Web Engineering

Developing Applications with WebML

Where we are?

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Overview

- Introduction
- What is WebML?
- Summary

- Slides material is taken from webml.org.

INTRODUCTION

Why WebML?
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 incoherent methodologies becomes deprecated

Target of WebML

- 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
WHAT IS WEBML?

The WebML models

- **WebML**
  - A conceptual language for high-level design of web sites.

- **Models:**
  - **Structure model** - data organization
  - **Derivation model** - 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 model** - definition of site pages as set of subpages and elementary publishing units
  - **Navigation model** - definition of links between pages and between units
  - **Presentation model** - positioning of the units in the page and definition of graphical appearance
Preview of WebML concepts

- Site = Structure + Composition + Navigation + Presentation

Structure Model (1)

- Question
  - What are the objects published in the site and how they are related?

- Answer
  - 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)

- 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
  - Author.BooksNumber = count(self.Author2Book)
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

DATAUNIT

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

INDEXUNIT

To publish a list of objects (e.g. IndexOfAuthors)
Composition: examples of Content Units rendering

**DATAUNIT**

Author

**INDEXUNIT**

Author

Author

first name: XXX
last name: YYY
photo:

Index of Authors

• S. Ceri
• P. Fraternali
• O. Versand

Navigation Model: Links

entity: author

Book [author2book]

- 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.:

  ![Diagram of a page structure](image)

  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

  ![Diagram of link types](image)
Write access: WebML operations

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

- E.g.: delete of an Author

Siteviews

- 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
- Access control and multi-devices delivery is achieved through Siteviews
Things to keep in mind
(or summary)

- 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

• Mandatory reading
    • http://webml.org/webml/upload/ent5/1/Chapter%209%20-%20%20WebML.pdf

• Web content
  – www.webratio.com
  – www.webml.org

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