Experts in Supporting Educational Publishers' Complex Needs

The information landscape has radically changed in the past few years and learners’ expectations of how they interact with content have changed with it. It is no longer enough to provide a printed book to teach a skill; learners expect to receive a range of content in a variety of formats: printed books, eBooks, dynamic learning portals, and mobile applications start the list. To meet these changing learner needs, educational publishers must convert their content to a neutral source that supports multi-channel content delivery. eXtensible Markup Language (XML) is that neutral source and the Darwin Information Typing Architecture (DITA) is an XML architecture designed for this purpose.
Current Content Source Limitations

Most content has been created in the format in which it is expected to be delivered.

Content Created for Single Deliverable

When you create content for a single deliverable, you can optimize the content for that particular delivery format; however, this strategy locks the content into a single delivery format and reusing it for other formats is a costly effort. For example, if you create content in InDesign for a printed book, you can optimize the content layout and flow for the book. You can generate an online PDF deliverable of the book fairly easily; if you need to reuse any of that content for an online course, you must convert the content to the course format, which may be XML. If you need to reuse that same content for delivery in a mobile app, you must convert it from InDesign again to yet another format, XHTML. As you realign your deliverables to provide integration across multiple delivery media, this one-off strategy does not scale and is not cost effective.

Content Reuse is Difficult

In addition to the financial challenges of converting content from one source to another multiple times, the content cannot simply be “moved” from one design to another.

- Content for books is written to be read from beginning to end. This approach creates dependencies that make it difficult to use the same content in a different order or for a different purpose, such as a mobile app. For example, wording such as “in the previous chapter” is not appropriate in a non-book experience.

- Non-XML sources embed the formatting into the content. When an author applies a format in a source file, such as an InDesign file, the styling is embedded into the content. Because this styling is not usually applicable in another deliverable, the formatting must be updated for each deliverable type.

- Tool-specific files lock your content into a dependency on the functionality, including output generation, for that tool.

These factors contribute to limiting the delivery possibility for your content.
Deliverables are Technology-Specific

In addition to your current source being held hostage in a specific toolset, you are forced to contend with the technology-specific requirements of the various deliverables.

- Printed books: printers require PDF files for printing books.
- eBooks: despite the attempts to agree upon a standard, there are competing technologies by company that support different features.
- Learning portals/online learning: each learning management system (LMS) has its own requirements for content (could be XHTML or XML).
- Mobile app content: most apps can display a flavor of XHTML.

Your current source is probably optimized for the printed delivery method, but as your learners’ needs change, you must provide these other deliverable types.

What is DITA?

“The Darwin Information Typing Architecture (DITA) is an open standard from OASIS for creating, managing, and publishing modular content. It supports the definition of new content types within a comprehensive content ecosystem, and has been increasingly adopted across a wide range of content disciplines and industries”

—The DITA Maturity Model, by Michael Priestley and Amber Swope (http://dita.xml.org)

XML Content Expands Opportunities

Unlike a tool-specific source, XML provides a neutral content set from which you can generate multiple deliverable types.

XML for Content

Although you may think of XML only as a programming language, XML is being adopted globally as a universal content source. Companies in all industries around the world are standardizing their content in XML to leverage the separation of content from delivery; they are creating their content as a neutral source to provide flexibility for deliverable generation.

XML is a neutral content source for the following reasons:

- Content is semantically identified rather than stylistically formatted. This means that a bulleted list item is identified as a list item rather than embedding the stylistic properties of how the list looks. If you need to provide the same list in multiple deliverables that look totally different, you do not have to change the content source.

- XML is a language, not a tool. This means that you have choice in the tools that you use to create the content and generate the deliverables.

XML as a language is supported with many architectural standards. Some standards are industry-specific, such as S1000D, the open-source standard for the aerospace industry. Other standards, like DocBook, are open-source architectures designed to support a specific deliverable type. DITA is an open-source, industry-neutral specification supported by the Organization for the Advancement of Structured Information Standards (OASIS) (http://www.oasis-open.org).
Transform Your Content and Your Business

To create a deliverable from XML content, you must process the content through a publishing engine that applies a transform to generate a specific deliverable. For example, if you have a set of XML files from which you want to create a book, process the files through the appropriate publishing engine using a transform that generates PDF output. You can take the same XML files and process them to generate another PDF with a totally different look and feel, a set of XHTML files for Web display, or even another XML standard; you simply must have the proper transform for the desired output.

XML Future-Enables Your Content

How many of us foresaw the advent of all the current deliverable types five years ago? Can you predict the quantity or variation of the deliverables your company will need to create to meet changing learners’ needs in the five years? If you separate your content from its delivery now, you do not have to try to predict the future; instead, you can future-enable your content so that it is ready to be transformed into whatever deliverables your customers need.

DITA for Publishing Content

Although there are many open-source XML architectures for content, DITA is the most neutral and flexible architecture currently available.

Specialization for Extensibility

The “Darwin” in DITA represents the ability to extend architectural support to new content types through the process of specialization. In support of the open-source standard, the OASIS DITA Technical Committee is constantly working on refining and extending DITA to meet the needs of an ever-growing and changing implementation base. This extension can be as minor as creating a single element to identify a common item type or as extensive as creating an entire framework for industry- or domain-specific content, such as machine industry maintenance content or the learning and training specialization for educational information.

Flexible Units: Topics and Maps

To support the goals of flexibility and reuse, DITA structures content into modular units called topics. You then organize the topics into collections of XML files called maps to provide the structure and hierarchy for each deliverable.
**Information Types**

Content is created for different purposes and many times those purposes are best supported with a consistent structure. DITA is a “typed” architecture in that it has a base type, called a topic, from which all other types are specialized to provide the ideal structure for the content. For example, a glossary item has at minimum a term and definition. Therefore, the glossary topic type provides the structure to provide the term and definition, as well as alternative forms and usage notes.

**Learning & Training Support**

The structure for learning and training information is fairly standardized by the best practices for instructional design. The DITA 1.2 learning and training specialization provides specialized topics and maps for consistently creating learning and training content:

- Learning map for organizing learning content into deliverables, such as training plans, course syllabus, course materials, etc.
- Learning plan topic for planning the learning deliverables. It includes semantic elements for items in the project overview, needs analysis, resources, processes, and delivery.
- Learning overview topic for identifying the learning objectives as well as learning unit prerequisites, duration, and intended audience.
- Learning content topic for the learning content itself as well and providing direct use of content from other DITA topics.
- Learning summary topic for providing context for the covered learning objectives and guidance for continued learning.
- Learning assessment topic for presenting assessment items, including support for open question, single-select, multiple-select, matching, sequence, true/false, and hotspot interactions. These can be presented as individual items or in collections for quizzes and tests.

In addition, there is also learning metadata, such as level of difficulty, intended user role and typical age for the intended user.

In the image:

**Single Select Question DITA Sample**

You can combine the learning- and training-specific topic types with the basic DITA topic types, such as concept, to create deliverables for almost any learning deliverable. For example, to deploy a class you need to create a wide range of deliverables that are for different audiences and delivered via multiple mediums.

You can create all the deliverables from the same content set as long it is created in reusable, consistently structured XML units. You simply organize the topics with a DITA map and generate the appropriate deliverable.
For a class, you might need to create the following deliverables:

- **Course plan** – use the learning and training plan topics, organize them into the proper hierarchy with a DITA learning map and generate a PDF.
- **Syllabus** – use the learning overview and content topics, organize them into the proper hierarchy with a DITA learning map and generate a PDF (for printing) and XHTML files (for online display).
- **Course materials** – use the learning and training overview, content, summary, and assessment topics along with concept topics, organize them into the proper hierarchy with a DITA learning map for each learning module or class and generate a PDF, XHTML, and XML (for import in LMS and delivery as online/remote learning).
- **Instructor guide** – use the same topics from the course materials, apply a filter to include instructor-only content and generate a PDF.
- **Student materials** – use the same topics from the course materials, apply a filter to include student-only content and generate a PDF.
- **Quizzes and tests** – use the learning and training assessment topics, organize them into the proper hierarchy with a DITA learning map for the quiz or test and generate a PDF and XML (for import in LMS and delivery as online/remote learning).
- **Mobile application content for memory drills** – use the glossary topics, collect them into a unit, and generate an XHTML for presentation via a mobile app.

**Summary**

If your content is not created and stored in XML, you are locked in to that format for both creation and delivery. This means that to produce an integrated set of deliverables for distribution across a range of media, you must convert your content multiple times using a process that is fraught with technical and logistical challenges, as well as cost-prohibitive. However, if you create your content in XML with DITA, you can take advantage of the separation of content from formatting, leverage the power of the DITA Open Toolkit with custom transforms, and deliver your content to learners the way they want it.
About Data Conversion Laboratory (DCL):

DCL ([www.dclab.com](http://www.dclab.com)) is a leader in helping organizations maximize the value of their content assets investment through digitization and organization, making reuse easier and providing greater accessibility. With DCL's process, content quality is vastly improved, systems are future-proofed, redundancies are eliminated and revenue opportunities are expanded. With expertise across industries including life sciences, government, manufacturing, technology and professional organizations, DCL uses its advanced technology and U.S.-based project management teams to help solve the most complex conversion challenges securely, accurately and on time. Founded in 1981, DCL is a multi-year winner of EContent's Top 100 companies.

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