

# Dynamic CONTENT MANAGEMENT

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Until recently, technical communicators created static content—content that is created in a specific way for a specific purpose (e.g., user guides and help) and that remains the same until the technical communicator deliberately changes it. As single sourcing has made it possible to write information once and use it many times, technical communicators have begun to create static customized content, which is designed to meet the specific needs of the user, the materials to be developed (such as user guides, reference guides, and training), and the delivery media (paper or online). The content is customized for a particular requirement at a particular time but cannot be changed without being regenerated by the author. Now, the ability to create dynamic content will change the way technical communicators envision, create, and distribute information.

## What Is Dynamic Content?

Dynamic content is information that is assembled only when it is requested. It does not exist as a document; rather, it exists as a series of information objects that are assembled in response to the user's requests or requirements. To understand dynamic content, think of the many e-commerce sites that exist today:

- Computer vendor sites where you can select from a series of options, such as hard-disk size, RAM, screen size, and even color, to customize the configura-

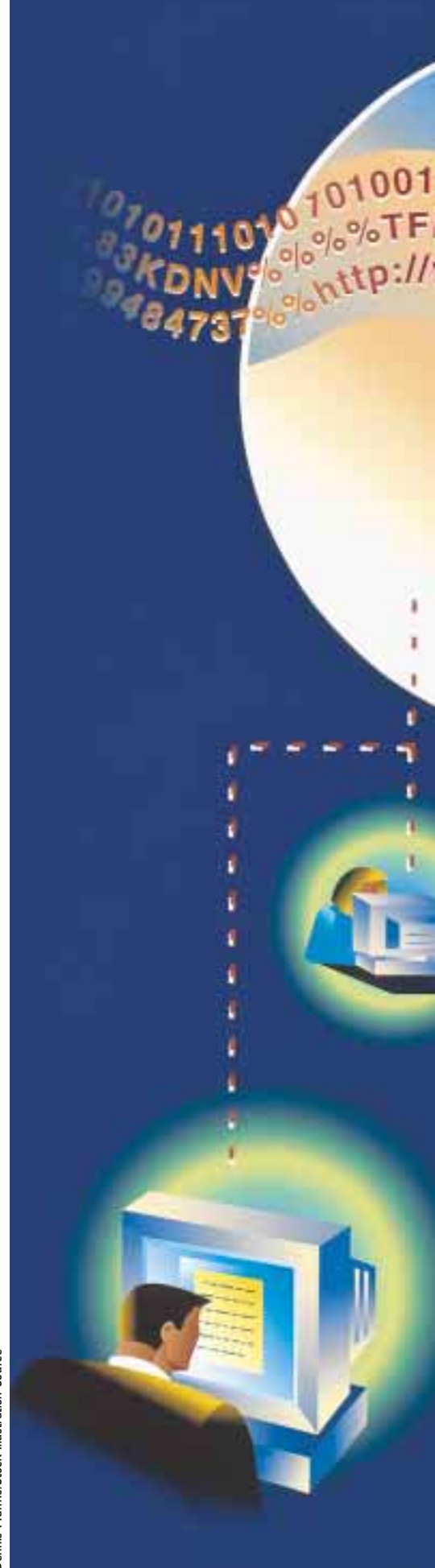
tion of your computer before ordering

- Clothing sites where you can enter your measurements, select fabrics, colors, and styles, and have your clothes custom made
- Automotive sites where you can select the make, model, options, and color of your vehicle and have the car delivered to your door

Now think of requesting customized information in this way. For example, consider a customer tailoring a piece of software to her own needs by choosing to use some components and not others. In the past, the technical communicator would have included documentation on all the components and let the customer pick through the information. Using a Web logon profile (a predefined user profile of the customer) or customer responses to questions or selections, a dynamic document automatically selects appropriate components of information from the information database, assembles them, and provides them to the customer.

To a certain extent, dynamic assembly of information has been possible with the use of *WinHelp* files, where a help file is provided if the component and its associated help file are present. However, this customization occurs at a large level of granularity (the level of modules or sections), whereas dynamic documents can customize information down to the word level.

Using dynamic content, we can choose relevant components of information and organize them to meet our customers'



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specific needs at any time. Our customers no longer have to take generic information and try to apply it to their situation.

#### *Personalization*

Dynamic content draws on a technology known as personalization. Personalization means providing specific, relevant information to defined users or user groups. We are able to determine user requirements through the following:

- *User profiles.* Users are assigned logins. Associated with each login is a user profile that identifies the user's role and information needs. When users log in they see only information that is relevant to them.
- *User selection.* Users can identify the type of information they want to view. They usually do this by selecting options on a form.
- *Profiles, selection, and personalization.* Using a combination of user profiles and user selections, the system learns the user's information patterns and determines what additional information may be relevant. The system then "pushes" the information to the user or provides selectable links.

#### *Profiling*

Personalization is supported by profiling—the process of describing a user's needs, requirements, and interests, based on her user profile. E-commerce sites use profiling to better target their products. Technical communicators use profiling to provide specific content to customers. To create a user profile, you must conduct a thorough audience and information analysis, develop information models, and assign metadata.

#### *Audience and Information Analysis*

To create a user profile, you must be able to describe your customer's information-usage patterns and requirements. You can gain this information through audience analysis. In the past, technical communicators have had a hard time getting this type of information from their organizations and have had to talk with customers to gain an understanding of their needs. If you are moving to dynamic documents, customer needs



must become your focus, and the focus of your organization. You need answers to the following questions:

- How many different types of customers do you have?
- Are there levels of expertise within a customer group?
- Are each of the customer types a distinct group, or can some of them be combined?
- What tasks does each type of customer perform?
- What type of information support do they need to complete their tasks?
- Which output type do customers prefer (e.g., help, Web, or paper)?
- What are your customers' goals and expectations?

Once you have completed your audience analysis, you must complete your information analysis. You need to determine the following:

- What types of information products (e.g., user guides, reference guides, help, training) you already produce
- Whether these information products meet your customers' needs, and why or why not
- How much information overlap exists across your customer base
- How much information overlap exists across your product base
- How much information overlap exists across your information products
- Which information is unique to a customer, information product, or product
- The level of granularity (i.e., section, paragraph, or word) at which your information can be "tagged" to provide customization and reuse

### *Information Models*

Once you've completed your audience and information analysis, you can start building information models, which describe your content. They allow you to create completely consistent content that can be assembled according to your customers' needs. Information models consist of information product models and element models.

The first set of models you need to

define are the information product models. It is important to recognize that information assembled without a logical order or context is useless to a customer. When hypertext was becoming "hot" in the late 1980s, a battle ensued over the value of linearity and organization vs. associated data with no specific order. Many proponents of associated data felt that organization and linearity were detrimental to the concept of hypertext. However, research and experience have shown that the people who stressed effective organizational patterns and information context were right. In other words, you need to define what elements are required to create effective information materials. For example, reference material provides specific details about a product, usually in the order of a product's features, while user documentation is organized to present tasks in the order that a customer requires them. And training material that does not include objectives, examples, and exercises is just a glorified user guide.

The following is a top-level example of an information product model for an online user guide:

- Overview
- Getting started procedures
- Configuration procedures
- Usage procedures
- Troubleshooting procedures
- Glossary of terms

The system uses information product models to select the correct elements that match the user profile and the users' specified requirements, and the "document" is dynamically built to meet their needs in the media of their choice.

You should also create element models for each type of information you produce (e.g., procedure, caution, overview). For a procedure such as changing a password, your element model may resemble that in Table 1.

Defining element models for all of your information ensures that you create structured content—content that is consistently written, identifiable, accessible, and reusable.

### *Metadata*

When you have created all your infor-

mation models, you need to define your metadata. Metadata is data about data. In other words, it is a way of "tagging" elements with more information about the elements. Some examples of metatags are *output* (help only), *customer* (System Administrator), and *platform* (Unix or NT). Using metadata, you identify which metatags apply to which element. See Table 2 for an example of metatag application using the element model described above.

### **Separating Content from Format**

As you define your models, it is very important that you separate the content from the format. The format will be defined as part of the templates or style sheets that support each of the media. If you separate content from format, you have considerable flexibility and control over the materials. You can display them in a new way very quickly by modifying the style sheet and never touching the content. You can also optimize the content for each medium by using inline graphics for paper and pop-ups or secondary windows for an online environment.

Note that it is possible to create dynamic paper documents. XML, the typical format used to support dynamic content, supports many outputs, including PDF. However, output to PDF is sometimes slower than output to HTML.

### **Designing Dynamic Content**

At first, designing and prototyping dynamic content can be daunting. The new requirements of models, structured writing, and metadata are initially intimidating, but designers and writers rapidly adapt. It may be helpful for you to build a "proof of concept" in tools such as *FrameMaker* and *Quadralay Webworks*, which together support conditionals and multiple media outputs, to test some of your ideas. This proof of concept will help you to better formulate your models and metadata as you go forward. However, creating true dynamic content requires some very powerful tools.

### **Delivering Dynamic Content**

E-commerce is the driving technology behind dynamic content. While e-commerce deals with the purchase of prod-



Table 1. An Element Model

Element	Example
Objectives 1	At the end of this lesson you will be able to change a password.
Objectives 2	At the end of this lesson you will be able to change a user's password.
Procedure title	Changing a password.
Link/cross-reference to previous procedure	The password must already exist—see Creating a password.
When to perform this task	Perform this task monthly or more frequently if you are concerned about the security of the password.
Procedure body	
Overview 1	Your password ensures that corporate data remain confidential and secure. Pick a password that is easy to remember but hard for someone else to guess. Try using the first letter of each word in a phrase.
Overview 2	You may need to change a password if a user forgets it or fails to change it on a regular basis. Ensure that the password you create does not remain active for very long. Encourage users to change the password as soon as possible.
(Notes, cautions, warnings)	Caution: Do not create a password that someone can easily guess. Do not use names of family or pets, or commonly known information such as birth dates.
Steps	1. From the Options menu, select <b>New password</b> . 2. Type the existing password. 3. Type the new password.
Explanatory text, result	The password must be at least 8 characters in length.
Example 1	<b>I need to change my password each month.</b> Password = intcmpem
Example 2	<b>This is your new password: change it immediately.</b> Password = tiynpcii
Steps	4. Retype the password.
Screens	n/a
Exercise 1	Change your password.
Exercise 2	Change the password.
Link to next procedure	n/a
See also	
Link/cross-reference to related topics/procedures	Creating a password

ucts based on specific customer requirements, our industry can use the same technology (such as portals, databases, metadata, and user profiles) to build information to meet users' needs upon request. E-commerce functionality includes personalization (discussed above), XML, dynamic document engines, content management systems, and portals.

### XML

XML, the format of choice for e-commerce, is also the format of choice for dynamic content. The majority of dynamic content engines work with XML, and those that work with traditional authoring tools such as Microsoft Word or FrameMaker convert the content to XML for faster manipulation. XML provides

the following benefits to dynamic content:

- *Structured content.* XML does not specifically require a Document Type Definition (DTD); instead, it can be well formed. ("Well formed" is the industry standard term for structured content that does not rely on a DTD to ensure conformance to the structure.) However, you cannot guarantee structure without a DTD or XML schema. The lack of structure will reduce the effectiveness of your materials.
- *Built-in metadata.* If you base your XML on semantic tags (tags that have meaning) rather than generic tags, the semantic tags automatically provide metadata about the content they enclose. For example, a semantic tag such as "overview" reveals more about

the data than a generic tag such as "para." In addition, XML supports attributes that enable you to apply metadata to elements.

- *Separation of content and format.* A semantically rich DTD separates content from format.
- *Database orientation.* XML was specifically designed to work well with databases. The first usage of XML has been application-oriented (e.g., e-commerce), relying heavily on databases for fast access to information.
- *Support for multiple media outputs.* XSL (XML stylesheets) supports output to many standard media such as paper (PDF), Web (HTML), Web-based help, HTML Help, XML, and other new technologies, including Palmtop, Pager, Webphone, and WebTV.

### Dynamic Content Engines

Dynamic content engines are the tools that read and interpret the customer profiling, access the database (i.e., the content management system), assemble the "document," dynamically serve the pages to the portal, and publish the content in the required media. While many categories of tools on the market provide this functionality, the best known are Web tools and technical publications tools.

Web tools contain their own content management systems, but were designed for maintaining Web sites rather than user documentation. Two companies that produce Web tools are Vignette ([www.vignette.com](http://www.vignette.com)) and Interwoven ([www.interwoven.com](http://www.interwoven.com)).

Technical publications tools are very new and have been designed to work with both Web content and traditional technical publications content. One of these tools, Arbortext *e3* ([www.arbortext.com](http://www.arbortext.com)), was designed to work with Arbortext's XML authoring and publishing tool *Epic*; it also integrates with a variety of content management systems, such as *Documentum* and Oracle *iFS*. Chrystal *Eclipse* ([www.chrystal.com](http://www.chrystal.com)) sits on top of another Chrystal product, the *Astoria* content management system. Eclipse can integrate with any XML authoring tool, but it has been specifically designed to integrate with *Xmetal*.

**Table 2. Metatags and Their Elements**

Element	Metatags		
	Information Product	Media	Customer
Objectives 1	Training	Web	Novice
Objectives 2	Training	Web	System Administrator
Procedure title	User guide, Training, Help	Paper, Web, Help	Novice, System Administrator
Link/cross-reference to previous procedure	User guide, Training, Help	Paper, Web, Help	Novice, System Administrator
When to perform this task	Training	Web	Novice, System Administrator
Procedure body	User guide, Training, Help	Paper, Web, Help	Novice, System Administrator
Overview 1	User guide, Training	Paper, Web, Help	Novice
Overview 2	User guide, Training, Help	Paper, Web, Help	System Administrator
(Notes, cautions, warnings)	User guide, Training, Help	Paper, Web, Help	System Administrator
Steps	User guide, Training, Help	Paper, Web, Help	Novice, System Administrator
Explanatory text, result	User guide, Training	Paper, Web	Novice
Example 1	Training	Web	Novice
Example 2	Training	Web	System Administrator
Screens	User guide, Training, Help	Paper	Novice, System Administrator
Exercise 1	Training	Web	Novice, System Administrator
Exercise 2	Training	Web	System Administrator
Link to next procedure	User guide	Paper, Web	Novice, System Administrator
See also	User guide, Help	Paper, Web, Help	Novice, System Administrator
Link/cross-reference to related topics/procedures	User guide, Help	Paper, Web, Help	Novice, System Administrator

## Content Management Systems

Content management systems are key to successful dynamic content. They enable you to store, tag, and make available the content for “publishing.” Aside from the traditional document management features such as version control and access control, a good content management system provides content tracking, metadata, and search and retrieval capabilities.

Content tracking includes where the element has been used or reused, its version history, its parentage (the original element from which the current element is derived, and also the elements that are “children” or “siblings”), its relationships

to other elements (components that can be displayed or linked together), and update control. Update control automatically notifies you when a component has been updated so that you can determine if the component is still appropriate. You may decide that the revised element is no longer appropriate and sever its relationship with the reusable element (this action is similar to standard copy and paste). The element is now a branched version of the original.

It is also very important to have powerful tools for finding and retrieving information. Retrieval methods should include full-text retrieval, contextual

retrieval (based on type of content), and metatag retrieval.

## Portals

Portals offer the ability to automatically categorize information or present specific information to a customer. Yahoo! is an example of a common portal. You can set up a portal to display only certain categories of information, which reduces customers’ search time. Portals combined with personalization enable you to display only the relevant content to the customer. A portal gives a customer a single point of access to content. Everything the customer might need should be accessible from this one interface.

Companies often use intranet portals to categorize key information for their employees on the basis of their job classifications (i.e., their profiles), then enable them to look at content that is specifically customized for their needs. Extranets can group customer information in the same way.

## New Skills

Moving to dynamic content will intensify the need for audience, task, and information analysis, as well as skills in structured writing techniques, information modeling, metadata design, multiple media design, and content management system or database access of information.

Individuals seeking a more technical path will need to be able to work with authoring tools (implementing the models in the tool through templates or DTD), DTD creation, content management systems (including database design and maintenance), workflow creation, output (style sheet creation), portals, dynamic document engines, and user profile definitions.

## Summary

Dynamic content management opens up many opportunities for technical communicators or, more correctly, information designers and architects. While it brings with it an added level of complexity, it gives us the opportunity to provide information materials that truly meet user needs. It is the job that will control the information of the future.

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rial is crucial to the invention stage of a writing project.

Other technical writing teachers may want to use this assignment to kick-start a report cycle and generate curiosity about the difference between planning for research and writing up the results of research. Teachers might also use the collected reference materials to teach synthesis, questioning of assumptions, divergent thinking, and other higher-order thinking skills. ❶

### Web Resources

League of Women Voters: [www.lwv.org](http://www.lwv.org)  
Izaak Walton League of America: [www.iwla.org](http://www.iwla.org)  
Natural Resources Conservation Service: [www.nrcs.usda.gov](http://www.nrcs.usda.gov)  
Sierra Club: [www.sierraclub.org](http://www.sierraclub.org)

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## Dynamic Content Management

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### SUGGESTED READING

Cartwright, Dave. "Customize Your Content With User Profiling." [www.webdevelopersjournal.com/articles/user\\_profiling.html](http://www.webdevelopersjournal.com/articles/user_profiling.html).

Malier, Eve, and Jeanne El Andaloussi. *Developing SGML DTDs: From Text to Model to Markup*. Upper Saddle River, N.J.: Prentice-Hall, 1996.

"Personalization and Content Management." [www.metatutorial.com/whitepapers/personalization.asp](http://www.metatutorial.com/whitepapers/personalization.asp)

Ramsey, Chris. "Content—The Foundation of Successful E-commerce." [www.tradespeak.com](http://www.tradespeak.com)

Tomsen, Kai-lan. *Killer Content: Strategies for Web Content and E-Commerce*. Reading, Mass.: Addison-Wesley, 2000.

## Biotechnology

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### Databases

The Web site of the National Center for Biotechnology Information of the National Institutes of Health at [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov) hosts both the GenBank DNA and protein sequence databases and the PubMed database of health and life science journal publications.

Such public government databases, as well as private corporate databases, are used heavily in biotechnology-related research. These databases are expanding rapidly with the accumulation of information about gene and protein sequences, spearheaded by large sequencing projects such as the Human Genome Project. Bioinformatics, which is the use of computers to analyze vast amounts of biological data, requires the ability to cross-reference pertinent data from such databases and to devise effective search strategies.

### Research Sites

The Web site of the Human Genome Project at [www.ornl.gov/TechResources/Human\\_Genome/home.html](http://www.ornl.gov/TechResources/Human_Genome/home.html) provides information about this enormous collaborative research effort.

### Regulatory Sites

The Web site of the U.S. Food and Drug Administration at [www.fda.gov](http://www.fda.gov) is rich with information critical for following documentation procedures for new drugs.

### Scientific Journals or Other Publishers

The Web site of the journal *BioTechniques* at [www.biotechniques.com](http://www.biotechniques.com) specializes in new techniques or new applications of existing techniques and is sponsored by research suppliers, who advertise their latest products.

The Web site of High Wire Press at [highwire.stanford.edu](http://highwire.stanford.edu) is Stanford University's collection of online research journals.

### Information Service Sites

BioMedNet, at [www.bmn.com](http://www.bmn.com), has news and information useful to researchers.

BioOnline, at [www.bio.com](http://www.bio.com), has

research information and industry news relevant for pharmaceutical and biotechnology researchers.

BioSpace, at [www.biospace.com](http://www.biospace.com), has profiles of pharmaceutical biotechnology companies and employment information.

SciQuest.com, at [www.sciquest.com](http://www.sciquest.com), is an e-commerce site with products from many of the major research suppliers.

LabVelocity, at [www.labvelocity.com](http://www.labvelocity.com), has product comparisons and information useful to researchers.

Bioresearch Online, at [www.bioresearchonline.com](http://www.bioresearchonline.com), offers employment searches and research product information.

BioExchange, at [www.bioexchange.com](http://www.bioexchange.com), has industry news and employment information.

If you're interested in tapping into biotechnology as a career option, these sites are great starting points to find out more about research and industry trends and information about employers, new technologies, and instruments. Communication in the biotechnology industry requires specialized knowledge as well as general expertise. But if you're willing to make the effort to acquaint yourself with biotechnology, there are opportunities for all kinds of technical communicators in this field. ❶

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