Portfolio Social Network

- Project report -

Student: Jordi Magriña Cortes
Bachelor Project
University of Southern Denmark

Supervisor: Nasrullah Memon

Summary

In the following document it is detailed the Bachelor Project of Jordi Magriña Cortes, exchange student in the University of Southern Denmark from the Universitat Politècnica de Cataluña, Barcelona.

First you will find an explanation of this project and why, instead of any other field in the computer software, I chose to create a web application and deep into web technologies. Also which is the reason for creating an application to provide a way to show his motivations and interests and facilitating users to create a different way to introduce themselves.

It is also explained the technologies used in the development of the web application, as well as the requirements that has been taken in mind when choosing them as well as the details of the system design such as the conceptual model and physical implementation.

You also will find a comparison with other similar or related projects that are already on Internet and what is the differentiation (value proposition) of my project compared with them, as well as my personal conclusion of the project, the limitations that the web application have and how I think that in the future can be improved.

I would like to thank my supervisor, Nasrullah Memon, for giving support to the idea that I presented and his interest in it.

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1. Introduction

In the first chapter of this document it is detailed the reasons and goals of this project.

1.1. Reason

When a student finishes his studies in the university, it is time to begin another big challenge in his life: to find a job. It is not an easy task, nowadays we all have to compete for a single position with other applicants from all over the world.

Normally, when someone apply for a job, he send his resume with a letter of motivation and that is all the information that the recruiter has in his hands to choose the candidates. Sometimes the recruiter can check Social Networks such as *LinkedIn*, but basically the information found there is almost the same as in the resume.

Because of the big amount of information of applicants that the recruiters have to handle, a lot of them are very pleased to see some of the work that the applicant did in the past, in the university or just personal ideas that became into projects, to make more easy the sift between applicants. Giving a portfolio, in just a few minutes by taking a look on it, the recruiter can get a more deep idea about the skills of the applicant and some aspects of the personality that can be decisive in a process selection, such as:

- Has an entrepreneur spirit?
- It is a methodical person or the result looks chaotic?
- Did he worked on group projects (group working skills)?
- Has the required personality qualities?
- Has directing skills?
- In which fields shows more interests?

This is the kind of questions that can be answered by taking a look into an applicant portfolio. In this project these aspects will be provided through a web application to let users create their portfolio.

1.2. Motivation

Probably all the students when they are about to finish their degree, they worry about which kind of jobs they can get and if they are really prepared to jump into the professional world. At least, for me it is like this.

Sometimes I search for job offers just to know which are the expected requirements and skills more common and the offered position.

In one occasion I read something that surprised me. A company that was not expecting applicants to send a resume to know if they studied in a good university or if they were students with good grades. They wanted to know if the applicant is a motivated person in his work, if he has interests and initiative in solving problems and passionate with creative ideas. They wanted to know it through a portfolio.

Someone might think that portfolios are oriented for art professionals like painters, photographers, web designers, graphic designers, etcetera. But in the field of computer software the code that a engineer write it is also a good way to know how he worked as well as the technologies and skills has put into practice.

I searched on Internet about this topic to find out if it was just a separate case or a general idea and I found a post in a Blog[1] with an interesting comment:

> *"When I've interviewed developers, they rarely bring any samples of their work to show. This puzzles me. Anyone can put together boilerplate resume text, full of assertive verbs and fancy keywords."*
>
> …

[1]http://www.codinghorror.com/blog/2004/10/a-programmers-portfolio.html

> *“You don't have to be working on a web application or website to have something worthy of putting in a portfolio. As a fellow developer, I can appreciate the beauty of a well-designed console application, or a clever applet with hardly any interface at all. If you've written code you're particularly proud of, show me that.”*

Ending with the following sentence

> *“The portfolio is important, but what's more important is that you are excited about what you worked on.”*

All these words gave me the motivation of creating my own portfolio, and I thought that the best way of showing that I am excited with my work is create my personal website.

After some time thinking and preparing the idea in my minds, I thought that I can turn this little personal portfolio that I had in mind in a web application to let others create their own portfolio. In order to enabling me the opportunity of creating a more dynamical site, with very different requirements.

This is a good reason for putting hands on in a real web application, and that is the reason why I proposed this idea for my bachelor project.

1.3. Writing the idea

The idea of this project is to create an **information system** to allow users to create a public portfolio to be accessed by others via Internet.

A **career portfolio** is a document used to plan and organize the education, show work samples and the skills used. A portfolio can be useful to apply for jobs, colleges, to track personal development, and many others. It depends on the personal situation. Any work that one can be proud of it can be exposed in a portfolio.

In the context of this project, users should be able to put in the portfolio the common information about themselves such as personal information (as in many other social networks) but also some information about the work, the specialties, and a description of his educational and professional background.

More importantly, user should be able to introduce the projects he worked on: personal ideas carried out into projects, project assignments from college which may be interesting, collaborations in existing projects, etcetera.

Here is where the user will be able to show which part of the project he was responsible, which skills and technologies were used to achieve the objectives, if it was a personal or group project, and show samples of the code (code snippets), an important part of the portfolio because it is where user will show real work.

Other important part of the system, the one that gives the “social” part to the application, must be the possibility of knowing with which other users of the network a single user had worked together in the same project and which responsibility inside the project had each member.

To differentiate from other web sites, the idea is focused in a reduced group of users, mainly software engineers but also to other professionals that programming is also a part of their job.

1.4. Value proposition

Nowadays there are various social networking websites and a more will come. It is difficult to introduce a new product into the field because there are very big companies with a large community of users. New products have to introduce something relevant to users to attract their interest.

This project wants to differentiate from other social networking websites focusing in a reduced group of users, in particular the software engineers (or professionals that programming is a part of their job), to give them a way to show their work through the specific vision of a portfolio.

This means that the user, in place of telling in which university has been studied or in which companies have worked (if any), that is the common information that can be found in many other social networking websites, can complement this information (that of course is necessary) with a portfolio by saying which skills he had and in which fields he is specially good, specifying where (in which projects) he has used his abilities and capacities to solve real problems, and which was the motivation for doing it.

It is also important, he can show real samples of the work that go along with the information provided, because, as said before in the previous pages of this document, a portfolio can give more information about the applicant such as if it is a person with interests, proactive with personal initiative, eager to learn, and many other aspects of himself that are more difficult to be appreciated without a portfolio. So if you are this kind of persons, you might be interested in having it.

Illustration 1 shows the design of the web site logotype.

Portfolio Social Network
don't tell. show your value

Illustration 1: Portfolio Social Network logo

1.5. Objectives

The main objective of the project is the creation of an **information system** that gives a solution to the previously explained requirements.

The general objectives for the creation of this application are:

- A information system available to be accessed via **web browser** and available to:
  - Access to users profile information (personal and professional)
  - Access to projects and the associated information
  - Support the social functionality of creating and joining existing projects and associate information about the role of each of the team members

More specifically, the user should be able to:

- Create a private user account to add and update his personal and professional information
  - Name of the user, email, date of birth, country and city
  - Password for accessing into the account
  - Personal website, LinkedIn and Twitter accounts (if any)
  - Professional headline, specialties and summary of the resume

- Create projects with the possibility of adding and updating the information
  - Name of the project, category, motivation, period and description
  - Website of the project (if any)

- Join projects by indicating the role and related information
  - Responsibilities inside the project, description and skills required for the development of the task
  - People in charge and dedicated hours
  - Add code snippets of the work

1.6. Benefits

For the applicant the principal benefit is to be able to show a more realistic view of his value to other people. If the applicant is a proactive person with interests, motivation and eager to learn, this will be a good way to show all his qualities that otherwise probably have gone unnoticed, and put himself in a better position in front of the other applicants.

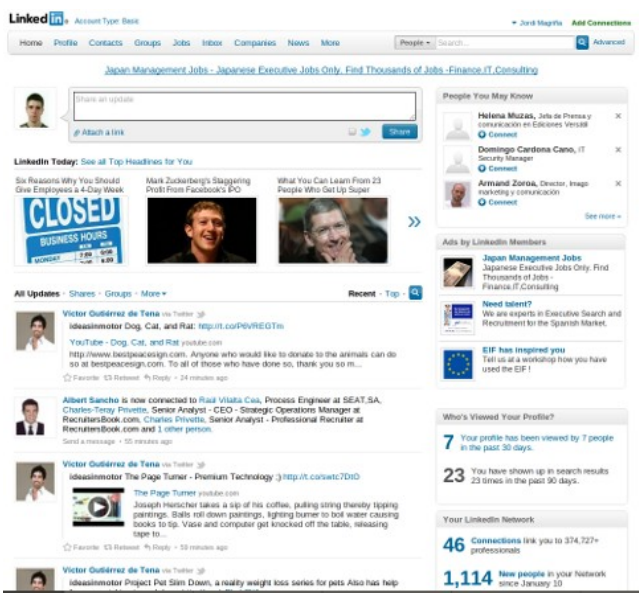
On the other hand, the benefits for the recruiters are that they will be able to see real work from the applicant, acquiring the capability of delve into specific aspects of the personality of the applicant that could be interesting in a process of selection, and also interests and experience in programming languages, technologies and tools that could be a plus to the position.

2. State of the Art

The state of the art refers to the level of knowledge and development reached at any particular time as a result of the latest methodologies employed. In other words, the state of the art is defined as the incorporation of new ideas and the most up to date knowledge. This chapter introduces those applications that we could define as “state of the art”.

Linked In

LinkedIn.com is the main social network for professional networking. With more than 135 million users over more than 200 countries. It can be used to find jobs, people, and business opportunities. Users can follow different companies and get notifications about the news and job offers available. They can recommend and be recommended by other connections of the network.



Japan Management Jobs - Japanese Executive Jobs Only. Find Thousands of Jobs -Finance,IT,Consulting

LinkedIn Today: See all Top Headlines for You

Six Reasons Why You Should Give Employees a 4-Day Week

Mark Zuckerberg's Staggering Profit From Facebook's IPO

What You Can Learn From 23 People Who Get Up Super

All Updates · Shares · Groups · More

Recent · Top

Victor Gutiérrez de Tena via Twitter
ideasinmotor Dog, Cat, and Rat: http://t.co/P6VREGTm
YouTube - Dog, Cat, and Rat youtube.com
http://www.bestpeacesign.com. Anyone who would like to donate to the animals can do so at bestpeacesign.com. To all of those who have done so, thank you so m...
Favorite · Retweet · Reply · 24 minutes ago

Albert Sancho is now connected to Raúl Vilalta Cea, Process Engineer at SEAT,SA, Charles-Teray Privette, Senior Analyst - CEO - Strategic Operations Manager at RecruitersBook.com, Charles Privette, Senior Analyst - Professional Recruiter at RecruitersBook.com and 1 other person.
Send a message · 55 minutes ago

Victor Gutiérrez de Tena via Twitter
ideasinmotor The Page Turner - Premium Technology :) http://t.co/swtc7DtO
The Page Turner youtube.com
Joseph Herscher takes a sip of his coffee, pulling string thereby tipping paintings. Balls roll down paintings, lighting burner to boil water causing books to tip. Vase and computer get knocked off the table, releasing tape to...
Favorite · Retweet · Reply · 58 minutes ago

Victor Gutiérrez de Tena via Twitter
ideasinmotor Project Pet Slim Down, a reality weight loss series for pets Also has help

People You May Know
Helena Muzas, Jefa de Prensa y comunicación en Ediciones Versátil
Connect
Domingo Cardona Cano, IT Security Manager
Connect
Armand Zoroa, Director, Imago marketing y comunicación
Connect

Ads by LinkedIn Members
Japan Management Jobs
Japanese Executive Jobs Only. Find Thousands of Jobs - Finance,IT,Consulting
Need talent?
We are experts in Executive Search and Recruitment for the Spanish Market.
EIF has inspired you
Tell us at a workshop how you have used the EIF !

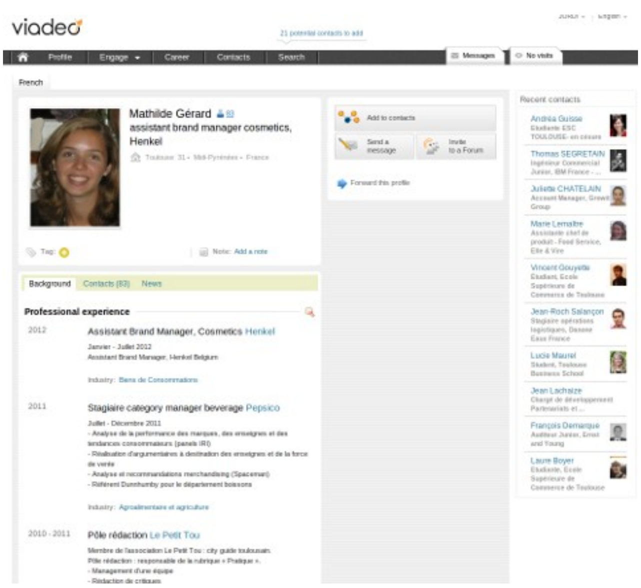
Who's Viewed Your Profile?
7 Your profile has been viewed by 7 people in the past 30 days.
23 You have shown up in search results 23 times in the past 90 days.

Your LinkedIn Network
46 Connections link you to 374,727+ professionals
1,114 New people in your Network since January 10

Illustration 2: LinkedIn web site screenshot

Viadeo

Viadeo.com is a professional social network with over 35 million members. With more than 200 employees, Viadeo lets members maintain a list of business partners, allowing them to stay in touch, use or help each other to find a job, or create business opportunities.



21 potential contacts to add

Mathilde Gérard
assistant brand manager cosmetics, Henkel
Toulouse 31 - Midi-Pyrénées - France

Professional experience

2012 Assistant Brand Manager, Cosmetics Henkel
Janvier - Juillet 2012
Assistant Brand Manager, Henkel Belgium
Industry: Biens de Consommations

2011 Stagiaire category manager beverage Pepsico
Juillet - Décembre 2011
- Analyse de la performance des marques, des enseignes et des tendances consommateurs (panels IRI)
- Réalisation d'argumentaires à destination des enseignes et de la force de vente
- Analyse et recommandations merchandising (Spaceman)
- Référent Dunnhumby pour le département boissons
Industry: Agroalimentaire et agriculture

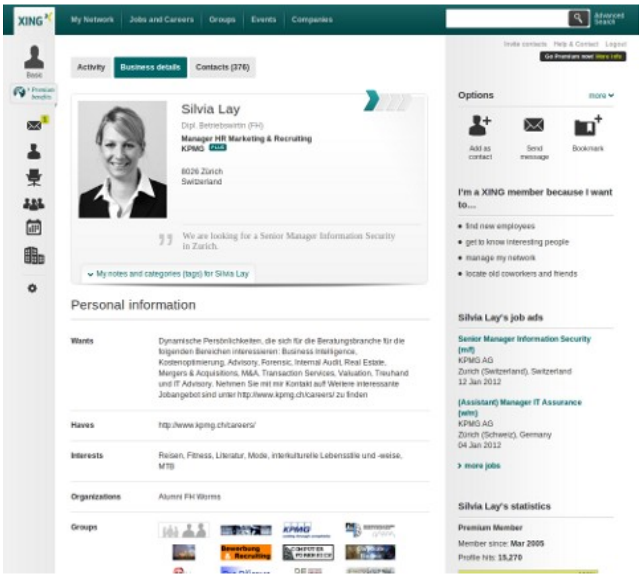
2010 - 2011 Pôle rédaction Le Petit Tou
Membre de l'association Le Petit Tou : city guide toulousain.
Pôle rédaction : responsable de la rubrique « Pratique ».
- Management d'une équipe
- Rédaction de critiques

Recent contacts
Andréa Guisse
Etudiante ESC TOULOUSE- en césure
Thomas SEGRETAIN
Ingénieur Commercial Junior, IBM France - ...
Juliette CHATELAIN
Account Manager, Growth Group
Marie Lemaître
Assistante chef de produit - Food Service, Elle & Vire
Vincent Gouyette
Etudiant, Ecole Supérieure de Commerce de Toulouse
Jean-Roch Salançon
Stagiaire opérations logistiques, Danone Eaux France
Lucie Maurel
Student, Toulouse Business School
Jean Lachaize
Chargé de développement Partenariats et ...
François Demarque
Auditeur Junior, Ernst and Young
Laure Boyer
Etudiante, Ecole Supérieure de Commerce de Toulouse

Illustration 3: Viadeo web site screenshot

Xing

Xing is a european social network for enabling small-world networks with more than 11 million users. XING, with more than 300 employees, is a platform where professionals from all kinds of different industries can meet up, find jobs, colleagues, new assignments, cooperation partners, experts and generate business ideas.



Silvia Lay
Dipl. Betriebswirtin (FH)
Manager HR Marketing & Recruiting
KPMG

8026 Zürich
Switzerland

We are looking for a Senior Manager Information Security in Zurich.

My notes and categories (tags) for Silvia Lay

Personal information

Wants: Dynamische Persönlichkeiten, die sich für die Beratungsbranche für die folgenden Bereichen interessieren: Business Intelligence, Kostenoptimierung, Advisory, Forensic, Internal Audit, Real Estate, Mergers & Acquisitions, M&A, Transaction Services, Valuation, Treuhand und IT Advisory. Nehmen Sie mit mir Kontakt auf! Weitere interessante Jobangebot sind unter http://www.kpmg.ch/careers/ zu finden

Haves: http://www.kpmg.ch/careers/

Interests: Reisen, Fitness, Literatur, Mode, interkulturelle Lebensstile und -weise, MTB

Organizations: Alumni FH Worms

Groups

I'm a XING member because I want to...

- find new employees
- get to know interesting people
- manage my network
- locate old coworkers and friends

Silvia Lay's job ads

Senior Manager Information Security (m/f)
KPMG AG
Zurich (Switzerland), Switzerland
12 Jan 2012

(Assistant) Manager IT Assurance (w/m)
KPMG AG
Zürich (Schweiz), Germany
04 Jan 2012

› more jobs

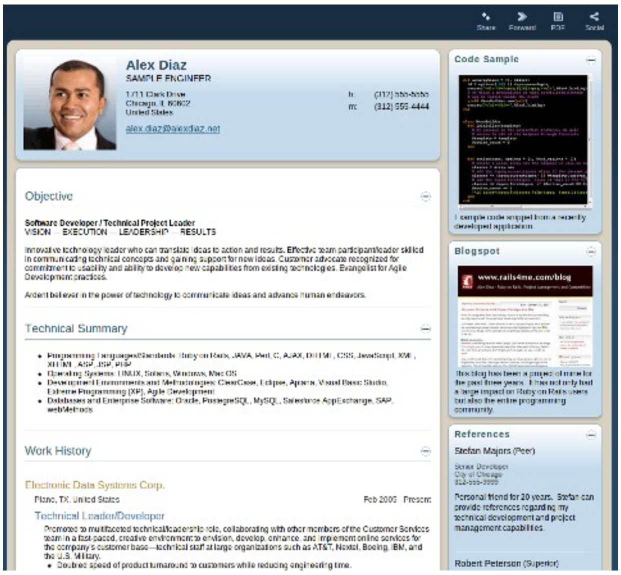
Silvia Lay's statistics

Premium Member
Member since: Mar 2005
Profile hits: 15,270

Illustration 4: Xing web site screenshot

VisualCV

VisualCV.com, even that does not fit in the definition of social network, have some interesting related similitudes with this project. VisualCV allows users to create an online resume, build and manage an online career portfolio and share professional qualifications with employers, customers, partners and colleagues.



Alex Diaz
SAMPLE ENGINEER
1/11 Clark Drive
Chicago, IL 60602
United States

h: (312) 555-5555
m: (312) 555-4444

alex.diaz@alexdiaz.net

Objective

Software Developer / Technical Project Leader
VISION — EXECUTION — LEADERSHIP — RESULTS

Innovative technology leader who can translate ideas to action and results. Effective team participant/leader skilled in communicating technical concepts and gaining support for new ideas. Customer advocate recognized for commitment to usability and ability to develop new capabilities from existing technologies. Evangelist for Agile Development practices.

Ardent believer in the power of technology to communicate ideas and advance human endeavors.

Technical Summary

- Programming Languages/Standards: Ruby on Rails, JAVA, Perl, C, AJAX, DHTML, CSS, JavaScript, XML, XHTML, ASP, JSP, PHP
- Operating Systems: UNIX, Solaris, Windows, Mac OS
- Development Environments and Methodologies: ClearCase, Eclipse, Aptana, Visual Basic Studio, Extreme Programming (XP), Agile Development
- Databases and Enterprise Software: Oracle, PostgreSQL, MySQL, Salesforce AppExchange, SAP, webMethods

Work History

Electronic Data Systems Corp.
Plano, TX, United States Feb 2005 - Present
Technical Leader/Developer
Promoted to multifaceted technical/leadership role, collaborating with other members of the Customer Services team in a fast-paced, creative environment to envision, develop, enhance, and implement online services for the company's customer base—technical staff at large organizations such as AT&T, Nextel, Boeing, IBM, and the U.S. Military.

- Doubled speed of product turnaround to customers while reducing engineering time.

Code Sample

1 sample code snippet from a recently developed application

Blogspot

This blog has been a project of mine for the past three years. It has not only had a large impact on Ruby on Rails users but also the entire programming community.

References

Stefan Majors (Peer)
Senior Developer
City of Chicago
312-555-5555
Personal friend for 20 years. Stefan can provide references regarding my technical development and project management capabilities.

Robert Peterson (Superior)

Illustration 5: VisualCV web site screenshot

In the chapter 7 of this document there is a comparison of the mentioned web sites in front of this project.

3. Functional Requirements

This is the definition of the functionalities that will be implemented in the projected application to achieve the desired objectives described in the *1.5. Objectives* part of this document.

3.1. User related functionalities

Here it is found the detailed functionalities of the user.

3.1.1. Registration

Anonymous users should be able to register into the system to join the community and be able to create the portfolio. The minimum information to should would be:

- Email
- Password
- First name
- Last name

The **email** and **password** fields will be used to identify unequivocally a single user given that the email is, by definition, unique in Internet (avoiding problems of user name collisions inside the application). The system should assign a number that identifies himself (an id) to facilitate the user session management. The password should be encrypted with the **MD5** hash function before being stored in the database for security reasons.

The system will also store the date and time of the user creation and the last login time of the user into the application for statistics purposes.

3.1.2.Log in

A registered user should log in into the web application by writing the **email** and **password** in the form. If the user checks the *"Remember me"* check box, a cookie will be created in the browser of the user to remember the credentials of the user for the next 30 days. Once a user is correctly logged in, the last login time information will be updated and he will be redirected to the main screen.

3.1.3. Adding and updating information

Once a user is registered the web application should ask the user to fulfill more information about himself (two step process registration) and also the possibility of changing some of the already provided personal information:

- First name
- Last name
- Country
- City
- Date of birth

Also the user should be able to add some of the professional information and his presence in other social networks:

- Headline (The professional headline)
- Specialties (General skills)
- Summary (An introduction about the studies, professional experience and goals achieved)
- LinkedIn account
- Twitter account
- Personal website

This information will be used with the purpose of providing more information to the portfolio.

3.2. Project related functionalities

Here it is found the detailed functionalities of the project.

3.2.1 Creation and update

Any registered user should be able create a new project in the application by providing the following required information:

- Name
- Category
- Motivation

This will be the minimum information needed to create a new project. For technical purposes related to the implementation, the application will assign an identification (id) to the new project that will simplify the storage of the information. It will be also stored the identification of the user who create the project and the time and date of the creation.

The user, optionally, can also provide the following information to expand the information:

- Start year
- End year
- Description
- Website URL

The creator of the project should be able to update the information previously provided.

3.3. Member related functionalities

Here it is found the detailed functionalities of the members of a project.

3.3.1. Creation and update

Logged in users should be able to join existing projects by giving the information relative to his functionalities in the selected project. The only required information to provide should be:

- Responsibility (which was his responsibility in the project)

But, if desired, the user will be able to provide also the information about:

- Description (which tasks he was responsible)
- Skills required (required for the development of the task)
- Number of people in charge (if any)
- Number of hours dedicated to the project
- Still working on the project check box

The user will be registered as a collaborator of the project. The system will assign an identification (id) to the member and also store the project id to provide the project context. The user can subsequently update the information.

3.3.2. Add a code snippet

A member of a project should be able show a sample of his work by providing a sample of the code, called “code snippet”. He has to indicate:

- Code language
- Code

This information will be saved in the database by assigning a unique id to the code snippet and with the id of the member (not the user) to identify which of the code snippets belongs to the referred member. The code will be stored in two ways: the first one in plain text, and the second one after being parsed by an HTML parser for a well looking and understanding view of the code.

4. Non-functional requirements

The non-functional requirements defines how a system is supposed to be. In other words, they can be expressed as the qualities of a system must fulfill.

For the realization of this project has been taken into account a number of factors as if the project was truly a business platform to be launched at the completion of the project.

4.1. Accessibility

It refers to the ability to access and use the web application for all people regardless of the technical disabilities that may have the user.

Specifically, It will have special care to follow web standards and technologies based on standards. This means that the application must be functionally by the majors web browsers such as Internet Explorer 8.0 or higher, Firefox 3.0 or higher, Chrome 2.0 or higher and Opera 9 or higher.

Note that support for previous versions of this browsers is not required because they may not follow the standards and therefore is almost impossible to provide the same user experience to the visitors.

4.2. Reliability and efficiency

It is related with the on line availability of the web application to the users. The use of a framework will help in the process of the maintenance of the application through the use of the MVC pattern, so the availability will be less affected.

The terms are also related with the architecture design chosen for the server that will serve the application to users. The most common scenarios are:

- **Single server**: Less performance and scalability and more fragile to availability but low cost and complexity.

- **Single server + Database server**: Better performance and more scalable. Availability is not improved and increases cost and complexity.
- **Replicated web server + Database server**: Improved performance (load balance), scalability and availability but increases notably the cost and complexity.

4.3. Usability

Synonym of the well-known "user friendly" term. Is the aspect related with the user interface that refers how fast the users learn and do the actions in the web application. To improve this aspect it has been taken into account the use of technologies to allow less reloads (for example, pagination does not require to reload the web page) of the page and use a clear website layout with a white and blue based theme.

4.4. Maintainability and security

The two concepts are covered by the use of a framework.

A framework that support the MVC pattern implementations allow to developers a clean separation of the layers of the application, allowing a more easy maintainability. Also, the code reuse makes the maintainability more simple.

In the security requirements, most of the frameworks are equipped with many security measures to help prevent the most common attacks such as SQL injection, cross-site scripting (XSS), cross-site request forgery (CSRF), and cookie tampering. In addition, we will store passwords using the MD5 hash function or encryption.

4.5. Scalability

Scalability is the property of a system that indicates its ability to extend the scope of operations without losing quality, which means that the system works with tolerable efficiency regardless of the number of users that are using the application. In a web application this property is important because we can not know, a priori, how many people are using our service. It is mainly determined by the server scenario chosen.

5. System Design

The design phase is one of the most important in the process of the software engineering. Consists in choosing the technologies that fits better in the project requirements and to choose good solutions in the implementation of the code.

5.1. Architectural pattern

There was no doubts about which architectural pattern use for this project. The Model-view-controller (MVC) is a proved solution for web applications. The pattern isolates the logic of the application from the user interface, allowing in this way independent developing, testing and maintenance of each layer.

Here is an explanation of each layer in the MVC pattern:

- The **Model** manages the behavior and data of the application, responds to requests for information about its state and responds to instructions to change state.
- The **View** renders the model into a user interface for a suitable interaction with the data.
- The **Controller** receives the user input and initiates a response by making calls on the model objects to perform actions based on the input.

A graphical description of the MVC pattern can be found in Illustration 6.

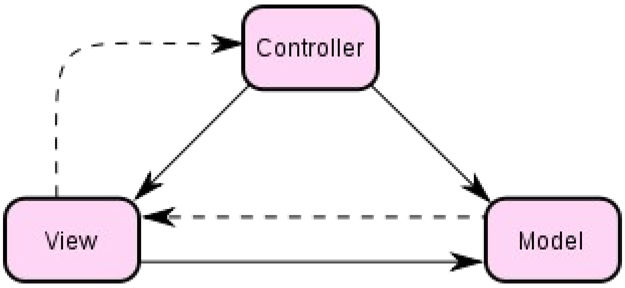


Illustration 6: The MVC architecture pattern

An example of the typical interaction between the layers is like follows:

1. The browser sends the request to the server that hosts the MVC application.
2. A controller is invoked to handle the request.
3. The controller interacts with the model, possibly resulting in a change of the model's state.
4. The controller invokes the view.
5. The view renders the data (often as HTML) and returns it to the browser for display.

5.2. Selection of technologies

In this chapter it is explained the criteria for the chosen technologies.

5.2.1. Language for logic implementation

There are a lot of alternatives when you are about to choose a language to implement the logic of a web application. The most extended languages in this kind of applications are Java, Ruby, PHP and ASP. All of them are object oriented languages allowing a good implementation of the MVC architecture pattern.

In this concrete project, because of my previous work in managing an application written in PHP, and because is the most used language in web applications, I had clear that I will like to use PHP as the main language for the logic implementation.

PHP (PHP: Hypertext Preprocessor) is a scripting language for the server-side of the application to develop dynamic web pages. The code can be embedded into a HTML source document and it is processed by a web server with a PHP processor module which generates the resulting web page. That means that not all servers can run PHP code, they need the mentioned module to process the code.

Illustration 7 shows the famous logotype of the php language.

Illustration 7: Logo of the PHP language

5.2.2. Framework election

The use of a framework aims to alleviate the work to the developer by making more easy common activities in the web development, such as the access to a database, session management for users, or managing templates.

The developer can save time by not having to code all the functionalities: the common ones are already written, so it is promoting the code reuse. Frameworks also provide some built-in functionalities and it is enforcing the good coding standards by the use of the MVC pattern. Also, and more important, the use of the framework will help to satisfy the **non-functional requirements** described in this document (accessibility, reliability, usability, security...)

There are a lot of frameworks in PHP that helps the developers to create web applications in rapid time, but each framework implementation is different and the developer needs to spend some time (the quantity of time depends on the framework) to learn how in particular works.

Before start the implementation of the web application I was doing a research about which framework can fit better to the project requirements, with support for the Model-View-Controller pattern and with a good Object Relational Mapping (a technology that converts data of the system to relational data for being stored in a relational database).

The candidates for the framework election were:

- **Zend Framework**: Is probably the most common and famous PHP framework because it was co-founded by two of the PHP core contributors. Requires a PHP 5 version and supports the MVC pattern. One of the biggest advantage of this framework is the extensive and detailed documentation and with a clear road map for the future. No scaffolding support.

- **CakePHP**: This is a famous framework because use many of the Ruby on Rails concepts that made this language a good option for the web application development. Allows the creation of web applications with the MVC pattern and requires a PHP 5 version. With scaffolding support. The framework has an extensive community of users and a good documentation, but a little bit poor in extension.

- **Symphony**: Is a framework that follows the MVC paradigm. Requires PHP 5 and it's easily extensible with external plug-ins. With scaffolding and a big community and documentation behind the project.

- **Yii**: Is one of the most recent frameworks that with the time are being more famous among the community of developers, even that it is still not really well known. Requires a PHP 5 version and follows the MVC pattern paradigm to create extensible applications. With scaffolding support and focused to be fast, secure and professional. With automatic form input and validation. Good and varied documentation. The community is growing with time.

There was not a lot of differences between the analyzed frameworks. From outside, they all seem fit good to the project requirements and they have similar characteristics.

Finally, I decided to choose the **Yii** framework for my project. One of the mosts important reasons for this decision was the community of users behind: not as large as, for example, the Zend Framework, but a community of people excited about the promotion of their favorite framework.

[1] *Agile web application development with Yii 1.1 and PHP 5*
[2] *Yii 1.1 application development cookbook*

In addition, I found some on line resources with tutorials and community forums and two published books[1][2] that they turned a key in the development of this project. One of them about the creation of an application from zero, and the other one with some “recipes” to improve and add more functionalities to the web application.

Illustration 8 shows the logotype of the chosen framework.

Illustration 8: Yii Framework logo

5.2.3. Database election

In a web application the database is very important, and even more if it's a social network, because it means that the database will have to receive, process and give response to, probably, a lot of accesses, and usually becomes the bottleneck of the web applications.

Fortunately, there is a free and open-source relational database that is a proved solution for scalable web applications. **MySQL** is a relational database that supports the needed requirements for this project and with the **phpMyAdmin** tool for handling the administration of the database in a easy way, it becomes to a very easy and reliable solution for web applications.

MySQL it is a wide-used database in all kind of web applications such as Wikipedia, Facebook, Twitter, as many others. Lately, the NoSQL databases are improving their presence in such web applications due to their better management of very large amounts of data, but for my project, I found MySQL enough scalable for a freshly baked application and a good choice also for the simplicity and the use of SQL to interact with the database.

Illustration 9 shows the logotype of the MySQL database.

5.2.4. MySQL engine election

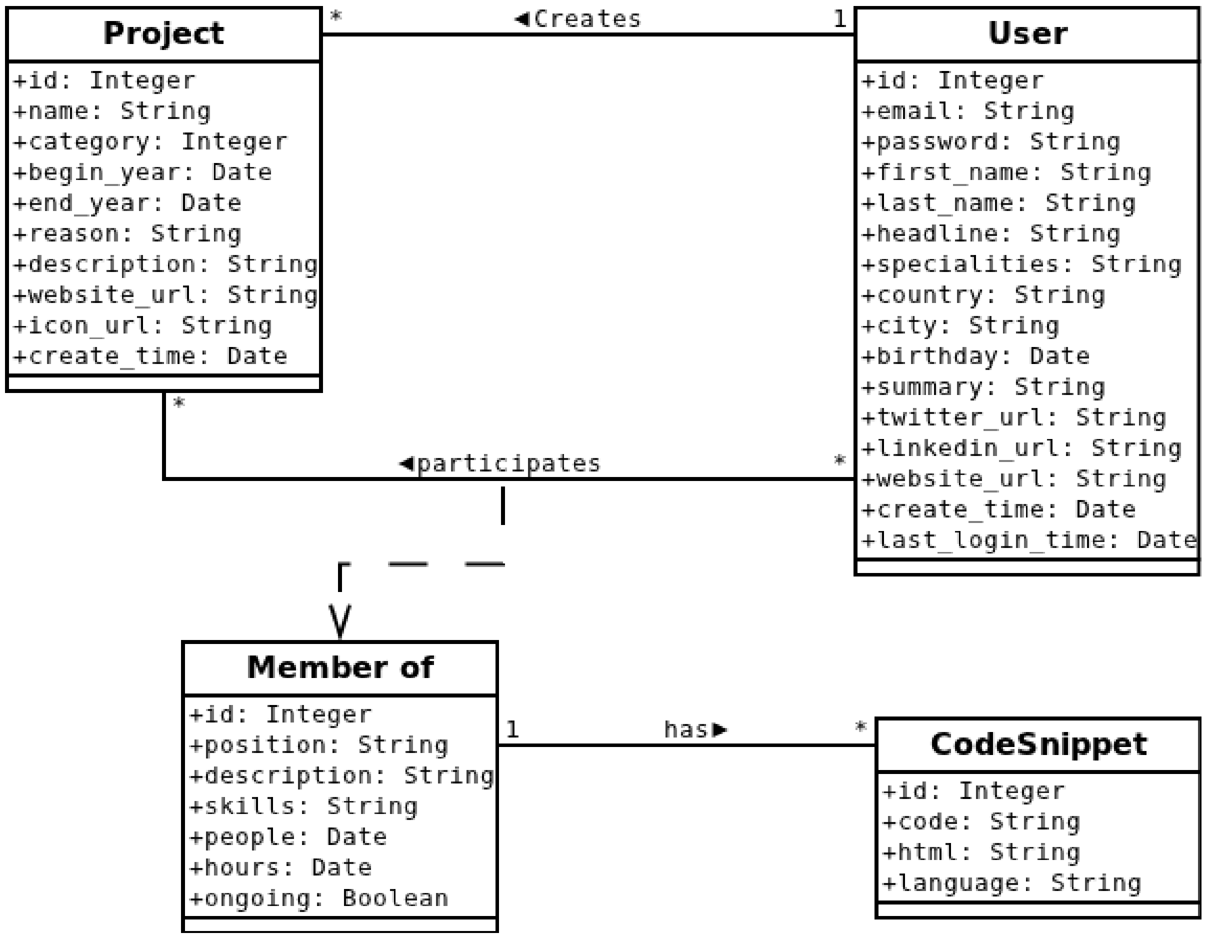
There are two popular engines for MySQL: MyISAM and InnoDB. **InnoDB** is more recent and it was designed for maximum performance when processing large amount of data and supports some features such as transactions and foreign keys. With InnoDB you get transactions, speed and Integrity. So, with the idea of scalability in mind, I thought that InnoDB was the appropriate election.

Illustration 9: The MySQL logo

5.3. Data Models

The data models describes the elements involved in the implementation of the application and how they are related. Next we will see the conceptual model in the UML modeling language and the physical implementation of the structure of the database.

5.3.1. Conceptual Model



5.3.2. Physical Implementation of the Database

The physical implementation is the conversion of the data model into a real solution. As the used database is MySQL, the statements are written in SQL language.

Physical Implementation: The user concept

```
CREATE TABLE tbl_user
(
    id INTEGER NOT NULL PRIMARY KEY AUTO_INCREMENT,
    email VARCHAR(128) NOT NULL,
    password VARCHAR(256) NOT NULL,
    first_name VARCHAR(128) NOT NULL,
    last_name VARCHAR(128),
    headline VARCHAR(128),
    specialities TEXT,
    country VARCHAR(128),
    city VARCHAR(128),
    birthday DATE,
    summary TEXT,
    twitter_url VARCHAR(128),
    linkedin_url VARCHAR(128),
    website_url VARCHAR(128),
    create_time DATETIME,
    last_login_time DATETIME
) ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE=utf8_general_ci;
```

Physical Implementation: The project concept

```
CREATE TABLE tbl_project
(
	id INTEGER NOT NULL PRIMARY KEY AUTO_INCREMENT,
	name VARCHAR(256) NOT NULL,
	category INTEGER DEFAULT 0,
	begin_year YEAR,
	end_year YEAR,
	reason INTEGER NOT NULL,
	description TEXT,
	website_url VARCHAR(128),
	icon_url VARCHAR(128),
	create_time DATETIME,
	creator_id INTEGER NOT NULL,
	CONSTRAINT FK_project_creator FOREIGN KEY (creator_id)
		REFERENCES tbl_user (id) ON DELETE CASCADE ON UPDATE
		RESTRICT
) ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE=utf8_general_ci;
```

Physical Implementation: The member concept

```
CREATE TABLE tbl_member
(
	id INTEGER NOT NULL PRIMARY KEY AUTO_INCREMENT,
	user_id INTEGER NOT NULL,
	project_id INTEGER NOT NULL,
	position VARCHAR(256) NOT NULL,
	description TEXT,
	skills TEXT,
	people INTEGER,
	hours INTEGER,
	ongoing TINYINT(1) DEFAULT 0,
	CONSTRAINT FK_member_userid FOREIGN KEY (user_id)
		REFERENCES tbl_user (id) ON DELETE CASCADE ON UPDATE
		RESTRICT,
	CONSTRAINT FK_member_project FOREIGN KEY (project_id)
		REFERENCES tbl_project (id) ON DELETE CASCADE ON UPDATE
		RESTRICT
) ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE=utf8_general_ci;
```

Physical Implementation: The code snippet concept

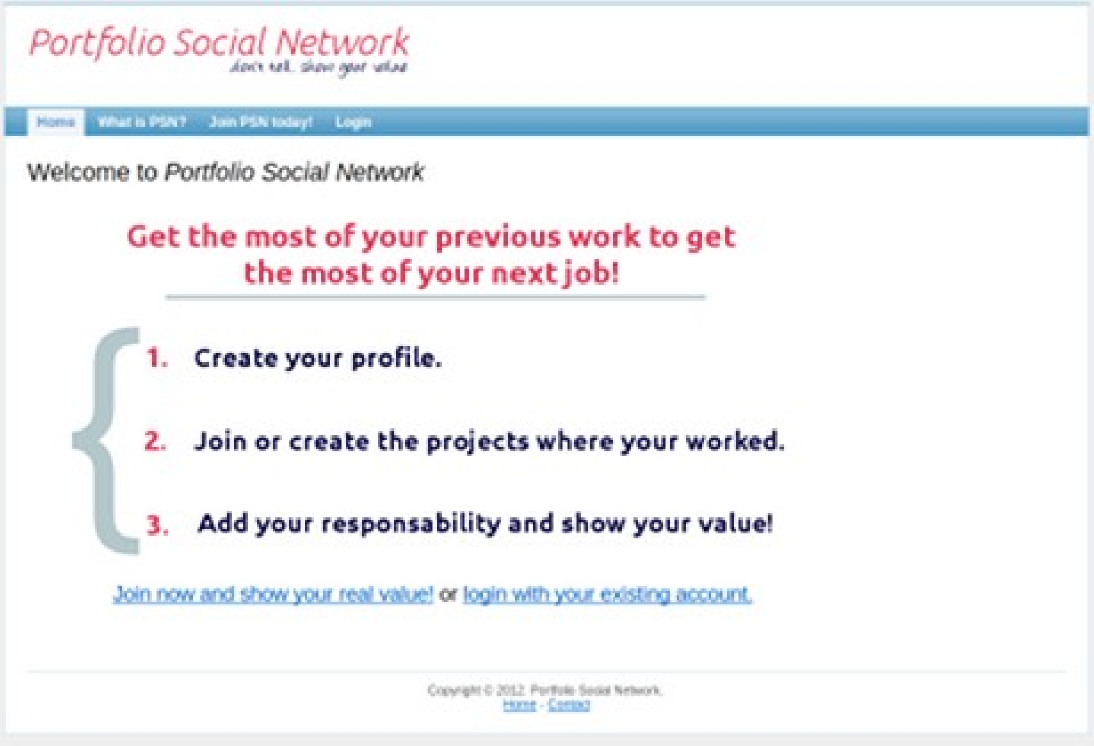
```
CREATE TABLE tbl_codesnipet
(
        id INTEGER NOT NULL PRIMARY KEY AUTO_INCREMENT,
        member_id INTEGER NOT NULL,
        code text,
        html text,
        language varchar(20) NOT NULL,
        CONSTRAINT FK_member FOREIGN KEY (member_id)
                REFERENCES tbl_member (id) ON DELETE CASCADE ON UPDATE
                RESTRICT
) ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE=utf8_general_ci;
```

6. The project in images

Here there are introduced the main screens to help the description of the project.

6.1. Welcome screen

Illustration 10 shows the main page. It is found a graphical introduction about the benefits of joining the network and the simple steps needed. In the menu there are links for knowing better what is all this about ("What is PSN?"), to join the community ("Join PSN today!") and a login button for already registered users.



Welcome to *Portfolio Social Network*

Get the most of your previous work to get the most of your next job!

1. Create your profile.
2. Join or create the projects where your worked.
3. Add your responsability and show your value!

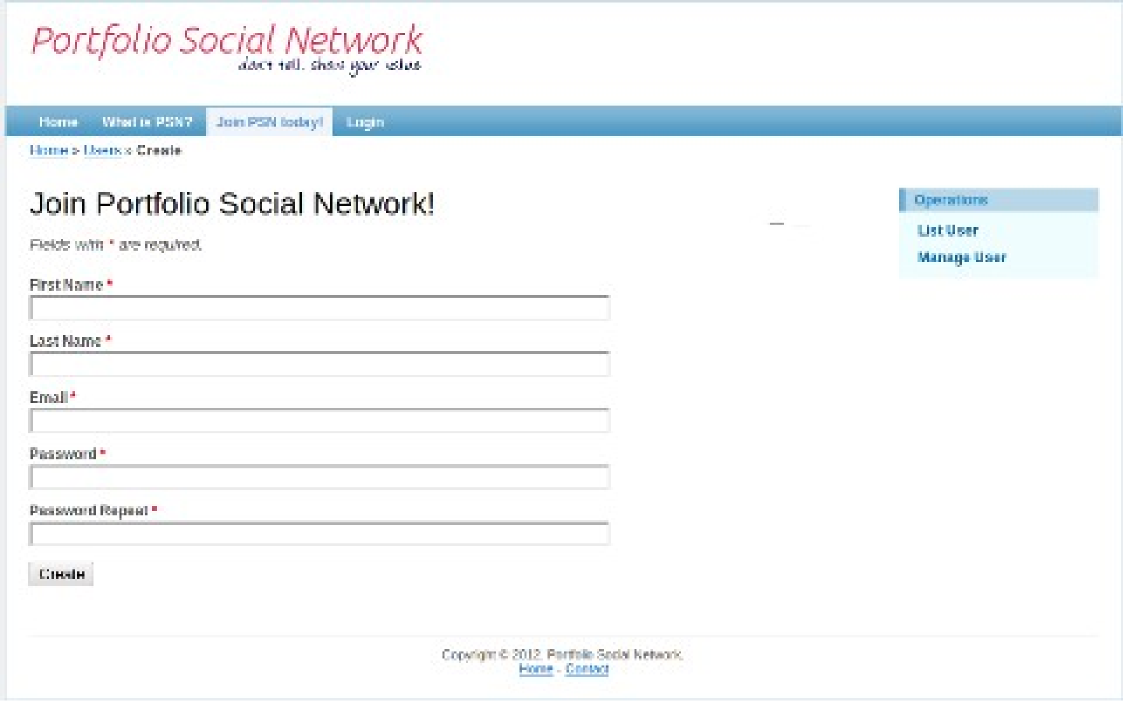
Join now and show your real value! or login with your existing account.

Copyright © 2012. Portfolio Social Network.
Home - Contact

Illustration 10: Welcome screen

6.2. User creation screen

Illustration 11 is the view of the page for user to create an account into the application by introducing some required information such as full name and the email and password information for logging in. To not seem a difficult and long registration process, the registration is divided in two parts: one that asks to the user a very basic information (as shown here) and another part where the user have to introduce more information about himself (see 6.3. *Adding and updating user information screen*)



Join Portfolio Social Network!

Fields with * are required.

First Name *

Last Name *

Email *

Password *

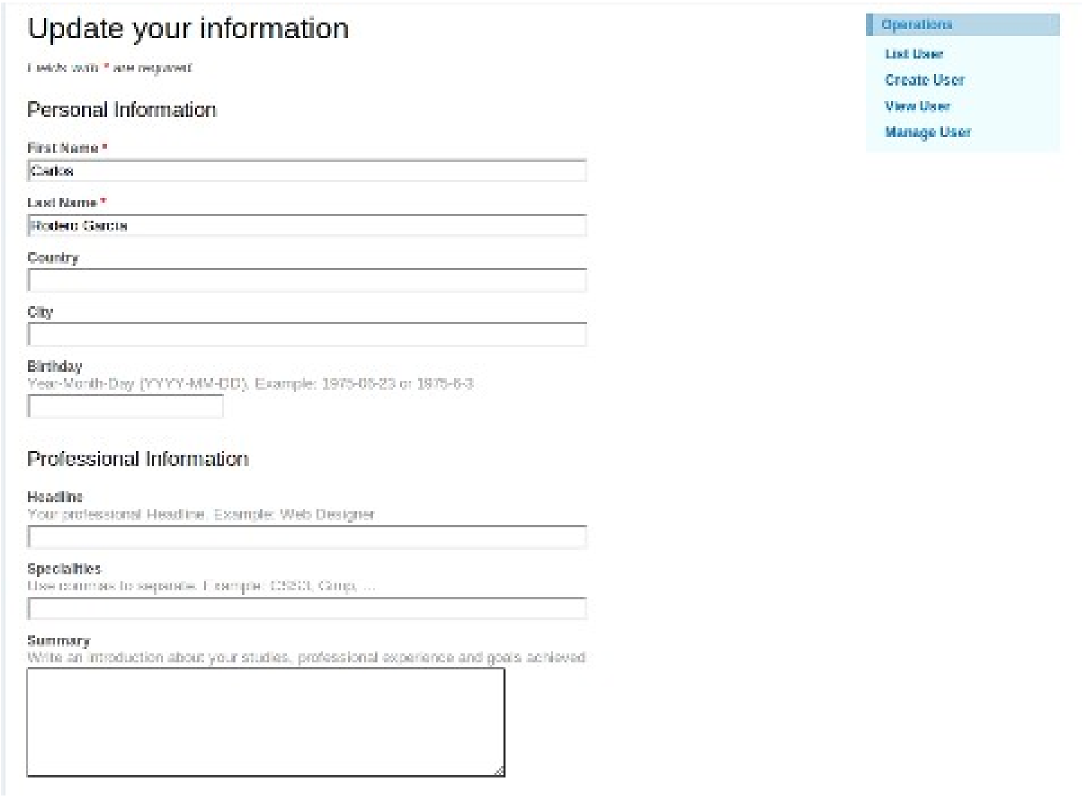
Password Repeat *

Copyright © 2012. Portfolio Social Network.

Illustration 11: Creating an account

6.3 Adding and updating user information screen

After a new registration, the application ask to the user to fulfill more personal information about himself, such as the date of birth, country and city, and also professional information like the specialties fields, a headline and a summary of the resume. We can see this view in Illustration 12.



Update your information

Fields with * are required

Personal Information

First Name *
Carlos

Last Name *
Rodero Garcia

Country

City

Birthday
Year-Month-Day (YYYY-MM-DD). Example: 1975-05-23 or 1975-6-3

Professional Information

Headline
Your professional Headline. Example: Web Designer

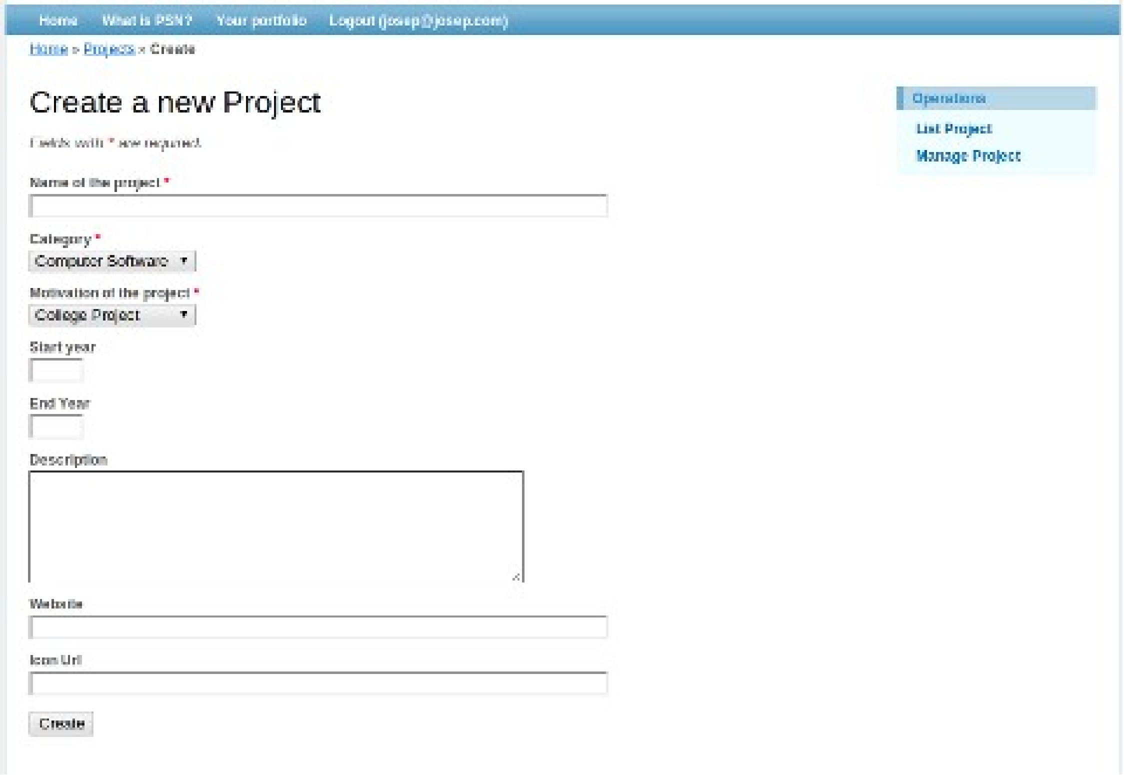
Specialties
Use commas to separate. Example: CSS3, Gimp, ...

Summary
Write an introduction about your studies, professional experience and goals achieved

Illustration 12: View for adding and updating user information

6.4. Project creation screen

A user can create new projects in the application by providing some required information like the name of the project, the category of the project (Software, hardware, network, ...) and the motivation (personal, professional, college assignment, …). Can also provide more information like the description and the period worked. Illustration 13 shows the creation of project screen.



Create a new Project

Fields with * are required.

Name of the project *

Category *
Computer Software

Motivation of the project *
College Project

Start year

End Year

Description

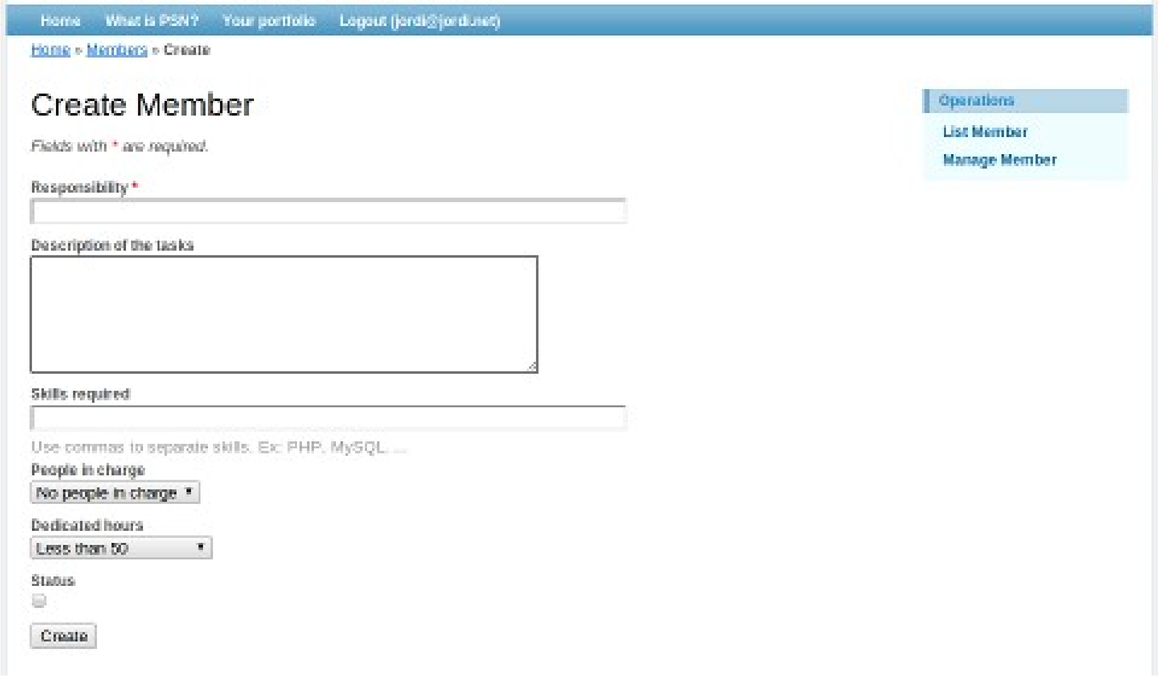
Website

Icon Url

Illustration 13: Project creation form screen

6.5. Joining project and adding information screen

Illustration 14 shows how users can join existing projects by providing his responsibility in the project and some other information like a description of the work that he was carrying out, the skills required for the task, the time spent and if he had other people in charge. Also can indicate if is still working on the project by selecting a check box.



Create Member

*Fields with * are required.*

Responsibility *

Description of the tasks

Skills required

Use commas to separate skills. Ex: PHP, MySQL, ...

People in charge

No people in charge

Dedicated hours

Less than 50

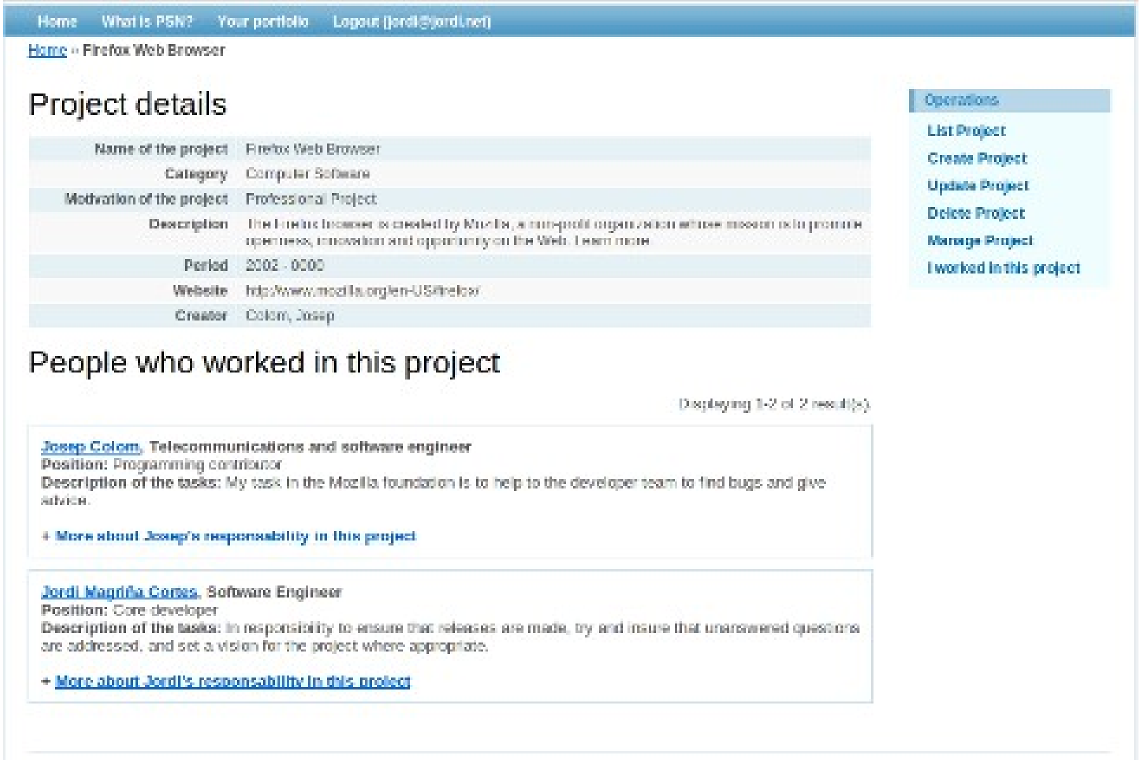
Status

□

Illustration 14: Form to join an existing project

6.6. Project view screen

Illustration 15 shows the project details view. It is found the information provided for a concrete project and the people that worked on the project with a concrete responsibility. There is a little introduction of each member of the team and by clicking into the name we can access to his Portfolio. Also we can get more information about the work carried out by the member by clicking into “More information about the responsibility” button.



Home » Firefox Web Browser

Project details

Name of the project	Firefox Web Browser
Category	Computer Software
Motivation of the project	Professional Project
Description	The Firefox browser is created by Mozilla, a non-profit organization whose mission is to promote openness, innovation and opportunity on the Web. Learn more
Period	2002 - 0000
Website	http://www.mozilla.org/en-US/firefox/
Creator	Colom, Josep

People who worked in this project

Displaying 1-2 of 2 result(s).

Josep Colom, Telecommunications and software engineer
Position: Programming contributor
Description of the tasks: My task in the Mozilla foundation is to help to the developer team to find bugs and give advice.

+ More about Josep's responsability in this project

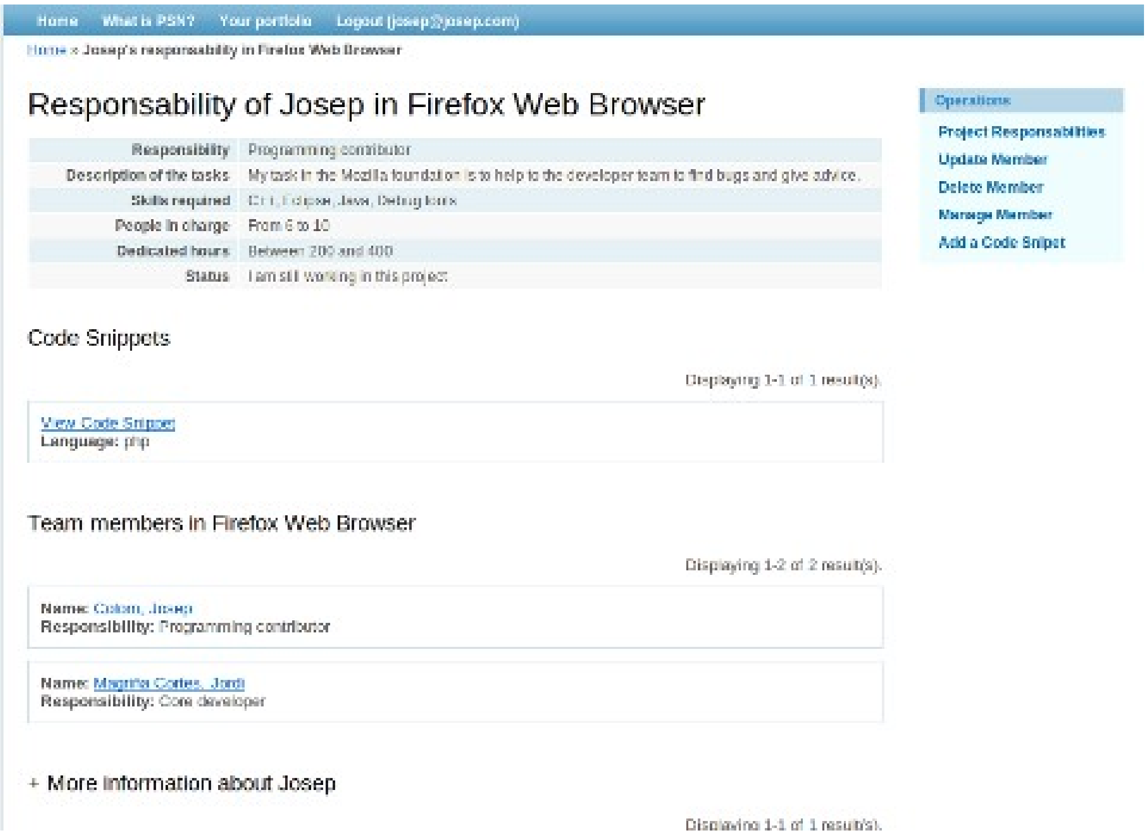
Jordi Magriña Cortes, Software Engineer
Position: Core developer
Description of the tasks: In responsibility to ensure that releases are made, try and insure that unanswered questions are addressed, and set a vision for the project where appropriate.

+ More about Jordi's responsability in this project

Illustration 15: View of the details of a project

6.7. Member of a project view

By clicking in the link to get more information about the responsibility of a concrete user we access to a view showing the detailed information provided by the user. That is, his responsibility in this concrete project, a link to the code snippets provided (if any) and the people who have worked in the same project. Illustration 16 shows how looks this view.



Responsability of Josep in Firefox Web Browser

Responsibility	Programming contributor
Description of the tasks	My task in the Mozilla foundation is to help to the developer team to find bugs and give advice.
Skills required	C++, Eclipse, Java, Debug tools
People in charge	From 6 to 10
Dedicated hours	Between 200 and 400
Status	I am still working in this project

Code Snippets

Displaying 1-1 of 1 result(s).

View Code Snippet
Language: php

Team members in Firefox Web Browser

Displaying 1-2 of 2 result(s).

Name: Colom, Josep
Responsibility: Programming contributor

Name: Magriña Cortes, Jordi
Responsibility: Core developer

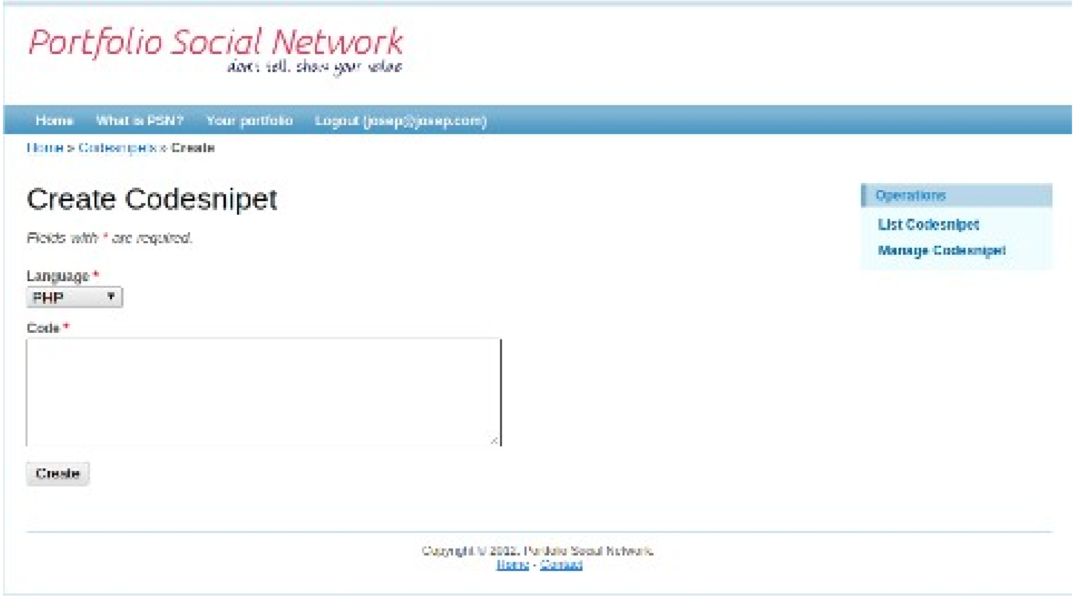
+ More information about Josep

Displaying 1-1 of 1 result(s).

Illustration 16: View of the work carried out by a user in a project

6.8. Adding a code snippet screen

A user can provide samples of the code for a specific work in a concrete project by specifying the language of the code and the paste in the text field the code. The application will parse the code and generate a view for a good looking and understanding of the code. Illustration 17 shows the form and Illustration 18 how the page renders the code.



Create Codesnipet

*Fields with * are required.*

Language *
PHP

Code *

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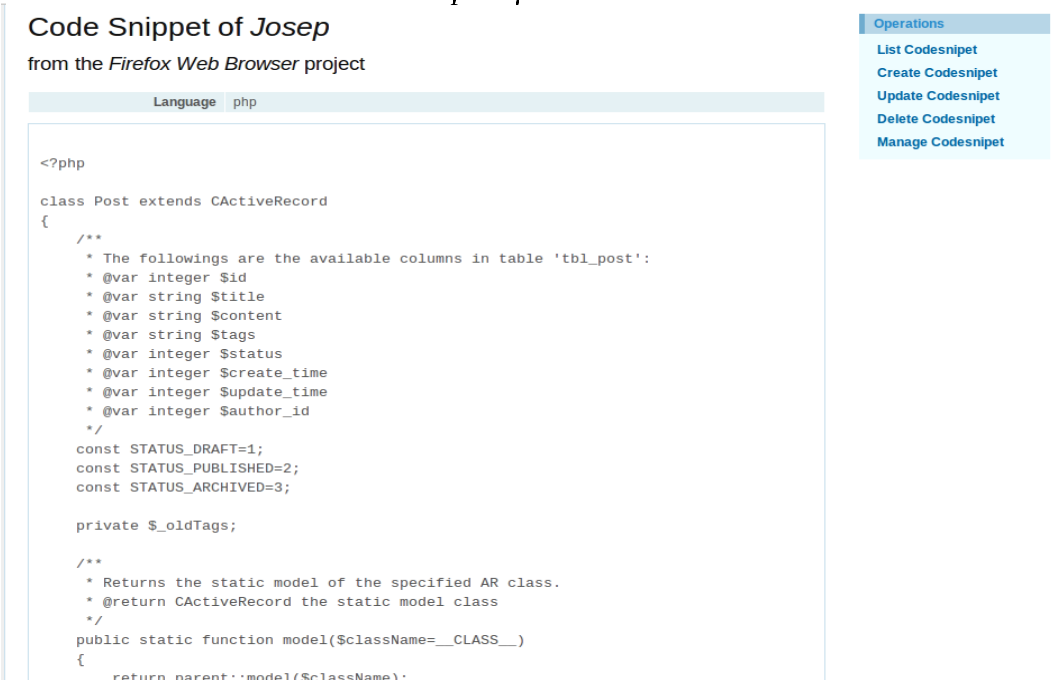
Home · Contact

Illustration 17: Form to add a sample of the work



Code Snippet of *Josep*

from the *Firefox Web Browser* project

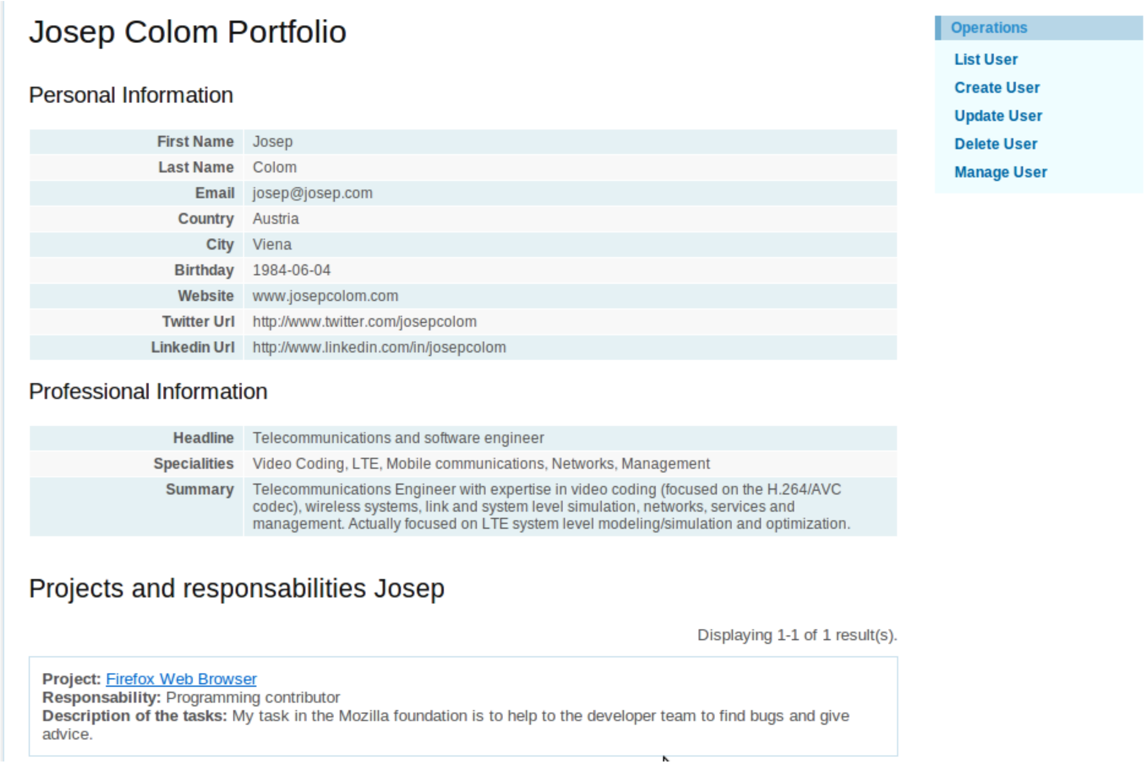
Language	php

```
<?php

class Post extends CActiveRecord
{
    /**
     * The followings are the available columns in table 'tbl_post':
     * @var integer $id
     * @var string $title
     * @var string $content
     * @var string $tags
     * @var integer $status
     * @var integer $create_time
     * @var integer $update_time
     * @var integer $author_id
     */
    const STATUS_DRAFT=1;
    const STATUS_PUBLISHED=2;
    const STATUS_ARCHIVED=3;

    private $_oldTags;

    /**
     * Returns the static model of the specified AR class.
     * @return CActiveRecord the static model class
     */
    public static function model($className=__CLASS__)
    {
        return parent::model($className);
```

Illustration 18: View of the code snippet

6.9. User portfolio screen

Finally, Illustration 19 is the view where it is shown the information about the user (personal and professional) and projects he has worked. By clicking into the projects we get and extended explanation of the work carried out by the user as seen in the 6*.7. Member of a project view* of this document.



Josep Colom Portfolio

Personal Information

First Name	Josep
Last Name	Colom
Email	josep@josep.com
Country	Austria
City	Viena
Birthday	1984-06-04
Website	www.josepcolom.com
Twitter Url	http://www.twitter.com/josepcolom
Linkedin Url	http://www.linkedin.com/in/josepcolom

Professional Information

Headline	Telecommunications and software engineer
Specialities	Video Coding, LTE, Mobile communications, Networks, Management
Summary	Telecommunications Engineer with expertise in video coding (focused on the H.264/AVC codec), wireless systems, link and system level simulation, networks, services and management. Actually focused on LTE system level modeling/simulation and optimization.

Projects and responsabilities Josep

Displaying 1-1 of 1 result(s).

Project: Firefox Web Browser
Responsability: Programming contributor
Description of the tasks: My task in the Mozilla foundation is to help to the developer team to find bugs and give advice.

Illustration 19: View of the user portfolio

7. Comparison

In this chapter we will go through a comparison between the four related applications available on Internet of business networking sites. **LinkedIn.com**, **Viadeo.com**, **Xing.com** and **VisualCV.com** are four applications that allows users to create an on line curriculum as an introduction of the user personal information, education and experience.

Table 1 analyzes the functionalities offered by the mentioned web sites that are related with this project objectives. There are analyzed the functionalities related to the concept of a portfolio, projects and collaborations.

	Project	LinkedIn	Viadeo	Xing	visualCV
Concept of Portfolio	Yes	Yes	No	No	Yes
User information	Yes	Yes	Yes	Yes	Yes
Personal	Yes	Yes	Yes	Yes	Yes
Education	No	Yes	Yes	Yes	Yes
Professional	Some	Yes	Yes	Yes	Yes
Presence in other social networks	Yes	Yes	Yes	Yes	Yes
Creation of Projects	Yes	Yes	No	No	No
Information about	Yes	Yes	No	No	No
People in the project	Yes	Yes	No	No	No
Information of collaborations in projects	Yes	No	No	No	No
Skills required	Yes	No	No	No	No
People in charge	Yes	No	No	No	No
Dedicated hours	Yes	No	No	No	No
Code Snippets	Yes	No	No	No	Yes [1]
Work images	No	No	No	No	Yes
People who you worked with	Yes	Yes	No	No	No

Table 1: Comparison table

[1] Only through a screen picture of the code

8. Limitations

We have to consider that in this field there are very big companies in it, such as LinkedIn, Facebook, Google, … with a lot of resources and people to bring and produce new ideas in order to take the most part of the cake that are the social applications. Specifically, LinkedIn, which is the most similar to this project site on Internet, was founded in 2003 and today has over 3.000 employees, with more than 135 million members in over 200 countries and available in fourteen languages[1].

In front of all this numbers this project has been focused in a very reduced group of users, to take a place among the big -but more general oriented- sites providing a concrete tool that will help the users with a professional orientation related to the software engineering.

There is a lot of work to do in social applications. In this kind of web applications, the users themselves are the responsible to create the content and therefore generate interest to other users to join and find a real value in it. This means that as more functionalities the application has, more able will be to attract users.

It is remarkable to say that in this project does not exist the concept of “friendship” or “follower” that it is so extended in other social networks. In this project, this concept was substituted for the relationship created between users when they share a project in common.

Some of the limitations are listed bellow:

- Users can not put screen shots of his work to complement the other infromation.
- No existence of the “like” or “recommend” concept, extended in social networks.
- Low interaction between users (less social).

[1] http://press.linkedin.com/about

9. Conclusions and future work

It was very interesting to participate in all the steps in the realization of a project: from the conception of the idea to the implementation of the code. This project has helped me to realize that one of the most interesting part of this process is thinking about the application should be.

Personally, it was really good to have the opportunity to work in this process because the project raised from a personal idea that I had in mind and I had the opportunity to carry it out. Of course, these are only the bases for something that can grow much more to be competitive in the difficult social network field.

From the point of view of learning, this project helped me to work with the php language in a framework context. The learning curve of the framework was higher than I expected and before I get to work in this project, I was practicing with another application following the indications of the book *Agile web application development with Yii 1.1 and PHP 5* to better understand the new environment.

In my opinion, in the future this project can be improved in several ways, for example:

- Implementation of the "recommended" concept as a way that a user can have to recommend the work of another user in a concrete project context.
- Adding a functionality to let users leave comments in the application to create a more rich social environment.
- Implementation of a Role Based Access Control (RBAC) to assign a role to users in each project context for a better management of the permissions of the requests of the users to the application.
- Integration with LinkedIn through the public API to let users log in into the application with the LinkedIn information.

10. Annex I. Bibliography

Books

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- *Yii 1.1 application development cookbook*, Alexander Makarov, Packt Publishing, 2011. ISBN 978-1849515481.

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- http://dev.mysql.com/doc/refman/5.6/en/index.html
- http://yiianswers.com/
- http://joshsharp.com.au/blog/view/why_you_should_be_using_a_framework
- http://www.ramirezcobos.com/category/yii/
- http://en.wikipedia.org/wiki/XING
- http://en.wikipedia.org/wiki/LinkedIn
- http://en.wikipedia.org/wiki/Viadeo

11. Annex II: Glossary

- **UML** : Unified Modeling Language. Is a standardized general-purpose modeling language in the field of object-oriented software engineering.
- **Information system** : Any combination of information technology and people's activities that support operations, management, and decision making.
- **Web Browser** : A software application for retrieving, presenting, and traversing information resources on the World Wide Web.
- **MVC** : A software architecture, currently considered an architectural pattern used in software engineering. The pattern isolates "domain logic" (the application logic for the user) from the user interface (input and presentation), permitting independent development, testing and maintenance of each layer.
- **HTML**: HyperText Markup Language. Is the main markup language for web pages.
- **Java** : Java is a programming language with general-purpose, concurrent, class-based, object-oriented language that is specifically designed to have as few implementation dependencies as possible.
- **Ruby**: A dynamic, reflective, general-purpose object-oriented programming language.
- **ASP** : A server-side script engine for dynamically-generated Web pages created by Microsoft
- **Framework**: Is a software designed to support the development of dynamic websites, web applications and web services. The framework aims to alleviate the overhead associated with common activities performed in Web development. For example, many frameworks provide libraries for database access, templating frameworks and session management.
- **Object Relational Mapping** : is a programming technique for converting data between incompatible type systems in object-oriented programming languages.
- **Scaffolding** : Technique supported by some model-view-controller frameworks, in which the programmer may write a specification that describes how the application database may be used. The compiler uses this specification to generate code that the application can use to create, read, update and delete database entries.
- **phpMyAdmin**: An open source tool written in PHP intended to handle the administration of MySQL with the use of a Web browser.

- **Relational Database**: A database that conforms to relational model theory.
- **NoSQL Database**: Database management systems that do not use SQL as their query language. These data stores may not require fixed table schemas, usually avoid join operations, and typically scale horizontally.
- **MD5**: The MD5 Message-Digest Algorithm is a cryptographic hash function that produces a 128-bit (16-byte) hash value

12. Annex III. Instructions

The application have some requirements to be executed due to the use of external technologies such as the scripting language or the used database. Here is the list of the requirements to execute the application:

Client-side:

- Web browser with Javascript enabled

Server-side:

- PHP 5.1.0 or higher
- MySQL 4.1 or higher

For the realization of this project I used Lampp (Linux version of Xampp). Lampp is a open-source web solution package consisting in the Apache HTTP server, MySQL database and interpreters for scripts written in PHP and PEARL programming languanges.

The latests version of Lampp (1.7.7) meets all requirements previously mentioned.

Configuration file

The configuration file of the application for database connection and some other configurable parameters can be found in:

/porfolio/protected/config/main.php