain look and feel.

The portal out of the box tools allows us to customize different content of the portal that is shown in the Figure 17. The portal header contains the Masthead, Tools, and Top- Level Navigation. We use Header area to customize the company Logo, welcoming area, search area, and top-level Navigation. The Top level navigation is the entry point for navigating through the Portal content. The navigation can have one or two levels depend on the configuration on the Framework page. The detailed navigation panel displayed the navigation content in tree format. The navigation Hierarchy is First level Navigation then second level navigation and lastly in detailed navigation. Content area displays the navigation result. It is collection of iViews and pages. All this content in the picture below can be customized using Portal theme editor and framework editor (SAP Help. 2013.1)

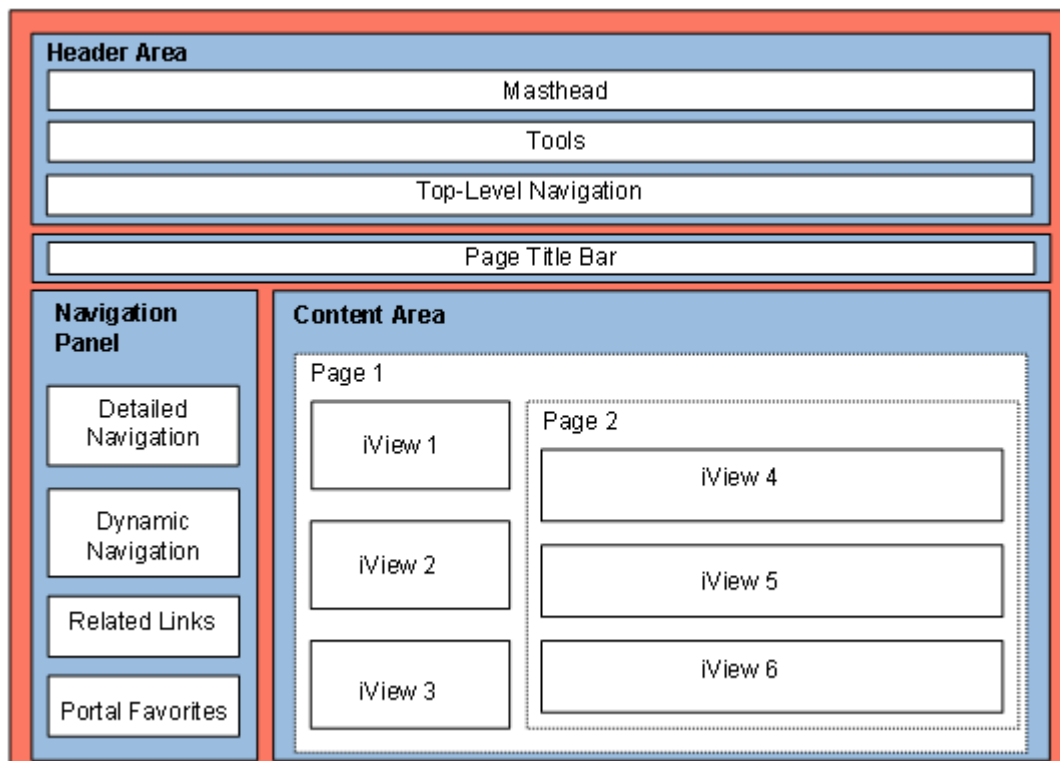


Figure 17: Portal Desktop

5.1 Theme editor

The Theme Editor is SAP out of box tool that is configured inside the Portal. The Theme contain overall look and feel part of the portal it has nothing to do navigational structure, layout, and content of the portal desktop. The tool allows changing the color, font, and other visual aspect of the user interface.

To use this tool one must be Administrator right at least the Content administrator Role. To use the tool navigate to Content Administrator tab and next click on Portal Display tab on the second level navigation finally click on Theme Editor which is located in Detailed Navigation. To start working on the Theme that SAP provides we first need to select and open the Theme we want to customize click on the button Save As and give Theme Name, ID and same the Theme.

5.2 Framework page editor

Framework page provide default layout of the Portal. There are two types of Framework page. One is classic Framework Page. The other one is Ajax Framework page which has better quality regarding the interface and it is much faster than Classic framework page. It eliminates all page refresh and only load the content that is requested. It enhanced client side cache, meaning all navigation requests are saved in client cache which will reduce server load. The next time when a user tries to login into the portal the navigation data is cached on the client instead of the server. Netweaver Portal starting from version 7.3 came as a default with Ajax Framework page.

The editor allows configuring the selected framework page. We can choose the page from dropdown list to edit the content. All the change that you make using this editor will automatically affect all Portal desktop to which the framework page has been added.

5.3 SAP NetWeaver developer studio

The developer studio is eclipse based development tool that is used to develop the whole life cycle of java based and multi-layered Portal applications. The tool offers single entry point for all java development tools, by allowing the developer to add and combine them with others. It supports to develop Web Dynpro, HTML, XML, J2SE, and J2EE Portal application. The developer studio allows the developer to develop, build, debug, deploy, execute, and monitor applications within the tool itself. This means that the developers don't have to switch different development environment for presentation and business logic. The development can be user interface, java persistence, or e-business logic, all this development can be supported centrally in one development tool. It significantly reduces development cost since the tool already provides wizards and variety of graphical editing tools. The tool is integrated directly to development infrastructure which is central system which provides platform service and synchronizes all developer tools. (SAP AG. 2007.1-8)

Using this development tool we can create a custom made JSP or HTML portal user interface. It is also possible to edit or customized SAP based portal contents.

5.4 Desktops & Display Rules

Portal Desktops provides different layout and look and feel for different portal users. Different combination of Portal Theme and portal framework page will result different Desktops with different look and feel, which then can be assigned to different user. It defines structural layout and design that display on the screen. Desktop is collection of themes and frame work page. Desktops then assigned to portal users using portal Display Rules.

To create Desktop we first need to make sure the Themes and frame work page we use to create the Desktop are available. The Framework Page defines the layout, structure and navigation or Portal elements, while the Themes define overall look and feel and the user interface in the portal desktop such as color, Font, contrast. To create desktop navigate to System Administrator tab-> System Configuration->Portal Display-> Desktop & Display Rules. Right click on the folder we want and then click New-> Portal Desktop. Provide the appropriate Name and ID and click next. On the step which asks to add Framework page please select the Framework you want to add right click and Add Framework page to Portal Desktop. On the next step where it asks to add the Theme please select the Theme you want to add right click and Add Theme to Portal Desktop. This will create a new Desktop with the Theme and Framework page we selected. As it is shown the below picture it is possible to have more than one Theme in the Desktop but we need to assign one of those Themes to be default one. (Jay R. 2008.275-294)

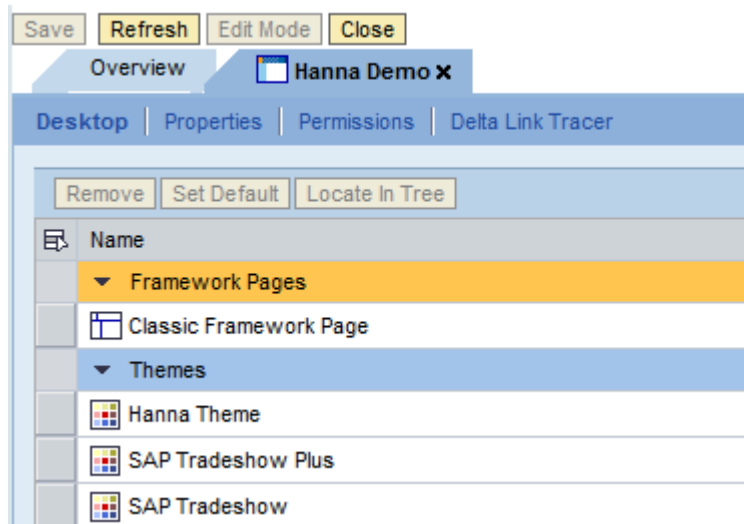


Figure 18: Portal Desktop items

The Rule collection is a collection of portal desktop display Rules. The Rules are used to define portal desktop to the different portal users, groups or roles. The rule uses IF-THEN expression. One Rule can have multiple IF conditions and one THEN expression. The IF condition can have user list, Group list, Role list, URL , Browser and so on while THEN expression can only have parameter of the portal desktop. As an example: IF (User=abc) or IF (Group=abc) or IF (Browser Type=IE), THEN Portal Desktop="parameter for the desktop". Navigate to System Administrator tab-> System Configuration->Portal Display-> Desktop & Display Rules->Portal Administrators-> Super Administrators-> right click on Master Rule Collection and open the Rule collection. (Jay R. 2008.275-294)

Save Refresh Edit Mode Close

Overview **Master Rule Collection X**

Rule Collection Properties Permissions Delta Link Tracer

Portal Display Rules Editor

Rule Collection Name: * Master Rule Collection

Rule Collection ID: * main_rules

Rule collections are used to assign portal desktops to portal users at runtime. A rule collection comprises conditions made up of IF and THEN expressions. Conditions are prioritized according to their order of appearance in the rule collection.

IF User = testets Apply

- Rule Collection
 - IF User = testets
 - THEN Portal desktop = pcd:portal_content/com.kone.portal_display/com.kone.kone_ajax_0
 - IF URL alias = portal/vajax
 - THEN Portal desktop = pcd:portal_content/com.kone.portal_display/com.kone.kone_ajax
 - IF URL alias = portal/classic
 - THEN Portal desktop = pcd:portal_content/every_user/general/defaultDesktop
 - IF URL alias = portal/interop
 - THEN Portal desktop = pcd:portal_content/every_user/general/interop/interop_desktop
 - IF User = *
 - THEN Portal desktop = pcd:portal_content/com.kone.portal_display/com.kone.kone_ajax

Add IF Expression Delete Move Up Move Down

5.5 Navigation Principal

As mentioned above the portal navigation is determined by Role assignment and Framework page settings. A person with specific Role will only have the navigation content which the Role provides. Top level and detailed navigation run in the iViews that are shipped with Framework page.

6 Conclusion and recommendation

As a conclusion like stated in the above SAP Netweaver Portal is significant for large businesses. It can be used internally only for employees also externally for clients and business partners.

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Jana R 2007 Implementing a Federated Portal Network URL:
<http://www.sdn.sap.com/irj/scn/go/portal/prtroot/docs/library/uuid/8065be82-d7b9-2910-11ac-d2be6b6c4970?QuickLink=index&overridelayout=true&12463995094117> Accessed 9 October 2013

SAP Help 2013 Portal Interface URL:
http://help.sap.com/saphelp_nwce71/helpdata/en/97/d4ee3d6434445ae1000000a11405a/content.htm Accessed 9 November 2013

SAP AG 2007 SAP NetWeaver Developer Studio URL:
<http://www.sdn.sap.com/irj/scn/go/portal/prtroot/docs/library/uuid/309c816e-7c51-2a10-05b6-9e0151d0ea2d?QuickLink=index&overridelayout=true&18425409723456>

Appendix

Appendix 1 : SAP NetWeaver software units for each use case

Use Case	Usage Types (Functional Units)	Standalone Engines	Optional Standalone Units	Clients
Building Composite Applications Business Rules Management and Process Composition	<ul style="list-style-type: none"> ■ AS Java ■ Adobe Document Services (optional) ■ Business Process Management and Business Rule Management ■ Composite Application Framework ■ Composition Environment Platform ■ NW Product Description ■ DI [optional] 		Developer Workplace	<ul style="list-style-type: none"> ■ Developer Workplace ■ SAP NetWeaver Developer Studio ■ Visual Composer ■ Adobe LiveCycle Designer (Optional) ■ Web Browser
Building Composite Applications Java Development and SOA Infrastructure	<ul style="list-style-type: none"> ■ AS Java ■ NW Product Description ■ DI [optional] ■ Enterprise Services Repository 			<ul style="list-style-type: none"> ■ Developer Workplace ■ SAP NetWeaver Developer Studio ■ Web Browser
Data Warehousing	<ul style="list-style-type: none"> ■ AS ABAP ■ BW ABAP ■ AS Java ■ NW Product Description ■ AS Java Extensions ■ BI Java ■ EP Core – Application Portal ■ Enterprise Portal 	Search and Classification (TREX)		<ul style="list-style-type: none"> ■ SAP GUI with BW Add-On/BI Add-On ■ SAP BusinessObjects Analysis, Edition for Microsoft Office* [optional] ■ SAP BusinessObjects Crystal Reports* [optional] ■ SAP BusinessObjects Xcelsius [optional] ■ SAP BusinessObjects Web Intelli-

				gence* [optional]
Building Integration Scenarios	<ul style="list-style-type: none"> ■ Application Server Java ■ NW Product Description ■ AS Java Extensions ■ Application Server ABAP ■ Process Integration ■ Enterprise Services Repository ■ Advanced Adapter Engine 	<ul style="list-style-type: none"> ■ Adapter Engine (JavaSE) [optional] ■ SAP Conversion Agent by Informatica [optional] 	<ul style="list-style-type: none"> ■ Advanced Adapter Engine [optional] ■ Advanced Adapter Engine Extended 	SAP GUI SAP NetWeaver Developer Studio
Integrating and Self Servicing Content with SAP NetWeaver Portal	<ul style="list-style-type: none"> ■ AS Java ■ NW Product Description ■ AS Java Extensions ■ EP Core – Application Portal ■ EP ■ Portal Add-on (for Building Communities with Wikis and Forums only) 			
Mobilizing Business Processes Developing Mobile Applications for Occasional Connectivity	<ul style="list-style-type: none"> ■ AS ABAP ■ Mobile ■ Application Server Java ■ DI ■ EP Core – Application Portal [optional] 			<ul style="list-style-type: none"> ■ SAP GUI ■ SAP NetWeaver Developer Studio ■ Mobile Client
Mobilizing Business Processes Enabling Mobile Applications for Occasional Connectivity	<ul style="list-style-type: none"> ■ AS ABAP ■ Mobile ■ Application Server Java [optional] ■ EP Core – Application Portal [optional] 			<ul style="list-style-type: none"> ■ SAP GUI ■ Mobile Client
Custom Application Development	<ul style="list-style-type: none"> ■ Application Server ABAP 			<ul style="list-style-type: none"> ■ SAP GUI

Appendix 2: SLD fetches information to other SAP tools

