The problems of automated distance learning systems community formation

Alexei Sharpanskykh

Vrije Universiteit Amsterdam

Department of Artificial Intelligence

De Boelelaan 1081a, 1081 HV Amsterdam, The Netherlands

e-mail: sharp@cs.vu.nl

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One of the main issues in the distance learning field is the enhancement of functionality and usability of a distance learning system (DLS) for its potential users (e.g., tutors, students, managers and administrators).

The partial solution for this problem is automation of activities within a DLS program environment. Taking into consideration that almost all DLS subsystems are autonomous and each subsystem interacts actively with other subsystems and an environment, a multi-agent model can be considered as a suitable basis for the automated DLS (ADLS) representation. In addition to the multi-agent basis, a more effective solution to the earlier posed issue is proposed in the paper. Namely, a new approach to model interaction among ADLS' in the form of a community is proposed. Different ADLS' are capable to interact with each other making use of common ontology basis.

The issues of ADLS community formation have not been investigated before. But there are several essential advantages in creation of such communities: members of communities could share the elements of their instruction materials; conduct common consultations; organise shared projects and collaborative problem solving.

In order to make the formation of such communities possible, several prerequisites are considered:

- Information must be represented and structured effectively.

- Common base terminology for different ADLS' is to be created.
- Registration and indexing services, as well as common protocols for interaction have to be provided.

One of the most promising ways to solve the first issue is to use concept-oriented structures [1] that can be used effectively for management, processing and visualization of ADLS' domain concepts.

Creation of the common terminology or conceptualization of the appropriate domain areas can be carried out by means of ontologies.

In addition to declarative concept ontologies, problem solving (task) ontologies are considered. The latter are used in the machine deduction algorithms for instructional scenario creation, automated tasks and tests assessment, and automated generation of answers to students' questions.

Registration and indexing services play a key role in a community and have the following functions:

- Supporting of the ADLS-members list and up-to-date information about them.
- Providing of extensive search facilities of information about the resources, granted by every member of a community.
- Storing of domain-dependant and domain-independent concept and task ontologies with the references to the appropriate instructional modules, where they are being used.
- Supporting of the multimedia library that is being formed of the elements from different instructional materials.
- Realization of a trust relationships policy in a community.

Two schemata of the trust relationships policy implementation, namely with the dedicated center (1) and based on the equality principle for all community's members (2), are discussed in the paper.

The practical example of interaction between the registration and indexing service and two different ADLS' during distance course development is given in the paper.

References

[1] Brusilovsky P., Riccardo R. Adaptive Hypermedia: Map-based horizontal navigation in educational Hypertext. In *Proceedings of the thirteenth conference on Hypertext and hypermedia*, pages 1-10, USA (Maryland), 2002.