

Federal Government LMS Experiences: Lessons from the Field

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ABSTRACT

Although Learning Management Systems (LMS) are well-established foundations for most Advanced Distributed Learning (ADL) solutions across the industry, Federal Government users have very different challenges from their private sector counterparts. Some of these challenges include incorporating and automating the use of established standard forms and related workflows, reporting and tracking data according to specific government requirements, and emerging requirements for enabling courseware sharing among Federal organizations and eventually the public. With many large Federal organizations facing these challenges recently, several common themes and issues have been identified by Federal users in both the military and civilian agencies. This paper will draw on specific experiences from both military and civilian agencies over the past few years to highlight the common themes and issues, how they are currently being addressed, how they will be addressed in the future, and how other Federal organizations can benefit from these “lessons learned.” Specific case studies will be provided using several different LMS products, and will include the following Federal organizations:

- The US Air Force
- The Government Plateau Users Group (representing over fourteen civilian agencies, including the IRS, TSA, VA, and USDA)
- The Departments of Labor
- The Department of Justice

The following key themes and issues will be discussed at length in the paper:

- Automation of standard forms (e.g., SF182) and approval workflow
- Reporting (including the new OPM Enterprise Human Resources Integration – EHRI – requirements)
- Integration with Learning Content Management Systems and Content interoperability
- Competency and Force Management
- Federal government-specific implementation and maintenance

The paper will also emphasize the role that enterprise LMS products are currently playing within each Federal organization, how they will be changing in the future, and leading issues still concerning current Federal LMS users.

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I – INTRODUCTION

Immediately following a large technology implementation, every organization expects a certain number of common issues (e.g., the performance of the technical platform, the accuracy and reliability of the new system, overall user acceptance, etc.). Once these issues are addressed, there is normally a “honeymoon” period where the system performs or even exceeds its basic functions as required. As organizations begin to mature and grow, however, they expect their new technology to expand, integrate, and grow with their needs. Learning Management Systems (LMS) have now been in place in the Federal Government long enough to have reached this phase with a number of large organizations (e.g., the IRS and the Air Force). This next stage of expansion truly tests the flexibility and extensibility of the technology, and often raises significant challenges and limitations that would otherwise go unnoticed. In the Federal sector, several broad categories have surfaced over the past few years:

1. Automating training workflows
2. Reporting
3. Electronic Content
4. Competencies
5. Maintenance

The challenges presented in each of these broad categories only become evident after the organization has operated and expanded the breadth and depth of the LMS and its overall training management initiatives. The purpose of this paper is to highlight the lessons learned from these more experienced Federal organizations, and to help outline the current approaches and challenges that new or emerging Federal LMS training initiatives are likely to face.

Before addressing the specifics of these broad issues, the following section provides a broad overview of LMS and LCMS technologies referenced later in the document, and the Federal communities that have discovered and pursued these areas.

LMS & LCMS Overview

Modern content delivery systems are normally Web-based, COTS systems that can be characterized into two general classes: 1) LMS software that automates the administration of learning events; and 2) LCMS software that enables authors to register, store, assemble, manage, and publish learning content for delivery via Web, print, or CD.¹

Both product classes have become common over the past five years, with many enterprise-class products blurring the line between the two. Put simply, students and courseware authors interact with an LMS (e.g., select a WBT course and register), while content owners and business process owners interact with an LCMS (e.g., to develop new content or reuse existing content, and to refine, automate, and enforce business processes). Some products, however, provide a mix of these functionalities.

While LMS and LCMS products have different strengths and weaknesses, they generally address the following areas of functionality:

LMS Functionality

- Student Registration and Administration
- Training Event Management (i.e., scheduling, tracking, and WBT delivery)
- Curriculum and Certification Management
- Skills and Competencies Management
- Reporting
- Training Record Management

LCMS Functionality

- Template-driven, Collaborative Content Development
- Facilitated Content Management (i.e., indexing and reuse)
- Publishing
- Workflow Integration
- Automated Interface with an LMS

¹ “Best Practices for Selecting Learning and Learning Content Management Systems”, Kerschenbaum & Wisniewski Biehn (I/ITSEC 2003)

In addition to LMS and LCMS products, many organizations employ a learning portal or single Web entry into their learning content and resources. While this gateway may redirect users to a number of different physical locations, it presents a single, consolidated interface and starting point for users. The portal becomes the presentation layer that links the various resources and systems (e.g., the LMS and LCMS) to the user.

The Federal User Community

Many large Federal organizations have been using enterprise-wide, COTS LMS products since early 2000. Although many Federal organizations have used client/server or mainframe-based systems before that time, these products were smaller in scope (usually used by a single office or division), and did not deliver and track standards-based Web-based training (WBT), which now dominates the industry. Among large Federal organizations, the Departments of Defense, Treasury, Justice, Labor, Homeland Security, and Veterans Affairs have been leading the charge towards enterprise-wide LMS implementations. Additionally, they have used a number of leading LMS products including, but not limited to, Plateau, Learn.com, Meridian KSI, and GeoLearning.

While Federal agencies routinely work cooperatively, this was taken to a more formal level with LMS products in late 2003. Spearheaded and sponsored by the IRS, the Government Plateau Users Group (GPUG) was established to encourage Federal Plateau LMS users to share their challenges, approaches, lessons learned, and help better communicate their needs to their various stakeholders in the future.² While the roughly twenty (20) Federal GPUG organizations focus predominantly on Plateau-specific issues, other Federal organizations with different LMS products do confer with GPUG regarding their experiences.

Since 2005, the Office of Personnel Management (OPM) GoLearn/eTraining initiative has provided a one-stop source for training and development products, tools, and services across the Federal government, and has also began Communities of Practice (CoPs) for its stakeholders.³ In fact, GoLearn representatives work closely with GPUG to help coordinate efforts with their various vendors, and involve the Federal organizations in their broader training mission. The findings

² See <http://portal.vertexsolutions.com/gpug> for more information on GPUG.

³ See <http://www.usalearning.gov/USALearning> for more information on the GoLearn/eTraining initiative.

presented in this paper are drawn from working with these various Federal organizations.

II – ISSUES FACING THE FEDERAL SECTOR

As mentioned earlier, the preponderance of experienced Federal LMS users have very similar issues and challenges as they advance the role of the LMS within their organizations. These broad categories are discussed in more detail below:

Automating Training Workflows

Challenges – Although every LMS implementation initially models the existing Federal organization's training workflow, many times the Federal workflow surrounding training differs among organizations even though they are mandated to use the same standard OPM forms and processes. In the civilian space, many agencies have been working towards implementing the standard OPM Training Request Form (SF-182) effectively via their LMS products. Even though the civilian Federal agencies all used the hardcopy SF-182 in one manner or another, the associated workflow (approvals, routing, etc.) was far from standard. The same is true for the DOD 1556 form used by military civilian organizations. Federal LMS users were facing the unenviable task of deciding how to address automated workflow (a key business driver for making training more cost effective) at the same time OPM and GoLearn were trying to make policy decisions about the proper role of an electronic SF-182.

Lessons Learned – It is critical for Federal agencies to approach the implementation of a “standard” form in a concerted manner. Working independently, many of the Federal organizations did not want to shoulder the entire burden of implementing an inherently governmental training form/process (the SF-182) in their LMS implementation. It was only after many of the civilian and military civilian agencies approached the appropriate oversight organization (OPM), eTraining representative (GoLearn), and the LMS vendor as a whole and in tandem did the effort make progress. Specifically, GPUG members are now working directly with OPM/GoLearn to help them facilitate the proper changes in the vendor product. New Federal LMS users, therefore, should look to the Federal LMS community before committing to implement customized training request processes within their product, since much of this work can be leveraged.

Reporting

Challenges – Every Federal LMS organization eventually finds that the standard LMS reports include from the initial implementation are insufficient for their growing and changing needs. For example, there may be new reporting requirements, or the size of the growing user audience exceeds the maximum capacity of the LMS report engine. For this reason, everyone wants to develop their own ad-hoc reports directly from the backend database (e.g., using Crystal Reports or COGNOS). Furthermore, from a technical perspective, it is inadvisable to run too many report queries directly from a production database unless the user population is not placing a heavy processing load on the computing platform. Taking this approach can risk slowing the production instance of the LMS to a crawl, or even of crashing the entire instance itself. Reporting is always mentioned as one of the more difficult and ongoing LMS challenges for the federal LMS community.

Lessons Learned – Federal users have discovered several important approaches to successful LMS reporting over the long-term:

1. Maintain a separate, synchronized database for running LMS reports. Unfortunately, this does require additional expense, and is not always an option for some users.
2. Special personnel are often necessary to develop ad-hoc reports. Someone with technical experience (i.e., database developer or administrator) and knowledge of the database structure (i.e., the tables and relationships themselves) is usually required.
3. Federal LMS users, under the right circumstances (i.e., using compatible LMS products and platforms), can share ad-hoc reports developed independently from one another. For example, the GPUG community has been working to share Crystal Reports among its users.

Electronic Content

Challenges – During the initial phases of an LMS implementation, users are accessing content that has been added to their various content catalogs by the vendor/integrator. Unfortunately, most Federal LMS users encounter issues when they begin adding new learning content to the catalogs. This is true whether the content is standards-based, SCORM or AICC modules, facilitated learning content developed using an LCMS, or custom content developed using traditional tools. From a technical perspective, LMS users are sometimes uncertain where the new content should physically reside within their technical

architecture. Users are often faced with finding the necessary storage capacity and physical location for their new content, and are unprepared for the decision.

Lessons Learned – Again, Federal users have discovered and identified several important considerations in this area:

1. It is important to note that there are different versions and levels of conformance within the SCORM. The two most prevalent versions are SCORM 2004 (the most recent) and 1.2. Within these versions, there are three (3) levels of conformance (Run-time environments – RTE 1 through 3). For this reason, content developers/providers and LMS users can both believe that they are technically “SCORM conformant” and still have problems.
2. The physical location of new learning content can be very important for security reasons. If new content is launched from a foreign Windows domain, users may experience the SCORM “cross-domain issue,” and be prevented from accessing the course for security reasons. Furthermore, learning content may have varying levels of sensitivity, and may need to be housed in different secure locations.
3. Experienced LMS users find that housing content properly requires the ongoing support of IT professionals. Similar to support for ad-hoc reporting, IT professionals are critical resources for helping the LMS support staff accommodate and secure new content.

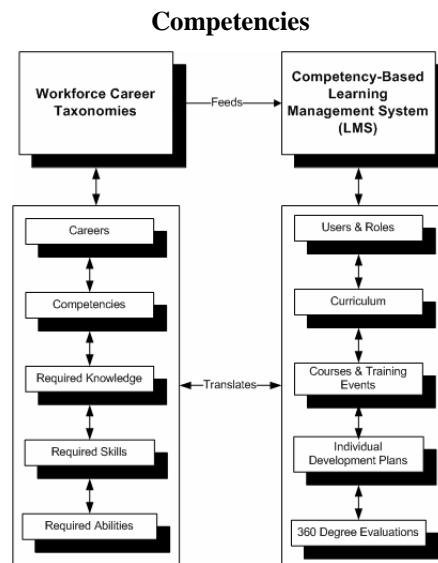


Figure 1 – Competency/LMS Relationship

Challenges – Most modern LMS products are able to map courseware to a pre-defined set of user competencies (See Figure 1, above). While the LMS products have this ability, many Federal LMS users are only now applying the competency components of their LMS products. While not strictly a competency issue, a key driver in this area is the new Enterprise Human Resources Integration (EHRI) requirements instituted by OPM. The EHRI initiative is intended to establish a central repository of Federal HR data, and to provide analytic tools to support HR and Federal managers in forecasting human capital requirements, identifying trends, and aggregating HR data across agencies and managing HR knowledge.⁴ Federal LMS users would like to use an extract from their LMS to transmit the required EHRI data to OPM to meet this requirement. Similar to automating the SF-182 process, since the EHRI initiative is relatively new, OPM is still working on finalizing their approach and methods.

Lessons Learned – From the broader competency perspective, Federal users have found applying competencies very challenging. From an EHRI perspective, the Federal community again found it critical to work together in addressing an inherently governmental requirement through new technology implementations:

1. Defining competencies is a much more difficult task than physically implementing them in the LMS.
2. Many Federal LMS users select Leadership Development as their prototype competency implementation because the model has been very well-defined, COTS content is readily available, and the upcoming retirement of the Baby Boomers has made Leadership Development a Federal HR priority.
3. In coordination with OPM/GoLearn, larger Federal LMS clients are adapting their LMS implementations to automate the communication of EHRI data to OPM, while smaller LMS implementations are performing manual extracts of the required data. Again, the higher degree of automation requires a larger investment by the Federal user.⁵

⁴ See http://www.opm.gov/egov/EHRI_overview.asp for more information on the EHRI initiative.

⁵ OPM/GoLearn is working currently to provide assistance and alternatives to Federal LMS users for reporting their EHRI data elements.

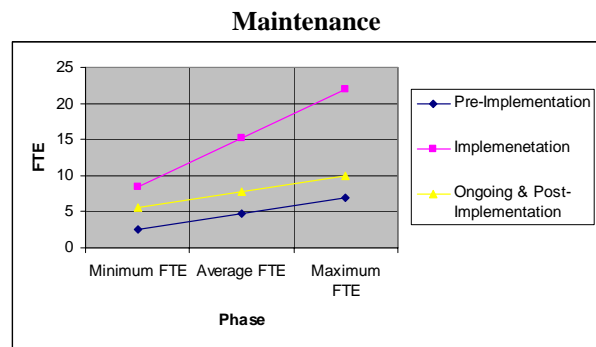


Figure 2 – FTE for Federal LMS Implementation

Challenges – Only after an organization has operated an LMS for over a year do they fully appreciate the amount of effort required to keep it fresh and operational. This includes maintaining the catalog, updating the user accounts, updating the managers and trainers, loading content updates, addressing ad-hoc reporting requests, etc. Furthermore, as additional features are released or implemented, those aspects of the LMS require a higher degree of support than existing features. Also, if hosting locations change over time (this is becoming more common as Federal agencies begin to outsource their content hosting), additional pressure is placed on the organization to support the transition.

Lessons Learned – Based on experiences over the past three (3) years, Figure 2 (above) shows the minimum, average, and maximum Federal full-time equivalents (FTE) required for each major phase of an LMS implementation (pre-implementation, implementation, and ongoing & post-implementation). It is important to note that this graph addresses the rollout of a single major release of an LMS. In other words, the introduction of a new release with new features (as opposed to bug fixes) often requires the organization to repeat these phases to some degree.

III – IRS AND AIR FORCE LESSONS LEARNED

The IRS and Air Force have both been strong leaders in the adoption and use of LMS products over the years. Their individual experiences and perspectives provide helpful insights into the challenges and focus of large, experienced Federal users.

The IRS supports a large number of users across the country on a 24/7 basis. They have a large course catalog containing a wide range of topics, and are constantly looking to meet and exceed the needs of their users. The IRS experiences are very consistent

with the challenges and lessons learned outlined earlier, but also have a few areas of specific concern.

To better support their content developers, the IRS is implementing an enterprise-wide LCMS to be used in concert with their enterprise LMS. They are among the first Federal civilian organizations to make such a large commitment to an enterprise LCMS, and have struggled with the best way to:

1. Address incompatibilities with SCORM content between the LMS and LCMS
2. Implement standard Web-based Training (WBT) and Electronic Performance Support System (EPSS) templates using the LCMS
3. Agree on the proper metadata to be used with their training content
4. Integrate the use of the LCMS into their content development process

Finally, with their very experienced end-users, the IRS is held to a very high standard by its user community. Users are not forgiving if their functionality becomes unreliable, even when transitioning from one release to another. For this reason, the IRS must remain extremely vigilant in regards to user attitude and acceptance of their LMS initiative at all times. Despite these challenges, however, the IRS continues to be a Federal leader in learning and performance support, and looks to be providing leadership in these areas for years to come.

From the Air Force perspective, a perennial leader in military training and education, they also have particular focus in addition to those issues already discussed. Considering the very sensitive nature of some of their content, controlling appropriate access is an ongoing concern. Although the Air Education Training Command (AETC) minimally controls non-technical training, some of the functional career fields control access to sensitive content and must manage this access via an e-mail request system. While AETC does not want to unnecessarily control access to content, they are constantly looking for new and better ways to address this issue.

Growing at roughly 4,000 new users per day, AETC must maintain a very high degree of user focus and integration to maintain the steady increase in user population. They work very hard to establish technical and procedural structures that will minimize changes and make them easier when required. This also includes particular focus on developing ad-hoc Crystal Reports as necessary. Above all else, AETC prides

itself on meeting customers' needs in a very timely manner.

IV – MOVING FORWARD

Certainly, the Federal LMS users will continue to grow and learn new approaches to address many of the challenges highlighted throughout this paper in the upcoming years. An unmistakable trend and challenge for Federal LMS users in the near future, however, is system consolidation. With shrinking budgets and an aging workforce, all Federal sectors are being asked to do more with less.

The Federal community is already being asked to consolidate LMS installations. No longer will a large civilian agency be able to justify the use of several LMS products – the cost of individual maintenance and training are just too high. In fact, a major theme in OPM/GoLearn is to outsource the hosting of each Federal organization's LMS at a central location. While this Application Service Provider (ASP) model is proven to be more cost efficient, it provides significant challenges to those organizations with unique privacy, security, and access concerns.

As the LMS vendors respond to feedback from the Federal LMS community, they hope to see the following product developments in the coming years:

- More extensible workflow functionality for training requests, approvals, and scheduling
- Tighter integration with COTS ad-hoc reporting packages
- Tighter integration between COTS LMS and LCMS products (potentially using emerging protocols such as AICC PENS)

Finally, as the Federal LMS community continues to partner with OPM/GoLearn, policy changes will make it easier for Federal users to rely on their automation to ensure compliance with applicable regulations. With the growing participation of the Federal community, and the ongoing cooperation from OPM, the vision and promise of eTraining (along with effective LMS integration) will continue to improve over the upcoming months and years.