



## Developing Enterprise Learning Information An Integrated XML Approach

### Abstract

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To communicate about their products and services, companies produce a wide range of customer-facing information products, including printed training materials, Web-based courseware, technical documentation and performance support tools. For these organizations, the production used to create these content assets can be inefficient and the resulting products can contain inconsistent and conflicting information. Employees and customers who rely on these information products can be confused and uncertain as to which source to trust.

This white paper describes the organizational issues at the heart of this problem and offers a solution that incorporates a single-source production methodology enabled by the development of a knowledge product. Customers and employees both benefit because they can now access consistent and reliable information from multiple points of context.

### The User's Dilemma: Conflicting Information

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Picture this scenario: One of your employees or customers attends a training class to learn how to use your latest application or product. Several weeks later, this individual starts to use the application or product for the first time and must reference the technical documentation to refresh their skills. In accessing the information, the individual discovers that the technical documentation is organized differently than the course training materials and also finds that some of the information is inconsistent. To resolve the discrepancies, the individual logs onto your organization's on-line customer support portal but again finds the content organized differently and containing more inconsistencies. Inevitably, the individual calls your customer support hotline to find out which information is the "trusted source."

Many times, upstream production problems result in inconsistent information. Once information is created in most organizations, it is stored in individual silos organized around the modality of delivery. You may have separate teams to support the development of materials such as for instructor-led training events, Web-based training, customer support materials, performance support systems, technical documentation. Each of these teams has its own writers, reviewers, processes, tools, IT infrastructure and support.

If you analyze the content being produced by each of these teams, you may find that a high percentage of the subject matter overlaps because each team develops content independently, resulting in a lack of consistency in organization, terminology and quality. As a result, your customer or employee who relies on this content can be confused and frustrated.

Using a siloed production methodology can be costly to your organization and also may negatively impact customer satisfaction because each modality of delivery can potentially:

- Recreate the same content multiple times
- Validate the same information through a separate editorial process

- Maintain numerous autonomous teams
- Invest in redundant authoring tools & content management systems
- Rely on expensive subject matter experts to transfer the same knowledge multiple times.

## The Foundation: A Unified Content Strategy

You can eliminate redundant and inconsistent customer-facing content in your organization by developing a single source of trusted content and using that single source to generate all related information products.

The first step in the process is to re-align the charters of the production teams across your organization. Organize each team by dividing the labor and defining responsibilities with an objective to add unique delivery value to the knowledge-base versus recreating the content each and every time.

The second step is to require each production team to collaborate as a collective unit to develop a joint task analysis of your company's publications with an eye to design an information architecture that shares common content. The joint task analysis normalizes the information structure across groups and identifies the supporting topic and titles. This is a critical step because it ensures that the organization of the information and the titles of the topics remain consistent from source-to-source.

The objective of the task analysis is to identify all of the required content and create a skeleton of all of the publications. In the next step, you can assign work across the teams and develop a project plan using the skeleton as a foundation.

By following these steps, the content is dissected, re-combined, and published to multiple outputs and can exist in a single repository. For example, the same installation procedure can be reused as part of an instructor-led training course, a Web-based course, a technical manual and in other modalities. Your organization gains consistency in the information generated about its products and/ or services.

## XML: The Enabler

You have the ability to reuse the same content within different publication types and delivery modalities if your content is created and stored in a granular, structured, yet flexible way. A procedure initially authored for a technical manual can be stored as a discrete element apart from the technical manual that references it. In this way, the procedure element can also be referenced in other documents such as a Web-based course or a performance support system.

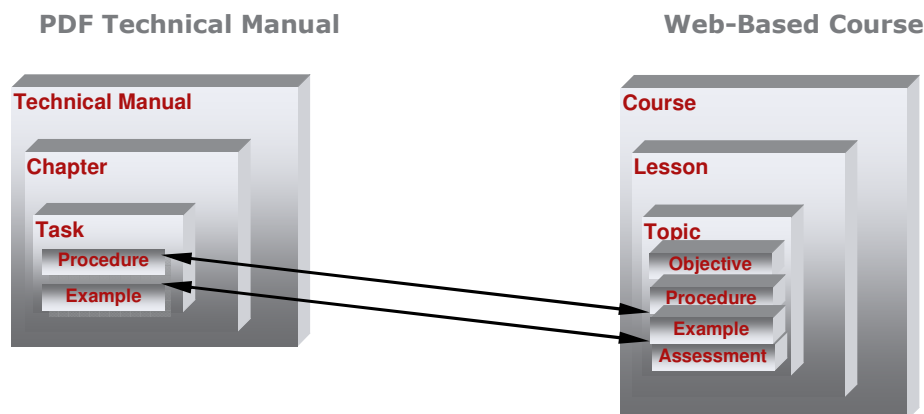


Figure A: Modular Content

**Figure A** shows how the same procedure and example elements are referenced within a PDF-based technical manual and a Web based course using XML as a technology enabler.

You can reuse content across different document types by separating the content from its presentation and rendering the same content object to different modalities. Transforming and storing your content in XML, and using other XSL technologies allows the same piece of content to be rendered to different formats. For example, XSL renders content to HTML, XSL-FO renders content to PDF, and XSLT renders content to other XML formats. An installation procedure has a different XSL technology applied when it is being published as a PDF Instructor-Guide, versus a SCORM-compliant Web-Course or a HTML customer self-help application, as illustrated in **Figure B**.

## Proprietary Solutions

Many vendors claim to provide solutions that address single-source content; however, most lack the ability to provide a fully integrated, end-to-end solution to meet the needs of all learning constituencies. The following discusses the advantages and disadvantages of selected solutions.

Learning Content Management Systems (LCMS) were developed to support the efficient production of Web-based courseware. With a LCMS, you gain efficiencies in content development because the solution offers reusable learning objects, collaborative authoring, authoring templates, and workflow capabilities; yet, there are significant pitfalls such as:

- You can only reuse content within a limited scope. Objects developed for a Web-based course can only be used for other Web-based courses.
- Likewise, you cannot reuse content from any other source such as using a technical manual to develop a Web-based course or any other course for that matter.
- LCMS solutions also lack flexibility. The system's templates are hard-coded and do not support customer-specific schemas. As a result, LCMS solutions cannot accommodate your unique content requirements.

Desktop Publishing Software (DPS) plus a Content Management System (CMS) provides a solution so that your technical documentation team can more efficiently develop modular, reusable technical documentation. This combined solution provides collaboration software, structured authoring, and workflow. Although a benefit to your documentation team, this solution does not provide a single source of content for the development of all customer-facing information.

- The DPS and CMS tools are generally proprietary data formats which limit the ability to reuse content across applications. Therefore, you can only use Microsoft Word content within other Word documents and Adobe FrameMaker content can only be used in other FrameMaker documents.
- The reuse of content is limited to the DPS tool which means that content in a technical document must be re-created for use in any alternate delivery modality. For instance, elements of an installation procedure have to be re-created for use in a Web-based course.

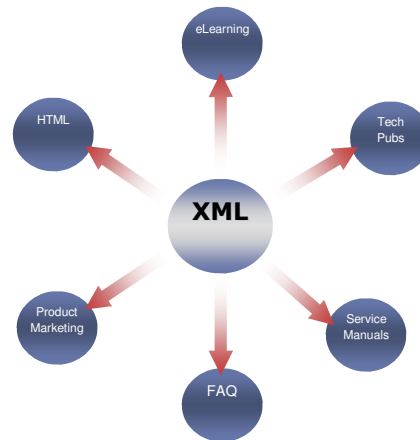


Figure B: XSL Publishing

- Unlike an LCMS, DPS and CMS tools do not provide support for the development of Web-based training.

A combined XML authoring software and Content Management System (CMS) provides you with a single source publishing solution for multiple outputs and can streamline the development of customer-facing information. Combining XML authoring tools with a CMS that offers XML services allows you to reuse parts of your documents across different document types. While this combined solution provides a measure of efficiency by offering content reuse, workflow, and structured authoring, it can fall short because most solutions target only technical documentation and have drawbacks in meeting other reuse requirements:

- Blending training and technical documentation requires a costly integration of the CMS, the authoring tools, publishing tools, training runtime services, and the Learning Management System. Often, integrating such a variety of disparate tools and services creates a disjointed authoring and previewing experience and an inefficient workflow.
- This solution is dependent upon the proprietary XML services provided by the CMS, which for the most part, are not designed to handle XML at the granular level needed for single-source publishing. This solution also typically doesn't provide a contextual query capability nor can it easily scale to support growing content.

## The Integrated Solution for Blended Learning

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The ideal solution to support blended delivery provides your organization with an integrated work environment over the entire XML life cycle and creates a cohesive experience for legacy conversion, authoring, editing, reviewing, publishing, and distribution.

- **Capture:** This integrated solution can provide subject matter experts with a way to contribute using the tools with which they are most comfortable such as Word, FrameMaker, Web-based forms, and others.
- **Convert:** This solution also can support the conversion of common document formats such as Word and FrameMaker because most of your current content is in those (non-XML) formats.
- **Store and Manage:** The solution can leverage existing content and available services for easy repurposing of content. With a scalable, channel-independent content repository, your organization can store varying content in a structured, yet flexible way for repurposing and distribution.
- **Assemble:** To easily support the assembling of new publications from existing content, you can query existing content to easily link it into a target publication. You can also easily preview content and content changes on-demand to simplify the publication assembly process and ensure content is always current. You can accomplish these objectives because content authoring, storage, and publishing are tightly integrated.
- **Deliver:** Your customers and employees can consume consistent, accurate, up-to-date information whether published in print format, on-line or delivered via wireless devices because the content is assembled from a single, trusted source. The same procedure may appear in the SCORM-compliant Web-based course, the PDF Instructor guide, the PDF technical manual, and the performance support system. The content is consistent even though the context, format and/or procedure may differ.

## Summary

A single-source approach to content development can improve your customer's experience and dramatically lower your production costs. A by-product of this approach is a content base of granular XML elements. Once the content is in XML format, it can be dynamically assembled and published to new customer-facing services such as premium subscription services, on-demand publishing for partners and customers, eBooks, just-in-time performance aids, and tailored training programs. Consistent customer collateral and customer-facing information products help create a superior customer experience, ultimately providing your organization with a competitive edge.

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### About Xyleme, Inc.

Xyleme, Inc. is the industry's leading provider of open and standards-based learning content management solutions that enable single-source publishing of training content. Xyleme is 100% XML-based to create massive efficiencies through modularity and reuse. With Xyleme, training organizations improve collaboration in content development, reduce time-to-market for customized training products, and minimize the cost of supporting a blended learning strategy for print, online and mobile delivery.

With Xyleme LCMS, the entire content life cycle, from authoring to storage to publishing, is pure open XML. Therefore, content is effortlessly repurposed across print, eBook, online courses and mobile applications and automatically synchronized across these learning products. Xyleme LCMS takes full advantage of user-generated content to support enterprise content development processes and can publish training content to both formal and social learning environments. The industry's leader in standards support, Xyleme complies with key industry standards including SCORM 2004 and 1.2, Common Cartridge, QTI and ePub.

For more information about Xyleme, Inc., visit [www.xyleme.com](http://www.xyleme.com).