Personalisation in Self e-Learning Networks

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Overview

• Why SeLeNe? - Motivation
• What is a SeLeNe?
• The SeLeNe information space – Learning Object metadata
• Personalisation in SeLeNe
  – Personal Views
  – Personalised query results
  – Notification services
Why SeLeNe?

- There are a huge number of learning resources now available on the Web
- Electronic “textbooks” can now be created collaboratively in ways that were previously impossible
- We need tools to allow for the discovery, sharing and collaborative creation of learning resources
- Semantic metadata describing these resources can enable advanced services more powerful than traditional Web techniques
What is a SeLeNe?

• Formed by members of a learning community
  – instructors, learners and content providers
• The community creates a collection of shared Learning Objects (LOs) and their metadata descriptions
• Users register and share a LO by providing a metadata description of it; some parts of the metadata can be automatically generated
• The descriptions form a metadata repository – it is the descriptions and not the LOs themselves that SeLeNe manages
• There are various deployment options, the most general of which allows the repository to be distributed across many Sites
Learning Object Metadata

- IEEE LOM chosen for SeLeNe
- Augment with “customised attributes” such as
  - Learning styles catered for
  - Detailed relationships between LOs
- Use taxonomies of
  - Topic/subject Domains (e.g. ACM-CCS)
  - Learning Objectives (e.g. Bloom’s Taxonomy)
  - Learning Styles (e.g. Honey and Mumford)
- All represented using RDF/S
SeLeNe Metadata Schema

Contributor

Learning Object

ISA

Learning Objectives Taxonomy

Learning Topics Taxonomy

Program

Course

Module

Lesson

Component

Name

Role

Organization

Title

Language

Format

Context

Level

Time

related to

has prerequisite

contributed by

part of

with subject

with goal
Personalisation

• There are many LOs available to users of a SeLeNe; some will be useful for them and others will not

• Personalised access to LOs provides learners with tools to aid the discovery of useful LOs:

  Views: Learner can browse the LO information space according to just the attributes of interest to them personally

  Search: Learners are presented with LOs relevant to their current educational needs

  Notification: Learners are notified of the updates and additions to the SeLeNe that are relevant to them
Personalised Views

- The user’s view of LO descriptions and schemas can be personalised to reflect their perception of the information space.
- Personalised views can be browsed and queried directly.
- RDF View Language (RVL) allows definition and population of virtual schemas and LO descriptions.
Personalised Query Results

- These depend on a User Profile, which includes
  - Some PAPI-Learner elements
  - Some IMS-LIP and IMS-RCD elements
  - Additional elements to record learning goals and learning styles

- LO descriptions are queried using RQL, generated from keyword-based queries – query generation takes account of the profile as well as the query
  - e.g. the language of LOs required can be specified

- The set of LO descriptions returned by query evaluation are ranked according to the original query and the User Profile
The SeLeNe User Profile

- IMS-LIP:QCL Qualifications
- IMS-LIP: Interests
- SeLeNe: History
- PAPI: Personal Info
- SeLeNe: Notifications
- New LOs
- Updated LOs
- New Users
- PAPI & SeLeNE: Preferences
- Accessibility
- Learning Styles Taxonomies
- LO Providers
- Date
- Learning Objectives Taxonomy
- Descriptive Verb
- Annotation
- Learning Topics Taxonomy

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Personalised Event and Change Notification

- Users can register personal Event-Condition-Action (ECA) rules, which act over the RDF repository like traditional database triggers.
- This enables notification of:
  - Registration of new LOs of interest to the user
  - Changes to descriptions of particular LOs
- Rules of the form:
  ```on event if condition do action```
  are automatically generated from user input to higher-level presentation and application services.
Open Issues

• RDF query processing over P2P systems needed
• Investigation of best algorithm for the personalised ranking of query results
• Combination of ECA rules with transactions and consistency maintenance in RDF repositories
• Design of User Interfaces for access to SeLeNe’s services
• Implementation and deployment of our service-based architecture for the system
Further details and technical reports available from:

http://www.dcs.bbk.ac.uk/selene/