Motivation for and concept of BolognaLife portal

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Abstract

The planning and implementation of study time outside the home university is currently connected with the overcoming of many hurdles. In the context of BolognaLife these shall be significantly reduced. The main goals of the Bologna reform were on the one hand the easement and enhancement of the mobility of students and lecturers and on the other hand the improvement of recognition of study achievements and final degrees. Both aspects are not implemented yet. The authors has designed a community-based web-platform for solving these problems. The paper describes motivation and concept for design and implementation of BolognaLife portal. Furthermore the challenges because of the heterogeneous national conditions in the higher education area of Europe are pointed out. The portal is a global platform for bringing universities from all over the world together to handle the challenges of Academic Globalization.

1. MOTIVATION

1.1. The Bologna Process

The Bologna Process was launched in 1999. It has contributed to the successful modernization of the German institutions of higher education. Germany and its European neighbours have set themselves the task of creating a European Higher Education Area by 2010 in the order to succeed in the international competition for the best brains. In Germany, we have taken advantage of the biggest higher education reform for decades to improve the quality of study courses, to enhance employability and to reduce the length of studies.

The Bologna Process is a voluntary process which is driven first and foremost by the dialogue between the Member States and the organizations involved, the so-called stakeholders. One significant element of cooperation is the exchange of good practice. The 46 Bologna Member States, universities, students and other stakeholders will continue to work towards their aim of creating a diverse, attractive and transparent European higher education landscape even after 2010.

The political objective is for 50% of all students to complete part of their studies abroad and for 20% of German students to spend at least one semester abroad. The quality and transparency of the range of studies available and the compatibility of degrees is important in this respect.

Funding also contributes to student mobility. The amendment to the Federal Training Assistance Act (BAfG) means that since 1 January 2008 funding is now available for the entire course of study, including the final phases, in all EU Member States as well as in Switzerland. Outside the EU, study periods abroad can be funded for up to one semester - and under certain circumstances for up to five semesters - within the framework of education and training which is otherwise undergone in Germany. In addition, intermediary organizations such as the German Academic Exchange Service (DAAD) and the Erasmus Programme provide scholarships for studies abroad in the context of university collaborations and programmes which lead to joint degrees in both Germany and a partner country. Theses courses are becoming increasingly attractive.

1.2. The Problem of Recognition

Some of the main goals of the Bologna reform were on the one hand the easement and enhancement of the mobility of students and lecturers and on the other hand the improvement of recognition of study achievements and final degrees. But these goals could not be achieved up to now. For the improvement of recognition of study achievements that a student acquired within a stay abroad during his study several instruments were introduced during the implementa-

tion of the Bologna process. These instruments which should facilitate the recognizing actors of respective universities to rate the yielded appraisals were as follows:

- the universities got invited to describe the educational objectives and the skills to be acquired of the modules for the purpose of comprehensability
- the instruments of the mobility programs (learning agreement and transcript of records)
- through the introduction of the European Credit Transfer System (ECTS) the work load which the student has needed for yielding the relevant appraisal should be intimated
- the ECTS grade intimates indepently from the national grading system how the student can be classified within his cohort

On international level the convention for recognition of qualifications in higher education area was generated and adopted 1997 by the Council of Europe and the UNESCO. The convention stated recommendations for recognition processes of higher education efforts. By ratification of the convention the countries commit to implement these recommendations.

There are a lot of reasons why the goals relating easier recognition could not be accomplished. The essential problem is that students still does not know which modules of foreign universities in their own university exist to be recognized. Besides complex programs like ERASMUS[1] it is only incumbent upon the students to inquire personally the responsible persons of the own university. Both for the students and also for the responsible persons of the universities that means time-consuming investigations and wasteful administrative acts. The opportunity to pass study module abroad during the non-lecture period successfully is nearly unthinkable. Transitive relations between modules, such as university A recognizes a module of the university B and also university B recognizes a module of university C are not handable in the current situation. In that case it would be university A could recognize the module of university C. But these transitions are not achievable without an appropriate system.

Due to that circumstances exchange programmes are limited to merely a few long-standing approved agreements between particular universities. In these cases the capacities for places to study for students from other countries are extremely limited. This allows student sure always to yield appraisals abroad, but neither place nor time are freely selectable. The making of agreements between universities is an extremely long process. Potentially the contents of teaching change more rapidly than such kind of agreements could be made.

For that reason it is in the most cases that there are individual decisions from the responsible teachers which modules they recognize. The teachers and the students need support for that problems. The students need a solution for finding suitable modules all over the world which they can pass for they study. The teachers need one for managing the process of recognition of modules all over the world.

1. see http://eu.daad.de/eu/index.html

2. THE PORTAL BOLOGNALIFE

2.1. Idea

The planning and implementation of study time outside the home university is currently connected with the overcoming of many hurdles. In the context of BolognaLife these shall be significantly reduced.

The portal is a global platform for bringing universities from all over the world together to handle the challenges of Academic Globalization.

A major problem is that even in case of study programs that are in close agreement with regard to the totality of skills, content and goals, the different modules that have been developed at each site are only in few cases compatible with each other in terms of objectives, content and formats. Experience shows that students who study abroad for a semester, often lose an entire academic year, because for many modules completed abroad there are no equivalent counterparts at the home university.

A consistent implementation of proven modules or complete programs of study appears against the background of very different input conditions, desired diversity and heterogeneous staff as neither feasible nor desirable. A more convincing concept is to indicate those modules, which have proved successful in more than one site and developed as an integral part of a study program for multiple sites as so-called Bologna Modules. The central idea of this concept is to establish a world-wide, loosely coupled, dynamic network of module responsibles from all disciplines. They cooperate in the design and testing of individual modules and contribute the relevant information on the Internet portal BolognaLife where it is made public.

For favorite modules, Bologna courses could be offered in addition to the regular, semester-long form in the form of a compact summer course (Bologna Course). BolognaLife serves the announcement and posting of Bologna courses. It is a global supplier of relevant information to all students who wish to complete one or more courses abroad. BolognaLife

offers adequate search capabilities that allow them to easily obtain an overview about which equivalent modules will be offered at which participating universities at what time. This is creating flexible options for students to make multiple experiences at other universities without losing study time. The system supports planning of semesters abroad and supports the related recognition of results.

For schools, module responsibles and program managers the Internet portal BolognaLife acts as a focal point and stimulus for international cooperation. BolognaLife brings transparency in the study program of all participating universities. It pushes to decentralized development, greater exchange and better networking in the International Higher Education Area. These allow the design of joint degree programs in much simpler and more flexible ways. The complexity of matching skills, goals and content, as well as discussion of appropriate teaching formats are reduced, because only individual modules or module sequences have to be discussed between the respective partners (which are the neighboring nodes in the network). With the establishment of the Bologna network an ongoing curriculum development process is set in motion that accompanies the regular expansion and updating of the Bologna modules. In the context of BolognaLife a simple decentralized structure with many active nodes is established, through which all matters of recognition can be resolved locally by simple means.

2.2. Concept

The planning and implementation of study time outside the home university currently comes with many problems that can be reduced by BolognaLife portal.

A major problem ist that in Europe despite a broad concsensus of the qualification goals and content of implemented study programs, very different modules were designed. These are compatible only in a few cases in terms of objectives, content and structure with each other. For foreign graduated modules there does not exist often suitable modules at the home university.

Implement proven modules or complete study programs consistently in Europe appear in the context of very different initial conditions, desired diversity and heterogeneous staffing structures are neither practical nor desirable. A convincing concept is to provide modules that are proven in more than one university and become a integral part of a study program for multiple locations as so-called Bologna Modules. The central idea to implement this concept is the creation of a pan-European loosely coupled, dynamic network of responsible persons from European universities from all disciplines. They work both with in the design and testing of individual Bologna Modules and make relevant information accessible through the BolognaLife portal.

Belonging to a Bologna-Module course will be in addition to the normal, semester-long form also regularly offered in the form of a compact summer course (Bologna-Course). Bologna Life is the announcement and posting of Bologna courses. It offers world-wide to all students appropriate search functions that allow them to easily gain an overview of the completion of each module too, which are offered at universities involved and all informations about the module itself. This creates flexible options for students, during the studies they make the same multiple experiences at other universities and their study lastens even shortener. At the same time, the system supports the planning of study abroad and the consequent recognition of studies and examinations.

For schools, module makers and program managers using the Internet portal Bologna Life it acts as a focal point and inspiration to the international cooperation. By bringing transparency Bologna Life transports steps forward to studies at individual universities. So it comes to decentralized development processes aimed at enhancing the exchange and a better networking in the European Higher Education Area. These kind of benefits arise in the design of joint degree programs much simpler and more flexible. It provides ways of vote of skill objectives and content, and in the discussion on appropriate teaching systems, because only individual modules or module sequences with the relevant partners (i.e. the neighboring nodes in the Bologna network) are aligned. With the establishment of the Bologna network, a continuous curriculum development process is being started, which is associated with the expansion and regular update of the Bologna-modules. Also developed within the framework of Bologna Life a simple decentralized structure with many active nodes, through which all matters of recognition by simple means can be resolved locally.

2.3. Objectives and principles

Bologna Life provides clear information about courses at universities in the European Higher Education Area and their mutual recognition. It is based on established modules and their responsible persons to jointly build a dynamic network where they exchange views on skills and content objectives and results, documenting in particular the mutual recognition of the modules. Also it supports the planning of individual

study abroad, facilitating the design of exchange and serves the notice and posting of Bologna courses (courses with places for visiting students). BolognaLife has no commercial interests and thrives on personal responsibility and personal trust. BolognaLife is implemented so that any registered person and only they themselves can decide who has access to what their person associated data is known for. It will finance the development, operation and maintenance from grants, donations and advertising. The latter may only be placed in a clearly delimited region. BolognaLife has no established bureaucratic structures. The system complements the various administrative routines of the respective locations.

3. IMPLEMENTATION

The authors designed and implemented a portal for the globalized academic world. The BolognaLife project is a community based Web2.0-application with all the benefits from Ajax technologies. Students and Lecturers can easily navigate through the whole system like in a desktop application. There is a world map for students available where they can see all the universities which offer modules for his personal study plan. Through the community character the student gets a lot of informations on how to study abroad in that special country given by other students wo made experiences in studying in that specific town and university and offering hints on how to live and work there. The teachers can easily handle the modules which they are responsible for. They simply set a unidirectional graph to other modules which are similar to their own modules and that students can book from all over the world. There is the possiblity to manage contingents of seats for students from abroad.

The portal BolognaLife is developed as a web application in Java using EJB3 for implementing a modern and stable web application connecting all the universities by web services. Used are the frameworks JBoss Hibernate[2] as relational persistence, JBoss Seam[3] combines the two frameworks Enterprise JavaBeans and JavaServer Faces and incorporates much needed identity management, PDF document creation, e-mailing and graph creation features, essential for a global platform. JBoss RichFaces[4] as a component library for JSF and an advanced framework for easily integrating AJAX capabilities into business applications without the need to write any JavaScript code, JBoss Drools[5] as business logic integration platform which provides an unified and integrated platform for rules, workflow and event processing, JBoss jBPM[6] as a flexible business process management suite and Apache Lucene[7], a high-performance, full-featured text search engine library written entirely in Java.

The portal is be developed as part of courses in computer science by students at Freie Universität of Berlin since 2009. The development is coordinated by the scientific staff Tino Naphtali and Ingo Dageförde. With the release of version 1.0 the source code is provided under a free license.

4. CHALLENGES

4.1. Study regulations

A major problem of implementing such an international project is the different realization of study regulations. Students must be able to find and to identify important modules, even by different structures of study regulations. The modules must be clearly assigned to a certain part of course. The challenge is to illustrate generically the courses of studies, so that a mapping is possible. Special considerations were made how the courses of studies were realized within the development of BolongnaLife.

4.2. Recognition of equivalent modules

An essential problem by an international portal usage is the huge amount of potential modules, which must first been proven of equivalence by responsible persons. That is just possible, if the portal provides them suggestions, which module from other universities is potentially equivalent. Therefore it is necessary to compare modules of different universities. Criteria for a matching can be:

- Analyzing the list of literature from the teachers. By comparing the ISBN number, similar modules can be identified. Also a system, often used by online shops like Amazon, which identifies modules with similar literature is helpful. Because of the fact that mainly books in English language are used in courses, a matching literature list is a sign for equivalent contents of modules. First tests have shown that this is just a possibility for modules with a long literature list. Especially modules with interdisciplinary books are hard to evaluate this way.

2. http://www.hibernate.org
3. http://www.seamframework.org
4. http://www.jboss.org/richfaces
5. http://www.jboss.org/drools
6. http://www.jboss.org/jbpm
7. http://lucene.apache.org

- second approach can be an analysis of affiliation from modules to courses and emphasizes of studies, of the amount of credits, of the prerequisites for attending, and of the recommended time during the studies. Difficult in that approach is the fact that necessary allocation of modules to one study or to an emphasize of study is often missing. Especially basic lectures are attached to several studies. As a result, modules will be recommended, which are located in other universities in other disciplines and therefore the universities will not count the credits.
- Relationships between tutors can be a sign for equivalent modules. If tutors from different universities have a direct connection, e.g. they quote from each other or they have released shared publications, there is a high chance of both doing research and lessons in the same faculty. Looking at those relationships just helps for comparing modules for bachelor and master courses. That feature on his own is not good enough to provide a sufficient suggestion. It is useful to connect that approach with other possibilities, which are explained here. The fact, that some tutors may not doing research or publishing is an obstacle to this approach.
- The most promising and complex procedure to find equivalent modules is an analysis of the attributes in connection with the semantic characterization of the respective module. Mature stochastic theory models (e.g. Support Vector Machine or Hidden Markov Model) cant be used, because it is not possible to generate necessary training amounts. Even so,first tests seems a possibility to do a semantic comparison. For that responsible persons tagged via webinterface keywords within the module description. The program Apache Lucene is able to compare modules by these keywords and suggests modules with similar topics[1][2]. Up to now it is necessary to tag the keywords manually, but this shall be made automatic soon. The IDEX system from DFKI have the ability to find relevant keywords in texts [3], independent from the domain.

4.3. Mapping of modules

A recognized equivalence of modules regarding similar lesson contents does not mean an automatic acceptation by those responsible. That might especially be the case of modules, which imparts content about theoretical concepts. Concepts are usually taught in association with examples of usage. So it might be that the University A is using the example of language C and the University B is using a self constructed language for teaching the module compiler construction. Although both modules teaching the basics, the educational objective and requirements might be different. That might interfere the further study at the home university, for that reason the equivalent module might be not excepted. Also the study context could be different. University A might teach the module compiler construction as a basic lecture at the study A1 and University B might teach it during the main study phase. The system will show alternative modules, which cannot be counted as an alternative module for A1 or B1. Basically such modules could have been found in a lot of different study courses. For that reason these kind of modules can be used for calculating for equivalence.

4.4. Voluntary use of portal

The use of the portal Bologna Life is voluntary. Students are free to use the portal to search for modules at foreign universities that may be recognized. At the other hand and that is problematic, also lectures and responsible at university departments are free to use the portal to offer their own modules as well as to recognize foreign modules. Thus, incentives must be created that this group of users has a significant added value and thus is willing to make use of the portal.

Incentives are provided so far:

- Automated generation of course page for web
- Automated notification of the professor, if other professor of linked modules have a new publication
- Statistical reports about participants in linked modules
- Features like in social networks

5. PROSPECT

The paper described the motivation and concept for design and implementation of BolognaLife portal.

The planning and implementation of study time outside the home university is currently connected with the overcoming of many hurdles. In the context of BolognaLife these shall be significantly reduced. The main goals of the Bologna reform were on the one hand the easement and enhancement of the mobility of students and lecturers and on the other hand the improvement of recognition of study achievements and final degrees. Both aspects are not implemented yet. The authors have designed a community-based web-platform for solving these problems.

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