

# An Integration Platform of Social Networking Applications to Support Life Long Learning in Rural Territories: the “SoRuraLL Virtual Learning World” Environment

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**Abstract**—Social networking applications can form a valuable tool towards lifelong learning, especially in rural areas where they can be used to enhance computer literacy and deal with the digital divide. In this paper we present the “SoRuraLL Virtual Learning World”, a platform that was implemented in the framework of the SoRuraLL Lifelong Learning program. The platform, which is organized per user and per user site, combines social networking and e-learning tools and targets populations in rural areas.

**Index Terms**— Social networking, life long learning, rural digital divide, social e-learning

## I. INTRODUCTION

SOCIAL NETWORKING APPLICATIONS are opening new doors for more effective learning and have the potential to support life-long competence development [1]. In this paper we present a life long learning environment, the “SoRuraLL Virtual World”, a platform that was implemented in the framework of the SoRuraLL Lifelong Learning program.

The paper is structured as follows: section II presents Social Networks and the notion of Social Web. Section III explains how Social Networking can be used in order to enhance computer literacy, especially in rural areas and presents the SoRuraLL project. In section IV, the SoRuraLL Virtual Learning World (the platform that was implemented) is presented in detail. A description of the system and its functionalities and an evaluation of the platform are included in this section. The paper is concluded in section V.

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## II. SOCIAL NETWORKS AND THE SOCIAL WEB

A social network is a social structure made up of individuals (or organizations) called “nodes”, which are tied (connected) by one or more specific types of interdependency, such as friendship, kinship, common interest, financial exchange, dislike, sexual relationships, or relationships of beliefs, knowledge or prestige.

During the last years the notion of social networks has become more popular to a wide range of web users. The main reason for this change is the development of technologies that facilitate interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web. This shift is described by the term “Web 2.0” [2]. This term is often applied to a heterogeneous mix of relatively familiar and also very emergent technologies. The former may appear as very much “Web 1.0,” and the latter may be seen as too evanescent to be relied on for serious informatics work [3]. The main difference of Web 2.0 is that users are not only content “consumers” but also content “providers”. A Web 2.0 site gives its users the free choice to interact or collaborate with each other in a social media dialogue as creators of user-generated content in a virtual community, in contrast to typical websites where users are limited to the passive viewing of content that was created for them.

Social Web has emerged as a major component of the Web 2.0 movement. The Social Web can be described as people interlinked and interacting with engaging content in a conversational and participatory manner via the Internet. Social Web is enabled by the following applications:

- **Wikis:** a wiki is a website that allows the easy creation and editing of any number of interlinked web pages via a web browser. A wiki enables communities to write documents collaboratively. A single page in a wiki website is referred to as a “wiki page”, while the entire collection of pages, which are usually well interconnected by hyperlinks, is “the wiki”. A wiki is essentially a database for creating, browsing, and searching through information. A wiki allows for non-linear, evolving,

complex and networked text, argument and interaction [4].

- **Forum:** a Web forum, or message board, is an online discussion site where people can hold conversations in the form of posted messages. They differ from chat rooms in that messages are not shown in real-time, to see new messages the forum page must be reloaded.
- **Blogs:** a blog is a website that allows users to reflect, share opinions, and discuss various topics in the form of an online journal while readers may comment on posts. Entries typically appear in reverse chronological order. Most blogs are primarily textual, although some focus on art (Art blog), photographs (photoblog), videos (video blogging), music (MP3 blog), and audio (podcasting). Microblogging is another type of blogging, featuring very short posts (e.g. Twitter.com).
- **Media Sharing:** media sharing allows digital communities to aggregate, upload, compress, host and distribute images, text, applications, videos, audio, games and new media. Popular media sharing sites are YouTube.com (video sharing), Flickr.com (photo sharing) and RapidShare.com (file sharing).
- **Social networking:** a social network service is an online service, platform, or site that focuses on building and reflecting of social networks or social relations among people, e.g., who share interests and/or activities. A social network service essentially consists of a representation of each user (often a profile), his/her social links, and a variety of additional services. Most social network services are web based and provide means for users to interact over the internet, such as e-mail and instant messaging.
- **Folksonomy:** a folksonomy is a system of classification derived from the practice and method of collaboratively creating and managing tags to annotate and categorize content. This practice is also known as collaborative tagging, social classification, social indexing, and social tagging.
- **Messaging applications:** messaging applications allow real-time direct communication between two or more people. The form of communication may be text, voice or video based.
- **Social Bookmarking:** social bookmarking is a method for Internet users to organize, store, manage and search for bookmarks of resources online. Descriptions may be added to these bookmarks in the form of metadata, so users may understand the content of the resource without first needing to download it for themselves. Such descriptions may be free text comments, votes in favour of or against its quality, or tags that collectively or collaboratively become a folksonomy. In a social bookmarking system, users save links to web pages that they want to remember and/or share. These bookmarks are usually public, and can be saved privately, shared only with specified people or groups, shared only inside certain networks, or another combination of public and private domains. The allowed people can usually view these bookmarks chronologically, by category or tags, or via a search engine.
- **Comments:** commenting allows Web users to publish their opinion for web recourses through comments. Commenting is very popular in blog posts and media sharing applications.
- **RSS:** RSS is a family of web feed formats used to publish frequently updated content such as blog entries, news headlines, audio and video in a standardized format.

### III. SOCIAL NETWORKING TO ENHANCE COMPUTER LITERACY FOR RURAL CITIZENS

Information and communication technologies are becoming increasingly integral to all aspects of society. They bring to many members of society benefits such as new ways of communicating, and more comprehensive sources of information and learning [5]. As more individuals are connected online, those who are not connected are increasingly in danger for becoming more marginalized within society. World widely there is a rising concern over this “digital divide” [6][7][8]. Most countries that have been concerned about this problem have instituted policies aimed at reducing aspects of it. In reality there are several possible concrete cases of the digital divide gap occurrence [9].

The Urban/Rural divide refers to those set of people without an enhanced data capability which will lead them to be unable accessing the expected benefits. This concern is seen to be greatest in relation to those living and working in rural and remote areas since the lower rates for data access for these consumers place them at a disadvantage in comparison to metropolitan consumers. For these citizens the problems of missing infrastructures, incentives and computer literacy (the factors leading to Digital divide) are bigger and more difficult to solve. The world widely experience shows that several specialized initiatives are needed for rural areas in order to anticipate expansion of current digital divide and at the same time to provide solutions to deal with the actual problem [10]. In general, the world wide experience shows that most of the effective solutions to ensure access to technology are involving also successful training, leading to enhanced computer literacy for local citizens [11][12][13].

Social Networking applications can form a valuable tool towards the above mentioned aims. They can form a powerful tool to:

- Teach students how to be effective collaborators in that world, how to interact with people around them, how to be engaged and informed twenty-first-century citizens [14].
- Build learning communities for primary and secondary education (involving teachers, students and parents).
- Assist specialized scientific education [15]
- Provide new opportunities for training professionals [16]
- Provide new opportunities for lifelong learning initiatives [17]
- Create a new learning style of “learning by doing” [18] by providing motivation for exchange of actual practical experiences.

However, for rural citizens, in order to let them gain the benefits from the above social networking applications, it is

important to understand their lower level of computer literacy and motivation, leads to a need for a different kind of customized solutions [19]. Under this perspective, in this paper we present an Information System (the so called “SoRuraLL Virtual Learning World” –VLW-) that has been developed within the SoRuraLL (www.sorurall.eu) Lifelong Learning Program. It delivers a specialized Social Networking platform customized to the needs and specific competences of rural citizens.

The methodology to achieve the most effective design of this customized environment was as follows:

- Initially all partners of the project collaborated to exchange experiences about:
  - current needs and problems in selected rural sites in partners’ regions
  - current status in relation with use of ICT Social Networks
  - best practices and success stories from experiences inside and outside the consortium
- Based on the findings of this extended collaborative work, an initial selection of functionalities to be included in the VLW have been decided and presented to the target groups in all countries through a series of workshops (customized to the specific situation of each targeted site). The outcomes of the workshops gave the consortium the opportunity to finally select the functionalities and interface to be implemented.

This list of these selected functionalities does not include only mature ones (chosen by the selected users as of high interest) but also several ones assessed as highly useful for the selected target groups based on their specific local needs identified. This led to several differences comparing with the functionalities of the general scope Social Networking platforms:

Generic and simple applications such as blogs, wikis, and forums have been chosen to be delivered separately (and not only integrated through the Social networking platform). As a result the whole environment is easily customized by the user to use only these generic and easy to use functionalities (instead of the whole sophisticated Social networking platform)

The whole environment is also easily customizable per country. As a result the multilinguality feature will not refer to the translation of user interface but mainly to the establishment of separate portions of it, per user site. For example the targeted user site in Ireland is customizable to use only blogs, video conference and external applications (which are the functionalities needed based on target groups specific needs). Of course a main transnational portion of the whole environment also exists and all separate local portions have a common database of users.

These two levels of customization (per user and per user site) are the main innovations which have been selected (based on the initial studies and the workshops outcomes) to make the so called “SoRuraLL Virtual Learning World Environment” an Information Environment adapted to the needs and competences of rural populations.

#### IV. THE SORURALL VIRTUAL LEARNING WORLD

##### A. System overview

The Sorurall Virtual Learning World is a web based platform that integrates several Web 2.0 services. The system is implemented with open source technologies (Apache, PHP, MySQL) and platforms (Drupal, Elgg, Dokeos). The different platforms were installed, configured and modified in order to operate as a unified service. Also, additional modules were implemented for the needs of the project. As a result the end-user interacts with the system through a common interface and the existence of the three different platforms is transparent to him/her.

As mentioned in the previous section the system is organized per user and per site. The Virtual Learning World is divided to seven portals (European, Bulgarian, German, Greek, Irish, Polish and Spanish) based on users’ nationality (Figure 1). All portals have the same interface, support the same functionalities and are used for the categorization of the content per country. For example the Greek user may select to use the Greek portal while he is also able to navigate to the Polish portal as well. This allows the interaction between people from different countries and the classification of the content based on language at the same time. The system supports Single Sign On (SSO) allowing all users to use any service from any portal with a unique account.



Figure 1. The main page of VLW

##### B. Users’ types

The SoRuraLL VLW supports four users’ types:

- Platform administrator: the administrator of the SoRuraLL VLW platform has full privileges over the platform functionalities and appearance. He is able to change or customize the appearance of the system. He is able to enable or disable specific modules and services of the application. Finally, the administrator is responsible for managing the accounts of the users (enabling or disabling access).

**National administrators:** national administrators are responsible for managing the provided services for each country portal. For example the Greek national admin may enable or disable the services that are provided to the users of the Greek portal. As a result, the enabled services may differ between different portals.

**Simple users:** simple users are subscribed in the SoRuraLL platform's database. In order to become a user of the system one has to apply, filling in the corresponding form. The platform administrator checks the application and accepts it or not. Simple users are able to navigate through the different portals and use the enabled (by the national admin) services for each one. They may also change the appearance of their homepage.

**Guest users:** guest users are not subscribed in the SoRuraLL platform's database. They are unable to log into the system and use the majority of the provided services. The only services that are accessible to guest users are blogs and wikis. However, guest users are only permitted to read blog and wiki posts and they do not have the right to create new posts or leave comments.

### C. System functionalities

As mentioned in a previous section, the SoRuraLL VLW system integrates three different platforms that operate as a unified service. The supported functionalities are presented per platform below.

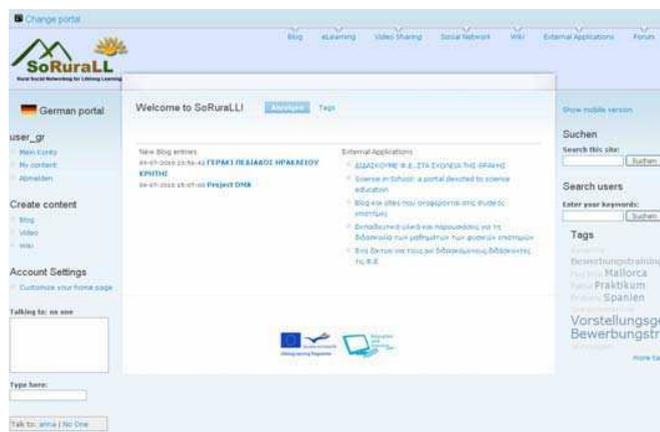


Figure 2. The integration platform: A Greek user navigating in the German portal

#### 1) Integration platform

This is the main entry-point to the integration platform, the Virtual Learning World. This part of the system is based on the open source CMS Drupal. The main platform (Figure 2) incorporates most of the functionalities of the VLW which are presented below:

- **Blogs:** users are able to create blog posts and also post comments on them.
- **Forum:** the forum allows users to exchange opinions on a variety of topics.
- **Video Sharing:** users may upload and share their videos or post videos from popular video sharing services like YouTube.

- **Wiki:** the wiki tool permits the collaborative creation of web pages.
- **External Applications:** this tool allows national administrators to add external links to other services and simple users to visit them.
- **Instant Messaging:** instant messaging allows users to exchange messages in real-time.
- **Tagging:** the system allows the tagging of all content that is uploaded to the platform, creating thus a taxonomic scheme. A tag cloud is included in each page of the VLW.
- **Video Chat:** this functionality uses an external service called Vagipe and allows the users of the VLW to start a video conversation if their computers are equipped with a microphone and a camera.
- **Web Chat:** web chat, comparing to instant messaging, permits the exchange of messages but not in real time. As a result the users are able to start a conversation and continue it in the future, without the need that all parties are online.
- **Mobile Version:** a mobile version of the VLW is available for users that are equipped with a mobile device with access to the Internet. Almost all functionalities are supported in the mobile version.

As already mentioned these functionalities can be enabled or disabled by the national admin of each portal.

#### 2) E-Learning environment

The e-learning application, which is based on the SCORM-compliant open source software Dokeos, is a tool for enhancing Lifelong Learning through an asynchronous e-learning platform. National administrators are able to create courses in their language. For each course they can enable a set of functionalities such as learning content upload, announcements, links, students groups, chat, forum, surveys, exercises, wiki, projects etc. Each user is able to subscribe to a course and follow it.

#### 3) Social Networking application

The Social Networking application allows users to create their own online social network by creating relationships with each other. Each user maintains his/her profile by providing personal information which is visible to his/her friends. The application supports the following functionalities:

- **Friends:** users are establishing mutual relationships and become friends.
- **File sharing:** friends are able to share files, such as photos, documents etc.
- **Blogs:** each user is able to create his own blog and upload blog posts that his/her friends are able to read and comment.
- **Groups:** groups are entities that users can join, leave and post content to. In this way, users may create communities based on common interests.
- **Pages:** this functionality allows users to collaboratively create a set of documents in the form of web pages.
- **Bookmarks:** users are able to bookmark content uploaded to the system such as status updates, files, blog posts etc. Bookmarks are organized in a list for each user, while someone can visit the bookmarks of his/her friends.

- Messages: this service allows users to exchange private messages.
- Tagging: the social networking application supports tagging of content, thus making searching and organizing data much more convenient.

#### D. System evaluation

The evaluation of the platform is based on usage data that are collected during the pilot usage phase (November 2009 to June 2010) with two different approaches that are presented in the two following subsections.

##### 1) System and content data

Those data are collected directly from the database of the platform and include information such as number of users, number of blog posts, number of forum posts etc.

Tables I, II and III present the collected data.

TABLE I  
NUMBER OF USERS PER LANGUAGE

Language	Number of users
Bulgarian	12
English (European Portal)	8
German	85
Greek	17
Irish	23
Polish	58
Spanish	31

TABLE II  
CONTENT PER LANGUAGE

Language	Blog posts	Forum posts	Wiki pages	Uploaded videos	Tags
Bulgarian	6	-	-	-	7
English	25	3	6	10	63
German	53	1	5	-	166
Greek	2	2	1	5	5
Irish	14	-	-	-	41
Polish	7	-	3	11	59
Spanish	5	6	42	2	76

Concerning the null values at tables II and III, as already mentioned, some services of VLW were disabled by the national administrator of the respective portal.

TABLE III  
SOCIAL GROUPS AND E-LEARNING COURSES

Language	Social Groups	E-learning courses
Bulgarian	-	-
English	-	3
German	3	2
Greek	2	1
Irish	-	-
Polish	1	2
Spanish	-	1

##### 2) Usage data

The Google Analytics script was installed in the platform in

order to collect data about the usage of the system. Our system, during the pilot period had 2158 visits from 712 unique visitors. Table IV presents the number of visits based on the origin country of the visitor.

TABLE IV  
NUMBER OF VISITS PER COUNTRY

Country	Number of visits
Belgium	122
Bulgaria	65
Cyprus	21
Germany	447
Greece	612
Ireland	82
Netherlands	10
Poland	285
Spain	452

A significant number of visits origins from countries that were not participating in the pilot phase. This is because some users despite their native language live all around Europe.

#### V. CONCLUSION AND FURTHER WORK

In this paper the SoRuraLL Virtual Learning World was presented, a web-based integration platform that was implemented combining open source technologies in order to enhance Lifelong Learning in rural territories. The platform incorporates social networking tools and e-learning applications and aims to deal with the digital divide, a problem that prevents rural populations from taking advantage of the new information and communication technologies. The platform was described in detail and an evaluation based on the content that was exchanged through the platform and other usage statistics was presented. Concluding, the evaluation from the pilot functioning of the system provided us with satisfying results concerning the usage of the platform. It seems that the impact of this web-based tool was positive, which is very important since users from rural areas are usually less familiar with computers. In the future we intend to perform a more thorough evaluation of the SoRuraLL Virtual World platform, taking into account the users' opinions. Moreover based on the results of this evaluation we will proceed with changes to the interface or functionality of the platform, if necessary.

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