
Enhancing a web-based community: the case of SIG-GLUE

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Abstract: The expansion of the web has reached outrageous proportions with the number of web communities existing and the number of those being created daily increasing dramatically. To parallel this phenomenon is the trend nowadays of mobile phone services. One of the most representative is the case of Greece, where in a period of five years about five million people subscribed for a telephone number for mobile devices. The communities are not static any more. The philosophy is: a universal community has to be mobile. This paper analysed the expansion of the community of SIG-GLUE in order to support mobile users with any necessary web service.

Keywords: web community; game-based learning; life-long learning; special interest group; content management system.

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1 Introduction

The constant expansion of the web has affected almost every online community. People feel the need to communicate, to collaborate, to share their knowledge and to openly express their opinions and thoughts. The blossoming of the online communities is great, not only in the number of members but also in the quality of the services they provide. Previous perceptions that online communication is hostile, divisive and uninhibited (Kiesler and Sproull, 1992) have been overcome over time. People are very familiar with the use of devices like personal computers, mobile phones, PDAs, *etc.* for their daily communication needs.

The extent of this need for communication is one of the most important reasons for the creation of web-based communities. The ease of being a member of such a community and the simplicity of communication and collaboration between so many people make such communities a must for most internet users.

All of the above led to many attempts to motivate users to act as groups. The idea is really simple: create a website that is the base for the community and support this site with a web service that can promote communication and collaboration. In order to construct a successful community, members must be able to fulfil their purpose and accomplish those goals that require other members to participate (Ferguson *et al.*, 2002). These days, existing communities have reached extraordinary numbers and the services they provide are at least of a high level. People want to learn about the communities and seek communities that best match their needs.

One community on game-based learning is SIG-GLUE. Game-Based Learning is an issue that concerns game developers, educators and trainees. The teaching methods based on educational games are expected to be extremely attractive to either university students or people who are concerned about Lifelong Learning. In addition, the social and educational aspect of this type of communities (Bouras *et al.*, 2004) is becoming increasingly interesting, both from the technological and social perspectives. Besides, the internet's characteristics facilitate the development of unique forms of interpersonal and

group interaction (Oren *et al.*, 2002). Therefore, the intention of this study is to create tools for an online community where the users can be organised into groups in order to discuss their ideas and exchange their own knowledge.

SIG-GLUE is a web-based community for people who are concerned about game-based learning in universities and about lifelong learning. The primary objective of the community is to inform the public about issues in game-based learning. In a second phase, the community wants to bring together educators, trainees, game designers and game developers who will collaborate and communicate in order to produce better educational games.

After six months of use, the community seems to be able to operate in an autonomous way, without the support of the creators. More than 200 people are members of the community and they communicate daily, expressing their thoughts and sharing their knowledge.

Many attempts have been made in order to create communities on specific educational issues. Developers, game providers and pedagogues have tried in the past to collaborate, aiming at the creation of either communities or games that can be used for educational purposes. TopSIM¹ provides different business games that have been used in business education and advanced training. Myzel (2002) is another online community game. The players have to select a role and try to survive in the virtual world of Myzel with its various planets and complex social and political life. Environmental Detectives was developed by MIT and Microsoft (2002) within the Games-to-Teach project. It is a handheld PC game where players role-play as Scientists investigating a rash of health problems in their city that stem from point-source pollution problems. Finally, Unigame² is a project that introduces the concept of game-based learning with a focus on the higher education sector and lifelong learning.

What is important to note is that almost every community of the aforementioned games, after a period of boom, became static or even disappeared without any member asserting for the continuity of the community. The reason is the same: lack of creativity, lack of support, lack of new services according to the epoch's trends.

This paper is structured as follows: Firstly, the community of SIG-GLUE is analysed according to the statistics of six months of use. Secondly, the most important elements that can ensure long life of the community are analysed. Afterwards, the basic architecture is explained and the more important issues are denoted. After the analysis, the changes that can be made in order to enhance the community and provide the users with more attractive services are reported. Finally, some concluding remarks and proposals for future work are provided.

2 The case of SIG-GLUE

As can be derived from its name, SIG-GLUE is a special interest group for game-based learning in universities and lifelong learning. Game-based learning in universities is an issue that has concerned scientists for many years, but its application in universities seems to be in its early stages.

In order to take some steps, firstly, it has to be clear that the students are very keen in playing games and that they are very attracted to games in education.

2.1 Analysis of main objectives of SIG-GLUE community

SIG-GLUE aims at creating a community (Special Interest Group) for the exchange of ideas and knowledge in the research field of Game-Based Learning in Universities and Lifelong Learning. This community will try to bring together both developers and users of educational games. The mission of this community will be multi-dimensional: The ultimate mission of SIG-GLUE is to enhance the quality of education in universities and lifelong learning by further promoting the idea of learning through games. The SIG-GLUE partners, as well as various GBL researchers, aim to disseminate the idea that using games in education (or training) enhances the motivation to learn and improves the process of understanding and learning. Through the development of this community and the use of the communication and collaboration web-based platform that will be created, it is believed that developers will be helped to create better educational games. This will be achieved by promoting exchange of ideas, knowledge and experience in designing and implementing educational games. The SIG-GLUE community will try to bring together as many developers, educators and users as possible. It will try to convince people of the value of game-based learning and explain how they can benefit from it. It will support educators to select the games that suit their needs or participate in the design of a game that will be adapted to their specific needs. Finally, it will support developers and encourage them to create better educational games. Creating a detailed specification of educational and gaming element and establishing a 'quality stamp' for educational games would further promote the above goals.

The use of an online community seems to be the best solution for bringing together developers, educators and simple users, all over the world. The tools of the community will promote communication between its members. Undoubtedly, the collaboration of all the aforementioned types of users is essential in order to produce better educational games. What is to be noticed is that the discussion between users should not be limited only to technological or pedagogic issues, but must be expanded in order to meet the demands even of simple users.

The community will contain workgroups, with each group covering a thematic field of interest in Game-Based Learning and Lifelong Learning. In each workgroup, there should be a moderator who will guide the communication and collaboration between the members of the group. But research has proved that in a formal workgroup or discussion the role of this 'virtual teacher' should be limited (Sotillo, 2000). The participants in the workgroups should not be like a worker, but they should be co-equal and exchange their experience and knowledge without any limitation. The role of the trainees in the community is very important because they are going to be the actual users of any game developed.

2.2 Analysis of the stats that can be collected from the SIG-GLUE community

After a short period of time, the stats collected from the SIG-GLUE community can be a source of pride. With little effort and only a few dissemination steps, already it can be announced that the community of SIG-GLUE members number more than 150, most of them active and eager to share their experience and knowledge. It is very important to note that the collection of statistics was not among the first objectives. The community's goal is to bring together even just a few educators, trainees, game designers and game

developers. But the numbers and the replication of the users is worth making into a statement about the statistics. After some discussion about the numbers of the community, it has to be checked which of the services attracted the users.

Most of the users use the forum section of the community. The communication through a forum seems to be a must for almost every community. Internet users are familiar with using a forum. They are attracted by the freedom of speech given through the forums. In addition, some groups are formed which have their own private space for conversation in the forums. The forum seems to be a very good start for the community. The library module comes second in terms of the number of visits and usefulness. Its use can be referenced by its name. It is something like a repository for knowledge and experience.

The important issue that makes the community blossom from its first months of existence is its philosophy. The community is openly sourced and open-minded. It is openly sourced as far as its code is concerned and open-minded as far as its members and roles are concerned. The last remark means that everyone is allowed to do almost anything in the community website without restrictions. The internet is a place of implementation of democracy. This means that users are not restricted, especially when the issue is education.

2.3 Analysis on the needs of the users of the SIG-GLUE community

The analysis of the statistics brought forward some results that concern the needs of the users of the SIG-GLUE community. As in every community, the users have specific needs on communication and collaboration tools, but each community has its own unique characteristics. This means that each community will have different functionalities according to the points of importance. Some communities need to communicate rather than collaborate.

The case of SIG-GLUE bring us in front of an occasion where both communication and collaboration tools are needed, but in different periods of time. This is a physical need of people who intend to work together. First they need and want to know each other in order to achieve a good level of communication. Then, they want to collaborate. These are exactly the needs of most of the users of SIG-GLUE.

The first phase of the community started after the collection of a questionnaire concerning the needs of the users, which was answered by few users. Almost every user expressed his/her certainty that what was missing from the community were expanded communication tools. An analysis of the users' answers shows that none of them is interested in collaboration tools. This can be explained because at first the users are cautious, they are not convinced about the success of the community, so they are actually afraid of collaborating with a stranger. They are even uncertain of sharing knowledge and experience.

After a short period of time, the users are accustomed to the communication tools of the community. More than 150 people are members of the community of SIG-GLUE and at least 50 are active members of the community, participating in most of the conversations. This brings up two major issues that concern the needs of the members. Firstly, in order to attract the users to continue communicating, more, enhanced tools of communication must be added. Secondly, after a period of communicating, the members of the community seem to be ready to begin collaborating.

The aforementioned issues imply that the communication tools must be enhanced with more functionality in order to meet the greater demands of the users. In parallel, new features must be constructed in order to promote collaboration between the members and the groups of SIG-GLUE. These are not the only needs of the users. The users are and should be demanding such things from their community in order to be active and part of the success of the community.

3 Bringing users together

The expansion of the web is enormous and the users of the internet have become used to the idea of using the World Wide Web for almost every work, simple or not. The use of the internet by the users is changing according to technological habits and modern trends. Web based communities have become a very easy way of bringing together users without their physical presence to a specific place or time. They do not have to accomplish any task or be present when discussions take place.

In order to achieve all these, very simple tools and lots of good temper are required. But, as aforementioned, the users are very familiar with the trends of the web. The existing tools do not seem to be enough for them. Most users delight in trying new methods of communication. They seem to be extremely attracted to communities and web services that are not 'conservative', but include an alternative way of doing something, even if it is a simple job.

3.1 The hidden power

In the previous section, reference was made to some reasons why some communities, after a period of blossom, begin to stop functioning, with most of the users becoming bored. Therefore, some special characteristics that may enhance the community should be found. A way to do this is to implement hidden or subconscious needs of the members of the community.

One way to enhance a community to attract its members is by using creativity techniques. Creativity techniques have the goal of generating ideas within a group of users and to promote the creativity of each group member (Woerndl *et al.*, 2005). From the simple new members of a community to the most advanced users and to those who are very keen on using collaboration and communication tools, creativity is always a challenge. Especially when referring to a community like SIG-GLUE, where pedagogues, trainees, game designers and game developers meet, creativity seems to be the essential ingredient of success. The creativity techniques can be classified into categories. The two main categories are the creative method, in which ideas are created by spontaneous thinking, and the systematic method, in which ideas are created by systematic and analytical thinking.

The aforementioned issue introduces a hidden technique in order to enhance a community. Another technique is to educate the members about the stable and unified structure of the community. One should think first of the community as a superorganisation and as a social system, because many online socio-technical systems function and operate similarly to offline systems, despite differences in implementation (Flor *et al.*, 2005). This means that the community's members act like they do in real life.

After this, it is easily understood that the members of the community, and therefore of the online society, would like to be treated as unique atoms with different needs and obligations. They would like to feel like they are in their real life and confront the web-based society like the offline society. In addition, the role of the administrator must be hidden, and he should educate only in special occasions, like the teacher's role in a virtual class (Sotillo, 2000). So, it seems to be very important to convince the members of the community on hidden issues like stability and unification.

Having a community treated as a superorganisation and as an offline society means that the members should follow some rules. But most of the web-based communities do not implement clearly any types of rules. This leads to the result that the policy of the community must be implemented in such a manner that the members would be informed about them without being interfered. Policies are an important component of any virtual community since they represent the foundation upon which the community can actually work. Because policies are crucial for the proper working of a community, techniques must be followed, assuring the integrity and confidentiality of crucial issues (Squicciarini *et al.*, 2005). It is of high importance that the members of the community are educated about the security of the community, which means correct flow of information, no revealing of personal information, encryption of private conversations and private groups documents, *etc.* In this way, the members will be attracted to use the community without any doubt or fear.

All the above issues concern the 'hidden power' of a community's elements. The next section will describe issues about enhancing a community that are more obvious to the user.

3.2 *The power of learning*

There is no doubt that this is an age where information and communication technologies are of high importance. This factor means that more and more people are informed about issues concerning everyone and everywhere in the world. But the community of the World Wide Web does not only want to be informed. The users are attracted by the learning character that has been given to the internet. More about web-based communities and the information society can be found in Pyati (2005), Ahmed and Blustein (2005) and Macher and Pathak (2005).

Regarding a web community, more specifically the SIG-GLUE community, its power is derived from the needs of people to learn. A web community must be able to foster science and promote a kind of education. This may result in a very limited web community, but we should take into consideration the positive points of this issue. An example of this can be the community of ICTP (International Centre for Theoretical Physics). This community addresses quite a limited audience, but it develops and becomes bigger year by year. This stems from the fact that the community has declared and confirmed its scientific and multicultural character (Fonda *et al.*, 2005), which attracts more and more people. What derives from all these, is that giving a sophisticated character to a community may become a very easy way to enhance it.

Learning through a community is actually an attractive point. But, how is this learning character achieved? This can be achieved through the learning object paradigm. A learning object can be defined as any digital resource that can be used to support learning (Wiley, 2002). The learning object paradigm has emerged during the past few years in order to accommodate the need for sharing and exchanging reusable learning

resources on the web (Chatzinotas *et al.*, 2005). In this way the members of the community will be able to retrieve and offer knowledge through learning objects, knowing that this knowledge is simultaneously converted into experience by the reusability feature of the learning objects.

3.3 The power of mobility of the atom

The issues discussed in the two previous sections bring to attention some issues that are actually known to be very attractive for users of the internet and members of a community. Besides all these, a community must follow the trends of the technology, and must be flexible enough in order to support all kinds of users.

The latest trend of the technology has the name 'mobility'. It refers to what its name says: provide to the users mobile access and functioning. A web-based community is actually founded on the internet. No access to the internet means no life for a community. In addition, the members of the online community can interact with each other (communicate and collaborate) only when they are in front of their personal computers and at the same time are connected to the web. There are a lot of arguments for a community that has flourished and is big enough to change hour by hour. This means that if a member of the community has not logged in to the website of the community for the past two or three days, he may become isolated from the rest of the members because he has discontinuity to information and knowledge.

Such a community must be enhanced with mobile features. The members of the community should be empowered with the ability to connect to the web-based community through a mobile device like a phone or a PDA. In addition, they should be able to participate in most of the features of the community through the mobile devices. This means that firstly, the community must support small-screen devices, following the open standards, and secondly, promote the functionalities in such a way that a mobile user can access and use them with the few tools (no mouse and no full keyboard) that the mobile device offers. Besides those, the users may also be informed about the transactions in the community via small messages or multimedia messages to their mobile devices.

Mobility seems to be very crucial and it is felt that it is an issue that will concern the web communities in the coming years. The active members of a community really need to be always informed about every action in the community and they actually demand universal access.

4 Design issues – architecture

In the previous sections, the needs of the users and techniques for bringing users together were described. In this section, focus will be on how we can use the aforementioned knowledge in order to create the appropriate architecture for the community.

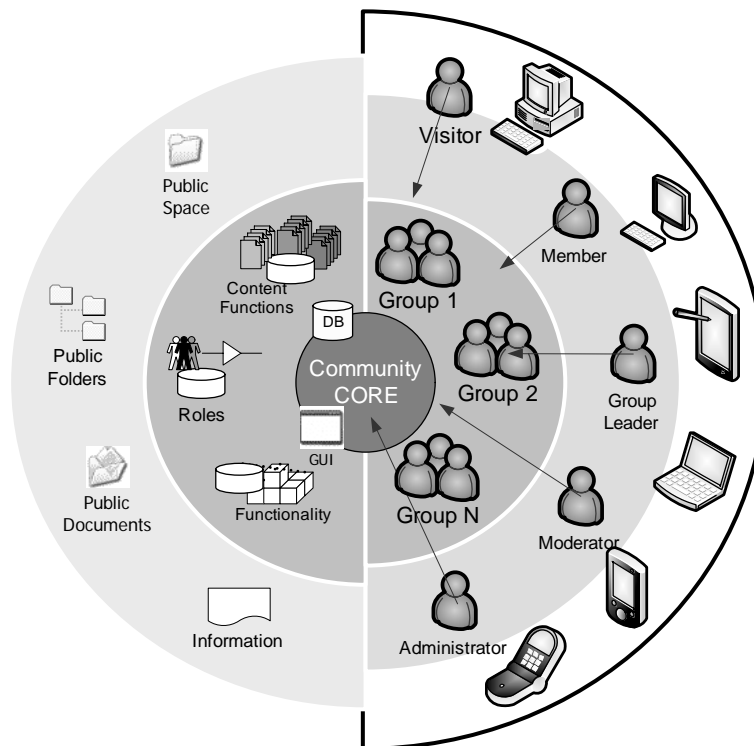
This community will provide users with educational aspects on game-based learning in universities and lifelong learning. It can be therefore seen as a web-based learning tool that can contribute to knowledge acquisition and should respect a number of instructional supporting measures (Cohen, 1994; Slavin, 1996). These measures have been developed to stimulate learning – favourable activities, proven suitable for face-to-face situations, as

well as partially tested in order to promote web-based collaborative education (Hron *et al.*, 2000; Weinberger *et al.*, 2002). The characteristics of each community differ, thus it is important to point out the unique characteristics of the SIG-GLUE community and take them into great consideration (Hron and Friedrich, 2003).

The basic needs and requirement for communication and collaboration of the SIG-GLUE community are organised into the following categories (Figure 1):

- needs for communication with each other or in groups
- needs for collaborating in groups
- needs for shared spaces to store and archive information
- needs for making available/disseminating information to the public.

Figure 1 Web community structure



4.1 Communication tools

SIG-GLUE members need to communicate among themselves in order to exchange opinions, ask questions, offer advice, *etc.* Communication should be both direct and indirect, and both private and public.

4.1.1 Direct

Direct communication requires that all participants participate at the same time and that communication is exchanged instantly (*i.e.*, with little or no perceived delay). Direct communication is required when one needs an immediate personal conversation with a specific person or with a group of people.

4.1.2 Indirect

This type of communication implies that the participants do not have to participate at the same time in a conversation and that the messages may be exchanged with a (possibly long) delay. In this type of communication the time factor is not counted at all and therefore it is used when delay in communication is not crucial.

4.1.3 Person-to-person and group communication

SIG-GLUE is a community where communication between groups is of high importance. Besides, the community is enhanced with the functionality of person-to-person communication in order to achieve a greater level of agreement between two sides.

4.1.4 Private, public and semi-public

Communication is called private when it includes only the parties that are meant to participate in a communication. It is very important not to reveal any of this information to the public. Private communication is needed for exchanges that are of a private nature, or do not concern others and would only overload them with useless information. As people within SIG-GLUE work together, it is highly probable that they might want to communicate in private for various reasons without sharing with the whole community (or parts of it).

However, taking into consideration that the main purpose of SIG-GLUE is to allow a large number of people interested in Game-based Learning to communicate and exchange results, it appears that what is needed most is public communication. All related members – game producers, game developers, content designers and pedagogues – need to easily access all communication functionalities and information exchanges within the community and gain the most from this. In addition to its public nature, this type of communication needs to be archived for future reference.

Between private and public communication, there is a need for semi-public communication. Semi-public communication is the one that is revealed to a special group of people, whose number is greater than the people who are actually communicating, but not to everyone.

4.2 Collaboration environment

Members of the SIG-GLUE community will need tools to support their cooperative work. This is especially true for the SIG-GLUE Working Groups where in each group the members will have a task to execute cooperatively. After the community's expansion, the collaboration environment will be converted into a shared working environment for

the SIG-GLUE ‘family’. This means that this environment should cover specific requirements in order to provide its members with adequate functionality.

4.2.1 Document sharing

A very common task that all the members will face is the need to compose documents for their work. The documents should be classified and collected into a place in order to create an archive for future needs and references. Therefore, document sharing seems to be essential for the better cooperation of the members of SIG-GLUE. This makes their work more practical and easier. Access control is also necessary, as there will be situations where only some members of the group could alter the documents while the rest will just read them.

4.2.2 Calendar

A calendar will be useful to keep the members informed about scheduled conferences, online meetings, and other events or milestones. For the Working Groups, a calendar can be used for scheduling tasks and monitoring work progress. In addition, each member might benefit from a personal calendar. All these various levels of calendars (personal, WG-wide, community-wide) should be merge-able so that one may see in one’s calendar the entries one is interested in and/or which pertain to one’s work within SIG-GLUE.

4.2.3 Support for workgroups

Members of the community must be organised into workgroups. The existence of the workgroups will result in better cooperation, more efficient work and better results. The environment must group members of the same group, support super-members and moderators of each workgroup and provide services that apply to the members of the whole workgroup.

4.3 Shared spaces

As the number of SIG-GLUE members increases, the use of attachments to exchange information becomes infeasible. In addition, forums do not usually support attachments to keep the space requirements down. An alternative is to have one (or more) shared spaces where files can be uploaded and made available to SIG-GLUE members. The shared spaces must include extended functionalities and specific roles for the members because the shared spaces contribute both to communication and collaboration. Depending on the scope of members having access, shared spaces can be public, or private.

4.3.1 Public folders

Public folders will be virtual online folders that will contain documents, deliverables and all other information that intend to be available for the public. Availability of these folders may be a specific service of SIG-GLUE or it can be provided as part of each workgroup area (one public folder per workgroup). Access to the data of these folders will be provided without any constraint.

4.3.2 *Private folders*

Private folders will contain information and documents that will be provided to specific users. These users may be all registered users or specific members of a workgroup. Access to these folders is controlled by access rights management system. A special case of these private shared folders is each WG's shared folder.

4.3.3 *Databases*

Databases contain structured information of various kinds, *e.g.*, an educational games database, a provider's database, a member's database, a links database, *etc.* In these shared databases, each member of the community (subject to having rights to do so) can submit, edit, delete and view information.

4.3.4 *Announcements database*

A special kind of such a database is a news database. As the main purpose of a community is the easy access to news, articles, results and the exchange of knowledge, a well-organised news database where every member of the community can submit links and articles of public interest is necessary. The news may be divided into various categories with the possibility that a moderator could add new categories.

4.4 *Basic platform*

All of the above communication and collaboration tools lead to the creation of a unique platform. Besides that, special attention must be paid to the full customisation of each members community (the so-called 'my' part of the community) and to the efficient administration of the content and the functionalities. Many available web tools exist that can be used in order to implement most of the aforementioned tools but the fundamental issue is to unify all these in a manner that would result in a complete environment, fully functional with unified layout and structure.

PhpNuke is an open-source content management system for the web that allows the easy creation of web portals that support web-communities. What really makes it suitable for use is the huge open-source community that stands behind it, providing additional modules and fixing possible existing bugs in the code. Despite this expanding community, PhpNuke is considered to not be a proper choice for a web portal as it lacks security.

After investigation of the positive and negative points of the PhpNuke platform, it was decided to use only the core mechanism of PhpNuke that does all the 'dirty' work of content management. All the further functionality that is needed by the community is added to the existing or to new modules. In addition, many changes are made to the whole platform of PhpNuke in order to achieve the necessary security level. Later, this paper will describe this core mechanism of PhpNuke that was used to construct the community of SIG-GLUE and methodology of using it will be given in order to transform any static pages to a functional online community.

5 Enhancing the community – implementation issues

In Section 3, three main categories of enhancing a web-based community were analysed. In the previous section the focus was on the architecture of the SIG-GLUE community. This section will try to describe what changes should be made to the architecture in order to really enhance the community of SIG-GLUE.

5.1 Hiding the power into the architecture

What is discussed in this paragraph is the hidden power that should be included in the architecture. Hidden power refers to the techniques that should be hidden in such a way that it will not interfere with the users of the community's interface.

The architecture should support personalisation and unification of the modules of the community. The community should have a stable and unified graphic user interface with integrity of information and security. What was done in order to enhance the community's integrity and security issues was to omit any unused functions, and modify all the functions that may contain any malicious code. The interface was changed in order to achieve a unified and stable layout, which resulted in the layout that is shown in Figure 2.

Figure 2 Screenshot from the main page of the community



As we can see from the picture, we transpose the right menu of the PhpNuke platform was transposed to the top of the page in order to achieve a unified layout throughout the different modules of the community, because there were occasions when modules covered the rightmost menu. The menu to left is the 1st level menu with the 2nd level menu coming right after the title of the page, as can be seen from the following figure.

Figure 3 Announcements module with submenu right after title: ‘Announcements’

After making the layout unified, all the functionality of the module had to be changed in order to give life to the superorganisation to act as a stand-alone system. The community became an ‘open community’ where the moderators are not needed to accept or reject the content from the members. The members are free to use any functionality of the community apart from those that could harm the content or the integrity of information. On the other hand, special attention was given to the ‘private’ spaces of the community in order to assure the members about the high security level. In this way was achieved the empowering of the community’s core system.

5.2 Promoting the ‘learning’ characteristic

SIG-GLUE is a community that aims to bring together people who are concerned about Game Based Learning (GBL) in universities and lifelong learning. Considering who might be in this group of people, it was concluded that they are all people who are concerned

about science and research, so it could be useful for the development of the community, to attract this kind of users by adding a sophisticated style to the community.

Firstly, places were created where one can learn about the community, in order to convince the people who are aware of GBL that the community's goals included GBL. In addition, means of synchronous and asynchronous communication were created in order to begin the discussion groups with the people who want to learn through the community. Besides that, it was essential to create databases and shared spaces in order to store the learning objects and convert them into experience and references.

The expansion capability of PhpNuke helped in creating the appropriate tools for promoting the learning characteristic. The Glossary, the useful Links and the Good Practices that can be found in the community point instantly to a place of knowledge spread and attract more and more people.

The community is separated into places that can be classified based on the access that the users have and from the type of content. Creating something that can be compared to a real library, the library of the community of SIG-GLUE includes almost everything that can be useful for someone who wants to be fully informed about GBL in universities and lifelong learning.

5.3 Supporting mobile users

The next step to be taken is to support mobile users. Something very easily done in order to make the users intimate about changes in the community and the support of mobile devices is the information through mobile devices. The members of the community will be informed through SMS or MMS about news of the community, new discussions in the forum, new forum posts that may possibly concern them, upcoming events, *etc.* This first step seems to be very crucial and will act as a venue for debate. From the results of this 'debate' it will be understood whether the users will be attracted by the community's mobile character or not.

If the results are positive, a redesigning of the community will begin. The redesigning will concern only the code of the community because it will have to be changed in order to be supported by small-screen devices. This means that either the html pages will be converted into a language supported by all the mobile devices or that the most crucial parts of the code will be rewritten in order to become visible and fully functional in a small device.

Most of the functionality must be changed because the mobile devices do not easily handle browsing the internet. This means that one can post a reply to the forum by sending a voice message, or synchronising the calendar of his/her PDA with the calendar of the community, downloading in this way all the events that may concern him/her.

5.4 Enhancing the community

Enhancing the community does not necessarily mean that more and more functionality and modules must be added. The community can be enormous in terms of the number of members and content and suddenly stop working for no reason at all. The community should have the appropriate foundation in order to stand the test of time.

Strict but flexible policy, enhanced security, integrity of information, sophisticated characteristics and support for any kind of user and any of the user's requests is the recipe for a community that will be a success.

6 Functionality – the ‘ideal scenario’

After discussing issues on how to enhance the community, it is the right time to explain the ‘ideal scenario’ of the empowered community. The functionality issues and the first scenario of the community can be found in Antonellis *et al.* (2005). The scenario that will be described contains a user, more specifically, a game designer, but in general the user could be an educator, a trainee, a game designer or a game developer and the scenario would still be the same.

The dissemination of information from the SIG-GLUE community through MMS advertisements leads a game designer to visit the community. She is attracted by the way she learned about the community (via MMS), reads all the information about the SIG-GLUE community and decides that it is a good idea to become a member of this community in order to share their experiences and acquire knowledge.

She registers into the community and creates her personal information and interests. An email is sent to the game designer welcoming her to the community and is followed by some information on what could be useful for her in the community according to the interests she created a few minutes earlier. After browsing the pages of the community that were supplied by the automatic mechanism, she finds it attractive to become a member of the game designers group. She creates an account of membership to the group and the group moderator gives the game designer full access to the semi-public functionality of the group.

The game designer can now become an active member of the community. She submits events to the calendar, takes part in the events and remains synchronised with the SIG-GLUE calendar by synchronising her mobile device. She takes part in the events of her group and posts replies to the discussions made. If, for any reason, she is away from a computer, she is able to take part in events, discussions and brainstorming by using the features that are designed for her mobile device. In addition, she uses the ‘library’ of the community in order to upload content and she downloads any useful content acquiring knowledge and gaining experience.

After a short period of time, and many hours spent in the community, she has a prototype idea on how to create a better educational game. She feels secure enough to share her idea with the members of the community. A new section in the discussions section of her workgroup begins and opinions from all the members are heard. A small survey begins on the different ideas derived from the discussion. The members of the group are called to vote for the best idea, either through their personal computer or mobile device (SMS, MMS). The results are posted to the community and the ideas are presented to the other working groups. The presentations can be found in the public sections of the community.

A considerable number of people are discussing the idea, trying to enhance it and support it by evidence, which is uploaded all the time in the community’s shared spaces. The idea is widespread through the member of the community’s groups. Many papers and practices on the idea are written and a universal survey and discussion begins in the community in order to conclude on the final idea. The results are posted and the final version of the idea becomes a complete proposal. The company of the game designer will design the game. Companies from the members of the groups will attend to the rest (practices, scenario, game developing, testing and production).

The 'idea' of the game designer has become an educational game and many Universities use the game because they learned about it through the community's dissemination features. The game designer could have created the game alone with her company, but through the aforementioned procedure, a learning game was designed with the collaboration of trainees, educators, game designers and game developers.

The example that was described introduces the ideal scenario of the community and seems to be a chimera, but it should be noted that the community does support all the aforementioned functionality, and if one wants to follow the aforementioned procedure, he/she will be able to do it.

7 Conclusion – future work

This paper presented the technological functionality and architectural issues of an enhanced web-based collaborative environment. The features of this environment include Shared Spaces, Communication tools and Collaboration tools. These features are implemented by creating an extended platform based on PHP-NUKE. PHP-NUKE and the use of PHP-MySQL technology were chosen because its open-source style harmonises to the style and tone of the open web-based community intended to be created. This platform includes all the necessary tools that are needed by the members of a community. In addition to the standard tools, some integration of them is compulsory in order to produce the adequate features for the members. Besides the basic tools, many more modules and blocks are created in order to accomplish the static pages or some features that are not implemented in PHP-NUKE. We analysed the demands of the community and specified the necessity of communication and collaboration between the members. Together with the above, the role of the members in the community was described thoroughly, because it is believed that the success of a community is based on the cognition of the target group rather than the use of advanced and perfect features. This means that firstly, focus should be on establishing the target group and its special needs and after that, modifying the basic architecture.

In the future focus will be on the needs that will come up through the use of the community and trying to cover the needs of the members in communication and collaboration issues. In addition, following new technology architecture, all the features and the services could be upgraded, with the aim of having a faster communication system and more productive collaboration features. Features, including video conference, voice conference, application sharing and smart notes tools, could be added as advanced modules of the platform or as stand-alone parts, which will use the same database with the platform. In conclusion, it is essential that a web-based community should follow new technology issues in order to become, not only a huge community in terms of numbers, but also to promote the collaboration and communication of remote internet users in an optimal way.

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Notes

- 1 *TOPSIM, Business games*, Planspiele by TERTIA Edusoft, <http://www.topsim.com>
- 2 *Unigame: Game-Based Learning in Universities and Lifelong Learning/MINERVA*, <http://www.unigame.net>