

TRAILER project overview

Tagging, Recognition and Acknowledgment of Informal Learning Experiences

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Abstract—The evolution of new technology and its increasing use, have for some years been making the existence of informal learning more and more transparent, especially among young and older adults in both Higher Education and workplace contexts. However, the nature of formal and non-formal, course-based, approaches to learning has made it hard to accommodate these informal processes satisfactorily, and although technology bring us near to the solution, it has not yet achieved. TRAILER project aims to address this problem by developing a tool for the management of competences and skills acquired through informal learning experiences, both from the perspective of the user and the institution or company. This paper describes the research and development main lines of this project.

Keywords-component; informal learning, tagging, recognition, acknowledgment, competences, skills, education, ICT, multilateral project.

I. INTRODUCTION

Tagging, Recognition and Acknowledgment of Informal Learning Experiences (TRAILER), Table I, is an ICT multilateral project funded by the European Commission, started on January 2012. During two years, a group of researchers from seven European institutions will work together to develop an innovative ICT-based service, which

will allow the learner to identify episodes and evidences of informal learning and the institution to recognize them in dialogue with the learner.

Technological and organizational innovation, and the affordances of the Internet, are facilitating increased access to knowledge and training for individuals that range from formal courses to informal *ad hoc* learning. However, the greater part of the informal learning that takes place, both within and outside institutional and organizational contexts, remains unacknowledged. Though informal learning has always taken place, the advent of ICT and, particularly, social media approaches, have facilitated these processes and, at the same time, have made them more visible.

Informal learning [1], which takes place in the context of everyday experience especially among young and older adults in both Higher Education (HE) and in workplace contexts, emerges from the activity rather than being planned. It is increasingly seen as an aspect of learning that deserves special attention. For example, the CEDEFOP European Guidelines for validating informal and non-formal learning contains experiences of more than 20 countries in the validation of informal and non-formal learning [2]; the ECOTEC Inventory of validation of non-formal and informal learning provides

with a catalogue of good practices in the area of validation for policy-makers [3]; the OECD Recognition of informal learning [4], the ILO International Standard Classification of Occupations, ISCO-88 [5] and ISCO-08 [6] are clear examples with regard to the importance of qualifications as closely related to skills and competences. There are also several initiatives relating to competence recognition in the EU, such as National Qualification Systems and EQF (European Qualifications Framework) [7]. Moreover, several technological initiatives for informal learning recognition such as the TENCompetence project [8] have been developed in order to provide with a set of tools for the acknowledgement of lifelong learning skills acquired by single users.

TABLE I. PROJECT SUMMARY

Financial institution	European Union. Lifelong Learning Programme. Sub-Programme ICT (KA 3) Multilateral Projects
Beneficiary	University of Salamanca (Spain)
Main researcher	Francisco José García Peñalvo
Partners	Universitat Politècnica de Catalunya (Spain) Open Universiteit Nederland (Netherlands) University of Bolton (United Kingdom) Dom Szkolen i Doradztwa Mykowska Aleksandra (Poland) Instituto Politécnico do Porto (Portugal) University of Belgrade (Serbia)
Reference	519141-LLP-1-2011-1-ES-KA3-KA3MP
Start date	01/01/2012
End date	31/12/2013
Total amount	544.349€
Website	http://trailerproject.eu

All of these initiatives are mainly focused on the validation of informal learning and, particularly, on the development of issues relating to certification and qualification with a view to the recognition of competences. Less attention is paid to aspects relating to the support for, and facilitation of informal learning so that learners can integrate it in their portfolio. Though the recognition, conceived as certification of informal learning, is important, TRAILER project aims to go beyond the recognition of informal learning in order to move towards its integration with other learning contexts.

Even if technology should let the project to reach a technical solution, the key issue will rely on the consciousness of effectively acquiring skills and competences by the user. To become effective, the learning process must fall under the control of the learner. The learner must be able to identify his/her own informal learning experiences and to tag them in relation to a predefined but evolving catalogue of competences in his/her portfolio. Based on this premise, the ICT technology supports this learning paradigm by providing with the proper architecture, as so as a tool to link informal learning experiences to the institutional interface in such a way that relevant experiences will be accessible to both the institution and the learner.

This work will present a complete overview of the TRAILER project describing its main objectives and outcomes (topic 1), the methodological approach (topic 2) and its first steps (topic 3). Finally, some conclusions will be drawn describing how the project will progress along the project life.

II. OBJECTIVES, OUTCOMES AND PARTNERSHIP

The main objective of the project is to incorporate the consciousness of informal learning as part of an individual's development; this starts with the identification by the learner of informal learning activities and the subsequent process in which these are made visible to the institution. This task will be done by developing methodologies and tools that will facilitate this process, making it transparent both to learners and institutions and allowing all the stakeholders involved to take the most of these processes.

This objective implies a series of related sub-objectives:

- To create communication channels between informal learning activity and institutional environments, which the learner will use to make the informal learning visible to the organization (employer or university) in order to enter into dialogue about the competences developed through these informal processes.
- To define procedures and tools with which the user tags instances of informal learning, and in doing so associates them with a predefined (but flexible) framework of competences.
- To create a space in which these tagged instances can be stored and then organised by the learner, in order to select instances or combinations of instances that the learner classifies as evidences of competence development and then chooses to make visible to the organisation.
- To provide the user with information about other users with similar interest, promoting social learning and collaboration between the users of the system.
- To facilitate, with a range of decision making and visualisation tools and an appropriate interface, the analysis by institution staff, such as tutors or HR managers, of the information the learner has made visible, in order to be able to make suggestions and provide feedback and support to the learner, define possible formal and non formal actions in the light of the informal activity and enter into dialogue with the learner in relation to this activity with a view to possible promotions or recognitions of competences acquired.
- To plan and to implement dissemination actions involving all relevant stakeholders in areas such as vocational training, universities, adult learning contexts and workplace training.
- To plan and to implement exploitation actions that promote uptake of the system developed in areas such as vocational training, universities, adult learning contexts and workplace training.

In order to achieve the aims described above, the principal outcomes expected during the project will be:

- The definition and application of methodologies and recommendations for the integration of informal learning in educational institutions and the workplace.
- The establishment of the technological framework for managing competences.
- A set of pilot actions of skill and competences acquisition, tagging and recognition by both users and institutions.

The consortium is composed by the following institutions:

- University of Salamanca - USAL (Spain).
- Universitat Politècnica de Catalunya - UPC (Spain).
- Open Universiteit Nederland - OUNL (Netherlands).
- University of Bolton - UB (United Kingdom).
- Dom Szkolen i Doradztwa Mykowska Aleksandra - DSD (Poland).
- Instituto Politécnico do Porto - IPP (Portugal).
- University of Belgrade - GB (Serbia).

All the members of the consortium have proven expertise in different areas covered by the project - methodological partners (UPC, USAL, OUNL), technical partners (UB, UPC, OUNL, IPP, GB), partners with institutional contacts and experience (DSD, UPC, IPP), and partners with European management experience (USAL, UPC, OUNL) - and the capacity and skills necessary to achieve the project objectives. In addition to this, such partners have participated together in several other projects; for instance, USAL and OUNL have worked together in an Regional Excellence Project and OUNL and UB have worked together in the TENCompetence project [8], these relationships add value to the consortium.

The University of Salamanca is the leader of the project. This institution possess experience in leading and participating in European, national and regional projects, as so as research experience in different areas in the fields of eLearning, LMS adaptation, mLearning, content definition, digital portfolios, interoperability, interaction, Personal Learning Environments and visual analytics.

The Universitat Politècnica de Catalunya has a lot of experience, among other areas, in mLearning, Personalization, Interoperability specifications and Standards, Learning Services and in Methodologies application.

The Open Universiteit Nederland has a range of experience, among other areas, in: lifelong learning, personalization, portfolio, learning in the work-place, informal learning, recognition of previous competences, learning networks, serious games, mobile learning, standards and specifications and so on. Also they have participated in projects related to competence recognition such as TENCompetence.

The University of Bolton has experience in the following areas: Personal Learning Environments, Learning specification and standards, mLearning and so on.

The Dom Szkolen i Doradztwa Mykowska Aleksandra is a Polish training centre that participates in tasks related to the institutional environment and companies competence, because of its extensive experience working with educational institutions.

The Instituto Politécnico do Porto has wide experience in higher education adaptation, informal tools, learner interaction and remote laboratories. They are responsible for the pilots and also for the recognition of the remote laboratories activities in the system.

Finally, the main contribution of the University of Belgrade is the integration of game based learning with the system.

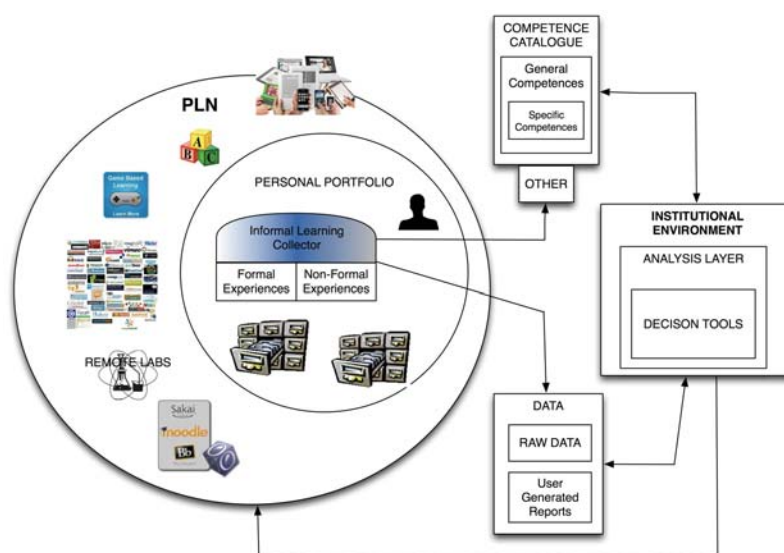


Figure 1. Methodological approach

III. METHODOLOGICAL APPROACH

The TRAILER methodology defines a framework composed by three main elements, as seen in Fig. 1. The core of this environment relies on the user's portfolio, which constitutes the nucleus and the space for user interaction with the whole system. Such portfolio will let the user to tag, manage and storage learning experiences, skills and competences acquired both in formal and non-formal learning context, in a well structured but flexible environment provide by the Competence Catalogue, which will constitute the second element of this ecosystem. The Catalogue will be organized in order to provide users with a sum of pre-defined competences (general competences and institutional competences to be fulfilled by user's institution), but this catalogue can be extended with new skills and competences provided by users, and such new abilities could be added to the institutional and/or the general catalogue by institutional and system administrators. Finally, the Informal Learning Collector, as the third element, will consist on a tool to rapidly tag events, information and contents throughout the Internet, in order to let the user manage a great amount of information which could become part of his/her personal catalogue of competences as inputs or outputs related to such competencies.

IV. FIRST STEPS

The Commission of European Communities, in the communication "Making a European Area of Lifelong Learning a Reality" defines informal learning as "learning resulting from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional but in most cases it is non-intentional (or "incidental"/random)" [9].

According to this definition, TRAILER project begins with a study, addressed to retrieve information with regard to the informal learning activities carried out by learners belonging to the target groups involved in the project. The objective is to identify which kind of informal learning processes effectively occur, which tools are being used, how they are being used, and what is being learned informally among employees and companies, students, teachers and Higher Education Institutions. The tools for acquiring this information are surveys and semi-structured interviews with learners and people in charge of institutions.

Nowadays, four public surveys are available, one for each target group (employees, companies, students and Higher Education Institutions), in three languages (English, Portuguese and Spanish). The surveys have been developed using forms distributed by Google Drive, a web tool that provides real-time collaboration, allowing staff members to check simultaneously the results of the surveys from any computer with Internet access. On the one hand, these surveys have been sent to individuals (students or employees), companies and institutions from countries involved in the project. On the other hand, the surveys have been published in blogs and social networks such as LinkedIn, Facebook, Twitter and Google+ in order to reach people from other European and non European countries.

After the data collection has been finished, a report has been created containing de data collection approach, the objectives, the results and conclusions that provide a clear picture of the informal learning situation in partners' countries.

At the same time, the consortium is working on the definition and implementation of the framework defined above in the topic 3. An architecture approach has been proposed, describing how to develop the different components included in the framework and the information's exchange among them.

Each component of the system will be developed independently. For this reason, the first element of the architecture is the definition of the communication layer that represents the connection between all components of the system, allowing knowing how the information travels from one component to other. This scheme is completed with the definition of several interfaces that abstract the implementation of the different components, in such a way as to let changing any of them without affecting the others. To do so, the project will take profit of web services implemented with JSON-RPC, a light-weight remote procedure call protocol (RPC) which uses JSON to encode data and transports them over sockets, over http, or in many various message passing environments [10].

The main components of the architecture will be the portfolio, the Competence Catalogue and the Informal Learning Collector (ILC), which are the technological solution associated to each element described in the methodological approach, as seen in Fig. 2.

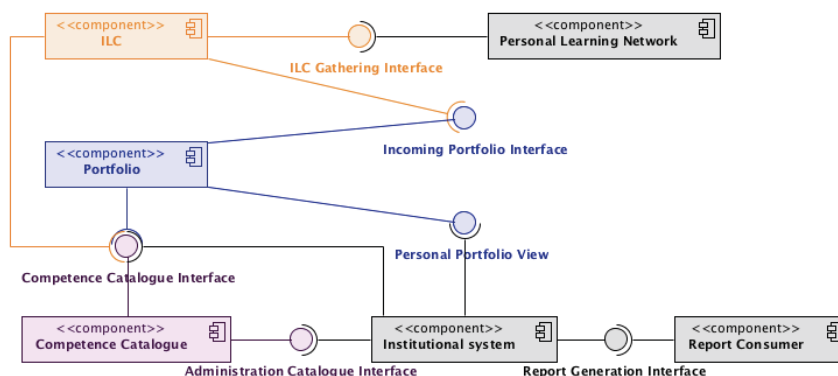


Figure 2. Architecture diagram

The portfolio will provide the user a set of tools for tagging, manage and store learning experiences, skills and competences acquired both in formal and non-formal learning contexts. User will have three ways to add competences to his/her portfolio. First, user can use informal learning activities gathered through the ILC to define new competences. Second, user can add new competences without associating them to an informal activity. Finally, user can add new competences and associate them to his/her formal contexts or his/her employment contexts.

It will be based on an existing Open Source development such as Liferay based technology, Mahara, IMS Portfolio, E-Scape or Elgg, with the purpose of focusing the development effort in the implementation of tagging, management and storage learning experiences, skills and competences acquired both in formal and non-formal learning context.

The portfolio will implement two JSON-RPC interfaces. The Personal Portfolio View will provide a way for publishing information from the users' portfolios, in order to let to institutional environments recover relevant information about formal, non-formal and informal learning experiences of their students or employees. The user will decide which information is available for the institution, so the interface will have to implement security measures to guarantee users' information security. All the interface methods take into account if the user is logged in and his/her capabilities in the system.

Second, Incoming Competence Portfolio Interface will be a gateway to the ILC in order to provide it a way to send informal activities to the user's portfolio. As in the previous interface security issues will be considered.

The Competence Catalogue will be hierarchically stated in order to provide a structured but flexible environment to manage the skills and competences through the users' portfolios. The catalogue should be developed in three abstraction levels. The first level will consist on a local catalogue that contains the competences added by the user and not (necessarily) validated by the institution. Whenever a competence from the local catalogue will be validated by a responsible of the institution, such competence will become part of the institutional catalogue, which represents the second abstraction level. Finally, the third level will be a general catalogue, which provides to all institutional catalogues a set of institutionally reviewed and accepted competences, it will be filled starting from the competences and skills provided by the ISCO-88. Also, throughout all the system life cycle, the base catalogue will be fed by competences located in the institutional catalogues, which become part of the base catalogue when a responsible of the system (with a super admin role) reviews and accepts them.

The catalogue contains three data types: competences, tags/keywords and working areas. In this context, a competence is associated with one or more working areas and is represented by zero or more tags. A tag or keyword is a word or short sentence used to describe competences, which allows users to easily tag their informal learning activities. Finally, a working area is a job activity that provides extra information about the competences, for example, "supervising other

workers" is different if user is a legislator or a machine-tool operator.

The Competence Catalogue will implement two JSON-RPC interfaces. The Competence Catalogue Interface will provide available competences, tags and working areas to the ILC and the portfolio. The interface will facilitate adding competences from the Catalogue to learner's portfolio and associating tags to informal learning activities added through the ILC. The Administration Catalogue Interface will provide a way to manage the Competence Catalogue from the Institutional Environment in order to add or edit tags, competences and working areas. Only users with admin capabilities will be able to use this interface in order to ensure the data integrity.

Finally, the Informal Learning Collector is a transparent link between the learner's informal learning and the portfolio component. The ILC will provide several ways to tag informal learning experiences to the user's portfolio in real-time. Specifically, three ways to send information to the ILC are available. 1) Using a bookmarklet in the desktop or mobile browser that will send current URL and additional information to the ILC. 2) Showing or introducing information in a specific widget container in a concrete moment. 3) Playing with games that will send to the ILC the information related to the story of the user activity in the game. Other components could be added to the system in order to provide new ways to send informal learning experiences to the ILC. The new components only will have to use the gathering interface to send information, regardless the programming language in which have been developed or the protocol used in the communication channel between them and the ILC. This is possible because the ILC implements a connector layer that facilitate to use any web services protocol (SOAP, REST, XML-RPC, etc.) in order to allow the integration of new implementations.

V. CONCLUSION

At the end of the first year of the TRAILER project, a functional prototype of the technological framework should be available in order to start testing and integration phase. Pilot experiences will take place during the second year of the project and they will provide relevant information to get a final version of the system, which will be a deployable software component packed in a CD and also installed in a server for its use. This prototype, as so as every outcome (software and reports) related to TRAILER project, will be freely distributed, since all the developments will be done based upon open source code solutions.

All TRAILER results are available through the official website of the project, <http://trailerproject.eu>. In addition to the website, there are different TRAILER profiles in major social networks (Facebook – <http://www.facebook.com/trailerproject>, Twitter - https://twitter.com/trailer_project and Google+ - <https://plus.google.com/117851857120649830001>), an open group in LinkedIn to talk about informal learning experiences, informal competences and how this information can be used by companies and institutions (<http://www.linkedin.com/groups/TRAILER-project-4446747>),

and a Flickr group to share images related to the events of the project (<http://www.flickr.com/groups/trailerproject>).

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REFERENCES

- [1] García-Peñalvo, F. J., Colomo-Palacios, R., and Lytas, M. D. "Informal learning in work environments: training with the Social Web in the workplace". Behaviour & Information Technology. In press. DOI:10.1080/0144929X.2012.661548.
- [2] CEDEFOP. "European guidelines for validating non-formal and informal learning", Office for Official Publications of the European Communities, Luxembourg, 2009. Available at http://www.cedefop.europa.eu/EN/Files/4054_en.pdf.
- [3] Otero, M. S., McCoshan, A., and Junge, K. "European Inventory on Validation of non-formal and informal learning". ECOTEC Research and Consulting Limited, Birmingham, 2005. Available at <http://www.uk.ecorys.com/europeaninventory/>.
- [4] Werquin, P. "Recognition of Non-Formal and Informal Learning: Country Practices", OECD – Organisation for Economic Co-operation and Development, 2010. Available at http://www.oecd.org/document/25/0,3746,en_2649_39263238_3713692_1_1_1_1_1,00.html.
- [5] International Labour Organization. "ISCO-88", 1987. Available at <http://www.ilo.org/public/english/bureau/stat/isco/isco88/index.htm>.
- [6] International Labour Organization. "ISCO-08", 2007. Available at <http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm>.
- [7] European Commission. "European Qualifications Framework (EQF)", 2008.
- [8] Open Universiteit Nederland, Altran, LogicaCMG, Universitat Pompeu Fabra, GIUNTI, Centre for Research and Technology, Universität Hannover, Institut Européen d'Administration Des Affaires, University of Bolton, Universiteit van Amsterdam, Sofia University, Stichting SURF, Synergetics, UNESCO-IHE and Association of Participants Agora. "TENCompetence", Available at <http://tencompetence-project.bolton.ac.uk/>.
- [9] Commission of European Communities. "Communication from the Commission - Making a European Area of Lifelong Learning a Reality", Brussels, 2011. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2001:0678:FIN:EN:PDF>.
- [10] JSON-RPC Working Group. "JSON-RPC 2.0 Specification", 2011. Available at <http://www.jsonrpc.org/specification>.