InPro training environment – training platform for BIM based collaborative working

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Construction industry and related research constantly tries to overcome traditional and deeply rooted methods of work and to replace them with novel principles introduced by information society. The efforts are evident in research strategies (Hannus, 2003; Samad, 2007) and many specific research projects that can be followed through construction IT related conferences like CIB W78 or ECPPM and can be tracked back more than 10 years ago. In all these efforts, we can recognise at least one common topic. That is model based approach to construction. This approach should introduce novel processes based on up to date information and knowledge.

InPro training environment is a deliverable of InPro (InPro, 2006) project performed under EU 6th framework programme for research and development. The project develops strategies and business models for a new building design process which enforce open cooperation between project partners and consider the building’s whole lifecycle. New business concepts and processes are defined that provide incentives for model-based working and open collaboration between all stakeholders during early design. From technology point of view, fully semantic ICT platform and tools are developed enabling exchange, sharing and reuse of information throughout the building lifecycle.

To achieve ambitious goal of construction industry transformation, targeted work packages are dedicated to development of training programmes for higher education as well as for professionals at all levels plus extensive dissemination activities. Educational content which is delivered via InPro training environment is direct result of the project research work.

InPro training platform builds on foundations of ICT Euromaster programme (ITC Euromaster, 2009). The programme complement existing university courses because during undergraduate studies, subjects are typically available that introduce computer science, elementary programming, office and CAD software. A European Masters curriculum in ITC tries to advance construction IT education, introduce more holistic perspective of IT in construction industry and integrate the fragmented profession. InPro training platform broadens the scope of Euromaster in a sense of target audiences. Beside universities, courses for building industry are developed. On the other hand, InPro learning content is more focused since it is related only to Early Design processes of construction projects.

To implement learning courses on such a broad scale it is inevitable to base learning platform on technically effective e-learning system. The platform should support wide array of teaching, lecturing and collaboration activities and tasks. Our experiences from Euromaster show that technical infrastructure is a vital part of the system.

The learning platform should be able to support preparation, storage and distribution of learning materials, implementation of self-study courses, online lectures, blended learning, student evaluation
and assessment. Beside traditional teaching activities, collaboration among participants, both student-lecturer and peer to peer are vital, therefore functionality like discussion groups, forums, blogs and wikis are necessary. Since InPro training environment content covers both teaching about new methods of working and learning about software tools that enable new way of working it is necessary to combine hands on learning following constructivist approach, with tutorial and group learning.

Based on our own experiences and market research we decided to implement system architecture with open source portal based software tool Moodle - Modular Object-Oriented Dynamic Learning Environment (Moodle, 2009) as the LCMS tool, Adobe Connect Pro (Adobe, 2009) is included as video/web conferencing environment and BIM laboratory is based on Share-A-space BIM collaboration hub developed by Eurostep (Eurostep, 2009).

Learning content is developed as a set of learning modules which should cover knowledge necessary to understand and to be able to work in “the InPro way”. The modules are structured in such a way that enables integration of InPro modules into existing and future university curricula. At the same time and to avoid duplicate work, the modules should also fulfil the needs of business courses targeted to industry professionals.

To meet specific needs and different levels of proficiency (existing and needed) the learning modules should be structured in several levels of detail and our proposal is that each module contains three levels of detail (overview, in depth theory and project work), which could be studied in sequence or independently. In such a way it is possible to use the same learning modules in variety of contexts. For example a university can integrate some InPro modules into existing curricula. At the same time, some construction company can use the same modules for their internal training.

Content of the learning modules focuses on early design processes of construction project from both methodological and technological points of view. Learning modules cover topics such as:

- Life-cycle design process and business models
- Model based energy analysis and design
- Decision making frameworks
- IFC topics for end users and IFC object versioning
- Model based scheduling
- InPro Open Information Platform and Share-A-space collaboration hub
- Client requirement processing
- Collaboration and approval workflows
- Cost management

References