Turismo Tenerife website

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Introduction

1.1 Context

Nowadays, Internet is not only a tool for search information or a knowledge tool. Currently is more than this, it’s a media of work, free time, live, culture... In the course of time the people use more frequently Internet for do his daily tasks, for instance, buy food, buy clothes, electrical appliances or even prepare a trip.

Every time is more frequently that the people manage his holidays or his trips by Internet instead that other people manages it, for example in a travel agency. The reason of this change could be because is more comfortable for the people or simply because they don’t want an intermediary who manage his holidays. The fact that there isn’t no travel agent when we are deciding where we go, make very important the opinion of the other people or information or images of the place where we want go.

Is for this reason what the most commons places for go in holidays invest more quantity of money in his webpages where display all kind of information of them.

In the webpage of place can exist a lot of the information, for instance, the monuments of the place, the most commons activities of the place, places where sleep, information offices, the history of the place... In summary, whatever information that can be interesting for the tourist for choose this place for go.

It’s at this time where the project Turismo Tenerife website takes sense, because this project consists into apply a new design in a website that currently exists. Where also new functionalities will be added, 40 approximately and improve the performance of another’s.

1.1.1 Which they have been the reasons for the development of this project?

The main reasons that have caused the development of this project have been, modernize the current website with a new design more modern and visual than the current, do more simply the work for create content inside the website, improve the performance of some functionalities and add new functionalities.

1.1.2 Which are the objectives of this project?

The objective of this project is get that with the design modifications of the website the users can search more easy and fast the things that they find.

With the modification of certain functionalities and the creation of other ones, the aim is build a website more complete with new features and improve some that exists currently.

Without forget that the website which we are working is a tourism website, specifically of Tenerife, so the most important objective is that the new modifications in the website are able to attract a major number of tourist for visit Tenerife.
1.2 Stakeholders

In this section will define the actors who have relation with the project, in terms that they will use it or they will be involved in its development.

**Turismo Tenerife**

Is the company which we are developing the project.

It’s a company that collect all the touristic information about Tenerife. They publicize the island, offer the best attention to the tourist, research what are the tourist predictions when they arrive. But the most important aim for them is publicize the island to get the major number of tourists.

**Trentia Consulting**

This project is developed by the company Trentia Consulting. Is a small company composed by 9 workers.

Trentia Consulting, it’s a company was born in 2006, is composed by a team of multidisciplinary professionals with a lot of experience on the technology world and various professional areas. Specialist in the integration and development of Microsoft software technology.

**Project director**

The person in charge of this post is Javier Tirado Pampin, hired by Trentia Consulting and project manager of this project, so is one of the most interested parts for the good development of the project. He’ll have to develop a part of the project and supervise the good functioning of the rest, elaborated by Santiago Garcia Blanco.

**Speaker project**

This role will do the teacher of the UPC, Miquel Barceló Garcia, who order to guide and check the good development of the project, following the rules stipulates by FIB.

**Developer**

The persons who develop the project will be Javier Tirado Pampin and the FIB student, Santiago Garcia Blanco, who will do the major part of the project. The FIB student will benefit of this project because is a final work degree and it will use to end the degree and receive the university degree. Javier Tirado Pampin will take the role of the project manager.

**Users**

This website is oriented for any user. The objective of this website is give information about the island of Tenerife through the services there are, the sports which can do, the places to visit...
2 State of the art

2.1 Study of the request

How I told previously, the customer wanted to renovate the current website because the major part of the pages needed a lot of time for loaded.

From a previous study of the project development, Trentia Consulting could detect the source of this high loading time. The guilty it was the functionalities of the web pages.

For instance, we can find the functionality about the weather, this one display to the user the weather information about a place of the island or beach or a golf course.

The functionality gets the data from XML documents generates by one windows service. There are 15 documents approximately, one for the island towns, other one for the golf courses and another one for the beaches and for each one of them there are one version for each language available on the website. The current behavior of the functionality consists in, the first person who loads a page from the website which have this functionality download all the xml’s in the language that the user is using at this moment.

For this reason, we can see that in much of the functionalities, we will be able to reuse his code because the behavior is the same but our objective is try to improve their performance. But not in all because there will some functionalities that we’ll have to remake again from another point of view for get a better performance.

2.2 Project Development

2.3 Technical Concepts

Next we’ll do a brief description of some meanings that we consider very important for understand the project content without problems.

2.3.1 Webpart

Are elements that form part of the web pages elaborated by Microsoft SharePoint. Are executed on the server side. In one web page there may be a lot of webparts, each one with a different functionality or not, all depends the finality of the webpage. Microsoft SharePoint provide us a quantity of default webparts but there is the possibility to create a custom webparts with the functionality that we want.

The webpart can have parameters that can use for change his behavior, his design, for indicate the source where get the information…. The user can fill in the parameter when edit the web page where the webpart is located. Is for this reason that create a custom webpart give the option to make a high variety of functionalities. All the code of the functionality is located in a file with the name, user control.

On the next image we can see the option that the user who have to fill in the content of the website can edit a web page.
This is an example of webpart. His functionality is display the information about blog which is associated through his parameters.

In this image we can see a webpart zone, that one of them is the webpart that we told before, blog webpart. If we select the webpart arrow located on the right side, we can see a pull-down-menu with all the webpart options.
2.3.2 User controls

It’s a Microsoft SharePoint element where develop the functionalities that we want to have the specific webpart. The user control has a file where specify the webpart design, this file has the .ascx extension. Besides the design webpart file, there is another one that specify the webpart functionality, this one has ascx.cs extension.

Illustration 4: User Control of the Blog Web Part

Aquest seria un exemple del codi que fa servir un Web Part, en concret el del blog, vist en la secció anterior, per tant, és el codi de la imatge és el contingut del fitxer amb extensió .ascx.cs.

Illustration 5: Code of the Blog Web Part

2.3.3 Site columns

On Microsoft SharePoint we can find libraries that storage different content, for instance web pages or images but there are elements lists of elements too. Both have columns that indicate the data type of his elements, for example a common column in a list and in a library could be the title column. When a list or library is created, a set of default columns are created but the user have the possibility to add new columns. The user can create a specific column for one list or library or create a global column. The global columns are columns that the user can add to any list or library of the website.

For create a global column, we have to go to the site columns section that we can find in the web page configuration of the page where we are.
On the top photo, we can see two types of column site created and on the top left side, the option to create another more.

There are different kind of site columns: one text line, various text lines, choice, number, money, datetime, Boolean....

2.3.4 Content type
We understand like a content type, a set of fields or columns that define the metadata of an element. We can create new content types from defaults Microsoft SharePoint content types. We can assign a content type to a library or list for that list or library can have the fields of the content type that we assigned.

2.3.5 Page design
We can difference two kind of designs, webpart designs and web page design. With web page design we want to mean the location of the webpart zone, if there are because there is the possibility to fix a webpart in the web page too. If we don’t fix a webpart in a web page, we can add webpart zone where the user can add all the webparts that they want. This fact gives a big dynamism to the web pages because the user can change the web page content through a way very fast and comfortable.

On the left side image, we can see the option for change the design of a web page. To arrive until here the user, have to edit the page how we showed before.
On the left side image, we can see the option for change the design of a web page. To arrive until here the user, have to edit the page how we showed before.

Illustration 8: Page designs

2.4 Market study

Exists a lot of tourism websites, but websites made with Microsoft SharePoint there aren’t a lot. The reason of this, is that Microsoft SharePoint is more usual for intranets because his enormous potential with document management.

The main features of this project is that is a tourism website and is made with Microsoft SharePoint. Is for this reason that to make the market study and can do the comparison the product of the project with their two main features, we’ll divide this section. One of them we talk about website made with SharePoint and the other one we’ll talk about the tourism websites.

2.4.1 Websites made with Microsoft SharePoint

I choose like an example these websites because besides to be made with Microsoft SharePoint, the company who created these websites is Trentia Consulting, that is to say, the same company who develop the Turismo Tenerife website. And the project manager of them is the same too, that is to say, Javier Tirado Pampin. So it’s a good example to show a possible result of the website that will developed through this project.
Fedefarma

This is the website of the company Federació Farmaceutica, the first medicine distributor of Catalonia. How we can see the home page is very simple. This simplicity obligates to the user to navigate through the website to find the information that they want. But the learning level of the website is not very high, that is to say, the user can find that they search without a lot of difficult.

Serunion

This webpage belongs to a restoration company. If we navigate through the website, we can see that is very intuitive and is not necessary spend many time to find the information that we want. In the home of this website we can find information that could be useful for us so could avoid navigate through the website. In my opinion this website is more usable and agile than Fedefarma website.
2.4.2 Tourism websites

The aim of this kind of websites is get the major number of visitors for the place that the website is talk about. To get this objective inside the website the user can find all kind of information about the place, for example, the services available, the events that celebrated....To put an instance of this kind of websites, we’ll show a list of the most efficient tourism websites on 2014. For calculate the websites efficiency, it has been used a parameters and sign system denominate, index of website quality (ICW). This system of parameters and sign can measure the quality and the performance of a website. The information that is measured by this system is, the website usability, the information architecture, SEO... From the next list we will analyze the first two, that are the tourism website from Galicia and Canarias.

<table>
<thead>
<tr>
<th>Comunidad Autónoma</th>
<th>URL</th>
<th>ICW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Galicia</td>
<td><a href="http://www.turgalicia.es">www.turgalicia.es</a></td>
<td>0,66</td>
</tr>
<tr>
<td>2. Canarias</td>
<td><a href="http://www.turismodecanarias.com">www.turismodecanarias.com</a></td>
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</tr>
<tr>
<td>3. Comunidad Valenciana</td>
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<tr>
<td>4. País Vasco</td>
<td>turismo.euskadi.net</td>
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<tr>
<td>5. Andalucía</td>
<td><a href="http://www.andalucia.org">www.andalucia.org</a></td>
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<tr>
<td>6. Castilla-La Mancha</td>
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<tr>
<td>9. Comunidad Foral de Navarra</td>
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<tr>
<td>10. Comunidad de Madrid</td>
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<td>11. Región de Murcia</td>
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</tr>
</tbody>
</table>

Illustration 11: Classification of the tourism websites
The big quantity of data on the home page of the website could cause that the user not see all the information. Another option is that the user leaves the website because he feels overwhelmed. Otherwise there is the option that the user can find the information that he wants without the necessity of navigate through the website because on the home page there are a lot of information.

In my opinion the learning level of this website is more high than the Canarias tourism website because no all the options are on the first navigate level, so there will times that the user will find the information he wants through mistakes.

The content of the website is very complete because contain a big quantity of possibilities to solve the user questions about Galicia.

Canarias Tourism Website
In this website we can highlight the quantity of information on the home page. For one hand this is good because the user can find the information that he wants without the necessity of navigate through the website but for other hand it could overwhelmed the user. Another negative aspect in the website is that in the home page, the user has to do scroll for see all the information.

But the most important of this website is that the learning level is very low because the user can find the information that they want without a lot of difficult. The reason of this is because the website content is not ambiguous.

2.4.3 Comparison
As the two tourism web pages are not comparable with the two SharePoint pages we will do a comparison table. We will compare the content and structure of the websites. We have to consider that is my point of view, so this opinion can’t be generalized.

<table>
<thead>
<tr>
<th>Page</th>
<th>Page content</th>
<th>Page design</th>
<th>Navigation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fedefarma</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Serunion</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Turisme Galícia</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Turisme Canàries</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>24</td>
</tr>
</tbody>
</table>

Table 1: Comparative between the market studies
3 Project scope

3.1 Objective

The main reasons to do this project, have been, update the website with a new design most modern and visual than the current, do more easy the work for create content in the website, improve the performance of some website functionalities and create new functionalities.

The objective of the new website design is get that the user can find the information in a more comfortable and more easy way.

With the modifications of some functionalities and the creation of new ones, we want to get a more complete website, with more tools to use for the user, improve the existent tools and increase the website services. But without forget that the main objective of this website with this development is attract the major quantity of people to the Tenerife island.

In the next images we can see the design of the current website and the new design that will apply, for see the difference between the two designs and appreciate the change of the website.

Illustration 14: Current Turisme Tenerife website

Illustration 15: New Turisme Tenerife website
The different task that will have the project are:

**Redesign some existent functionalities:** To discover which webpart of the website we have to remake because of slow down the web page where is it, we’ll use a tool that show the cost of the different parts of the webpart code. This mechanism to analyze a webpart execution is a SharePoint tool.

**Create new functionalities:** There are functionalities that the current website not have, so the first step is analyzing all the documentation that the customer gives to Trentia Consulto for each new development. The objective is doing the maximum number of operations on the server side so win velocity on the customer side. The number of the new functionalities is 40 approximately.

**Create page designs:** This section is oriented for the personal who have to change the website content because right now the website disposes a big quantity of page designs very ambiguous because they are very similar. So the objective is creating the less number of page design as possible.

**Migration the website to the new server:** This is the final stage of the project when we put the website on production. On this stage we have to migrate all the SharePoint databases to the new SQL Server. We have to install SharePoint and all the language packages, this website is available on six languages, on the SharePoint server.

### 3.2 Website problem

The customer wanted to begin this project because of the next facets:

- Some of the web pages of the website have low performance because of the webparts behavior that contain.
- Many of times the people who have to change the website content spend too much time to modify some content of the webpage because of the complexity of the page design.
- The responsible of the website have seen the necessity to add new functionalities to some web pages.
- Renew the current server for another more powerful.
3.3 What’s the difference in a website made with Microsoft SharePoint?

The main differences in a website made with SharePoint with respect to a website made with another technology are the option to have different page designs for each web page or the possibility to add or remove very easily functionalities from the web page. When we talk about functionalities or webpart, we want to say a different element from the web page like a service searcher, a map which display the most economies hotels, the weather information of a specific point of Tenerife...

It’s a very important aspect because the dynamism of a web page, the fact of change the web page content easily, could get that the user visit the website with frequency because they not get tired. Besides, SharePoint offers a lot of elements to use, for example, default lists, custom list, image libraries, documents libraries, a big quantity of default pages... Definitely Microsoft SharePoint is very powerful.

3.4 Scope

This project, how we said before, have the objective to increase the income of Tenerife island. This is possible because apart from the cultural places where the tourist can go, the website displays the different services on Tenerife island too. On the current websites exists this web pages but the current performance could do that a lot of users leave the web page before to the web page ends loading. So this fact could cause that some services are not known for a lot of users.

Is for this reason that the improve of the website performance, the load time of the searcher or the service searcher, can get that some services that no tourist know, now could be known. So that, with the passage of time, this website could be one of the main source of income of Tenerife island.

3.5 Obstacles and solutions

3.5.1 Obstacles

Ignorance of the technology

The most of the tools that I’ll use to develop this project, I’ve never used before. This cause that during the time that I dedicate to learn how it works, the progress of the project will be null. When I talk about tools I refer to programs and programming languages.

Functionalities implemented

Of the current website, there are functionalities that will be in the new website. But some of this functionalities, we’ll have to adapt them for the new designs or to the other functionalities or for improve their performance. This imply understand and manipulate the code of other person, depends on how could be difficult.
Distance with the customer

Sometimes a meeting face to face is more productive than a meeting by phone or skype. A distance meeting can produce that doubt not solve totally or spend more time than is normal for solve it.

Compatibility with the different internet navigators

The website will be public, anyone will be able to accede, so that the website will have to be compatible with the maximum number of internet navigators as possible. Some internet navigators are more compatible with some programming languages than others, so that we’ll have to do test with the major number of internet navigators.

3.5.2 Solutions

Work mates

The main solution of the majority of this problems is the fact that develop this project is in a company because there are people that have a lot of experience with the tools that for me will be new. A lot of the problems that I’ll find, my work mates will know how to solve them. Besides, my work mates will teach me the programming languages that I don’t know.

Documentation

The customer will give us a detailed documentation for develop the new website.

3.6 Work methodology

The methodology used to develop this project has been the SCRUM methodology. SCRUM methodology is a development methodology very easy that require a hard work because it’s based on the continuous adaptation of the project circumstances. Consists to elaborate the product incrementally through brief iterations. These iterations have the name sprint.

The fact that we had chosen this methodology, was for the magnitude of the project because we thought that could be the best way for the customer verify gradually all that we do. Another reason, was avoid maximum number of bugs when we publish the website.

So we agreed with the customer to do meetings by skype or phone, each 3 weeks approximately. Previously to the meeting, we publish the update version of the product on their servers so that the customer can test the changes. In this way when we do the meeting, the customer can give us feedback about the website changes.

Besides of the meetings in the end of each sprint, we put in contact with the customer by mail weekly. In this way we can stay on touch and resolve little doubts and not wait until the end of the sprint.
3.7 Work tools

During the project we won’t use only one kind of tools. We will use different kinds of tools, the tools to develop and the tools to control the project progress for give feedback to the customer.

3.7.1 Development tools

The main project tool is Microsoft SharePoint 2010, that is the platform which we use to create the website. The tool that we use to develop the project is, Microsoft Visual Studio 2010. With this program we’ll develop different webparts of the website, create page designs, create css styles...

But we will use another interesting tools, the most important are:

Microsoft SharePoint Designer, to modify css styles or edit some webpart in a web page.

Microsoft SQL Server, where we will work the databases of the website.

Event Viewer, server tool where is stored the website. With this tool we will able to see more detailed the possible errors in a web page or in the website in general.

3.7.2 Control tools

During the project, will be necessary have feedback with the customer at the end of each iteration and between one iteration and another. The meetings face to face will be very difficult because the customer lives in Tenerife and us in Barcelona so we will have to find some tools for communicate us with him, for instance, by mail, by skype or by phone.

We use a tool of Trentia Consulting, with name timetracker, where we have to introduce the hours dedicated on each task of the project and a brief description of it. We do that to have a control of the project progress or to give to the customer a report of dedicated hours.
To manage the website bugs, we will use a tool with the name BugTracker. We’ll begin to use this tool when we’ll be on the production stage, in this stage the customer will be able to introduce content in the website and use the web page functionalities.

3.8 Validation method
How I told previously, with this methodology, the supervision of the project will be continuous. Each month the customer will give use feedback about the changes on the website. The objective of that is to arrive at the end of the project with the minimum number of bugs.

We’ll get the customer feedback through skype, phone or mail. To validate the new part delivered to the customer.

At the end of each iteration, the customer tests the final product of the iteration, to sure that the product works well.

The method to validate that the result of each iteration works well will be that the customer will choose two or three users to test the product. These users will introduce content in the website and will check if the website replies correctly. That is to say, the tests will base on statistics, the users will measure the potential problems that they have had in the moment to introduce the data in the website.
4 Temporal planning

4.1 General planning

4.1.1 Calendar
The duration of the project is approximately of nine months. The start date is on September 1, 2014 and the end date is on June 22, 2015. This project how we can see, no started at the same time as GEP. This project began at the moment when I started to work on Trentia Consulting, the company who develop the product and where I work currently.

During the first month, my workday was of 6 hours daily. At the second month, my contract was modified to work 8 hours daily.

As is a temporal planning, exists the possibility that the project planning and the delivery date can change.

4.1.2 Global consideration
The magnitude of the project and the customer necessity to have it finished as soon as possible, cause that the project director, Javier Tirado Pampin and the Trentia Consulting technical director too, has had to develop the **SBO page design** and the **master page** of the website. In spite of I didn’t develop these two ones, I have had to understand and modify them during the project due improvements or bugs.

4.2 Tasks description

4.2.1 Start
In this initial phase, the project director taught me during a week the basic concepts about Microsoft SharePoint and the Tenerife project. That is to say, this task consisted to do daily meetings with the project director. This task no have dependency of another one.

4.2.2 Development iterations
The project has a lot of web page which have to modify his design and the functionalities that they have. Besides we have to create the new page designs. We understand as templates or page designs, the configuration that can have the web pages. Through the page design we can change the element distribution in a web page or the content that display.

This is the phase with more work. This phase could be end on 4 months. Is difficult to predict the end date exactly because each task that we found on the website is different at the previous task.
In the project, we’ll have the same number of iterations as the number of page designs or templates that there are. The difficult degree of templates depends on their number of parameters. While the difficult degree of the web pages depends on the number of functionalities that have and how difficult are. As of today, the customer has specified the next templates and page designs, where there are a set of functionalities, some of them we will explain then:

Templates: SB0, FC, ST1, S1, product.

Pages: Home Tourism, Home Convention Bureau, Home Film Comission, Home News, Home Investigation, Home trade, Home Corporative, Contact, Calendar, Map page, master page.

Functionalities: services searcher, recommended activities in Tenerife, weather function, calendar with search filters, image gallery, videos reproduction, map with the services that the user search, mail service for resolve doubts, content page searcher...

Further forward we will explain with more detail each of this functionalities and page designs.

The structure of each sprint will be the same for page designs and templates. Each iteration will depend on his predecessor because only one person works on them. Except SB0 template and the master page, that the person who will do these will be the project director. So, the iterations will be elaborate for the next tasks:

**First task**

We will study the documentation that the customer gave us for the element which we are developing.

**Second task**

We have to contact with the customer, to claim us that there isn’t no misunderstanding, solve some doubt of the documentation or solve some doubt of the customer.

**Third task**

Consists to develop the element that we have been working on the previous tasks. This task can be very different depends on the element that we develop. The templates that we have to spend more time are, SB0, for his difficulty because it has a lot of configurations and FC, this one because will be the first template that I’ll work and I'll have to spend more time than with the rest.

When we talk about the duration, we can find web pages which use functionalities already created. So, the work on this web pages will be on edit the design and add the webparts, we estimate this work in one day approximately. There are another kind of web pages which have functionalities more specifics, like the calendar. On the calendar we have to configure all the filters to search events on it. Another example of this kind of web pages is the home. We estimate the work on this web pages will be between one and two weeks.
Fourth task

This is the final task of the iteration. This consists on meet up with the customer to give us feedback of the sprint. If we had to resolve some bugs, we would return to the third task.

4.2.3 Migration of the website

We have to differentiate another kind of process that we have to do in the project, the migration of the website to the client server because all the develop phase being done on develop server. This process will depend on the develop iterations of the website. When we finish this iterations, we can publish the product to the customer server. On this iteration which have the duration of ten days, we can distinguish the next tasks:

First task

On this task, we will install Microsoft SharePoint with languages packages with which the website will be available. We will have to associate the Microsoft SharePoint databases to the website and configure it to be available from any internet navigator.

Second task

While we do all the develop of the new website, the current website is operative so there are people who introduces new content on it. As we don’t want lose all this work, we will do a process to migrate all the new content from the current database to the new website database. This task consists to elaborate this process.

Third task

This last task of the iteration consists on publish and install the project solution elaborated with Microsoft Visual Studio 2010 to the customer server.

We will repeat this last iteration frequently from the moment that we configure the website on the customer server. While the customer edits the content of the website, we’ll develop improvements, solve bugs or develop other’s functionalities.

4.2.4 Improvements and solve bugs

Once the project has been installed on the customer server, the customer will be able to edit the website content, use the functionalities and templates, create lists...

Although we give a stable version at the final of each iteration, when we publish the website on the customer server can appear bugs. The good way to work could be divide each bug in a one iteration but it is very difficult because we don’t know the number of bugs that there will be. Is for this reason that we consider this stage as an iteration, that we will be able to do in parallel with the development of others functionalities of the website. This is possible because could have moments where there no errors or improvements so not for this the stage will be closed.
This phase depends on the migration process and his duration can’t determine because depends on the content that the customer wants to add. But if we rely that the customer won’t add more content, we can estimate that his duration will be three months.

4.2.5 Process to change the page designs
Once the customer began to work with the website content, he saw that was impossible change manually the page designs of all pages in the website because the number of web pages in the website is very huge. For this reason, the customer ordered a process to do this task automatically. This process applies the styles and add the functionalities that the customer wants. It’s an iteration with certain difficulty so we estimate his duration on one week approximately. This iteration depends on the migration of the website because until that the website not be published in the customer server, the customer won’t able to use this tool.

4.2.6 Documentation
The documentation stage of the project will begin with the GEP subject. From seven delivers on one month approximately, I will do part of the project documentation. Each of the delivery dates and contents of each one, have been specified in the subject material that the teachers who manage the subject gave at the start of the course.

This section no has dependency of other, so we will able to do in parallel with the develop of the website.

4.2.7 Prepare the defense
This section consists on do a study of all the project documentation, prepare the parts of the project that we will show as a prove of the correct functioning of the website and do a power point presentation for defense the project in front of the court project. We estimate the duration of this section will be two months approximately, since the website is finished until the presentation of the project in front of the court project.

This is the final stage of the project and it depends on the all tasks of the project. Since the documentation to defense the project until de development of the project.

4.3 Evaluation of alternatives and action plan
This is a huge project where the customer can add new improvement or changes in the website. Currently the customer already has added some new functionality or some new web page to remodel. An example of it is the process to change the page design automatically. Is for this reason that the complete finalization of the project will depend on the customer. For the final delivery of the project I will establish until a certain stable development. The project that I will deliver will have enough content to display to the court project. Therefore, we can sure that the project will be finalized for the date estimated on the calendar section.

The problems caused for my ignorance with the new technologies to develop the project, will not modify the delivery date because in Trentia Consulting there are a big team with a lot of knowledge and experience that will help me.
4.4 Resources

Along all the project, we will do the next resources:

4.4.1 Hardware
- DELL Laptop
- Development server
- Production server

4.4.2 Software
- Enterprise Architect.
- Microsoft SharePoint 2010
- SQL Server

Operative systems: Windows 7, Windows Server 2008 (development server) and Windows Server 2012 (production server)
Illustration 17: Gantt diagram
<table>
<thead>
<tr>
<th>Task name</th>
<th>Duration</th>
<th>Start</th>
<th>End</th>
<th>Dependence</th>
<th>Risk</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>5 days</td>
<td>Mon 01/09/14</td>
<td>Fri 05/09/14</td>
<td></td>
<td></td>
<td>Project manager, Developer</td>
</tr>
<tr>
<td>Development of the website</td>
<td>93 days</td>
<td>Mon 08/09/14</td>
<td>Wed 14/01/15</td>
<td>24</td>
<td>Low</td>
<td>Project manager</td>
</tr>
<tr>
<td>Master Page</td>
<td>5 days</td>
<td>Mon 08/09/14</td>
<td>Fri 12/09/14</td>
<td></td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>FC Template</td>
<td>24 days</td>
<td>Mon 08/09/14</td>
<td>Thu 09/10/14</td>
<td></td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>S80 Template</td>
<td>31 days</td>
<td>Mon 15/09/14</td>
<td>Mon 27/10/14</td>
<td>2</td>
<td>High</td>
<td>Project manager</td>
</tr>
<tr>
<td>Home Turismo</td>
<td>10 days</td>
<td>Fri 10/10/14</td>
<td>Thu 23/10/14</td>
<td></td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Calendar</td>
<td>14 days</td>
<td>Fri 24/10/14</td>
<td>Wed 12/11/14</td>
<td>5</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>SL Template</td>
<td>4 days</td>
<td>Thu 13/11/14</td>
<td>Tue 18/11/14</td>
<td>6</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>ST1 Template</td>
<td>4 days</td>
<td>Wed 19/11/14</td>
<td>Mon 24/11/14</td>
<td>7</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Product Template</td>
<td>6 days</td>
<td>Tue 25/11/14</td>
<td>Tue 02/12/14</td>
<td>8</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Convention Bureau</td>
<td>4 days</td>
<td>Wed 03/12/14</td>
<td>Mon 08/12/14</td>
<td>9</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Film Commission</td>
<td>1 day</td>
<td>Tue 09/12/14</td>
<td>Tue 09/12/14</td>
<td>10</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Press</td>
<td>3 days</td>
<td>Wed 10/12/14</td>
<td>Fri 12/12/14</td>
<td>11</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Trade</td>
<td>1 day</td>
<td>Mon 15/12/14</td>
<td>Mon 15/12/14</td>
<td>12</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Investigation</td>
<td>4 days</td>
<td>Tue 16/12/14</td>
<td>Fri 19/12/14</td>
<td>13</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Corporative</td>
<td>7 days</td>
<td>Mon 22/12/14</td>
<td>Tue 30/12/14</td>
<td>14</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Contact</td>
<td>4 days</td>
<td>Wed 31/12/14</td>
<td>Mon 05/01/15</td>
<td>15</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Map page</td>
<td>7 days</td>
<td>Tue 06/01/15</td>
<td>Wed 14/01/15</td>
<td>16</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Migration to the production server</td>
<td>10 days</td>
<td>Thu 15/01/15</td>
<td>Wed 28/01/15</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install Microsoft Sharepoint with the language packages on the new server</td>
<td>1 day</td>
<td>Thu 15/01/15</td>
<td>Thu 15/01/15</td>
<td>Low</td>
<td>Developer</td>
<td></td>
</tr>
<tr>
<td>Content migration process of the current website to the new one</td>
<td>8 days</td>
<td>Fri 16/01/15</td>
<td>Tue 27/01/15</td>
<td>20</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Upload and install the project solution</td>
<td>1 day</td>
<td>Wed 28/01/15</td>
<td>Wed 28/01/15</td>
<td>19</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Improvements and solve bugs</td>
<td>67 days</td>
<td>Thu 29/01/15</td>
<td>Fri 01/05/15</td>
<td>18</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Process to change page design automatically</td>
<td>6 days</td>
<td>Thu 29/01/15</td>
<td>Thu 05/02/15</td>
<td>18</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Documentation</td>
<td>32 days</td>
<td>Mon 16/02/15</td>
<td>Tue 31/03/15</td>
<td></td>
<td>Medium</td>
<td>Analyst</td>
</tr>
<tr>
<td>Prepare the defense</td>
<td>16 days</td>
<td>Wed 01/04/15</td>
<td>Wed 22/04/15</td>
<td>23</td>
<td>Low</td>
<td>Analyst</td>
</tr>
</tbody>
</table>

Illustration 18: Project tasks
5 Economic management and sustainability

We have to do the economic study of the project to be sure that the project is viable. With this study we will decide if we can go ahead with the project or its production can produce more losses than gains so wouldn’t be productive develop the project.

For do this study is necessary consider all the resources for develop the project.

5.1 Identification of the costs

5.1.1 Direct costs by activities

In this section we will assign the cost and the role of the person who develop each one of the activities that appear in the Grant diagram of the temporal planning.

5.1.1.1 Roll

In the majority of the projects, the people who participate make different kind of role. Part of project team make a certain tasks and the other part make another tasks, this receive the name of role.

In this project we can find three kind of roles, each role has a different economic payment. The economic payment depends on the responsibility of the role and the policy of the company that have to develop the project, in this case Trentia Consulting.

The project manager, is who plans and manages the project and controls the good evolution of it. In this project, who makes this role is Xavier Tirado Pampin. The cost of this role per hour is of 40 €.

Developer, is who has the task to develop the project. In this project, the persons who make this role are Xavier Tirado Pampin, project manager too, and Santiago Garcia Blanco, FIB student. The cost of this role per hour is of 25 €.

Analyst, is who makes the task of do the project documentation and prepare the defense of the project in front of the court project. The cost of this role per hour is of 32 €.

So, the table of the roles with their respective cost would be the next:

<table>
<thead>
<tr>
<th>Roles</th>
<th>Project manager</th>
<th>Analyst</th>
<th>Developer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost hour(€)</td>
<td>40</td>
<td>32</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 2: Cost of the roles involved in the project

5.1.1.2 Table of cost by activity

Then, we will define a table with each activity of the project, we will assign the role of the person who makes the activity, the duration of the activity and his cost.

We have to have in mind in the moment to calculate the number of the development hours per day that during the first month working in Trentia Consulting, the developer Santiago Garcia Blanco didn’t make a full working day. His workday was of six hours per day while the Javier Tirado Pampin workday was eight hours per day.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Role</th>
<th>Estimated time (h)</th>
<th>Cost(€)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start</strong></td>
<td>Project manager and Developer</td>
<td>40 + 30</td>
<td>1.600 + 750</td>
</tr>
<tr>
<td><strong>Development of the project</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Page</td>
<td>Project manager</td>
<td>40</td>
<td>1.600</td>
</tr>
<tr>
<td>FC template</td>
<td>Developer</td>
<td>158</td>
<td>3.950</td>
</tr>
<tr>
<td>SB0 template</td>
<td>Project manager</td>
<td>248</td>
<td>9.920</td>
</tr>
<tr>
<td>Home Turismo</td>
<td>Developer</td>
<td>80</td>
<td>2.000</td>
</tr>
<tr>
<td>Calendar</td>
<td>Developer</td>
<td>112</td>
<td>2.800</td>
</tr>
<tr>
<td>S1 template</td>
<td>Developer</td>
<td>32</td>
<td>800</td>
</tr>
<tr>
<td>ST1 template</td>
<td>Developer</td>
<td>32</td>
<td>800</td>
</tr>
<tr>
<td>Product template</td>
<td>Developer</td>
<td>48</td>
<td>1.200</td>
</tr>
<tr>
<td>Home Convention Bureau</td>
<td>Developer</td>
<td>32</td>
<td>800</td>
</tr>
<tr>
<td>Home Film Comission</td>
<td>Developer</td>
<td>8</td>
<td>200</td>
</tr>
<tr>
<td>Home Press</td>
<td>Developer</td>
<td>24</td>
<td>600</td>
</tr>
<tr>
<td>Home Trade</td>
<td>Developer</td>
<td>8</td>
<td>200</td>
</tr>
<tr>
<td>Home Investigation</td>
<td>Developer</td>
<td>24</td>
<td>600</td>
</tr>
<tr>
<td>Home Corporate</td>
<td>Developer</td>
<td>56</td>
<td>1.400</td>
</tr>
<tr>
<td>Contact</td>
<td>Developer</td>
<td>32</td>
<td>800</td>
</tr>
<tr>
<td>Mapa page</td>
<td>Developer</td>
<td>56</td>
<td>1.400</td>
</tr>
<tr>
<td><strong>Migration to the production server</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install Microsoft Sharepoint with the language packages on the new server</td>
<td>Developer</td>
<td>8</td>
<td>200</td>
</tr>
<tr>
<td>Content migration process of the current website to the new one</td>
<td>Developer</td>
<td>64</td>
<td>1.600</td>
</tr>
<tr>
<td>Upload and install the project solution</td>
<td>Developer</td>
<td>8</td>
<td>200</td>
</tr>
<tr>
<td><strong>Improvements and solve bugs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process to change page design automatically</td>
<td>Developer</td>
<td>536</td>
<td>3.350*1</td>
</tr>
<tr>
<td><strong>Documentation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare the defense</td>
<td>Analyst</td>
<td>256</td>
<td>4.096*2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>2084</td>
<td>42.490</td>
</tr>
</tbody>
</table>
Then, we will show a table with a summary of the hours and costs of the project phases.

<table>
<thead>
<tr>
<th>Project phases</th>
<th>Dedication(hours)</th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project manager</td>
<td>Analyst</td>
</tr>
<tr>
<td>Start</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Development iterations</td>
<td>288</td>
<td>0</td>
</tr>
<tr>
<td>Migration of the website</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Improvements and solve bugs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Process to change the page designs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Documentation</td>
<td>0</td>
<td>256</td>
</tr>
<tr>
<td>Prepare the defense</td>
<td>0</td>
<td>128</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>328</strong></td>
<td><strong>384</strong></td>
</tr>
</tbody>
</table>

Table 3: Summary of the cost of the project tasks

*1 In the phase of bugs and improvements is not possible specify his exact cost because the estimate hours referenced the interval of time that we will dedicate to resolve bugs or to do improvements demanded by the customer.

The bugs are included in the cost of the project while the improvements, each one will have an independent cost. So until the customer demands the improvements, we won’t able to estimate their cost. So, we will estimate that the total cost of this phase, ¾ will be dedicated to resolve bugs and the rest to do improvements.

*2 In the documentation phase and the preparation of the defense phase is the same case, we won’t do this in a workday, so we won’t dedicate eight hours per day. The time that we will spend on the first one will be ½ of the specified time and on the second one will be ¼.

### 5.1.2 Direct costs

#### Internet connection

The connection hasn’t been hired specifically for this project. That is to say, the connection has been hired previously. We can suppose that the bandwidth will be of 20%. The monthly cost of internet is of 60€.

#### Infrastructure

The development server has a cost of 3000€.

The work laptop that I use to connect to the develop server and develop on it has a cost of 650€.

Both haven’t been bought specifically for this project. So, we will estimate their cost in a %. This % will reference to their use in the project.

The production server belongs to the customer, so we can’t consider it as a cost of the project.
Software

Currently Trentia Consulting disposes a MSDN subscription. This subscription gives to Trentia Consulting all the necessary software to develop the project. The yearly cost of this subscription is of 3000€. We will estimate their cost in a %.

The operative system of the laptop is Microsoft Windows 7 which comes with MSDN subscription.

The operative system of the develop server is Microsoft Windows Server 2008. The production server is a virtual machine. The virtual machine is managed by the program VMWare Server. The operative system of the server is included in the MSDN subscription while the VMWare Server is for free.

The SQL Server, Microsoft SharePoint, Microsoft Office, Microsoft Visual Studio, Microsoft SharePoint Designer are included in the MSDN subscription.

Transport

The transport is the road from my house to the office but as I go by walk there isn’t no cost.

Work office

Place where will develop the project. In this place we have to keep in mind the water, the light, the heating and other expenses of the office.

Project presentation

This section keeps in mind, the copies, the bookbinding and the printing of the project. We estimate the extension of the project will be 160 pages. Each page of the project will have a cost of 0,05€ (included bookbinding). We have to keep in mind that we will do four copies, three for the court project and one for the project director.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Use(%)</th>
<th>Cost(€)</th>
<th>Estimate Cost(€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Server</td>
<td>10</td>
<td>3000</td>
<td>300</td>
</tr>
<tr>
<td>-Laptop</td>
<td>25</td>
<td>650</td>
<td>162,5</td>
</tr>
<tr>
<td>Software</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>3000</td>
<td>300</td>
</tr>
<tr>
<td>Transport</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Work office</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Project presentation</td>
<td>100%</td>
<td>0,05</td>
<td>32</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>806,5</strong></td>
</tr>
</tbody>
</table>

Table 4: Indirect costs of the project
5.1.3 Amortization
The amortizations in a project is a very important part for know if the project is viable. Because not always the necessary resources in a project, are covered by the project. Although if the resources are not covered by the project can be interesting because these resources could be applied in other project. In this section we have to keep in mind the project manager view to know if the resources of the project will able to be reusable in the future.

Trentia Consulting has not had the necessity to invest money to buy exclusive software or hardware for this project. Trentia Consulting had the hardware and the MSDN subscription previously to the project and both are not exclusive of this project. So for this project we use a % of both, because currently they are being used for other projects.

Contingency

For the planning of contingency of the project, we booking a part of the budget of the direct and indirect costs, specifically a 5%.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Percentage</th>
<th>Concept cost (€)</th>
<th>Contingency cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct costs</td>
<td>5</td>
<td>42.490</td>
<td>2.124,5</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>5</td>
<td>806.5</td>
<td>40,4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>2.165</td>
</tr>
</tbody>
</table>

Table 5: Direct and indirect costs keeping in mind the contingency planning.

5.1.4 Unexpected events
In the project always exists risks. The risks consist a mix between restrictions and uncertainty that can cause losses for the company.

For this reason, is very important studying the possible unexpected events that can have the project. Some possible risks that we could find in the project are:

Bad estimation of the delivery date

Fix a delivery date very tight could cause a delay of the project that would provide an increase of the cost of the project and this increase could not be accepting by the customer. The possibility that can occur this risk is of 25% because a big part of the development is made and the customer already has introduced content. The possibility to deliver the thesis to the court project with delay is less because I’ll deliver a stable version and with enough entity to be a thesis. But the risk to deliver with delay exists because I have never used a lot of tools for do the project and the customer could add more functionalities. All of this makes that we have to keep in mind this possibility. We can estimate five days of delay respect to the delivery date. This is equivalent to 40 work hours more.

Infrastructure problems

During the development of the project could appear incidents. For example, some computer or server broke down. To solve this problem, currently we have available more laptops and servers to
use. The cost to do this is restoring the database of the old server into the new. This task is estimate like a work of the project manager with a cost of 40€ per hour and a possibility of 5%. And with an estimate time of 2 hours.

The table of risk would be the next one:

<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk(%)</th>
<th>Role</th>
<th>Dedicated Hours</th>
<th>Concept cost (€)</th>
<th>Risk cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliver date</td>
<td>25</td>
<td>Developer</td>
<td>40</td>
<td>25</td>
<td>1.000</td>
</tr>
<tr>
<td>Infrastructure problems</td>
<td>5</td>
<td>Project manager</td>
<td>2</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.080</td>
</tr>
</tbody>
</table>

Table 6: Cost of the unexpected events of the project

### 5.2 Estimation of the errors

If we keep in mind the previously sections, we can define the total cost of the project.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Cost(€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct costs</td>
<td>42.490</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>806.5</td>
</tr>
<tr>
<td>Contingency</td>
<td>2.165</td>
</tr>
<tr>
<td>Risks</td>
<td>1.080</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>46.541.5</td>
</tr>
</tbody>
</table>

Table 7: Total cost of the project

### 5.3 Conclusion

If we keep in mind that the cost that the company will have to pay is the salary of two workers, where one of them will work like internship and his price per hour is of 7.8€, we can say that is a project very viable.

### 5.4 Management control

To measure the real cost of the project, we will use a tool of Trentia Consulting, the name of this tool is TimeTracker. This tool allows register all the tasks that we do during a project with their respective descriptions. So through this tool we can control all the iterations of the project. Also we can see during the project if the iterations have delay or our estimation was correct.

Once the project ends, we will able to know the real cost of the direct costs and the risks that we have estimated. So we will have to calculate the real cost of the project and compare it with the cost that we have estimated at the start of the project.

If the final cost of the project is highest than the cost that we have estimated at the start of the project, we would have to check if with the cost estimated of the risks, we can cover it, if not is the case we will have to cover it with the contingency budget. In the case that there aren’t unexpected
events or there are some of them but not all, the budget that we estimated for this, we will consider it like a contingency budget.

While the project is progressing, we can determine the deviations of the project through the next mechanism:

- Deviation in the realization of a subtask with price = (estimated cost – actual cost) * real hours consumption
- Resource deviation with price = (estimated cost – actual cost) * actual consumption
- Deviation in the realization of a subtask in consumption = (estimated hours consumption – actual hours consumption) * estimated cost
- Deviation in the realization of a subtask in consumption = (estimated consumption – actual consumption) * actual cost
- Deviation by volume of sales = (actual sales – budgeted sales) * estimated margin
- Deviation by sales margin = (actual margin – estimated margin) * quantity of sales

**Deviation in total costs**

- Total deviation in the realization of subtasks = total cost of the estimated subtask – total cost of the actual subtask.
- Total deviation in resources = total cost of estimated resource – total cost of actual resource
- Total deviation of sales = total budgeted sales – total actual sells
- Total deviation of fix costs = total cost fix budgeted – total actual fix cost
6  Sustainability

This section assesses the sustainability of the project, it focuses on three aspects: Economics, social and environmental.

6.1  Economic

To evaluate this section, both material and human cost shall be referred to. The material capital, which has been invested in the project resources, is not exclusively for this project because it will be reused in other projects for other companies for their personal tasks. Therefore, for this aspect, it is a reasonable cost. Whereas in the cost of human resources, there will be only two workers. One of them will be an intern to save costs.

The project is quite competitive because of its costs which would be difficult to see if a portal with Microsoft SharePoint has not been used. If we looked for another company, a cheaper one would be found, but it would not dispose of the experience that the professionals which form part of "Trentia Consulting" have.

With regard to future changes to the portal, each of them will have an individual cost. Which means they will be part of a separate budget.

Another intern could be hired in order to carry out the project quicker, but it would be an extra expense. The tasks would be done faster, but the salary would have to be equivalent to having a new programmer.

Each task developed has been indicated with its time and difficulty except for the first tasks which were influenced by the lack of work needed some time to adapt.

6.2  Social

Nowadays, the country is going through complicated stages, which were due to the crisis in all the professional sectors. Now, there seems to be a way out.

This project may be a means for the island of Tenerife to raise a greater amount of income in form of tourists which would be thanked to the portal created. The current portal needs a change because it has some deficiencies, performance issues on certain pages in which can cause a lot of people to end up being unaware of certain services available in Tenerife. Therefore, it loses a possible investment that could be very necessary given the context in which what is happening to the country.

This project aims to gather tourists and to help those interested in knowing the services, activities or cultural sites that exist in Tenerife.

6.3  Environmental

The project as a physical resource only needs a laptop and two servers, of which the development server is used for other projects. while the laptop is two years old and has been used for other projects. As for the clients server, details are unknown. For documentation, everything worked on is
not printed unless necessary. If it is printed, recycled paper was used to reduce the environmental cost.

In the event that the project is not a TFG, the environmental cost would be lower because of the documents and its copies for the presentation would not be necessary.

Some features of this project or procedures could be used in others. In fact, a problem that was encountered during the implementation was fixed by looking at other projects. Finally, the people in charge of carrying out the project have no need to take any means of transport to reach their workplace, because they can walk from their home so they do not contribute to polluting the planet.

<table>
<thead>
<tr>
<th>Sustainability</th>
<th>Value (over 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>7</td>
</tr>
<tr>
<td>Social</td>
<td>7</td>
</tr>
<tr>
<td>Environmental</td>
<td>8</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

Table 8: Comparison of the sustainability aspects of the project
7 Microsoft SharePoint

7.1 What is Microsoft SharePoint?
It consists of a set of Microsoft tools focused on making the business productivity more efficient. The main objective of SharePoint is to increase productivity and access to relevant information. Some of the most relevant features are:

* create a wide range of enterprise solutions, such as intranets, extranets, portals, web applications.

* It is a great tool for cooperation and participation.

* It is a good content manager, it allows you to create and manage documents quickly and easily, files and web content.

* It has the ability to work with other Microsoft tools as well be Microsoft Excel, InfoPath ...

* It allows you to do business intelligence tasks.

One feature that stands out from the rest is the way of making managing content. It offers security and manages information and documents. It has control on older versions, which users have access to it and a way to attach it to the workflow.

The architecture of SharePoint 2010, which is used in this project, will be formed by Microsoft SharePoint Foundation, which was the old version Microsoft SharePoint Services, and by Microsoft SharePoint Server 2010, which was the old version of Microsoft SharePoint 2007.

Here there is a diagram of the architecture mentioned before.

Illustration 19: SharePoint 2010 structure version 1
7.2 Microsoft SharePoint Products

Microsoft SharePoint has different products to get the best out of the it, which will be used full or partially the following products.

7.2.1 Microsoft SharePoint Designer

It is the main tool specifically dedicated, which is available from Microsoft SharePoint to design websites and manage the pages that have different locations or sites.

Even though the design of the pages can be configured with Microsoft Visual Studio, which has programmed the solutions of Microsoft SharePoint. Microsoft SharePoint Designer provides tools that allows us to see the design-time appearance of the page as the user is changing it. It has the advantage that the user can see a resemblance with what will be published on the page.

Well, as it is seen, this tool is a WYSIWYG (What You See Is What You Get), allowing the user to view real-time the layout of what the page will look like it is location.

Through this tool, the different sections available of the portal can be browsed, in the case of this project. As it is seen in the following image, it shows in the lower left section, all the folders of the section in which we are in, and on the left its contents. In this case, we have selected the pages folder in order to edit it.

![Illustration 20: Navigation on Microsoft SharePoint Designer](image-url)

As previously mentioned, one of the advantages of this tool, regarding the editing of the page layout in Microsoft Visual Studio, is to see the results in real time. As it is seen in the screenshot, at the top is the code and at the bottom its result.
7.2.2 Microsoft SharePoint Server

It is an integrated set of server software applications that help teams improve their productivity and efficiency. It is a business platform that allows everybody involved in the ecosystem of the company the possibility of sharing their content which is part of the company’s business process, which could be files, images, audios, reports.

Microsoft SharePoint has the tool called SharePoint Central Administration in order to manage its content. It can create web applications, define the database which are associated with them, configure the domains so they can access the application, create metadata, upload new solutions that integrate with our web application...

SharePoint allows you to create several web applications, each assigned to different ports. Each of these applications can consist of a set of sites, which can be made up of sub-sites but one of these sites should be the main site, called root.

Each of these Web applications have to be associated with a SharePoint database, in which all information found in the portal, whether it is sites, documents, pages, lists, users. Because in the end, all the content of SharePoint will be stored in the databases.
In the next image you can see the architecture.

![Sharepoint Server 2010 structure](image)

As it is seen, there are two versions, the Enterprise and Standard. The main difference between the two is their content, the Enterprise is a full version. As it is seen in the picture above, the tools such as InfoPath, Perf Point, Access, Visio or Excel can use the SharePoint environment if it is the Enterprise version. Therefore, SharePoint Enterprise is focused on a more technical environment that requires a large number of resources.

SharePoint Server 2010 includes a set of services that allow resource sharing between different web applications. These services are called service applications. It allows each web application to use different services in the same server.

![Scheme of the SharePoint servers](image)

### 7.2.3 Microsoft SharePoint Foundation

It is a versatile technology that the businesses and organizations of all sizes can use to increase the efficiency of their business processes and improve their team productivity. It allows the possibility to have access to all documents and information needed, regardless of the geographic location.

The sites based on SharePoint Foundation 2010, called SharePoint sites, raise the file storage to a new level and provide communities for group collaboration that allow users to collaborate on documents, tasks and events. It makes it easier to share contacts and other information.

It provides a basic platform for creating web-based applications that allow great flexibility and scalability that can meet the changing and growing business needs.
SharePoint Server 2010 is based on SharePoint Foundation 2010, both of them share a lot of similarities in architecture. SharePoint Server provides a greater number of features and services as an application. It also takes into account the different and wider management functions of user profiles. In the next image, it is seen clearly how the fundamentals from SharePoint Server are subtracted from SharePoint Foundation.

7.3 Differences between Microsoft SharePoint Server and Microsoft SharePoint Foundation

The main difference is that Microsoft SharePoint Server was created based on Microsoft SharePoint Foundation.

SharePoint Foundation is the core technology of SharePoint Server, it is designed for small and medium enterprises or departments that need to collaborate safely on the web with a low budget.

Instead SharePoint Server is designed for organizations that want to deploy a business collaboration platform for all types of content.

All the features available in SharePoint Foundation are also available in SharePoint Server.

SharePoint Foundation is understood as a tool that can solve the problem of a department, but when it is needed to build a cross-platform of productivity and collaboration in an organization, then the use of SharePoint Server will be required.

Below, a clearer idea can be better perceived. It is a global picture of all the SharePoint ecosystem functions, from which, the ones that are in bold is covered by SharePoint Foundation.
7.4 Similar products

Some products with a certain similarity to Microsoft SharePoint are briefly explained which could have been taken as alternatives considering one of the main problems that Microsoft SharePoint has is the high cost of their licenses.

7.4.1 Alfresco

Alfresco is an enterprise content management system (ECM). It is an alternative developed with Open Source Java, based on open standards and suited for businesses with an operating systems like Windows Unix Solaris and some versions of Linux.

It is designed for users who require a high degree of modularity and scalable performance. It includes a content repository, that has the same role as a shared drive and also excludes the need to install any additional desktop application.

Some of the types of solutions it offers are:

- Document Management
- Web Content Management
- Management of images
- Management records
Nuxeo is essentially a document repository. It is an Open Source product, developed by java, based on open standards and business oriented with can be used with Windows and operating systems like Unix. It stands out for its high performance, scalability and its modularity which leads to a lower cost in changes.

Some of the types of solutions it offers are:

- Document Management
- Web Content Management
- Management of images
- Management records
Illustration 27: Nuxeo interface
8 System specification

In this section we will explain some of use cases that we can find in the functioning of the project and in the data model that is defined by Microsoft SharePoint where it stores all the tables for the good functioning of the system.

Finally, we will define the behavior system model through some sequence diagrams associated with the use cases explained previously.

To do the next sections, we have defined the actors who interact with the system. These actors are;

Administrator

The project manager and me are who do this role. This actor is whom checks that the website and all the developments work well.

Edit content user

Is who introduces all the content of the website. This actor uploads the images, the documents, creates the web pages of the different sites...

Web visitor

This role is developed by all the users who visit the website to know more about Tenerife or for another reason.

8.1 Use case model

We can understand like a use case, a set of steps or activities that we have to do to make some process.

In this section we are going to expose the use cases that define the actions most commons or importants in the functioning of the website. Each use case will have a description of their steps.
8.1.1 Use cases diagrams

8.1.1.1 Manage site

Use case 1: Create list or library

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to create or import a list.

Main success scenario:

1. The system displays all the methods to create a new list.
2. The actor chooses the kind of list that he wants to create.
3. The actor introduces the name of the list.
4. The system saves the new list.

Alternative flow:
1a. The actor wants to add a new library

1a1. The actor introduces the library name.

1a2. The system saves the new library

2a. The actor chooses import a new list.

2a1. Through the file explorer the actor chooses the list that he wants to import.

   Return to step 4.

3a. The list name is incorrect because already exist or because there is some strange word.

Use case 2: Edit a list

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to edit a list of the current site.

Main success scenario:

1. The actor chooses the list that he wants to edit.
2. The actor chooses the option to configure the list.
3. The actor adds a new file in the list.
4. The system saves the changes.

Alternative flow:

2c The actor wants to export the list.
2c1. The actor chooses export the list to excel.
2c2. The actor selects where save the list.
   Use case ends

2d The actor wants to add a new element in a list.
2d1. The actor fills the fields of the new list element.
2d2. The system saves the new element in the list.
   Use case ends

2e The actor wants delete a list element.
2e1. The actor selects the list element that he wants to delete.
2e2. The system saves the changes.
   Use case ends
2f. The actor wants to edit an element of the list.
2f1. The actor selects the list element that he wants to edit.
2f2. The actor modifies the field or fields that he wants.
2e2. The system saves the changes.
Use case ends

3a The actor wants to delete the list.
3a1. The actor selects that he wants to delete the list.
3a2. The system deletes the list
Use case ends

3b The actor wants to delete a list field.
3b1. The actor selects the field that he wants to delete.
3b2. The actor deletes the field of the list.
3b3. The system saves the changes.
Use case ends

Use case 3: Manage the documents library

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to add or delete a document.

Main success scenario:

1. The actor wants to add a new document.
2. The system displays a file explorer where the actor can choose the document to add.
3. The actor fills the data fields of the document that he wants to add.
4. The system saves the document.

Alternative flow:

1a. The actor wants to delete a document.
1a1. The actor selects the document that he wants to delete.
1a2. The system saves the changes.

Use case 4: Manage the image library

Main actor: Administrator, Content editor
Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to add or delete a document.

Main success scenario:

1. The actor wants to add a new image.
2. The system displays a file explorer where the actor can choose the image to add.
3. The actor fills the data fields of the image that he wants to add.
4. The system saves the image.

Alternative flow:

1a. The actor wants to delete an image.
1a1. The actor selects the image that he wants to delete.
1a2. The system saves the changes.

Use case 5: Manage sites

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to create a new site.

Main success scenario:

1. The actor fills the configuration form of the new site.
2. The system saves the modifications of the new site.

Alternative flow:

1a. The actor wants to delete a site.
1a1. The actor goes to the configuration place of the site to delete it.
1a2. The system saves the changes.
Use case ends.

Use case 6: Add page

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to add a new page in the site.
Main success scenario:

1. The actor introduces the name of the new page.
2. The system checks that the data are correct and saves the page.

Alternative flow:

2a. The System display an error message because the page name has some incorrect word. Returns to step 1.

8.1.1.2 Use cases of a page

Use case 7: Manage page

Main actor: Administrator, Content editor
**Precondition:** The actor has signed in with their credentials and he has been validated by the system.

**Trigger:** The actor wants to edit the content of a page.

**Main success scenario:**

1. The actor selects edit the page to modify the webparts that are inserted.
2. The system displays the webparts that contains the page which the user is editing.
3. The actor selects the webpart that he wants to edit.
4. The actor changes the webpart parameters that he wants.
5. The system saves the changes.

**Alternative flow:**

1a. The actor wants to edit the page properties.
   1a1 The actor edits page properties.
   1a2 The system displays to the actor the page properties.
   1a3. The actor modifies the property or properties of the page that he wants.
   1a4. The system saves the changes.
   Use case ends.

   1a2a. The system can’t save the modified properties of the page.
   1a2a1. The system displays an error message because the values introduced in the page properties by the actor are not valid.
   Return to step 1a1.

1b. The actor wants to see the page properties.
   1b1. The actor selects the option to see the page properties.
   1b2. The system displays the page properties.
   Use case ends.

1c. The actor wants to delete the page.
   1c1. The actor chooses the option to delete the page.
   1c2. The system saves the changes.
   Use case ends.

1d. The actor can’t edit the page.
   1d1. The system not allow the actor edit the page because is being edited by another person.
   Use case ends.
3a. The user wants to delete a webpart.
3a1. The actor selects the webpart that want to delete.
3a2. The system saves the changes.
Use case ends.

3b. The actor wants to add a new webpart to the page.
3b1. The actor selects the option to add new webpart in the webpart zone that he wants.
3b2. The System displays the webparts libraries available.
3b3. The actor selects the webpart that he wants of the webpart library.
3b4. The System adds the webpart.
3b3. The actor edits the webpart parameters for adequate the behavior of the webpart.
3b4. The System saves the changes.
Use case ends.
Use case 8: Publish page

**Main actor:** Administrator, Content editor

**Precondition:** The actor has signed in with their credentials and he has been validated by the system.

**Trigger:** The actor wants to publish page because he wants to be visible for all.

**Main success scenario:**

1. The actor selects the option of publish page.
2. The system saves the changes that the actor has made and publish the page.

Use case 9: Change the page design

**Main actor:** Administrator, Content editor

**Precondition:** The actor has signed in with their credentials and he has been validated by the system.

**Trigger:** The actor wants to change the web page where he is in this moment.

**Main success scenario:**

1. The actor selects the page which he wants change the page design.
2. The system displays the page.
3. The actor edits the page.
4. The system displays to the actor the page in edition mode.
5. The actor selects the option with the name, page layout and selects the page design that he wants.
6. The system saves the new format of this page.

**Alternative flow**

3a. The actor cannot edit the page
3a1. The page is being edited by another person.

Use case ends.
Use case 10: Unprotect page

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to unprotect a page because he wants modify their content.

Main success scenario:
1. The actor selects the page to unprotect.
2. The system will unprotect the page.

Alternative flow

1a. The system cannot unprotect the page
1a1. The page is already unprotected by other person.

8.1.1.3 Webparts use cases

Use case 11: View webpart

Main actor: Administrator, Content editor, Web Visitor

Precondition: Preconditions are not necessary.

Trigger: The actor wants to see the webpart of the page.

Main success scenario:
1. The actor goes to the page where is the webpart.
2. The system displays the page with their content, where is the webpart that the actor wants to see.

Use case 12: Edit webpart

**Main actor:** Administrator, Content editor

**Precondition:** The actor has signed in with their credentials and he has been validated by the system.

**Trigger:** The actor wants to modify the parameters of the webpart to change their behavior.

**Main success scenario:**

1. The actor edits the page where is the webpart.
2. The system displays all webparts of this page.
3. The actor edits the webpart that he wants modify.
4. The system displays all parameters that webpart has.
5. The actor modifies the parameters that he wants.
6. The system saves the changes.

**Alternative flow:**

1a. The actor can’t edit the page
   1a1. The page is being edited by other person.
   Use case ends.

4a. The webpart hasn’t parameters.
   Return to step 2.

6a. The system can’t save the changes.
   6a1. The System displays an error because some parameter has an incorrect value.
   Return to step 4.

**8.1.1.4 Migration process of pages data to their variations**

The project also has some processes. The customer wanted some process to change automatically the page design of the pages and add webparts. This processes are necessary because in the website there are a big number of pages to modify their content.
Use case 13: Migrate data to variation of current page

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to migrate the data of the current page to their equivalents in other languages.

Main success scenario:

1. The actor selects the migration data process of pages to their variation.
2. The system displays the migration data form of pages.
3. The actor chooses the option “page” in the kind of migration section and configure the rest of the form to migrate the data that he wants.
4. The system migrates the data specified by the actor and save the changes.
5. The form takes the default values.

Alternative flow:

4a. The data specified by the actor haven’t migrated.
4a1. The System displays an error message.
Return to step 2.
Use case 14: Migrate data to variations of site pages

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to migrate the data of the current page to their equivalents in other languages of the pages in the same site of the current page and with the same content type.

Main success scenario:

1. The actor selects the migration data process of pages to their variation.
2. The system displays the migration data form of pages.
3. The actor chooses the option “page of site to their variation” in the kind of migration section and configure the rest of the form to migrate the data that he wants.
4. The system migrates the data specified by the actor and save the changes.
5. The form takes the default values.

Alternative flow:

4a. The data specified by the actor haven’t migrated.
4a1. The System displays an error message.
Return to step 2.

Use case 15: Migrate data to pages of current site

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to migrate the data of the current page to the other pages in the same site and with the same content type.

Main success scenario:

1. The actor selects the migration data process of pages to their variation.
2. The system displays the migration data form of pages.
3. The actor chooses the option “pages of the current site” in the kind of migration section and configure the rest of the form to migrate the data that he wants.
4. The system migrates the data specified by the actor and save the changes.
5. The form takes the default values.
8.1.1.5 Massive process to build webpages

Use case 16: Massive addition of webparts

Main actor: Administrator, Content editor

Precondition: The actor has signed in with their credentials and he has been validated by the system.

Trigger: The actor wants to add a group of webparts and a specific page design to a page of a site and their variations.

Main success scenario:

1. The actor selects the massive process to build webpages.
2. The system displays the form of the process.
3. The actor configures the form of the process to apply the page design and the webparts that the actor wants in the pages and the variations that the user specifies.
4. The system configures the pages with the changes specified by the actor.
5. The form takes the default values.

Alternative flow:

4a. Can’t modify the pages specified by the actor.
4a1. The System displays an error message.
Return to step 2.

8.2 Data model

8.2.1 SharePoint database

The data model is used to specify what data have to manage the system. SharePoint disposes of his own data model which is very big.

The SharePoint data architecture is formed by different databases where each one has a different function. From all of them we focused in the databases which we have worked during the development of the website.

Content database, is the database that we use more during the project. It contains the data of the sites and site collection.

Server database, it contains the data about specific configurations of the server.

Profiles database, it contains the data of the users profiles.

SharePoint configuration database, it saves the configurations settings of SharePoint.

How we told before, the database with we have worked more is the content database, so is the database that we will explain then.

All data that we use in Microsoft SharePoint are saved in the content database. This database contains a big number of tables that are associated between them. Each one of this tables disposes a different information, depends on the data that the user looks for, the user will search in one table or in other.

Then we will detail the content of some of the tables in the content database of SharePoint. Because of the big number of tables in the content database, we will explain the most important tables or the tables that we have used more.

AllDocs: Table that contains information of the documents and elements in the lists and libraries

AllUserData: Table that contains information of the lists elements from all sites.

AllLists: Contains information of the lists from each sites.

Features: Contains information about the activated features for each site.

Groups: Contains information about the SharePoint groups of each site.

Roles: Contains information about all SharePoint roles (permission levels) of each site.

RecycleBin: Contains information about all elements that the user has deleted and are in the SharePoint recycle bin.
**Sites:** Table that contains information about all sites of the site collection.

**UserInfo:** Contains information about all users of the site collection.

**Webs:** Table that contains information about all webs of the site collection.

In the next image, we can see the SharePoint content database with some tables, some of them we have talked recently.

[Diagram showing database structure]

Illustration 33: Part of the tables of the website content database

Because of the complexity of the database, then we will show a brief diagram about the associations of some tables of the SharePoint content database.
8.2.2 SharePoint architecture

The SharePoint 2010 architecture is based on architecture by layers. Follows the architectonic style named, model, view and controller (MVC). Each layer is perfectly separate of the others, this fact gets an easiest maintenance of the application. An example of this is that we can modify the view without necessity to modify the controller and we can modify the controller without necessity to modify the view. The work that realize each one of the layers it the next:

Model: represents the information with that the application works.

View: is the layer that converts the model in a page which the user can interact.

Controller: The controller layer processes the request produced by the interaction of the user with the interface of the application. This layer also makes changes on the model or view.
8.3 Behavior model

The behavior model is the part which indicates the associations between the user and the system. Because of the big number of use cases, I have chosen the six most important use cases in my opinion and I will do the sequence diagram of each one. The sequence diagram describes the interactions between the user and the system. On each sequence diagram also we will display the contracts of the operations defined on the diagram.

8.3.1 Publish page

context DomainLayer::publishPage(path: String)

post The page has been published correctly.
8.3.2 Add page

context DomainLayer:: createPage(nom: string, pageDesign: pageLayout) : PublishingPage

exc invalidword: The name of the page has some invalid word.

post result = get a new page in the current site where is the user.

8.3.3 Edit webpart

context DomainLayer:: editPage() : WebPartManager

post result = get the object which manage the webparts of the page where we are.

context DomainLayer:: getWebPart(WPId: int) : WebPart

post result = get the WebPart with the name specified by the user in the page where we are.

context DomainLayer:: editProperties(p: var)
**post** the property of the webpart has changed with the new value specified by the user.

### 8.3.4 Migrate data to variation of current page

**context** DomainLayer:: migrateData(set(migrationType: string, lang: bool, dataType: string, properties: string), OriginPage: page)

**post** the data specified by the user have been migrated to the Language variations equivalents to the pages of the current site. The Language variations where migrate the data are specified by the user too.
8.3.5 Migrate data to variations of site pages

Illustration 40: Sequence diagram of the use case of the migrate data to variations of site pages

**context** DomainLayer:: migrateData(set(migrationType: string, lang: bool, dataType: string, properties: string), OriginPage: page)

**post** the data specified by the user have been migrated to all pages of the current site.
8.3.6 Migrate data to pages of current site

**context** DomainLayer:: migrarDades(set(migrationType: string, lang: bool, dataType: string, properties: string), OriginPage: page)

**post** the data specified by the user have been migrated to the Language variations equivalents of the current site. The language variations where we migrate the data are specified by the user too.

### 8.4 No functional requirement

The no functional requirements are all the properties which the system must accomplish. The no functional requirements are all requirements which no describe information to save neither functions to do.

#### 8.4.1 Humanity and usable requirements
### Requirement #01. Requirement of easy usability

**Description**
The website must be easy to navigate and must have a clear content.

**Justification**
The user must navigate through the website and find which he expects.

**Satisfaction criteria**
The website will have a web page where the user will able to ask questions to the personal of the website.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>3</th>
<th>Customer dissatisfaction</th>
<th>4</th>
</tr>
</thead>
</table>

**Priority**
High

Table 9: Requirement of easy usability

### Requirement #02. Requirement of personalization and internationalization

**Description**
The system will be available in 6 languages, Spanish, English, Italian, German, and French.

**Justification**
The user must be comfortable when he/she navigates through the website so the language mustn’t be an obstacle.

**Satisfaction criteria**
On each page will indicate on the top side, the languages that the page is available.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>2</th>
<th>Customer dissatisfaction</th>
<th>3</th>
</tr>
</thead>
</table>

**Priority**
High

Table 10: Requirement of personalization and internationalization

### Requirement #03. Requirement of compression and courtesy

**Description**
The website will use an appropriate language and will be understandable for any user.

**Justification**
The user must feel well and they must understand all the content of the website with no difficulty.

**Satisfaction criteria**
All text in the website will be revised by a person with a great literary domain.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>3</th>
<th>Customer dissatisfaction</th>
<th>4</th>
</tr>
</thead>
</table>

**Priority**
High

Table 11: Requirement of compression and courtesy

### Requirement #04. Learning requirement

**Description**
The users must navigate through the website without necessity of previous knowledge.

**Justification**
The necessity of previous knowledge would cause many users do not enter on the website.

**Satisfaction criteria**
The website design has been elaborate by a professional team with a great experience.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>3</th>
<th>Customer dissatisfaction</th>
<th>5</th>
</tr>
</thead>
</table>

**Priority**
High

Table 12: Learning requirement

#### 8.4.2 Appearance and style requirements

**Requirement #05. Style requirement**

**Description**
On the website design there won’t buttons that may confuse the user with their functionality.

**Justification**
The existence of buttons with ambiguous functionality can cause that the user leaves the website or not find that he wants.

**Satisfaction criteria**
Any button or link with a certain ambiguity, will have a brief description of what he does.

| Customer satisfaction | 3 | Customer dissatisfaction | 4 |
### Table 13: Style requirement

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
<th>Justification</th>
<th>Satisfaction criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>#06. Accessibility requirement</td>
<td>The content of the website have to be made in a font that not imply difficulty for the user.</td>
<td>The content of the website have to be in a size easy to see for the user and with a font that be comfortable to read.</td>
<td>Previously to publish the content of the website, a professional team will have to evaluate their format and meaning.</td>
</tr>
<tr>
<td>Requirement</td>
<td>#07. Requirement of modifications</td>
<td>The website can have the necessity to add new webparts or modify the behavior of some of them.</td>
<td>As time passes can exist the possibility of add new sections on the website or new functionalities.</td>
</tr>
<tr>
<td>Requirement</td>
<td>#08. Support requirements</td>
<td>The system has to dispose an email where the user send doubts about the system functioning.</td>
<td>The users must be able to resolve the doubts that they have about the functioning of the system or the Tenerife island.</td>
</tr>
<tr>
<td>Requirement</td>
<td>#09. Adaptability requirements</td>
<td>The website should display correctly the 90% of times on the latest versions of the internet navigators most commons(Firefox, Chrome and Internet Explorer)</td>
<td>The user can use different navigators to enter to the website. We have to ensure that the user not need to change the navigator to enter into the website.</td>
</tr>
</tbody>
</table>

#### 8.4.3 Support and availability Requirements
Table 17: Adaptability requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
<th>Justification</th>
<th>Satisfaction criteria</th>
<th>Customer satisfaction</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10. Availability requirements</td>
<td>The website will be available 24 hours on 365 days of year.</td>
<td>For the fact that is a public website because any person from any place can enter, it has to be available on any moment.</td>
<td>The website has to have a percentage of functioning of 90%.</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Customer dissatisfaction</td>
<td></td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

Table 18: Availability requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
<th>Justification</th>
<th>Satisfaction criteria</th>
<th>Customer satisfaction</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>#11. Maintenance requirements</td>
<td>The website will have at least one administrator who will do the maintenance tasks.</td>
<td>To avoid or resolve incidences, the website will have at least one administrator.</td>
<td>The website will have at least one administrator.</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Customer dissatisfaction</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 19: Maintenance requirements

8.4.4 Security Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
<th>Justification</th>
<th>Satisfaction criteria</th>
<th>Customer satisfaction</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>#12. Integrity requirements</td>
<td>The system will keep the logic integrity of the data.</td>
<td>The logical integrity of the database data is essential to guarantee the good functioning of the website.</td>
<td>The data structure of SharePoint and their procedures keep the data integrity.</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Customer dissatisfaction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Table 20: Integrity requirements
### Requirement #13. Security requirements

**Description:** The website will measure the daily number of website visitors.

**Justification:** To have a control of the web pages most visited and to have a control of the overload of the website.

**Satisfaction criteria:** The website will have a set of control tools and logs to obtain all of this data.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>1</th>
<th>Customer dissatisfaction</th>
<th>2</th>
</tr>
</thead>
</table>

**Priority:** High

---

### Requirement #14. Immunity requirements

**Description:** The website must guarantee the security of their data front possible attacks.

**Justification:** Keep the security of the website is important to avoid the server crash or to protect their databases.

**Satisfaction criteria:** Each week we’ll analyze the website with antivirus and antispyware to avoid attacks. Besides we will regularly do backups for no lose the data of the website.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>3</th>
<th>Customer dissatisfaction</th>
<th>4</th>
</tr>
</thead>
</table>

**Priority:** High

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### 8.4.5 Cultural and politics requirements

### Requirement #15. Cultural requirements

**Description:** We will censure all derogatory messages, swear words and sexist or racist words.

**Justification:** The visitors of the website mustn’t feel offend by comments of other persons.

**Satisfaction criteria:** For each comment in the social networks or in the web pages content of the website there will a professional team who will check all the texts.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>1</th>
<th>Customer dissatisfaction</th>
<th>4</th>
</tr>
</thead>
</table>

**Priority:** High

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### 8.4.6 Legal requirements

### Requirement #16. Standardization requirement

**Description:** The system must accomplish the W3C standards because are based on web pages.

**Justification:** The website must accomplish the current standards to display correctly on any platform

**Satisfaction criteria:** All standards defined by W3C are accomplished.

<table>
<thead>
<tr>
<th>Customer satisfaction</th>
<th>1</th>
<th>Customer dissatisfaction</th>
<th>1</th>
</tr>
</thead>
</table>

**Priority:** High

---
9 Implementation

9.1 Platform
For the development of the project, we have used the platform, Microsoft Visual Studio 2010. We have chosen this tool because is the main platform for the development of the SharePoint solutions.

How we explained in the previously sections, we have used Microsoft SharePoint Designer to modify the HTML code of the web pages.

9.2 Programming language
During the development of the project, I have developed in different programming languages. On the server side has been with .Net while client side has been with Javascript because is powerful and fast. For the web page designs, I have used HTML with CSS style sheets.

9.3 Object models
SharePoint has an object model which can manage all the system elements through the programming. The object models of Microsoft SharePoint Foundation, how I have explained in the previously sections, is who has the SharePoint base. Microsoft SharePoint Foundation has 76 namespaces in 19 assemblies.

Of these namespaces, I would like highlight the namespace `Microsoft.Sharepoint.dll`. This namespace has methods, elements and events to work with sites, subsites and lists.

9.3.1 Architecture
In this section we want display a diagram to show how can be the architecture of a typical site on SharePoint. We will do this through the collections and objects of the Microsoft SharePoint namespace.
A web application is composed of a set of sites where possibly some of them will have others subsites under him. To get programmatically all existent sites in a web application, we can get through the site collection object. We can use this object through SPSite class. Each site collection includes a set of SPWeb objects. SPWeb is the object that represents a web site and manages a site.

Through the SPWeb property named List, we get the object SPFieldCollection. This object represents all lists in a specific site.

Through the SPLIST object, we can manage the site lists. We can highlight the properties, SPFieldCollection, returns all the fields from a list and the property with the name items, returns a SplistItemCollection object, that represents all rows from a list.

To manage individually the items from a list, we can use the SplistItem object and for manage the fields of a list, we can use the SPField object.

**9.3.2 Classes**

Then, we going to explain with a more detail some of the most used classes during the development of the project, we have mentioned this classes on the previous section.

**SPSite**

This class represents a site collection with their subsites that exist on the web application. The SPSiteCollection is a collection of all sites of the web application.
For manage the content of a site programmatically, it’s necessary get a SPSite object and then, create a SPWeb object from this SPSite object. With the SPWeb object, we can get all the elements of this site.

Exists the Microsoft.SharePoint.SPContext method, with this we can get the SPWeb object of the site where we are currently without necessity to use the SPSite object.

**SPWeb**

This object represents web site of the site that we are currently. Through the methods of this object, we can manage their content. We can create an instance of the SPWeb object through the SPSite method, named OpenWeb. With this method, if we don’t specify an url as a parameter, we get the SPWeb associated with the site object. Exists the possibility to call this method with a parameter, that is the url of a site, in this case the method will return the spweb object of the url that we have specified.

If we want get a collection of all subsites that contains a specific site, we can use the method AllWebs.

**SPList**

Each SharePoint site can dispose of different lists or libraries that are represented with the SPList object. The set of SPList from a site are represented by the SPListCollection object.

Once we get the list that we need, we can modify their columns, that are associated to the SPField object, add new columns...

There are certain fields in the lists that are invisible, that are used by the system to maintain the internal information about the items. We can’t see these field through the user SharePoint interface, the only way to see them is programmatically.

For other hand, there are fields named lookup, these fields make reference to the values of other fields that belong to other lists. These lists can be in the same site or in other one. So this field contains values from other field.

**SPItem**

SPItem are objects that represent the items that contain the lists or libraries. Through these objects we can get all the values of an item and modify them.
**SPQuery**

With this class, we can do queries to the SharePoint lists. This is very useful to filter elements in a list. With this we can reduce the load time of a page when we have to deal with lists with more than 100 elements.

To indicate a query to the SPquery object, this has the `Query` property. Once we assign the query that we want to do, to execute it in a list, we have to use the `GetItems()` method. For instance, `list.GetItems(SPQuery object)`.

### 9.4 Installation and configuration of Microsoft SharePoint Server 2010

In this section we will detail the steps to start up the website in a server, doesn’t matter if the server is a production server or is a development server. Because although the finality of both servers is different, that is to say, the first one is which hosting the web page in their time to life, so this server will manage the visits in the website while the other server, as his name indicate, is for develop the website, the time to life of the second one will be the time that we need to develop the website.

#### 9.4.1 Installation

The SharePoint version with we have developed this website and we will set up and install on the server is the 2010 version. The previous step to install Microsoft SharePoint 2010 on the server, is to check if this server accomplishes the minimum prerequisites to work correctly but if is it possible overcome the prerequisites. On the development server we will need more performance during the development of the website because we will work with the development tools like Microsoft Visual Studio 2010 and in the assembly and debug process, the server will need a lot of resources.

The previous step to start the installation of SharePoint 2010 Server is install the Framework 3.5. If we don’t install this, the wizard that guide us during the SharePoint installation will return us a message error.

Once we have installed the Framework, we can proceed to install Microsoft SharePoint Server 2010. The process will consist to follow the steps of the SharePoint wizard. One of these steps, will ask us for the validation key of the product to avoid possible piracy cases. On other step, will ask us for the name of the SQL server where we want to install the SharePoint databases, the name of the content database and the username and password of the SharePoint administrator.
Finally, another of the steps of the installation process that we can highlight, is when the wizard asks us for set up the port of the web application and the security that we want to use. The available options for the web application security are NTLM or Kerberos, we will choose the default values.

Once the installation finalized, we will must install the language packages of the languages that the website will be available. In our case we must install the language package of Spanish, English, French, German, Italian and Russian.

9.4.2 Server configuration

When we finish to install the language packages and SharePoint, we will must to create and configure the web application of the website. In the web application configuration, we will must specify their name and the port. Besides, we will must specify the content database, this database will create automatically in the server that we specified on the installation process.
In our case, we don’t want the default database that the system creates automatically because we want to use the database of the current website for no lose the existent content. So we can delete the database that the system creates automatically.

We leave the default values for the other options. On the next image, we can see a screenshot with other options that we can configure when we create a new SharePoint web application.

For attach a different content database to which the system creates automatically to the web application, we must go to the section named managed content databases in the SharePoint central administration. On this section we must add a new content database where we must specify the SQL server where is it and the name of the database. On the next image we can see the section that we explained previously.
9.5 Add solution to the project
When we have installed and configured SharePoint, the next step is, add and implement to the server all the solutions that we have developed with Microsoft Visual Studio.

9.6 Execute the migration data process
This step wasn’t set out at the start of the project, but there was a period of time that the customer began to modify the new content and the design of the web pages. But the initial idea of this period of time, it was that the customer tests the new website. But in that moment, we still had not migrate the database of the current website to the new database.

So, we proposed to the customer the possibility to do a process that migrate all the new changes that the customer had made on the new website to the database of the current site. With this, we get that the customer don’t lose their work on this period of time. The customer agreed with the idea because he knows that he had modified more content than he thought in a first instance.

9.7 Add managed metadata
Besides of metadata, that are all fields that give us information about an element, that is to say, their properties, we can find the managed metadata. The managed metadata are data that the user adds through the SharePoint central administration and we can see this kind of fields since all lists of the website. To see this kind of data in a list or library, we must add a managed metadata field, then we have to specify which value of the managed metadata structure we want. The managed metadata can be a data structure, that is to say, a value, like sports, that contains other values, like water sports or earth sports. So if we choose the sport value as a managed metadata of the new field, the values of this field could be, water sports or earth sports because this values belong to the sport managed metadata, that is the value that we have chosen for this new field.

So the next step of the installation consists on add the managed metadata’s in the new website because, on the current website exists lists that use managed metadata and if we not add this values on the new website, this won’t work well.
10 Website content and structure

10.1 Designs

First of all, before to talk about the website content and structure, we must highlight that the HTML designs and part of the CSS styles of each of their pages have been developed by another company that is not Trentia Consulting.

Inside the website, we can see a lot of web pages, depending of their page design, their content is distributed different and can have different webparts. But there are pages that have the same page design but have different content and different webparts.

This is one of the strong point of SharePoint, the possibility to configure the page designs and webparts to not display always the same content. So there is the possibility that two pages with the same page design and with the same webparts, can have a different aspect for the final user but in reality have the same structure of webparts and page design.

The difference between page designs is the number of webpart zones and the location of these. That is to say, is the zone where we can add webparts. The WebPartZone are specified by HTML code, as we can see on the next image.

We decided the number of page designs create as of a study at the beginning of the project. We did this study, as of the templates that the website should have, all this templates have been specified on the project documentation that the customer delivered at the beginning of the project. We grouped the templates as of their similitude.

Then, we detail each of page designs and pages that we have specified on the Grant diagram of the project. We will group this section, as of the page designs of the pages. On each templates, we will display an image of the current design and the new, so we can see the change.
10.1.1 End pages
We understand as end pages, all pages of a site, that are not the default page of it.

10.1.1.1 FC template
This template or page design is oriented for the end pages.
10.1.2 Default pages or index
Each site has a default page, named index too. The default page is that which the user goes when he enters in a site without specify the page inside this. In this section, we include the calendar page because use a SB0 page design, because is the page index of the calendar site.

10.1.2.1 SB0 template
This template is for the default pages of a site.

Illustration 50: Equivalent to the SB0 page layout on the current website

Illustration 51: SB0 page layout on the new website

10.1.2.2 Calendar
This is the calendar page, it uses a SB0 template, the difference with the other pages with the same page design are the searching filters by events. The available filters in the page are:

- Date filter
- Text filter
- Filter by the zone where is located the event

Filter by the category of the event
Current website

![Calendar page of the current website](Image)

Illustration 52: Calendar page of the current website

New website

![Calendar page of the new website](Image)

Illustration 53: Calendar page of the new website

10.1.2.3 Professional pages

Are sections of the website oriented for specified topics of Tenerife island. For each one of this section we have developed a different page design because the customer wanted one different for each one, although some of them could grouped.
10.1.2.4 Home Convention Bureau

This template is for the website section named Convention Bureau. This section offers for the professional organizing of congress and meetings a complete and large information about the services, equipment’s and the specialist companies from the island.

New website

Current website

Illustration 54: Page layout of the home page of the Convention Bureau on the current website

Illustration 55: Page layout of the home page of the Convention Bureau on the new website
10.1.2.5 Home Film Commission
The template Home Film Commission is for the website section named Film Commission. The content of this section is oriented to help to the producers and directors to find the perfect location to shoot their film, short, documental or advertising spot. This section offers free advice about permission of shooting in Tenerife.
This page design is for the press section of the website. It is an area oriented for journalists, they can find, dossiers, press notes, article proposals, photographs...

Illustration 58: Page layout of the home Press on the current website

Illustration 59: Page layout of the home Press on the new website
10.1.2.7 Home Trade

This page design is oriented for the website section named Trade. This section has as objective to give answers for the possible questions of the users about the Tenerife island.

Illustration 60: Page layout of the home trade on the current website

Illustration 61: Page layout of the home trade on the new website
10.1.2.8 Home Investigation

This template is for the section of the website named investigation. This section offers to the professional tourism regardless if is private or public, an information and analysis for better planning, managing and competitiveness of their activity and facilitate the decision making of the different touristic agents.

Current website

New website

Illustration 62: Page layout of the home investigation on the current website

Illustration 63: Page layout of the home investigation on the new website
This page design has been created for the section of the website named corporative. On this section we can find all kind of information about the Turismo Tenerife company.

**Current website**

![Current website illustration](image1)

Illustration 64: Page layout of the home corporative on the current website

**New website**

![New website illustration](image2)

Illustration 65: Page layout of the home corporative on the new website

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10.1.3 Specific pages
This page designs are oriented for specific pages. We can’t generalize this pages like the others. The reason of this, is because their structure not have the enough homogeneity to group with other page designs.

10.1.3.1 Home Tourism
This template is for the home page of the website.

Current website

New website

Illustration 66: Home page of the new website

Illustration 67: Home page of the current website

10.1.3.2 Product template
Is a template created for the sections; Tenerife Golf, Tenerife Nature, Tenerife Select, Tenerife comfort island, Tenerife No limits.
Current website

**TENERIFE GOLF**

Illustration 68: Equivalent to the product page layout on the current website

New website

Illustration 69: Product page layout on the new website
10.1.3.3 Contact template

This template is for the contact page. This page is to communicate with the people who manage the website.

**Current website**

Illustration 70: Equivalent to the contact page layout on the current website

**New website**

Illustration 71: Contact page layout of the new website
10.1.3.4 Map template

This template is for the map page, where on the central of the page are a map centered on the Tenerife island. On this map, will display all the interest places that we select on the top filter.

**Current website**

![Current website illustration](image)

*Illustration 72: Equivalent to the page layout of the map page on the current website*

**New website**

![New website illustration](image)

*Illustration 73: Page design of the map page on the new website*
10.1.3.5 First level pages

We understand as first level pages, all the pages that are one level under to the language root level. That is to say, would be the pages that we can see on the next image.

Illustration 74: Navigation menu of the website

When we select any of this menu options (Qué hacer, Qué visitar...), we are going to their index page. The index page of this pages will be designed with one of the next templates.

10.1.3.6 S1 Template

Illustration 75: Equivalent to the S1 page design of the current website

Illustration 76: S1 page design of the new website
Current website

Illustration 77: Equivalent to the ST1 page layout of the current website

New website

Illustration 78: ST1 page layout of the new website
10.2 WebParts

The elements that we find in each page of the website pages can be a user controls or a webparts, this depending on if are fixed on the page or not.

The webparts are elements that we can add or remove from the webpart zone that are defined on the page design. The webparts are an element associated to a user control, while the user controls are the part which have the code of the webpart. But there are certain pages that we want fix an element without possibility to remove it. In this cases we add directly the user control to the page design. Some example of this cases would be the case that we display on the next image, the bread crumb that is on the top of this website and indicate us where we are in each moment.

Then, we are going to explain some of the most important webparts that we have developed for the website. Keeping in mind the quantity of existing webparts, we’ll choose the 10 most important webparts in our opinion.

10.2.1 The weather
The functionality of this webpart is based on display the temperature of the selected place via webpart parameters. The place can be a golf course, a beach or a township. The data of this webpart get via XML files that are generated via Windows process, this process launches every day. Once the process has generated the XML files, we can navigate for this content to get the data that we want to design the HTML of the webpart.
10.2.2 Partner searcher
The functioning of this webpart is based on search all the existent companies in the website through a SQL query, this query must accomplish the specified conditions in the searcher. The conditions of the query depend on the filters that the user specify. The only parameter that have this webpart is to specify their CSS class to apply one design or other. The first step to do the search is index the website content because the search is about all the website content. To index the website content, SharePoint through the central administration disposes of a process to index all the website content.

<table>
<thead>
<tr>
<th>Current website</th>
<th>New website</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="current_website.png" alt="Current website" /></td>
<td><img src="new_website.png" alt="New website" /></td>
</tr>
</tbody>
</table>

Illustration 82: Parameters of the webpart of the searcher of the associated page

10.2.3 SB0 map
The functionality of the map on the SB0 page design displays the elements that accomplish the type specified by the user. The available types are displayed on the right side of the webpart, these types are get from a list that is located in a site named Map. This list specifies the name of the type and the URL where we can find all the elements which belong to this type. So the functioning of this webpart consist on to get all the elements of the types informed on this list, through the page where there are all these elements. Once we are on a page where are all the elements of a certain type, we get all and we save the properties that we need, in this case are, the longitude, the latitude, the title, and the URL. With all this data, we build a JSON structure where on the client side we will use to get the needed information to mark on the map each element of the specified type by the user.
10.2.4 FC map
This functionality is for the pages use the FC page design. This webpart hasn’t parameters. The objective of this functionality is display the location of the company or service of the page that is associated. When we load a page that has this webpart, this functionality gets the latitude and longitude values and marks the service or company on the map.

Illustration 85: Map webpart of the FC page layouts FC

10.2.5 MP1 map
The aim of this webpart is that the user can display the companies, services or places that are selected through the checkboxes on the top side of the map. The user also can do the search though the text field where we he must type a set of character related which he wants find. The functioning of this webpart is the next, first of all we go to the list on the root of the website named MapaRecurso, for each element on this list, we check if on the field publish has type the value S, if is the case we get the value of the field named idMapa. With this value, we go to other list on the root of the website named DetalleMapaRecurso and we get all the elements with the same value in the idMapa field. The elements of the list MapaRecurso are all the checkbox categories displayed on the webpart.
Once we have got all the elements of the MapaRecursos list, we create an array with all of them to can work with them on the client side with JavaScript to win velocity.

Illustration 86: Map webpart of the page layout Map

10.2.6 Headboard SB0

This webpart as its name indicates, is the headboard of the pages with the SB0 template. Depends on the configuration of this webpart, we can see one information or other. The parameter control type has different values; these values are:

CAB1: displays the associated image with the URL property of the page, the title of the page if we select the option “Display resource of the site” and the associated text with the esTexto property of the page.

CAB2: displays the images and videos of the site list named Sliders Cabecera with the page title and the text associated with the esTexto property of the page.

Title: only displays the page title.

LineTitle: displays the title associated with the esTitulo property of the page and under this draws a line.

PageTitle: displays the title associated with the esTitulo property of the page.

TextTitle: displays the page title and the text associated with the esTexto property of the page.

At last, we find the parameter named Video on lightbox, if we select this option, the webpart reproduces the headboard videos on a lightbox, if not reproduces the videos on the headboard space.
10.2.7 Multimedia gallery

The functionality of this webpart is display the image and videos on the site list named *GaleriaMultimediaTenerife*. This list creates automatically when we add the webpart on the page. Each page of a site has associates the images that must display in their multimedia gallery, is for this that the list has a lookup field that indicates the associated page of each element. The only parameter that the webpart has is to indicate the page to move when we select the button named *Ver toda la galería*.

10.3 Performance

One of the main requests in the moment to renovate the website, was improve their performance, the time to load the pages. To do this we have used a set of methods that we’ll explain then. To display the improve of the time to load the pages of the website we have used certain tools that we will explain on the section, performance valuation.
10.3.1 Methods

10.3.1.1 Execute code on the client side
One of the problems that we found, are the excessive connections client – server on some pages of the website. This fact, causes that the most of the interactions of the user with the page have to establish a connection with the server, this causes that the user must wait a lot. To solve this problem, we execute the code on the client side with the famous programing language named JavaScript.

On the most critical cases, these where was needed a constant connection with the server to consult certain data models, we converted these data models in JSON objects to work with them on the client side. With this, we avoid the continuous client – server connections.

10.3.1.2 Pages on memory
The costly process to get the content of certain pages, obligate to reduce the time to load this pages, the way to do this is save their data structures in the cache memory.

10.3.1.3 Delete unnecessary files
This improvement consists to delete one the initial loading of the JavaScript files that are not really necessaries or load them when are necessary. Although is a little improvement, this reduces a certain quantity the loading time and avoids transfer files that are not really necessary.

10.3.2 Performance valuation
To measure the performance of the both websites, we choose two tools that compare the website equitably. The first tool returns a value above 100 that displays clearly which of the two websites have better performance. This tool is from Google, is a company with the enough confidence to believe the results that it returns us. It is an online tool that calculates the performance of the web pages in mobile devices and pc's. The link to use this tool is the next one: https://developers.google.com/speed/pagespeed/insights/.

The value above 100 that returns the tool of Google to evaluate the web page that we indicate uses different factors,

- Time to load on the first part of the page: it is the required time since the user requests a new page until the internet navigator displays the first part of the page content.
- Time to load completely the page: it is the required time since the user requests a new page until the internet navigator shows completely the page content.
Besides, we also must re-mark that this tool not keeps in mind the network aspects to evaluate the performance of a website.

To measure the performance between the two websites, we have chosen a second tool because the first tool although has a big friability because the company who made it is Google, there are some occasions that the value that returns varies with the same page. So to have a second point to comparison, we have decided calculate the time to load the page by a plugin. We can install this plugin in the web navigator. The name of the plugin is app.telemetry and his function is return the time to load of the page.

We have to keep in mind although that the current and the new website have the same content, the distribution of it is not the same. This means, that there are pages that display more information than before or have some new functionality. This cause that the time to load a page of the new website could be bigger than the current website or the performance could be worst.

Despite the high number of website pages, we have selected a specific number of them to measure their performance because measure the performance of all them is unviable. The method to select which pages evaluate their performance has been through the number of visits that them receive. That is to say, we have selected the pages most visited, concretely the 10 pages most visited.

Besides, we also will comment certain pages that have a high time to load for each interaction of the user with the system.

We have to remark that during the development of each page, we have used a SharePoint tool that displays the time to load of each element of the page. This tool has resulted us very useful to know which elements of the page that has a high time to load.

Through the next table, we can compare the performance of the current website and the current website. To measure the performance of the websites with most precision, we have executed both tools 5 times and we have made an average with their results.
### 10.3.2.1 Pages most visited

<table>
<thead>
<tr>
<th>Page name</th>
<th>URL of the new website</th>
<th>Website</th>
<th>Puntuación (above 100)</th>
<th>Time to load (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td><a href="http://www.webtenerife.com">http://www.webtenerife.com</a></td>
<td>Current</td>
<td>33</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>65</td>
<td>1.9</td>
</tr>
<tr>
<td>Orquesta Sinfónica de Tenerife</td>
<td><a href="http://www.webtenerife.com/que-hacer/cultura/festivales/orquesta+sinfonica+a+de+tenerife.htm">http://www.webtenerife.com/que-hacer/cultura/festivales/orquesta+sinfonica+a+de+tenerife.htm</a></td>
<td>Current</td>
<td>45</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>69</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>68</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>56</td>
<td>2.1</td>
</tr>
<tr>
<td>Parque nacional del Teide</td>
<td><a href="http://www.webtenerife.com/que-visitar/parque-nacional-del-teide/parque+nacional+del+teide.htm">http://www.webtenerife.com/que-visitar/parque-nacional-del-teide/parque+nacional+del+teide.htm</a></td>
<td>Current</td>
<td>44</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>69</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>69</td>
<td>2</td>
</tr>
<tr>
<td>Universidad de la Laguna</td>
<td><a href="http://webtenerife.com/tenerife/La-isla/Sociedad/Universidad-de-La-Laguna/universidad-de-la-laguna.htm">http://webtenerife.com/tenerife/La-isla/Sociedad/Universidad-de-La-Laguna/universidad-de-la-laguna.htm</a></td>
<td>Current</td>
<td>43</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>68</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>70</td>
<td>2.5</td>
</tr>
<tr>
<td>Comer y beber</td>
<td><a href="http://www.webtenerife.com/que-hacer/comer-y-beber/?tab=1">http://www.webtenerife.com/que-hacer/comer-y-beber/?tab=1</a></td>
<td>Current</td>
<td>45</td>
<td>1.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>47</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>37</td>
<td>3.88</td>
</tr>
</tbody>
</table>

Table 25: Comparison of the performance between the current and the new website on the most visited web pages.
Besides the pages on the before table, there are certain pages that establish a communication client – server for each iteration of the user with them. The time to load since the user done the request until the page show the request is approximately of 10 seconds. On the new website, this kind of problems have been solved using this tasks on the client side with JavaScript. With this method the user receives a reply almost immediately. When we load the page, it created on the client side the JSON structures or arrays with all the data necessary depending on the request of the user. Some of pages that use this new functioning are: http://www.webtenerife.com/El-Tiempo.htm and http://www.webtenerife.com/prensa/notas-de-prensa/index.htm.
11 Conclusion

Then, we will talk about the conclusions that we have got of the project. Also we will talk about the future work on the website. At last, we will argue the reason of the technical skills that we had defined at the beginning of the project.

11.1 Project conclusion

The main objectives of this project were renew the design of the Turismo Tenerife website and improve their performance. Besides, we had created new functionalities or improvements. As we could see on the before sections, we have got all these objectives although the website performance still can improve.

The main topic of this project is SharePoint, how has been the relationship with this tool and the work with it. During the project, I have been able to see the fantastic aspects of SharePoint but also I have been able to see their part less good. We must highlight the powerful of this tool, nowadays is one of the best content managers that I have seen. SharePoint allows use an unlimited variety of elements. SharePoint is a great tool for company environment, like an Intranet. But if we want use SharePoint in a public area instead of in a private area, like a website, we can get a very dynamic website with a powerful content.

Another aspect I liked a lot of this tool, although this aspect is shared with other tools, is their facility to use with other programming languages, for instance, HTML, JavaScript, CSS… This also was useful to learn more than one language during the project.

Although SharePoint has a lot of positive aspects, is like any tool We can find nowadays in the market, always by one aspect or other, in a personal opinion or not, has some feature that doesn’t like to everybody. In SharePoint this fact is the instable that can be in some occasions. The fact that all their content is saved in a database, in different tables that are associated, causes for example, if we change some content type, we will must delete all the lists that use it, from all sites and then delete the previous content type, if we don’t delete it, the new content type doesn’t work and the new functionality of this new content type neither. Also, some management mechanisms of SharePoint can leave to work properly. This is a situation I have found in a lot of moments but there are more problems. I have dedicated a lot of hours to solve all of them. Is for this reason I have said that SharePoint has very good aspects but sometimes is an intractable tool too.
Another aspect to keep in mind is the time dedicated to understand the programming languages of SharePoint, their structure and their classes. Although I have spent a lot of hours learning all of this, I have still the feeling that I don’t know nothing about SharePoint because every day I learn something new of it.

The contact with the customer in the feedbacks of each iteration of the project, above all in the period of bugs and improvements, have been a new experience for me. Although in other jobs I have had contact with the customer is not comparable with the magnitude and the importance of this project. The problem of this part is the distance with the client, this fact didn’t allow to celebrate physical meetings so we had to find others tools to communicate with the customer, like skype, mail or telephone. With physical meetings, we could have closed problems of the project in less time a because of misunderstandings about the functioning of certain webparts or pages.

Definitely, I think develop a project in a company, has been very enriching, I have won a lot of knowledges, I have seen that all that I learned in the university has a real use. Besides I have won responsibilities because all that we develop has a consequence in the project, learn to deal with a customer...

11.1.1.1 Future prediction of the website

Once we finished to implant all that we planned at the beginning of the project, the customer has continued adding processes to design the pages of the website more quickly and improvements for the content of the pages. When we finished this period of elaboration, the next period will be the maintenance of the website. In this period, we will solve the possible bugs that can appear and develop new functionalities or improvements. So we can say that the project doesn’t finish now, the project will continue. The time to life of this project could be bound with the website although really depends on the customer.

11.2 Check of the technical skills

Then, we will specify the technical skills associated to the project that we had chosen in the moment of the matriculation of it. These technical skills have been associated with a brief explanation of the reason of how we will get it in the project.

11.2.1 Skill CES 1.1

Develop, maintain and evaluate systems and complex or critics software [Enough]

In the project as we explained before consists in develop a website, which has some critic functionalities like the searcher in the “Associated” section. This searcher disposes a big quantity of registers, more than 500, these reference to pages of the website. We must accede to these web pages to get the metadata that we need to display on the results of the search. The necessity to accede in each web page to get the data, implies that 500 registers are a lot although for nowadays is little.
Depending on the filter level that the user specifies, the time of the search result will change. This a critic section, we must do tests to measure the execution time of each filter to try reduce the reply time. Because if the reply time is very high could make lose a potential customer for Tenerife.

11.2.2 Skill CES 1.3
Identify, evaluate and manage the possible potential risks associate in the software elaboration. [Deeply].

For each improvement or new functionality added by the customer or the initial proposal, we have estimated the hours based on the possible problems that can find on each one. We apply this case more frequently on the improvements that the customer adds because for each one we must estimate the possible risk that can have, the hours to develop the improvement and finally their cost. So we will work this specification deeply.

11.2.3 Skill CES 1.4
Develop maintain and evaluate services and distributed applications by network support. [enough].

As is a web project, the network is vital, without it the project is unavailable for no user. The best example to accomplish this specification is that to start up the website and maintain it, we need use the IIS web server and their services.

11.2.4 Skill CES 1.5
Specify, design, implement and evaluate data bases [A bit].

This specification, instead of work a bit like we said at the beginning of the project, I have worked it enough. This is because of that during the project, I have seen the importance of the databases in Microsoft SharePoint. For instance, we find a process demanded by the customer, this process has been specified on the project Grant diagram. This project consists on migrate all the new content of the current website to the new website. To do this we have needed take all the content from the databases, documents, images, list elements... and copy them in the new website. This process will detect automatic all these elements.

11.2.5 Skill CES 1.7
Control of quality and design tests in the software production. [Enough]

We use the SCRUM methodology, the iterations and the feedbacks in each one of them by the customer, imply that there are certain checks of the product to secure the good functioning of the product and their quality.

11.2.6 Skill CES 1.8
Develop, maintain and evaluate control systems and of real time. [Deeply]

Exists two tools to maintain a certain control of the website when it be functioning, in test phase or in the content design period. This tools allow us to know all the events in any page of the website. One of this tools is the event viewer of the server where is hosted the website and the other one
are the SharePoint logs. In a software that must be operative always, will be necessary a **deep control** to prevent that the users are affected by some bug.

**11.2.7 Skill CES 2.1**
Define, manage the requirements of a software system [A bit]

All software’s dispose of a certain requirements for their functioning, it’s true that certain requirements are more important than others. As this website is a software, it will be necessary specify the necessary requirements to work correctly. **Hardware requirements**, for example the server features where the website will be hosted to work correctly. **Software requirements**, for example if the website is available in mobile devices or which versions of internet explorer that will be available the website and which no.
12 Check the planning and the budget

12.1 Deviation
The initial planning of the project has suffered a bit deviation but we cannot consider it critic.

The cause of this, is the iteration “Improvements and bugs correction”, this period has extended more than we estimated in the beginning of the project. This has been caused by the next points:

- More bug than we expected initially. The customer has found errors during the pages design and using the webparts.
- New changes that the customer added. These changes affected on the initial development.
- New pages of the website that the customer requested improve.
- New processes that the customer requested to design the website pages more quickly and more comfortably.

We have not considered the magnitude of this deviation critic because nowadays the iteration “Website development” disposes a stable version in a lot of pages so we can see their correct functioning. This iteration contains the biggest part of the project.

Besides, the iteration that has suffered the deviation could be catalogued like a maintenance of the website. This iteration will remain open to give support to the customer in case to need some improvement or change in the time to life of the website.

12.2 Changes on the planning of the website
The data to introduce the project have not suffered no changes in relation of initial planning in spite of the deviation. The website will be introduced in front of a court in the July 2015 turn.

The modification in the temporal planning is caused by the changes in the iterations, “Improvements and correction of bugs”, “Documentation” and “Prepare the defense”. This changes have been caused by the extension of the iteration, “Improvements and correction of bugs”.

In the initial planning, we specified that the project will end two months before to their deliberation so we have a big margin of maneuver although as I said, part of the changes requested by the customer are to enrich the website.

So the dedication of hours in the iterations of the project that have suffered a modification in their planning, is the next:
We have reduced the iteration “Prepare the defense” to devote these hours to the other two iterations that have suffered the deviation. We were able to do this because for each iteration, we have assigned extra hours. We have assigned these extra hours to transfer them to other iteration if was necessary or to devote in the same iteration by possible problems on it.

We must highlight again, the two iteration that have suffered this considerate increment of dedicated hours, it is cause of the new requests of the customer. These requests were not specified at the beginning of the project.

### 12.3 Changes of budget

Because of the changes of the planning, we have updated the project costs. As we will able to see then, the affected parts are highlight in red.

#### 12.3.1 Roles

<table>
<thead>
<tr>
<th>Roles</th>
<th>Project manager</th>
<th>Analyst</th>
<th>Developer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost hour(€)</td>
<td>40</td>
<td>32</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 27: Cost of the roles involved in the project

#### 12.3.2 Project iterations

<table>
<thead>
<tr>
<th>Project phases</th>
<th>Dedication(hours)</th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project manager</td>
<td>Analyst</td>
</tr>
<tr>
<td><strong>Start</strong></td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Development iterations</td>
<td>288</td>
<td>0</td>
</tr>
<tr>
<td>Migration of the website</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Improvements and solve bugs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Process to change the page designs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Documentation</td>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>Prepare the defense</td>
<td>0</td>
<td>112</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>328</td>
<td>384</td>
</tr>
</tbody>
</table>

Table 28: Data of the project iterations with the deviation
In the phase of bugs and improvements is not possible specify his exact cost because the estimate hours referenced the interval of time that we will dedicate to resolve bugs or to do improvements demanded by the customer.

The bugs are included in the cost of the project while the improvements, each one will have an independent cost. So until the customer demands the improvements, we won’t able to estimate their cost. So, we will estimate that the total cost of this phase, $\frac{3}{4}$ will be dedicated to resolve bugs and the rest to do improvements.

In the documentation phase and the preparation of the defense phase is the same case, we won’t do this in a workday, so we won’t dedicate eight hours per day. The time that we will spend on the first one will be $\frac{1}{2}$ of the specified time and on the second one will be $\frac{1}{4}$.

12.3.3 Indirect costs

<table>
<thead>
<tr>
<th>Concept</th>
<th>Use(%)</th>
<th>Cost(€)</th>
<th>Estimate Cost(€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet connection</td>
<td>20</td>
<td>60</td>
<td>12</td>
</tr>
<tr>
<td>Infrastructure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Server</td>
<td>10</td>
<td>3000</td>
<td>300</td>
</tr>
<tr>
<td>-Laptop</td>
<td>25</td>
<td>650</td>
<td>1625</td>
</tr>
<tr>
<td>Software</td>
<td>10</td>
<td>3000</td>
<td>300</td>
</tr>
<tr>
<td>Transport</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Work office</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Project presentation</td>
<td>100%</td>
<td>0,05</td>
<td>32</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>806,5</strong></td>
</tr>
</tbody>
</table>

Table 29: Indirect costs of the project

12.3.4 Contingency

<table>
<thead>
<tr>
<th>Concept</th>
<th>Percentage</th>
<th>Concept cost (€)</th>
<th>Contingency cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct costs</td>
<td>5</td>
<td>49.666</td>
<td>2.483,3</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>5</td>
<td>806.5</td>
<td>40,4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>2.524</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 30: Contingency of the project with the deviation

12.3.5 Possible problems

<table>
<thead>
<tr>
<th>Risk</th>
<th>Risk(%)</th>
<th>Role</th>
<th>Dedicated Hours</th>
<th>Concept cost (€)</th>
<th>Risk cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliver date</td>
<td>25</td>
<td>Developer</td>
<td>40</td>
<td>25</td>
<td>1.000</td>
</tr>
<tr>
<td>Infrastructure problems</td>
<td>5</td>
<td>Project manager</td>
<td>2</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1.080</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 31: Cost of the unexpected events of the project
### 12.3.6 Total

<table>
<thead>
<tr>
<th>Concept</th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct costs</td>
<td>49,666</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>806,5</td>
</tr>
<tr>
<td>Contingency</td>
<td>2,524</td>
</tr>
<tr>
<td>Risks</td>
<td>1,080</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>46,541.5</strong></td>
</tr>
</tbody>
</table>

*Table 32: Total cost of the project with the deviation*
### Table 3.3: Gantt diagram with the deviation

<table>
<thead>
<tr>
<th>Task name</th>
<th>Duration</th>
<th>Start</th>
<th>End</th>
<th>Dependence</th>
<th>Risk</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>5 days</td>
<td>Mon 01/08/14</td>
<td>Fri 08/08/14</td>
<td>Low</td>
<td></td>
<td>Project manager, Developer</td>
</tr>
<tr>
<td>Development of the website</td>
<td>91 days</td>
<td>Mon 08/08/14</td>
<td>Wed 14/01/15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MasterPage</td>
<td>5 days</td>
<td>Mon 08/08/14</td>
<td>Fri 12/08/14</td>
<td>Low</td>
<td></td>
<td>Project manager</td>
</tr>
<tr>
<td>FC Template</td>
<td>24 days</td>
<td>Mon 08/08/14</td>
<td>Thu 09/08/14</td>
<td>Medium</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>SEO Template</td>
<td>11 days</td>
<td>Mon 12/08/14</td>
<td>Mon 27/02/15</td>
<td>High</td>
<td></td>
<td>Project manager</td>
</tr>
<tr>
<td>Home &quot;itineo&quot;</td>
<td>10 days</td>
<td>Fri 10/10/14</td>
<td>Thu 28/02/14</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Calendar</td>
<td>14 days</td>
<td>Fri 24/10/14</td>
<td>Wed 12/11/14</td>
<td>Medium</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>SJ Tertulía</td>
<td>4 days</td>
<td>Thu 13/11/14</td>
<td>Tue 18/11/14</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>STI Template</td>
<td>4 days</td>
<td>Wed 19/11/14</td>
<td>Mon 24/11/14</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Protac Template</td>
<td>6 days</td>
<td>Tue 25/11/14</td>
<td>Tue 02/12/14</td>
<td>Medium</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Home Convention Bureau</td>
<td>4 days</td>
<td>Wed 01/12/14</td>
<td>Mon 08/12/14</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Home Ilum Comision</td>
<td>1 day</td>
<td>Tue 09/12/14</td>
<td>Tue 09/12/14</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Home Press</td>
<td>3 days</td>
<td>Wed 10/12/14</td>
<td>Fri 11/12/14</td>
<td>Medium</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Home &quot;yate&quot;</td>
<td>1 day</td>
<td>Mon 12/12/14</td>
<td>Mon 13/12/14</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Home Investigation</td>
<td>4 days</td>
<td>Tue 16/12/14</td>
<td>Fri 18/12/14</td>
<td>Medium</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Home corporate</td>
<td>7 days</td>
<td>Mon 21/12/14</td>
<td>Thu 30/12/14</td>
<td>High</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Contact</td>
<td>4 days</td>
<td>Wed 31/12/14</td>
<td>Mon 05/01/15</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Map page</td>
<td>7 days</td>
<td>Tue 06/01/15</td>
<td>Wed 14/01/15</td>
<td>Medium</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Migrate to the production server</td>
<td>10 days</td>
<td>Thu 16/01/15</td>
<td>Wed 02/02/15</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Install Microsoft SharePoint with the language packages on the new server</td>
<td>1 day</td>
<td>Thu 15/01/15</td>
<td>Thu 15/01/15</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Content migration process of the current worklists to the new one</td>
<td>8 days</td>
<td>Fri 01/02/15</td>
<td>Tue 27/01/15</td>
<td>High</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Upload and install the project solution</td>
<td>1 day</td>
<td>Wed 28/01/15</td>
<td>Wed 28/01/15</td>
<td>Low</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Improvements and solve bug</td>
<td>10 days</td>
<td>Thu 29/01/15</td>
<td>Sat 20/02/15</td>
<td>High</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Process to change page design automatically</td>
<td>6 days</td>
<td>Thu 29/01/15</td>
<td>Thu 05/02/15</td>
<td>High</td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Documentation</td>
<td>75 days</td>
<td>Mon 01/02/15</td>
<td>Fri 29/02/15</td>
<td>Medium</td>
<td></td>
<td>Analyst</td>
</tr>
<tr>
<td>Prepare the defense</td>
<td>14 days</td>
<td>Mon 01/02/15</td>
<td>Thu 18/02/15</td>
<td>Low</td>
<td></td>
<td>Analyst</td>
</tr>
<tr>
<td>Task name</td>
<td>Duration</td>
<td>Start</td>
<td>End</td>
<td>Dependence</td>
<td>Risk</td>
<td>Role</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>----------</td>
<td>--------------------</td>
<td>--------------------</td>
<td>------------</td>
<td>------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Start</td>
<td>5 days</td>
<td>Mon 01/09/14</td>
<td>Fri 05/09/14</td>
<td></td>
<td></td>
<td>Project manager, Developer</td>
</tr>
<tr>
<td>Development of the website</td>
<td>93 days</td>
<td>Mon 08/09/14</td>
<td>Wed 14/01/15</td>
<td>24</td>
<td></td>
<td>Project manager</td>
</tr>
<tr>
<td>Master Page</td>
<td>5 days</td>
<td>Mon 08/09/14</td>
<td>Fri 12/09/14</td>
<td></td>
<td></td>
<td>Project manager</td>
</tr>
<tr>
<td>FC Template</td>
<td>24 days</td>
<td>Mon 08/09/14</td>
<td>Thu 09/10/14</td>
<td></td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>SB0 Template</td>
<td>31 days</td>
<td>Mon 15/09/14</td>
<td>Mon 27/10/14</td>
<td>2</td>
<td>High</td>
<td>Project manager</td>
</tr>
<tr>
<td>Home Turismo</td>
<td>10 days</td>
<td>Fri 10/10/14</td>
<td>Thu 23/10/14</td>
<td>4</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Calendar</td>
<td>14 days</td>
<td>Fri 24/10/14</td>
<td>Wed 12/11/14</td>
<td>5</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>ST1 Template</td>
<td>4 days</td>
<td>Thu 13/11/14</td>
<td>Tue 18/11/14</td>
<td>6</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Product Template</td>
<td>4 days</td>
<td>Wed 19/11/14</td>
<td>Mon 24/11/14</td>
<td>7</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Convention Bureau</td>
<td>6 days</td>
<td>Tue 25/11/14</td>
<td>Tue 02/12/14</td>
<td>8</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Film Commission</td>
<td>1 day</td>
<td>Tue 09/12/14</td>
<td>Tue 09/12/14</td>
<td>10</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Press</td>
<td>3 days</td>
<td>Wed 10/12/14</td>
<td>Fri 12/12/14</td>
<td>11</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Trade</td>
<td>1 day</td>
<td>Mon 15/12/14</td>
<td>Mon 15/12/14</td>
<td>12</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Investigation</td>
<td>4 days</td>
<td>Tue 16/12/14</td>
<td>Fri 19/12/14</td>
<td>13</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Home Corporate</td>
<td>7 days</td>
<td>Mon 22/12/14</td>
<td>Tue 30/12/14</td>
<td>14</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Contact</td>
<td>4 days</td>
<td>Wed 31/12/14</td>
<td>Mon 05/01/15</td>
<td>15</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Move page</td>
<td>7 days</td>
<td>Tue 06/01/15</td>
<td>Wed 14/01/15</td>
<td>16</td>
<td>Medium</td>
<td>Developer</td>
</tr>
<tr>
<td>Migration to the production server</td>
<td>10 days</td>
<td>Thu 15/01/15</td>
<td>Wed 28/01/15</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install Microsoft Sharepoint with the language packages on the new server</td>
<td>1 day</td>
<td>Thu 15/01/15</td>
<td>Thu 15/01/15</td>
<td></td>
<td></td>
<td>Developer</td>
</tr>
<tr>
<td>Content migration process of the current website to the new one</td>
<td>8 days</td>
<td>Fri 16/01/15</td>
<td>Tue 27/01/15</td>
<td>20</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Upload and install the project solution</td>
<td>1 day</td>
<td>Wed 28/01/15</td>
<td>Wed 28/01/15</td>
<td>19</td>
<td>Low</td>
<td>Developer</td>
</tr>
<tr>
<td>Improvements and solve bugs</td>
<td>103 days</td>
<td>Thu 29/01/15</td>
<td>Sat 20/06/15</td>
<td>18</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Process to change page design automatically</td>
<td>6 days</td>
<td>Thu 29/01/15</td>
<td>Thu 05/02/15</td>
<td>18</td>
<td>High</td>
<td>Developer</td>
</tr>
<tr>
<td>Documentation</td>
<td>75 days</td>
<td>Mon 16/02/15</td>
<td>Fri 29/05/15</td>
<td></td>
<td>Medium</td>
<td>Analyst</td>
</tr>
<tr>
<td>Prepare the defense</td>
<td>14 days</td>
<td>Mon 01/06/15</td>
<td>Thu 18/06/15</td>
<td>23</td>
<td>Low</td>
<td>Analyst</td>
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Table 34: Detail of the project tasks with the deviation
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