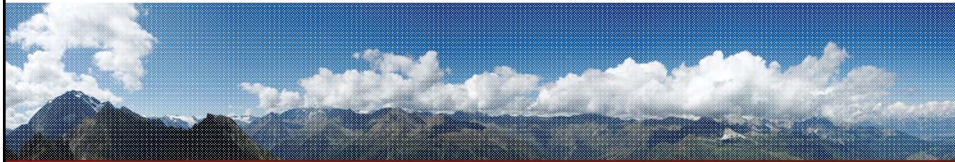


Web Engineering

Developing Applications with WebML



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Where we are?



#	Date	Title
1	5 th March	Web Engineering Introduction and Overview
2	12 th March	Requirements Engineering for Web Applications
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4	9 th April	Web Application Architectures
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Overview



- Introduction
 - What is WebML?
 - Summary
-
- Slides material is taken from webml.org.

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Why WebML?

INTRODUCTION

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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

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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

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WHAT IS WEBML?

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The WebML models

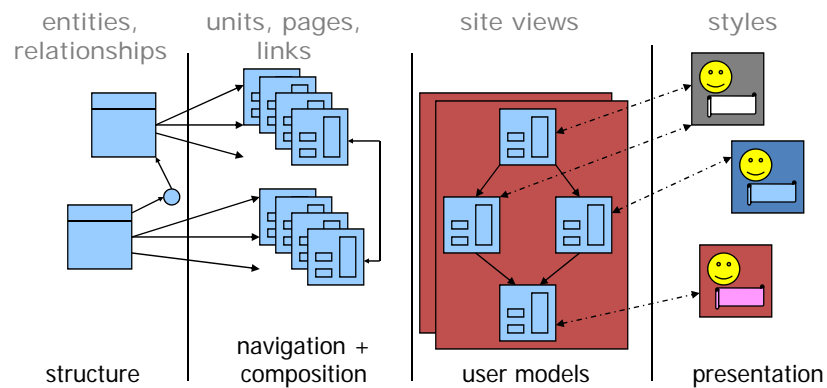
- WebML
 - A conceptual language for high-level design of web sites.
- Models:
 - *Structure model* - data organization
 - *Derivation model* - redundant data definition
 - Derivation is the process of adding redundant information to the structure model, in order to augment its expressiveness and define 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

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Preview of WebML concepts



- Site = Structure + Composition + Navigation + Presentation



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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

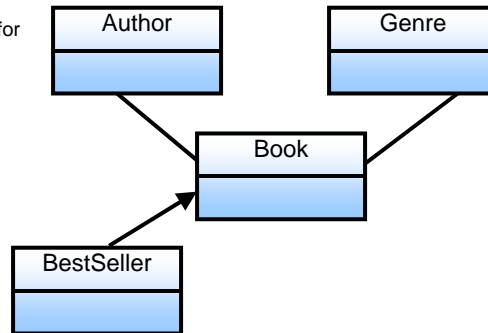
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Structure Model (2)



- Simplified Entity-Relationship model

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



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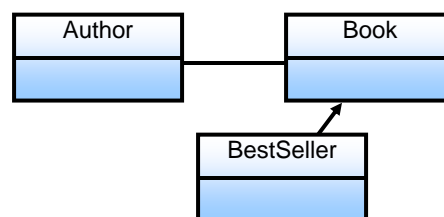
Derivation Model



- 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)`



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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?

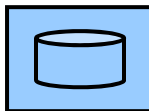
- A1: Content units ([Composition](#))
- A2: Links ([Navigation](#))
- A3: Pages ([Composition](#))

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Composition: examples of Content Units description

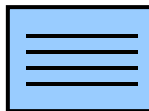


DATAUNIT



content

INDEXUNIT



content



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



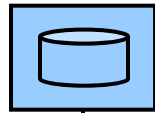
To publish a list of objects
(e.g. IndexOfAuthors)

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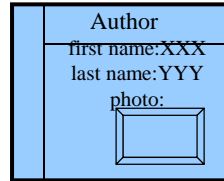
Composition: examples of Content Units rendering



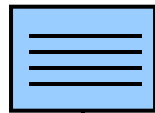
DATAUNIT



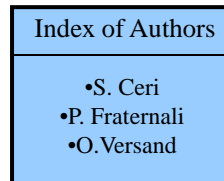
Author



INDEXUNIT

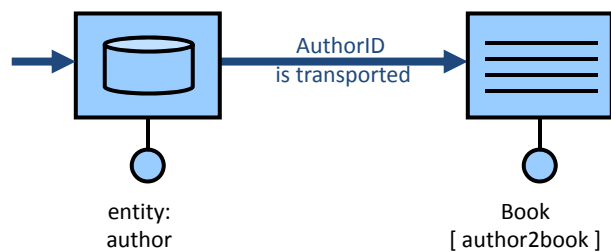


Author



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Navigation Model: Links



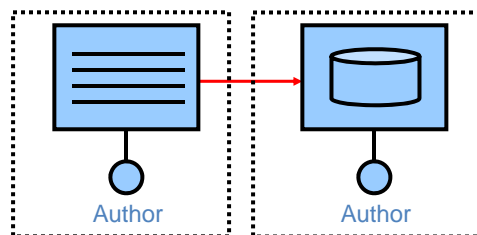
- Semantics of a link:
 1. Moving from one place to another
 2. Transporting information from one place to another (navigation context)
 3. Activating a computation (side effect)

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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.:



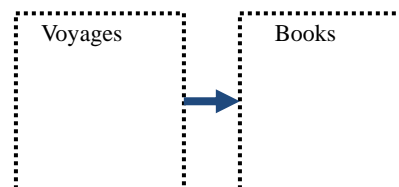
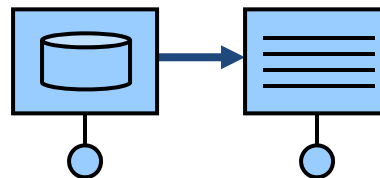
index of authors and the selected author are shown together in the same page

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Types of links



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

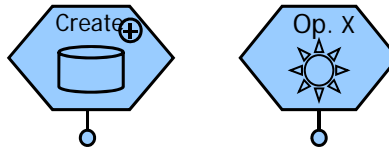


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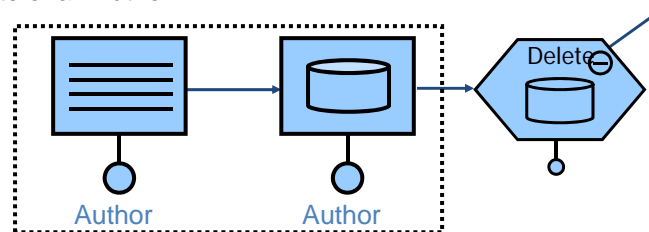
Write access: WebML operations



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



- E.g.: delete of an Author



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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

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WRAP-UP

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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!

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Bibliography



- 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>
- Web content
 - www.webratio.com
 - www.webml.org

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Questions?

