Abstract:

The days where a web site consisted of a small amount of linked pages lie far behind us. Today, web sites are complex applications, containing large amounts of constantly changing information and functionality. To avoid usability problems typically associated with large ad hoc designed web sites, a systematic, well-structured approach is required. Web site design methods address this need by separating the different design concerns involved in web site creation: requirements analysis, data design, navigation design, presentation design and implementation. By focussing on one aspect at a time, the designer is better able to cope with the intricacy of web site design, thereby improving the quality and usability of the resulting web site. However, even with the use of web design methods, the design of web sites is not an easy task. Due to the large variety in targeted visitors, each with different goals and intentions, and the diversity of the offered information and functionality, devising an efficient and easy to grasp site organization and navigation structure proves difficult. Taking into account web site usage information could help the designer to gain a better insight in the browsing behaviour of the users and to provide the best-suited design. However at design time this information is usually not available. Manual analysis of web site access logs is already applied, possibly resulting in manual changes or a complete redesign of the web site. The approach suggested in this dissertation goes one step further: to offer the web designer, during design, the ability to anticipate and react upon web site usage information. The result is adaptive web sites: sites that automatically improve their organization and presentation based on user access data. It is argued in this dissertation that the use of adaptation strategies, which are (design) specifications of how a web site can adaptively change (at runtime) based on user access information (from all users), aids the designer to improve the usability of web sites. Using adaptation strategies, a designer can anticipate runtime browsing behaviour, validate certain design decisions, automatically select between design alternatives and help the web site owner to better achieve business goals. The work is presented in the context of WSDM, an existing web design method. To support adaptive behaviour, an adaptation specification language has been defined, which allows the designer to specify, at design time, the adaptive behaviour that is allowed at runtime. The adaptation specification language is exemplified with three useful adaptation strategies, each illustrating one of the aforementioned benefits. To validate our ideas, a prototype implementation to support WSDM design and implementation, with adaptation support, was performed. The prototype was used to implement a case study, which demonstrates the applicability and effectiveness of designer specified adaptation strategies to automatically re-organize the web site (navigation) structure and organization.