Relationships between users, resources and services in learning object repositories

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MTSR 2012, Cádiz, Spain

Scenario (I)

Our **student**:

• Computer Science degree
• Fourth semester
• Enrolled into "Introduction to Databases" and "Data Mining"
• Loves programming

She wants to find resources for her data mining project, so she goes to the institutional repository…

Scenario (II)

The **institutional** repository:

- Created by (and for) librarians
- Stores documents
- Basic services:
    - Upload (restricted)
    - Browse / Search
    - Download
- Recent submissions

Will our student find what she is looking for?

Search

[   ]   **Go**

Advanced Search

Browse

By Collections	Index
Communities & Collections	Author(s)
Academics [2526]	Title
Institutional [503]	Issue Date
Research [868]	Subjects

Institutional Repository

in other words, network.
Which is, in short, an absolutely ideal way

0:00   YouTube

The UOC's institutional repository contains the digital publications in open access produced by the UOC in research, teaching and administration.

More information

Repository leaflet

The documents available on the O2 repository can be found on:

RECOLECTA   mdx MATERIALS DOCENTS EN XARXA   RACO Revistes catalanes

amb accés obert   TDX Tesis Doctorals en Xarxa   RECERCAT Dipòsit de la Recerca de Catalunya

Google   SCIrus for scientific information only

Publish

How to publish
Information for authors

Repository by the numbers

Number of items	3897
Visits	577825
Downloads	834437

Subject Search

Check the boxes next to the categories that you wish to search under, then hit "Search...". Categories can be expanded to refine the search terms, and as many categories can be selected as required.

[+] ☐ Theme areas
    ☐ Arab and Islamic studies
    [+] ☐ Arts and humanities
    [+] ☐ Computer Science, Technology and Multimedia
    ☐ City management and urban planning
    [+] ☐ Economics and Business

It's not just searching and browsing

- How are documents organized?
- How have they been described?
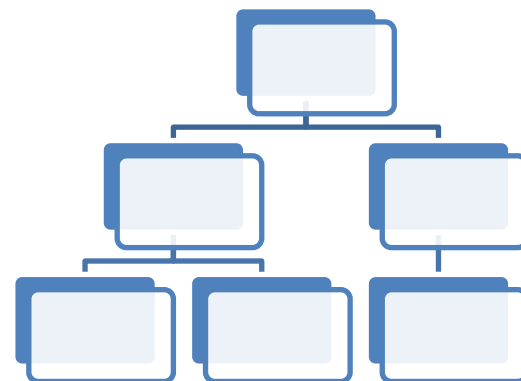
The institutional repository cannot be a mere digital shelf where to deposit documents in a simple hierarchical structure

We need **context** and **relations**

Project framework

- **M**ining, data **A**nalysis and **V**isualization based on **S**ocial models in **E**-**L**earning (MAVSEL)
- 3 year UAH / UOC project

  The learning process is the result of learners interacting with resources, services and other learners; we can analyze such interaction and improve the learning scenario (i.e. the institutional repository)

Current situation (I)

- The institutional repository does not "know" its users (except permissions for uploading):
  - No context for browsing or searching →
  - No guidance → structure becomes a maze
  - No recommendations (only recent submissions)
- Stores documents: title, author, date, keywords
- Documents are unrelated to each other

"Invisible"

Current situation (II)

- Interviews + survey to students and teachers
- Most students (87.5%) are unfamiliar with the institutional repository; most teachers (67.4%) too; they do not use it except if "forced"

"it's not easy to find things"
"unrelated to the learning process"
"resource description needs to be improved"
*"what / where is the institutional repository?"*

Our proposal (I)

Main goal: make teachers and students take control over the institutional repository

- From documents to resources
- Contextualized searching
- Improved browsing → navigation
- Additional services → social layer

Our proposal (II)

- Improve resource descriptions:
  - Domain (i.e. statistics, programming, ...)
  - Current / potential use (courses, degrees)
  - Type / level / intended use
- Establish relationships between elements
- Additional services:
  - Resource rating, favorites, tagging, sharing
- Analyze paradata for recommendation purposes

# Adding context and relations
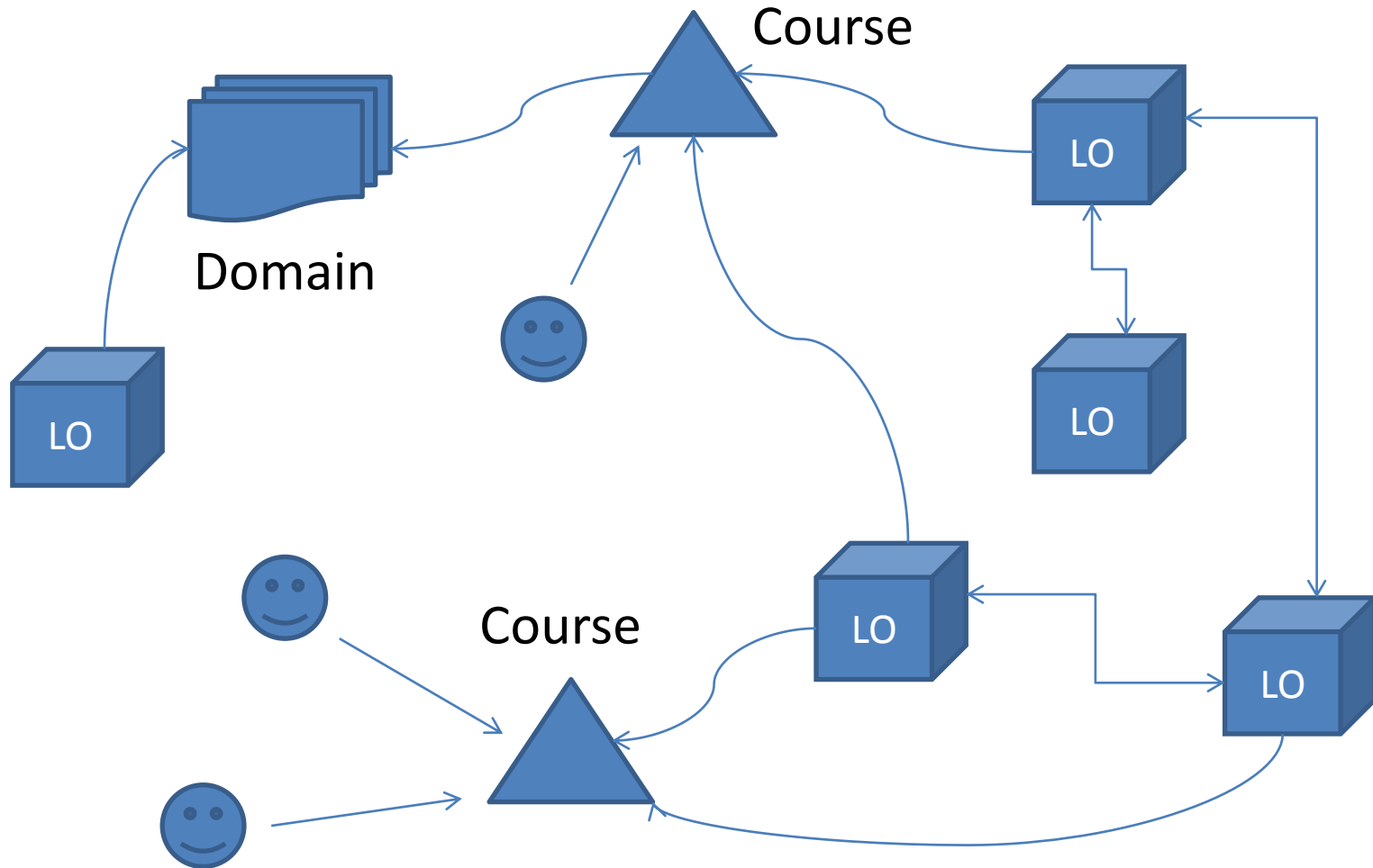
Relationships

- Between resources:
  - Dublin Core: *references, requires, is version of*
  - Explicit: *exemplifies, deepens, summarizes*
  - Computed: *isCloseTo*
- Between users:
  - Computed: *isCloseTo*
- Between users and resources
- New levels: course, domain

Extending Dublin Core

- Used for describing content, not context
- Currently now:
  - dc:subject
  - dc:type
  - dc:format
  - dc:relation
- "Flat" representation of an ontology
- OAI-PMH needs to be considered

Establishing a metric

- Resources:
  - Reputation scheme $F_R(R_i)$
  - Distance $d_R(R_i, R_j)$

- Users:
  - Reputation scheme $F_U(U_i)$
  - Distance $d_U(U_i, U_j)$

- Users and Resources:
  - Distance $d_{U,R}(U_i, R_j)$
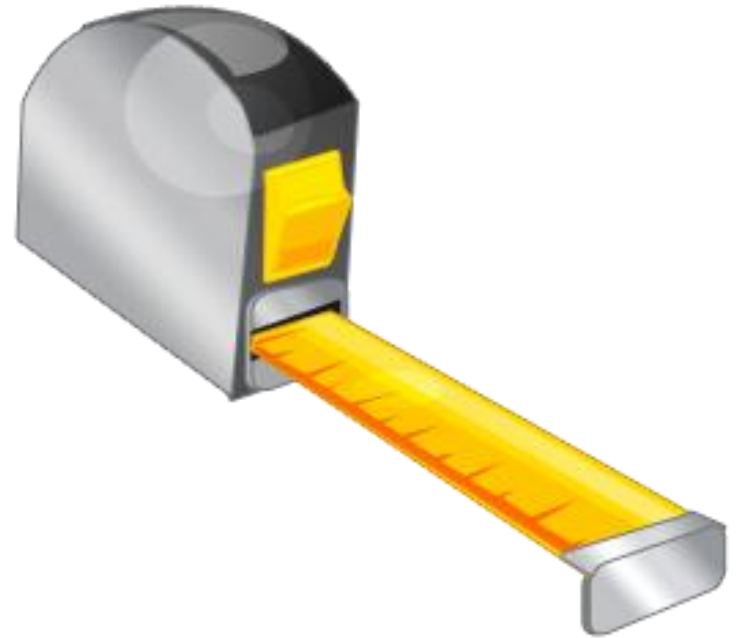
Analyzing paradata

- Resources:
  - Number of times accessed, downloaded
  - Rankings, number of favorites
  - Tags
- Users:
  - Number of resources downloaded, rated, favorited, tagged
  - Navigational patterns

Recommendation system

- Most "popular" resources
- "Related" resources for a given resource

  - Most "active" / "expert" users
  - "Similar" users for a given user

"Appropriate" resources for a given user

Conclusions and future work

- The institutional repository is underused
- Resources are isolated → no discovery
- We want learners to take a more active role
- Describe resources according to **learners' needs** and **particularities** (i.e. **context**)
- Implementation of the service layer
- Design of the reputation scheme
- Pilot test during Spring 2013 → MTSR 2013!!!

Thank you!!!

MAVSEL project:

http://personal.uoc.edu/MAVSEL

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