

XML Based Course Websites

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Abstract: XML, the extensible markup language is a quickly evolving technology that presents a viable alternative to courseware products and promises to ease the burden of web authors who edit their course pages directly. XML uses tags to label kinds of contents rather than format information. The use of XML enables faculty to focus on providing contents, leaving the task of rendering contents to experts who provide a single stylesheet used for formatting purposes. This stylesheet has to be edited once, saving time and effort and ensuring consistent appearance of course pages that reference it. However, the major benefit of XML is the ability to provide pinpoint search engines. Additionally, web-based editors can be provided to make editing pages easier.

Introduction

The *Extensible Mark-up Language (XML)* is a promising new technology for creating, maintaining, and searching course pages. XML shows the most promise when it comes to searching for information. Furthermore, the use of XML reduces the overhead of editing web-pages by separating form and contents. Content providers have to do just that, provide the contents. Similar web-pages are rendered by a common stylesheet. It only has to be edited once. A common stylesheet ensures uniform appearance of web-pages that are of the same kind. This in turn provides for ease of navigation and recognition of location.

When it comes to course web-sites, there are largely two alternatives: to edit and maintain them directly or to use courseware products such as (WebCT 2002) or (Blackboard 2002). The benefits of direct editing are complete control over appearance and contents; the major drawback is a lot of work formatting contents. The benefits of courseware products are ease of use and integration with other academic systems, such as the Banner; a drawback is that formatting and functionality are as provided. We propose a third option which is slowly become a viable alternative: the use of XML. We will show in this paper that XML shares most of the benefits of the two current alternatives: ease of contents creation and maintenance as well as complete control over appearance and contents. A major added benefit of XML is the ability to furnish very precise search engines, enabling users such as students, prospective students, or prospective employers to quickly locate relevant information.

Industry started using XML a while ago, chiefly to unify information between companies and their suppliers (Goldfarb & Prescod 2000). We show an application of this technology that demonstrates its benefits for academic use. We will briefly explain the main components of XML and in the process show how XML separates form and contents. We will demonstrate how common information can be placed into separate files, greatly aiding in the maintenance and consistency of course sites. We will show how to provide web-based editors as well as search engines for course pages. Finally, we will report on the status of the project.

Separation of Form and Contents

XML is three technologies in one. It consists of *XML* proper, which is a language for labeling contents. There are *Document Type Definitions (DTDs)*, which are used to specify kinds of documents. Among others, DTDs specify the labels to be used in XML documents. Finally, there are languages to render XML documents. Typically, web-authors use either the *Extensible Stylesheet Language (XSL)* or *Cascading Stylesheets (CSS)*. Since XSL is more powerful when it comes to the way final documents can

be composed, we chose XSL over CSS. At this point, only Internet Explorer 5.5 and higher support XSL. Most other browsers support only CSS.

In what follows, we present an example of an XML document containing a course description of one of our courses. We want to show how XML supports the separation of form and contents. The challenges of dealing with larger documents such as syllabi will be addressed in the conclusions. Figure 1 shows an XML file containing course description information for CSSE 100, one of our courses. In general, white space does not matter and should be used to enhance readability. XML tags are identified by opening and closing angle brackets. A closing tag is identified by a forward slash preceding its name. An opening and closing tag form an *element*. To aid in readability, we boldface the tags in this write-up.

The second line indicates that this document is of the type as specified in the *course_description.dtd* document. The third line asks web-browsers to use the *course_description.xsl* document to render this document. The contents proper is nested inside of the *course_description* element. There, we find information on the course *id*, its *title*, number of *credits*, and a brief catalog course *description*.

There are several benefits to a well-designed stylesheet. (i) If all pages of a given kind reference the same stylesheet, then they all appear the same. This greatly aids users in finding information across courses. (ii) If changes to the appearance of course pages have to be made, only one document has to be edited. (iii) Content providers only have to reference a stylesheet. This leaves the worry over appearance to specialist versed in web-design. Since every HTML based web-page has to be concerned with form in addition to contents, not having to worry about appearance offers a significant time savings.

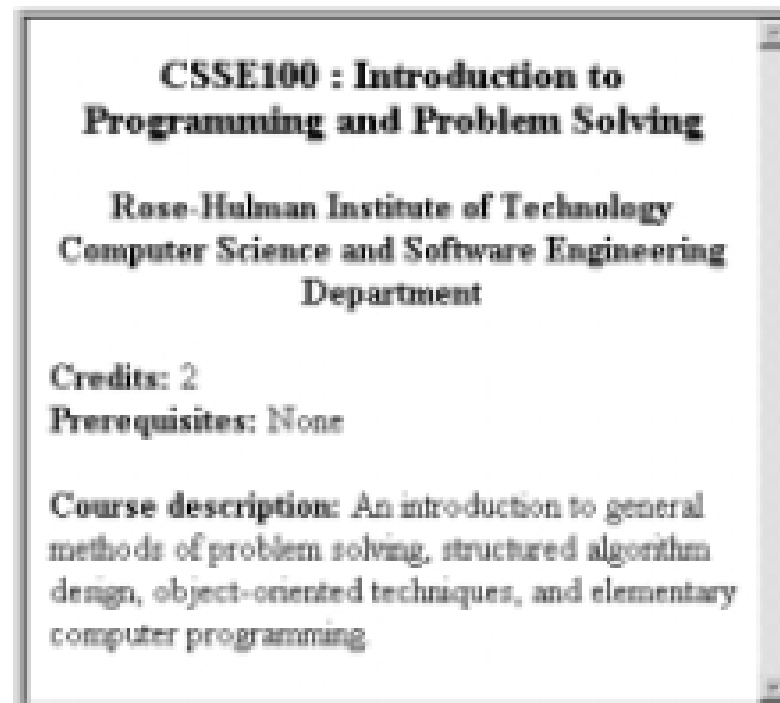


Figure 2: Sample XML document as rendered by our stylesheet

A further benefit of XML is the ability to take information common to documents and place it into a separate file. For example, the document of figure 2 contains information about the department and institution. Notice that they are not part of the file displayed in figure 1. Since this information is common to all course description pages, we placed it into a separate file which is displayed in figure 3.