Personalisation in Self e-Learning Networks

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Overview

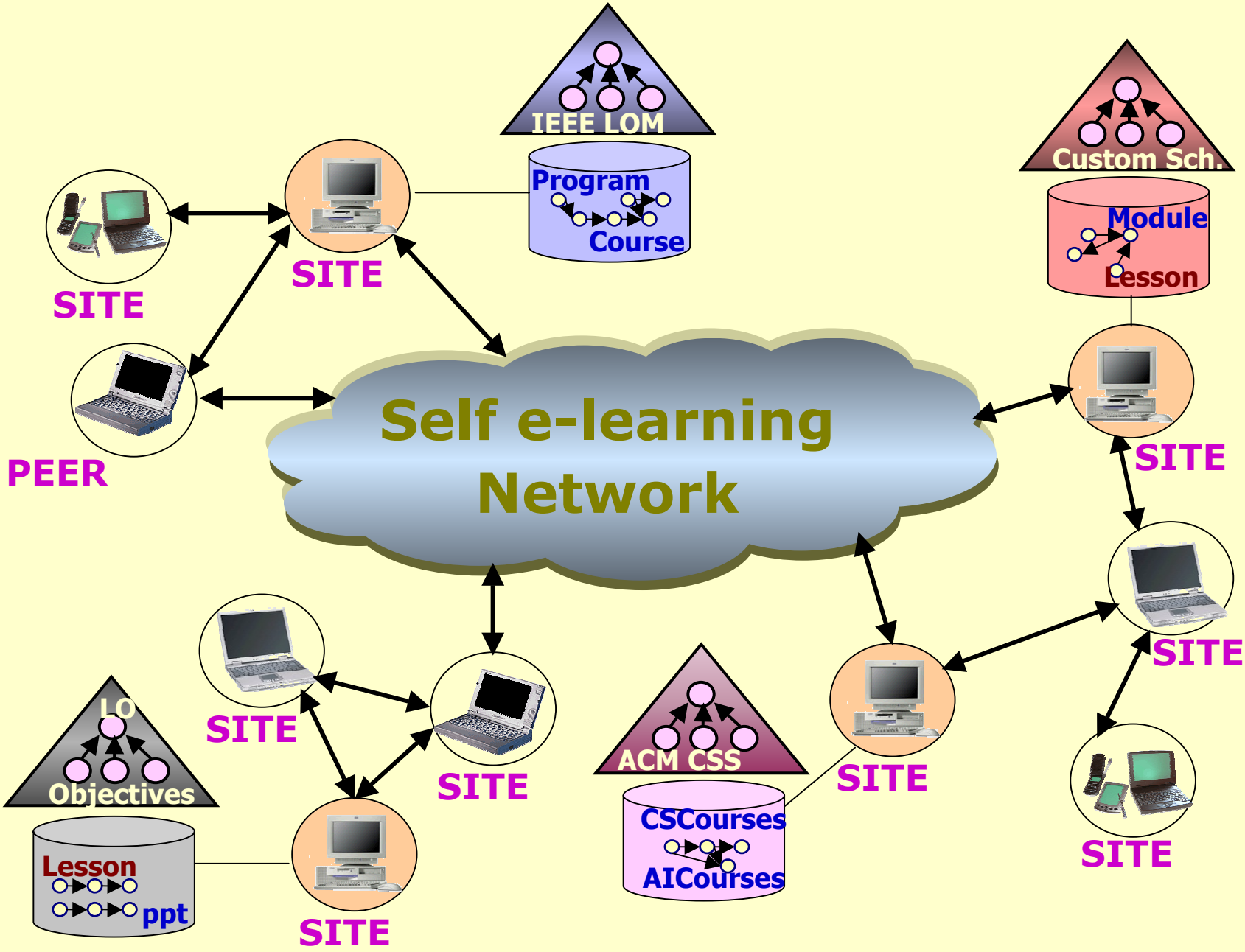
- Why SeLeNe? - Motivation
- What is a SeLeNe?
- The SeLeNe information space – Learning Object metadata
- Personalisation in SeLeNe
  - Personal Views
  - Personalised query results
  - Notification services

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


IEEE LOM
Program
Course
Custom Sch.
Module
Lesson
SITE
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PEER
Self e-learning
Network
SITE
SITE
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SITE
LO
Objectives
Lesson
ppt
SITE
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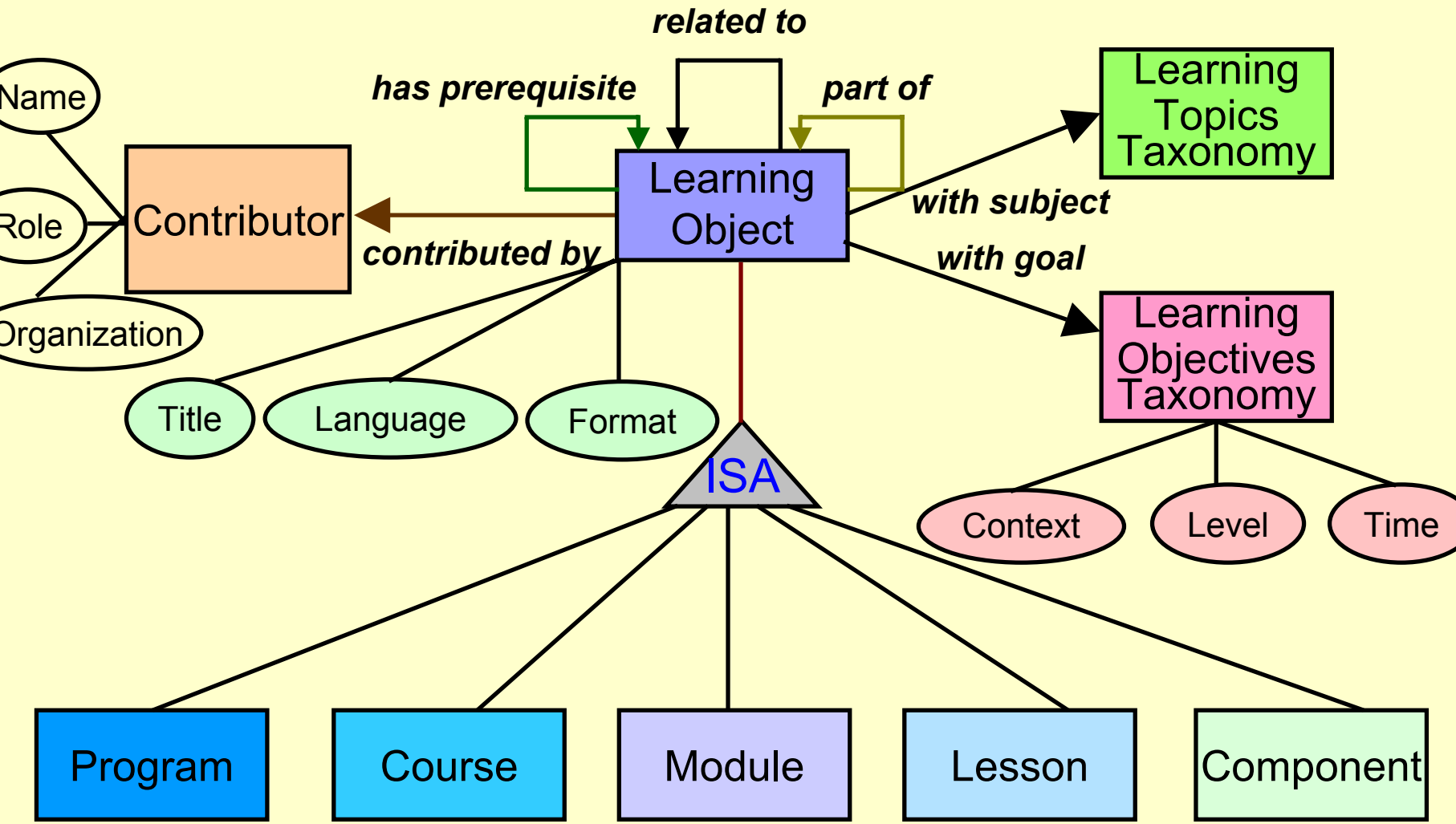
ACM CSS
CSCourses
AICourses
SITE
SITE

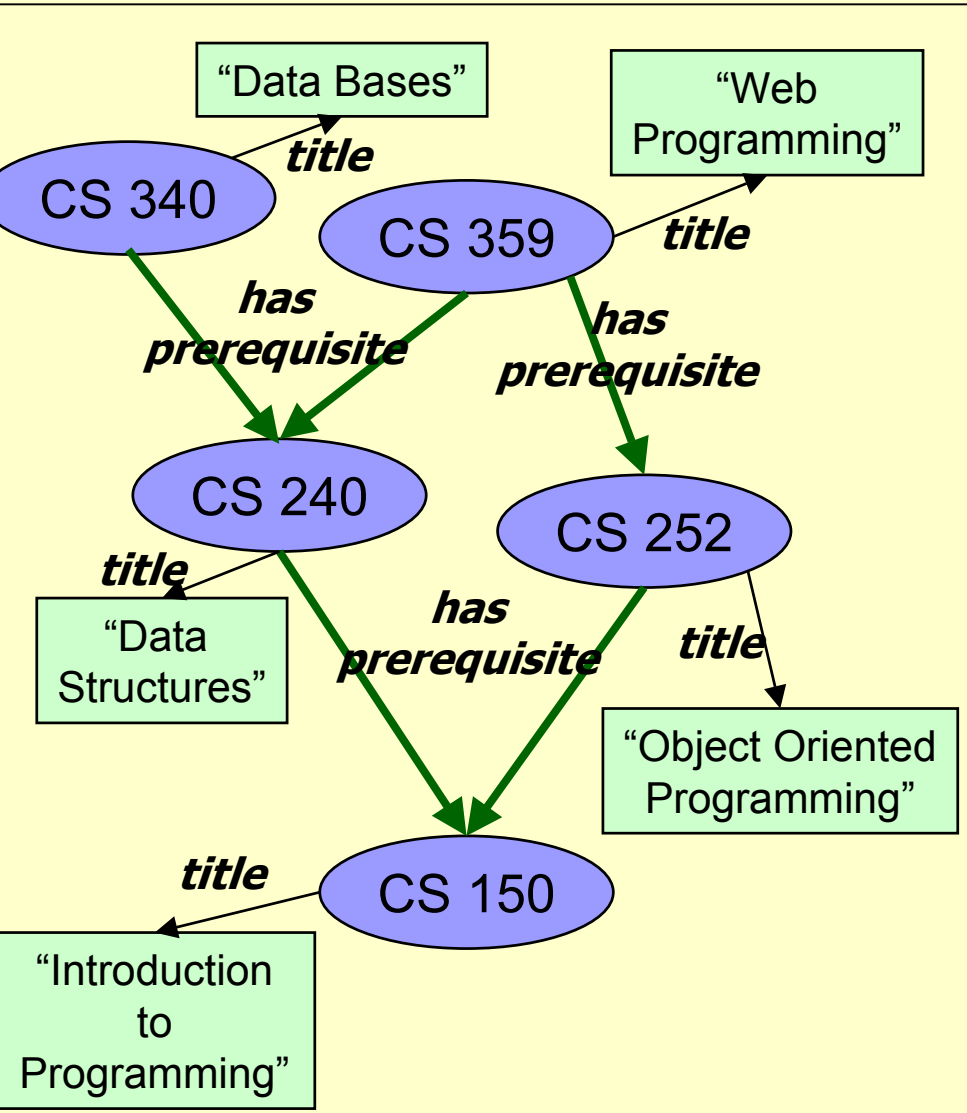
Learning Object Metadata

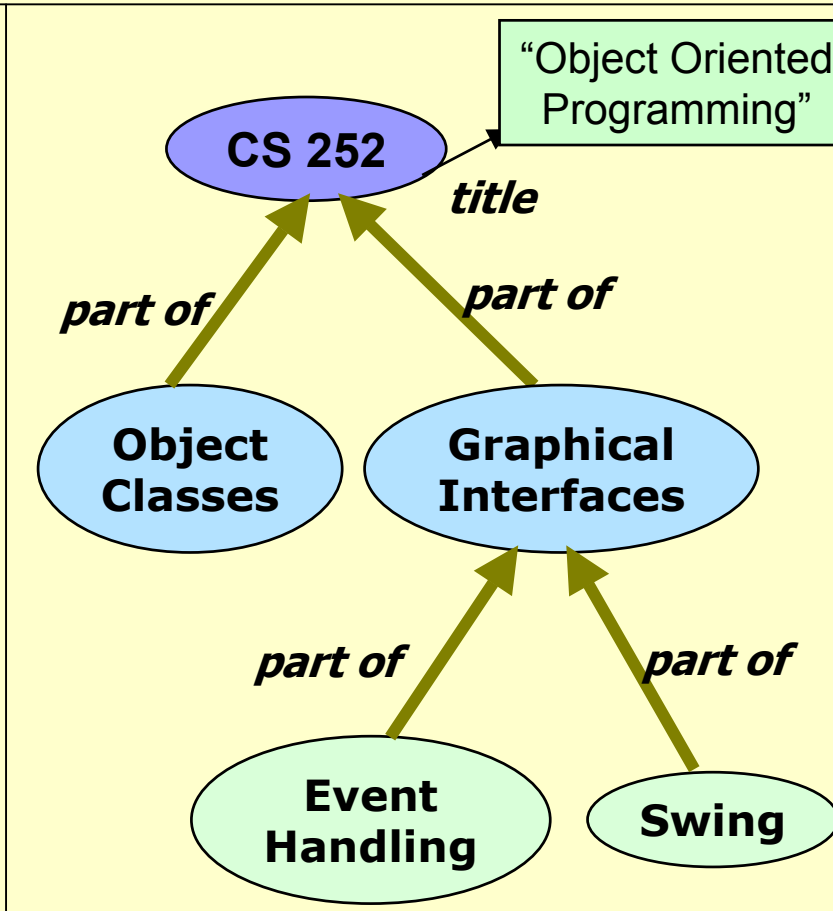
- IEEE LOM chosen for SeLeNe
- Augment with “customised attributes” such as
  - Learning styles catered for
  - Detailed relationships between LOs
- Use taxonomies of
  - Topic/subject Domains (e.g. ACM-CCS)
  - Learning Objectives (e.g. Bloom’s Taxonomy)
  - Learning Styles (e.g. Honey and Mumford)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

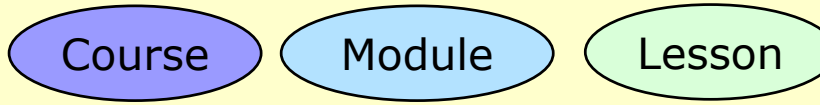
SeLeNe Metadata Schema



LOM-RDF Example







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

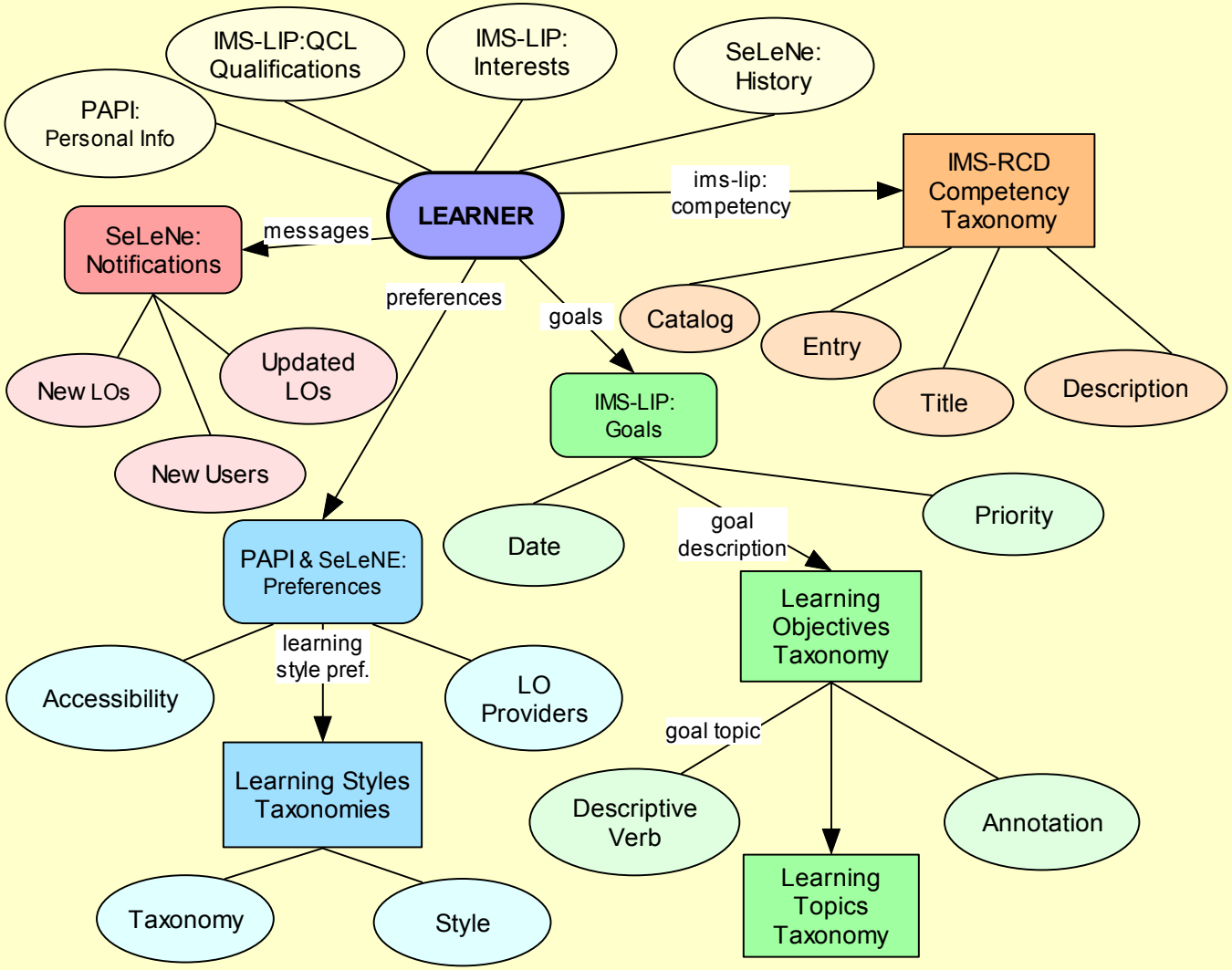
Personalised Views

- 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



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/