Web Engineering
Developing Applications with WebML

16.11.2009

Overview

- Introduction
- What is WebML?
- Wrap-up

Slides Material from: webml.org

Why WebML?

INTRODUCTION

WebML purpose

- WebML aims at providing a structured approach to the design of Data-intensive Web sites
- A set of integrated Models should help designers in high-quality Web sites production
- All the facets of Web design should be addressed
- Use of old or uncoherent methodologies becomes deprecated

Target of WebML

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- Target: data intensive Web sites
  - large amount of data
  - interfaces directed to general public
    - exploratory
    - browsing-oriented
    - personalized (1 to 1)
  - volatile content, structure, navigation, presentation
- WebML is not the right approach for:
  - Small Web sites (Homepages, …)
  - Static Web sites

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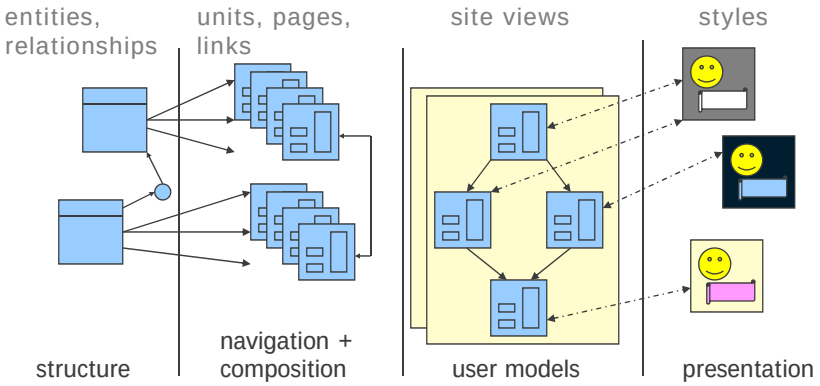
WHAT IS WEBML?

The WebML models

- WebML: a conceptual language for high-level design of data-intensive web sites
- Models:
  - Structure: data organization
  - Derivation: redundant data definition
    - Derivation is the process of adding redundant information to the structure model, in order to augment its expressiveness and define different views and groupings of the same data.
  - Composition: definition of site pages as set of subpages and elementary publishing units
  - Navigation: definition of links between pages and between units
  - Presentation: positioning of the units in the page and definition of graphical appearance

Preview of WebML concepts

- Site = Structure + Composition + Navigation + Presentation



Structure Model (1)

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- Q: what are the objects published in the site and how they are related?
- A:
  - Entity: an object type in the application domain
  - Attribute: scalar property of an entity
  - Relationship: A connection between entities
  - IS-A hierarchy: classification and grouping
- Compatible with Entity-Relationship and UML class diagrams

Structure Model (2)

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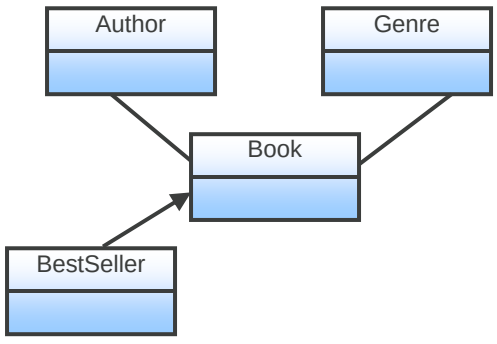
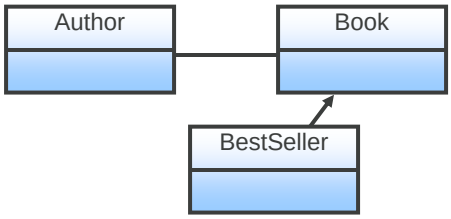
- Simplified Entity-Relationship model
  - Binary relationships between entities
  - IS-A hierarchies
  - Simple typed attributes in entities
  - Derivation model can be applied for redundant data



Derivation Model

- Redundant data can be easily specified using a WebML-OQL (Object Query Language).
- E.g.:
  - BestSeller := Book where Book.Sales > 50,000

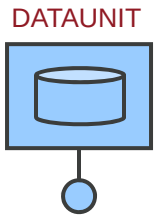


Hypertext Model

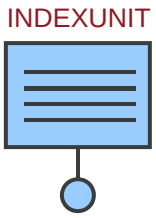
- Q1: what information is published in the hypertext nodes?
- Q2: how are the hypertext nodes connected?
- Q3: how is the hypertext divided into pages served to the user?

- A1: content units (Composition)
- A2: links (Navigation)
- A3: pages (Composition)

Composition: examples of Content Units description

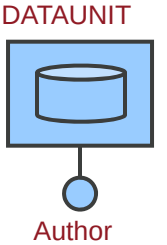


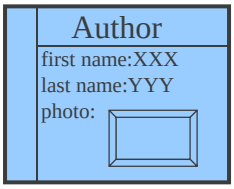
To publish information about A SINGLE object
(e.g. AuthorDetail)

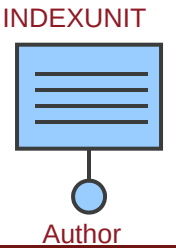


To publish a list of objects
(e.g. IndexOfAuthors)

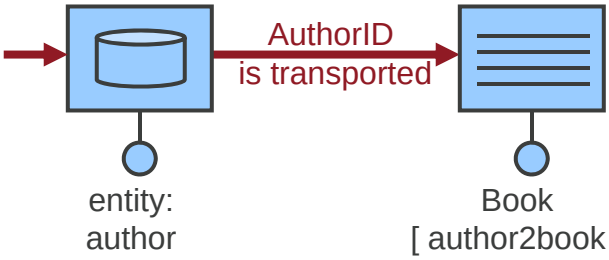
Composition: examples of Content Units rendering







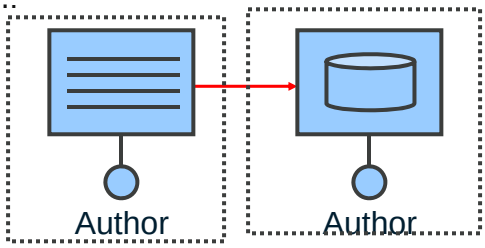
Navigation Model: Links



- Semantics of a link:
  1. Moving from one place to another
  2. Transporting information from one place to another (navigation context)
  3. Activating a computation (side effect)

Composition: Pages

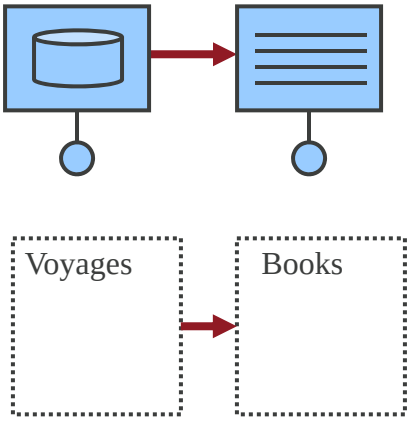
- A Page is a structured container of units and links
  - Possibly structured in and/or sub-pages
  - Abstraction of screen, frame, card, deck...
  - Permits one to cluster related information for more efficient communication
- E.g.:



index of authors and the selected author are shown together in the same page

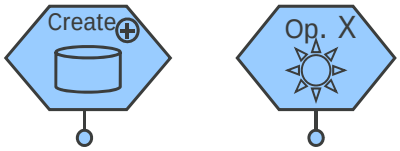
Types of links

- Contextual links
  - Between units
  - Context transported
- Non-contextual links
  - Between pages
  - No context transported

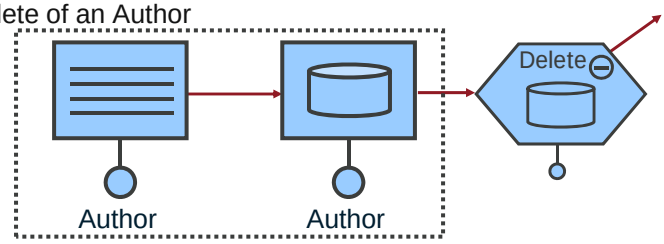


Write access: WebML operations

- Some predefined operations are provided
- Customized operation can be defined



- E.g.:delete of an Author



Siteviews

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- A Siteview is a set of pages that the user can experience as a whole Web site
- Different site views can be defined for different devices and different groups of users
- Thus, access control and multi-devices delivery is achieved

Things to keep in mind (or summary)

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- WebML is Domain Specific Language (DSL)
  - Is not UML or MDA
  - But …
- WebML is about Model Driven Design and Development
  - Focus on data intensive Web applications
  - Automatic code generation of Web applications
- One model for each layer
  - Content
  - Navigation
  - Presentation
- Tool Support!

Bibliography

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- Mandatory reading
  - M. Brambilla, S. Comai, P. Fraternali, M. Matera. "Designing Web Applications with WebML and WebRatio". In book: G. Rossi, O. Pastor, D. Schwabe, L. Olsina (Eds.). Web Engineering: Modelling and Implementing Web Applications (Human-Computer Interaction Series). Springer, October 2007, ISBN: 978-1846289224
    - http://webml.org/webml/upload/ent5/1/Chapter%209%20-%20WebML.pdf
- Suggested
  - www.webratio.com
  - www.webml.org

Questions?

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