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XML Data Structures for Tailoring of Web Sites to Promote Behavioral Change

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Abstract

Web sites should use theoretically-based individually tailored content to maximize their effectiveness in promotion of behavioral change, Personal tailoring of content is difficult in computer systems and infrequently linked to theoretical models. This poster describes an approach for creating tailored content that combines an external XML representation of the tailoring process with a run time interpreter and content management system. The approach offers a robust and explicit method for personalization of the content of web sites.

Keywords:

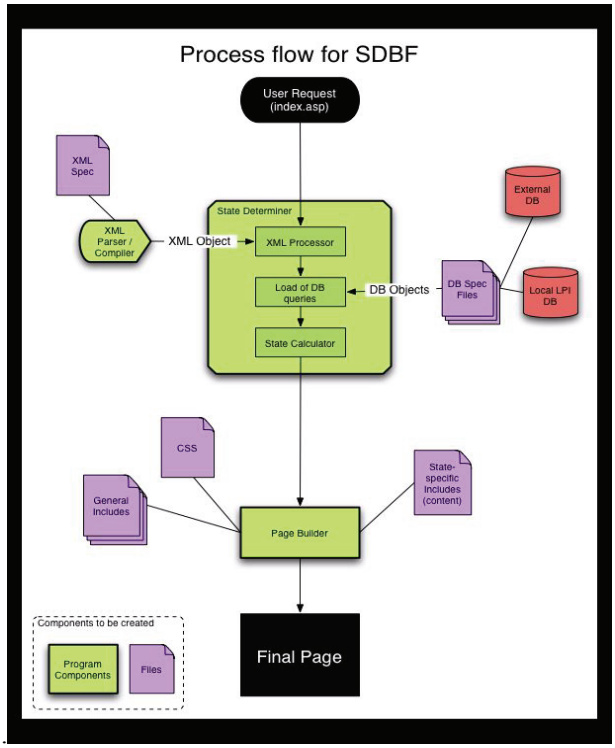
internet, behavioral medicine, Extended Markup Language (XML), content management system

Introduction

A large body of research has shown that personally tailored educational materials are far more effective in the promotion of behavioral change than untailored materials, regardless of the underlying theories for tailoring (Stages of Change, Health Belief Model, Motivational Interviewing, etc.). Tailoring of the content of web sites is a difficult task and the specific strategies for tailoring, along with linkages to formal models, are rarely described. In this paper we describe an approach for explicit representation of tailoring protocols that separates the knowledge and algorithm for tailoring from its implementation.

Methods

We designed a system where the complete specifications for tailoring of a web site, including tailoring based on personal data multiple external databases and tailoring the stage of an experimental protocol, were represented in XML in an external file. This approach allowed designers to rapidly change the nature of interactions on the site without rebuilding all of the linkages and other tools for state maintenance. Under this architecture, when a user requests a page, the XML specification for was read in, parsed by a compiler program creating an XML object. The XML object included specifications for database transactions with both of the project databases to compute the state of the system for tailoring. Based on the XML instructions and queries to the external databases, the appropriate state for the web site was computed. Based on the state, a software module called the page building assembled a tailored web page using cascading style sheets, html components, and custom built programmable Flash (Macromedia) objects. This final page was presented to the user. The advantage of this system is that the entire process for tailoring is explicitly represented within the external XML file. This explicit process may aid linkage to the web site with an ontology representing the interventions used in the web site. It also reduces maintenance effort.



The approach combines the explicitness of XML representations with the robustness of a content management system. Using this model, we created a large web site for a randomized trial of web based communications intervention for smoking cessation. Performance on a Linux APACHE P4 Pentium web server was not an obstacle for a research scale (n=220 subject) implementation.