

SAP NetWeaver Portal and Content Management

Applies to:

SAP NetWeaver Portal

Summary

The SAP NetWeaver Portal offers basic content management capabilities to maintain unstructured information for your users. Using the SAP NetWeaver and especially the SAP KM possibilities to integrate 3rd party Content Management Systems opens doors to much more. This paper uses a classification approach to the integration of content management systems into the SAP NetWeaver Portal.

Author(s): Rován H. Siegfried

Company: Unilog Avinci – a LogicaCMG company

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Author Bio



Rován H. Siegfried is manager of the SAP NetWeaver team of Unilog Avinci (LogicaCMG) in Ludwigshafen, Germany. His primary focus is the evaluation and integration of SAP NetWeaver solutions. Before joining Unilog Avinci, Siegfried has been responsible for the SAP NetWeaver activities of Freudenberg IT in the USA and Germany. Formerly, he has also been the chairman of ASUG's SIG for Portal Implementation and Support and headed the Michigan Portal Interest Group.

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SAP NetWeaver Portal and Content Management

SAP's NetWeaver offering and especially the SAP NetWeaver Portal is at the edge of becoming an enterprise commodity. More and more companies decide to take the approach of enabling easier and more comfortable access to a company's information resources and important digitalized tasks. With such an approach the SAP NetWeaver Portal comes into play and functions as the universal and web-based user interface. Certainly, this is the approach to a process-centric delivery of information and possibility for process interaction.

The history of SAP has shown and proven the strength of SAP: providing a complex but strong software solution for all kinds of enterprises and their needs. The SAP NetWeaver Portal is now an up-to-date technology within the SAP NetWeaver Technology Platform that functions as a web interface to enterprise specific applications – even non-SAP applications. But here lies the caviar: the SAP NetWeaver Portal focuses on enterprise information and not on the management of unstructured content. The information provided through enterprise applications are primarily in the foreground. Definitely, it has never been SAP's strong focus to provide a portal software that allows building a plain internet portal mainly focused on and around unstructured content. Compare it to yahoo.com for example: the yahoo portal focuses on news, finance, communities (e.g. Yahoo Groups), etc. Comparing such an Internet portal with an enterprise-centric portal from SAP shows a large difference especially in the design and content display capabilities. A platform which supports flexibility in regards to content manageability and its user friendly and user attracting display immensely increases what I call the portal sexiness factor.

The ultimate goal of content management within a portal is to manage unstructured content like news, information pages and portlets, etc. The management capabilities should enable:

- easy and self-explaining content creation
- distributed manageability allowing departments or different office locations to manage their own content areas
- publishing into different channels
- access control for content
- support content versioning
- support publishing workflows
- support time-based publishing and un-publishing
- ensure the compliance with the corporate design standard(s)
- supporting the enrichment of structured content and process-oriented information flow

Well, understand the SAP NetWeaver Portal as an integration platform and not as a one-way street in regards to its design and content display capabilities. Using this perspective you will immediately be able to scale the sexiness factor to the level where it meets the given objectives. The usage and the eventual integration of a 3rd party content management solution will open a complete new set of possibilities. But before looking at the integration of additional software solution, let us look under the hood of the SAP NetWeaver Portal and understand what comes out-of-the-box with the included Knowledge Management component.

The SAP NetWeaver Portal and Knowledge Management (SAP KM)

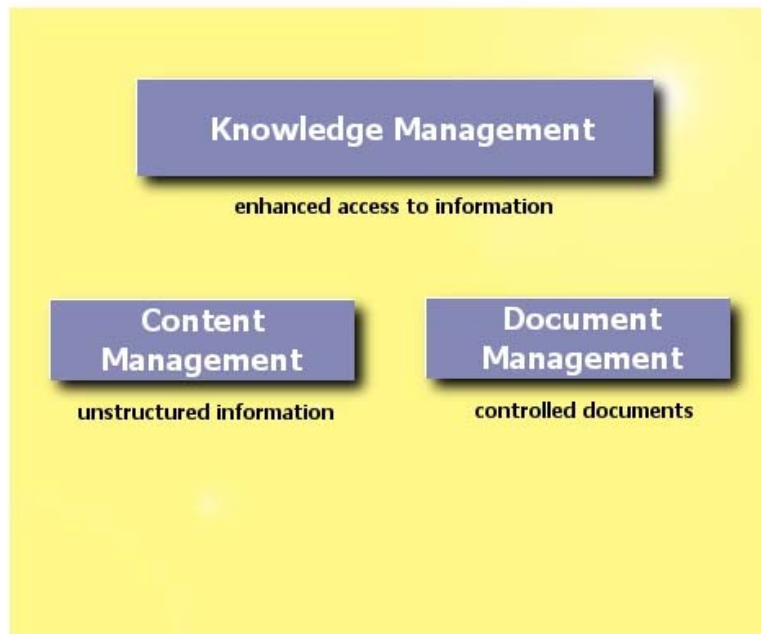
The SAP NetWeaver platform does not only provide the SAP NetWeaver Portal and the underlying SAP Web Application Server (WAS) but also holds the SAP Knowledge Management (KM) component. While the portal functions as the people's user interface, KM is a component and enhanced integration platform for unstructured content which plugs into the portal. Structured content can be easily distinguished from unstructured content: structured content can be fitted in a definite set of data fields, such as Material Number, amount, weight, measurement; unstructured content varies each time in length and content possibly containing formatted text and images both in various formats.

KM is primarily a platform allowing integrating unstructured content and therefore allowing a user to find a central access point to such content. With the use of different types of so-called Renderers within SAP KM, which control how content is being displayed, it is possible to display content in different ways – even the use of image maps is possible. KM can be considered to be quite powerful as soon as it comes to integration of external information sources, so-called repositories. A repository is a logical storage space for information and data. The set of adapters to different repositories is highly sufficient – it is possible to integrate repositories like Windows file servers and Lotus Notes databases for example. The set of 3rd party software adapters is growing as well and therefore underline the integration capability of external information sources with KM.

In addition to the integration feature, KM offers a large set of Repository Services. Such services add workflow, time-based publishing, access control, etc. to the content items contained within a repository. Nevertheless, not all Services function with every type of repository and it might become necessary to consider different repository integration options.

The best and certainly most used functionality of KM is the availability of KM Repositories, which reside within KM itself. This eliminates the need to provide external repositories lying outside of SAP NetWeaver. And certainly, these repositories are the ones with the most functionality supported by all the available Repository Services.

Lastly, KM also provides a quite powerful Search and Classification engine with TREX (Text Retrieval and Extraction). I do not want to discuss the features of TREX in detail, but it's worth mentioning its existence especially in regards to the fact that search is always an important topic when it comes to discussing knowledge management, content management, or document management solutions.



Content Management with SAP KM

We now start looking into more detail of the Content Management (CM) capabilities of KM. Keep in mind that, in general, knowledge management focuses on functionalities that enable users to access information while content management focuses on the maintenance and display aspect of content. SAP KM offers in addition CM functionality – let's see what's behind this:

The KM's CM functionality can be separated into three features:

- HTML editing
- Plain-Text editing
- XML-Forms for quick publishing

The first is that you have a very simple and rudimental WYSIWYG HTML editor for editing HTML files. The second is again a simple and rudimental plain-text editor for editing text-based files. Both editors can be launched from the KM Navigation iView which is similar to a file explorer. The third and more sophisticated solution is the so-called XML-Forms. With XML-Forms an administrator is able, as the name says, to create forms that can be used by content managers to publish content. Further, with the help of XSLTs it is possible to control the look & feel for the display of published content. Most often, XML-Forms are being used for simple publishing of company news. When creating new content pre-computed fields can be used to set the current date or the current author's name for example. This solution is targeted for quick publishing purposes – XML-Forms become very difficult to maintain and soon are at their natural end when it comes to dynamic content and as soon as more complex content management features are being asked for.

The Need to Integrate More

In many cases the KM framework and its content management capabilities are sufficient. Nevertheless, if the content management requirements start to exceed the existing functionality the next step is to overcome the weakness with the enhancement of existing functionalities. Facing such a need you will find two options: one is to find a solution that uses the existing SAP NetWeaver infrastructure or, two, to integrate a full grown Content Management Solution. When approaching the CMS market you most probably will find it quite confusing when reviewing the offerings from different vendors and reviewing the respective price and feature differences. It helps to start separating the products and to classify them. The currently existing solutions can be divided into the Web Content Management (WCMS) class and the Enterprise Content Management (ECMS) class. We can add a third class which we call the KM Editor Enhancement class, because we are approaching content management from the SAP NetWeaver Portal.



The differences between the three classes can be summarized:

	KM EDITOR ENHANCEMENTS	WEB CONTENT MANAGEMENT SYSTEMS (WCMS)	ENTERPRISE CONTENT MANAGEMENT SYSTEMS (ECMS)
COSTS	\$	\$\$	\$\$\$
USER FRIENDLYNESS	medium	High	High
AVAILABILITY OF ADDITIONAL FEATURES	low	Medium	High
APPLICATION PLATFORM	SAP NetWeaver	Own	Own / J2EE compliant
DOCUMENT STORAGE	SAP KM	Own / SAP KM	Own
ACCESS CONTROL	SAP KM	Own / Adapter	Own / Adapter
SINGLE SIGN-ON	built-in	Some	Some
CONTENT ORIENTATION	Document	Page	Object
CONTENT RENDERING	SAP NetWeaver	WCMS	ECMS

Option 1: KM Editor Enhancement

The weakest part of KM's CM capabilities is the available Editors. The existing editors are simple ones or in the case of XML Forms the users creating new forms need to be very tech-savvy. So, naturally the next and most inexpensive step is to target the editor functionality. Here you basically face two options: (1) adding a new editor application or (2) use the existing XML-Forms capability and adding pre-defined forms with enhanced editing features. If you decide to add a new editor application, you can certainly decide to implement such a solution yourself. There are several vendors offering even Java-based editors, such as EditOnPro offered by the company RealObjects (<http://www.realobjects.com>). You can even decide to purchase one of the currently existing Business Packages including the editor and the necessary integration. With the second option you avoid adding an additional application on top of your environment and you only add pre-defined XML-Forms and enhanced rendering iViews. Such you can also achieve with acquiring according Business Packages.

The integration of the content itself does not change very much. Still, content is being displayed with the help of standard KM-iViews. Some enhancements provide an additional iView that uses enhanced Renderers to display an edit button to the content owners and authors. The rendering of content is always being done by SAP KM. And the iViews are still manually assigned to Pages, Worksets, and/or Roles.

Obviously, the advantage of the KM Editor Enhancement approach is at hand: it is a low cost solution. The downside is the highly limited amount of additional features and the lack of support. In most cases this approach often leads to the request to enhance the capabilities of such a low-cost solution. This will add additional consulting/development costs to the initial costs and needs to be done at one's own risk, especially in regards to operability with the next SAP NetWeaver releases.

PRO	CONTRA
1. Leveraging the existing SAP NetWeaver platform	1. No additional features
2. No additional hardware is required	2. Limited vendor support
3. Facing relatively small software licensing costs (if at all)	
4. Limited costs for the integration	

Option 2: Integration of a Web Content Management System (WCMS)

The option of integrating a 3rd party Web Content Management System is the next level to be approached as soon as the functionality and features of SAP KM in regards to content management are not meeting your requirements. The WCMS option is certainly more expensive. Besides the additional software licenses, it always requires the use of a second server, and in most cases even a server on a separate piece of hardware and operating system.

WCM Systems entered the market especially in the late 90's with the growth of the Internet. They primarily target the content management aspects for Internet and Intranet web pages. They are page-oriented, meaning that the most granular content container is considered to be a page. Nevertheless, most WCMS allow the editing of container elements like text paragraphs, images, tables, etc... Editing is also the key strength of such systems. Most often they provide a very rich WYSIWYG editor together with the option of so-called inline editing allowing changing the content elements directly on the web page. Content creation and maintenance becomes very intuitive for the content authors – a very unique selling point.

The underlying technology of the WCMS is often difficult and becomes sometimes a challenge for an IT department trying to standardize. Some WCMS are still not J2EE compliant or are in transition offering parts that are already J2EE compliant. The result is that there will be at least one additional system running on a different OS and/or different web and application server combination.

The integration into the SAP NetWeaver Portal is possible – some vendors already offer SAP certified solutions. The integration itself has different aspects:

Single Sign-On (SSO) – the most important

SAP offers the possibility to use so-called SAP Logon Tickets, which are certificate based method of establishing a trust relationship between systems. Essentially, such avoids that the user of the SAP NetWeaver Portal has to authenticate twice as soon as he views an iView that displays content from the content management system. His credentials are being trusted by the integrated system automatically. The User Mapping option available through the SAP NetWeaver Portal is not really an option due to its security lacks. Most vendors focus their SAP NetWeaver Portal integration on providing a pre-build solution using SAP Logon Tickets. If such is not available SAP offers more general solutions such as specialised ISAPI filters for a Windows environment.

In general, it would be possible to integrate content through URL-linking and without using SSO. Though, the disadvantage is that dynamically generated or personalized content access won't be possible and that additional and very powerful features will be missing. The usage of such dynamic content requires that the content is being rendered by the WCMS and is not copied or moved to a KM Repository without specific ACL settings.

Content Store

The Content Store describes the place where content and its metadata is being stored and how it is being stored. The currently existing WCMS offer very different ways. Some offer the storing of content simply on the file system, within a specific database, or within a variety of databases. Also, it is important to be aware of how content and its metadata is being stored – not only the format but also the relationship of content/container items must be asked. Some WCMS systems still take the so-called staging approach. Staging means that the content is being managed and maintained directly within the WCMS. As soon as it is ready to be published it converts everything (or only the delta changes) to HTML and publishes it to the web server. Most of the staging system has been enhanced meanwhile to now allow for inline editing and for the usage of specially handled dynamic content. The first SAP certified WCMS integrated solutions take an interesting approach: the content is being maintained within the WCMS solutions and its own editing/administrator environment. The content is being stored simply in the underlying file system and is being published to a KM Repository residing within SAP KM.

The importance of asking for the content store of the WCMS has two interesting aspects: (1) additional licensing costs if the solution requires a database. Depending on the database vendor this will have a significant increase on the total costs. (2) The future-proofness of your solution. During the usage of such a system you will be creating large amounts of content. You will be collecting texts, images, attachments, multimedia content, etc.. Your solution should allow opening up an upgrade path for the future to even a different CM System through export functionalities of all content.

User Store

Most probably you have gone through the discussion of where and how user IDs should be stored for the SAP NetWeaver Portal already. With adding an additional user-based system such as a WCMS you have to revisit this discussion. The most common SAP NetWeaver Portal scenario is to use the corporate LDAP as the user store – essentially, you should be deciding to use a WCMS that is able to use the same LDAP. The next step is to make sure that WCMS is capable of using LDAP Groups especially for controlling access to content. Naturally, you should already be using LDAP groups in conjunction with your portal roles. With both of these requirements you will be well equipped for a good start and SSO will not become difficult due to different user IDs for the same user. Now you have to tackle the next step aligning the two content sources, meaning the portal and the WCMS. The navigation is the ultimate entry point to content.

Navigation Integration

Nevertheless, the most difficult part is the alignment of you portal's role and navigation concept with the content being provided by your WCMS system. There are many best-practice scenarios all depending on the type of content within your WCMS, the use of dynamic content or WCMS-based applications, your user audience, etc...

Unfortunately, there currently is no WCMS integration scenario available offering a common administration user interface to allow content and navigation administration for both systems, the WCMS and the SAP NetWeaver Portal, at the same time. The good news though: the first WCMS vendors have started to enable PCD (Portal Content Directory) access with their integration solution. Such allows the author from within the WCMS to decide where within the SAP NetWeaver Portal the content is being published and displayed. The author can even add navigation entry points (links) to the TLN (Top Level Navigation) or the Detailed Navigation. Such is being achieved with the use of the PCD Web Service. Certainly, an interesting scenario which should thoroughly be aligned with your role and navigation concept – otherwise there is a good chance for a future maintenance pitfall.

Workflow

Most WCMS provide good tools in regards to publishing workflows. There are even systems that understand workflow as the central piece of web content management. Generally, the workflow capabilities are much better than the publishing workflow capabilities of SAP KM – especially from the view of user friendliness. Nevertheless, the workflow of the WCMS is not integrated into the SAP world. The only option available today would be to integrate a web interface of the WCMS workflow. The ultimate goal, though, should be one common interface for all workflows. SAP provides the Universal Work-List (UWL) through the SAP NetWeaver Portal, which potentially should be the central entry point for someone's workflows. Essentially, 3rd party vendors most probably will use the UWL in the future as soon as SAP announces its interface as being officially public.

PRO	CONTRA
1. medium cost solution	1. platform compliance
2. High user-friendliness especially in regards to content authoring	2. Enhanced features are limited
3. functionality can be programmatically enhanced	3. Some systems use content staging

With the use of a WCMS you certainly gain more content management functionality. Your authors will be able to maintain content in a more efficient and simpler way. Depending on the software vendor you will gain additional services around your managed content such as versioning for example. Some vendors even offer additional enhancement packages that allow adding additional functionality to the system. But I strongly recommend reviewing the system architecture of a possible solution. It is not only the features you should be aware of but also the maintainability and costs of operating of your overall architecture.

Option 3: Integration of an Enterprise Content Management System (ECMS)

The last option is the integration of an Enterprise Content Management System (ECMS). Certainly, an ECMS is the high-end solution in regards to content management, and, it is definitely the most cost intensive. Often, when taking the first steps in reviewing an ECMS, you find asking yourself where the benefits of a system can be found that requires the development of templates before it can actually be used. But exactly this is the benefit: the outstanding flexibility of the content usage. ECM Systems understand granular pieces of content as objects. If you look at an article consisting of a headline, sub-headline, multiple paragraphs and an image, the single objects can now be aligned differently with different templates. One template might render the image on top of the page and the text as a single-column below, while the next template renders a three-column layout with the image integrated using the exact same content. Further, you are now able to assign an unlimited amount of different types of objects to a content container allowing creating articles with only one image and others with many. This high level of flexibility distinguishes ECM Systems from WCM Systems, which are page and not object oriented.

Due to the approach of ECM Systems where a system starts off as a basic environment, most vendors offer a very rich amount of modules and components that offer additional pre-build functionality. Also, most of the services which WCMS vendors sometimes require you to purchase are already included in the basic package. The flexibility of ECM Systems further allows the publishing of content not only to web-based systems but to a variety of media – print media for example.

The integration and the certification of such by SAP have evolved very similar as within the WCMS market. Some vendors already offer an SAP certified solution for the integration of their solution into the SAP NetWeaver Portal. Such an integration solution always contains a SSO packages and eventually additional iViews that offer special content display and navigation options.

The possibilities given by the features of any ECMS are the most you can expect and should allow to meet a very high percentage of your requirements. Very interesting though is where the industry currently tends to develop to. Basically, there are two standards which are influencing the decision for the integration of a Content Management System into a SAP NetWeaver Portal:

The first standard is JSR-170 defining the separation of the content storage from the editing component for the content. The standard is still in its very early definition stage and the current commercial CMS vendors have not yet implemented it. But it is interesting to understand what the standard is approaching. Basically, it allows the exchangeability of the content editor due to the fact that the content is stored in a completely standardized way. At its full extend, this would allow to pick a content store from vendor X while you use a content editor from different vendor Y. An idea which needs to be re-thought: today's content management vendors always offer the content storage together with their content editor as one package. The split of such a package and the offering of the content store separately from the content editor might very well not meet the natural intent of the vendors of selling complete packages. Having in mind that most vendors join the committees defining the according standard, I assume that a complete implementation of the standard is still further away. The awareness of this standard though needs to be kept to be able to react upon future possibilities.

The second standard is JSR-168 defining the possibility of exchanging content from one portal to the next – Web Services Remote Portlet (WSRP). In regards to an integration approach this standard becomes interesting as it possibly provides additional ways to integrate content formed into portlets within your CMS being integrated into your SAP NetWeaver Portal. Actually, the SAP NetWeaver Portal already supports parts of the WSRP standard.

Essentially, the implementation of the above standards can be expected to take place rather within ECM Systems. An additional perspective adds the fact that all ECM Systems are J2EE compliant. This compliance underlines the architecture of such systems to be very close and similar to SAP NetWeaver architecture. So naturally, the next evolution step is to port ECM Systems to the SAP NetWeaver platform allowing reducing the amount of hardware needed for an integrated solution. The final result would be that it becomes possible to deploy a high-end content management solution to the SAP Web Application Server (SAP WAS) which also runs your SAP NetWeaver Portal. Such a solution will not only reduce costs on the operations side but will also open doors in regards to functionalities and integration possibilities. Indeed, the first content management vendors have started such an approach and are taking the first steps of adjusting their solution to where it uses the SAP WAS as the underlying J2EE application server.

PRO	CONTRA
1. J2EE compliant	1. high cost solution
2. object-oriented content management	2. requires development of templates
3. highly flexible and extendable	
4. pre-packaged solutions/enhancements	

Quo Vadis

The classification of Content Management Systems allows for a more directed and controlled approach when trying to integrated additional content management features into a SAP NetWeaver Portal. The software market and its evolution have never come to a full stop and will certainly not in the future. Having the trends of the content management market in mind, such as the evolving JSR-170 standard, helps to align the existing requirements with the best fit of integration. The most important decision-influencing facts are the awareness of where SAP develops SAP NetWeaver especially in regards to KM and how vendors of content management systems understand their integration into SAP NetWeaver. Here it is important to make sure that the integration has been reviewed and approved by SAP. The assurance of such can be found with the SAP certification of the solution. In addition, an eye should be kept on the further evolution of SAP KM especially in regards to the JSR-170 standard and to the ECMS vendors porting their application onto the SAP WAS.

The project to integrate a Content Management Systems needs to strongly focus not only on technology but also on the influence of the CMS to the portal's role and navigation concept. It helps to come to a found understanding of the (unstructured) content's lifecycle beforehand. It needs to be understood who creates content and how it is being created; it needs to be defined who changes and deletes content. The outcome of this exercise is a content lifecycle concept that stands beside the portal's role and navigation concept. The project's outcome should not only present a seamless integration of two systems but should provide a solid basis for the maintenance of both in regards to role and content maintenance.

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