

Final Paper: Enterprise Architecture Content Strategy

ICT 4010-2: Enterprise Architecture

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November 11, 2018

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Executive Summary

An Enterprise Architecture (EA) unites both business and technology to integrate enterprise-wide strategy, business processes, workflows, knowledge, and resources (Ross, Weill, and Robertson 2006). This non-profit healthcare organization will reap the rewards of an established EA as it will decrease costs associated with business processes that are duplicative and/or inefficient, merge and eliminate redundant services and systems to enhance end-user experience, establish a standard instructional design methodology and process to ensure that training projects are appropriately scoped, and provide a means for end-user performance support through the implementation of new technology that interfaces with information access points, including the electronic medical record (EMR) system, the intranet, EMR Dashboards, and the Learning Management System (LMS).

The Open Group Architecture Framework (TOGAF) provides a design, planning, and implementation formula for establishing an effective and stable EA within the organization. This framework establishes the components necessary for integrating IT and business processes by documenting goals, processes, and standards agreed upon by each department representative in an EA project group. The scope of this project is to analyze the enterprise's current processes and technology in relation to training and document assets of the enterprise. This is done with the goal of positioning the enterprise's business and service processes, data, support systems, and technology to respond to future changes within a volatile industry where information must be created, updated, and accessed at a moment's notice.

General Background

Note: This background consists of my general observations and experiences within my department and previous roles within the organization.

More frequently than not, it has been the case within the organization that a request for an eLearning or formal in-person training is received by the Learning and Development department where it has already been determined by the requester that end-users “need to know” something. Regardless of behavior changes, duplicative training is mandated annually as a solution despite evidence that the training will lead to observable behavior changes (e.g. RN’s taking handwashing modules yearly to prevent infection).

In the same vein, not only are training modules being taken by end-users regularly without proper analysis as to what they are trying to achieve, but the same modules are being developed repeatedly throughout the organization since there is no communication or collaboration between business units to determine what content (training or other) currently exists in order to reuse all or parts of the content. This is a significant cost to the organization as the development time for a single, 1-hour eLearning is approximately \$2,800. If there were 3 of the same topic eLearning developed, that’s a loss of \$5,600 between the two extra eLearnings. After multiplying this cost between 13 hospital systems creating their own one-hour versions of the same topic, it is apparent how quickly development costs add up in addition to costs associated with end-user’s time, especially at it pertains to nursing staff who are required to complete these variations of the same training to float between hospitals.

There are a few things that can be done enterprise-wide that will help save time, resources, and money while contributing to a more satisfied workplace. Business processes can become leaner, starting with how requests for “training” is addressed and who addresses these requests. Many of the requests are really requests for help; the SME seeing an issue and assuming training is the solution. The issue might be resolved by an environmental change, a communication, or a simulation activity, rather than formal training. Establishing a centralized committee who can give sound consultation when fielding these requests, connect the requester with the appropriate people to address concerns outside of training, and establish metrics for training when training has been determined to be the solution, will in turn help establish a learning culture.

This potential solution only takes care of eliminating unnecessary training, but not the duplication of training. Currently, within each site, there are program coordinators that use Articulate to create eLearnings. Then, at the corporate level, the developers use Captivate. The electronic medical record (EMR) training team uses a Learning Content Management System (LCMS) to develop both their eLearnings and supplemental classroom materials. Since all systems provide the same basic functionality, there is an opportunity to adopt one standard development system. Program coordinators are not dedicated to eLearning development; it is only one facet within their role. By creating a central instructional design and training team, one development platform can be used. The LCMS would be the ideal platform as it allows developers to share blocks of content between projects, decreasing development time and eliminating redundant eLearnings. Additionally, the LCMS interfaces with another system, the Content Delivery Service (CDS), that allows for one storage place for all data assets.

Identification of Major Architecture Issues

The enterprise has experienced issues for the last ten years related to duplicate processes and systems being used by multiple resources. In sum, these inefficiencies are directly related to a lack of content and enterprise strategy, management, and a lack-of integration of data and knowledge between departments. A holistic enterprise architecture addresses these concerns and provides an avenue to resolution to the following issues:

1. Inefficiency of business processes

Multiple inefficient enterprise-wide business processes regarding intake and development are being used for creating content that is not cataloged or shared between sites, leading to mass duplication of content and training.

2. Silos and duplicate system services

The organization has several content development systems performing the same services in multiple department areas.

3. Ineffective training:

Training requests from stakeholders are fulfilled without knowing if training or knowledge is the root of the issue, causing resources to focus on solutions that may not solve a problem.

4. Multiple knowledge base systems

End-users responsible for patient care have multiple places for accessing content with a high-risk of accessing incorrect information due to the multiple areas required for content maintenance.

Analysis of Major Architecture Issues

Issue 1: Inefficiency of business processes

Business Case

There are no formally established business processes for training requests or content creation on an enterprise-level, nor does it exist on a departmental or site level. Each hospital and clinic create documents and training content on the same or very similar topics. Since a framework has not been created to establish collaboration between the departments, topics such as sepsis prevention, pressure ulcers, and other patient-centric content are created multiple times rather than sharing between the sites. While all sites understand that their purpose is to provide whole-person care to their patients, the strategy for how to provide information to healthcare workers administering that care is obscure.

Research has shown that using technology-enhanced learning, such as eLearning, is healthcare worker's preferred method of receiving information (Scott, Baur, and Barrett 2017). The enterprise adopted this form of training ten years ago, however, it has moved beyond training into a communication tool in the guise of "training." When every request is "training," it increases stress on the end-user, wastes budget and resource time, and loses the interest of the audience (Robertson 2018). Since each site is creating "training" for any topic, the enterprise risks exhausting the workforce while spending thousands of dollars a year on end-users taking ineffective and unnecessary training. Finances are also wasted due to the creation of duplicate training as there is no way to know if there is existing content developed from another site that is already being used.

Baseline Architecture

Each hospital and clinic have dedicated program coordinators responsible for intake requests from site subject matter experts (SME) that include risk and compliance, physician and nurse leadership, as well as HR and legal departments. For each request, the program coordinator creates an eLearning from the PowerPoint sent to them from the SME with the goal of rapid development. The intake and development process do not include any instructional design methodologies, such as ADDIE, to ensure that the content is being communicated and formatted in the best possible way (Culatta 2018). This creates a vast amount of “training material” that could otherwise be communicated via a simple email or in a pre or post-shift huddle. This process is performed at each hospital and clinic site as well as within the corporate office, all creating similar content from different software being hosted in different places. Additionally, these SMEs do not communicate with each other to know if similar issues that they are addressing at their individual sites are also being seen at other sites. Appendix A demonstrates the current business process for receiving requests for eLearning and “training.”

Target Architecture

Using TOGAF as the architecture model, the target framework (Appendix B) aims to break down silos by creating a committee for receiving and evaluating every education and documentation request. This ensures that all assigned projects align with the overall enterprise business and technology strategy. This committee will support the governance of intake and training and should be formed of multiple instructional designers, metrics team leads, site process improvement advisors, and information services leads who will:

1. consult with the requester to understand the issue and if training is needed,
2. determine if a request merits an eLearning, email, meeting, job aid, or another type of output, and
3. assess if there is existing content for the topic matter, and if not,
4. creates any document or web-based training using the Learning Content Management System (LCMS)

All requests deemed as “non-training” or “communication” will filter to the process improvement advisors and IS to determine how to create a solution, environmentally, technically, or other.

An IT Architecture is also needed to prevent sites from acquiring their own software for eLearning development once licenses have been revoked as well as to prevent PowerPoints from being uploaded to the LMS. Partnership with the Nursing Executive Council is recommended for preventing the approval of education requests before the intake committee first conducts an analysis and consultation regarding the request.

Gap Analysis

There are a few gaps that need to be addressed for the enterprise to move intake requests, analysis, and development to a committee. Currently, no central intake processes are in place nor is there communication between sites of what content currently exists.

Stakeholders across all sites should identify experienced instructional designers who are familiar with instructional design methodology to be a part of the intake process. This process will be documented and communicated to requesters as to how their requests will be addressed and defined. Additionally, metrics, site, and IT stakeholder must identify actors to

partake in the intake process as well for collaborating on solving enterprise-wide or site-specific issues.

Regarding the LCMS, currently, only one department within the corporate office uses the software. However, the software allows for the sharing and reuse of existing content so that developers can create eLearnings, job aids, student guides, instructional guides, etc. from content already developed in the system. Moving all developers to the LCMS decreases development costs as the outputs are already branded and not all content will require being developed from scratch if it already exists in other projects.

Issue 2: Silos and duplicate system services

Business Case

Currently, the architecture consists of multiple different software systems used to create eLearning content as well as numerous areas for upload and maintenance. These areas include the Learning Management System (LMS) for user registration and tracking, SharePoint, YouTube, EMR Learning Dashboards, Shared Drives, and the intranet. As there are no standards for training material structure, subject matter experts (SME) who are knowledgeable about the topics, but are not instructional designers, create PowerPoints for upload to these sites. In addition, only one of the software systems used to create eLearning can identify and communicate with the developer what topics and modules have already been created so that they can be reused. The legacy systems are also incapable of having direct integration with the LMS or any other interface, whereas the LCMS has capabilities to integrate with both the existing LMS and future CDS, promoting a single source for content.

There is also a great need for a standard look and feel to the content to be addressed. Since no standards are currently in place, all eLearning and document look vastly different from each other and do not adhere to already established enterprise-wide branding standards. This is important since there is a role for internal branding as it relates to employee behaviors aligning with the corporate identity (Punjaisri and Wilson 2017). All these technology and process silos are indicators of being in the first stage of architecture maturity (Ross, Weill, and Robertson 2006).

Baseline Architecture

The current architecture enables multiple software licenses to be distributed amongst the eLearning team, 13 hospital teams, as well as designated program coordinators within the clinical team. The software licenses are granted by the IS department upon approval of a site manager. There are no constraints as to who can acquire a license, signifying that anyone without an instructional design background can receive a license if their manager requests it. The eLearning team uses Adobe Captivate as their development tool, the sites use Articulate Studio, and the EMR training teams use an LCMS for developing their eLearnings and supporting materials. In conjunction with the LCMS, the EMR team also uses ADDIE instructional methodology and Microsoft Style so that the content can be reused in other EMR guides and courses. This was implemented only on a team level as the eLearning and site teams do not use a specific methodology when developing content using the two different eLearning tools and PowerPoint.

There is no standard across teams for quality assurance testing as it varies greatly between sites and software. From a site standpoint, software upgrades are directed by IS,

however, no additional support is offered. Any issues with Articulate requires that the program coordinator troubleshoots and resolves the issues on their own. Since the program coordinators are not experts in the software, this takes a considerable amount of time and effort to research solutions to try to resolve issues or even to save a corrupted project. This is the same principle for the eLearning team when Captivate malfunctions. Neither team has a vendor-customer relationship with their respective software companies, and so must resort to YouTube research and posting to forums for assistance.

The LCMS is supported internally with an LCMS team who also have a direct relationship with the vendor. Upgrades are thoroughly vetted and tested before end-user developers can see and use any new functionality. In cases of system-outages, the LCMS team uses JIRA to submit significant issues, whereas the vendor is contractually obligated to investigate. Testing of upgrades consists of a user acceptance testing environment (UAT) where the LCMS analyst can test each piece of the release notes to ensure the system functionally has not regressed in any way. System change requests from the organization's end-user developer base are submitted via email to the LCMS team inbox and are investigated or submitted to the vendor via JIRA. This part of the architecture has worked well for this team, however, is not used in other areas of the organization.

Target Architecture

Phasing out legacy eLearning software platforms is necessary for standardizing the technology architecture landscape. The intent with this target architecture is to consolidate tools being used for eLearning and documentation creation into one supported platform that achieves business goals that secure the integrity of all future content (Ross, Weill, and

Robertson 2006). Establishing an IT Architecture using TOGAF will allow for consistent and efficient support for all eLearning developers and instructional designers, while simultaneously providing fewer options for content development, lowering maintenance and licensing costs.

From a platform perspective, the LCMS would be best for implementing system-wide content development as it allows for integrating and reusing content across teams, supporting the goal of enterprise-wide collaboration and decreasing the duplicative development of similar eLearnings. The LCMS as a platform provides the beginning structure of a service-oriented architecture (SOA) as it integrates with other technology services such as the LMS and the CDS that are addressed under Issue 4. The workflow for project completion in the LCMS enables upload to the CDS, which connects with user access points such as the LMS, intranet site, and EMR Learning Dashboards. Within CDS, content lifecycle expiratory dates are mandatory and aids in ensuring that all content being consumed by end-users are relevant and up-to-date. To support this architecture framework, the LMS team will only allow content published and uploaded to the CDS to be accessible from the LMS.

The technology architecture standardizes system upgrades, issues, and enhancement requests as they can then be vetted and tested through the LCMS team, which then governs how the system is used and who uses the system. It also provides standards to the request and issues reporting process as a single team will support the users rather than multiple individuals supporting themselves.

Gap Analysis

To move to a single development platform requires eliminating both Captivate and Articulate from our license catalog and all computers. This also means that any existing eLearnings that were created using these software tools will no longer be supported. The teams will need to be prepared to move existing content into the LCMS if, after being analyzed, it is deemed appropriate for the system and is redesigned to promote reuse within the system. Those who are part of the enterprise solutions committee (who support the targeted EA) are to determine if the transition from Articulate and Captivate should occur gradually or happen immediately. Another gap to be addressed is that only the EMR training team is versed in using the LCMS; all other teams will need software and style training. This will require 8 hours of training per user as well as certification status as the nature of the system requires a full understanding of writing for reuse and element structures for object reuse within projects.

Issue 3: Ineffective training

Business Case

This issue is closely tied to Issue #1 but is different as it addresses the follow-up (or lack thereof) after a training is complete. No governance or standards are in place that requires metrics to be collected for assessing if knowledge has been attained and if the behavior has been changed. This is closely related to the silos that each site and department are currently in, as collaboration with the metrics team and process improvement advisors is non-existent. Never are key performance indicators (KPI) determined or analyzed for evaluating if the training

is successful or effective. Collecting metrics on each training module to gauge if the problems that initiated the training have been solved or improved are necessary for:

- reducing the costs of employees taking unnecessary education
- increasing patient safety
- empowering the enterprise to change their training strategy if it is deemed ineffective

The user experience also suffers when training is mandated without justification. Granted, some training is necessary for the sake of accomplishment, such as yearly regulatory training, however, all other training requests are currently fulfilled without collaborating with the metrics team for analysis or follow-up.

The enterprise does not use metrics in relation to training as it is not part of the workflow and business architecture. Additionally, one of the primary reasons as to why organizations do not utilize metrics is due to the workforce being reluctant to have their performance measured (Kerzner 2015). Even if the organization did use metrics, many have little understanding of what constitutes a KPI and how to select and analyze those metrics (Kerzner 2015). Evaluating training after the fact is associated with better patient outcomes (Shapiro et al 2008), in turn, saving the organization money in the form of less lawsuits and a better reputation of care within the community.

Baseline Architecture

The current business architecture does not provide a workflow that encourages or enables instructional designers or members of the metrics team to evaluate training outcomes. The only evaluation performed is if a learner has completed their training, which is only

available using the LMS and is only governed in Q4 as it relates to Federal and State compliance, where the company could be fined if users do not take the training.

The volume of non-mandatory content that is developed yearly averages 30 modules per site, a total of 390 hospital-based eLearning a year. This does not include the 80 mandatory eLearning's that are created from the corporate office, in addition to another 120 eLearnings that stem from issue requests. The sheer amount of eLearning makes it difficult to imagine following-up to collect performance data based on the content of each eLearning.

Target Architecture

The analysis phase of ADDIE will eliminate unnecessary training (Battles 2006) so that the evaluation phase is more feasible to accomplish. All content that is deemed as skill development will be developed with core metrics in mind, including, time, cost, resources, scope, quality, and actions as well as KPI's to understand the following (Kerzner 2015):

- What contributes to the success or failure of the training?
- What elements of the training are measurable, quantifiable, adjustable, and controllable?
- What represents the performance in the present and in the future?

The enterprise solutions committee will need to establish a process to link metrics and evaluation of each valid training request.

Issue 4: Multiple knowledge base systems

Business Case

Ease of accessing tip sheets, videos, and other performance support materials is imperative to aiding the end-users who provide care to patients. A healthcare worker should not need to go between multiple applications to find information that they need at the time they need it. Physicians and nurses currently access the enterprise intranet site to look for policies, the EMR website for EMR specific material, the EMR Learning Dashboards for other information that varies from the EMR website, the LMS, as well as SharePoint. The difficulty of accessing material at the time of need is also the Achilles heel for all site developers as they are responsible for maintaining the material. These five sites all house content that content owners must remember to update, which is often the same content in different areas. The process to complete this is tedious as each individual site requires a Service Now ticket and the specific location of the document. This is currently not formally tracked, leading to duplicate hyperlinks to similar, but different or even outdated information. This opens the door for potential patient care risks if an incorrect document is accessed by an end-user.

Having multiple places to upload content is confusing for those attempting to update content or upload new content. For instance, early 2018 began with a Q1 loss of more than \$10,000 due to the content repository legacy system no longer being supported by the vendor.

The issue with the system and the content within this system included:

1. No reporting mechanism to understand what content is in the system, where it is being used, and how and where it is being accessed.

2. Mass file exportation was unavailable, requiring a manual saving process for thousands of documents and eLearning.

3. Metadata could not be acquired regarding who owned or uploaded the content as well as the age, increasing the probability of end-users accessing outdated and irrelevant content.

This project alone required hundreds of hours of planning, assessing, and saving one piece of content at a time. While this work has been completed, there is still a considerable risk to all other content being housed in a variety of areas as they also cannot be reported on to determine who is accessing the content and the reason, nor is there any ownership of the documents and eLearnings themselves, just the application.

Baseline Architecture

The current architecture consists of up to ten application areas where content is stored and maintained. When a program coordinator or eLearning developer creates:

- A policy, they upload it to the intranet site. They will also upload it to the LMS if it is part of an eLearning. This policy then lives in two places.
- An eLearning, they upload it to the LMS. If there is video in the eLearning, they are uploaded to the enterprise-wide shared drive as well as YouTube. They are also linked to the eLearning.

The videos and audio then live in a total of three places.

- A document, they upload it to either the LMS, intranet site, SharePoint, shared drive, or possibly a combination of all four, depending on where the end-user will need to access the content. When updated, the program coordinator must remember to update the document in all places it was originally uploaded. They also need to remember that it was already created at some point in time.

When an EMR trainer creates:

- A policy, they upload it to the intranet site. They will also upload it to the LMS if it is part of an eLearning. This policy then lives in two places.
- An eLearning, they upload it to the LMS, unless it is non-SCORMED content, then it will be uploaded to the EMR website. If there is video in the eLearning, the video resides in the shared drive as well as in YouTube and then embedded into the eLearning. The eLearning is then uploaded in two different places and the videos reside in two different places.
- A job aid, instructor guide, or student guide, all live in one or a combination of places, including the intranet, SharePoint site(s), EMR website, EMR Learning Dashboards, and the shared drive, a total of six different places.

The intranet, EMR website, EMR Learning Dashboards, and YouTube channel require that a Service Now ticket is submitted for the eLearning or the document to be uploaded and for updates to the material.

Target Architecture

The current technology architecture landscape needs a single repository for all content. A formal RFP was completed by the enterprise three years ago to determine what system would be best to house all content. It was determined that a Content Delivery System (CDS) (Appendix F) would meet the needs of the enterprise as it meets the following criteria:

- Agility of interfacing within multiple applications, including the LCMS for decreasing publishing workflows
- Data collection of end-user content consumption

- xAPI returns information regarding the end user's experience with the content to the Learning Record Store (LRS)
- Customizable REST API calls to collect metrics that are not out-of-the-box for the CDS
- Vendor and internal IS support

Within the CDS, each piece of content, as well as individual objects within the content, can be tagged with metadata with who uploaded the content, who owns it, and an expiration date. This supports an enterprise-wide content strategy that is one facet of the overall enterprise architecture strategy of merging both business and technology processes. The software application also breaks down technology silos since content that is updated in the CDS then automatically updates its corresponding hyperlinks to other applications while maintaining a version history. The new business and technology architectures will require that processes and governance be established regarding what content is uploaded to the CDS and how it will be maintained. If the architecture for Issue 2 is implemented, then the only software systems being used for content creation is the LCMS, Microsoft Word, and PowerPoint.

For new content created using the LCMS, the developer can publish the project in the desired format, fill out mandatory fields to ensure that the content resides in the correct area of the CDS, and click "Upload." If the LCMS content is a SCORMED eLearning, the current process for requesting the LMS team to upload the content should be evaluated as the CDS produces thin packages rather than .zip files for upload into the LMS system. Governance and standards will also need to be discussed regarding the process for tagging content, including implementing a system-wide taxonomy for aiding system search capabilities.

A CDS portal could take the place of an EMR website as well as EMR Learning Dashboards, supporting the architecture principle of IT efficiencies and enabling the enterprise to move to an optimized core of data and processing standards (Ross, Weill, and Robertson 2006). The new architecture would consist of the CDS being embedded directly into the EMR site as a tab feature where the user accesses any EMR related content that applies to their role. This will be a single sign-on (SSO) service to prevent unnecessary roadblocks to accessing content at the time of need.

Gap Analysis

The organization has yet to invest in a CDS or analyze how end-user access points can be consolidated. With the rise of cloud computing, implementing a CDS secures enterprise assets as scores of information can then be stored, accessed, and processed better than the current state. Additionally, an enterprise-wide content strategy must be in place in conjunction with a CDS implementation since having a single content storage solution helps with content maintenance, metrics, and reporting. A process for uploading both LCMS content and non-LCMS content will also need to be documented and communicated to content developers, IS, and end-users if any access points for content retrieval changes. Security measures will need to be evaluated as the communication between the EMR and the CDS can only occur from the CDS to the EMR, not the other way around. This is to ensure that patient information remains secure.

Solutions and Alternatives

Issue 1: Inefficiency of business processes

Recommended Solutions:

The enterprise, its employees, and the patients they serve benefit the most when the resources supporting the partnership of business and technology are strategically used. Additionally, lean business processes encourage adherence and ease of use of EA governance standards. To address the current inefficiencies, the many redundant business processes must be consolidated to an enterprise-wide intake process for customer requests. This will greatly reduce the amount of content needing maintenance and tracking as well as assist in helping the customer have their problems appropriately addressed to obtain successful results.

The framework requires a collaborative committee consisting of process improvement advisors, instructional designers, metrics analysts, and IS representatives as the new workflows and technology solution directly affect these roles (Linden 2010). This committee is to be responsible for the planning, documentation, and implementation of the overall content strategy and is the governance committee as they will be the filter for all end-user issue resolution. Together, they will consult with the end-user to determine if their request or problem can be solved using training or communication solutions or if there is a different root cause, such as an environment issue that can be addressed. This process will meet the goal to eliminate unnecessary and expensive training while freeing up time for the instructional designers to focus on the full spectrum of ADDIE methodology for true training needs.

A standard process model associated with this business architecture would constitute an instructional design methodology adopted as an enterprise-wide instructional design philosophy to ensure that any content being developed has been scoped and designed for effectiveness. The architecture governance and standards will require a global writing style, QA, and after training evaluations. While Microsoft Styles has been the preferred written style on the EMR training team and has been successfully used throughout their development process, the committee will need to collaborate to determine if Microsoft Styles will also meet their needs when using the LCMS. To avoid more silos, one standard style should be agreed upon prior to using the LCMS. Establishing these standards and artifacts (such as business workflows) will:

- Create a leaner process for instructional designers and developers to generate content outputs that align with best practices for creating effective instruction.
- Provide a central location for end-users to make requests for problem solving help and training.
- Establish a dedicated system-wide core group for analyzing issues and designing, developing, implementing, and evaluating the proposed solutions.
- Prevent development software licenses being used by non-core instructional designers and developers.
- Leverage workplace social media as a communication tool rather than using the LMS to help engage the workforce (Qualman 2009).

Within the information and technology architectures, social media should be considered as an option for wide-spread communication on business units or departments, supporting the

goal of decreasing unnecessary training and easing the process of getting timely information to staff. Several enterprise-centric social media options exist that would help ensure that the appropriate staff members see the communication. Specifically, Facebook Workplace is a great candidate as a site manager could “go live” to give mass communication to staff members with a recorded video for those who were unable to attend the live meeting. This is the basis of socialnomics since communication spreads faster using the web rather than word of mouth (Qualman 2009). Because healthcare facilities require staff 24/7 365 days a year, enterprise social media provides a means to communicate with all staff once, regardless of their shift. Additional standards surrounding work-related social media would need to be put in place to ensure that no HIPPA regulations or compliance issues occur.

Alternatives

Other options were considered for creating leaner business processes as part of the business architecture, specifically, the option to have an individual intake process for each site where the program coordinator receives all site requests and then proceeds to go through the ADDIE methodology and coordinate with their site process improvement advisors. However, since program coordinators have other responsibilities outside of eLearning development and instructional design, having a dedicated team for this process is the superior choice, especially since the dedicated team is also the team that governs and regulates the EA. Additionally, this alternative process only assists with site-specific solutions rather than evaluating if issues are wider spread. Keeping end-user requesters in mind as well, having a central location for requests provides a process that is less confusing for stakeholders.

*Issue 2: Silos and duplicate system services for content development****Recommended Solutions:***

The enterprise must define an IT strategy that corresponds to the business strategy. Moving from a Diversification operating model to a Unified operating model will require that standard processes and systems are in place to help with integrating content in systems that are accessed by end-users (Ross, Weill, Robertson 2006). The Learning Content Management System (LCMS) was chosen to replace both Captivate and Articulate eLearning software systems due to their interoperability with other software interfaces. Additionally, to maintain content integrity and ease access for end users, a CDS system should also be implemented to maintain a single-source for content. The LCMS was chosen for the following reasons:

- **Standardization:** Authoring templates created by the LCMS admin and the Learning and Development Specialist allows for reuse of content elements between multiple projects. It is a system requirement that a single written style is established to have content between projects blend together smoothly. Additionally, there are standard outputs that developers will use to prevent the time consumption of choosing colors and fonts, as well as to prevent the need to develop specifically for mobile as the templates are responsively designed.
- **Interoperability:** The LCMS works in conjunction with the CDS to ease the publishing of new or updated content. Because of its xAPI, CDS can be embedded in the UI of other applications and collect data on the user and how they interact with the content.

- **Support:** There is a dedicated support team for the LCMS, who would also support the CDS as they are from the same vendor. Additionally, the LCMS team works closely with the vendor to vet all upgrades and to support enterprise end-users.
- **Efficiency:** The LCMS allows for object-level reuse of content so that once content is developed, it can be used multiple times in multiple projects within both web and print outputs.
- **Governance:** The EMR training team uses a Design and Style Guide to assist in writing for reuse and clarity. This guide would also be used by others working in the system. Additionally, a quality assurance process that checks for written style and functionality needs to be established for checking the content before end-user consumption. A dedicated person or team could be responsible for this function.

Alternatives

Articulate and Captivate are well renowned for their eLearning development capabilities. Since both are currently used in the enterprise, along with the LCMS, it was considered to eliminate just Articulate and keep using Captivate and the LCMS. Articulate functionality is limited as it cannot create software simulation training like Captivate nor does it come with the suite of media editing software, hence Captivate would be chosen. However, after comparing Captivate to the LCMS, this solution was not selected as Captivate only provides a means to create eLearning and no other documents. It also does not give developers the ability to search and reuse existing content. Since the enterprise is moving away from software simulation training, moving all developers to the LCMS is what fits the overall enterprise strategy best.

*Issue 3: Ineffective training****Recommended Solutions:***

The ADM business models and architecture integrate the processes needed for measuring training effectiveness. Training effectiveness focuses on understanding the reasoning as to why or why not the learner has attained a certain level of proficiency (Ford 1997, 12). This requires follow-up after a training to measure its results. Kirkpatrick's classic model of training provides four levels of evaluation- learner's reaction, measurement of what they learned, the transference of information that affects their behavior, and the business outcomes that occur when there are behavior changes (Strother 2002). When used on the centralized instructional design team, this model will help scope the projects and help instructional designers discuss metrics with the metrics team to determine objectives, learning outputs, and evaluation methods. Eliminating unnecessary training by implementing Solution 1 will also decrease ineffective training.

Alternatives

The alternative to collaborating with the metrics team is for the instructional design team to implement Kirkpatrick's model themselves in collaboration with the SME. Since the instructional design team is not familiar with all lines of business as it pertains to collecting enterprise-wide metrics, this is not suggested as there is more benefit working directly with the metrics team when creating a project plan.

*Issue 4: Multiple Knowledge Base systems****Recommended Solutions:***

Companies who integrate business process and technology earn higher profits and experience less technical failures (Bernard 2012). A Content Delivery Service (CDS) supports business processes as it provides performance support to end-users seeking just-in-time information. Using its xAPI, CDS interfaces with other applications, such as the EMR or the enterprise intranet site, to provide access to information in a central location at the time of need.

The enterprise acknowledged the value of a CDS three years ago, however, it was not a significant initiative at the time, hence it was never implemented. Looking at the original statement of work, this investment will provide an ROI in less than a year since it prevents healthcare workers from accessing outdated content due to its ability to support a content lifecycle. It also decreases the time spent in updating hyperlinks to content in multiple systems. The value goes beyond the ROI in the form of employee satisfaction as it supports critical business processes (Bente, Bombbosch, and Langade 2012). Because of its integration with the LCMS and LMS, its xAPI can collect valuable metrics within external applications, strengthening the support of an enterprise-wide content strategy (Herbst et al 2014). Using its xAPI to integrate with other applications also supports Solution #3 as it can help determine what information should be trained through search analytics collected in the Learning Record Store (LRS) using REST API. This feature assesses what content is being accessed, by whom, through

what application, as well as tracks the times and days where content experiences the most traffic.

Alternatives

Implementing a Content Management System (CMS) to host all content in a single repository was considered due to the cost in comparison to a CDS. However, because of file size and file type restrictions, some of the enterprise's knowledge assets would need to be maintained elsewhere, hence defeating its purpose of supplying a single system for content storage, management, and maintenance. A CMS also does not have an API to integrate with other applications like a CDS allows, nor does it help with the integration of business processes and technology, which complicates the process of the enterprise becoming a Unified operating model.

Roadmap

Implementation of the EA will be completed in a phased approach to support existing materials currently developed in Captivate and Articulate in order to mitigate risks of non-compliance with governmental agencies. This high-level roadmap discusses the approach for implementing each solution as they align with TOGAF ADM phases. It also includes topics regarding EA maintenance. Each phase is estimated to take three months, indicating an EA could be established within a year.

| Description | Steps |
|--|---|
| <p>TOGAF ADM Preliminary Phase and Phase A</p> <p>Timeframe: Months 1-3</p> | <ul style="list-style-type: none"> • Establish an EA workgroup that can then establish the enterprise solutions committee to be a part of the EA workgroup. The workgroup will consist of LCMS team, all L&D Directors, IS Director and manager, as well as the corporate eLearning team Lead. • Review enterprise current state for requests and content development for context. • Map organizational model and workflows. • Identify principles of the architecture as they relate to business and technology. • Identify current and aspiring operation models as well as departments most affected, soft units seeing some change in their work, and stakeholders outside of the EA workgroup. • Document governance and on-going support of the EA model. • Identify business requirements as they are related to intake, government and regulatory compliance, workflows, and contingencies. • Define KPI's of the EA. • Identify risks, map the level of risks, and create mitigation plan. • Create Statement of Architecture Work with the changes to existing areas, new workflows, the impact, resources needed, performance, communication plan, and governance. |
| <p>Phase B-Solutions 1 and 3:</p> <p>Consolidate Business Processes between site teams and corporate team.</p> <p>Adopt metrics and evaluation standards for measuring training ROI.</p> <p>Timeframe: Months 3-6</p> | <ul style="list-style-type: none"> • Define business problems, gaps, and new business processes (Appendix A). • Create target Business Architecture description that addresses gaps within the gap analysis (Appendix B). • Identify business drivers for addressing stakeholder concerns (Issues 1-4). • Create Enterprise Solutions Committee: consists of all instructional designers, metrics team representative, IS leads, and site process improvement advisors. • Document business functions vs services. • Work with stakeholders from L&D Departments, Metrics Department, IS, and site Directors. • Partner with metrics team to learn what tools are available to assist instructional designers with follow-up. • Establish standard evaluation governance using Kirkpatrick's model. |

| | |
|--|---|
| <p>Phase C- Solution 2: Eliminate extraneous eLearning development software. Consolidate training assets into one tool and database.</p> <p>Timeframe: Months 6-9</p> | <ul style="list-style-type: none"> • Simplify the application landscape by consolidating application and business processes into one to eliminate duplication of functionality. • Develop the Target Architecture Framework that supports the Business Architecture (Phase B). • Create support plan for content currently created in software that will be eliminated. • Determine the transition plan for actors moving from one software system to another, including the new workflows, technical hardware components, and standards. • Create data governance surrounding content assets within the LCMS and CDS. • Partner with IS to establish governance and workflow for license requests. |
| <p>Phase D- Solution 4: Implement a Content Delivery Service (CDS) system.</p> <p>Timeframe: Months 9-12</p> | <ul style="list-style-type: none"> • Document enterprise-wide IT system associated with training and content development as it pertains to the scope of the EA. • Determine reusable tech (CDS), the roles and responsibilities of IS, and the governance associated with the technology. • Address and document service agreement of technological services and IS engagement in maintenance of the EA. |

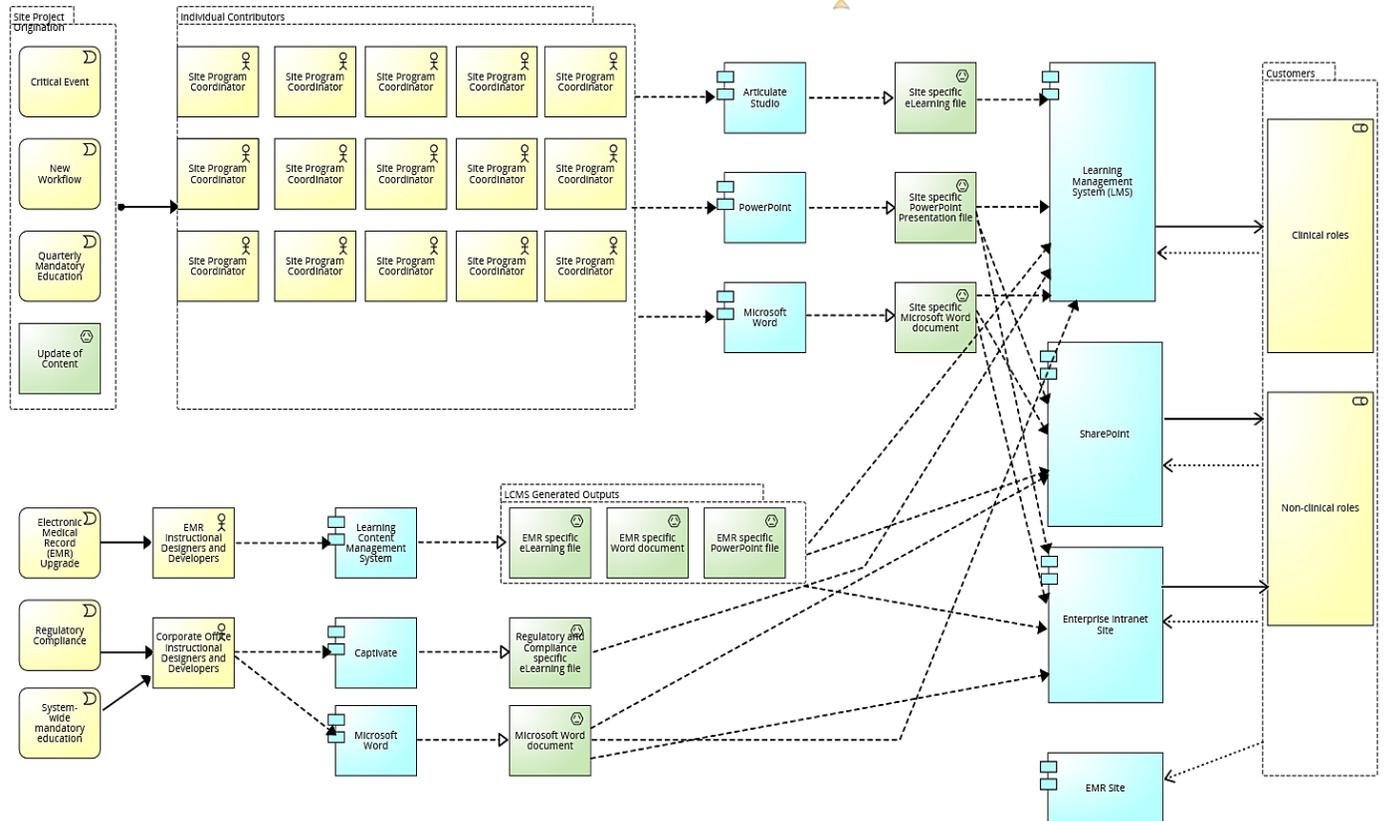
Conclusion

The issues of workflow inefficiencies, duplicate systems providing the same services, multiple content access points, and ineffective training are solvable through an enterprise architecture as it maps business processes to technological solutions while melding the individual departments into one cohesive unit under one content strategy. Following the blueprint provided by TOGAF, business processes and technology solutions are readily adaptable to the ever-changing training and content needs of the organization, while providing stability in core business processes for reliability. The current status quo risks patient safety if

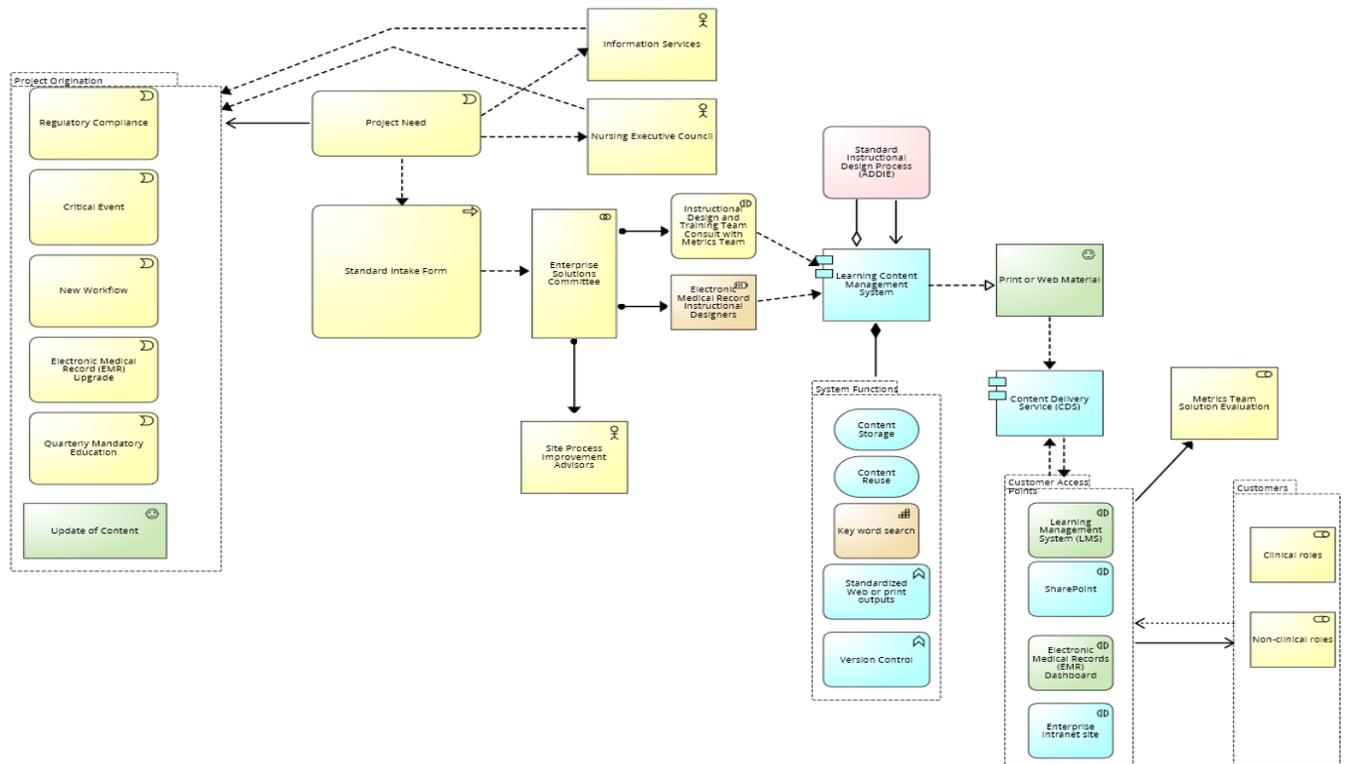
healthcare providers are not able to access reliable content easily and are being “trained” in areas that are unnecessary while not being evaluated in the topics where training is needed. The current status is also resource intensive and wastes money supporting redundant legacy systems. An EA strategy defines the enterprise landscape being built in the organization using one development tool, through one group, servicing the entire enterprise’s needs with researched instructional design methodology and integrated technology that supports the business aspects of the entire enterprise. With a strategy in place, a unified operating model can exist that will best serve those who serve the patients that trust the organization with their care.

Appendices

A. As Is: Business Processes



B. To Be: Business Processes



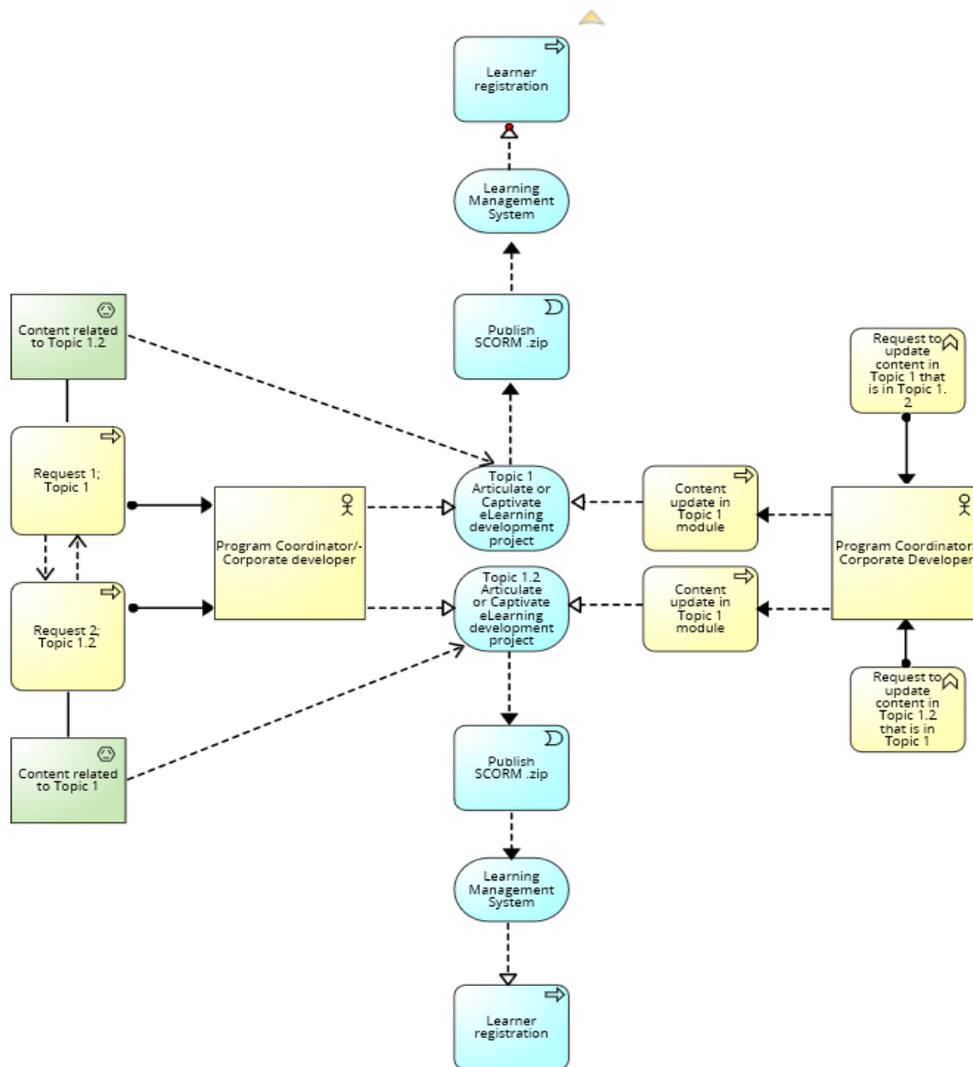
C. As Is: Application Matrix

| Software/Actor Matrix | | | |
|--|----------------------|-----------------------------------|-----------------------------|
| Development Software (Y-Axis) and Actor (X-Axis) | Program Coordinators | Corporate Instructional Designers | EMR Instructional Designers |
| Articulate | x | | |
| Captivate | | x | |
| Learning Content Management System (LCMS) | | | x |
| PowerPoint | x | x | |

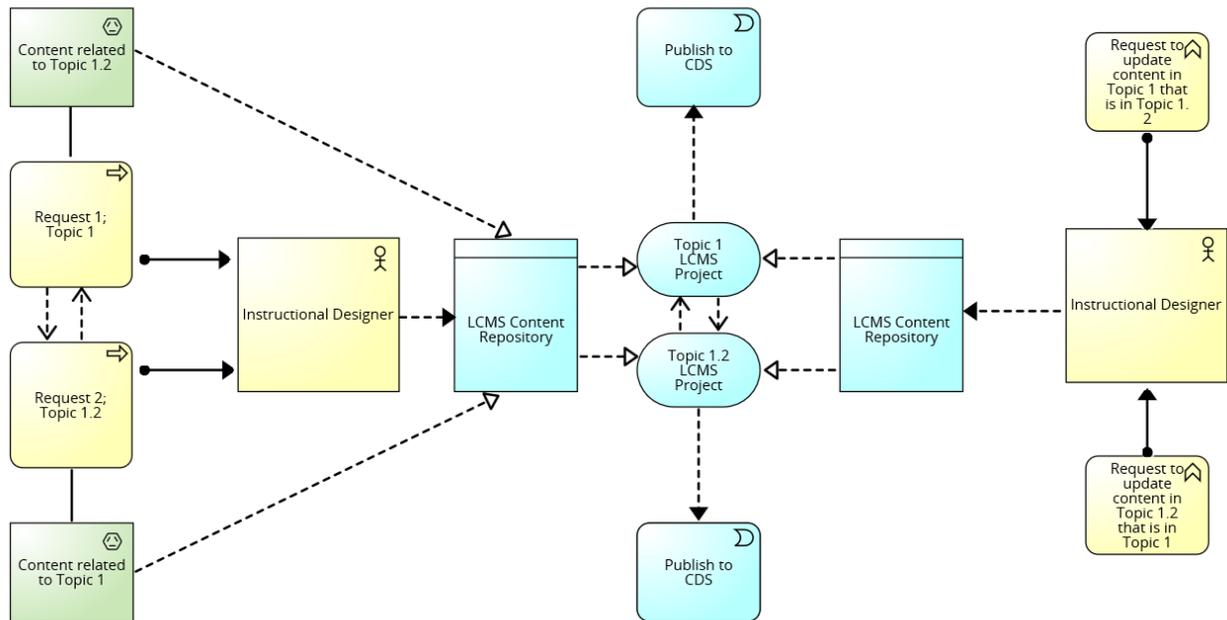
D. To Be: Application Matrix

| Software/Actor Matrix | | |
|--|-------------------------|-----------------------------|
| Development Software (Y-Axis) and Actor (X-Axis) | Instructional Designers | EMR Instructional Designers |
| Captivate | x | |
| Learning Content Management System (LCMS) | x | x |

E. As Is: Application Architecture



F. To Be: Application Architecture



G. Principle Architecture Statements

| Architecture Principles | | |
|--|---|--|
| Statements | Rationale | Implications |
| Principles of content management, training, and information services effect all departments within the organization. | To provide quality training and supplemental content, projects must be scoped and analyzed using best practices within Instructional Design with the lens of process improvement. | <ul style="list-style-type: none"> Cost and resource wastes for creating unneeded "training." Duplicate content without a catalog. End-user burnout from too much training. |
| Consolidate training assets into one tool and database. | Selecting one development tool that enables sharing content elements and is able generate multiple web and print outputs saves time, resources, and costs associated with development time. | <ul style="list-style-type: none"> Expiration of Articulate and Captivate tools will require that existing content developed from these tools will need to be redesigned once the request for update is received. Each existing project requesting update will need to be reanalyzed to determine if training is needed. New users will need to be trained on the development software. |
| Adopt metrics and evaluation standards for measuring training ROI. | Every training costs a considerable amount of time develop and, for the end-user, to compete. Evaluating the effectiveness of the training is necessary to ensure that goals are met, especially related to patient-centric healthcare initiatives. | <ul style="list-style-type: none"> Require adoption of metrics and analysis methodology. Once adopted, the Instructional Design and Training team will need to learn how to apply the methodology. Will require partnership with SMEs and Metrics team during development of the objectives as well as for follow-up. |
| Service Oriented Content Management | Implementing a Content Delivery Service allows for a single source for content to reside to aid an overall enterprise content strategy. The CDS interfaces with the LCMS and other applications for blended integration and ease of use. | <ul style="list-style-type: none"> Content will need to be grouped to ensure end-users receive relevant content. Creating custom REST API calls for data collection within the LRS requires collaboration with the web development team. To interface with other application, will need collaborated with business and IT groups outside of the scope of this EA project. |

References:

Alleman, Glen B. 2015. *Performance Based Project Management*. Accessed November 10, 2019.

<http://www.maxwideman.com/papers/performance2/performance2.pdf>.

Battles, J.B. 2006. "Improving patient safety by instructional systems design." *Qual Saf Health Care*. Accessed October 28, 2018.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2464865/> .

Bente, Stefan, Uwe Bombosch, Shailendra Langade. 2012. *Collaborative Enterprise Architecture*.

Bernard, Scott A. 2012. *An Introduction to Enterprise Architecture*. Bloomington, IN: Authorhouse.

Culatta, Richard. 2018. "ADDIE Model." Accessed November 1, 2018.

<http://www.instructionaldesign.org/models/addie/>.

Ford, Kevin J. 1997. "Improving Training Effectiveness in Work Organizations." *Psychology Press*. Accessed November 10, 2018.

<https://books.google.com/books?hl=en&lr=&id=2FGZAgAAQBAJ&oi=fnd&pg=PP1&dq=training+assessment&ots=q32QxqIG2Q&sig=C2zdG55Z6YkJPK1D8qAjJvpoSw#v=onepage&q=training%20assessment&f=false>.

Herbst, Andrea, Alexander Simons, Jan vom Brocke, Oliver Müller, and Stefan Debortoli. 2014.

"Identifying and Characterizing Topics in Enterprise Content Management: A Latent Semantic Analysis of Vendor Case Studies." *European Conference on Information*

Systems. Accessed November 8, 2018.

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.669.7208&rep=rep1&type=pdf>.

Huggett, Cindy. 2013. *The Virtual Training Guide: How to Design, Deliver, and Implement Live Online Learning*. Accessed November 11, 2018.

https://books.google.com/books?hl=en&lr=&id=YjJdAwAAQBAJ&oi=fnd&pg=PP1&dq=The+Virtual+training+guidebook+:+how+to+design,+deliver,+and+implement+live+online+learning&ots=qCIJKYpxw7&sig=6Yp0wCSMef0DPpBIKnc20K_jfRc#v=onepage&q=The%20Virtual%20training%20guidebook%20%3A%20how%20to%20design%2C%20deliver%2C%20and%20implement%20live%20online%20learning&f=false.

Kerzber, Harold Ph.D. 2015 "Project Management Metrics, KPIs and Dashboards." International Institute for Learning, Inc. Accessed November 5, 2018.

https://s3.amazonaws.com/academia.edu.documents/46594659/1315b_-_Kerzner_-_Understand_Metrics.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1541283023&Signature=T2G%2FYCpx62vl6H9CX7%2F0tBRAk50%3D&response-content-disposition=inline%3B%20filename%3DProject_Management_Metrics_KPIs_and_Dash.pdf.

Linden, Russell Matthew. 2010. *Leading across boundaries: creating collaborative agencies in a networked world*. Accessed November 6, 2018.

<https://books.google.com/books?id=ow72YRLJk0gC&printsec=frontcover&dq=leading+a>

crossboundaries&hl=en&sa=X&ved=0ahUKEwIU28ncq83eAhUf3YMKHVrbAkAQ6AEIKDAA#v=onepage&q=leading%20across%20boundaries&f=false.

Punjaisri, Khanyapuss, and Alan Wilson. 2017. "The Role of Internal Branding in the Delivery of Employee Brand Promise." *Journal of Brand Management: Advanced Collections*.

Accessed November 2, 2018. https://link.springer.com/chapter/10.1057/978-1-352-00008-5_6.

Robertson, Tanya. 2018. "The Disadvantages of Over-training in the Workplace." Accessed

November 1, 2018. <https://smallbusiness.chron.com/disadvantages-overtraining-workplace-20625.html>

Ross, Jeanne W., Peter Weill, and David C. Robertson. 2006. *Enterprise Architecture as Strategy: Creating A Foundation for Business Execution*. Boston, MA: Harvard Business Press.

Scott, Karen M. BEd, MA, PhD; Baur, Louise MBBS(Hons), PhD, FRACP, FAHMS; Barrett, Jenny

BA, MEd, DEd. 2017. "Evidence-Based Principles for Using Technology-Enhanced Learning in the Continuing Professional Development of Health Professionals."

Journal of Continuing Education in the Health. Accessed November 9, 2018.

https://journals.lww.com/jcehp/Abstract/2017/03710/Evidence_Based_Principles_for_Using.10.aspx .

Shapiro, Marc J., MD, Roxane Gardner MD, MPH, Steven A Godwin MD, Gregory D. Jay MD,

PhD, David G. Lindquist, MD, Mary L. Salisbury RN, MSN, Eduardo Salas PhD. 2008.

“Defining Team Performance for Simulation-based Training: Methodology, Metrics, and

Opportunities for Emergency Medicine.” *Academic Emergency Medicine*. Accessed

October 30, 2018. [https://onlinelibrary.wiley.com/doi/full/10.1111/j.1553-](https://onlinelibrary.wiley.com/doi/full/10.1111/j.1553-2712.2008.00251.x)

[2712.2008.00251.x](https://onlinelibrary.wiley.com/doi/full/10.1111/j.1553-2712.2008.00251.x) .

Strother, Judith B. 2002. “An Assessment of the Effectiveness of e-learning in Corporate

Training Programs.” *Florida Institute of Technology*

[http://www.irrodl.org/index.php/irrodl/article/viewArticle/83/160Tauber?utm_campaign=elearningindustry.com&utm_source=/dramatically-reduce-corporate-training-](http://www.irrodl.org/index.php/irrodl/article/viewArticle/83/160Tauber?utm_campaign=elearningindustry.com&utm_source=/dramatically-reduce-corporate-training-costs&utm_medium=link)

[costs&utm_medium=link.](http://www.irrodl.org/index.php/irrodl/article/viewArticle/83/160Tauber?utm_campaign=elearningindustry.com&utm_source=/dramatically-reduce-corporate-training-costs&utm_medium=link)

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Qualman, Erik. 2009. *Socialnomics: How Social Media Transforms the Way We Live and Do*

Business. Accessed November 9, 2018.

[https://books.google.com/books?hl=en&lr=&id=yAqD19i2U0UC&oi=fnd&pg=PT13&dq=](https://books.google.com/books?hl=en&lr=&id=yAqD19i2U0UC&oi=fnd&pg=PT13&dq=using+social+media+in+business&ots=AxKcU_uS-K&sig=6GPXoloQS2rloM25cBjLT5ZWN1A#v=onepage&q=using%20social%20media%20in%20business&f=false)

[using+social+media+in+business&ots=AxKcU_uS-](https://books.google.com/books?hl=en&lr=&id=yAqD19i2U0UC&oi=fnd&pg=PT13&dq=using+social+media+in+business&ots=AxKcU_uS-K&sig=6GPXoloQS2rloM25cBjLT5ZWN1A#v=onepage&q=using%20social%20media%20in%20business&f=false)

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[n%20business&f=false](https://books.google.com/books?hl=en&lr=&id=yAqD19i2U0UC&oi=fnd&pg=PT13&dq=using+social+media+in+business&ots=AxKcU_uS-K&sig=6GPXoloQS2rloM25cBjLT5ZWN1A#v=onepage&q=using%20social%20media%20in%20business&f=false) .