Object-Oriented Conceptual Modeling of Web Application Interfaces: the OO-$\mathcal{H}$Method Abstract Presentation Model

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Abstract Object-oriented conceptual modeling approaches must be reconsidered in order to address the particulars associated with the design of web application interfaces. In this context, the paper introduces the presentation layer of OO-$\mathcal{H}$Method, an extension of the OO-Method conceptual modeling approach that is devoted to the specification of this kind of interfaces. The OO-$\mathcal{H}$Method presentation approach is based on the concept of templates. Each page template may fall into one among a set of categories, which together cover the different presentation perspectives captured in the model. In order to better define the page template structure, a new diagram is introduced: the Abstract Presentation Diagram (APD). The APD does not need to be drawn from scratch: the navigation structure previously defined in the OO-$\mathcal{H}$Method Navigation Access Diagram (NAD) provides the information needed to automatically generate a default APD. This skeleton template structure may be further refined and enriched with the aid of the OO-$\mathcal{H}$Method Interface Pattern Catalog. As a result, a web application interface is generated in an automated way.

1 Introduction

The research effort inverted by the scientific community in hypermedia modeling approaches specifically devoted to the development of web sites has led to different projects and products. Some of the most relevant examples studied so far are HDM [7], HDM-lite [6], OOHDM [17], RMM [9], ADM [1, 11] or Strudel [5]. However there is still, as far as we know, a gap to be filled: that of web applications' interaction issues. In this context our research efforts have been focused on the proposal of 'Not Yet Another Method' for web modeling, but on a set of semantics and notation that allows the development of web-based interfaces for existing OO-Method [14, 15] applications. This proposal, known as

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OO-$\mathcal{H}$Method [8], extends OO-Method with two new diagrams: (1) the Navigation Access Diagram (NAD) and (2) the Abstract Presentation Diagram (APD).

Both the NAD and the APD can be further enriched and refined by means of a set of interface patterns, which are defined in the OO-$\mathcal{H}$Method Pattern Catalog[2]. The OO-$\mathcal{H}$Method Pattern Catalog provides a user-centered Hypermedia Interface Pattern Language [16] that offers alternative solutions to well-known hypermedia problems, considered from the user point of view. Furthermore, its use allows the designer to choose the most suitable among a set of possible implementations. The patters can fall into one of the following three categories: (1) Information patterns, that provide the user with useful context information, (2) Interaction Patterns, which cover user-interface communication issues such as protocol-related features for invoking services and (3) Navigation Patterns, that determine the way the user is going to move through the system. The information and patterns captured at the NAD level suffice to automatically generate a default APD, which provides the designer with the skeleton page template structure on which to perform further refinements. This article introduces the APD main semantic and structural features.

The remainder of the article is structured as follows: section 2 gives an overview of the NAD and the concepts captured there, which are the basis for the generation of the default APD. Section 3 introduces the APD and describes in detail, by means of an example, both the concepts and the template constructs associated with this diagram. It also defines its construction process (automatic default generation and refinement). The web interface that is generated from the information captured both in the NAD and in the APD is shown in section 4. Section 5 makes a comparison with related work, and section 6 presents the conclusions and further work.

2   OO-$\mathcal{H}$Method Navigation Access Diagram

For a more general perspective of the approach, a small example is going to be employed all along the paper: a Chat Management System. As a basic explanation (for reasons of brevity) it is assumed that there are several possible chat topics. Each message corresponds to a single topic. Besides, messages are hierarchically structured so that a message can be the start point of a new discussion line inside its topic or, otherwise, be a response to another previous message. The chat user, whose behaviour we will model, is able to read messages and reply to an existing message. OO-$\mathcal{H}$Method associates a different NAD diagram with each agent (user-type). This diagram is based on the following constructs:

1. Navigation Classes (NC): they are domain classes whose attributes and methods have been filtered and enriched in order to better accommodate the specific features of hypertext. This enrichment causes different types of attributes to appear: V-Attributes (attributes that are always visible), R-Attributes (available to the user on demand, by means of any kind of