MASTER THESIS

TITLE: Study and deployment of an interuniversity collaborative (wiki) platform on sustainability

MASTER DEGREE: Master in Science in Telecommunication Engineering & Management

AUTHOR: María José Quero González

DIRECTOR: Juan Carlos Aguado Chao
Introduction

DATE: December 12th 2012

Title: Study and deployment of an interuniversity collaborative (wiki) platform on sustainability
Author: María José Quero González
Director: Juan Carlos Aguado Chao
Date: December, 12th 2012

Overview
The aim of this project is to create a collaborative tool, a wiki, which can be used together by professors, researchers, administrative employees, and students of any of the Universities who are committed to experimentation on Sustainable Development.

Sustainable Development is growing up thanks to different researchers and conscientious people who start careers committed to social and environment aspects by their own. If these kind of persons contribute worldwide with their best to this wiki, it will be very advantageous for everyone. Each of them can see the work of other developers and can contribute with their own investigations, simultaneous helping and getting help from other participants of the wiki.

Returning to the wiki, it is important not only to connect people but to collect, exhibit, permit voting and selection of the best entries exposed in the database of the wiki. It is a collaborative web. More precisely, it is an open website to visit and to collect information but not to contribute on it. People who are interested in participating have to create an account and, from this moment, they can contribute with new entries, modify existing ones or participate in surveys about the best one study of the year. The most important reason to force user identification is to avoid any harm to the web. Each change can be controlled and reverted, if necessary, by the responsible of the wiki. This operation will be explained with more details during the project. During this exposition all the contents of this website will be detailed, and also the choice and use of the software that was selected to create it. Finally, after working with the project, both the improvements that it will need, and the final solution to the detected problems will be explained. Of course this project can continue with other students, and many possible improvements to the original page are outlined and prepared.
INTRODUCTION

CHAPTER 1.NECESSITY OF THE PROJECT

CHAPTER 1.POSSIBLE SOFTWARE SOLUTIONS

2.1. Introduction

2.2. Possible Softwares to create a wiki

2.2.1. Google docs

2.2.2. TWiki

2.2.3. Confluence

2.2.4. MediaWiki

2.2.5. PBWiki

2.2.6. Socialtext

2.2.7. Wikispaces

2.2.8. Wikia

2.3. Comparison of the possible softwares

2.4. Selected software

2.5. Conclusions

CHAPTER 2.USE OF THE SELECTED SOFTWARE

3.1. Introduction

3.2. Requirements of the system

3.2.1. Simple One-Download Installation

3.2.2. Multiple Download Installation

3.3. Installation of the software

3.4. Work with the software

3.4.1. How to create a new page/entry

3.4.2. Introducing information

3.4.3. Inserting internal and external links

3.4.4. Redirecting pages

3.4.5. Deleting pages

3.4.6. Protecting entries

3.4.7. Creating content table

3.4.8. Creating “see also” or “see more”
3.4.9. Introducing images................................................................................................................21
3.4.10. Browsing history..................................................................................................................22
3.4.11. Discussion of an entry.........................................................................................................23
3.4.12. Watch a page .......................................................................................................................24
3.4.13. Vote a page ..........................................................................................................................24
3.4.14. Cloud tag...............................................................................................................................25
3.4.15. Introducing a map..................................................................................................................25
3.4.16. Collaborative Code..............................................................................................................26
3.5. Use of the administrator user.......................................................................................................27
3.6. Privileges to the other users.......................................................................................................27
3.7. Upload to the server....................................................................................................................28
CHAPTER 3. ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACT.................................................30
4.1. Environmental Impact of the Wiki............................................................................................30
  4.1.1. Environmental Impact of the Sony Vaio Laptop.................................................................31
  4.1.2. Environmental Impact of the Mac Mini Server.................................................................31
  4.1.3. Environmental Impact during the use of the system.........................................................33
4.2. Social Impact of the Wiki...........................................................................................................33
4.3. Economic Impact of the Wiki....................................................................................................33
4.4. Conclusions...............................................................................................................................34
CHAPTER 4. CONCLUSIONS AND FUTURE LINES........................................................................35
BIBLIOGRAPHY..............................................................................................................................36
INDEX OF FIGURES

INDEX OF TABLES
INTRODUCTION

The objective of these pages is to explain with details the final thesis based on a collaborative web between researchers, students...about Sustainable Development. It is a web to publish the improvements that anyone interested in this topic has developed. The aim is that other researchers or students around the world can see the documents, contribute with their own ideas, vote for the most interesting students and participate in discussions about all the topics that are in the website.

In the first chapter it will be explained why this collaborative web is necessary. Continuing with this, in the second chapter, the software that was used to create the web will be presented, and also the different improvements that was realized. In the third chapter all the tools available in the web and the method to use them will be explained. Finally, the last chapter is going to give details of the environmental impact of this project. To conclude it, the last chapter describes different ways to continue with the project and the concluding ideas of this project too.
CHAPTER 1. NECESSITY OF THE PROJECT

This project starts after the necessity of some members of the UNESCO Chair of Sustainable Development at the UPC to create something to contribute to the Sustainable Development all over the world.

The Sustainable Development is growing up by coordinated researches of universities or companies mainly. But many persons who are interested in this study begin their research activity by themselves. And of course students of universities are developing projects guided by researchers of her campus.

In all cases people around the world are dedicating time and effort to develop something. If there was anywhere a pool to store the knowledge of all of them together, the process of development could become easier. For example, if one people starts studying a theory and it can look it up in this common pool probably he or she would find that someone else has done this study before. With this information that person could also help to improve the current theory with his or her knowledge and complete or correct things that he or she founds wrong in the present study. On the other hand, if the person finds that no one has studied this field before he or she can start this project and when needing help, knowledge or something else, can contact with other people to ask them for it.

This pool would simplify the study of any field, avoid duplicating work if someone has done it before, search for help in a new study if necessary, study different points of view of a result, etc....

When these members of the UNESCO Chair of Sustainable Development at the UPC, in close collaboration with the international Universities arrived at this conclusion, the necessity of for this project was clear. It starts with the idea of a website in which these persons who are interested in the Sustainable Development can collaborate together.

The idea of the website was to create a wiki because it is the best way to interact with other people to collaborate in the entries. Initially, the line of work is focused on this wiki and the necessary entries to take the maximum benefit out of this website. After that, it appears some improvements are needed, like allowing people to discuss the documents, permit voting each entry to determine the best or even integrating code by different authors to collectively build a computer program.

This wiki is constantly growing up with different ideas but these are the basic ones on which the project is based. During these pages the improvements and future lines to continue will also be explained.
CHAPTER 1. POSSIBLE SOFTWARE SOLUTIONS

2.1. Introduction

In this chapter it is going to be explained different softwares that can be used to create a wiki and why the selected one. The second section has the aim to describe different software solutions that nowadays can be used to create a collaborative website, the advantages and disadvantages of each one and compare all the software together in the third section. The last part of this chapter explains the selected software to realize this website and the reasons to select it.

2.2. Possible Softwares to create a wiki

In this section it will be explained some softwares that nowadays are available to create a collaborative web. These kinds of websites can be created using applications, tools and applications programming interfaces web 2.0. There are lots of softwares that can be used to create a wiki. Only few of these are taking into account to create this comparison: the ones that are believed to be most useful to the project purpose.

The majority of these softwares are easy in use. They provide initial patterns to follow and programming is very intuitive. So, to decide which of them is the best software, the way is finding out the tools that are needed to the project and available in the software or how to use the tools of the software in their benefit to find the proper solution.

2.2.1. Google docs

Google docs is a group of Web 2.0 tools which allow working in a collaborative way with documents, worksheets, projects…and other documents. One of these main advantages is that only individuals that have been invited to the document can collaborate in it preventing the inappropriate use of the information.

The main characteristics of this free software are that permits:
- Create basic documents.
- Upload fields.
- Collaborative and Instantaneous edition.
- Online Publication.
- Versions and Changes Control.

2.2.2. TWiki

TWiki is a Web 2.0 platform to create, share and combine contents. It allows creating specific applications to the user and makes easier edit contents, asking questions and answering to other users, make comments and update the platform. It is mainly used to business work.

This website provide to the users:
- Work together to create and edit documents.
- Collaborate to modify the papers.
- Internal email to talk about the collaborative fields.
- Multilanguage.
- Discussions.
- System of Frequently Asked Questions (FAQ).

2.2.3. Confluence

*Confluence* is a web application that makes easier the collaboration between team works to administrate their knowledge. It is used in the business world basically in corporate world. It allows the collaboration, edition of contents, share contents…

These main characteristics are:

- Real time information through blogs.
- Notifications to obtain actual information.
- Editor WYSIWYG (What You Say Is What You Get).
- Configurable options.
- Easy to use.
- Discussions.
- Share and control documents.

2.2.4. MediaWiki

*MediaWiki* is a free tool liberated under the General License GNU. It was created for Wikipedia but nowadays it can be used as a general solution. It is powerful and scalable software with lots of advanced characteristics. *MediaWiki* is a specialized tool in collaborative writing of documents. In this website is permitted to publish, edit contents, share resources and RSS alimentation. Is very easy edit and write pages in these kinds of webs. This is one of the main reasons that *MediaWiki* became very popular.

The most important characteristics are:

- Good Graphical Interface.
- Modifications register.
- Version control.
- Revert changes.
- Editor WYSIWYG.
- Discussions.
- Multilanguage.
- Good model of permissions and security.
- Different access levels.
- Statistics about the visited entries.

2.2.5. PBWiki

*PBWiki* is the world leader supplier in solutions to the enterprises and education. Recently it launched *PBWiki* to manage documents. It is an easy and fast platform to collaborate with documents between employers, customers, suppliers…inside and outside of the firewall.

It allows to the equipments collaborate as easy and flexible as another wiki. In few hours, or minutes, the clients can create and fill a repository of documents to share in the firewall or out of this.

These main characteristics are:
- It allows to the user to control and manage the access to the documents.
- Automatically storage of document’s revisions.
- Easy graphical interface.
- It permits to find inside documents or wiki pages.
- Upload different files together.
- 2GB of free storage to each user.

2.2.6. Socialtext

Socialtext is a professional wiki service online which allows collaborating with other users in the projects. It permits to each user access to a share document in a personal form. It works in mobiles and free of advertisements.

The characteristics of this wiki are:
- It allows making comparison between two wiki versions.
- Lots of fields are allowed to upload (images, videos…)
- RSS notifications about modifications in the own wiki
- It can be published using the HTML code in a web.

2.2.7. Wikispaces

Wikispaces is known probably as the best wiki to a learner. It is easy to configure and to personalize it. There is a big community to help any problem to all wikispaces user. One of these main disadvantages is that this space is maintained by advertisements and, other disadvantage is that doesn’t allow access control to the contents.

Its main advantages are:
- Revision control.
- RSS notifications and by email.
- WYSIWYG Editor.
- Security copies in .zip fields
- Only uses HTML to personalize the website.

2.2.8. Wikia

Wikia is a platform that allows creating a wiki in an easy an intuitive manner. It is similar to PBWiki in use and both have an attractive visual interface.

Its main characteristics are:
- It allows uploading Youtube videos
- Email notifications about modifications in your wiki
- It has a forum
- Create emails list to send information to a particular group
- Don’t have access control
- Changes control
2.3. **Comparison of the possible softwares**

In this third section, taking into account the previous one, it is going to be done a software comparison. It is an important decision to select the appropriate software which adapts and allows the needed properties to the platform explained in the necessity of the project (chapter 1). It will be shown in the Table 2.. Software Comparison.

<table>
<thead>
<tr>
<th>Software</th>
<th>Number of Editors</th>
<th>Storage</th>
<th>Content Access Control</th>
<th>Revision Comparison</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google Docs</td>
<td>In documents 200 editors and unlimited in spreadsheet. Only 10 simultaneous in docs and 50 in spreadsheets</td>
<td>5000 docs and 1000 spreadsheets per user.</td>
<td>Yes. Only individuals that have been invited can do so.</td>
<td>No.</td>
<td>It doesn’t allow managing group and contents evaluation</td>
</tr>
<tr>
<td>TWiki</td>
<td>Unlimited.</td>
<td>Unlimited.</td>
<td>Yes.</td>
<td>Yes. Complete audit trail.</td>
<td>It doesn’t permit contents evaluation</td>
</tr>
<tr>
<td>Confluence</td>
<td>Unlimited.</td>
<td>Unlimited.</td>
<td>Yes.</td>
<td>Yes.</td>
<td>All the capacities are only available during a trial period.</td>
</tr>
<tr>
<td>MediaWiki</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>No.</td>
<td>Yes.</td>
<td>It does not allow voting and evaluate contributions.</td>
</tr>
<tr>
<td>PBWiki</td>
<td>1 to 3</td>
<td>2GB.</td>
<td>Yes. Access to content can be controlled at the Folder Level/Page Level.</td>
<td>Yes.</td>
<td>It is maintained by advertisements.</td>
</tr>
<tr>
<td>Socialtext</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>Yes. Access to content can be controlled at the Folder Level/Page Level.</td>
<td>Yes. Side by side comparison is a unique feature.</td>
<td>All the capacities are only available during a trial period of 14 days.</td>
</tr>
</tbody>
</table>
2.4. Selected software

After doing different comparison between the most important software that nowadays are available to create a wiki, it is time to decided which will be used to realize this project. All of them have interesting characteristics, but taking into account the preferences explained in the chapter 1 each of them have problems to be the used software.

- **Limited user:** the softwares that have a limit in the number of users are not interesting to this project. It is necessary to assure that all the participants who want participate can do it. So, taking into account this premise PBWiki and GoogleDocs are rejected.

- **Storage:** it is important to avoid limits in the storage because it can suppose a big problem to develop the project. Wikispaces, PBWiki and GoogleDocs cannot be used because of this exception.

- **Revision comparison:** it is an important item to know which changes had been done in the wiki and to undone if necessary. All of these softwares have this possibility except GoogleDocs.

- **Trial period:** if the software is only free for a trial period is not interesting for the project. It will be discarded Confluence and SocialText.

- **Advertisements:** there are softwares that will be maintained with advertisements and, for this project, it will be rejected. It is not wished to have adverts in this wiki project. Wikispaces and PBWiki are rejected.

With the before premises the softwares that can be used at this moment to develop the project are: TWiki, Mediawiki and Wikia. It can be observed in the Table 2. Summary of Software Limitations the limitations of each of the possible software.
Possible Software Solutions

<table>
<thead>
<tr>
<th>Software</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>MediaWiki</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PBWiki</td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Socialtext</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Wikispaces</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Wikia</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 2. Summary of Software Limitations

*TWiki*, from the point of view of a developer could be an interesting software. It allows all the necessities that this project wants. The two disadvantages that have made reject this software were that:

- This software is only used in business work.
- It is a difficult platform to work. And one of the main purposes of this project is the facility to program this wiki.

*MediaWiki* is considered the most powerful platform that nowadays is available to create a wiki. It is easy in use and has no limits in users or storage. The main disadvantages of this software are that it doesn’t allow:

- Voting entries of the wiki.
- Content access control.

As it is considered the best solution to make this project, it is looked up to a solution to these two problems.

To solve the problem of voting entries the solutions is to create a link inside the wiki to other website dedicated to votes. This new website can provide better solutions that the votes that are in the wiki softwares which permits voting.

The content access control is not one of the aims of the project. In spite of this it is been partly solved. It will be explained in the next chapter, but it was modified one of the settings to permit only modifications by identified users.

The last possibility is *Wikia*. It seems one of the best possible solutions because it has an attractive interface which attracts the user. Its main problem is that anyone can modify the wiki, it is impossible to know who had modified it and undone these changes. It is a big problem and the main reason to discard this software. The other problem is that is maintained by the company and it cannot be lodge in the server.

### 2.5. Conclusions

All of the explained softwares are very powerful to develop a good wiki. As it was explained in the section before each of them have disadvantages. Most of these disadvantages turn into the reject of this software but others can be solved with other tools.

This is the main reason to select *MediaWiki*. It is a powerful software that provides most of the
necessaries tools to this project. The facilities in use are a powerful weapon to select it. The appropriated change control is other important reason. It is important to know which changes had been done and undone it easily if these changes are not appropriated. The no limitation in storage and users is other important reason to choice it. One of the aims of the project is to collaborate with people around the world, and it implies nonrestrictive access. The two disadvantages that it has can be solved with other external tools, so, it became the selected one to finally develop the project.
CHAPTER 2. USE OF THE SELECTED SOFTWARE

3.1. Introduction

This chapter is the body of the project. In it, it will be explained the selected software (MediaWiki) to create the wiki. The aim of the chapter is to describe the entire program from the installation part to the final solution, when the wiki is in the server available to the users.

To do this, the first part is to describe the needed requirements of the system to allow the possibility to create a wiki (section 3.2) and the installation of the software to create it (section 3.3). After that, different explanations about how to create a page (section 3.4), privileges of the administrator (section 3.5) and users (section 3.6) and how to upload the final program to the server (section 3.7) are explained.

3.2. Requirements of the system

There are two possibilities to which place can be installed the MediaWiki software: locally in a pc or in a server in a public domain. In both cases the system needs:
- a web server to send the generated packets to the web browser,
- PHP to run the software and
- a database to store the pages and site data.

This can be done in two different forms: with a single installation or with a multiple one. It will be explained in the following paragraphs.

3.2.1. Simple One-Download Installation

It is possible to install the requirements with only one installation. It must be with the Xampp program which provides the installation and configuration of all the important packages needed. It can be used with Windows and with Linux too and includes the necessary tools to run the wiki software.

3.2.2. Multiple Download Installation

The other possibility is to install each component individually. Firstly it will be installed the web server. The most common is the Apache server and it will be easily and free downloaded from his website. Other web servers that can be used are the Sun Java System Web Server or others less popular like Cherokee or Hiawatha. Secondly, it is necessary to install PHP software, minimum the 5.2.3 version. Finally, the database server is the last requirement to run correctly the MediaWiki software. It is needed to install MySQL, SQLite or Oracle to accomplish the requirement of a database.

Both possibilities are good to obtain the requirements of the system to install the MediaWiki software. In first instance the wiki will be run locally in a computer to learn the software and to create the platform, so, it is decided that the first option is more practical. It only needs one installation and is a software that works easily. Finally, the project will be lodge in a server, and it has all this requirements to work, so it is not a problem.
3.3. Installation of the software

In this section it is going to be done the installation of the software. This software (*MediaWiki software*) will provide the interface of the wiki. When all the steps were done the wiki will be created, and only it will be necessary to work in it to introduce the information.

The first step to install the software consists on put the *MediaWiki* folder on the server directory. If it is going to be used locally with *Xampp* is necessary to put it on the main directory of this program. In both cases the next step is going to a navigator and introduces the URL where the software is (in the local case: http://localhost/wiki, where “wiki” is the name of the folder). It will appear a message indicating that there is no wiki configured with this name and it will be a redirecting message to the configure site.

After selecting the language to the program and accepting the conditions and revising the requirements arrives the selection of the database. In this case it will be marked the *MySql* database, and after that two things:

- Identify the wiki: named the database wiki that are being created with the “database name”.
- User account for installation: put a username and a password to complete the installation.

These two configurations are for the database, not for the wiki.

Finally it arrives the most important part. In this part it is necessary to give a name to the wiki because it will be the name with will be used. As it will be observed in the Figure 3. Installation part, name to the wiki in this case the name of the wiki will be “*my_newwiki*” and the project namespace will be the same.

![Figure 3. Installation part, name to the wiki](image)

The last part consists on create the administration account. It will be explained the importance of this account in the section 3.5. It will be given a name and a password to the administrator and finally it is important to put an e-mail address to restore this account in case it will be forgotten (Figure 3. Installation part, administration account).
When all these parts were done, it will appear a *LocalSettings* file to download. This file is very important because it contains all the configurations that are been given in this process of installation. It is necessary to place it on the directory of the software, because without it, the wiki will not run. After all these steps, the wiki will be created in blank and it is time to work in it.

### 3.4. Work with the software

In this section it is going to be explained how to use the installed *MediaWiki* software to personalize the wiki. The first step is how to create a new page or entry. After having it created is important to know how to introduce the information, to link with other pages, create a redirection in a website….and different tools which may be interesting to work with the software.

#### 3.4.1. How to create a new page/entry

There are different methods to create a new page in the wiki and all of them arise to the same ending. The developer of the page can do which he likes most because there is no difference.

The main page of the wiki is always done by the software but it must be modified. There is no information apart from the panel navigator. It is important to explain in this main page basic and interesting information about the wiki which will be developed. This page can be modified as often as wished. The next step is to create other pages to associate it to this wiki. There are different forms to do this. In all cases it is going to be supposed that only the main page is created.

- **Using links:** it is possible to create a new page for the wiki using a link in the main page (or in other pages). It means that, when the developer is in the editing mode of this main page it is needed to introduce with the “internal link” bottom the name of the page which it is wanted to be created. When this bottom is pushed it appears “[[Link Title]]” in which it is necessary to substitute the text for the name of the page that it is wanted to be created. It is shown in the Figure 3.. Use of the Internal Link to create a new page creating the “Edification” internal link with the bottom.
- **Using the URL:** other way to create a new page is introducing in the navigator the page which would be created (for example: http://localhost/wiki/index.php/New). If it doesn’t exists appears the option to create it. This is shown in the Figure 3.. Use of the URL to create a new page.

- **Search panel:** the last option is search for the page in the search panel. If it doesn’t exist it appears the option to create it on this wiki as it can be seen in the Figure 3.. Use of the search panel to create a new entry.
3.4.2. Introducing information

When the new page is created it is time to introduce the necessary information. This software provides an easy way to introduce the information because it consists only on write as if it was a text editor. It is necessary to press the “edit” bottom situated in the page. It appears a modified page in which it can be written the content. A good form to create the page is organizing it in sections. The titles of each section can be done introducing the title section between this sign “==”. If it is wanted to create other inferior level, it consist only in adding a new “=” sign.

As it can be observed in the Figure 3.. Different sections in an entry the “challenge” title is the title of one section. The other two titles are in other inferior level and they appear with other kind of text. In the other part of the Figure 3.. Different sections in an entry it can be observed the final result of the created sections.
When the different sections are structured it will be introduced the information. The text will be introduced in a normal form, or it will be an italic or bold text. To change this text is only needed to press the bottom which indicates this type of text and write it. Other possibility that can be used is change the text size. This is not often used but can be done putting the text between <big> or <small> as it can be seen in the next figure (Figure 3.. Create small text)

Other things which will be important to facilitate the reading when creating an entry are the form like the text is structured. It would be interesting to introduce tables with information, boxes to emphasize a part of the text, create a list…

- **Table**: create a table is easy and it can be used to structure information, create comparisons…All the process is shown in the Figure 3.. Create a table.

Written in the editing mode

Obtained in the wiki

- “{|}” and “|}” identify the limits of the table
- “|+” is optional and is to specify the subtitle
- “|!” is optional too and indicates the head
- “|” is to put each line of text
- “|-” it serves to separate lines inside the table

There are more options when a table will be created. It will be selected the color, the type of border…

- **Boxes**: the idea of this tool is only to remark a part of the text that the writer considers important.

This kind of instrument is very useful and easy in use. It consists only in introducing the text tabulated, and the result is a box as which will be observed in Figure 3.. Box to remark the text.
3.4.3. Inserting internal and external links

Other important tools that can be used in a wiki are the creation of internal or external links. Both of them facilitate the reading because they connect the present entry with another that can be in the same wiki or in other site in Internet.

The method to create an internal link was explained in the 3.4.1. section and in the Error: No se encuentra la fuente de referencia. The way to create an external link is very similar to the last one. It consists on pressing the bottom of the external link and introduce the website between the brackets (with http:// before the name) followed by the name that it is wanted to appear in the entry to link. The process can be observed in the Figure 3.. External link. It will link with the website of www.google.com and in the entry will appear the text “More Info”.

3.4.4. Redirecting pages

A redirection can be useful in case of duplicate entries or in pages that were created by error with a similar name or meaning than other. In these cases the best solution is to create a redirection of the website that were created later or the one that have less
information. Until doing the redirection it is important to pass additional information that the final website need to have because the redirected one disappear automatically when the process ends.

It is explained with the next example: The entry “Energy” was created but it contents few information. After that, the page “Energy & Climate” was created and contents a lot of information about this topic. When the problem was detected is important to solve it. The best solution in this case is not to delete the page (3.4.5. section) because it can be people that will continue searching for it, so, it is better to redirect it to the correct one.

- The first step is to look through the “Energy” page and compare with “Energy & Climate” and transfer important information which was in the first one but not in the second one.

- The second step consists on click the arrow that is situated in the right of the page and selects the option Move as it can be observed in the Figure 3.. Option Move.

![Figure 3.. Option Move](image)

It will appear a new page to indicate the redirected page and to inform of the reason. It is shown in the Figure 3.. Move Page. The “move page” gap is the one that will disappear. The “to new title” gap is the page in which it will be redirected. In the “reason” part is necessary to indicate that it will be move because is a duplicate entry. Finally press the “move page” bottom and the redirection will be done.

![Figure 3.. Move Page](image)

To make sure that the redirection was correctly done it is necessary to write in the navigator the “Energy” web and something like Figure 3.. Redirected page will appear. After the title it is shown the text “Redirected from Energy” which indicates that the redirection is working properly.
Other form to redirect a page to other that exists in the wiki is using this easy command in the page that will be redirected.

```markdown
#REDIRECT [[Main Page]]
```

In this case it is being redirected the website to the Main Page of the wiki. Between the brackets it can be collocated any existing entry of the wiki.

### 3.4.5. Deleting pages

A useful tool to solve a problem of a page created by error is to delete it. It cannot be done by the normal users but only by the administrator. It consists on click the arrow that is situated in the right part of the page and clicks the delete bottom.

It appears a deleting page in which it is necessary to select a reason to delete the selected entry. It will be by "other reasons" or by a request of the author, vandalism or by a copyright violation.

### 3.4.6. Protecting entries

It is another tool that only will be used by the administrator. It is useful to avoid that a page will be modified. It will be interesting to use in the main page, because probably, it will not be modified by other persons, only by the administrator, and to avoid problems or vandalism, is better to protected it.

### 3.4.7. Creating content table

The content table is an automatically index which is useful to organize the entry. In this index appear all the titles that are in this entry and pressing any of this it will go to the corresponding part of the page. The typical content table will be observed in the Figure 3.. Content Table.
To create this type of index it is necessary to write in any part of the editing mode of the entry the “__FORCETOC__” text and the content table will appear in the upper part of the site.

3.4.8. Creating “see also” or “see more”

The “see also” or “see more” is commonly used in wiki pages. It serves to link the present entry with others which can be interesting for the readers. Is not a particular tool, it consists on introduce the title (“see also” for example) followed by an external link (if the information is not in the wiki) or an internal link (if the interesting information is in the wiki).

There is a little difference between the “see also” and the “see more”. The first one linked to pages with similar contents or projects, normally in the same wiki. Normally this text is in small words to emphasize the links, as it can be observed in the Figure 3.. “See also” text inside an entry. The other one (“see more”) normally extend the information that is in this entry, typically it can be a page that contents the total information of this extract. This example is shown in the Figure 3.. “See more” text inside an entry.

3.4.9. Introducing images

The design of the entry is very important to attract the attention of the reader and to make easier the reading. A good form is referring during the text to images which clear up the information.
The way to do is explained in the Figure 3. How to upload an image and introduce in the text. In the first step, it is necessary to be in the editing mode, press the bottom that indicates to embed an image and introduce between the brackets the name of that image. Accepting the changes, in the view mode it is shown this name and a broken link as it can be observed in the second step of the Figure. Pressing this link it is redirected to the upload images page, shown in the third step. Here it is necessary to select the directory of the photograph and upload it to complete the process.

(Embedded File Bottom)

**Step 1**

**Step 2**

**Step 3**

**Figure 3. How to upload an image and introduce in the text**

There are different possibilities to improve the appearance of the photograph, but the most commonly used is to put it in a square. It is easily done by introducing the text “thumb” in the embedded file. Other important thing to do is a little explanation of how can it be observed in the image, like a title of the photograph. Both things must be done in the editing mode and it can be observed in the Figure 3. Improving and image.
The last technique that is commonly used is the gallery of photographs. It will be used in case that there is a group of photographs that must be shown together. In the case it consists on introducing the photos inside the “gallery” group as it is shown in the Figure 3.. Gallery in editing mode

![Figure 3.. Gallery in editing mode](image)

The result of that gallery will produce a strip of images as it can be observed in the Figure 3.. Gallery of images

![Figure 3.. Gallery of images](image)

3.4.10. Browsing history

The next explained tool is the view history. It is an important and useful instrument that serves to view all the contributions which are done in any entry of the wiki. It is interesting to avoid vandalism or to revert a mistaking change.

The way to use is easy and consists on pressing the “view history” bottom which is located in each entry of the wiki. To explain that it will be done with the Figure 3.. Resume of browse history page and the different points that it has. It appears a list with all the changes that were done in this page and the person who has done each one (point 1 in the Figure), moreover to see all the contributions of the persons. It appears a list and it can be selected a period of time and it is possible to see all the modifications of this user (point 2 in the Figure).
If it is necessary it can be undone the last modifications (because of errors, vandalism... point 3 of the Figure) and if necessary block the person who had done this action. This last action can only be done by an administrator or somebody with the appropriated permissions.

It is possible too, to make a comparison between two modifications and it can be done pressing both that will be compared and press the “compare selected versions” bottom and appears something like the point 4 of the Figure. In it appears the modification or modifications and the line of each of one.

User who had made the change (1)
Revert the change (3)
List of contributions (2)

Compare versions (4)
3.4.11. Discussion of an entry

This website has a principal objective that all the people that use it can contact and talk with each other. Nowadays, there is not the possibility to talk in a private way, so, the most useful tool is the discussions embedded in each entry. Each entry corresponds to a project, and each project may need a discussion to solve problems, to ask for more information...

It is simply in use, because it consists only on go to the discussion page and edit as if it was a text editor. The only needed requirement is that the person who collaborates might be sensible and introduce her name or her identifier in the website to allow a minimum order in the discussion and to allow that other persons can answer to specific comments.

The best way to do it is in the editing mode of the discussion click to “Add topic” and, in it, introduce a significant phrase. In the example in the Figure 3.. Discussion of an entry it is shown the user’s name and the date/hour of the comment. Each person who answer this topic or who had a new one might realize the same process.

Obtained in the wiki
Written in the editing mode

There is the possibility to add an extension of the wiki to change that discussion to a chat. It is probed in the local site and the result is that visually is not as organized as the discussion and, it produces errors in working, so, it is better that option before an optimization of that extension.

3.4.12. Watch a page

Watch a page tool is similar to follow the correspondent entry. It can be done in all the pages of the wiki and it consists in pressing the “watch” bottom situated in the right part of the site. With this tool the obtained result is a new page in which it will be listed all the changes done in the entries that are been followed by the user.
The list is in the special pages under the title “my watchlist”. As it can be observed in the Figure 3.. My Watchlist it appears a list of the last pages that are been modified since the last active time in the wiki. Pressing the “diff” link it appears the differences between the present version and the new (it is the same that in the point 4 of the Figure 3.. Resume of browse history page). Pressing the “hist” bottom appears the history of changes in the marked website. It is the same that in the principal part of the Figure 3.. Resume of browse history page.

3.4.13. Vote a page

This tool has the function to allow people who visit an entry to vote for it if they liked the content. After a period of a year it will appear the most voted page during this year. There were different possibilities to allow voting a page. It will be done by little programs which permit inserting voting inside the page: EasyPoll, FPoll…The best drawback of these programs is that only allow one active question and a limited number of answers in each questions. The problem of having only an active question is not a big problem because, in principle, with one question which asks for the most interesting entry can be solved. These programs were finally discarded because of the limited number of answers. If only one question can be active and with a limited number of answers around 50, is impossible to introduce all the projects of the wiki as answers, which are over the order of 400, to vote for them.

One of the contemplated solutions to this problem consists in use an external website which allows creating more than one question with a limited number of answers of 50. This website is visually attractive but it is maintained by publishing. Taking into account this drawback it was contemplated to probe it in a trial period with the next result: during 3 months of this period approximately more than 2 months this website is not working properly. Mainly, it appears the problem of a broken link; the questions pages cannot be loaded. These two drawbacks became into the reject of this website.

The selected solution consists in use one of the most powerful tools that can be founded freedom in the Internet: a questionnaire supported by Google Docs. It allows an unlimited number of questions and answers. Other important think that this program permits is the possibility to vote in one unique answer to more than one project. After voting, the results can be shown if the user wants.

This program is not as attractive visually as the previous one but as it belongs to a big
company, it will work properly most of the time. The results of this questionnaire will be shown in a bar chart and there is another graph with the frequency of use of the page. The only requirement to use this program is having an account in Google and having the link (it is shown in all the parts of the website to allow voting).

3.4.14. Cloud tag

The cloud tag is a tool which serves to view easily the most important entries of the wiki. The own website has a statistical page in which appears all the pages order by the number of visits and it can serve to the administrator to create a cloud tag with this information. The cloud tag is a separate application introduced in the wiki and it collocates in different sizes the entries of the wiki. With this, the users can see quickly the most visited websites; probably because of an actual or new item that causes that increment of visits and it facilitate the search to many people who wants to visit this same entry.

The process of the cloud tag was created by the program Tag Cloud Generator. It is a simple program in which it can be introduced all the needed tags and their URL. Using the frequency pages of the wiki it will be assigned their priority (1 the less visited and 10 the most visited). It can be selected the colors of the tags, the font, the size of the font, the borders of the square…as it is shown in the Figure 3.. Tag Cloud Generator.

![Figure 3.. Tag Cloud Generator](image)

After that process it will appear the generating code of this cloud tag. In this case it is selected the HTML code, and using a converter from HTML code to Wiki code and introducing that obtained code in the wiki, it will appear something similar to what is shown in Figure 3.. Tag Cloud.

![Figure 3.. Tag Cloud](image)

3.4.15. Introducing a map
This project needs to introduce maps in its contents to collocate the projects in the correspondent point of the world. This tool is not integrated in the basic software but is available as an extension. To introduce it in the present system is necessary to download from the website the maps extension and the validator. Both of them functions will be explained next.

The validator is a tool needed in all the cases that an extension will be running in the system. If the system is working without any added extension, this is not necessary. Its only function is to show if there is an error in the extension’s working. For example in the case of the maps, if it is going to be created a map with a point that does not exists or contains any mistake in the programming, this validator shows a message indicating the error, it can be something similar to “there is an error in your syntax” or “Parameter coordinates must be one or more valid locations”. In conclusion, this extension helps the developer to make easier to detect a failure in the extensions work, because there are not as predictive as the basic functions.

The extension of maps is the needed in this project. That is a powerful tool because it is provided by the map’s application of Google. After downloading the “pack” of both extensions (map and validator) and adding them to the Local Settings folder, the wiki is prepared to show all the wishes maps.

Once the extension is installed is very easy to work with it. It only consists on introduce the location point between the brackets including the text “#display_point:” followed by the city and it will be shown the map, as it can be observed in the Figure 3.. Display a point in a map.

![Figure 3.. Display a point in a map](image)

The same procedure will be done to add more points, changing the title “display_point” by plural (display_points). There are different options to adapt the map to the needed requirements. It will be explained next.

- **Create a pop-up**: in most cases, is not enough the collocation of the point, it is needed to indicate its meaning. The most common form is adding a pop-up to the point. That element will show a picture or a text, or both of them. It can be observed in the Figure 3.. Insert a pop-up the procedure. Firstly, it is indicated the place (Aegonplein in Netherlands). After that, it starts the creation of the pop-up. Each element will be marked with the “~” symbol. Secondly appears an image named “aegonplein.jpg”, and it will be between the brackets because is the form to indicate a figure in the wiki, as it was explained in the 3.4.9 section. Thirdly, the text “Aegonplein” will indicate an internal link inside the wiki, because of the brackets. Inside the pop-up will appear this internal link, and if it will be marked, it is going to be redirected to the “Aegonplein’s page” inside the wiki. Finally, there is a text with no link. It is only to indicate something important but with no relevant link inside or outside the wiki, in this case the city, country and the year of this project.
- **Zoom:** other interesting thing used during the creation of the site was the possibility to zoom into a map. This zoom is between 1 and 21 points. If it is not selected, the program will place the most indicated. If it is wanted to change the selected zoom, the procedure consist on specify in the editing mode after all the comments a text similar to “| zoom=18”. In this case it will be shown a zoom of 18, it can be increased to 21 or reduced to 1. The procedure is shown in the Figure 3.. Zoom in a map.

- **Type of map:** these is other option inside the map which, if it is not collocated the program will show always in the same mode. It is possibly to select if it is wanted to see a “satellite” map or a “normal map”. If nothing is indicated the map will be shown as a normal map, but it is wanted to be in a satellite mode it must be indicated by the text “|type=satellite” as it can be observed in the Figure 3.. Type of maps.

- **Sizes:** by default, the size of the map is 740x600 pixels. The first one indicates the width and the last one the height. It these parameters are wanted to be modified it is necessary to indicate, in the same way as the previous the width or the height. In the Figure 3.. Sizes in a map it shown the modified sizes in which the parameters are 640x400 pixels.

There are other parameters that can be modified but not as important as these. Different
options are the selection of the scale, the controls, the units, indicate the latitude…

3.4.16. Collaborative Code

It was explained previously the different lines of development of that project. One of these was the possibility that the persons who want can introduce it part of a Java’s code. The objective is making a program about something with the collaboration of different developers, whose can introduce a piece of code or a method to complete the final program.

The way of use is selecting in the sidebar the link to the “collaborative code” and introducing here the part of code indicating the necessary information, with comments and all the facilities to other developers. When the code is complete it will be compiled by the responsible person of that part and comment the results and improvements.

3.5. Use of the administrator user

The administrator is an important and required figure in this project. It is necessary to have someone that controls and manages the website. The administrator user has some privileges that nobody else has. It is important to maintain the order in the website.

The different privileges that the administrator has and the normal user cannot access are the following ones:

- **Protect an entry**: it was explained in the 3.4.6 section and it consists on cannot permit to the users to modify the protected entry. It is interesting to the main page or to other than rarely has to be modified or that the administrator wants to control totally.

- **Delete an entry**: normal users cannot delete a page. It serves to avoid vandalism or other problems. This tool is only available to the administrator to delete a mistaking website or by other reasons.

- **Block/unblock users**: if a user makes actions to destroy the website, do inappropriate comments or something else that damages the website, the administrator can block the user for a period of time or an indefinite period and unblock when the administrator considered.

- **Unwatched pages**: it was explained in the section 3.4.11 the use of watch a page. The unwatched pages list contains all the entries that are no followed by anyone. It appears a list with all the entries that contains this wiki and the possibility to watch since this moment pressing the bottom “watch” in the entry that is wanted to following.

- **Deleted user contributions**: this special page contains the list of deleted contributions. It will be selected by the user name or ip address to know the movements of each user. It appears information about the deleted page and the content. It allows the possibility to modify the user rights or to block this person if necessary.

- **Import pages**: this special page is useful to recover a backup of the website or to import information of another wiki. Previously it is necessary to export the information in the same wiki, as a backup, or in other wiki to import in this one.
Import the page is an easy process that consists in selecting the text that will be imported and it will appear in the wiki.

- **View deleted pages**: this last one special page serves to view and restore (if necessary) a deleted page. It can be done by two methods: one is obtaining the deletion log in which appears all the pages that are deleted from this wiki. The other form is search for pages that are needed to validate if is deleted or by deletion time.

### 3.6. Privileges to the other users

The normal users are the people who can create an account and participate in the website. To avoid problems, all of the tools explained in the 3.5 section are not allowed to a normal user. However, a series of privileges were given to these users to collaborate in the site:

- All the logged users can modify any entry of the wiki (except the ones that are protected by the administrators). Moreover, any unlogged user cannot edit the entries.
- All the logged users can discuss all the entries of the wiki.
- All the logged users can upload any wanted file.

### 3.7. Upload to the server

The process to upload the wiki to the server is similar to the process to install the wiki in a local pc, as it was explained in the 3.3 section. The process consists on install the MediaWiki software in the corresponding folder of the server and, after that, do the installation process explained in 3.3 section. In it, it will be selected all the preferences and databases to use during the life of the project.

Before the installation, it is necessary to accomplish some requirements in the system, explained in 3.2 section. These requirements are:

- a web server to send the generated packets to the web browser,
- PHP to run the software and
- a database to store the pages and site data.

The own Mac Mini computer, used as server, accomplish all these requirements except the last one, it needs a database. In first instance, to install that database, a mysql database was thought to install but, finally it was decided that the best option was install the xampp program which was installed in the local pc in which the probes were done. The decision of select this one is because it is a powerful software which works easily. In case that one day the database stops working the only action to do is restart the mysql database which is inside the xampp pressing a bottom.

It allows too, a simple way to create the wiki: there database is mostly configured and the only thing to do after install xampp is install the MediaWiki software in the same way that was explained before, in 3.2.1 subsection.
CHAPTER 3. ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACT

In this chapter it is going to be explained the different impacts that this project can produce. The most commonly is the environmental impact, which can give an idea of the repercussion in the environment during and after the use of that wiki. The second impact that had been considered is the social impact which it is going to give the effect that the project is going to have in the readers. The last impact that would be considered is the economic impact in which it is going to be explained the cost that the wiki site will produce.

4.1. Environmental Impact of the Wiki

This environment starts with the initial idea of the project, going through the designing part, construction, useful life of the system including the normal use, maintenance and emergency case, and ending with dismantling, reuse and the recycling or waste of it. Next, it will be treated all these parts of an environmental impact study focusing on the materials and elements that were used to produce the wiki.

To make easier the parts, it will be explained with the Table 4.. Parts of the System Life. In it, it will be found the different parts of the project and the elements that are involved.

<table>
<thead>
<tr>
<th>Processes</th>
<th>Sub-processes</th>
<th>Involved elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designing the System</td>
<td>Idea</td>
<td>Sony Vaio Laptop</td>
</tr>
<tr>
<td></td>
<td>Designing part</td>
<td>Sony Vaio Laptop</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Sony Vaio Laptop and Mac Mini Server</td>
</tr>
<tr>
<td>Useful Life of the System</td>
<td>Use</td>
<td>Mac Mini Server + PCs + iCloud</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>Mac Mini Server + Sony Vaio Laptop</td>
</tr>
<tr>
<td></td>
<td>Emergency</td>
<td>Mac Mini Server + Sony Vaio Laptop</td>
</tr>
<tr>
<td>Ending part of the System</td>
<td>Dismantling</td>
<td>Mac Mini Server</td>
</tr>
<tr>
<td></td>
<td>Reuse</td>
<td>Mac Mini Server</td>
</tr>
<tr>
<td></td>
<td>Recycling/waste</td>
<td>Mac Mini Server or Sony Vaio Laptop</td>
</tr>
</tbody>
</table>

Table 4.. Parts of the System Life

The impact of the three processes of the project includes basically the impact of the administrators computers although the useful life in which any computer can use the wiki. In the next sections it will be explained the environmental impact of these elements to obtain an idea of the impact of the whole project.

As it can be observed in the Table 4.. Parts of the System Life, the project was done with a Sony Vaio Laptop and the server is allocated by a Mac Mini. These two elements form an important part of the environmental impact of this project. During the useful life of the project it is supposed that anyone can use it, so it is described like any PC. Next, it is going to be explained the environmental impact of the Sony Vaio Laptop
which is used to design, prove and create the project (and will be used in case of emergency or some maintenance) and the impact too of the Mac Mini Server in which is allocated the wiki that is in production.

4.1.1. Environmental Impact of the Sony Vaio Laptop

Sony Company is highly aroused with the environmental impact of their elements both in the manufacturing process and in the own use of the laptop.

**Manufacturing and Distribution Process:**

- During the manufacturing process, one of the most important parts is the factories in which the product is created. The company assures that all their factories make an important effort to reach the objectives of reduction residues, energy and carbon emissions that they have established in their environmental plan “Road to Zero”. In this plan, they are committed to reduce the environmental impact of the company and to use the resources in a responsible way until 2050.

- To fulfill the ISO 14001, which objective is to reduce the environmental impacts, Sony created their Global Environment Management System in each factory with more than 100 employees and uses 100% of renewable energies.

- As the products are being smaller they can reduce the packing size. Nowadays they are using reusable bags not to waste any packing. This point affects in the distribution process because each truck can contain more equipment and reduce the contamination.

- The last part of this process involves the suppliers of Sony. To be a Sony supplier it is necessary to pass an auditory and obtain the Green Partner Certification in which the company determines the environmental criterion to all their suppliers.

**Options in the Laptop:**

- Sony assures that all their personal computers fabricated from 2010 to the actually have approximately the 85% of the plastic pieces done by recyclable materials.

- One of the most important options during the use of one of these laptops is the energetic saving. They include a system which adapts the graphics to the form that the user needs, maximizing the energetic efficiency and the battery duration.

- The Vaio gamma satisfies the requirements of the Energy Star certification which promotes the electric products with efficient consumption of the electricity, reducing the emission of Greenhouse Effect gases.

4.1.2. Environmental Impact of the Mac Mini Server

Apple is other company highly aroused too with the environmental impact in all their products. It will be explained next the manufacturing and distribution process in which they are reducing the emissions and the options in the own laptop to help the environment.

**Manufacturing and Distribution Process:**

- During the last years the company is reducing the size in the materials and which
it, the used elements to make it and it involves the reduction of the carbon emissions during this process.

- Other of their challenges is to reduce toxic substances like arsenic, mercury, PVC, BFR…in their products. The majority of countries nowadays allow these materials but, as it is known that there are toxics, Apple and their suppliers are working to eliminate it of their products.

- It is used during the whole manufacturing and assembling process materials that respect the environment. The company demand to their supplier to follow their code of conduct and submit to regular audits.

Options in the Laptop:
- Mac Mini is the personal computer with the lowest energy consumption in the world. It reduces the costs and the environmental impact which is coming from the energy plants.

- One of the important things of this computer is the advanced administration of the energy. This computer uses hardware components which have lower energy consumption and works with the operative system together to save energy. After an inactive period it automatically actives the repose period in which the save of energy will be incremented.

- This Mac Mini accomplishes the Energy Star certification with a margin of the 80% of the limit of the certification.

- Mac Mini uses recyclable aluminum which has more possibilities to be recyclable at the end of his life.

iCloud, the cloud storage of Apple:

iCloud is a tool of the Apple Company which serves to storage all the information of the users on remote computers servers. The server used in this project (Mac Mini) can uses iCloud, if the administrator considered it necessary, to storage the needed information in the cloud.

Apple assures that their information was storage in centers that prove their agreement with the reduction of the environmental impact making ecologic and efficient buildings. The Maiden center, in North Caroline, has obtained the LEED Certification that is a group of regulations with the aim of the sustainability in the buildings. The Apple’s objective is to operate in this installation with an elevated percentage of combination of renewable energies. They are doing projects with this aim, such as the construction of a solar panel to the final users or the private installation of the biggest combustible cells of the EEUU.

The designing elements that allow the save of energy in the Maiden center are:
- A chilled water storage system to improve chiller efficiency by transferring 10,400 kWh of electricity consumption from peak to off-peak hours each day
- Use of “free” outside air cooling through a waterside economizer operation during night and cool-weather hours, which, along with water storage, allows the chillers to be turned off more than 75 percent of the time
- Extreme precision in managing cooling distribution for cold air containment pods with variable-speed fans controlled to exactly match airflow-to-server requirements from moment to moment
Instead of this, *Greenpeace* has recently done a study of the company’s clouds and *iCloud* has failed it. The majority of the servers of other companies over the world are situated near the Poles to take advantage of the natural cold to refrigerate their databases. Otherwise, Apple had situated their servers in North Caroline, California and Oregon involving with this extra energy consumption to achieve the needed temperature in the servers. 

Other *Greenpeace* study assures that the dependence in coal of the Maiden center to the supply of energy is about 61,5%. The overall energy that comes from coal in the Apple company is about 55,1% being like that study of big companies the one that has more dependence of the coal sources.

4.1.3. Environmental Impact during the use of the system

This last part of the process is difficult to estimate because it depends on the server (which its impact was described previously) but furthermore in the users. This impact is difficult to predict because depend on the number of users that are visiting the website and the actions that are doing (it does not have the same consumption read an entry or search, download or entry information to the wiki).

So, it will depend on the computers in which the users are connected. As the environmental impact is an important factor nowadays, the majority of the companies dedicated to the computers are aware of this, and they are trying to reduce it in all the different possibilities. In conclusion, it is supposed that, approximately, the environmental impact can be as the previous ones.

The environmental impact has another important part, the positive one. The objective of the wiki is the sustainable development, so, the use of it will produce a very positive impact in the environment. The different published projects provide ideas to improve possible projects that will be realized in the near future. From the point of view of a city or a town, if the researcher of that municipality can access to that website and read the documents, probably he or she would use it in the next future projects of the city, improving the environmental impact of their city.

4.2. Social Impact of the Wiki

The social impact cannot be determined from the used tools that are used to generate the project. That impact depends on the effect that the wiki site can produce in the persons who access to that website.

It is an important factor the aim of that project: is a collaborative web about Sustainable Development. The person who usually read or access to that tool is a person who is conscious with the environment and wants to improve the present situation.

All the projects that are available in that site talk about different forms to improve the present state of the environment. Probably, the majority of the visitors will be researchers or persons involved in that world of the sustainable development, but, it can be used by other persons who access to that website by searching something in Internet or by a recommendation. If these persons read the documents about the sustainable projects it is probable that they begin more conscious with the present situation of the world and with the importance to maintain and improve the environment.

So, that tool can give different opportunities: in one hand it would be a source of information for researchers that have the possibility to improve the environment with their projects and, on the other hand, it can influence in people not related with this topic to be interested in it, make conscious about the situation and help to the
environment with little actions. In the first case, researchers can carry out big changes in
the environment helping with projects in big cities or with big actions to have an effect
on the planet. The second case, the individual persons, will not do big actions, but if day
after day that person realizes little actions (as recycling garbage, using correctly the
electronic tools, maintaining the green zones of their city…) it would become in a big
result to the environment. Being a person aware of the environment usually helps to
raise friends awareness with the environment too. The person normally talks about the
actions that he or she is doing to help the planet and the repercussions that it can
produce. Their group of family and friends will become awareness too after the giving
reasons.
The other important positive aspect that this website can give to the society is given by
the sustainability. The Sustainability is defined as a balance of the species with the
resources of their environment. In fact, these aspects might be environmental, economic
or social with the aim to achieve an indefinite progress to the humanity. This progress
will benefit the human race for the rest of the time in a very positive form.
The other side of the coin is necessary to be considered, because it can produce a
negative social impact too. The use of the Internet in general is producing adverse
effects in the society.
It is said that with an excessive use of that kind of tools people are losing their
imagination because they can find all that they would like to know. In the same context,
the persons are reducing they mental effort. It is typically to have a problem and, after
thinking a few minutes, without obtaining any solution, starts a search in the Internet to
find the solution to the problem. The last effect and very important too is the reduction
of the attention to the verbal information because it is thought that the information that
are available in the Internet will be always better than the information that nearby
persons can give to a problem.

4.3. Economic Impact of the Wiki

The last important impact that will be taken into account is the economic impact that
this site will produce.
The economic impact will be very positive because the use of a collaborative website.
The possibility of the interaction between researchers often produces an increase of the
economic advantages. The users can improve the value and the experience with a
collaborative website. The decisions will be taken easily because the interaction with
the researchers can be “permanently” in contact and the deadlines will be decreased,
which reduces the costs of their company.
The use of that wiki for the researchers can improve in other way the economic impact
positively. The persons who are usually using that website will talk with other
researchers about that tool making it more popular. The use of the website to interact
and to interchange ideas will improve the economic impact.
The negative part of the economy will be the produced expenses from the creation and
maintenance of the wiki site. The student who had developed that wiki had produced an
economic impact about the dedicated time to create the site and to introduce the
information. Since the day of the starting up the server is in constant running, and this,
produce too an economic impact.
But this negative part can entail a positive one: at first time the student has introduced
all the projects and has a “waste” of time and money, but, after this first part is
completed, the projects will be introduced by the own researchers when they are
developing or when they have finished the project.
4.4. Conclusions

The environmental impact is a very important factor in the realization of a project. After the research of the impact produced by each component involved in the system it is concluded different things.

Firstly, it is important to take into account the impact produced by the developer computer because during the first period of the project (designing) it is the only element involved. As conclusion of its impact, it is deduced that the manufacturer is very aroused with the environment and the computer is following all the possibilities that nowadays are in their hands to reduce the impact in the world.

The second element involved, and the most important, is the server. As soon as the website is working in the Internet, this one is the element that will keep her always active. His manufacturer is, like the previous one, very aroused with the environment. The only opposing problem is the study realized by Greenpeace about their cloud. It is reasonable to think that the company is working to solve these problems, with the tools that are explained in the 4.1.3 section, in which is treating to improve new solutions to their problems.

The last element involved, and probably the most important after the server, is the computer’s users. Taking into account different studies realized of personal computers, it is concluded that users usually change their PC’s after a period of two or three years. The environmental impact is something that companies are more aware nowadays, and, from three years ago, at least, these companies are improving elements and solutions that benefit the environment. So, it is though that these computers can impact to the environment as one of the others (the developer computer or the server). It is important to know that, the impact of realize the different possibilities of the website impact in different ways (is not the same read an entry or upload a file), but, in average, their impact will be the same.

The conclusion of this impact is that the elements involved are probably every day more efficient and helping the environment, so, its impact will be reduced over the time. The social impact will be very positive if people make aware about the importance of develop a sustainable development of the environment. Day after day, people will help with actions to improve the present state of the world doing their actions or even, visiting the sustainable zones of their city and using it in an adequate way. The impact about the economy probably will become positive along with the social one. People can use that tool and, after few time, it can get more popular and researchers can use it as a daily tool for their work. The negative economic impact is only related with the operation of serves and other computers. From the point of view of the maintenance the researchers will maintain an update the website and only a few tasks of improvement or maintenance will be done by the administrators of that page producing a minimum cost.
**CHAPTER 4. CONCLUSIONS AND FUTURE LINES**

The principal objective of the project was covered: the wiki website is working properly and with all their requirements accomplished. From the point of view of the student this project was achieved in different ways: the most important is that the website is working with all the information, but in personal terms, the realization of an study of the different possibilities, the trial periods for most of them (different softwares were proved to value it), finding the advantages and disadvantages of each of them, etc… resulted in a work of management of information, time and organization.

The aim of the study for the student is to learn something during the realization of it, and put into practice important concepts already learned in the master. The selected branch of management during the career provides the student knowledge of how to manage a project, organize their time and structure the project from the beginning to the end, as if it were realized in a company. Other important thing is to begin the project only with the idea, search for different solutions, prove that possible solutions to value the most appropriated to the requirements, and solve the problems that will appear during the realization of the implementation…this is the biggest part of the project.

It is fundamental to find sources of information or opinions about the tools that will be used and the experience of other developers and search for the most adequate for this project and adapt it with extra tools to complete all the requirements of the project. To be able to join all these points together is a very interesting process of research and development that puts the student in a position of a research in a real situation. This demands to the student autonomy to work and develops him or her personally and for his or her labor future.

Nowadays, the wiki site is working properly, but it has needed different problems to be solved. One of the most important lessons learned is the importance of making periodical backups of the information. If the system fails, the information will be recovered. Another important extracted conclusion is the importance of working with powerful softwares that allows that the system to be working the majority of the time; is not a good impression that the website or their applications does not work in most occasions. It will produce that the people stops using that, and, it would be a failure in the objective of the wiki.

The core of the wiki is the interaction and exchange of knowledge. Nowadays, there is an approach used by the many organizations called “Open Innovation” on which this wiki site is based. Open Innovation is an innovation strategy in which the companies can and should use external ideas as well as internal with the aim to realize strategic and R&D projects. The central idea behind Open Innovation is that in a world of widely distributed knowledge, companies cannot afford to rely entirely on their own research, but should instead buy or license processes or inventions. It also means that companies use both internal and external channels to market their products and technologies. In this context, universities and research centers offer new perspectives and solutions to companies using this model. Such innovation relates to the possibility of occurrence of what is known as collective intelligence. The creation of the wiki will give to all the researchers a new channel to communicate and to exchange their knowledge using the Open Innovation technique. It should be improved with one of the future lines that will be explained later, the “Text Mining”, which can facilitate the search of ideas inside the wiki site.

This project will not stop here. The most important parts of it were covered, but there
are different future lines that can be realized during the web page useful life by other students.

On the other hand, probably another program will be available to cover in the same website the needs of the polls. Actually, as it was explained in the corresponding chapter, the programs which allow voting in the same website have some serious drawbacks. The aim of the poll is that all the projects that are active in the website can be voted by the public and after a year obtaining the “winner”. The day that the website started working, it contained over 400 actives projects, and the programs to cover the poll, only allow one active question with only 50 answers (not sufficient to cover the project number, it is needed to use one answer per project, so 400 answers at least). That is not an important problem but it will be interesting to introduce, if possible, the polls in the same website not to maintain another questionnaire separately.

On the other hand, there are other lines of development that are foreseen but not yet implemented in the wiki site. Both are very connected to the final objective: the first one is the development of an embedded chat and the other one is the interaction automatic study of both connectivity between researchers, topics and its evolution. Their final objective is to make statistics of the website uses and the interactions or discussions among the researchers and topics.

The importance of the interaction between the implied researchers that use the web page was explained during the project. In the chapter 3, it was also explained that in each entry there is a discussion to comment the active page. All the users must use this tool to connect with each other. In the future, it is wanted to embed a chat that allows the possibility that the persons interact if necessary to join information. Actually, the MediaWiki software has the possibility of changing this discussion web by a chat, but it allows only a chat for all the users, so, at the end, is the same result of the discussion, and in this last one, is more organized. The aim of the creation of a chat from the point of view of the creators, apart from the interaction between researchers, would be to make statistics about the use of this tool by the persons, with whom they interact, the frequency… With those interactions, with this future partial and “monitored” chat or in the discussion site, another future development to the project appears: the automatic extraction of information from each connection.

Once the researchers are interacting in the website, the register of the chat will be saved. In the current stage, with no chat, the interaction is only available in the discussions pages. With this information the other development line grows. It consists on extracting these texts from the discussion web and converting them into processable data, from which an automated analysis will allow to extract very useful information. This technique is nowadays very active development and it is known as “Text Mining”. By using it, it can be automatically known which researchers are talking about which topics, what words are they using most, and how these interactions and terms evolve. It is important to say that this technique is able to extract the most popular topics or words are based on powerful programs which that transform that text in processable data, and with a list of synonyms are able to extract the most popular words accurately and without duplicated meanings.

It is important to mention that in both studies (the interaction between persons and the topics of the moment) the aim is neither commercial nor publicly available. It is intended only for the UNESCO Chair of Sustainable Development at the UPC staff to administer, enhance and conduct social research on how the Sustainability researchers interact. Therefore every of their opinions and worries will be considered but also how they relate to each other and how their discussion topics evolve with time.
Conclusions and future lines
BIBLIOGRAPHY

[7] https://twiki.cern.ch/twiki/bin/view/Main/CMSUniandesGroupComputing (Twiki)
[8] https://confluence.atlassian.com/display/DOC/Confluence+Administrator%27s+Guide (Confluence)
[27] http://www.wired.com/wiredscience/2012/04/how-dirty-is-apples-icloud/ (Greenpeace study of the iCloud coal dependence)