An Integrated Solution among Social, Personal and Formal Learning for Lifelong Competences

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Abstract. In the Knowledge Society the worker should benefit from learning experiences which intersect formal learning moments with both individual and collaborative informal learning, according to a vision of authentic lifelong edu-cation" The paper suggests an innovative *answer to the "lifelong competence" management* approach. In this context a Lifelong Learning Model (LLM) finds its realization through an integrated solution among the personal, social and formal learning. The vision is sustained by a conceptual architecture, which represents a distinctive and enabling factor for the management of competence allowing to customize training paths on the worker profile. The idea is related to the integration between a Personal Learning Environment (PLE), a learning community and the solution of the Polo di Eccellenza L&K, the learning plat-form IWT (Intelligent Web Teacher).

1 Introduction

The Life Long & Wide Learning perspective has created new challenges as regards understanding, exploring and supporting new learning dimensions, such as learning experiences self-directed, personalized and on demand for the Lifelong competence nurturing.

The fundamental features in this scenario are:

- *learning for Lifelong competences:* it's almost consolidated the idea that learning is an activity contextual to human life and professional work.
- *Informal learning:* it is more and more diffuse the awareness that the most part of learning and competence development, happen away from traditional formal contexts [1].
- *Web 2.0 and social software:* the Web evolution related to the modalities of the active participation of users has led to the introduction of e-Learning 2.0 concept [2].
- *Connectivism:* the connectivism theory [3] has emerged as a theoretical paradigm able to accept the peculiar learning modalities of the network.

The Technology Enhanced Learning (TEL) sector aims to provide the life long worker with a self-regulation that shows itself in the capability of:

- identify and manage personalized professionalization courses;
- handle efficient learning strategies for skill and knowledge acquisition;
- work by goals and evaluate the results of the personal development plan;
- realize activities/professional and personal development plans.

The scientific community has started to criticize the distance education based only on LMS systems (the so-called "Dominant Approach") and has started to consider the deployment of the new approach, known as "Social Learning" for Lifelong learning [8].Taking into account these aspects, we show in the next section the Polo di eccellenza Learning and Knowledge (L&K)'s idea: the creation of a system that integrates a PLE [7] such as the learning platform IWT (Intelligent Web Teacher) and a Community for lifelong competence management.

2 The Polo di Eccellenza L&K's Approach: a Lifelong Learning Model

In accordance with the challenges of the Knowledge Society, the domain of re-search, bound to Technology Enhanced Learning (TEL), has to focus its attention on modelling environments and systems as socio-cultural artefacts wholes able to enable adequate learning path in formal, informal e no formal space. [9].

A new model is described below. This model is the result of a research activity that takes into account some important factors occurring in the new learning scenario, as:

- the complexity and diversity of involved knowledge: it is important a complete comprehension of the different typologies of knowledge and of the principles that are useful applied for their value, valuation or certification.
- the dimension of self-direct and autonomous learning: any model of lifelong learning should take into account motivational, personal compounds that defer to an active and responsible involvement of the user.
- the dimension of personalization: the concept of personalization as an organizing principle for innovation in education, suggests that ultimately the individual learner can and should be the center of a ubiquitous learning solution. [4] The development of adaptive learning experiences is a radical shift towards learner-centric models and requires an equally radical shift in the instructional models, teaching methods and overall pedagogy to effectively support learner-centric learning
- the multi-dimension of a technological solution: this level takes into account the emergence of learning environments in which the learner is the centre of numerous requests and he is asked to learn to face the complexity of a system in which he plays always an active role.

We introduce an image that, at a conceptual level, well expresses "the ways" that a user can undertake inside a framework of integration of didactic modalities linked to formal learning, personal learning and social one.

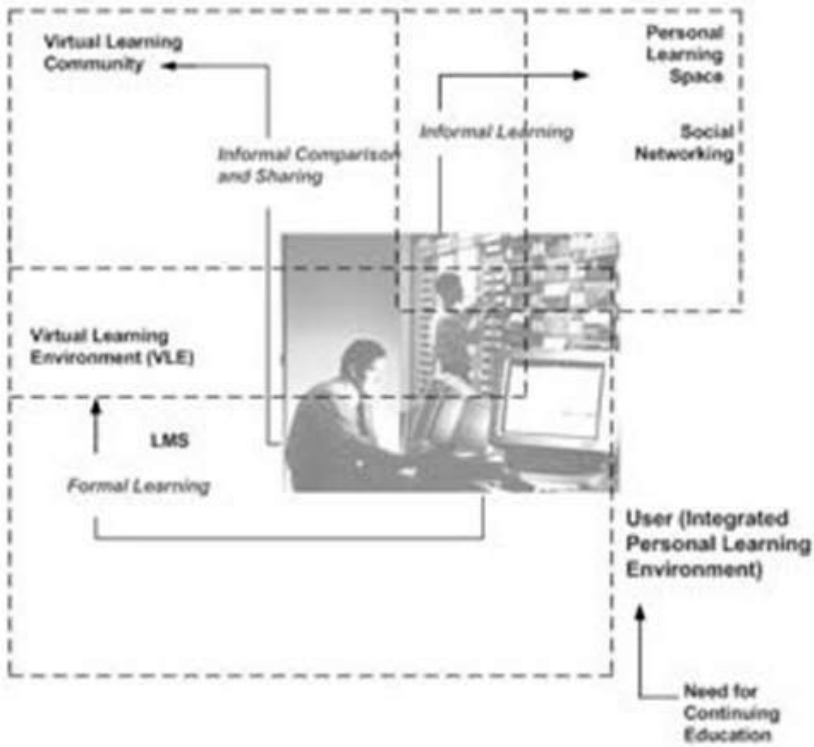

Fig. 1. Integration of learning modalities.

Most of this framework has been adopted by the Polo Learning& Knowledge to activate a support service for lifelong learners. There is a growing debate on how a new e-Lifelong Learning Model could be integrated effectively in lifelong learning technologies. (Calvani et. al., 2008; De Vita, 2007; Federici & Ragone, 2008).

2.1 The Lifelong Learning Solution

The Lifelong Learner Model allows to represent, in a way that the machine can process, the learners' characteristics in order to create a more effective and efficient learning experiences.

In order to answer to this conceptual model, the collaboration of the three virtual environment is necessary for giving a solution at technological level: Personal Learning Environment (PLE), Learning Management System (LMS) and Community. This integration will be structured on different levels of services and applications aiming to training and acquiring new competences. [11].

The image below translates methods and opportunities in an integrated solution sup-porting lifelong method.

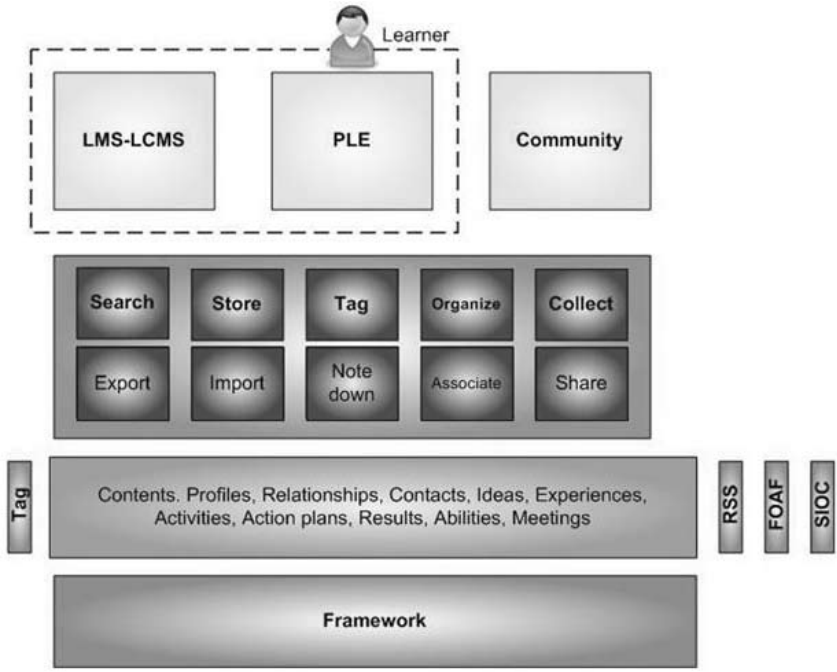

Fig. 2. The integrated solution supporting lifelong method.

The development of a good profiling system should support processes of reaction and intuition in intelligent systems able to identify the didactic experiences more responding to user's cognitive preferences and learning and surfing styles. At the same time, the personalized experience should be able to guarantee the requirements of completeness and high pedagogical expressivity.

During the execution of learning activities, workers could feel the lack of expertise about one or more topics related to the activities they are involved in. Obviously, they can express, in a more easily and quickly way, their needs using natural languages rather than navigate learning resources catalogues and assemble by themselves the learning units suitable to satisfy their educational needs.

The Personal Learning Environment (PLE) is a space that leads both the design of learning spaces and refreshing of competences portfolio, able to direct collaborative activities, on a wide scale (from formal to informal) and the net of professional contacts or linked to free time with an exchange of relationships mainly informal.

IWT is a intelligent learning and knowledge solution aimed at filling the lack of support in terms of flexibility and extensibility affecting the existing e-learning systems. IWT includes specific Knowledge, Competence and Learner Models (this latter being mainly oriented to self-learning), which are ontology based and able to answer to the specific needs of the worker. [5].

The Virtual Community, instead, can be considered a productive means for specific learning and activities, that can, step by step, find different solutions. It is assumed that in a learning community the acquisition processes can

emerge accidentally from interactions among the same members that have the possibility to share specific competences. Let's see in details as the integration among the appliances and their relationships can permit to pursue two scientific directions:

1. Reinforcing the development of some mechanisms:
    a. From the PLE space the user calls the LMS and has the chance to ex-press his needs in terms of knowledge and abilities through a natural language; as a reply, he gets an introduction, like a suggestion, about the Formative Objectives more suitable for the specific profile; it will be possible, inside the repository, to do a research of the formative objectives that mostly answer to the declared formative needs.
    b. The user, from the PLE, has the possibility to file, through a structured system of tagging, all it is important for his lifelong learning experience. These resources, rightly tagged, can be revised both according to reusing in the processes of generation of personalized Learning Path in LMS and to enriching didactic, individual activities in a personal working environment (PLE), and in informal group activities.
    c. The updating of the Profile of the user is displayed through *My Page*, on the basis of the results of the didactic activities that are executed. Once that he has executed his personal, formal, learning path, in LMS the given results will be stored as competence levels (knowledge and abilities) in the data layer. They will be useful to go on enriching the user's profile in terms of covering of the gap on a stated ontology or didactic domain. My Page is shaped for information to be visualized and not. PLE memorizes the info in the data layer that is read by *My Page*.

2. Reinforcing some techniques and approaches of informal, social network:
    a. Recall of collaborative, didactic experiences; the formal, didactic activities are made in LMS but their activation can be made by the PLE that will reach, through API with catalogues, lists, shown by LMS. By PLE a need is expressed in terms both of knowledge and of ability. The system can also suggest, among the different activities, those informal, collaborative that are suggested as mostly suitable to the development of the abilities on which you can find the gap. The info can be memorized both by PLE, and LMS and the Community.
    b. Creation of community of interest more or less linked to formal, formative paths; from PLE it is possible to invoke the space "community" to start the group activities. The knowledge produced by the session as to some steps and tasks of the chosen strategy like a didactic resource-output- of the collaborative activity, can be re-used and re-put in circulation as learning resource. Such a resource can so be recalled both by the formal learning spaces LMS and those informal, to enrich and generate didactic paths.
    c. The resources produced by the collaborative activity can be object of social tagging so to share the good quality of the resource. The

same collaborative activity can be taken again by competence community and re-used to start moment of structured formation of the community space. The resource is subject to a value judgement on the executed activity in terms of didactic efficiency for a stated type of objective.

3 An Application of the Polo L&K's Approach: the Meeting OnLine

In order to put in practice the model shown in the previous section, we present in this section a collaborative learning scenario: the Meeting On Line (MOL), that avails of the integrated solutions for competence development shown in the previous section.

The integration of Figure 2 is contextualized as follows: in *Community* a workgroup is created for the activity of meeting online; this is in relation with the environment *PLE* as regards to the portfolio of the participants and with the system *LMS- IWT* [1] as regards to the formalized learning.

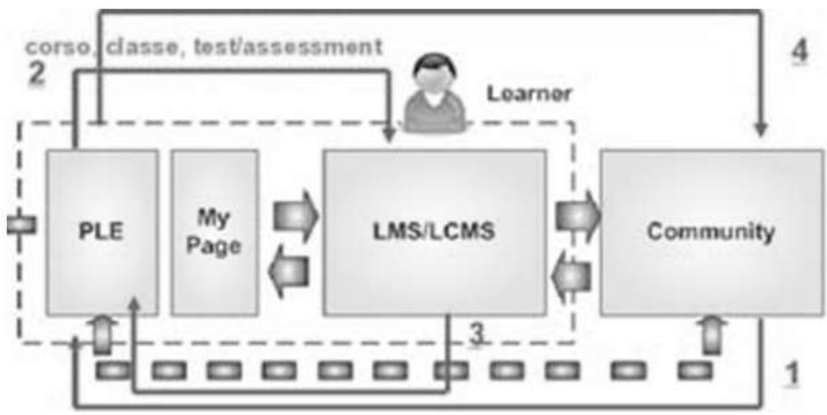

Fig. 3. Contextualization of the Lifelong Learning Model.

The scenario opens with a setting phase of data through a special/suitable panel de-fined in the LMS: date and time of the meeting are scheduled, using the support of an Agenda/Diary. Then through an e-mail, it is notified the event to the participants of the session.

The session starts with an "informed discussion of preparation": the coordinator creates a blog in which he inserts a message and its agenda. After everybody has expressed his own opinion, within a stated period of time, you cannot add new comments to the blog. At the same time the users are given the chance to express a rating vote about every message. On a parallel way, inside a shared Area, the coordinator delegates a participant to collect all the resources, previously produced by the team and referring to the agenda. The document, created by the instrument "narrative net-work", is linked to the "informed and shared discussion". We suppose that the access to the meeting is bound to the acquisition of some target concepts. After sharing the agenda, the subject is invited by the system to deepen and consolidate some knowledge, collaborating

[1] IWT (http://www.didatticaadistanza.com/) is an innovative learning platform produced by MoMA, spin-off of the Polo di eccellenza L&K.

with other participants with the same gaps/problems.

The process is the following. From the community a control of competences inside the PLE (step 1) takes place. If some formative gaps are found, the user re-calls the system IWT, for benefiting of those courses that let him fill a gap (step 2).

The formative path is automatically created by IWT. The user benefits from it in-side a class and he is submitted to a test/assessment, and after finishing it, his profile inside the PLE is up-to dated (step 3). Now the user is ready to take part again to the Meeting inside the Community space (step 4).

Now we enter into the real phase of the meeting. The instruments that the participants have at their disposal are webcam, chat, shared board. The manager manages the opening and the disposition of all objects. In this phase the responsible of the project virtually meets the participants. At this phase the mastery of the meeting theme is a prerequisite that can be verified by the visualization of the participants' profits: these are updated on the basis of the results of the executed didactic activities.

For every point of the agenda, the responsible of the meeting project will consult the reference person/referent who will show/display the eventual products in relation to the previous tasks. The participants can book to take part to the discussions, clicking a button in the interface of the meeting.

The system should only show to the responsible, the names of the people who have made the booking for speaking, according to the temporal sequence, after that the coordinator should manage the speaking time turns.

For this phase, a prerequisite is the knowledge of the produced material of discus-sion; it can be verified by the visualization of the participants' profits: these are up-dated on the basis of the results of the executed didactic activities.

The instruments necessary in this phase are: shared space files (shared Area), news Clouds, or a tag cloud social news application, that shows the tags occurring in each faced motion.

After discussing each points of the agenda, everything, that has been produced, is collected and the meeting is closed. The output, as a whole, will be a set of new tasks (or closed activities) that will be formally distributed, by drawing up a report. The report will be a synthesis document, drawn up by different hands, by using an instrument of collaborative writing and a shared managing system.

It will have new tasks, given according to abilities and competences and to locate them, it will be useful to consult each participant's profile.

4 Conclusion

The key aspect of the innovation in Technology Enhanced Learning (TEL) has been the move toward more learner-centric solutions in which needs, objectives and engagement are principles that a learning experience must satisfy for an autonomous learner, the Knowledge worker in Knowledge Society. Building upon this, and driving towards a more enriched and personalized learning experience, we take a 'lifelong learning space' in order to access and share a range of different resources, tools and services in support of Personalized Learning Path.

We have introduced a new LLM that, at a conceptual level, well expresses "the ways" that a user can undertake inside a framework of integration of learning modalities linked to formal learning, personal learning and social one. A specific collaborative scenario of "envisioning", the Meeting online, has been taken into account in order to develop collaborative activities through the integration of a PLE, a LMS and a Virtual Community

This PLE will provide a solution that is responsive to the user's requests, creating pedagogy driven learning experiences that are adapted to:

- the worker's needs that could be expressed in a natural language (they could emerge from daily work), being related to fill a competency gaps
- the worker's knowledge (existing competency and skill) and preferences considering also the pedagogical aspects providing the more suitable learning activities (even complex one like simulations and games) in different space formal or informal.
- the worker's performance, reorganising the learning experience (proposing alternative learning space) in case of problems emerged after an assessment phase on some specific target of competence.

Actually, the authors are engaged in empirically validated collection of instructional results of the experiments and the implications of research. The Lifelong learning Model is applied to the dynamic context where group of interest need opportunity for competence nurturing. The results of the experimentation will be discussed in future work.

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