Healthcare Training Content Management Strategies Whitepaper

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1.0 INTRODUCTION

The *Pharmacy Technician Training Program* will be a source of training for Air Force, Army, Coast Guard, Navy, and VA Pharmacy Technicians. This blended program will meet goals of the stakeholders as well as the Advanced Distributed Learning (ADL) vision to "provide access to the highest-quality learning and performance aiding that can be tailored to individual needs and delivered cost-effectively, anytime and anywhere." The training will be conducted at the Military Education and Training Campus (METC) at Fort Sam Houston, Texas, throughout the Veterans Health Administration (VHA), and at government locations throughout the world.

Concurrent Technologies Corporation (*CTC*), as part of the *Pharmacy Technician Training* project, was tasked with recommending an approach for storing, discovering, retrieving, and managing sharable healthcare training content. The *Pharmacy Technician Training Program* is a catalyst for exploring the concepts presented in this paper, however this whitepaper is written within a context of sharing healthcare training content across all federal agencies that provide healthcare training. It looks at goals that will support this aim and that are achievable within the next five years.

The whitepaper is intended to convey concepts and recommendations. To aid understanding, the concepts are presented in a general form, without specifics relating to particular organizations or programs. This approach also aids in the transference outside federal healthcare training as these same concepts can be applied to other groups of organizations such as state and local governments, commercial entities, and communities of practice other than healthcare.

1.1 Benefits of Sharable Training

In this whitepaper, "sharable training" refers to training objects (typically e-learning, but may include other delivery methods), which are shared across multiple organizations. Before noting the benefits of sharable training, it may be advantageous to answer a more basic question: "If sharing training is so beneficial, why haven't we done so in the past?" The simple answer to this question is that the technological solutions have only recently matured to provide the capabilities required to support truly sharable training materials. The more complicated answer centers around national and world economic pressures which are forcing organizations to streamline processes and products for maximum efficiency.

The potential benefits of sharable training are substantial. Most significantly, sharable training impacts an organization's bottom line by saving money and other resources that would have been applied to the acquisition or development of training materials. Sharing also encourages the development of standards and where standards exist, interoperability and overall quality improve.

At the operational level, sharable training provides flexibility to both learners and instructor/trainers. In conjunction with technology that supports sharability, training may be easily customized to different groups and individuals. When used as a supplement to resources already available to content developers and training administrators, sharable training adds value with minimal additional cost or effort. This results in learners getting just the information they need, right when they need it, from valid and up-to-date sources.

1.2 Healthcare – An Ideal Proving Ground

Healthcare is an ideal industry for proving out concepts related to reusability. The field has common goals and purpose, tried and true practices, accredited job functions, and established forums for communication and collaboration. The knowledge, skills, and abilities (KSAs) required in healthcare professions are similar, if not standard, throughout the industry. Medications are a good example of this. Medications are used in the same way and have the same effects on people regardless of the environment in which they are administered—a hospital, doctor's office, ambulance, nursing home, or battlefield anywhere in the world.

1.3 Definitions

The following terms are used throughout this whitepaper.

Community of practice – individuals or organizations that interact to learn from each other as they strive to reach their common goals. Common practices often emerge from these groups.

Content object – "chunking" of instructional activities according to a learning taxonomy (i.e., course, module, or lesson). Where reusability is a goal, content objects are usually organized by the smallest piece of complete content—typically a single learning objective.

Learner/performer – the individual who is receiving the training. When on the job, the learner is a performer (performs job functions with expertise acquired in training).

Learner profile – data record within a Learning Management System (LMS) that captures information about a learner, such as competencies, training records, and other personal characteristics.

LMS administrator/content manager – this individual, group, or committee may go by various names. Within this whitepaper, this title refers to those who plan, configure the system, and implement learning interventions within an organization.

Professional profile – not to be confused with the learner profile in the LMS, a professional profile is a means of verifying professional credentials and listing undergraduate and professional education.

Organization – an entity that may make up a community of practice: businesses, agencies, consortiums, etc.

Sharable content – training objects (typically e-learning but may include other media and delivery methods) which can be shared across multiple organizations.

Sharable Content Object Reference Model - The Sharable Content Object Reference Model (SCORM®) is a common technical framework that provides guidelines, specification, and standards for the creation of reusable and sharable content objects (Advanced Distributed Learning, 2008).

2.0 TRAINING WITHIN ONE ORGANIZATION

Before exploring the topic of sharing training across multiple organizations, it is advantageous to define a typical training system in a single organization. The following description explains the relationships among components that might be found in an organization's training system.

To accomplish its mission, every organization provides direction and structure to its organizational functions. Organizational personnel perform in job roles which contribute to accomplishing the organization's mission. The end goal for each employee is optimal job performance. Job performance is defined in terms of competencies, or the knowledge, skills, and abilities (KSAs) the employee must demonstrate for optimal job performance. Performance-based strategies define competencies specific to organizational job roles. Employees are assessed on the required competencies for their job role to determine levels of proficiency. Where employees do not meet the required levels of proficiency, interventions, typically learning interventions, are invoked. Competencies are mapped to training content, often in the form of courses, which the employee completes to gain the needed KSAs. The content may be developed internally or acquired from external sources.

A LMS is the point-of-entry for learners, and provides the interface for them to interact with the training. Employee competencies, training records, and other personal characteristics are captured as a learner profile in the LMS or other data tracking system. When learner profiles are combined with the capabilities of many LMSs and SCORM, training can be tailored to each individual learner's needs.

The training courses themselves or their individual content objects must be accessible to the LMS. A repository functions as a holding tank for content, containing content objects, courses, and assets. A repository may be either internal or external to the organization, but should be a secure place to store and organize content, as governed by policy and procedure.

Content objects are usually found through LMS course catalogs and/or search functions on the catalog. In some cases, metadata may exist, or the LMS may support advanced searches, though finding objects may be as simple as performing keyword searches.

The LMS administrator/content manager role encompasses functions as diverse as monitoring and updating data, interfacing with learners, and resolving LMS/repository issues.

Figure 1 illustrates a typical training system as described in this section.

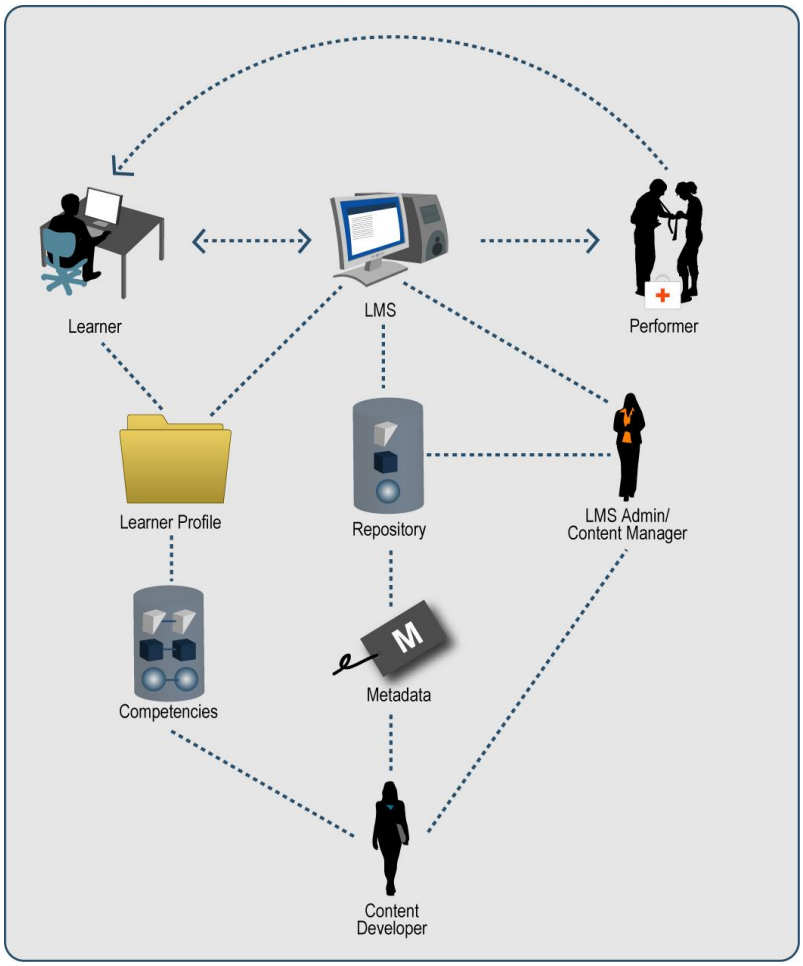


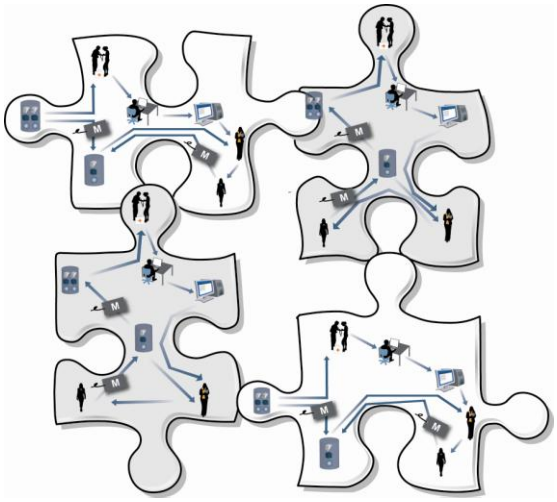
Figure 1. Typical Organizational Training System

In some organizations, in addition to the LMS, a Learning Content Management System (LCMS) is used to develop, store, perform content administrative functions, and/or deliver content. It is currently common for organizations to use either the LMS or the LCMS as a default content repository.

A strategically constructed training system allows organizations to get the right training to the right people at the right time. It helps the organization adapt to meet emerging needs, changing business conditions, job functions, and personnel changes.

3.0 SHARING TRAINING ACROSS ORGANIZATIONS

Now that the benefits of sharing training have been identified and the typical training system in a single organization has been defined, it is possible to analyze the cumulative effect across a community of practice. Healthcare-providing agencies in the federal government are an example of a community of practice. Each agency has a training system in place. How can these systems fit together to create a cohesive picture that attains the benefits of shared training while preserving organizational individuality and autonomy?



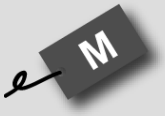
To be viable, shared training must be transparent to the learners and the individual organization.

3.1 Sharing Training Across Organizations – A Natural Fit?

An integrated training system begins with the discrete components that constitute the training system at each organization. Assuming an organization has a functioning training system as described in Section 2.0, each component of the training system can be examined for its degree of "fit" in the context of shared training across a community of practice.

Table 1. Effect of Sharing on Training System Components

Training System Component	Degree of "Fit"
Learners 	Learners benefit from sharing by increased access to up-to-date training related to their jobs. Otherwise, learners should be relatively unaffected.
Job roles (performers) 	Job roles for an organization are specific to that organization and remain unaffected by a strategy to share, though they may be similar to job roles in other organizations.
Competencies 	Where organizations perform similar functions, the associated competencies would also be similar. For shared training then, organizational competencies must be in alignment with the competencies upon which training obtained from other sources is built.

Training System Component	Degree of "Fit"
Learner profiles 	Learner profiles are specific to the learner's organization. In the case where learners move from one organization to another, the degree to which the format of their learner profile matches the profile at their new organization will aid, and potentially simplify, the management of the learner's training in the new organization.
LMS 	Theoretically, an organization's LMS is unaffected by a sharing strategy as long as the LMS conforms to established standards. Options for learner access to shared content are explored in Section 3.2.
Content repository 	An internal organizational repository would be unaffected structurally by a sharing strategy. However, there would be more sources for content that may be stored in the organization's repository.
Metadata 	Metadata facilitates the discovery of learning objects in a repository or LMS. As long as metadata is implemented consistently across an organization, it should function for that organization. Metadata may be impacted in a shared environment if the metadata an organization records is not compatible (i.e., not a common metadata taxonomy) with metadata used by others in the organization or in the community of practice.
Content developer 	The role of content developers would remain the same. However, this group would have additional resources for the acquisition and/or creation of content.
LMS administrator/ content manager 	The role of LMS administrators/content managers would remain essentially the same, though they may have additional job functions such as collaboration/communication with other organizations and conformance with various standards in the community of practice. They also would benefit from the availability of additional resources.

At the outset, it appears that individual organizations would be affected in beneficial ways by efforts to share content across organizations. In initial practice, it has been more complicated, since some of the elements, as discussed in later parts of this whitepaper, are not yet fully implemented. Efforts such as the Pharmacy Technician Training project are leading the refinement of processes, the improvement of methods, and the development of best practices.

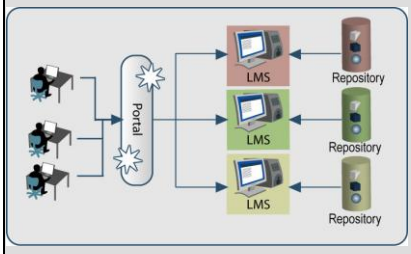
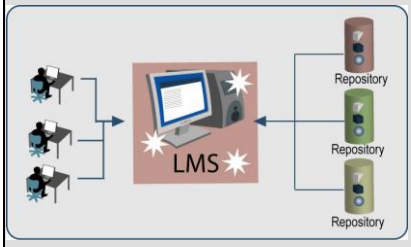
3.2 Learner Access to Shared Content

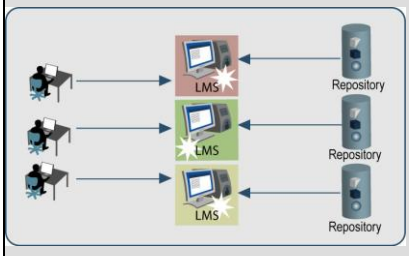
LMSs are the means by which learners access training content. Within an organization, the LMS is generally a single point-of-entry to all training, requiring a single login/password. In a world

where training is shared across organizations, how will learners access training that originates from sources outside the organization for which they work?

The advantages and disadvantages of some options for accessing shared healthcare training content in our example community of practice are compared in Table 2. Authentication is represented in each of the graphics by starbursts.

Table 2. Options for Learner Access to Shared Content

Option for Accessing Content	Advantages	Disadvantages
Portal Grants learners access to an LMS based on the learner's profile or organization; the point-of-entry is common for the entire community of practice, but the LMS is specific to the organization or employee  	• Everyone in the community of practice will go to the same place to access training • Logins managed, even if learners need to access LMSs from other organizations • Authentication managed by central authority • Each organization will still have their own LMS, allowing requirements outside the community of practice to be met • Expedites the tracking of learner profiles if they move between organizations	• Central authority must be determined; will require another layer of bureaucracy • Policies and procedures may make this option slow in implementation • Possible loss of identity of organizations • Difficult to integrate all training system accounts into a single secure database • Licensing issues when users need to access LMSs other than the one that belongs to their organization • Tracking of learner profile information becomes problematic when the profiles of one or more communities of practice are managed outside the organization
Single LMS One large LMS that supports the entire community of practice  	• Only one LMS, no need for secondary systems • Administration centralized • Only one cost (though it may be very large); costs could potentially be shared, particularly for maintenance; license costs may be lower per person • All the courses would be available from the LMS; no need to get access to a different LMS • Expedites the tracking of	• Central authority must be determined; will require another layer of bureaucracy • May be difficult for a community of practice to agree upon the requirements of the LMS, making the procurement or development of the single LMS difficult • Organizations may decide to implement their own LMS (or keep their legacy LMS) in order to meet organization-specific needs or needs of other employees who don't belong to

Option for Accessing Content	Advantages	Disadvantages
	learner profiles if they move between organizations	the community of practice • Could have multiple administrators for the single LMS (one administrator per organization), but that may result in too many people having access to accounts. Still would require a master administrator to manage the administrators • Policies and procedures may make implementation of this option slow • Access and control procedures will be dictated by the software of the single LMS, rather than policy • Possible loss of identity of organizations
Organizational LMSs Assumes adherence to common standards 	• No need to agree on a common system • As this is the current state, relatively little disruption to regular business practices • Mostly managed by individual organizations, simpler management and administration • No additional levels of bureaucracy needed • LMS serves needs for whole organization, not just healthcare • Each learner has a single point-of-entry into one LMS • Would follow common methods and standards for healthcare training and tracking agreed upon by the community of practice • Organizations could maintain their internal policies and procedures	• Differences between LMSs, or LMSs and other tools that do not conform to agreed upon standards • Requires an access point for content from other sources in order to eliminate need to access other organizations' LMSs (e.g., a common repository) • When learners transfer to a different organization, they will be required to access and learn how to use the system at their new organization • When learners transfer to a different organization, any learner profile data, if not standardized, may be difficult to move to the new system

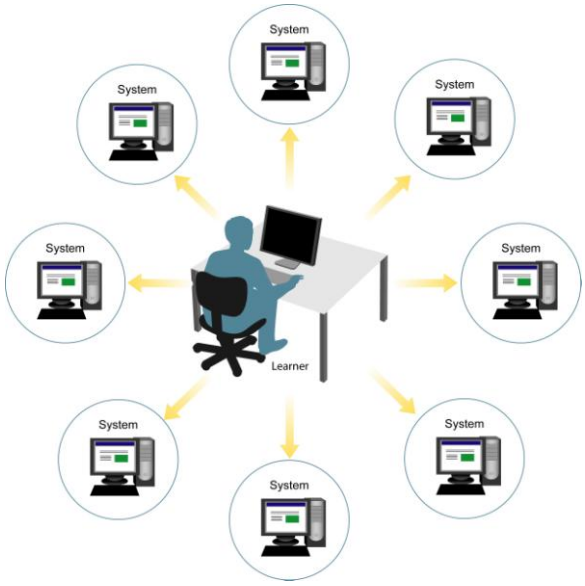
Authorization, access, distribution, and delivery are key to the ability to share training. The methods used must work for both the organization and the individual employees, recognizing that each organization will have employees from many different communities of practice.

3.3 Initial Efforts for Sharing Healthcare Training

Most organizations within the federal healthcare training community of practice are currently focused on implementing an organizational LMS. The current state of their efforts ranges anywhere in the process from defining requirements for LMS procurement, to organizational deployment, to refining policies and procedures based on use of the implemented system. Additionally, these organizations are seeking to meet the training requirements of their workforce through the development and/or acquisition of training content.

As the benefits of shared training have become apparent, a variety of approaches have been discussed and attempted within the federal healthcare training community of practice. The efforts of organizations within the community of practice should be commended, as they are being pursued in the midst of challenges and uncertainty. Several organizations are attempting to open up their systems to learners external to their organization or to share training developed internally with other organizations. There are also efforts that involve the coordination of content development, the potential for shared objects and assets, LMS access, and other related tasks across organizations.

These efforts signal progress and point to the feasibility of sharing training across a community of practice. While movement is in a positive direction, the results sometimes leave learners and training administrators to find their way through a complicated web of systems, policies, and available content. For instance, it is not uncommon within some organizations for new employees to be required to access four or five different systems to get the training they need.



It is clear that future methods for sharing training across organizations must be transparent to the learner, allowing them to focus on the task at hand, gaining the capabilities they need for optimal job performance.

3.4 Standards and Forums to Promote and Facilitate Shared Healthcare Training

In order to share training across organizations, forums for communicating needs and formulating strategies across organizations are required. For instance, the development of the *Pharmacy Technician Training* program was sponsored by the VA/DoD Joint Executive Council (JEC) and guided by the VA/DoD Health Executive Council (HEC) Continuing Education and Training Work Group (CETWG). These councils were established to facilitate collaborative initiatives

and work groups/task forces that have emerged from the initiatives. These efforts show the commitment of the VA and DoD to increase sharing across federal agencies (VA, 2008).

Another initiative sponsored by the federal government to foster sharing across organizations is the ADL Initiative, sponsored by the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD P&R). It is a collaborative effort between government, industry, and academia to establish a distributed learning environment that permits the interoperability of learning tools and course content on a global scale. The ADL vision is to "provide access to the highest-quality learning and performance aiding that can be tailored to individual needs and delivered cost-effectively, anytime and anywhere." SCORM is one part of the ADL Initiative. More information about ADL can be found at http://www.adlnet.gov.

A related organization dedicated to global collaboration and sharing across disparate organizations is LETSI. LETSI (Learning-Education-Training Systems Interoperability) is an international non-profit federation dedicated to improving individual and organizational learning and performance. LETSI's mission is to promote increased global adoption of e-learning. One of the ways that this is accomplished is by providing leadership and vision across multiple markets and sectors (e.g., healthcare). MedBiquitous (described in the paragraph below), along with eleven other organizations – ADL included, is a founding sponsor of LETSI. These organizations are assisting with the formation of LETSI. More information about LETSI can be found at http://www.letsi.org.

Within the healthcare industry, a not-for-profit organization called MedBiquitous—an international consortium of professional medical and healthcare associations, universities, and commercial, and government organizations—is dedicated to advancing healthcare education through technology standards that promote professional competence, collaboration, and better patient care. MedBiquitous' efforts currently include standards development for professional profiles, healthcare learning object metadata, SCORM for healthcare, virtual patients, medical education metrics, activity reporting, competencies, and other areas related to healthcare education and training (MedBiquitous, 2008). More information about MedBiquitous can be found at http://www.medbiq.org.

4.0 CONTENT MANAGEMENT STRATEGY RECOMMENDATIONS

Content management involves the processes and systems for the creation, storing, discovering, and accessing of training content. The recommendations in this section are based on the following proposed system for sharing training across organizations.

4.1 A System for Sharing Training Content Across Organizations

Learners access training through their organization's LMS, a single point-of-entry for their training requirements. Their training requirements are based on the competencies identified for their job role. These competencies are congruent with competencies established within the community of practice, in this case federal agencies that provide healthcare services. Content objects shared across organizations within the community of practice are built to the standard

competencies, furthering the ability to effectively incorporate content objects obtained from the community of practice into curricula. A learner profile is kept for each individual, also based on community of practice standards, and travels with individuals as they move from job to job. Learner profiles are updated as training is completed. Competencies and learner profile standards should be developed and managed by inter-organizational committees within the community of practice.

The content objects are stored in a collection of repositories made available by various organizations within the community of practice. A community of practice registry allows "discoverability" of the objects contained in the repositories. LMS administrators/content managers and content developers search the registry when designing curricula for objects that can be used within their education and training programs. When content is found that matches the training needs, it is retrieved from the repository where it is stored and then used as an entire course or as a piece of a course in the organization's LMS.

Where it is determined that content objects need to be developed, the applicability for reuse by others in the community of practice is analyzed and, if the results are positive, the content is then designed in accordance with competency standards and best practices for the design and development of sharable content. Organizational LCMSs may or may not be present, depending on the needs of the organization, but where LCMSs are used to develop content, the content should be compatible with SCORM, and not proprietary, to ensure interoperability in the community of practice. When the content is complete, it is metadata-tagged and placed in a repository and registered in the registry.

These concepts are illustrated in Figure 2.

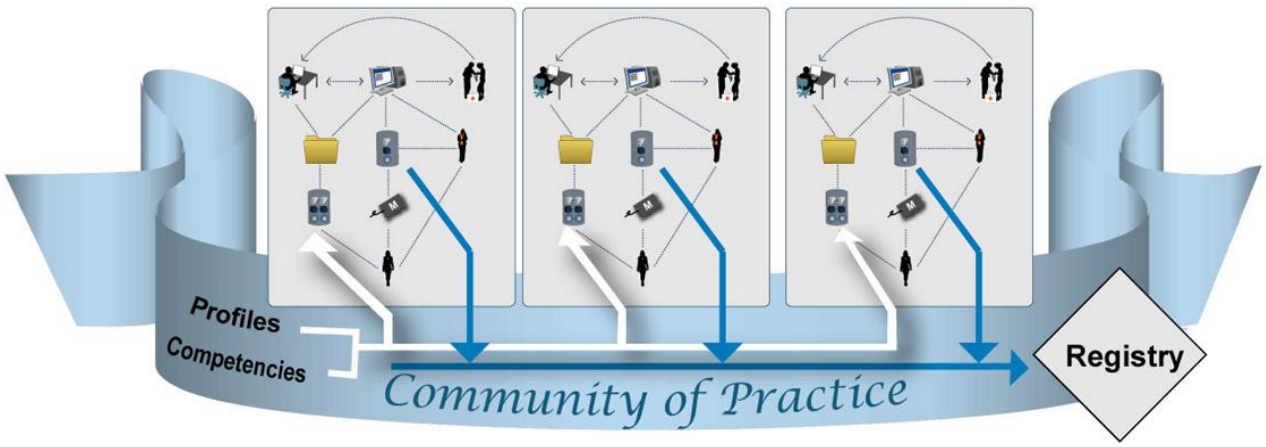


Figure 2. System for Sharing Content Across Organizations

4.2 Content Management Recommendations

These recommendations apply to all organizations within a community of practice. Industry standards are the foundational element of these recommendations.

4.2.1 Maintain organization-specific LMSs for learner access to content
4.2.2 Address interoperability issues as a community of practice, partnering with vendors for maximum interoperability
4.2.3 Establish competencies and competency maps based on standards within the community of practice
4.2.4 Adopt SCORM for content creation and acquisition
4.2.5 Create and follow best practices for the development of sharable, reusable, and repurposable training content
4.2.6 Apply technology for dynamic and customized delivery of content to learners
4.2.7 Establish policies and procedures for the lifecycle management of sharable, reusable, and repurposable training content
4.2.8 Adopt ANSI/MEDBIQ PP.10.1-2008: Healthcare Professional Profile
4.2.9 Adopt ANSI/MEDBIQ LO.10.1-2008: Healthcare Learning Object Metadata
4.2.10 Use competencies as central metadata element for the discovery of content
4.2.11 Store content in repositories accessible within organizations and the larger community of practice
4.2.12 Research repositories currently available to healthcare-providing federal agencies and organize a "collection" of repositories for use across the community of practice
4.2.13 Establish a registry aligned to the needs of healthcare-providing federal agencies

4.2.1 Maintain organization-specific LMSs for learner access to content

Of the options discussed in Section 3.2, it is recommended that each organization maintains its own LMS, as is reasonable and sensible for the organization. LMSs perform important functions for organizations and those needs will remain intact regardless of sharing efforts across a community of practice. This approach will realize the benefits described in Section 3.2. Its success is dependent on the adherence of LMS vendors and training providers to SCORM. In cases where tools or products are not conformant with this standard, efforts to ensure conformance should be undertaken. Solutions may result in changes to acquisition strategies or contract requirements.

4.2.2 Address interoperability issues as a community of practice, partnering with vendors for maximum interoperability

Many LMSs are still in the process of implementing SCORM, and thus, interoperability issues may arise. When this happens, it is tempting for organizations to "tweak" their content to work in their LMS, but this then further reduces interoperability and the potential to share that content. It is recommended these issues be taken directly to the LMS vendors, who are likely under contract to provide system conformity.

For consistency across organizations, and taking advantage of strength in numbers, it may be beneficial to create a committee or other governing body to address interoperability issues. Members of the community of practice would take issues with implementation and deployment to this committee for discussion and resolution. The committee could be the interface between application or system vendors and the community of practice, creating a partnership for maximizing interoperability. This will maintain the integrity of systems across the community of practice, and when done across multiple industries, will promote integrity and consistency across the e-learning community itself.

4.2.3 Establish competencies and competency maps based on standards within the community of practice

Learning objects are designed to meet specific learning and/or performance objectives. These objectives should be based on competencies required for job performance, making competencies a critical consideration in the development of shared training. Competencies are fundamental to the assurance of quality education and training. Many healthcare educators are defining competencies for practicing clinicians. To be successful, there needs to be a global catalog of unique competencies agreed upon and managed by the community of practice. Once established, and with proper oversight, it will be a powerful tool for the management of shared training and individual training programs.

MedBiquitous has organized a Competencies Working Group with the goal to establish specifications for a competency framework that will allow 1) comparison of learner achievements against competencies relevant to their profession and specialty, and 2) development and management of learning materials based on standard competencies (MedBiq Competencies WG Charter, 2008).

SCORM assists with the implementation of competency-based learning strategies by providing a standard way to deploy content across systems. The application of SCORM-conformant content and LMSs promotes interoperability and ensures compatibility of competency-based learning strategies.

It is recommended that organizations develop competency maps/hierarchies for the positions in their organization, based on standards set for competencies within the community of practice. Even though the MedBiquitous Competencies Working Group is still pursuing the goal of a competency framework, it is possible to follow and even participate in the development of these specifications. The CanMEDS Physician Competency Framework developed by the Royal College of Physicians and Surgeons of Canada should also be explored as they have a strong international adoption. More information about the CanMEDS can be found at: http://rcpsc.medical.org/canmeds/index.php.

4.2.4 Adopt SCORM for content creation and acquisition

For most federal organizations, SCORM is a mandate. The Department of Defense led the way with DoD Instruction 1322.26: Development, management, and delivery of distributed learning

(DoD, 2006). Other federal agencies have followed suit and thus the SCORM specification is commonly being implemented across the federal government.

Though sponsored and first adopted by federal agencies, SCORM is not restricted to use by the federal government. It is a common technical framework that provides guidelines, specifications, and standards for the creation of reusable and sharable content objects that can be applied across any community of practice. A description of SCORM versions, as well as SCORM documentation, examples, and tools can be found at this location: http://www.adlnet.gov/scorm/index.aspx.

4.2.5 Create and follow best practices for the development of sharable, reusable, and repurposable training content

Best practices for the development of sharable, reusable, and repurposable training content are beginning to be established. They are coming out of efforts, such as the *Pharmacy Technician Training Program*, that are attempting to generate content for use in multiple organizations. In addition to adherence to technical specifications, best practices for media, interface design, and instructional design should be followed for optimal reuse of learning objects in other curricula and environments. The community of practice may want to define a reuse strategy and implementation guide for those involved in the design and development of learning objects.

4.2.6 Apply technology for dynamic and customized delivery of content to learners

The tools and technologies associated with modern training systems allow for the dynamic and customized delivery of content to learners. LMSs, learner profiles, and SCORM are key elements for these capabilities. For instance, a learner profile could identify learners that have a disability requiring them to see Section 508 compliant content, allowing the LMS to automatically route them to this content. Or in the case where multiple audiences may receive the same basic course, different audiences could be served learning objects specific to their needs and job responsibilities. Additionally, following best practices for sharable and reusable content allows the content to be used in different ways, such as just-in-time training or as part of Electronic Performance Support System (EPSS) tools. These are powerful capabilities that are currently largely underused.

4.2.7 Establish policies and procedures for the lifecycle management of sharable, reusable, and repurposable training content

As the practice of sharing training content across multiple organizations or an entire community of practice is still in its infancy, policies and procedures for the lifecycle management of this content are not yet established. It is expected that classifications of content will evolve from these initial efforts, perhaps including the following:

Repurposable and reconfigurable – this is content that has no licensing or other restrictions and is provided for reuse by others in the community. Those reusing the content may pull the content apart and make changes and other adaptations to configure the content for their needs. Once

changes are made, maintenance of the content becomes the responsibility of the individual organization. Creative Commons bears exploring for this type of content, as they have defined conditions for the reuse of creative work. More information about these conditions can be found at: http://creativecommons.org/about/license.

"Owned" or centrally managed – this is content provided for reuse, but not alteration, by others in the community. It has one "owner," which may be one individual, one organization, or one committee of organizational representatives that is responsible for the lifecycle management of the content, including all content updates.

Licensed – this content will be the most difficult to share. Typically acquired from commercial sources, licensing restrictions may prevent widespread reuse. As the practice of reuse grows, new approaches to the acquisition of content should be explored. These new approaches may prompt adjustments to current business models and even the development of new business models.

There are obviously many issues around the lifecycle management of sharable content and it is recommended that these issues be explored in a formal way and in the context of the community of practice. Healthcare-providing federal agencies and the larger healthcare community have the opportunity to construct a model for the lifecycle management of sharable content that can be adopted by communities of practice in other industries.

4.2.8 Adopt ANSI/MEDBIQ PP.10.1-2008: Healthcare Professional Profile

The ability to validate the credentials of healthcare professionals is critical to ensuring patient well-being. Regulating bodies and healthcare-providing organizations need a standard way of tracking data about healthcare professionals in order to quickly identify fraudulent parties and increase responsiveness to national priorities, particularly in times of crisis. A standard profile format facilitates exchange of information across organizations and ensures that patients and the public receive accurate information about those providing services.

A multitude of organizations collaborated through MedBiquitous to derive a standard format for the profile data of healthcare professionals, specifically describing undergraduate and professional education that result in diplomas or certifications. The resulting Healthcare Professional Profile, ANSI/MEDBIQ PP.10.1-2008, provides a common format for the following types of data:

- Identifiers
- Name
- Address
- Education
- Training
- Certification
- Licensure
- Disciplinary actions
- Academic appointments

- Occupation
- Personal information
- Professional memberships

The Professional Profile can be downloaded from the MedBiquitous website, http://www.medbiq.org (MedBiquitous, 2008 [press release]).

4.2.9 Adopt ANSI/MEDBIQ LO.10.1-2008: Healthcare Learning Object Metadata

Metadata is "data about data," basically, information about information. Metadata can be used to describe a resource. The resource may be a book, a document, a video clip, or other media. It provides a means to fully describe and identify e-learning content so that it can be efficiently located, selected, retrieved, combined, use/reused, and targeted for appropriate use. Metadata is ideally added to objects at the time of creation. Metadata is essential for searching large collections of learning objects, such as would be found across a community of practice. Repositories and registries are not useful tools without a means to search for and find content. Even with these tools, if there is not a common taxonomy for metadata across a community of practice, use of repositories and registries would be clunky and ineffective.

The SCORM technical framework and the Learning Object Model (LOM) metadata standard provide a basic structure for describing and aggregating learning objects. These models do not, however, address the special requirements for healthcare education and training. MedBiquitous has created an extension to the LOM, documenting custom vocabularies and metadata elements for healthcare learning objects. An example of a custom vocabulary is *educational context*, where items specific to healthcare were added to the existing vocabulary (patient education, caregiver education, continuing professional development, etc.). An example of a healthcare extension is the element *target audience* (profession, specialty, reading level, and category), (Smothers, 2008).

The Healthcare Learning Object Metadata Specifications and Description Document can be downloaded from the MedBiquitous website, http://www.medbiq.org.

4.2.10 Use competencies as central metadata element for the discovery of content

Organizations who manage their training and performance improvement programs to competencies should have a large catalog that contains all the competencies required for functions performed by personnel at the organization. Where these competencies are standard with competencies in the associated communities of practice and recorded in metadata for training objects, they become powerful search tools.

When a training manager or content developer is searching for content, their primary focus is learning objects that match the competency required. This is the piece of information they know for sure and the one that is most important to them. If they can search for content using standard competencies, their search will yield the most effective results. This method also reduces uncertainties associated with other searches and creates efficiencies in performing reusability analyses (required by the DoD).

4.2.11 Store content in repositories accessible within organizations and the larger community of practice

Many organizations are still heavily immersed in implementing their LMSs, and so are generally using the LMS as their repository, with decisions regarding other options to be made in the future. Repositories are not required elements of learning systems, though eventually many organizations, particularly large organizations, may benefit from making a repository or network of repositories available for organization personnel. It is also possible for organizations to share a repository.

When content objects are tagged with metadata and placed in a repository, personnel then have the ability to search and discover content to directly deploy in the LMS or to use in building other educational and training curricula/programs.

For proper function, LMSs need access to a repository to download content updates, even if the repository is not part of the LMS. It is possible to build in a system that alerts LMS administrators/content managers when new or revised courses or content becomes available. Content can be inserted into a repository from a number of sources, both inside and outside the organization. Content stored in a repository will be the most useful if it conforms to standards for training delivery, including standard competencies. In the acquisition or development of repositories, it is critical to ensure the ability of the LMS to support the desired metadata. Repositories should use the same schema that is used to tag learning objects.

4.2.12 Research repositories currently available to healthcare-providing federal agencies and organize a "collection" of repositories for use across the community of practice

The availability and sophistication of repositories used by healthcare-providing federal agencies are currently unknown, making it difficult to craft recommendations for their use across the community of practice. Such a study should include an analysis of policy as well as technology. Research results may show a discrepancy between the repositories currently in use and the repositories needed by the community of practice.

The resulting collection of repositories would be linked by a central registry, as described in the next section. Figure 3 assists with visualization of this concept.

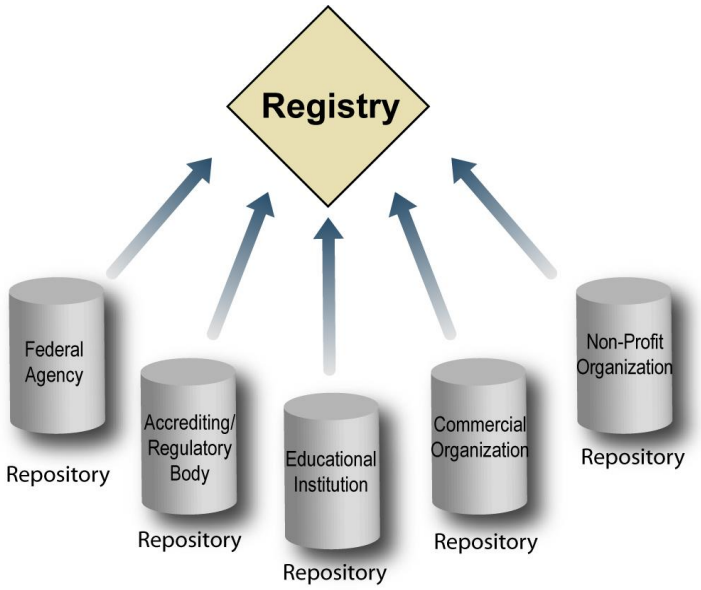


Figure 3. Repositories Linked by Central Registry

4.2.13 Establish a registry aligned to the needs of healthcare-providing federal agencies

Within a community of practice, it is advantageous to create a "one-stop shop" for the search and discovery of content. This can be done through the creation of a registry. A registry is a library of records, or catalog(s), of content objects available for use.

Where objects are intended for use by others within the community of practice, they should be tagged with standard metadata and registered with the registry at the time they are placed in a repository.

Although typically searched by content developers and training administrators looking for content to incorporate into their programs, registries are available for anyone to use. These individuals cannot be expected to be aware of all the repositories available and access each separately. These logistic and administrative challenges are resolved through use of a central registry. When a registry search yields the desired results, the content can be downloaded or accessed from its "home" repository or requested from the organization that owns the repository, where policy prevents those outside the organization from directly accessing the content.

There are three basic options for building a central registry:

1. Build from the ADL Registry code base – the ADL Registry is a registry currently available for use by the Department of Defense (DoD). ADL plans to release the code for public use and, while no formal release has yet been announced or organized, it could be requested from the DoD.

2. Build to ADL concepts – study CORDRA™ (Content Object Repository Discovery and Registration/Resolution Architecture) and the ADL Registry, and design a central registry

for the community of practice based on the same concepts, but with code developed from scratch.

3. Build from scratch – the community of practice may choose to design and build a central registry on its own, without replicating or duplicating other systems.

A formal analysis and assessment is required for determining the most appropriate method for building a central registry for healthcare-providing federal agencies.

5.0 CONCLUSION

Determining optimal content management strategies for the sharing of e-learning content and implementing such strategies will require resolving complex issues collaboratively and may take years to accomplish in their entirety. However, the recommendations contained in this whitepaper, if initiated in good faith and with sufficient resources, have the potential of setting the path for implementation and establishing some best practices within the next five years. Translating the recommendations into actionable steps will require some careful analysis, including establishing a baseline of the present systems and creation of a blueprint for the ideal approach.

As demonstrated by the success of the *Pharmacy Technician Training Program*, communities of practice that are similarly engaged will be able to share solutions and assist each other. Others that have hesitated to embark on this type of implementation may find encouragement and leapfrog over the early adopters, crafting more advanced solutions.

The incremental, but inevitable increase in available, sharable training content will also invigorate the work of content developers and content managers currently limited in their content resources. As interoperability improves and the use of metadata, repositories, and registries becomes more sophisticated, the payoff for learners, content developers, and organizations alike should be more than enough motivation to continue refining content management strategies and advance inter-organizational collaboration.

6.0 REFERENCES

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