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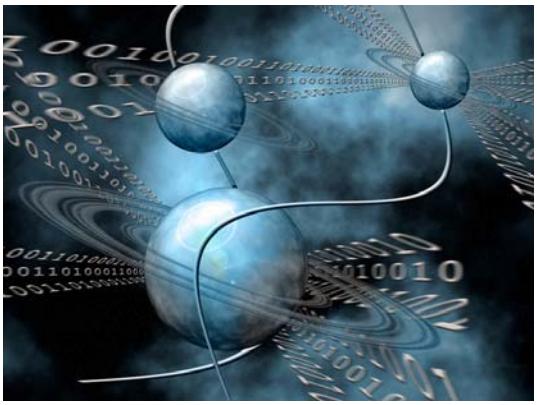

Reusability 2.0: At the Intersection of Learning and Enterprise Content Management

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By Bryan Chapman, Chief Learning Strategist
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Abstract: If your company is like most organizations, you likely have one or more content management practices already in play. Perhaps your company uses content management as the backbone for a dynamic, content-driven webpage; or maybe you share files with others from a centralized document management system; or possibly you have a database of standard operating procedures (SOP's) that govern the actions of all employees. Content management is a mainstream strategy for keeping up with a fast-paced business environment. At the same time in the same organizations, training professionals are either using or exploring how to leverage learning content management solutions for efficient content creation, reusability, and multimode content delivery. The problem is that the typical content management solutions operate in isolation and don't work well together...but that's about to change. This paper will explore how training teams are leveraging valuable content from other parts of the organization and identifying content that can be shared outward for the greater good of the organization. This paper will help you assess the current status of your content strategy and implement an 8-step model for mapping out an integrated content management approach which includes taking an inventory of your existing content, planning for reusability, selecting the right tool(s) for the job, and motivating content contributors to embrace the strategy.

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Introduction

Have you ever worked on a coworker's computer and gotten lost in his or her folders? Have you wasted time hunting around for a document, while trying to decipher the organizational schema? As individual computer users, we develop intuitive patterns and workflow around how content (digital assets) is organized for efficiency. Files that are most important and used most frequently are stored for easy access and use, while content used less frequently is systematically organized for reference purposes and future reusability. While a personal organizational system works fine for an individual, it becomes a hazard when others need to share files and content.

Most of us work as part of a team that may be part of a bigger group, located inside an even larger company. In this environment, our content management approach not only has to be well-defined, but also clearly understood by team members who will collectively share the vision of how content is used in relation to workflow. The symptoms of a company with a less-than-desired content management vision are as follows:

- **Content silos:** Critical content is often found on individual desktops or multiple servers and has to be manually searched out and requested to complete daily tasks.
- **Multiple versions:** If you've ever had to ask the question "who has the most recent version?" you know why this is a problem.
- **Redundant development:** If you are unaware that content similar to what you need exists, the natural course is to create new content, which results in both multiple versions and redundant content development.

Most training professionals have only limited influence on defining an organizational content management strategy, but there is something we can do about it. The purpose of this document is to outline how we, as training professionals, should position ourselves within the broader context of content management to 1) leverage content being used in other parts of the organization, and 2) prepare ourselves to be contributors, not just consumers, of shared content.

Enterprise Content Management Defined

In order to plan a cohesive content management strategy, it is important to understand some of the key components. Consider the following definitions:

Enterprise Content Management (ECM): Technologies used to capture content, store, preserve, and deliver documents and content related to organizational processes. ECM tools and strategies allow the management of an organization's ***unstructured information***, wherever that information exists. *Source: Wikipedia.com*

Content (in context of ECM): Information and experiences that may provide value for an end-user/audience. Content may be delivered via any medium. *Source: Wikipedia.com*

Learning Content Management System (LCMS): Multi-developer environment where developers can create, store, reuse, manage and deliver learning content from a central object repository. *Source: Brandon Hall Research*

Let's start with the broader enterprise. If your organization is like most, you have more than one content management technology in play inside your company. As the definition of ECM suggests, the documents and content in each repository serve the specific needs of each sub-group (see Figure 1.0). For example, the documentation department stores source material and print-ready versions of documentation in a central location where writers, graphic artists, project managers, etc. can pull up the latest and greatest version of books, manuals, and other print publications. Simultaneously in another part of your organization, the marketing and sales department stores the latest information about company products and/or services inside a management system or as redundant copies on each salesperson's computer.

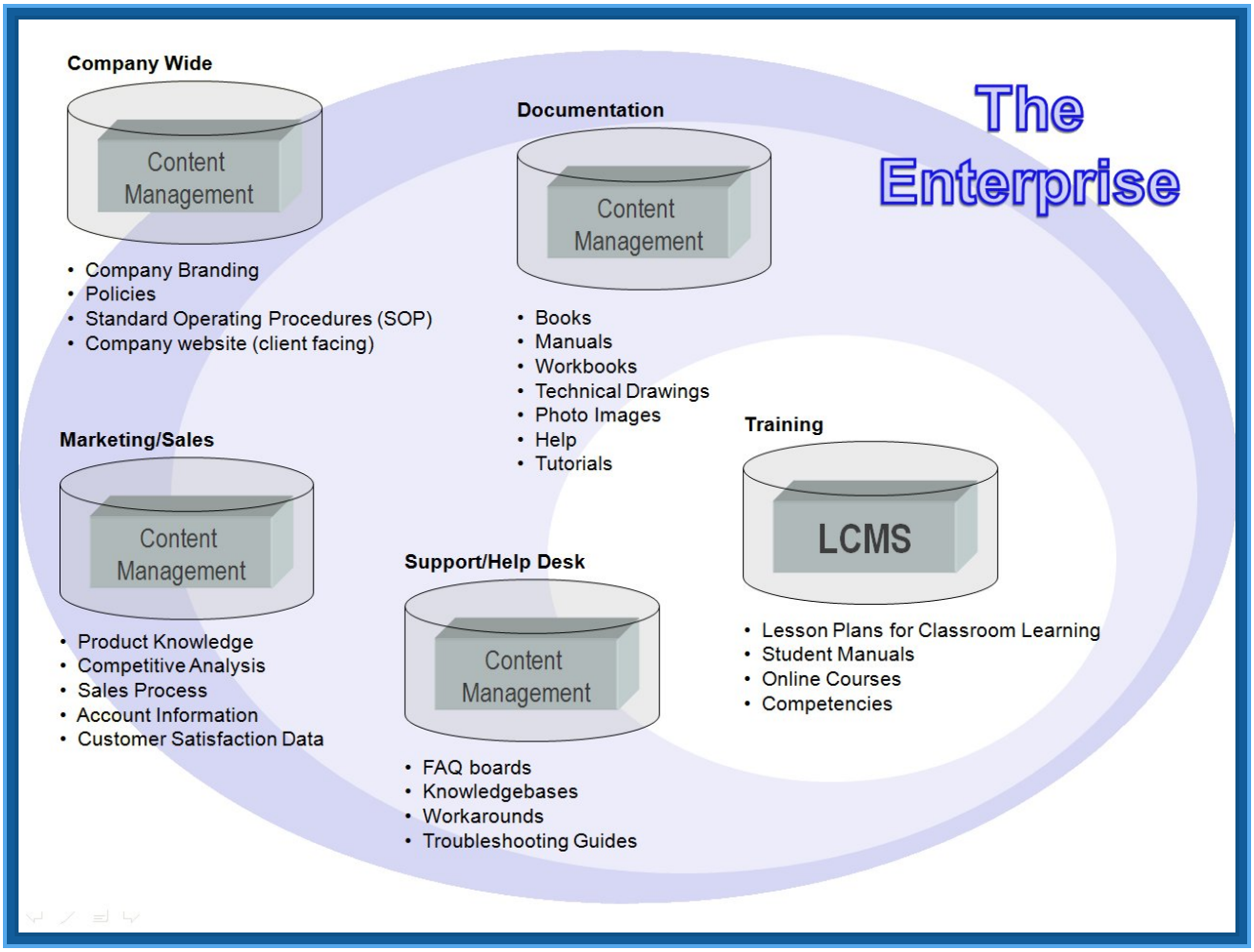

***Figure 1.0**: Most organizations have multiple content management systems in place*

In yet another part of the organization, training also owns and stores digital learning assets that are of great value to the company. The work we provide captures and stores information from subject matter experts on a wide variety of topics ranging from job-specific procedures, to leadership skills, product knowledge and sales techniques, how to run mission critical software, and any other content that has been deemed important enough to spend time and effort to transfer to our workforce. This information is generally contained within lesson plans used in the classroom, student manuals, and encoded into online learning courseware. Many companies that create large volumes of training materials have started to apply techniques to eliminate content silos within their own department, manage multiple versions of learning resources, and lessen redundancy in training development using LCMS's. However, using an LCMS in isolation only solves these issues at the departmental level, while the opportunity exists to more efficiently leverage content across the entire enterprise.

Think for just a moment about existing content in your company that would be useful for training purposes. How much of this content do you currently borrow and use in training (often creating another version of the content, resulting in duplication in development)? Here are some likely candidates for reuse within training:

- **Company policies:** Can be used as part of new hire orientation training and/or referenced from skills-based training
- **Company branding**: Including logos, color schemes, taglines, photographs, etc.
- **Product information:** Training for internal staff, partners, resellers and even customer training
- **Standard Operating Procedures (SOP's):** In highly regulated industries, this is critical teaching content.
- **Knowledgebases**: We use these for problem solving and to find the most up-to-date information. Does it make sense to merely "copy" this information for use in training or is there something else we can do?
- **Drawings and graphics:** Frequently used in documentation, but why not use the same drawings as a natural part of training?
- **Content as a product:** We live in the Information Age, when many companies sell content, whether as a main product line or in connection with our other products and services.

In the case study section, we'll analyze scenarios in which companies have efficiently leveraged these types of enterprise content for maximum benefit.

Stages of Content Management (from a Learning Perspective)

As you inventory content repositories across your company, you will most likely find that not all content is neatly organized using advance content management technology, and ready for use. Rather, you will encounter different stages of sophistication from very simple mapped network schemas to highly advanced, integrated-content systems. The following chart can be used to assess your own content management approach and classify methods used by others in your company (see Figure 2.0). These stages represent a natural progression and evolution.

Stage	Description
Stage 0	Content stored on user desktops
Stage 1	Shared files on mapped (network) drives
Stage 2	Basic content services such as check in/check out and access control (e.g., Microsoft SharePoint, Documentum, etc.)
Stage 3	Project-based content repository with workflow (stand-alone LCMS, reusability restricted to training applications)
Stage 4	Simple linking to external content management repositories, asset sharing (i.e., using protocol such as WebDAV)
Stage 5	Integrated content and workflow (communities of practice, team space/workgroups, centralized reach to extended content, defined delivery channels)

***Figure 2.0**: Stages of content management*

Stage 0: Content stored on user desktops
For very small companies and non-integrated workflow, Stage 0 may be sufficient due to limited time and resources.

Stage 1: Shared files on mapped (network) drives
As digital assets multiply, which is inevitable, greater efficiencies are gained by moving shared files to a common location on a company network. During this stage, there are usually discussions about how file folders will be organized to facilitate finding and using important files, and what file naming standards will be used so that end-users can recognize context and purpose of files without having to open each and every file. Mapped network drives solve the problem for some time, until someone starts to notice that files sometimes appear and disappear, or are changed without approval.

Stage 2: Basic content services
At this point, companies look to deploy traditional content management systems (CMS's) which provide better methods for managing master versions of critical files through check-in and check-out, secure access to files, archiving and roll-back to previous versions, and robust tagging and search capabilities to find content more efficiently. Typical tools used at this stage of evolution include Microsoft SharePoint, Documentum, Vignette, Interwoven, OpenText, and many other CMS technologies.

Stage 3: Project-based content repository with workflow
Companies move to Stage 3 when there is a demand to leverage content for multiple purposes and different target audiences. For example, a training department creates lesson plans in Microsoft Word and online learning courses using standard authoring tools such as Articulate, Captivate, Flash, etc. (desktop authoring tools). After some time, they discover a need to create multiple, derivative versions of courses for different audiences; that content needs to be more granular to support creating new versions of content; that there is a need to single-source content development to support a single production pass to simultaneously create lesson plans, student guides, e-learning courseware, synchronized PowerPoint slides for the classroom, job aides, and output to mobile learning devices. By definition, applying content management strategy to meet the single sourcing need is called "reusability 2.0." (For more information on reusability 2.0, you can visit www.xyleme.com and download a whitepaper on this topic entitled "Reusability 2.0: The Key to Publishing Learning".) In order to meet this need, some training departments have deployed LCMS technology, which allows users to create very granular learning-objects that can be combined for multiple purposes.

Other parts of the organization deploy project-based content repositories with workflows. For example, many technical support groups use this strategy to organize troubleshooting information into client-facing knowledgebases, complete with frequently asked question (FAQ) boards, procedural information for fixing problems, articles on topics of interest, etc. Again, the focus is not just on organizing the information but rather how content fits into workflow to maximize unstructured content. This application is fundamentally different from Stage 2 - *Basic content services*, where content is merely stored and retrieved on demand.

From a training perspective, many people ask how LCMS solutions are different than traditional content management solutions, which are both capable of storing and retrieving content. What makes LCMS technology different is that it allows individual content objects to be organized into structured learning courses, complete with testing, assessment, tracking interactions, and communicating learner progress with Learning Management System (LMS) technology for reporting purposes.

Stage 4: Simple linking to external content management repositories, asset sharing
Stage 4 generally begins with awareness that companies have content that exists external to the LCMS that is, in fact, valuable to the training group. If the training group is still working at Stage 0 – *Content stored on user desktops* or Stage 1 – *Shared files on mapped (network) drives*, then the only recourse is to make a copy of the content and embed it at the course level. This can cause some significant problems. For example, company policies should exist in only one location so that documented policies are always current and no one has to ask "Do I have the right version?" Fortunately there are standards for how disparate content management systems communicate with each other at the core level and make content in another content management system appear as if it were local to someone using his/her CMS or LCMS solution. One such common protocol is called WebDAV. Click here for more information on this protocol.

Stage 5: Integrated content and workflow
What often kicks off Stage 5, or the highest level of evolution, is the need to integrate content across several repositories into daily workflow and provide access to critical content at the point of performance. For example, tech support databases, used primarily by end customers, become a part of software application training. Standard operating procedures, owned and housed by Human Resources, become primary learning content that is intermingled with other opportunities to learn. Learning content from all

sources is available in different media and in different modalities such as just-in-time help or as part of structured courses.

In the next section, we'll look at three case studies that illustrate best practices and examples of converging learning and enterprise content management.

Case Studies

The following case studies demonstrate that there is not a one-size-fits-all approach for leveraging enterprise content. Each organization has their own needs related to optimizing learning and creating the right business case for creating an evolved content management strategy.

Case Study #1: Informa – Integrating Content and Workflow

Meet the company: Informa is the largest, privately-owned information provider to global academic and scientific, professional, and commercial markets via publishing, events, and performance improvement. The company has 10,000 employees with offices in 80 countries. Informa publishes 2,500 subscription-based products and services delivered electronically and in hardcopy, and 45,000 books. Each year Informa produces over 12,000 events, including thousands of training events, around the world. The company is the parent of several well-known performance improvement companies including Achieve Global (sales, customer service, and leadership training), ESI International (project and contract management training), and Huthwaite (sales performance training).

Challenges: Each of Informa's branded, performance improvement companies was independently experiencing the challenges of managing vast amounts of training content, including versioning and archiving reusable content. The Informa businesses were experiencing varying levels of difficulty adapting to new requirements around digital delivery of learning content. In addition, they were encountering severe production delays and quality issues delivering localized training and customized courses to global clients, which account for a significant portion of annual revenues. From the parent company level, the prospect of working on point-solutions for each line of business was extremely daunting and inefficient. Instead, the company determined that participating businesses could work synergistically to create a content management strategy and implement a common technology that could be adapted to support variable conditions in each brand.

Previous Methods of Content Management: Content in the form of source material, lesson plans, workbooks, textbooks, PowerPoint, e-learning courses, video, etc. existed in many locations with some files in silos on individual desktops (Stage 0), master copies of source and print-ready material on shared network drives (Stage 1), and content such as video and other media stored in content and video server locations (Stage 2). Most content existed as documents (Word, InDesign, etc.). Each time a customized or multilingual version was created, it required making a copy of the previous file and adapting it for its new use, which led to problems in updating multiple versions.

Solution: The parent company and stakeholders representing each of the brands formed a team to conduct a common needs analysis of business and technical requirements. The team was responsible for (1) analyzing output formats currently created by each of the companies, (2) walking through workflow and customization requirements, (3) looking at lifecycle management of company products, (4) assessing the feasibility of single-source development in support of multiple product outputs including lesson plans, student guides, reference material, e-learning, knowledge portals, job aides, and PowerPoint, and (5) making a preliminary plan for the migration of legacy content. During planning sessions, the team

mapped workflow commonalties and documented "use cases" (which describe a day-in-the-life of anyone who would interact with the system including content developers, administrators, project managers, contractors, and technical writers) to determine a content sharing strategy.

Tactical: In order to do it right, the team decided it would be in everyone's best interest to create a proof-of-concept before trying to create the entire system. Through further analysis, it was determined that the project would need the support of more than one technology, so they decided to engage the services of a system integrator with experience in both publishing and learning systems. Here is a list of some of the major sub-systems needed to make the project successful:

1. **Team space:** Beyond a simple document management system, it was important to the team to have a virtual community of practice; a place to collaboratively work on new projects. The basic idea is that any team member, whether a full-time employee or a contractor, can log into a project-based team room and instantly have access to all source material for the project, legacy content, workflow tools showing project status and who is working on what, design templates, automatic notification, and access to all resources through an extended search engine. Documentum was selected to fulfill this part of the system.
2. **Document/digital asset management system:** Underlying the team space is a robust document management repository containing all source documents, master files, and production-ready content organized and partitioned by project and company. Workers at each company only see content that relates to their projects. By centralizing all master documents, Informa is pooling valuable company assets that will not be lost, misplaced, or overwritten. Documentum was selected as the technology base for this part of the system as well.
3. **Publishing center:** To support advanced reusability by creating and repurposing granular content, the system also provides utilities for creating XML-based content. This part of the system is directly accessible from the team space environment and is responsible for single-source development of content that can simultaneously publish output to lesson plans, student guides, e-learning, synchronized PowerPoint and many other formats. The technology selected for this part of the project was Xyleme LCMS, supporting reusability 2.0.

The production system does an excellent job of integrating workflow and content. For example, when logging into the system, team developers are given a choice about what type of workflow to use, such as:

- Create a New Product (from the ground up)
- Level 1 Customization (take an existing product and change the look and feel and other branding information only)
- Level 2 Customization (changing instructional examples within an existing module)
- Level 3 Customization (adding new modules of content to existing course)
- Level 4 Customization (extensive re-write)

To accommodate variation in processes across the businesses, workflow can be adapted when needed through a visual workflow editor. Processes such as metadata tagging requirements, output templates, and subject matter expert sign offs and reviews are all under the control of each division.

Benefits/Results: One of the most significant contributions of the new system is the movement toward non-linear product development. Sections of course development can be independently created and reviewed without having to send around copies of individual documents. Reviews take place using the same technology used to create content.

Through the proof-of-concept phase of the project, many of the desired benefits have been achieved including:

- Decreased overall development time (once working through change management that occurs when moving from a linear design process to working at a granular level)
- Single-source production in support of multiple output formats
- Elimination of content silos (especially for content that exists only on someone's desktop)
- Exposed existing content held in the central repository to designers and authors through metadata and full-text searching tools
- OnDemand publishing through external print publishers (such as Docutech)
- Future proofing content; by creating content in XML, content remains separate from presentation and can be easily adapted as new technologies come along
- Reduction in engineering support. For this project any tools and utilities created benefit all stakeholder companies, minimizing the need to re-create the same solutions for use by different groups.
- Facilitation of language translations. XML is an ideal format for isolating language assets, having them translated (through outsourcing), then reapplying the new version to an output template.
- Substantial reduction in the time it takes to create custom versions of courses for customer by mixing and matching modules, adding or editing content, changing the look and feel, then re-publishing a new version

Lessons Learned: We asked this company what lessons they learned through the process that would help others who are making plans for applying enterprise content management as part of their learning practice. Lessons learned include:

1. Don't skip a detailed blueprinting process. It not only sets a proper level of expectations among stakeholders, but it also will help streamline the proof-of-concept and final deployment process, which will save you money in the long run.
2. We encountered some push back when our developers looked at the prospect of working in XML versus spending most of their development tool in old-familiar tools like Word and PowerPoint. You need to be prepared to show the benefit and work efficiencies of working at a granular level. We were glad that we took the time to produce a proof-of-concept because it allowed us to really show the benefits.
3. Make sure you have good representation from stakeholders on the front end of the project. This paid big dividends for us. It would have been a lot harder to try to bring others on board later in the project.
4. If financial justification for enterprise investment becomes a roadblock, look to other applications in the business that could benefit from a powerful core piece of software. This may be basic business document management, records management, or process bottlenecks that could benefit from a flexible business process management tool.

Case Study #2 - Pharmaceutical Company – Central Management of SOPs

Meet the company: This company is relatively small by pharmaceutical standards with just under 2000 employees. Although owned by a much larger parent company, this pharma doesn't share business or training practices with its parent and has operated autonomously since it began operations.

Challenges: Pharmaceutical companies are under regulation of the US Food and Drug Administration. By law, they are required to have thorough records of controlled, standard operating procedures for any practice related to research, manufacturing, and testing of drug products. The FDA requires pharmaceuticals to ensure that each employee completely understands and follows approved standard operating procedures based on a series of "Good Practices," such as Good Laboratory Practice (GLP), Good Auditing Practice (GAP), and Good Manufacturing Practices (GMP). Not only are pharma staffs required to read and understand the procedure, but the company is also under obligation to provide evidence that staff members have learned the procedure as well.

The challenge is that the company manages and updates standard operating procedures from a central database, accessible through the company's intranet. The training department monitored changes and worked them into training on the procedures, but soon it became apparent that the training group couldn't actually report which version of the SOP had been taught, putting the company in jeopardy of being out of compliance and incurring enormous fines. Something had to be done and converging enterprise content management and learning was the answer.

Previous methods of content management: SOPs were stored in a central database. When training created supporting learning materials they would extract a copy of the SOP from the database and create appropriate instructor-led and e-learning course materials.

Solution: Instead of using SOPs as source material, the training department decided to use them as front-line training in a blended learning environment. The group continued to create training around the SOPs. Through customization, they create a WebDAV interface between their LCMS (used to create learning objects) and the SOP database. In effect, SOPs appeared as primary learning content in their own content management system (Stage 4: *Simple linking to external content management repositories, asset sharing).*

Tactical: To create a curriculum in support of the SOP's, training developers started each lesson with a requirement for learners to read and digitally sign that they had both read and understood the content of the SOP. Behind the scenes, the SOP that learners read was literally coming from the master company repository, yet digital signatures were stored locally in the learning system. The version number of each document was captured each time the document was retrieved, so the tracking system always recorded the most recent version used. Following the sign off, learners received a brief exam of material they had just read. Training developers must keep close attention to changes in the SOP and verify that the questions match the content. This score provides further evidence that not only did learners read the material and sign off, but they also remembered what they had just read. Following the exam, a notification is sent directly from the learning system to both learners and their immediate supervisors indicating that further on-the-job training is required to complete the process. The learning system also provides a digital sign-off form to be completed by the supervisors.

In this case, enterprise content management allows documents to be externally housed, maintained and retrieved, while wrapping learning content around this critical document.

Benefits/Results: Previously, the company had maintained training records using manual, paper-based records. As a result of changing the routing of content and tracking the flow of content, records are maintained electronically making it easy to see when regulatory compliance issues are not met.

Lessons Learned: When asked what lesson this company learned through their content integration exercise, they made the following comments:

- We had some minor trouble in the beginning making sure everyone had access to both our LCMS and the SOP database, but working through the issues was well worth the effort. We now have extensive audit trails of how and when training took place and are ready for any future audit in this area.
- Reading alone doesn't make for very good training. It is much better to link the activity to other learning opportunities.

Case Study #3 - High Tech/Software – Linking Systems across Lines of Business

Meet the company: This company can be found among the Top Software 100. When it comes to leveraging advanced learning technologies and practices, this company had a very conservative approach to making change. In short, they were often the last ones to take a risk with emerging technologies.

Challenges: Several years ago, the company undertook a major initiative to become more unified in production and internal development. They quickly realized that there was an incredible amount of redundant development among the customer education group (learning/training), documentation, and technical support. Each group spent thousands of hours each year developing documented procedures of how to use their software application. To make things even more complex, the company advertised the ability to adapt their learning programs for specific customer needs, which often caused a synchronization problem between customized learning programs and online help systems. They decided to use a mixture of learning content management and enterprise systems to solve the problem.

Previous Methods of Content Management: Throughout this large company, the training group identified numerous content management solutions used in other departments. In fact, even within the documentation group, there were different content management technologies in play by product line. Tech support was using some standard web-based solutions specifically targeting knowledgebases and FAQ boards. Training had thousands of hours of e-learning created using standard, desktop authoring tools. These courses were not modular by design, so developers were required to open up the source files, then copy and paste the content to another location (not very efficient at all).

Solution: The company decided it was time to significantly decrease redundant development by applying an enterprise content management strategy. The movement started within the training function. Next, the people who created help systems for their software wanted to get involved with the project, and eventually the entire documentation team joined the project. They formed a content management committee and created a manual prototype of a master XML document that contained enough content about a single company product to support creation of manuals, lesson plans, student guides, and e-learning materials.

The first iteration of the project was homegrown. Without even using a content management system, they created small XML files and stored them in a Windows file folder (tree view). They created a rendering engine that would parse through the tree and create books, chapters, modules, and pages that mirrored the tree view, while literally adopting the name of each folder as the title for each section. For e-learning courses, modules and topics where created by parsing the same tree. The XML file (one per folder) contained all of the content needed to automatically create e-learning courses. Although this idea made it very easy for developers to quickly make changes and re-compile, they found the process difficult to manage and maintain. The manual process also didn't embrace reusability very well, so the committee decided to integrate enterprise-content management technology.

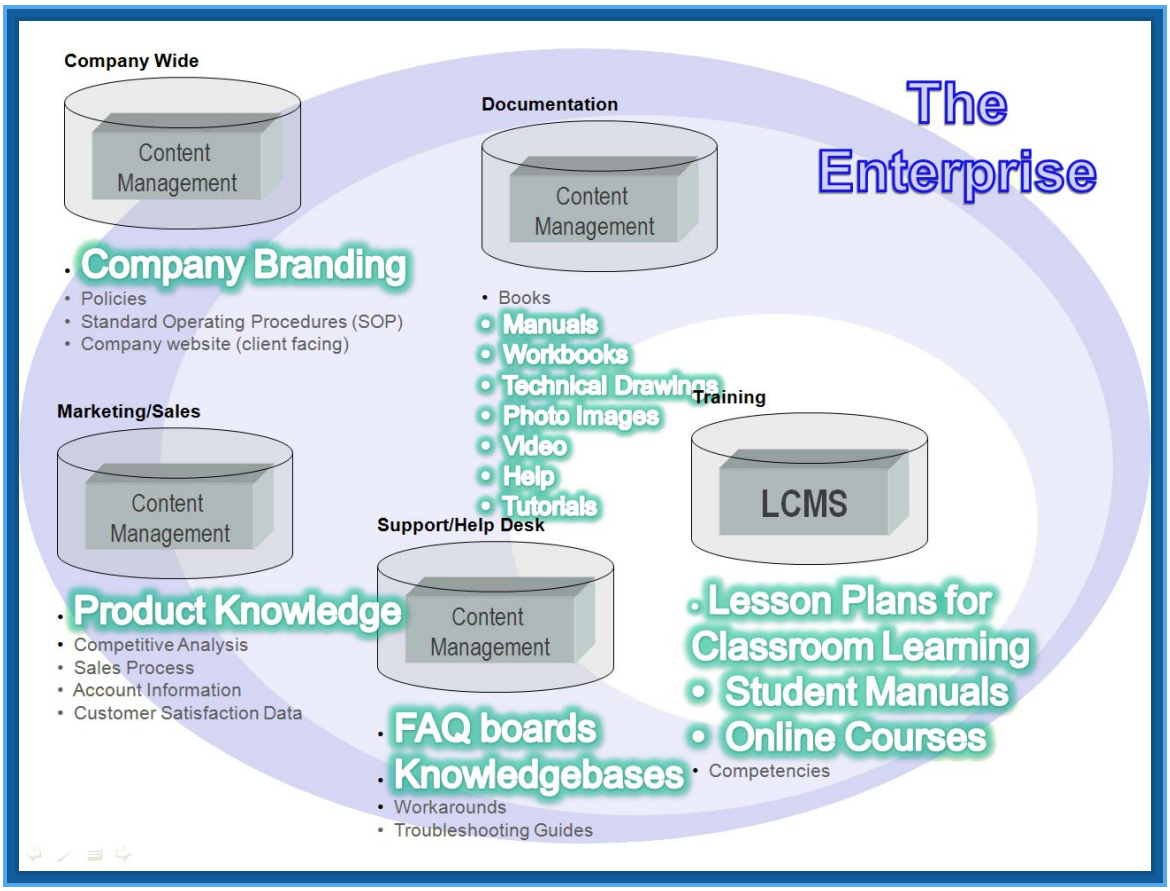

***Figure 4.0**; Software company shares content across the enterprise*

Tactical: Like Informa, the team created a detailed blueprint of how content could optimally be shared among company divisions. Three groups - training, documentation, and technical support - worked on the first (homegrown) version. For the next version, they brought in some other groups including marketing/sales that also had a need to scale learning and product knowledge training for sales staff, partners, and resellers. Instead of opting for a singular content management technology, the company decided to proceed with technologies already in place within each division. For example, documentation already had a media server in place to store items such as graphics (in different resolutions), video, photographs, animations used in help files, etc. In reality, media producers in the company were considered primary content contributors to the learning process, although most of them had no idea they were participating in the learning content development process. Graphic artists create technical drawings of company products which are metadata tagged and stored on the media server. The company even has a part-time video crew that shoots video of product demonstrations that are added to the repository.

By the time instructional designers are assigned to work on a project, they simply open the LMS and run a search across all repositories. Instead of starting their designs from scratch, they often find lots of material that has been prepared for other purposes. The media itself does not automatically become available to learners. Only through the instructional design process does content make its way into structured courses and in knowledgebases. The net effect is that content is readily available in support of all types of development.

Benefits/Results: This company has dramatically reduced development time for all output types in training, documentation, help system, tech support, and marketing/sales.

The company had been advertising their ability to customize learning content for customers. Before the content management shift, development costs were high and margins low. By investing in the technology and infrastructure, customization has become a highly profitable activity.

Lessons Learned: The training group at this company shared the following lessons learned through the content management conversion process.

- We learned a lot through our first experiment with creating small XML learning objects. This prepared us tremendously to make the shift to a full content management approach. The design of modular learning objects stuck with us. Making the changeover to creating content in modules was perhaps the hardest part of the project. It took a lot of patience to work with people who are used to writing lengthy documents.
- We also learned a lot by creating a prototype, long before we considered what technology to use. There are no standards that we know of to date that help you decide how to optimally design simultaneously for print-based learning and e-learning. Some things like objectives and information screens transfer directly, but much of the content needs to be purposely prepared for the correct output.

8 Steps to Create Your Own Enterprise Content Strategy

Creating your own content management strategy can be as simple as answering the following two questions:

1. What specific content exists in other parts of the company that could be leveraged by training?

2. What content does training have that could be used by other parts of the company?

Seems simple enough, doesn't it? The following eight steps provide a framework for working with members of your organization on a content management strategy that will benefit the entire company.

Step 1: Form a content management strategy task force

If you want to have a real and lasting impact with your content management initiative, you will likely be crossing a number of divisional boundaries to assemble the right team. You will be most effective if you consider these relationships to be mutually beneficial and not just for the purpose of increasing the amount of content available to training. Here is a checklist to help you find the right people:

- ☐ Learning Champion – someone who can speak on behalf of your corporate learning strategy.
- ☐ Knowledge Management System Owner(s) – if your company already has a knowledge management system in place containing valuable, centralized company assets, they will likely have some great information about what it takes to set up and manage a content management approach. Depending on the size of your company, there may be multiple KM owners.
- ☐ IT representative – you are going to need IT support to pull this off, even if you are planning on outsourcing to consultants. The IT person will know what common protocols are used for back office interoperability and communication. He/she will also be able to describe any challenges you will face with having systems communicate to each other.

- Specific Content Owners – throughout this report, we've talked about some of these owners such as documentation, tech support, and marketing/sales; but knowing your own company the way you do, there are likely other key players. For example, in a healthcare company, perhaps you will find a rich database with hundreds of case studies that can be used as teaching cases. Or, if you belong to an oil and gas company, there may be a repository containing research on exploration and production practices.
- Senior Management – having senior management sponsorship can mean the difference between creating a successful, long-lasting strategy versus a short-term, quick fix.

Step 2: Inventory existing content resources

As a team, the next step in the process is to inventory where synergies exist between content repositories. A healthcare company recently decided that it was time to merge their knowledge management and e-learning development practice so they convened to discuss what resources were available. The most important outcome of the meeting was that the inventory showed that only about 15% of the content contained in the company's eight content management repositories would have a direct impact on training. What was in the other systems? The other systems contained information such as confidential patient records, directories of doctors, background information, facilities, etc.

What did they find that was useful? They found a database of eyes, ears, nose and throat case studies complete with photographs, x-rays, and case write ups. It took a bit of work to remove confidential information and clear the use for teaching purposes, but it was like discovering a gold mine that saved the training group hundreds of hours of creating teaching scenarios.

The lesson learned? Keep it simple. You'll find lots of data that isn't useful, but you may also discover some unexpected surprises.

Step 3: Map content to critical workflow

Do you have process documents that sit on the shelf and gather dust? Many companies do. We've seen them. Start making your content actionable by placing it along the critical path where it is most useful. For example, let's say your job is to train automotive repair technicians. Somewhere in your company, there are volumes of "fault isolation trees" that prescribe best practice diagnostic approaches. If the content is readily available, make it available to your courses designers, or better yet directly to learners. You could teach them both good troubleshooting techniques and also how to find information for scenarios not covered in class.

Step 4: Determine Output Types and Reusability Options

One of the best ways to map content to output is to work backward. Start with training materials and training products you produce and work backward through the process, asking at each step, "What content, workflow automation, templates, or anything else would make products like this come together better, faster, cheaper?" Then, make a plan on how to move that data closer to the production process.

Here's a great exercise that will help you to see this clearly. If you already produce both instructor-led training and e-learning, and especially if you create similar content in both formats, dissect the content and look at how many times the same content was created twice to produce both deliverables. In most companies, the ILT course is created first, and then turned over to specialist to convert the same assets

into an e-learning course. This is NOT an efficient process. Learning Content Management Systems hold the key to more fully automating this process, while eliminating redundant tasks.

Step 5: Blueprint your content management strategy as use cases

Draw a picture of how content flows through your development process. This picture can be the catalyst for making new discoveries about how to bring workflow and content into perfect harmony.

The key during the blueprinting process is to describe how users interact with the system in very specific terms. Use cases do much more than simply describe features and functions you want in a content management system. The following example shows the difference between a feature and a use case:

Feature	Use Case
Manage Changes in Documents	When customizing a lesson plan for the purpose of creating a new derivative version, the system must keep both the original version and only specific changes made to the new version. In short, we don't want the content management system to create a copy of the document that must be updated separately.

See the importance of the specific use case?

The most important thing about writing good use cases is that they can be used when evaluating appropriate technology for your content management platform. Instead of inviting a vendor in to give a standard demonstration, invite them in to specifically address how they will meet your requirements as stated in use cases.

Step 6: Find the right tool(s) for the job

There are three main technologies to consider here. Depending on the sophistication of your content management strategy, you may need to use multiple technologies working in tandem (i.e., Informa Case Study) or you may be able to meet your needs by using just one of them. Here are the types of technologies you will encounter in your search:

- **Traditional Content Management Systems (CMS):** If you are looking for Stage 2 – *Basic services* content management, using a content management system alone will work well. CMS products will allow you to compile content into print-based deliverables and web content, but they lack the native ability to assess learner performance and track completion of course materials. Some of the tools in this category include Microsoft SharePoint, Documentum, Vignette, Interwoven, OpenText, etc.
- **XML publishing tools:** These tools are designed primarily in support of print-based publishing with some abilities to deploy content on the web. If you plan to create documentation or print-based learning, this category of tools may be a great place to start. Without extensive customization, XML tools by themselves are not generally configured to support interactive learning, tracking, structured courseware and assessment. Some of the tools in this category include ArborText, Vasont, and XMetal.
- **Learning Content Management Systems (LCMS's):** Some LCMS tools are ideally suited for organizing learning content and delivering it in multiple formats. Although they can perform basic document management and also have workflow capabilities, they may not be as robust in these areas as traditional CMS's.

Step 7: Prototype and Proof of Concept

Before moving to full deployment, we recommend using your selected technology to create a prototype and proof-of-concept. This serves two main purposes. First, you can work with your design characteristic, and match desired output types; and secondly, the prototype and proof of concept become your main teaching aids to demonstrate the power of using content management to create learning. In a fully functional prototype, you will be able to demonstrate (using your own internal practices and outputs) how to:

1. Decrease development time through modular design and development
2. Create multiple output types through a single-source development process
3. Revise and update content in minutes without creating a new version of the content
4. Translate content into different languages without creating a new version
5. Integrate workflow and content into a seamless process

Step 8: Change Management - Evangelize Modular Design

Although this is listed as the last step in the process, it is proposed that you begin this step at the outset and run it concurrently through the entire content management adoption cycle. It is important to make sure that content developers realize the benefits of content management as demonstrated through prototyping and proof of concept, and that linear design will simply not allow them to keep pace with rapidly changing business practices.

Summary and Advice

Every organization, regardless of size, needs a proactive content management strategy. Perhaps we are not all ready to leap to a Stage 5 – *Integrated content and workflow* solution, but we can put the wheels in motion toward better content sharing across the enterprise, even if today's solution is to implement content management techniques within our own department or division.

We've learned through the case studies that content management is worth the effort. Gains in efficiency are abundant to those who put forth the effort.

Remember that success is not determined merely by the technology you choose. Technology is an enabler, but is NOT the key to leveraging ECM. The biggest challenge is collaboratively creating a plan that benefits all stakeholders and results in new and improved efficiencies in workflow, optimal organization of learning content, change management, and new and improved ways to meet current and future business and learning needs.

About the Author

Bryan Chapman is Chief Learning Strategist at Chapman Alliance, a provider of research-centric consulting solutions that assist organizations to define, operate and optimize their strategic learning initiatives. As a veteran in the industry, he has over 20 years experience and has worked with organizations such as American Express, Shell, Kodak, Sprint, Sharp Electronics, Honda, IBM, Microsoft, Avon, UNICEF, The Food and Drug Administration, U.S. State Department to help them optimize learning efficiency through the use of innovative learning techniques and technologies.

Bryan was formerly the Director of Research and Strategy for independent research and consulting firm Brandon Hall Research, where he served as the primary author and researcher on high profile projects such as the LMS Knowledgebase, LCMS Comparative Analysis Report, Comparison of Simulation Products and Services, and a comprehensive study of custom content developers in the industry. In addition, Bryan was responsible for structuring Brandon Hall Research's consulting practice. He continues to provide technology-selection services in partnership with Brandon Hall Research as a registered Associate.

Chapman Alliance
(801) 568-7011
bryan@chapmanalliance.com

