



Prototyping Navigation in Web-Based Information Systems Using WebML

Jaroslav Kuruc¹, Peter Dolog² and Mária
Bieliková¹

¹ Institute of Informatics and Software Engineering,
Faculty of Informatics and Information Technologies,
Slovak University of Technology in Bratislava, Slovakia
{kuruc,bielik}@fiit.stuba.sk

² L3S Research Center, University of Hannover, Germany
dolog@l3s.de



Introduction

- Hypermedia applications
 - huge amount of information with complex structure
 - need for a well-organized development process, appropriate analysis and design methods, techniques and notations
- Models of hypermedia applications
 - formal description of the structure/behavior of the system
 - source for a generator, which (semi)automatically builds up the skeleton of the system implementation



Outline

- Web Modeling Language
 - WebML and navigation modeling
- Extracting Abstract Navigation from WebML
 - Transforming WebML hypertext model into a state machine
 - Visualizing state machine
- WEBModeller
- Conclusions



Web Modeling Language (WebML)

- Visual language for conceptual modeling of web applications
- Defines the following conceptual models
 - data model – defines the data used by the application
 - hypertext model – defines the organization of the front-end interfaces of the application
 - content management model – defines operation units that can be used to manage and update the content

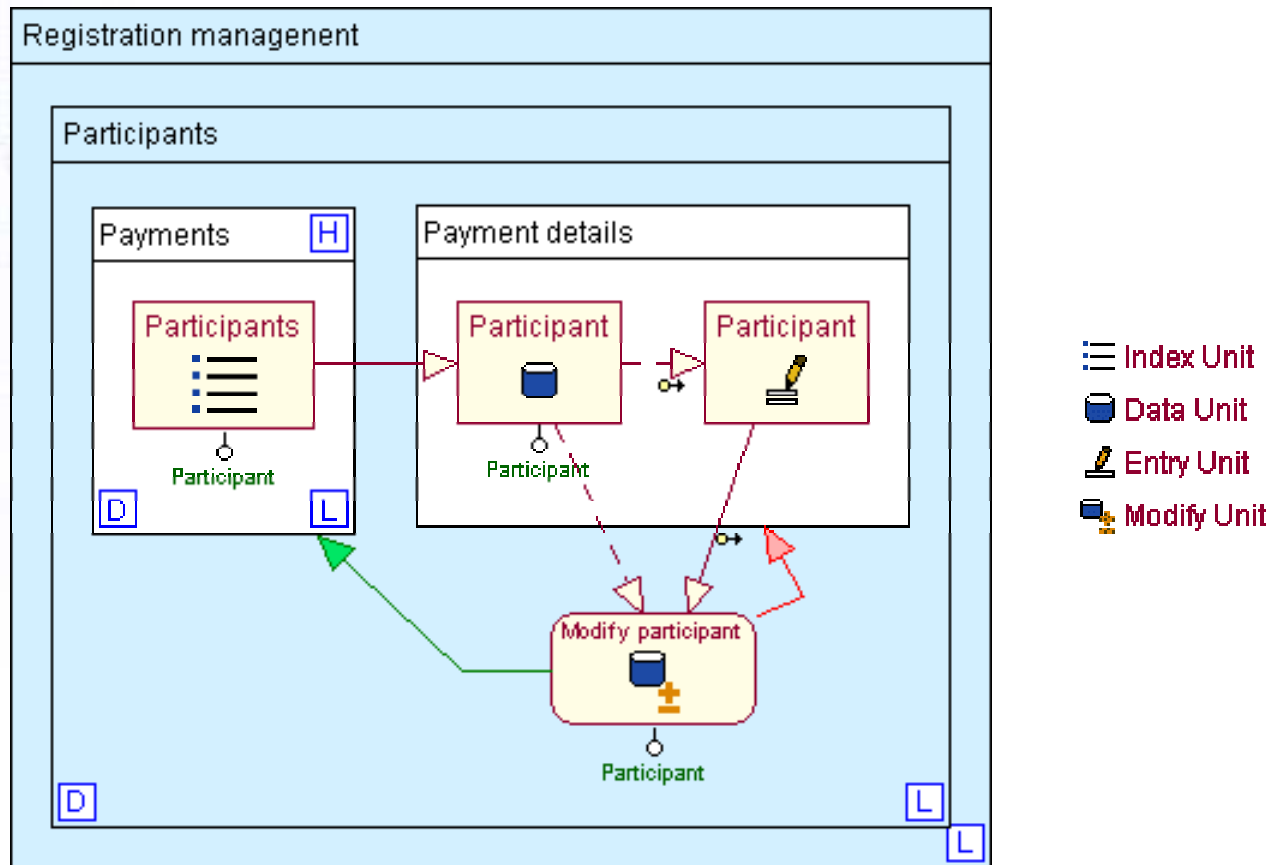


WebML and Navigation Modeling

- Hypertext design – three views
 - page structure of the particular site-views
 - contents of the pages
 - operations performed over the contents
- Hypertext model – several types of units
 - container – encapsulates units into logical parts
 - content unit – defines content of a page
 - operation unit – defines operations executed over the content units



Sample: WebML Hypertext Model





Extracting Abstract Navigation from WebML

- Modeling techniques provided by the WebML modeling language emphasize structural view
- State machines provide us with means to model abstract navigation models from user interaction point of view
 - simple and effective technique of extracting the user interaction aspect of navigation from WebML models
 - supports the navigation analyst in his task of communicating navigation design decisions and navigation model evolution

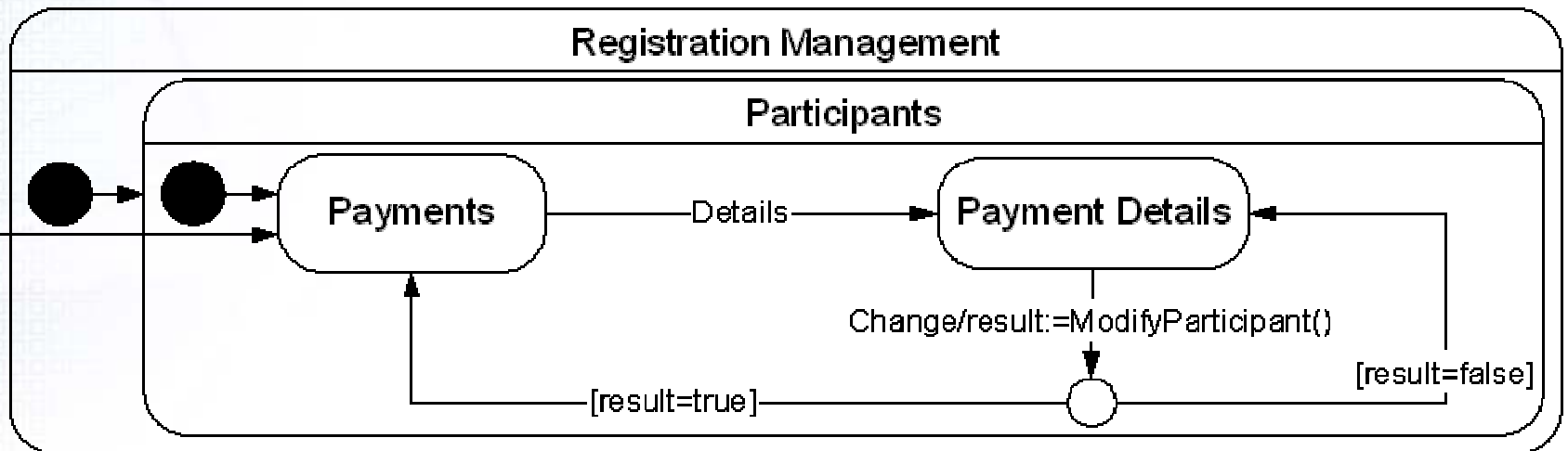


Transforming WebML Hypertext Model into a State Machine

- Input
 - WebML hypertext model
- Output
 - state machine, which maps navigation from the input hypertext model
- Principles
 - page is represented by a state in the state machine
 - link is represented by a transition between the states in the state machine
 - links leading from/to page contents are taken as links leading from/to page itself



Sample: State Machine



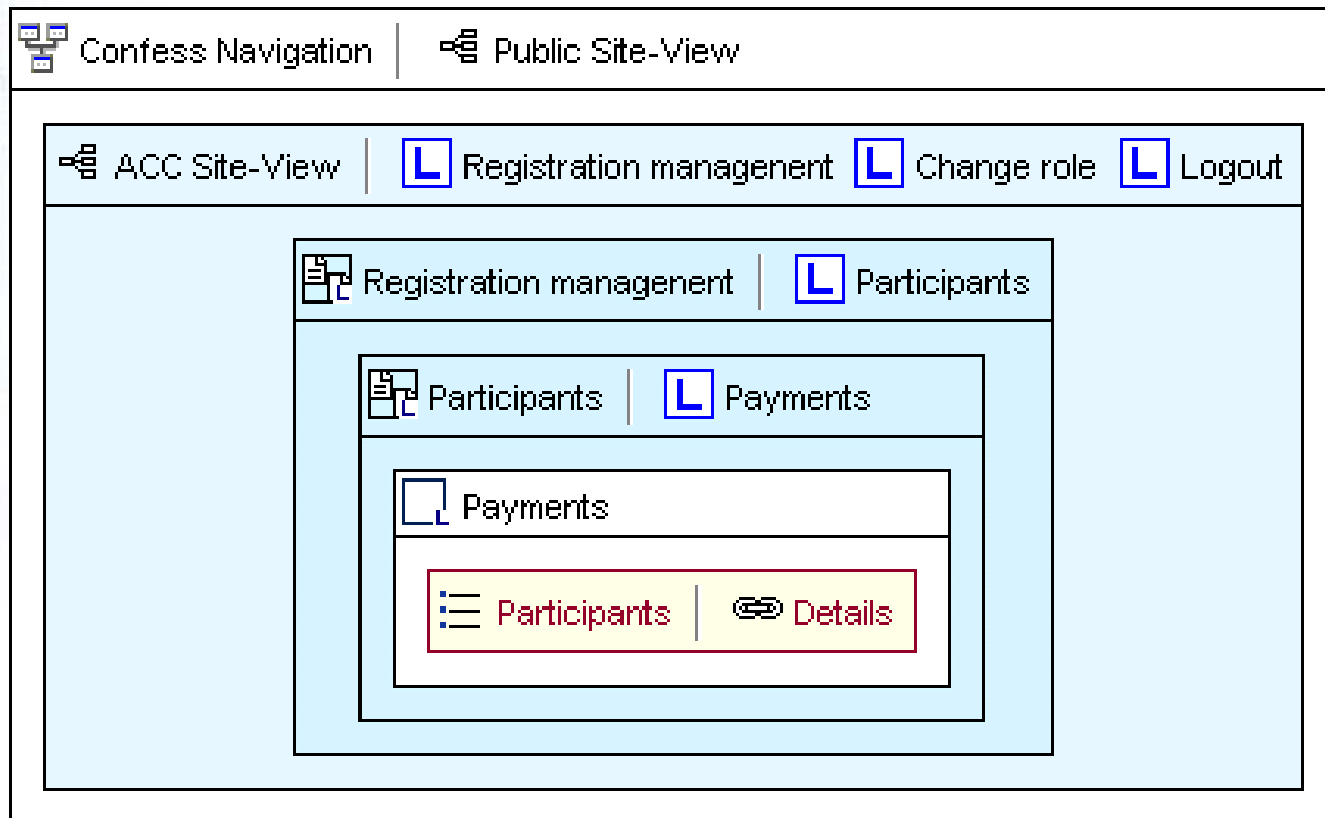


Visualizing State Machine

- Show current state with its outgoing transitions
 - after selecting one of the transitions, the state machine sets the current state to a new state into which the selected transition leads and consecutively shows this state
- Similarity with browsing
- Graphical representation consistent with the WebML notation



Sample: State Machine Visualization





WEBModeller

- Prototype implementation of the proposed transformation and visualization method
 - Java application
- Transformation method of WebML hypertext model into a state machine
 - realized by the XSLT engine
- Visualization of the state machine
 - implemented using the JStateMachine library



Conclusions

- Improvement in navigation prototyping when designing data-intensive web applications using WebML
 - extracting a state machine from WebML hypertext model
 - underlying model in prototyping tool
 - help in navigation model evolution and design decisions
- Prototyping based on abstraction of hypertext model
 - alternative way to prototype a navigation in hypertext model
 - validation of the navigation model
- Future
 - two directional transformation between static hypertext model and its dynamic part which models the navigation



Thank you!