M-ADAPTWEB®: AN ADAPTIVE E-LEARNING ENVIRONMENT FACING MOBILITY

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Overview

• Motivation
• Managing learning objects
• Recommending process and adaptability
• Infrastructure of m-adaptweb
• Case study
• Conclusions and future works
Adoption of the m-learning environment *transparently* by the student, adapted to student’s context and needs
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Managing learning objects

AdaptWeb®

• Adaptive web-based learning environment
  – Able to adapt hypermedia courseware contents and navigation to student’s characteristics and preferences

• PHP, MySQL and XML

• Available at http://adaptweb.sourceforge.net
Managing learning objects

- ROIA repository
  - Uses Dublin Core metadata standard
- Communicates with AdaptWeb®

<table>
<thead>
<tr>
<th>Element</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributor</td>
<td>An entity responsible for making contributions to the resource</td>
</tr>
<tr>
<td>Coverage</td>
<td>The spatial or temporal topic of the resource, the spatial applicability of the resource, or the jurisdiction under which the resource is relevant</td>
</tr>
<tr>
<td>Creator</td>
<td>An entity primarily responsible for making the resource</td>
</tr>
<tr>
<td>Date</td>
<td>A point or period of time associated with an event in the lifecycle of the resource</td>
</tr>
<tr>
<td>Description</td>
<td>An account of the resource</td>
</tr>
<tr>
<td>Format</td>
<td>The file format, physical medium, or dimensions of the resource</td>
</tr>
<tr>
<td>Identifier</td>
<td>An unambiguous reference to the resource within a given context</td>
</tr>
<tr>
<td>Language</td>
<td>A language of the resource</td>
</tr>
<tr>
<td>Publisher</td>
<td>An entity responsible for making the resource available</td>
</tr>
<tr>
<td>Relation</td>
<td>A related resource</td>
</tr>
<tr>
<td>Rights</td>
<td>Information about rights held in and over the resource</td>
</tr>
<tr>
<td>Source</td>
<td>A related resource from which the described resource is derived</td>
</tr>
<tr>
<td>Subject</td>
<td>The topic of the resource</td>
</tr>
<tr>
<td>Title</td>
<td>A name given to the resource</td>
</tr>
<tr>
<td>Type</td>
<td>The nature or genre of the resource</td>
</tr>
</tbody>
</table>

Properties of Dublin Core (Dublin Core, 2011)
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Recommending process and adaptability

- Processes
Recommending process and adaptability

- Menu of concepts:

  Link adaptation examples in the environment:
  - Adaptive link annotation
  - Adaptive link hiding
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Infrastructure

Learning Objects of different types (e.g. sound, html, doc, pdf, video, graph, etc.)

LO repository

LOs in different languages

Profile

Student personal data

Context

Learning domain data

Semantic layer

Mobile situations

Student’s context

Recommendation and Adaptation Engine

Adaptive Interface and recommended LOs

Technological and location data
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Case study

General scenario – learning activity: the students of the middle school (8th grade) have to develop a research work about the Liberal Revolutions occurred in Brazil in the beginning of the XX century. They have to choose one Revolution to explain and also relate the chosen revolution with other revolutions that were occurring in Europe at the same period.

Profile of student_1: José lives in Rio Grande do Sul, a state in the south of Brazil. He is developing the discipline of History, in the modality of distance learning. As he is visually impaired, he needs special functionalities when using a web-based learning system. Also, his learning style is active (learn by trying things out, enjoy working in groups) and verbal (prefer written and spoken explanation).

José’s current situation: José is in the library, searching for some material about the Farroupilha Revolution. He is currently using his tablet to help him in this activity, connected in the Wi-Fi network from his school library.

Profile of student_2: Maria lives in Bahia, a state from Northeast of Brazil. She is also doing the discipline of History in the modality of distance learning. Her learning style is active, but she is visual (prefer visual representations of presented material, such as pictures, diagrams, flows and charts). As she had lived for 2 years in Canada, she has skill in English and French.

Maria’s current situation: Maria is on the bus, going to her college, using her smartphone. She is searching for some material about the Sabinada Revolution, another Liberal Revolution occurred in Brazil. She is connected through a 3G data connection, which varies according to her location.
Context of João = {

hasDevice (O_Student·João, O_Device·Tablet),

hasNationality (O_Student·João, O_Nationality·BR),

interac_pref (O_Student·João, O_Student·Style1),

hasKnowledge (O_Student·João, O_Domain·History),

hasCourse (O_Student·João, O_Course·8th grade),

hasTask (O_Student·João, O_Task·RW_01),

hasRestriction (O_Student·João, O_Restrict·Visual),

hasLocation (O_Student·João, O_Location·IPLibrary),

style_1 (O_Student·João, O_Student·Verbal),

style_2 (O_Student·João, O_Student·Active),

hasConnection (O_Student·João, O_Netwk·High)
Case study

Context of Maria = {
  hasDevice (O_{Student:} Maria, O_{Device:} SmarthPhone),
  hasNationality (O_{Student:} Maria, O_{Nationality:} BR),
  interac pref (O_{Student:} Maria, O_{Student:} Style2),
  hasKnowledge (O_{Student:} Maria, O_{Domain:} History),
  hasCourse (O_{Student:} Maria, O_{Course:} 8th grade),
  hasTask (O_{Student:} Maria, O_{Task:} RW_01),
  hasLocation (O_{Student:} Maria, O_{Location:} Transit),
  style_1 (O_{Student:} Maria, O_{Student:} Visual),
  style_2 (O_{Student:} Maria, O_{Student:} Active),
  hasConnection (O_{Student:} Maria, O_{Netwk:} Medium),
  langSkill (O_{Student:} Maria, O_{Student:} English),
  langSkill (O_{Student:} Maria, O_{Student:} French)}
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Conclusions

- AdaptWeb® an adaptive e-learning environment
- Towards to m-AdaptWeb
  - a module developed to provide situation and context-aware behaviour to mobile students in courses of the e-learning AdaptWeb®
- A simple but actual contribution of this work is the description of one feasible infrastructure – particularly containing a recommendation and adaptation engine
  - adapting the content and navigation taking in account properties of student’s context in a specific mobile situation
Acknowledgements
THANK YOU!

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