The development of a Mobile Communities Application

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Abstract

The study describes the development of the mobile extensions of a virtual system community, result of the cooperation between the Laboratory of Maieutics of the University of Trento and the Institute of Advanced Management System Research (IAMSR), Åbo Akademi, Turku (Finland). The objective of the cooperation was to create mobile modules for the virtual communities platform, equipped with e-learning services, specific instruments for online collaboration as well as services typical of web 2.0. The resulting platform, called MobiC (Mobile Community), was released at the beginning of 2009 and is now being tested and extended to various fields, among which to life-long learning projects in which our research group is involved.

1 Introduction

The world of virtual communities – VC (Preece, 2001) and, in particular, of learning VCs, has for some time now been the center of attention of the media, thanks also to the wide diffusion of web 2.0 and, more recently, to the great echo that social networks such as Facebook™, Myspace™, LinkedIN™ etc. are having in the world of research and their impact on the social habits of netizens.

Our research group has for many years now been involved in the management of a VC platform used as an experimental and research example applied to e-learning topics but, above all, to communication and collaboration through ICT. In this context, for the past few years, close collaboration has been established with the Institute of Advanced Management System Research (IAMSR), Åbo Akademi of Turku (FIN), an institution outstanding in Europe for the research and development of innovative mobile services. The aim of the collaboration with Finnish colleagues relying on the experience of both teams in developing mobile services (Colazzo & Molinari, 2005, Carlsson *et al.*, 2006) was to expand into the mobile universe the functionality of Comunità Online – Online Communities - COMOL (Colazzo & Molinari, 2007 b). COMOL is a platform that supports collaboration/cooperation mainly (but non only) in the e-learning settings and has been entirely designed, developed and managed by the Laboratory of Maieutics. At present, this platform is used in the academic environment (University of Trento and Åbo Akademi) both as a platform for life-long learning projects and in the P.A. field (Casagranda *et al*., 2009; Colazzo *et al*., 2009). The idea to equip COMOL with services directed at the mobile world is not new; in the past we have projected and experimented some prototypes suited to the state of art as they were at the time (Andronico *et al*., 2004; Andronico *et al*., 2005; Colazzo *et al*., 2005). There is no doubt that, compared to the past, the scenario has greatly changed because of: a) the existence of more powerful devices b) the removal of many typical limitations of the mobile instruments (keyboard, size and resolution of video, batteries) c) the availability of mobile Internet connections and reduced costs d) the explosion of web 2.0/social networks phenomena as a result of the connection "anytime, anywhere" e) the explosion of the phenomena of geo-reference services and all that follows when an appliance is equipped with a GPS.

The extension we are introducing in this paper is mostly the result of these experiments. The idea of collaboration between our work group and the Finnish one for developing a mobile application aimed at training was formed in the Spring of 2008. The objective set by the two groups was to develop an application compatible with the recent mobile devices, capable of including a series of services within an e-learning context and collaborating also in a

non formal way. COMOL is accessible in an optimal way through a personal computer connected to the net, but its interface has not been designed to be used through different devices such as a mobile phone (with a clearly much smaller screen that of a PC).

For this reason we decided to develop a "light" version, more flexible to be used also through appliances different from a PC. The whole version was to be set in an applicative context that partly adapts itself to the needs of training in a more narrow sense and partly extends the use of the metaphor od VCs to more collaborative areas where the border between learning, collaboration, cooperation is always very hazy.

The paper is articulated as follows: the first section describes the main characteristics of the COMOL creation on behalf of our group. The second section sets out to illustrate the motivations that made us create the MobiC platform. The third section deals with the main functions activated in MobiC.

2 The COMOL experience

In this part we briefly describe the basic idea of the COMOL system. Our work group has for some years now concentrated on the design, development and experimentation of an e-learning environment, used as a support for courses in blended mode (Franks, 2002) at the University of Trento. COMOL is a system that contributes to create co-operational spaces among groups of people in the net. The entities within which the system organises the cooperation of a group of people are called VC. In each virtual space the system offers the participants a certain number of communication services (synchronous or asynchronous) to be activated at the discretion of the community administrator. Some of these services are typical of an e-learning environment (like, for instance, the diary of the lessons) but the most part of the services are totally general and usable in processes of heterogeneous cooperation.

It follows that, even though the system has a mainly applicative e-learning scenario, its uses in the context in which it has been installed (mostly training entities and public administration) are moving fast towards what originally had been foreseen in the founding metaphor of the system, that is, the community where the collaborative and cooperative processes that take place are not directly linked to didactic activity.

Indeed, on the one hand, COMOL is far from the traditional systems of e-learning, such as Moodle™, compared to which it offers different services better usable through the VC metaphors. On the other, our system is not, and does not mean to be, one of the many platforms of social networking, even if it has (ante-litteram) many of its characteristics. Suffice to mention one fundamental difference among the many: the participants in COMOL are not anony-

mous, seems that the system communities are not the result of a spontaneous aggregation of people "emerging phenomena on the net" in the sense given by (Rheingold, 1993) but, rather, a space that extends into the virtual processes of cooperation among people whose identity enriches the community.

Furthermore, the system is strongly linked to the concept of "role" that the single person has in the community to which are associated specific "permissions" relating to the about 60 services made available to its users by the platform. COMOL makes, therefore, available to the authenticated and authorised users a series of services, linked also to logics typical of the web 2.0 world (O'Reilly, 2005); in addition to the classical services of an LMS (such as download/upload of files, didactic timetable, forum), services such as chat, wiki, blog that give you the opportunity to carry out activities linked more to social life and services typical of collaborative environments, such as video-conferences, web-meetings, desktop sharing, integration with multi-media interactive blackboards, etc.

3 MobiC

The success of the COMOL experience made us amplify its use to mobile devices: the convergence between mobile devices and community services favours the functions of use and reproduction of various training contents, capable of interacting with geo-referential devices linked to the place of learning (Colazzo *et al*., 2007 a). The so called "situated learning" is interesting in the traditional learning environment but is even more specifically relevant in the life-long learning contexts that we are examining, where the subject is no longer part of the standard training circuits (classroom, teacher, course, etc.) but finds him/herself in a working context in which he/she needs to learn (consult a manual, share opinions, interpret documents, etc.).

We have, therefore, decided not to limit ourselves to adapt the PC version to the mobile device via browser, but to develop a solution specific to the case. First of all, the use of a mobile device is, for obvious reasons, far different from the use of the PC (screen dimensions, usage times, connection speed, etc.). Furthermore, the services to be used and appreciated within a mobile device are not the same as those available in a classical web application.

The collaboration of our team with the Finnish colleagues came about because of the convergence between the concepts of community and mobility; indeed, the approach based on the metaphor of VCs makes it possible to transfer into a virtual environment the relations among users in real life. The idea of the MobiC (Mobile Communities) stemmed from these and other considerations. The system is capable of offering the users of COMOL connected with the mobile device a subset of services available on the platform, suitably selected

in order to be easily used through a device with a smaller screen compared to a PC. Furthermore, the use of a mobile device makes it possible to foresee functionalities otherwise not repeatable in the system, especially the geo-reference services referring to the position in space of the user. Such functionalities are rapidly spreading due to the capillary diffusion of devices equipped with GPS modules.

The first phase of the project, completed with the creation of the first version of the system, has contemplated the integration into the mobile platform of the subset of COMOL services, selected in the design phase; the home page of the system is shown in Fig. 1. COMOL and MobiC are connected in a bi-directional way: the changes applied to whichever of the two has effects on the other, making it irrelevant where the user carries out the action permitted by the service. The home page introduces the index of services available via the mobile device; from this page it is possible to select the community within which to carry out one's activity (at the arrival of the system the last community visited will be shown) and, once access has been granted, the system shows the services available in that community. Thanks to the bi-directional integration, the user can use his/her usual access credentials.

Fig. 1: Interface of MobiC

The interface of the system is the result of usability studies carried out in collaboration with the Finnish group that has stimulated us to develop a very light application, preferably also easy to use.

4 MobiC Main Services

Introducing the main services at present implemented in MobiC, we need to distinguish the COMOL services made available in mobile environments, and services of the mobile universe. Hereafter we introduce briefly the two groups of services highlighting the differences and similarities for the groups transferred from the native COMOL environment.

4.1 Authentication and Access

The mobile user of COMOL connects him/herself to the URL of the system. The system recognises that the user is connecting him/herself from a mobile device and provides an interface optimized for reduced size screens, at present 320x240 pixels. Once connected, the user can choose within which community to operate: in order to facilitate interaction on mobile devices it is suggested to default the access to the last 10 communities used, showing the last one visited.

4.2 Events Calendar

The user is enabled to keep a personal calendar and to access events shared within each community. In this way it is possible to create community events, for example, a meeting of the components of a work group so as to conclude a project in progress.

4.3 Quiz

MobiC foresees also the possibility to offer multiple choice tests: we have chosen this type only, compared to the many types of the Web version (free text, drop down, self-composition, rating, etc.) because it is much easier for the mobile user. The insertion of a text is not required, which in many cases is most difficult, but only the choice of an option within a group of possible answers.

4.4 Blog

The integration of the blog service offers the participant the possibility to manage a personal space so as to be able to interact in a direct way with other users of the platform. This interaction greatly reduces the need of knowing how to publish contents (text and images), offering the user an active role in the community with the help also of the geo-referential tag of post and relating images/photos.

4.5 Chat

The availability of the QWERTY keyboard has made it possible to introduce a chat service into the mobile device, offering synchrony of communication among the members of the community, enriched by the functionalities of a closed community.

4.6 Personal profile and friends

Each COMOL user has on hand a personal profile and a list of contacts among the participants in the community of the user him/herself, thus creating a small social network. The chosen mechanism differs from that used in other services such as Facebook™, that is, the net of friends (Boyd, 2006) in which it is possible to access the list of contacts of each user. This opportunity can be considered as positive to some experiences but also critical in formal learning contexts (universities, companies); indeed, some statistics (Compete.com, 2007) show that the majority of users involved in such nets spends more time in the so-called "peoplesurfing" (surfing among the profiles of friends visualising images, personal information, list of friends, etc.) restricting the privacy of each user. The mechanism used in COMOL is, instead, based on self reputation; each user must necessarily ask the friendship of a potential friend who, in turn, must accept it. In no other way a user can access contacts of other users but only the list of participants in each community.

4.7 Service of geo-location

Geo-location functionalities indicate our position on the surface of Earth thanks to the GPS system. Generally the ideal solution is a connection between a GPS module and a mobile phone browser through the interface of specific programmes. Such connection is solved through the installation and application dedicated to that purpose, in our case the software created for this carries out two specific operations:

- access to the GPS coordinates using the APIs offered by the device;
- send the coordinates through an HTTP request to the service of geo-location uploaded in the browser (in our case MobiC).

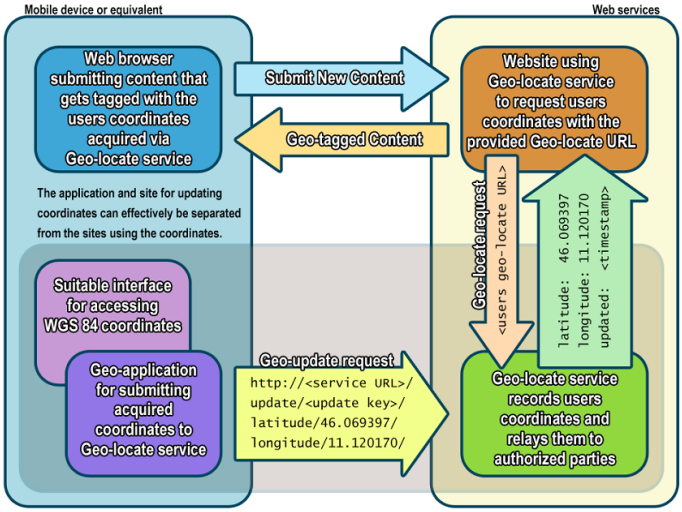

Fig. 2: The geo-location service of MobiC

The geo-location service within MobiC enriches the application with information that otherwise could not be used in the web version. Indeed, it is possible to:

- visualize on the map the position of the person's contacts (if the latter decides to make them available). Our work group has for some years now been engaged in designing proximity learning services such as, for example, "What Are You Studying" (WAYS) (Colazzo *et al*., 2007 a), that is partially integrated into MobiC.
- link a new post within the blog to a specific position in space; as for instance by adding to the description of a photograph the place in which it had been taken.

The software at present is compatible with the devices that support Java.

Fig. 3: Geo-location service and details of two users (U = current user and F = friend of user).

Conclusions

This paper has briefly presented the experience of integration between one platform of virtual communities and mobile technologies, especially transferring services available on the Web platform to mobile services enriching them with peculiarities offered by a different device. MobiC offers transparent access both to traditional services / possible new versions of existing services thanks to the peculiarities of modern devices.

At present MobiC is in an experimental functional phase. This phase will be followed by a second one of re-design and experimentation in didactic contexts. One of the important aspects of the new version will be the possibility to read RFID devices (at least the passive ones) or bi-dimensional bar codes. This will make it possible to use these tags to obtain web sites for specific didactic material.

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