Lifelong Learning and Virtual Communities in the Public Administration: a case study

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Abstract — This work introduces our experience in developing L3, a project that aims at developing an educational and collaborative environment oriented towards public employees of our provincial administration (Autonomous Province of Trento - P.A.T. - Italy). Our research group has been involved for years in the design and development of e-learning applications; in the new L3 system we realized that the simple re-design of a traditional e-learning system was too limited respect to the needs, mainly users' active participation in a more "social" sense. This work presents the first results of the project, which has a three years' duration, and its future development towards a "Private Community Environment".

Index Terms — e-learning, lifelong learning, virtual leaning communities, web 2.0

I. INTRODUCTION

The context of this work is a Technology-Enhanced Learning application developed autonomously by our work's group. This system was initially configured as a Learning Management System directed to universities’ reality, and based on the metaphor of virtual learning communities.

This choice is motivated because the metaphor of course, the most used by the e-learning systems, is not able to cover all the interactions that may take place within working groups, aggregative and collaborative structures that we can define in a first instance "communities".

Our first experimentation was based on the e-courses, structures strongly linked to the real courses carried out in real classrooms. Subsequently, our choice has been moved, as mentioned before, to different structures (virtual communities) or e-Communities.

We think that the definition of Jenny Preece [1] about on line communities seems appropriate to describe the metaphor that we adopt, indicating the communities as a site in the cyberspace consisting of:

- individuals who interact socially while seeking to satisfy their own needs taking on specific roles such as leader or moderator;
- a common purpose, for example an interest, a need, an exchange of information or a service that justifies the existence of the community;
- policies in the form of tacit assumptions, rituals, protocols, rules and laws that guide the interactions among individuals;
- information systems that support and mediate social interactions and offer a sense of belonging.

The sharing and transmission of knowledge among the various users are two of the possible aims of the virtual community (VC). In the measure in which one learning community contributes to the pursuit of these two specific objectives it can be called a learning community or, even better, a "Virtual Learning Community". The third issue that characterizes a virtual community, in the approach that we are adopting, is connected to the cooperation among its participants. Our work is based on the concept of VCs adopted by Lèvi [2] [3] [4]: he defined the virtual communities as groups of people who are in contact because they share some kinds of knowledge and interest, corresponding with each other using interconnected computers in a cooperation process. This approach differs from that adopted by other authors, such as Beamish [5] that considers the virtual community as a group of people who communicate using computer mediated communication tools. The participant of these communities are physically in different places but however they can exchange information on common interest in a communitarian way. Rheingold [6] considers VCs as an emerging social phenomena. More relevant to us is the approach of Jones [7] [8] that separates conceptually the technological structure of VCs (named virtual settlement) from the community itself.

These observations have allowed us to conclude that the metaphor of community is the best to be suited within an university environment.

After these observation it was born a new web dynamic application, called On Line Communities, able to meet the information and training needs of the Faculty of Economics of the University of Trento.

The collaborative approach [9] [10] is a very strong incentive for us for the development of On Line Communities; the philosophy that led us to rebuild the system was to allow the exchange of users’ experiences within a virtual environment, and within well-defined areas known as “communities”. This approach is very

The International Conference on E-Learning in the Workplace 2009, www.icelw.org
different, for example, from the traditional ones of other e-learning applications. The community is a container ready for didactic processes, but not only: research teams, recreation groups, friends, secretariats, board of directors, colleagues, anything that could be an aggregation of people around a scope using virtual spaces on the web.

In this work we want to describe our work in this field, and in particular the evolution of our platform from the typical concept of e-learning to the wider concept of lifelong learning, connected to the new technological innovations of web 2.0.

The work is organized as follows: the second section will describe the technological base of our discussion, On Line Communities platform based on the metaphor of learning virtual communities. The third section will introduce the Lifelong Learning project for the Public Administration of our territory, the Autonomous Province of Trento in Italy. In the fourth section we will describe some new characteristics of the platform, implemented for the real needs of our Public Administration. In particular the implementation of a video cast service, the integration of a SCORM player that supports the publication of virtual lessons and the evolution of the platform to services more oriented to the collaborative approach, like what we define in this moment with the term “web 2.0”. For this last part it is important to analyze the impact of that adoption in a system directed to the employees of a Public Administration.

II. ON LINE COMMUNITIES

In the academic year 1998/1999 the Faculty of Economics of the University of Trento decided to have a software system able to enrich its traditional teaching as an extension on the Web. The first aim was to settle the increasing number of teachers’ personal web pages into a single platform. To pursue this result it was necessary to have a Learning Management System (LMS), capable of supplying a virtual environment able to support the educational courses of the Faculty. The resulting system started to function from the second half of 1999 and during this period the system counted approximately 1,200,000 accesses. Being a quite traditional LMS, in 2002 some observation convinced us to redesign the software:

- The needs for cooperation within the academic environments is extending to all the activities that constitute the context in which didactics takes place, not just to the specific “lecture”;
- models of teaching / learning (such as learning by problems, learning by projects, cooperative learning and their combinations) can hardly be connected to the e-Course, especially when the software directly represents the metaphor of traditional courses;
- the organizational didactic scenario changed with new regulations made by academic institutions, and these changes inevitably reflected on the LMS functionalities. It is important to note that these types of changes are usually the result of a debate process in which both elements of cooperation and negotiation interact;
- the didactics of an university are not built only as a set of studies and tests, but these activities are inevitably intertwined with the university’s organization and its information system;
- in an academic context, not everything concerning teaching: for example, the entire faculty is more than a container of degree courses and a degree course is more than a container of lessons.

To answer these (and other) needs another founding paradigm was need, with at least three basic characteristics:

1. Generalization respect to educational settings;
2. suitability to support cooperation processes;
3. capability of modeling and preserving organizational structure and roles of the educational institution.

This new way of conceiving the collaboration platform was found in the concept of virtual community. The system that arose, called On Line Communities [11], was born in 2003 and runs in February 2005. Our work started before the boom of web 2.0 [12], that has now invaded and changed the way people think and build services on the net.

The main characteristics of a community could be summed up as follows:

- Each Community offers many services to registered users that have different roles/permissions inside the community.
- The services are general applications that enable the users to communicate in synchronous and asynchronous way, to publish contents, to exchange files, to coordinate events, etc.
- Services offered by a community are activated by a manager of the community according to the needs, and the users of a community can use them with different rights and duties.
- Rights/duties in the community are different from rights/duties for the services.
- Communities can be aggregated into larger communities with hierarchic mechanisms and infinite nesting levels. Communities can also be

Figure 1: On Line Communities Accesses (May 2009)
aggregated in an arbitrary way into larger communities disregarding the possible position of a hierarchical structure, in a sort of “transversal” link that overcomes the concept of “hierarchy” and follows the idea of “mesh”. Thanks to these features, a complex but powerful mechanism of propagation of services/roles/permissions/rights/duties can be set among communities of the same branch or of different branches.

- All users are recognized by the system and by the community: people external to the system can see public part of the community (services, material, contents etc.) only if the managers allow this (ex. a blog of one community could be opened to external contributions).
- Services can take advantage of the “mesh” structure of On Line Communities to provide some interesting though non-existing features, like “transversal wikis”, or “merged blogs”. One blog, in fact, can be the “fusion” of all the blogs of children communities, or a wiki can take the definition transversally from all wikis in related communities.
- Last but not least, a VC is the container for collaboration processes not limited to educational activities, but for any collaboration activity needed in an organization. Research teams, recreation groups, friends, meetings, conferences, secretariats, board of directors, next social dinner, anything could be an aggregation of people around a scope that can take advantage of the virtual spaces offered by the Virtual community.

The core of the application is composed by some abstract entities, i.e., VCs as aggregation of people to which some communication services are available in order to obtain certain objectives. With this approach, it could be possible to represent all the hierarchical relationships between different types of educational communities (such as Faculties, Didactic Paths, Master Degrees, Courses, etc.), as any other relationship among communities inside organizations.

III. THE LIFELONG LEARNING PROJECT (L3) FOR THE AUTONOMOUS PROVINCE OF TRENTO

L3 (Lifelong Learning) is a project to be implemented by our university, commissioned by the Autonomous Province of Trento (P.A.T.) as an e-learning platform aimed at becoming a technological environment for training and collaboration projects within the P.A.T. itself and connected offices. The aim of our work is mainly technological: our task is to supply the Autonomous Province of Trento with a tool enabling to improve internal training processes. The system we are developing has, however, some peculiar characteristics:

- The system will operate on a territorial basis.
- The system should be able to guarantee temporal continuity of the training experience which goes beyond the single case of training and ideally is extended to at least many years.
- The system must be tightly integrated with the information system of the P.A.T., in particular with the Personnel Management system that manages the history of all the training activities performed by each single employee in P.A.T.
- The system should be able to support different collaboration activities, not only those strictly related with training activities.

These circumstances, together with previous experiences in creating e-learning platforms within the university, have induced us to use once again the metaphor of “virtual learning community”.

The first lifelong learning project that we have developed was directed to the managers of our Public Administration and in particular on the theme of e-procurement. We set up a group of courses, explaining the participants the mechanisms that underlie the e-procurement: the name of the project was ESPERTO (E-learning for the development of e-procurement in Trentino).

The second step is the development of a bigger project, named L3 (Lifelong Learning), directed to all the training courses for all the employees of our Public Administration.

IV. NEW SERVICES IN A LIFELONG LEARNING APPROACH

In the development of the new platform, we have decided to implement a set of new services, with the aim to support the training activities of the employees of our Public Administration.

We have decided to develop three different lines of services:

a) Multimedia services, like the possibility to play the video of the lesson, together with the slides and notes;

b) Training activities tracking services, like the possibility to use SCORM (Sharable Content Object Reference Model) material;

c) Web 2.0 and Social Network services, more oriented to increase the collaboration levels among the participants.

A) Multimedia Services

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1 The project was co-financed by CNIPA (Italian National Center for Informatics in the Public Administration). Project ID n. 36672/335
One feature we want to integrate into our VC platform is the possibility of accessing to a particular LO regarding the videos of the lectures, providing this video with some extra features that are:

- audio/video part of the lecture, in medium quality/resolution, but in such a format that the learner can recognize the progression of the lecture and is able to hear very well (in our preliminary experiments, and in other experiments [13] audio quality has been demonstrated to be fundamental);
- slides used by the teacher, transformed in JPEG single files to be synchronized with lecture progression;
- timeline of the presentation, where the user can interact to change the pace of the lecture;
- index of the presentation, for hyper textual navigation into the lecture contents;
- time bar for controlling/playing/pausing the presentation.

All these components are assembled in a unique learning object using the SCORM standard, thus creating a unique package that represents a highly-realistic substitute of what happened during the physical lecture. This is what we imagine to be the best replacement to having being physically at the lecture, and we believe that, in some sense, this learning object could have some extras that are even better than being there: for example, the possibility of hyper textual navigation through the lecture slides.

The necessity of this type of service came up because we prepared a training path distributed on the territory. This geographical configuration, represented in the map, has conducted us to create a new service in our system, which allows the more realistic presence of people to the lecture, and the possibility of accessing off-line to the more realistic representation of what happened during the “real lecture”, i.e., the live lectures held in the central classroom. Of course, the service will not replace the relationship which takes place between the teacher and the students during lessons, but could be a supporting service. On the whole total of hours of lectures, 30% of them will be completely remote, with few people physically in front of the teacher, and the others scattered all over the Province. Each of the five classes will be of about 20 people.

These conditions pushed us to improve the quality of our educational material, which means:

- on one side, to create the most realistic surrogate of the face-to-face lecture: webcasting enriched with the features explained above has been our choice.
• on the other side, to create a material that could be easily re-used and manipulated in the future, and this is where the SCORM standards come out.

B) Training activities tracking services

Due to the relevance for the L3 project of the reuse of educational material, and in order to meet the demands of the provincial Public Administration, we decided to package the didactic material (including the webcasting material) using the SCORM standard, therefore providing the opportunity to use the didactic material within a SCORM-compatible system.

At this point, with SCORM-compatible educational material available and ready to be used by participants, we had different possibilities to include this kind of material inside the platform. This operation could mean different solutions, more or less invasive respect to the previous version of the platform that was not SCORM-compliant. The following are the two extreme solutions, with many variations in the middle:

• the simplest solution, upload a simple SCORM package (a .zip file) created with external tools, and let the user download it and play it autonomously, outside the platform and using a SCORM player;
• on the opposite, creating a SCORM-compatible editing environment directly inside On Line Communities, and let the users follow SCORM-based educational material from inside the platform: this is in theory the perfect solution, but it is really complex and costly due to continuous evolution of these tools and standards, and the necessity of creating an authoring tool SCORM-compatible.

In a first experimental phase we were chosen to follow the first approach, in order to provide in a short time to our participants the material. At the conclusion of the Esperto project two questions were raised:

• Are the users really using the material that they have downloaded?
• How long users stay on the didactic materials?

These questions were not considered in a first step, because we wanted to test the platform in a different context from the university. After that we have chosen to follow also the second solution, which allows users to use the SCORM material directly in the platform. Following this approach through the use of a dedicated player, we can understand in more detail what users actually do with the materials.

In fact, a SCORM player is able to:

• track the actions performed by users (what content they have used, the quiz statistics, etc.);
• plot the time performed by users to conclude a lesson (or part of it).

We have integrated into the platform a commercial player, providing to the users a full statistics system on their actions. On the one hand, the teachers have the opportunity to know the real use of their virtual lessons. Also each participant can monitor the commitment that is dedicating to a specific training course.

C) Web 2.0 and Social Network services

If we look at the whole range of application fields where we are using On Line Communities, the platform clearly evidences its nature of a collaborative environment that wants to stimulate the participation and put to value users’ cooperative work. Today, with the advent of new communication and collaboration paradigms, On line Communities has become an example of a computer support cooperative work system (CSCW) dedicated to teaching/learning. In recent years, we extended our system to functionalities and services typical of Web 2.0. However, some relevant differences exist between the approaches used by web 2.0 applications and the ones used in On Line Communities. To overcome these differences, a changing of the rules used in the virtual space is required, and these changes have a direct influence on the entire architecture of the system.

The cooperative virtual space of On Line Communities is actually a closed environment. The users participate to the activities inside the system directly with their real identity. In fact, a person who enters a virtual community of our system is authorized firstly by the platform administrator (for certifying user’s credentials), and after
by each community administrator for each community the user wants to enroll with. Once the user is accepted inside the community, from that moment he/she is automatically in contact with all the people inside the community. This is the pillar of the virtual community: I’m in the community because I share its scope, and all the people of the community have more or less the same interests / objectives / tasks. Following this logic, the user is not obliged to declare, accept, or manage his/her contacts inside that community: s/he will never have to face the “domino” effect of most social networks, where you will be connected to a friend of a friend of a friend. Of course, On Line Communities allows each user to manage friends’ lists, but this is different from managing community members. The differences between “friends” and “community members” are very precise and marked, and the user is allowed by the platform to manage these two different concepts.

Given that the increase of social interactions is not a negative aspect in principle, the risks deriving from the direct use of the most used social network approach (like for example the approach used by Facebook [14]) into an environment with different aims are very high. According to some recent statistics [15], the majority of users who use the so called “social networks services” are concentrating on the well known “people surfing”: navigating into the friends’ profiles, look at pictures, personal information, etc. We are aware of the clear phenomenon that is emerging from friends’ social network [16]; it is true that the action of adding a person to the friends’ list requires an approval, but it is also true that a user can see at any moment the people connected to his/her friends; a critical consequence is to become implicitly a friend of my contacts’ friends, thus starting a sort of recursion in the friends’ list of friends.

The circumstances that we consider favorable in our system (lack of anonymity and control of the external accesses) have origin in two explicit requirements of our Faculty of Economics. The exclusion of anonymity is the result of a belief that normally indicates that the anonymity into virtual learning environment should be banned, so that the actors cannot shirk from their responsibilities. The second circumstance (access control) stems from the will of a substantial number of teachers to block the publication on the network of their own courses’ Learning Objects. These choices made the system impermeable to the users’ social dynamics, or to the communities existing in the social networks.

To overcome these limits without affecting our constraints requires a radical change of the system architecture that sees the person as a member of one or many communities. On the other hand, in the web 2.0 applications, the participants exist as individuals who, for example, can create themselves a specific community. The rethinking of the system with these ideas is changing our community system to a sort of “community 2.0” system: we like to define it as a “Private community Environment” (PCE). The difference between the two approaches is that the communities in our systems are created as an extension in the virtual space of real didactics. On the contrary, in web 2.0 social networks, virtual communities emerge from the interaction among users’ own networks.

Following this line, we studied how to modify the architecture of our system, as we wanted to implement the good part (from our perspective) of the incredible revolution introduced by social networks. We wanted to transform our virtual communities platform into a sort of bridge system between the classical methodology followed into the most famous LMSs (like for example Moodle [17]) and the new web 2.0 and social networks applications (like for example Facebook, MySpace and Flickr), without losing the focus on the learning processes.

The architecture that we developed has two fundamental goals:

- As we have said, to make our system more permeable to all experiences that take place inside the web, including applications for social networking and Web 2.0;
- Keep control, up to a certain level, of the actions taken by users of our system. In fact, our context is connected to learning environments / academic settings, and not directly to leisure time.

Following these approaches, many drastic changes have been introduced into the platform, moving the focus from “community” to “user”. As an example, when the user connects to the system, the user’ personal home page and its services are presented, trying to create a real Personal Learning Space (PLS).

We are imagining the new users’ Personal Learning Space as an aggregation of two distinct environments. The user will be free to decide what part of his/her relations and contents to import (into On Line Communities) or export (to social networks applications). From a technological and management point of view, this approach presents more problems than solutions. This solution also required a strong review of many parts of On Line Communities, and in particular the management of users’ roles and permissions.

This approach has different values, in particular regarding the teaching strategies; in fact exporting the contents outside an e-learning platform could accentuate the social role of the educational institution as a source of knowledge and of better didactic practices.

On one side, this solution gives to the user more freedom than into a classic LMS, but on the other side, it is more difficult for didactic institutions to be implemented. In fact, while the institutions are becoming a knowledge centre through the participation of its members, at the same time they are being exposed to the risk of the complexity and the personal relationships of its members.

The user can access to the list of communities where s/he is enrolled in. But together with this, the user finds a set of services that are typically connected to his/her own person, a sort of personal space within the system. The services are “general”, so in this condition the user will
use services that are at “personal” level. This can be repeated and nested when the user enters inside a community: he will find (more or less) the same services, but this time these will be the services of that community, with different permissions, roles, list of contacts etc. A typical example is the Blog service: when I’m inside my PLS, the Blog is my blog, when I’m inside the community “workgroup XWZ”, the service Blog refers to the blog of that community: same service, totally different context and contents, totally different the role of the user could be. Finally, thanks to the inheritance mechanism among communities provided by the platform, the blog of that community can be merged with the blogs of parent community/ies, or with the child communities, or with sister communities (children of the same parent community).

V. CONCLUSIONS

Our first experimentation, focused on a small part of the public employees of our Autonomous Province, was very important for the L3 project. We have identified the most useful services for our public employees; in particular the possibility to use web cast and SCORM material is a key factor for the final success of the project.

What clearly emerged from our experiments is an interesting perspective for a virtual community system like ours.

Firstly private and public institutions need virtual collaboration spaces, places on the web with collaboration and web 2.0 tools available for their employees / partners. Secondly traditional LMS are not suitable for these needs, mainly because they are oriented to e-learning, and their pillars are metaphors like “classroom”, “class”, “course”, rather than other ideas more oriented to collaboration, like “community”, “group”, “team”, “secretary”, “board”, “office”, “department”. A classroom is of course a community, where collaboration is oriented towards a specific target, i.e., training. This is just one component of collaboration, very important of course, but is not the whole idea that companies / public administrations need.

Finally, social networks like Facebook, MySpace, Youtube, etc. are not suitable for companies, as their large numbers and main objectives are not allowing small, “private” communities where collaboration can take place in a private, reserved, personalized space. The main objective is “the more we are, the more we will interact”: this is not exactly what a company, or a public institution wants in most of the settings.

The evolution of the platform is now available for a second experimentation, directed to a larger group of employees; in particular we are setting up a group of courses, with the participation of more or less one thousand of people. This second step will be necessary to understand the final requirements that we will integrate inside the platform; for this experimentation we are providing some new collaborative / web 2.0 services like the hierarchical wiki, blog, workbook, etc. that follow the hierarchical structure of On Line Communities.

REFERENCES


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Manuscript received 12 May 2009. Published as submitted by the author.