Chapter VI

Toward Noninvasive Adaptation of Metaphors in Content

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Abstract

Web information systems (WIS) can be considered as media. These media implement a tool language that enables access to content. Accessing that content aids users in achieving their goals. The language in which that content is given nowadays is often natural language or very close to it. Consequently the content involves metaphors. As the Web is open to virtually everyone, the users of WIS are likely to differ from each other with respect to ethnicity, language, gender, age, culture, education, preferences, physical or mental handicaps, and so forth. Consequently users are likely to respond differently to the metaphors occurring in the content. This chapter, therefore, proposes an approach to adapting the employed metaphors to user types for improving the value that the WIS offers to its users. This is expected to result in both increased user
acceptance and number of business transactions. Therefore, an increased return on investment for the WIS is expected as well. We propose a conceptual model for user type and context-aware mapping of concepts in a target domain to concepts in a source domain. The respective mapping is used for modeling metaphors. We formalize that mapping in terms of the Higher-Order Entity-Relationship Modeling (HERM) language and in the Web Ontology Language (OWL). The conceptual model we provide can be used as a basis for hot generation of content representation such that the metaphors occurring in the content are adapted to the types of the users interacting with the WIS. As a step toward implementation, we formulate a high-level architecture that enables us to noninvasively adapt the metaphors in the WIS content to the types of the users. We report our experiences regarding exploration of the feasibility of the architecture. These experiences result from implementing a prototype that shows how metaphors—in a noninvasive manner, that is, without changing its code or content—can be added to the contents of an already-existing WIS. The chapter is completed by presenting the results of formal user evaluation which demonstrate the user acceptance of the respective metaphors.

Introduction

According to Hirschheim, Klein, and Lyttinen (1995, p. 11), Langefors defined the term “information system” from a functional perspective as “a technologically implemented medium for the purpose of recording, storing, and disseminating linguistic expressions as well as for the supporting of inference making.” According to Kaschek, Schewe, Wallace, and Matthews (2004), a Web information system (WIS) is understood as an information system that is integrated in the Web and uses it as a resource. Integration of an information system into the Web makes it open in the sense that virtually everyone can access it. The extent to which system developers know the system users at development time is therefore larger with respect to WIS than it is with respect to information systems in general. User typing and adaptation to users, thus, must be taken more serious in case of WIS than in case of traditional information systems.

We slightly modify a classification of the languages used to interact with a WIS we found in Wallace and Matthews (2002) as “tool language,” “domain