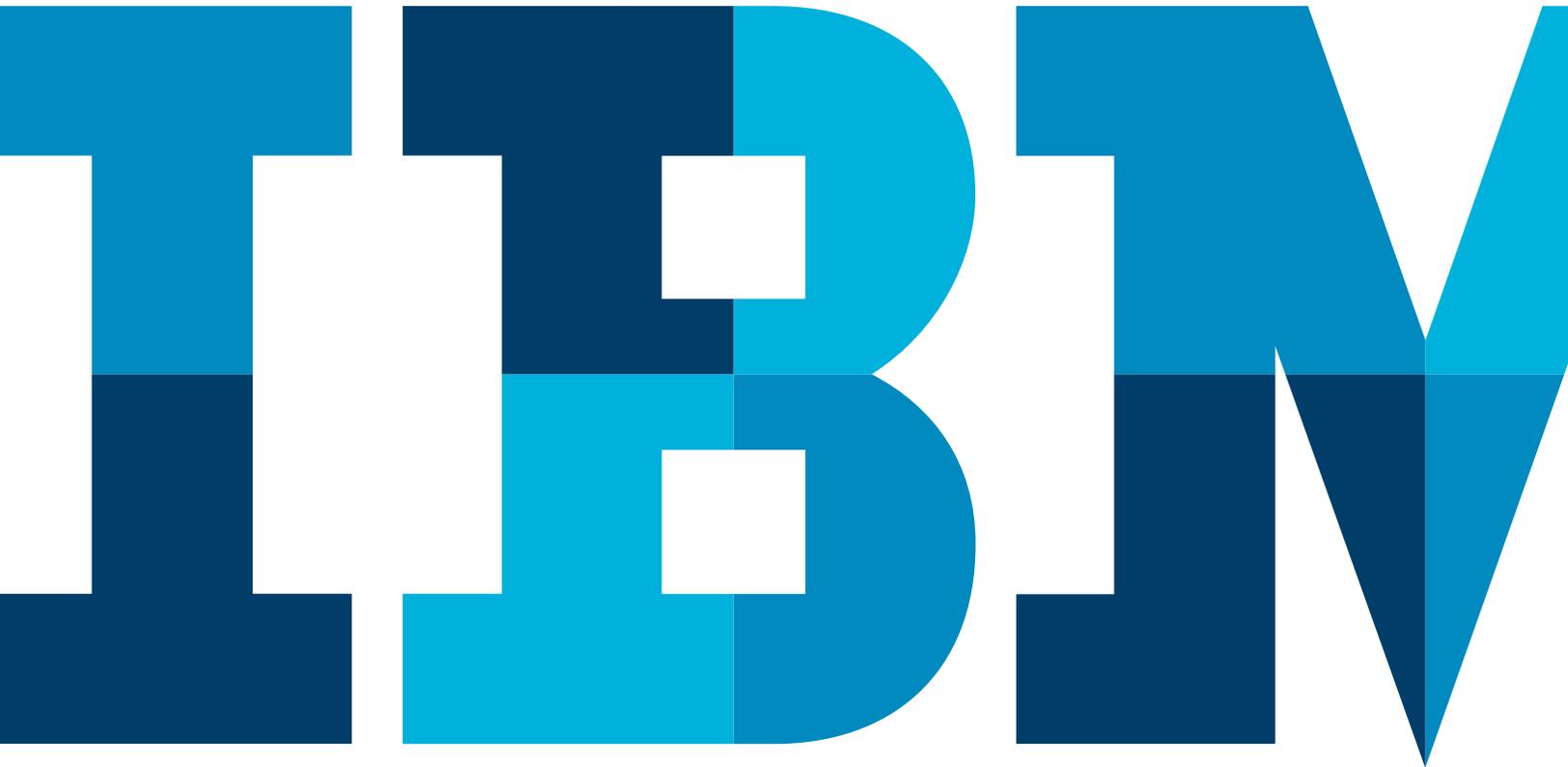


DMS, CMS and LCMS Comparison

A comparison of Document Management Systems, Content Management Systems and Learning Content Management Systems



Enterprises that have embraced a strategic learning approach acknowledge that the learning problems they face will not get solved without focusing on automating the process for development, management, maintenance and personalized delivery of modular learning. But, many times strategy decisions are made without understanding some of the fundamentals associated with an enterprise's learning content.

Because of the similarity of terms used in their names, ("CMS" in the term "LCMS") buyers are often confused as to why they need a learning content management system (LCMS) if they already have a document management system (DMS) or a content management system (CMS). In many instances, the confusion arises because of a lack of understanding between the roles of two such systems and the synergies that can arise from these systems working together.

Although robust enterprise learning applications include specialized content management functionality, the reality is the functional overlap between an LCMS and a traditional document management or content management system is small.

The assumption that learning content in whatever form is simply content creates the perception that existing content or document management systems can be used as an LCMS and provide for all of their learning content needs as well. The other issue is that the term "learning content management system" complicates the matter more, since it makes one think that the core of LCMS is content management. Actually, the core of LCMS is a learning application that deals with the development, management, maintenance and delivery of learning materials.

This paper will describe concepts surrounding the use of LCMSs as a learning platform working either as a standalone platform, or in concert with an enterprise content or document management system to meet the needs of the learning organization.

The Document/Content Management System

Numerous studies highlight that over 80 percent of a typical organization's content is unstructured. This content exists everywhere in the organization: engineering drawings and specifications to sales and marketing collateral; centralized servers and shared file systems to individual hard drives; and web-based sources such as wikis and blogs. Additionally, content may be highly accessible to the creators, but there is often no logical way for others to know the content exists or how to access it. Oftentimes, if a content creator—often a marketing professional or an engineer—leaves the organization, content stored on his or her individual computer disappears as the computer is overhauled for new use. Furthermore, documents exist in a wide variety of formats, which inhibits document sharing because the "read" technology may or may not be normally available. Finally, as an organization provides new offerings, products and services, the unstructured content continues to grow at a phenomenal rate. Because this unstructured content lives everywhere, workers must spend more time looking for the information that is pertinent to their jobs. The stark realization however, is that if existing content cannot be easily located by workers, it will most often be recreated.

The document/content management system horizontally addresses the inability to organize unstructured content across an organization by providing the capability to tag and categorize the content. This tagging and categorization is put into place by having the content contributors fill out information before or as the content is included in the system.

This newly "structured" content is now meaningful to the organization. Individuals can be pointed to the DMS/CMS to pull specific documents, search for drawings and find the answers to information within the categories. The DMS offers precise searching, easier navigation than uncharted file sharing systems and can be tailored to specific groups based on security. The DMS/CMS does not enable reuse

in traditional terms. Reuse within a DMS/CMS is typically characterized by finding the document, copying it locally, making changes and uploading the document under a different name, category, etc. This does not really constitute reuse—in reality, workers “re-purpose” instead of “reuse” the existing content.

The DMS/CMS as a content vault

Fundamentally, the DMS/CMS should be looked upon as a “vault.” This software vault behaves in much the same manner as the vault at your local bank. Essentially the vault is used to store things. It has no knowledge of what it stores but rather simply provides a location for those items.

Given the importance of the items within the vault, infrastructure exists to ensure the bank can maintain items stored within the vault. Security and access controls ensure that only authorized people can view and/or change the contents of individual containers within the vault during specified times. Logs exist to track who has signed-in and accessed the vault. Workflow exists to examine and catalog new items and track what was placed in or taken out.

Compare these physical vault functions with those of the typical document or content management system and one can see the many similarities. The DMS/CMS contains information that it basically knows nothing about except for the location and the information needed to find it again. It does not care whether the item is an executable piece of code or a 500-page document. The DMS/CMS system maintains access and logging for all items in the vault, and typically provides a defined workflow associated with getting content in and out of the system. Newly created objects are typically created outside of the system and then placed into the vault. As a result, newly authored items do not necessarily have any relationship to other items in the system other than potentially being located in the same section of the DMS/CMS. Just like the physical vault in which you may have a necklace in one container and a set of matching earrings in another—the vault does not know that they make a perfect set.

The Learning Content Management System

A generally accepted definition of an LCMS is “a system used to develop, manage, maintain and deliver learning content in a modular form,” as opposed to monolithic training. A learning content management application includes a specialized content management system built around the schema and best practices in instructional design and the delivery of high-impact learning. These systems serve up learning content created for the purpose of educating and supporting end-users. A learning content management system is generally implemented because learning managers and training coordinators realize training content is being duplicated for different outputs, and the one-size-fits-all, monolithic training is an inefficient way of developing, managing, maintaining and delivering content. In addition, organizations are demanding improved efficiencies from learning and development leadership, and end-users are demanding the availability of more and more learning content that can help them to perform their jobs more efficiently and effectively.

The delivery of modular and personalized learning can only be achieved with a system that can natively support instructional design concepts and schemas, and enables development, management, maintenance and delivery of learning content at a granular level which subsequently gets linked and assembled into learning modules. The fact that the LCMS provides the facility for the author to locate and reuse small chunks of learning materials and assemble them for delivery to a large number of output media is central to the critical need of an LCMS.

In order to meet the requirements associated with managing granular learning content, the LCMS has evolved into a platform with a repository that understands the structure, interactions and tracking required of learning content and has the concepts of objects, modules, lessons and topics required to support it. In addition, the LCMS must provide for traditional content management functions

such as versioning and security. Closely coupled to all of the above requirements is the need for authors to easily find and retrieve items for maintenance and for reuse, re-purpose and assembly into new learning materials. For this to work effectively, the LCMS must provide a robust metadata tagging, searching and assembly system.

Similarities and differences between a CMS and an LCMS

The similarities between the systems include:

- Storing content saved in any format
- Organization of content based on some hierarchy
- Tagging of content (simple tagging in the case of the DMS/CMS)
- Searching the content based on keywords or other documented methods
- Cohesive delivery of content
- Reporting on content usage
- User access control and logging
- Adding or importing content based on security

An LCMS system offers these characteristics that a CMS does not:

- Emphasis on content development including rapidly building substantial content against a learning content model (i.e., pre-populated with templates for learning objects)
- Granular searching of content objects for reuse and repurpose
- A deep understanding of the hierarchy associated with learning concepts and training
- Customized workflow as it relates to training and the creation of learning content
- Instructional design methodologies used to create/reuse learning content
- Deliberate inclusion of required learning content components: e.g., the ability to create and manage robust pre-and post-assessments to support prescriptive and adaptive learning

- Learning paths associated with job descriptions and career paths established, updated and used to help learners progress in a logical fashion
- Course completion and learning path tracking
- Compliance and certification tracking
- Deploying content to support Instructor Led training requirements (presentations, instructor guides, student guides) as well performance support, mobile or webbased training
- Deploying content in a variety of native formats based on the organization's and learner's publishing requirements

As you can see, both applications manage content and have the potential to overlap on some areas of basic functionality. However, the fundamental focus of each application prevents them from accomplishing each other's jobs.

To further the distinction between LCMS and DMS/CMS technologies we must look at the specific functions provided within a robust learning application such as the Kenexa® LCMS. The functional areas that make up the IBM Kenexa LCMS are:

Development

Successful learning requires quality content—therefore creation tools for an LCMS should make the content creation as easy as possible by including implementing instructional design methodologies, template use, and permitting reusability of content. The IBM Kenexa LCMS enables authors to create structured content aimed specifically at the purpose of creating robust learning for the end-user. Authorized individuals can quickly develop content using easy-to-use, forms-based tools or content contributors may use other familiar tools, such as Microsoft Word and PowerPoint. These files may be ingested into IBM Kenexa LCMS and automatically transformed into native IBM Kenexa LCMS content to be assembled into learning objects.

Management

The IBM Kenexa LCMS repository provides the foundation for the storage and management capabilities provided by the IBM Kenexa LCMS framework. All objects created within the authoring interface and media maintained in the media manager are managed in the IBM Kenexa LCMS repository. Content authored outside of IBM Kenexa LCMS based on learning industry standards such as SCORM or AICC may be imported and managed as reusable content in the repository. IBM Kenexa LCMS enables the creation of metadata associated with the different types of content that it manages as well as providing complete versioning, rollback and workflow capabilities for content managed in the repository. These capabilities include:

- Configurable metadata management enabling the creation of metadata tagging schema that supports any combination of industry or corporate standards
- Granular objects of any type and level can be linked, reused and repurposed
- Visual object reuse reporting and navigation
- Complete versioning with object history and version rollback
- Object check-in and check-out with locking and synchronization

Assembly

The IBM Kenexa LCMS framework and authoring interfaces also enable the reuse and creation of structured learning from previously existing content, eliminating the need to re-create existing content. The process of assembling content into more structured units is facilitated through a robust search capability and the use of structural templates that enable learning strategies to be implemented and enforced. Authors may search for previously created content and assemble it into logical units such as topics, learning objects, chapters and/or courses. This enables authors to link together existing IBM Kenexa LCMS content, SCORM or AICC content, or other externally authored content.

Delivery

In order to fully support personalized learning for end-users, content must be provided that is pertinent to users' jobs, learning styles and gaps in knowledge. Because IBM Kenexa LCMS manages content at a granular level and can dynamically assemble the content at delivery time, learning content may be adapted to the end-user based on information the system knows about them. This includes the ability to assess an end-user's knowledge levels through testing, and prescribing just the right amount of content to fit the knowledge gaps of end-users and dynamically adapting the type and amount of content that is delivered, as well as the "look and feel" based on a user's profile.

Publishing

Organizations often need to deliver learning content in a wide variety of media formats to support their learning strategy. The ability to publish multiple formats of the learning content from a single source of information rounds out IBM Kenexa LCMS's definition of an LCMS. IBM Kenexa LCMS's ability to separate content from format enables IBM Kenexa LCMS to serve as a publishing mechanism for content into a number of different formats. For example, content created for training end users on a procedure can be reused and published from the repository as a user guide, or as a job aid delivered from a PDA. Without any additional development work, content can be delivered in one or all of the following formats:

- Online courses through the internet, extranet or intranet
- Print documents formatted with a table of content, chapter breaks and appendices
- Presentation slides
- CD-ROMs
- Downloadable bundles for offline viewing
- Mobile devices
- Packaged in accordance with industry standards for easy transferability

Although there are some overlaps between the IBM Kenexa LCMS system and those features provided by traditional document management system, the IBM Kenexa LCMS system provides a much richer learning focus on all of these items. This seemingly functional overlap does not prevent IBM Kenexa LCMS from working in conjunction with a DMS/CMS. When overlaps in functionality do exist, the needs of the organization and the user population within it will determine which functionality is leveraged from the available systems.

LCMS and DMS/CMS integration points

Strategically, it has been determined that numerous integration points exist between IBM Kenexa LCMS and traditional document or content management systems. The following represent examples of the different levels of integration that can occur between IBM Kenexa LCMS and these systems.

Access IBM Kenexa LCMS content for deployment from existing DMS/CMS interfaces

In this example authors create learning content from within the IBM Kenexa LCMS application. When a course is ready for distribution to the end-user population, the action of setting the course into production registers a link in the CMS/DMS system to the learning materials stored in IBM Kenexa LCMS. Access to the learning content is controlled by the DMS/CMS interface. When the content is launched it is delivered seamlessly from IBM Kenexa LCMS, leveraging all of the IBM Kenexa LCMS delivery and tracking functions while leveraging the DMS/CMS user interface.

CMS librarianship

In this example the CMS provides for all check-in/checkout capabilities, storage, versioning and management of the learning content that has been created and assembled through the IBM Kenexa LCMS authoring interface. IBM Kenexa LCMS's dynamic delivery and its publishing capabilities are utilized to deliver content to the

end-user in the format that they need (e.g., e-learning, document, presentation and/or mobile). In this example we see the authoring, assembly, delivery and publishing capabilities of IBM Kenexa LCMS being leveraged together with the storage, management and distribution capabilities of the CMS/DMS.

Virtual repositories/CMS sharing

In this example both IBM Kenexa LCMS and the DMS/CMS provide search and link access to each other—content in one repository can be used by the other. This would provide the capability of creating content and storing it in either application and allowing IBM Kenexa LCMS's assembly capability to assemble building blocks from each repository into structured learning components. The content continues to reside in the repository in which it originated, and IBM Kenexa LCMS's dynamic delivery capability brings all the content together and delivers it to the end-user. For content that is stored in the CMS that is devoid of any formatting, one can use the IBM Kenexa LCMS publishing capabilities to deliver the materials in a different format. In this example we see the CMS retaining its storage, assembly, management and distribution capabilities, while IBM Kenexa LCMS is leveraged to provide the dynamic assembly and learning to ensure tailored content is delivered to the student.

Leveraging CMS/DMS content

As previously discussed, most of the materials stored within traditional CMS and DMS systems are not primarily targeted for learning and training. Much of what exists in these systems are design documents, functional descriptions, drawings, graphics, compliance and legal documentation, and other media whose purpose is to provide information to end-users. When learning or training is created, the information contained in the CMS/DMS is generally used as reference information or supplementary information for the learning. In this example the CMS/DMS serves as a repository for such reference information. IBM Kenexa LCMS, in turn, uses its authoring and assembly capabilities to include this

referential information as part of the materials that get presented to the end-user. IBM Kenexa LCMS authoring and assembly provide the framework for linking into the CMS/DMS system for this information. Upon delivery, IBM Kenexa LCMS retrieves the information from the CMS/DMS and displays it to the end-user. In this example we see the authoring, assembly and delivery capabilities of IBM Kenexa LCMS being used while leveraging the storage and management capabilities of the CMS/DMS for the information it traditionally will maintain. Content based on validated or controlled information can be automatically updated from the original DMS/CMS source.

These examples provide the framework for the strategic direction being carried out by IBM. It has been suggested that a possible solution to the perceived overlap between IBM Kenexa LCMS and the CMS/DMS is the use of a training authoring tool such as Toolbook or Dreamweaver and storing this content in a traditional CMS/DMS system for management of the training. It should be noted that this solution falls well short of the impact that a true learning application can have on the enterprise when working in conjunction with the CMS/DMS. This shortfall is predicated primarily on the inability of such a system to obtain the granularity necessary to assemble dynamic, just-for-me learning or the granularity required for any reusability of content within an object. As noted previously, DMS/CMS systems act like a bank vault, and as a result, have no knowledge of what they contain or how the content relate to each other. This is in direct conflict with the concepts associated with a learning application in which objects that support similar learning objectives need to be assembled into a topic, chapter, or course. The combination of authoring tools with a CMS/DMS allows for the management of whole courses but not the reuse and assembly of the components within the course. It also fails to achieve the goal of single sourcing where the content can be reused and reassembled into materials such as documents, PDA-delivered content, or presentations for instructor-led training.

Conclusion

As described throughout this document, the use of document management systems (DMS) and learning content management systems (LCMS) arise from completely different needs in an organization. The two systems may link to each other or work in concert in order to truly enable reusability of content. The need for a DMS is often a central document repository with easy navigation and search capabilities that may or may not have object or user tracking. An LCMS is organized for educational purposes specifically, with the ability to create, manage, maintain and deliver personalized content to a targeted audience. The combination of these systems' strengths provides for a robust environment which continues to serve the needs of their user base while creating a comprehensive system by which the enterprise can grow.



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