
A METHOD TO AUTOMATICALLY RECOMMEND COURSE ALTERNATIVES IN THE WEB-BASED COURSE BROKER CUBER

Latifa Boursas and Jörg Keller, FernUniversität Hagen

Abstract

The EU-funded project CUBER strives to develop a web-based course broker facility where prospective students can inform about study programs offered by the CUBER partners. As these students might want to tune existing programs to their interests, course alternatives should be offered by the system to support this tuning. To do this, the CUBER systems needs a mechanism to automatically derive whether two courses can be exchanged in a program or not. We report on our achievements towards this mechanism.

Introduction

Prospective students currently find information about study opportunities on the internet either at institutions' web sites or in collections provided by third parties. The former have the disadvantage that many sites have to be visited in order to get an overview of the market. The latter have the disadvantage that the information often is incomplete or not provided at a sufficient level of detail, e.g. which courses exactly comprise a study programme.

The CUBER project [1], funded by the European Commission under the IST-programme in the 5th framework, strives to develop a web-based facility where institutions themselves provide information about their study programme at a level of detail that comprises meta-data of single courses. The prospective student can search this information to find courses or study programmes satisfying his needs and interests. The CUBER consortium comprises distance teaching institutions and conventional universities of all over Europe.

Often a prospective student is not satisfied with a study programme as it is offered. He might want to exchange a particular course in that programme against a course that better suits his interests and needs. However, that course might only be offered by another consortium member. So the question arose whether the student can receive a recommendation by the system whether this exchange is possible. This recommendation should naturally not be based on static exchange tables, as these would be too cumbersome to maintain. In the sequel, we will report about our approach to solve this problem.

Automated Course Exchange

The goal of CUBER's Workpackage 9 "Credit Point System Integration" is the automation of course acknowledgement. Consider the situation of a student planning to enrol into a study programme, who wishes to exchange a course A of his programme against a course B by another provider that better suits his particular interests and needs. Currently, the student requests this exchange at his local administration. The request is granted or denied after some administrative process which takes weeks or even months.

Requests of this kind also happen when a prospective student is tailoring a programme offered to him by the CUBER system. In this case, however, a decision has to be done by the system as the student expects an immediate response. A similar kind of request happens if a prospective student requests acknowledgement of courses he has already completed successfully in a previous study. An immediate answer is necessary here as well in order to enable the student to guess his total workload to complete the programme offered to him by the CUBER system.

Note, that the above "decisions" are not binding for the institutions involved. Therefore they might be considered a best effort guess. On the other hand, this guess may only differ from the institution's final decision in very peculiar instances, in order not to risk acceptance by the system's users.

In order to find out to what extent course acknowledgement can be automated, we first looked for an existing system that:

- is recognized at least all over Europe;
- is used in practice on a large scale;
- allows transfer and acknowledgment of study success internationally.

The only system implementing these points is the European Credit Transfer System ECTS [2]. While ECTS does not allow automatic acknowledgement of courses, the process is strictly formalized. Furthermore, ECTS provides an established and unified "currency" for course extent, the ECTS credit points [3].

In the first part of our study, we considered the case that both courses A and B are offered by CUBER partners, i.e. that metadata for both courses are available to serve as input to the acknowledgement algorithm. We started with a survey of the practice of course acknowledgement in the institutions, and partly, in the countries, that participate in the CUBER project. To do this, a questionnaire was distributed to all CUBER partners. The questionnaire contained questions about ECTS and on the current procedures for course exchange and acknowledgement. We evaluated the questionnaires received [4].

From the findings of this survey, we extracted the rules and parameters representing the process of course acknowledgement, i.e. the decision process whether one course can be exchanged against another. We identified the information about courses needed to evaluate those rules and parameters, and verified that this information is present in the course metadata.

We found that the decision process involves

- the courses' extent, e.g. the number of ECTS credits assigned to them;
- the courses' placement in the curriculum, i.e. whether they are undergraduate or graduate;
- the courses' examination methods, i.e. whether only presence of students was checked, whether assignments were evaluated, or whether there was an examination at the end of the course;
- the courses' contents, i.e. whether the topics covered by the courses match sufficiently.

Note that these findings are consistent with the findings of a study to evolve ECTS into the European Credit System ECS [5]. While the first three parameters can be compared more or less schematically, the comparison of the contents proved difficult. To overcome this difficulty, we apply a combination of standard categories and a self-adapting keyword database to represent contents.

Future Work

In the second part of our study, we are about to evaluate the acknowledgement algorithm found in the first part. This is accomplished by a field study that constructs a set of requests for course exchange and validates the rules found so far by a comparison of the decisions taken by the administration of two providers and the system, respectively.

Furthermore, we want to treat the case that course B is from a previous study of the prospective student, i.e. that no metadata are present for that course. In this case, the student must enter the relevant data about course B into the CUBER system. We will investigate how the necessary data can be input by the prospective student with minimal effort to increase acceptance and minimize user frustration, but also providing enough information from the CUBER system's point of view. As course content descriptions will surely be among the data to be entered, we will in particular investigate how this can be done such that the user is supported by the system and thus helped to use

the standardized descriptions the CUBER system needs. It is however clear to us that there will be no perfect solution to this challenge, as this could easily mean a project of its own.

Last, we plan to investigate the issues regarding the reliability of data supplied by an arbitrary user, i.e. the constraints and plausibility checks to be applied to ensure that this data has some credibility at least.

Conclusions

Within the services provided by the CUBER system, flexibility for the user, i.e. the prospective student, is a strategic goal to achieve acceptance. The facilities for course exchange, i.e. by automatic recommendation of possible alternatives to a particular course in a study programme, try to support this goal. The achievements towards automatic exchange or acknowledgement of courses are promising, as the ongoing evaluation indicates today.

References

1. CUBER Project Partners (1999) *CUBER – Personalised Curriculum Builder in the Federated Virtual University of the Europe of Regions*. <http://www.cuber.net>
Kember K and Kelly M (1991) *Lessons to be Learned? Parallels between Australia and Hong Kong in the development of Distance Education*, Distance Education, vol 12, no 1, pps 7-26
2. European Commission (2002) *ECTS – European Credit Transfer System*. <http://europa.eu.int/comm/education/socrates/ects.html>
3. Csanyi G and Keller J. (2001) *Report of the CUBER Workshop: European Credit Transfer System as Basis for Generalized Course Recognition*. CUBER Deliverable 8.6. <http://www.cuber.net/web/html/publications.html>
4. Galindo Ramos E, Kautonen H and Keller J. (2001) *Intermediate Report on Exchangeability of Courses Including Revision of Meta-Data*. CUBER Deliverable 9.1. <http://www.cuber.net/web/html/publications.html>
5. Adam S and Gemlich V (2000) *Report for the European Commission. ECTS extension feasibility project*. <http://europa.eu.int/comm/education/socrates/ectsext.html>

Authors

Latifa Boursas, MSc.
FernUniversität Hagen, Computer Science Department
Postfach 940, 58084 Hagen, Germany
Latifa.Boursas@FernUni-Hagen.de

Prof. Dr. Jörg Keller
FernUniversität Hagen, Computer Science Department
Postfach 940, 58084 Hagen, Germany
Joerg.Keller@FernUni-Hagen.de