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Auzonet: Diseño e implementación de una
red social para comunidades de vecinos

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Abstract

The lifestyle of today's society moves away the contact between neighbors which has always existed in all communities in which it promotes the exchange of goods, favors and often vital information for all the inhabitants of the community. In addition, the growth of cities makes that meeting the needs and concerns of the inhabitants ever be a more difficult for municipalities task.

Auzonet as digital platform focused on the residents, provides the perfect setting to neighbors having a web platform to exchange all this information and the organizations as data source.

Keywords

OpenData, Web, App, Social network.

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1. INTRODUCTION

The aim of this project is to create an online social platform that benefits different parties, on the one hand, the residents themselves having a common point of meeting in the community through internet where they can post notices or information corresponding permanently to the community in a virtual cork, simile of physics that normally exists in doorways, and to publish requests or offers of items or services allowing interaction of stakeholders across the platform.

On the other hand, the information generated by the use of the platform can be a source of high-quality data for services of the municipalities, so that, analyzing these decisions can be made based on the real needs predominate more in each neighborhood.

This project must be developed on the basis of European project **[WeLive]** which **[DeustoTech]** **[Morelab]** belongs to, using the libraries and programming interfaces that makes available. WeLive is a web platform for the promotion of OpenData created by several European entities that provides a range of services for developers and public entities for the purpose of data dissemination and exploitation of them in third-party applications at no cost.

The main challenges will tackle this project are:

- Creating a social web portal with the required functions.
- The exploitation of public datasets that add value to the application.
- The creation of new datasets depending on the spindle.
- Creating a mobile application able to interact with fellow on the web through an interface.

In addition, during development they may be needed to develop new software components that allow customized integration with WeLive and can be reused in future projects by making them publicly available in the application repository of WeLive.

This project will need technical ability and interpersonal skills to achieve good collaboration between teams WeLive and create Auzonet to achieve the best possible solution.

To carry out major development of the application, it will use a web framework that allows implement most of the functions of the web application with maximum code reuse and greater efficiency, as when developed mobile application, is going to be necessary a framework that allows the development at the same time for all operating systems currently on the market.

The previously mentioned tools add the challenge of conducting an investigation about the mobile web development frameworks and learning the model of communication that requires WeLive to interact with public data .

All phases of development will demonstrate exhaustively the knowledge acquired during the university degree and also require new learning, both technical and theoretical knowledge.

This document describes the project and make an approach to the most similar solutions exist today and will discuss the importance of Open Data and what it brings to society, the WeLive

1. INTRODUCTION

project will be described and all possibilities that offers.

After, planning and development process will be described.

In the development chapter the internal development process will de explained, reasoning tools finally have been used and the reasons for their choice and the structure of the project and possible functional divisions of software components, design and requirements.

Finally, the conclusions found throughout the entire process of creation and information will be taken about the use in tests scheduled for future projects will be presented.

2. BACKGROUND AND RATIONALE

2.1. BACKGROUND

Creating a social network of neighbors in which all members of each portal or community can interact with each other by sharing resources and information is not a new initiative, in other countries like Germany or United States similar projects [**larazon**] have been developed, internet has extended the creation of communities of all kinds of areas, however, the already existing proposals rarely get benefit of the public entities data, and in many cases, they are the most reliable source of information for building applications and services for citizens.

Although it is true that currently, many public entities make available this data in digital format only by the look of transparency and are unaware of the true value of themselves, is one of the motivation of this project, in fact, have been moments during the development in which the data found poorly formatted and have had to request modifications to the agencies involved.

The fact that most of datasets that are published by public organizations are not used in systems created by third parties, causes certain unconcern in the status and integrity of them.

2.2. RATIONALE

This project aims to unify the capabilities of communication between people that internet provides with the benefits of the Open Data to citizens, something that rarely have been done in similar initiatives.

3. GOALS AND SCOPE

3.1. PROJECT DEFINITION

Auzonet must meet the expectations of at least two types of users:

Citizen: It is the primary user of the system and the beneficiary of the features offered by the platform and the source of the information that the system creates for later exploitation.

Public institution: It who analyze the data generated by the platform for statistics and promoting services that improve the quality of life in cities and people.

To achieve this it will develop:

- A web application where users can register their neighborhood based on existing data published by the council of Bilbao, the rest of neighbors interested can join to it and get benefit from its functions.
- A mobile application that lets you interact with the main functions of the web from a smart-phone.

3.1.1 Functionality

Users can search their portal trough an interactive form based on the existing neighbors and streets of the city of Bilbao, for better confirmation of the place, a small map showing the exact situation of the door will be displayed, if the information is correct, a few setting should be configure like the privacy level of the community having the option to protect it with a password or add a few lines of welcome message to new members via mail.

Each user can belong to more than one community of neighbors, considering that may want to be aware of the community of their usual residence and for example the holidays.

Each neighborhood community represented in the application has its own home page where you can see the cork with warnings or information notes published and a lower table divided into two sections called Requests and Offers where will be displayed the posts created by members of that community.

From the home page of each community, the user can create a request for a product or service or to publish an offer in which can specify whether you want to get paid or offer the service for free.

To ensure some confidence when working with another user, a karma level system represented by a numeric value that is higher or lower by other users past reviews determine the trust level of each user.

3. GOALS AND SCOPE

3.1.2 Limitations

Auzonet never going to manage payments among individuals, beyond the simple fact of a history of interactions between requests and offers between neighbors. Interested parties should agree on a transaction which methods used to pay if they require and have the complete responsibility for ensuring the successful transaction in a legal economic frame.

Will be the users themselves who in case to use the platform will have to register their portal in the section for creating communities to make use of the software functions.

There are no plans to develop applications with the native development kit of each mobile operating system for avoiding multiple processes of simultaneous development during the creation of the mobile application, web technologies to deploy the application available on the market will be used.

3.2. DESCRIPTION OF THE EMBODIMENT

3.2.1 Development methodology

The realization of Auzonet is separated in two main functional units, first will focus on finalizing the web application and then mobile app.

As can be seen in the figure 3.1 the development phases are going to be the following:

Requirements: Analysis of the main functional requirements.

Design: Design data and logical structures needed for running the application and approach to the aesthetic design of the solution.

Web application development: Implementation process of the main application, with Welive project integration and "responsive" design for fitting on different screen sizes.

Mobile application development: Implementation process of mobile application that get benefits of the "responsive" design of the web application.

Tests: Different executions by end users and bug detection on the feature usage processes for debugging, It will try to involve collaborators and friends of the programmer for making real usage of the platform.

Being a project that involves only one developer will not be used agile methodologies that facilitate cooperation and teamwork, instead, a system of lists of tickets with different classifications will be used in a task manager software.

Tasks are classified as follows:

Table 3.1: Ticket categories.

Category	Description
Functional	Features that represent the core of the application.
Not functional	Features that enrich the user experience.
Bug	Faults to debug.
Improvement	Suggestions or new functionalities that add value to the platform.

Sometimes, certain tasks can come from external sources such as suggestions for improvement or major deficiencies found in a test, in that case, they are added to the list with the corresponding label and prioritized according to their importance.

3.2.2 Intermediate products

- Web application.
- Public data integrated via WeLive platform.
- Mobile application.

3. GOALS AND SCOPE

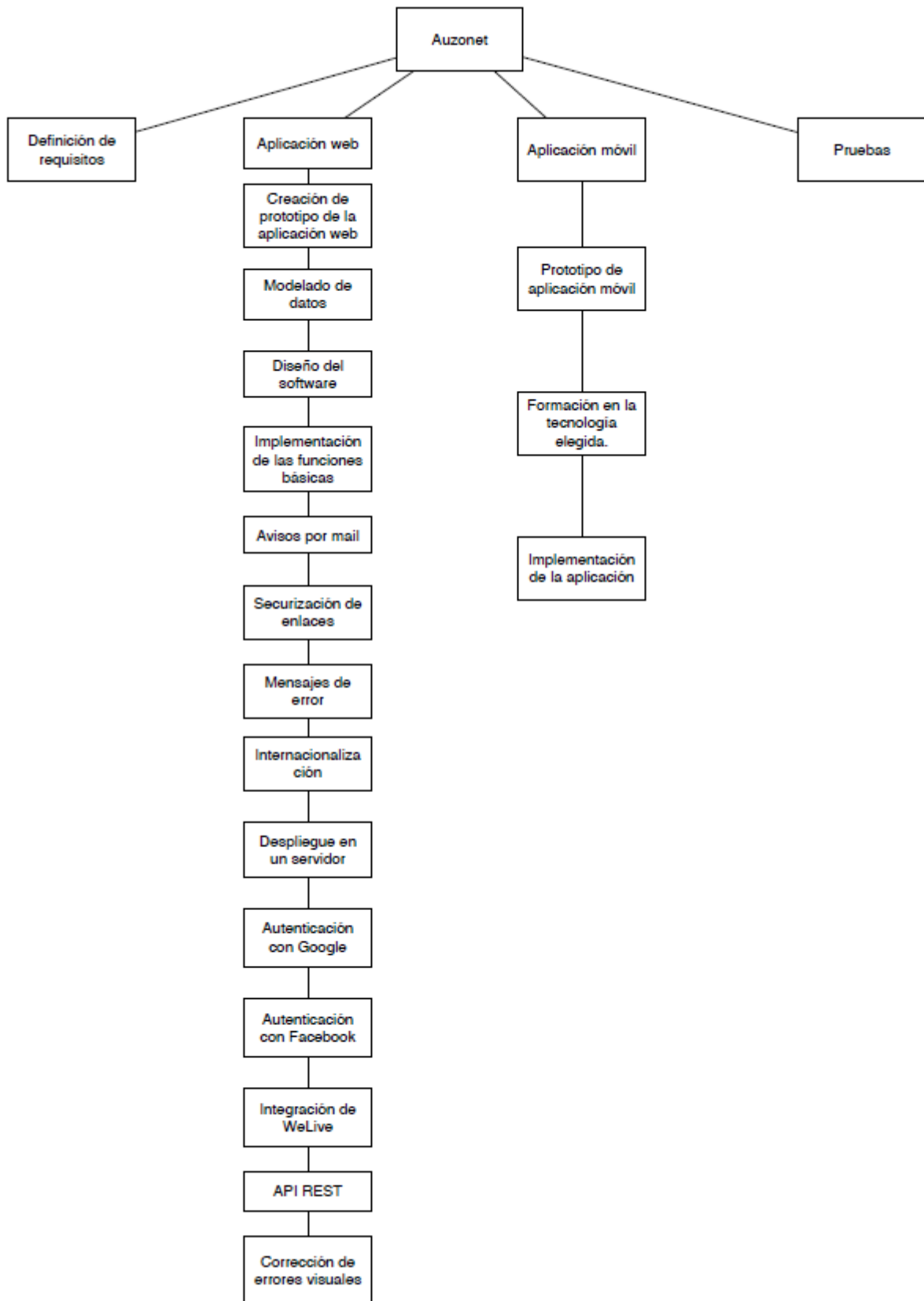


Figure 3.1: EDT

3.2.3 Main tasks

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 1 Descripción: Definición de requisitos	Duración: 5 días.
	Esfuerzo: 15 horas.
	Tareas previas:
Criterios de terminación: Concretar un documento formal donde se incluyan las características que va a cumplir el software y de qué forma van a estar implementadas. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Programador _____ _____ _____ _____
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo de aplicaciones web y móviles y almacenamiento en la nube.	

Figure 3.2: Task 1

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.1 Descripción: Creación de un prototipo de la aplicación web navegable y que muestre todas las secciones que va a disponer una vez acabada.	Duración: 5 días.
	Esfuerzo: 15 horas.
	Tareas previas: 1
Criterios de terminación: Disponer de un prototipo creado con alguna herramienta de prototipado rápido que permita hacerse una idea de la apariencia final de la aplicación. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador Software de prototipado
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo de aplicaciones web y móviles y almacenamiento en la nube.	

Figure 3.3: Task 2.1.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.2 Descripción: Modelado de datos en un esquema relacional.	Duración: 3 días.
	Esfuerzo: 9 horas.
	Tareas previas: 1
Criterios de terminación: Confeccionar un esquema de base de datos relacional donde se especifiquen todas las entidades que se van a emplear en el software. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de bases de datos relacionales.	

Figure 3.4: Task 2.2.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.3 Descripción: Diseño del software.	Duración: 5 días.
	Esfuerzo: 15 horas.
	Tareas previas: 3 4
Criterios de terminación: Confeccionar esquemas UML de la interacción de las clases de código en la aplicación. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de UML.	

Figure 3.5: Task 2.3.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.4 Descripción: Implementación de las funciones básicas del portal. <ul style="list-style-type: none"> - Publicar peticiones. - Publicar necesidades. - Establecer acuerdos de colaboración entre usuarios. - Creación de página de perfil de usuario. 	Duración: 15 días.
	Esfuerzo: 45 horas.
	Tareas previas: 5
Criterios de terminación: Disponer de una aplicación web ejecutada en un servidor de desarrollo con las funciones previamente descritas. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web.	

Figure 3.6: Task 2.4.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.5 Descripción: Creación de un sistema de usuarios capaz de generar perfiles personales y datos asociados a cada cuenta.	Duración: 6 días.
	Esfuerzo: 18 horas.
	Tareas previas: 5 6
Criterios de terminación: Acceso a las funciones del portal bajo usuario y contraseña garantizando seguridad en las acciones. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web.	

Figure 3.7: Task 2.5.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.6 Descripción: Implementación de notificaciones por email de las acciones en la web relativas a cada usuario.	Duración: 3 días.
	Esfuerzo: 9 horas.
	Tareas previas: 7
Criterios de terminación: Que la aplicación sea capaz de enviar emails debidamente formateados a los usuarios informando de la actividad en sus publicaciones. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web.	

Figure 3.8: Task 2.6.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.7 Descripción: Securización de enlaces, de forma que un usuario ajeno a un acuerdo, no pueda interferir él ni realizar modificaciones alterando los enlaces del navegador.	Duración: 1 día.
	Esfuerzo: 3 horas.
	Tareas previas: 6
Criterios de terminación: Haber establecido una comprobación en todas las acciones del portal acerca del usuario que está registrado en cada momento. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web.	

Figure 3.9: Task 2.7.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.8 Descripción: Mensajes de error en las situaciones de excepción de forma que el usuario sepa en todo momento el comportamiento de la aplicación.	Duración: 1 día.
	Esfuerzo: 3 horas.
	Tareas previas: 6
Criterios de terminación: Controlar todos los casos en los que un usuario puede producir una situación de error en el sistema y mostrar un mensaje acorde. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web.	

Figure 3.10: Task 2.8.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.9 Descripción: Internacionalización, localizar todas las cadenas de texto en español y en inglés habilitando un portal multilingüe.	Duración: 2 días.
	Esfuerzo: 6 horas.
	Tareas previas: 10 8 6
Criterios de terminación: Disponer de un control para cambiar el idioma de la aplicación y poder leer la interfaz en al menos dos idiomas. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web.	

Figure 3.11: Task 2.9.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.10 Descripción: Despliegue en el servidor en la nube accesible a internet.	Duración: 4 días.
	Esfuerzo: 12 horas.
	Tareas previas: 6 8 11
Criterios de terminación: Disponer de una dirección web accesible en internet donde esté alojada la aplicación de forma definitiva. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web y herramientas en la nube.	

Figure 3.12: Task 2.10.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.12 Descripción: Autenticación con Google.	Duración: 2 días.
	Esfuerzo: 6 horas.
	Tareas previas: 6
Criterios de terminación: Habilitar la opción de registrarse nuevos usuarios con una cuenta de Google existente. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web y APIs de seguridad.	

Figure 3.13: Task 2.12.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.13 Descripción: Autenticación con Facebook.	Duración: 2 días.
	Esfuerzo: 6 horas.
	Tareas previas: 6
Criterios de terminación: Habilitar la opción de registrarse nuevos usuarios con una cuenta de Facebook existente. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web y APIs de seguridad.	

Figure 3.14: Task 2.13.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.14 Descripción: Integración con la plataforma WeLive para ganar acceso a la información de portales de Bilbao.	Duración: 2 días.
	Esfuerzo: 6 horas.
	Tareas previas: 6
Criterios de terminación: Poder disponer de un selector de las comunidades existentes en Bilbao de vecinos en la hoja de registro de la comunidad. Validado por: Diego López-De-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web y API de WeLive.	

Figure 3.15: Task 2.14.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.15 Descripción: Creación de una API para la comunicación con una aplicación móvil.	Duración: 4 días.
	Esfuerzo: 12 horas.
	Tareas previas: 6 12
Criterios de terminación: Disponer de una serie de direcciones desde donde un usuario móvil pueda interactuar con la plataforma. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web y REST.	

Figure 3.16: Task 2.15.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 2.16 Descripción: Corrección de errores visuales en pantallas de alta densidad.	Duración: 1 día.
	Esfuerzo: 3 horas.
	Tareas previas: 12
Criterios de terminación: Disponer de una correcta disposición de los elementos de la interfaz incluso en pantallas de alta densidad de píxeles. Validado por: Aitor Brazaola (Analista) Responsable: Diseñador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo web.	

Figure 3.17: Task 2.16.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 3.1 Descripción: Prototipo de la aplicación móvil.	Duración: 1 día.
	Esfuerzo: 3 horas.
	Tareas previas: 1
Criterios de terminación: Disponer de un prototipo rápido de funcionamiento de una aplicación móvil para manejar las funciones principales del portal. Validado por: Diego López-de-Ipiña (Jefe de proyecto) Responsable: Programador	Recursos: (4) Ordenador portátil Programador Software de prototipado
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo móvil.	

Figure 3.18: Task 3.1.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 3.2 Descripción: Formación en la tecnología elegida para el desarrollo de la versión móvil.	Duración: 4 días.
	Esfuerzo: 12 horas.
	Tareas previas: 21
Criterios de terminación: Realización completa de un tutorial corto de introducción a la herramienta. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Programador
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo móvil.	

Figure 3.19: Task 3.2.

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario Fecha: (2) 11/01/2016	
Identificación de Tarea: 3.3 Descripción: Implementación de la aplicación móvil.	Duración: 15 días.
	Esfuerzo: 45 horas.
	Tareas previas: 22
Criterios de terminación: Aplicación instalada en un dispositivo de pruebas con las funciones requeridas funcionando. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Programador Smartphone de pruebas
Competencias, conocimientos y notas: (3) Conocimientos de desarrollo móvil.	

Figure 3.20: Task 3.3.

3. GOALS AND SCOPE

HOJA DE TAREAS	
Nombre: (1) Aitor Brazaola Vicario	
Fecha: (2) 11/01/2016	
Identificación de Tarea: 4	Duración: 4 días.
Descripción: Pruebas de la aplicación móvil y la aplicación web.	Esfuerzo: 12 horas.
	Tareas previas:
	2 20 17
Criterios de terminación: Ofrecer usar las aplicaciones a al menos tres personas ajenas al desarrollo. Validado por: Aitor Brazaola (Analista) Responsable: Programador	Recursos: (4) Ordenador portátil Smartphone de pruebas
Competencias, conocimientos y notas: (3) Experiencia durante el desarrollo del producto para identificar los posibles fallos que aparezcan.	

Figure 3.21: Task 4.

3.3. ORGANIZATION

3.3.1 Organizational structure

The organization as can be seen in the figure 3.22, is composed by the Project manager, and the student who perform the roles of programmer and designer.

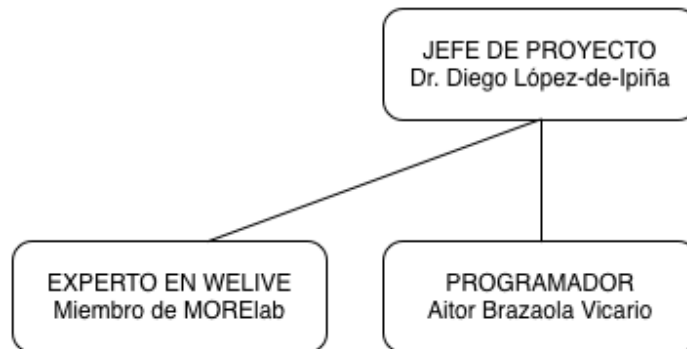
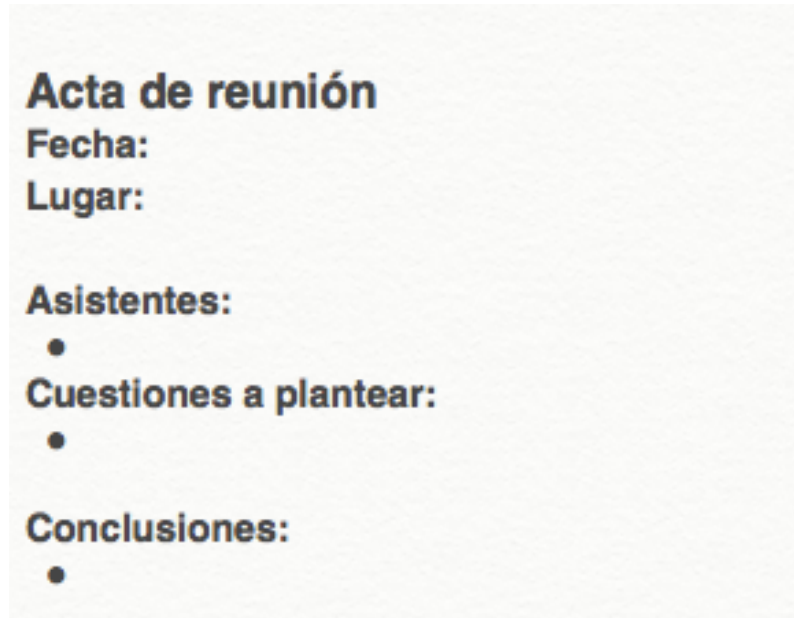


Figure 3.22: Organizational schema

Every two weeks there will be a session for reviewing the work done and the necessary changes will be assessed and if the product is already to consider as a functional unit.

3. GOALS AND SCOPE

The main assistants will be the programmer and the project manager, the details exposed will be gathered in the meeting act, the template used for this proposal can be seen in the figure 3.23, and will be prioritized over the rest of the features in the pipeline, avoiding develop in an incorrect way.



The image shows a template for a meeting act (Acta de reunión) on a light gray background. The text is in a bold, sans-serif font. The fields are as follows:

- Acta de reunión**
- Fecha:**
- Lugar:**
- Asistentes:**
 -
- Cuestiones a plantear:**
 -
- Conclusiones:**
 -

Figure 3.23: Template meeting act

3.3.2 Human resources plan

The student will be the unique physical person in the development team but will be necessary the acquisition of various roles along the project, it is true that un punctual cases can be helped by other mates of the laboratory where is working on, but the most of the project is developed by him. Following, there are listed the main roles played by the student:

Programmer: It is responsible for creating all the logic of the program and perform the different configurations in the devices responsible for the platform work. Its functions also cover the early stages of software design, data schema creation and conduct appropriate tests to detect errors.

Designer: It is commissioned to design a user interface that fits all available screens and make the application accessible to people with disabilities and ensure a satisfactory user experience and consistent navigation between different sections of the web.

In addition to the student, the project has its project manager who is responsible for approving all changes and proposals that the student considers interesting to improve the product, will be present at the meetings and will be responsible for marking the milestone dates.

4. PLANNING

4.1. PRECEDENCE DIAGRAM

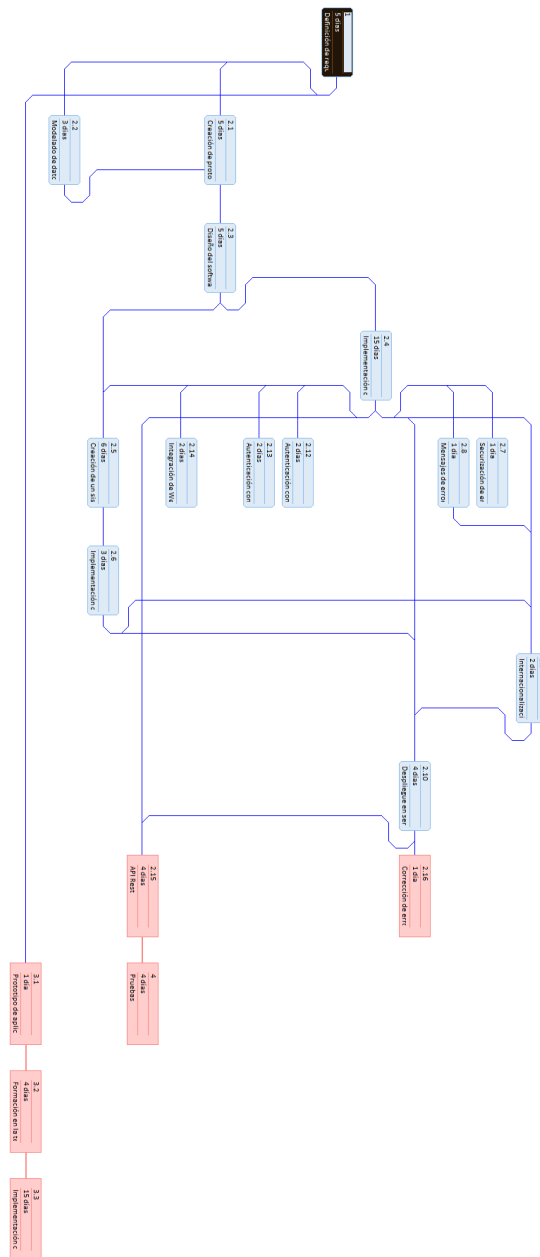


Figure 4.1: Precedence diagram

The project development is going to happen during the working time in DeustoTech MORElab of 4 daily hours, and the team will be formed by the following actors:

Programmer: Person in charge of programming the control structures of the platform.

Designer: Person in charge of the final appearance with the end user will interact.

Project manager: Person in charge of monitoring the progress of the project and its organization.

Experto en plataforma WeLive: MoreLab team member participating in the development of technical advice WeLive platform for the team.

4. PLANNING

4.2. GANTT DIAGRAM

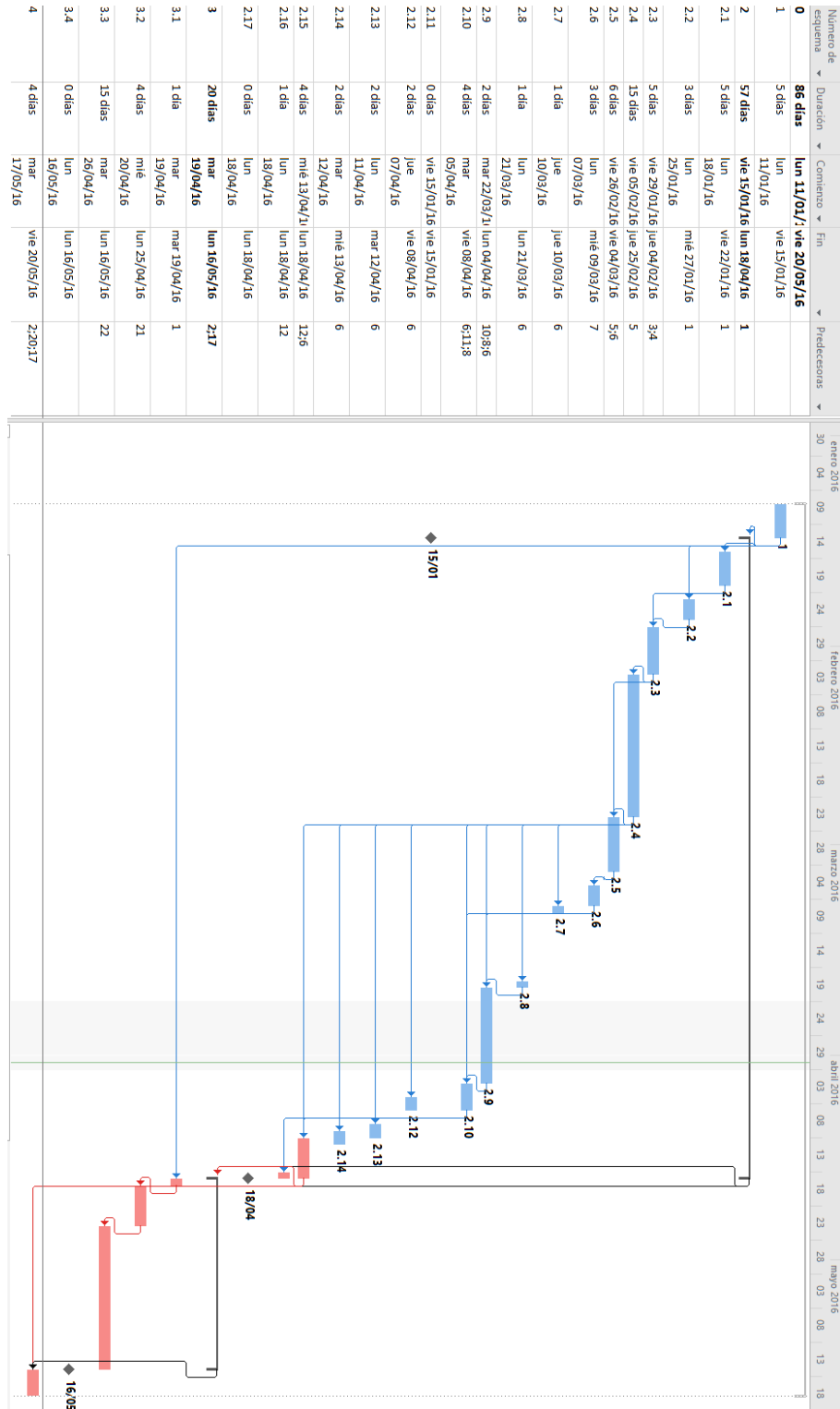


Figure 4.2: GANTT diagram

4.3. WORKLOAD ESTIMATION BY PROFILE

The following estimation is based on the different profiles of the total 255 hours:

Programmer: 215 hours.

Designer: 22 hours.

Project manager: 15 hours.

WeLive platform expert: 3 hours.

- 1. Requirements definition: 15 hours.
- 2. Web application: 168 hours.
 - 2.1. Web application prototype: 15 hours.
 - 2.2. Data modeling: 9 hours.
 - 2.3. Software design: 15 hours.
 - 2.4. Implementation of the core features: 51 hours.
 - 2.5. Users system creation: 18 hours.
 - 2.6. Implementation of mail notifications: 15 hours.
 - 2.7. Link security checks: 3 hours.
 - 2.8. Friendly error messages: 3 hours.
 - 2.9. Internationalization: 6 hours.
 - 2.10. Server deployment: 12 hours.
 - 2.13. Visual customization and logo: 6 hours.
 - 2.14. WeLive API integration: 12 hours.
 - 2.16. High density displays visual fixes: 3 hours.
- 3. Mobile application: 60 hours.
 - 3.1. Mobile application prototype: 3 hours.
 - 3.2. Learning the selected technology for development: 12 hours.
 - 3.3. Mobile app implementation: 45 hours.
- 4. Tests: 12 hours.

5. BUDGET

The budget will take into account only the hours of work because the necessary equipments are already owned by the programmer and DeustoTech facilities where the project is located.

Table 5.1: Budget by profile.

Profile	<i>Workload</i>	<i>Cost</i>	<i>Price</i>
Programmer	255 h.	9€/h.	2295€
Designer	22 h.	9€/h.	198€
Project manager	12 h.	50€/h.	600€
WeLive platform expert	3 h.	6€/h.	18€
TOTAL			3.111€

6. DEVELOPMENT

The main section of the development is going to be for the web application, the part of the project with more effort, and technologies involved in development, then, the mobile application as a derivative product from the web app will be explained in detail reasoning the technologies used with their advantages and drawbacks.

Both products has been submitted to testing with collaborators and the process of the tests will be detailed, finally a user manual will be included for helping to use all functionality implemented by the platform.

6.1. WEB APPLICATION

6.1.1 Software and Hardware requeriments

The application must have a good user interface, allowing users from all ages for using it with less effort, furthermore, the application must make a good usage of the public data of the Bilbao's council provide using WeLive platform.

Software requirements

- All communities existing on Bilbao must be available for register in the platform.
- The communities must have a common place to exchange information among members.
- The users information must be protected with security measurements for avoiding data stealing or spam.
- Users can post or attend offers among them.
- Users can post or attend requests among them.
- Users can set an access password to communities for avoid external viewers.
- Users can belong to more than once community.
- There have to exist a way for measure the trustfulness of each user in the community, a reputation system.
- There have to exist a mail notification system in real time for the activity in each community.
- The look and feel of the platform should fit to different sizes of screen.

Hardware requirements

- The application must run on MORElab servers.

6. DEVELOPMENT

- The performance of the application must be smooth and fast on every web browser.
- The platform must have a smartphone application.
- The platform must be able to manage a huge quantity of request concurrently with no fault.
- No new hardware than the already existing on MORElab must be need.

6.1.2 Hardware specification

For fulfilling the previous requirements and taking advantage of the web server technology already available on MORElab, the server where the application is deployed belongs to the laboratory and the same domain of MORElab applications is used. The application is accessible on <http://apps.morelab.deusto.es/auzonet>

The hardware requirements are going to fit the existing hardware shared for other applications developed on MORElab, specifically, in the server called "Olentzero" with the following specifications:

- Intel(R) Xeon(R) CPU E5-2430 @ 2.20GHz
- 16 GB RAM
- 1TB Hard disk

Deploying here the application where already have available a complete software environment of web dependencies save time reusing already existing modules.

6.1.3 Software specification

The web application running on "Olentzero" server must have the following software installed for correct performance:

Ubuntu Server 14.04.4 LTS: Open Source operating system running on "Olentzero" server.

Python 2.7 or newer: Python is a widely used high-level, general-purpose, interpreted, dynamic programming language.

Django framework 1.9: Develop the web application

gunicorn: Python WSGI HTTP server for UNIX to serve the web application

nginx: A free, Open-Source, high-performance HTTP server and reverse proxy for serve the static and media files.

pip: A python package manager for install python packages in the virtual environment.

supervisord: A client/server system to monitor and control processes on UNIX-like operating systems for monitoring the gunicorn instance that serves the web application.

virtualenv: A tool to create isolated python environments for create an isolated environment for developing and deploying purposes, without library conflicts.

virtualenvwrapper: A set of extensions to virtualenv for ease the use of virtualenv through the command line.

MySQL: For storing the data.

Django is a modular web framework extensible via applications, which are basically plugins that add to the core functionality of Django special features, in Auzonet development, has been installed the following ones:

django-bootstrap: For native integration of front-end library Twitter Bootstrap.

django-bower: For manage all the front-end packages and libraries.

django-favicon: For generating and inject the appropriate sizes of favicons in different browsers.

TODO: A schema of how the software layers are on top o the other.

Back-end

Auzonet, has some administration functionality on a separate web in the same server, accessible in the URL <http://apps.morelab.deusto.es/auzonet/admin> with an admin account, there are the management console in which is possible to manage all tables on the database schema.

Some features considered advanced, are only possible to perform here, contacting with the admin of the site. For example:

- Setting new categories for requests and offers.
- Change details of already registered users and communities.
- Remove user accounts.
- Resetting passwords.

In the last chapter are included ways to implement some of the mentioned options in the public user interface, but by the moment, only the features that has been considered essential has been implemented.

User registration process

When a new user is registered in Auzonet, a tiny wizard starts asking him if is searching an already created community or wants to register one for the first time, in case of registering a new one, the form displayed will gather data directly from Bilbao's council public data for showing the neighbors selection drop downs.

A set of subsequent AJAX calls to WeLive REST API are performed for obtaining the data.

TODO: Show the code responsible of getting WeLive Data.

During the registration process, an email is sent to the user for confirming the set up of the new account and another one is sent when the community process creation has finished and the user belongs to it automatically.

After the portal selection process, the user can set a password to the community, that password is stored in the community table of the database and is necessary for allowing others to join into community.

6. DEVELOPMENT

From the user perspective that joins into an existing community, can select the community at the beginning of the process after registering from a drop down showing all registered ones, if the community is private, a password will be prompt, once the join process is finished, will receive an email with a custom welcome message set by the creator of the community.

TODO: Add a chart of the registration flow process.

6.1.4 Deployment considerations

As any other Django developed application, some steps have to be followed for setting a clean installation of Auzonet in a server

TODO: Put a network map

During the development on the student's laptop, the application has been using an SQLite database running on a local server, this type of database is inadequate because the technical limitations of performance, for ensuring a fast and reliably data access a MySQL database.

"Olentzero" as previously mentioned already have installed typical software used by Web Applications, and there is no need to install a new instance of it, only creating an specific schema for Auzonet and configure the settings file for accessing it is required.

6.1.5 Issue management

All changes and requests received during the development process of the project will be managed through the following procedure:

1. Communication via electronic support of the requested modification.
2. Request meeting with the project manager for decide if the change has to be implemented.
3. If so, assess the technical changes required on the platform before deploying.
4. If the changes are technically feasible and fit the budget and schedule, proceed to implementation.
5. Modify the work plan and budget.

6.2. RESPONSIVE DESIGN AND MOBILITY

6.3. TECHNOLOGY

6.3.1 Hardware

6.3.2 Software

The software involved in the development of this project is structured in the following blocks:

- Web application
 - Front-end
 - Back-end

- Mobile application

Web application: Front-end

HTML5

One of the requirements of the project was guarantee the maximum compatibility with the most common web browsers, because of that, for writing the views of the user interface, the last version of the HyperText Markup Language has been selected, HTML5 contain several improvements in the syntax that makes easier to develop and better for indexing in search engines, performance in rendering rich elements like videos and more.

HTML5 also come with more improvements that makes the template code cleaner easier to maintain, and provide certain characteristics that improve the smartphone page viewing, specially in this project, because of the technologies used for deploying in mobile devices, ensuring the best performance on smartphones is priority.

CSS3

For achieving a clear structure in the front end code, taking account the importance of getting an attractive design, the code responsible of all the visuals has separated in different external CSS files, actually, the most part of the CSS classes belongs to Twitter Bootstrap front end framework, but in some parts of the web like the landing page, it was necessary to develop custom classes in custom files.

The decision to select version 3 of CSS is because as with HTML, this project also serve as learning proposal of the latest technologies for developing the future web, although is already know some feature incompatibilities in some browsers, the advantages in number of lines of code saving and new effects has taken more in account.

JavaScript

Being the language most extended on web development, the election of this technology ensure maximum compatibility with almost every device on the market. All the logic placed on client side is programmed with this language, from the AJAX calls, to controlling the user interface animations along the application.

JavaScript makes easy to manage dynamically any element on the pages, and thanks to dynamic panels fired by JavaScript events has been saved a handle of HTML pages on this project.

The following JavaScript libraries has been used for improve the language capabilities:

jQuery To simplify most used web development JavaScript operations.

jQuery UI For adding a toolkit of user interface elements.

jQuery numeric For helping to avoid non-numeric input in some forms.

Chart.js For drawing charts.

Twitter Bootstrap

Twitter Bootstrap is an easy way to provide good user experience through good user interface already built in CSS classes already created by experts in design, moreover, all their CSS classes

6. DEVELOPMENT

are responsive and prepared for represent contents in wide variety of screen sizes using media queries.

Some parts of the application are fully designed by the student, like the landing page or logo, but getting benefit of all the CSS classes designed by professionals in Twitter Bootstrap framework, help to get a more sophisticated and advanced look to the application.

TODO: logo de Twitter Bootstrap

Bower

Today, the amount of libraries involved in a web development is huge, and keep the latest versions of each is a nightmare for programmers, with Bower, the libraries can be managed from repositories, and be installed, updated or removed with one command line.

As similar UNIX tools like apt-get on Linux, Bower unify the package dependence for web developments providing a same file structure for avoiding library reference errors in the HTML pages and keep a detailed log of all the operations related.

TODO: logo de Bower

Web application: Back-end

Unlike the front-end there are high variety of programming languages and frameworks for server side, the most extended is PHP but the learning proposal of the project was learn building a real application a new language and framework for web development, PHP is a language with the student already had used during the degree and researching on internet, others with high capabilities are growing.

Along the research, the following technologies were taken account:

- Python with Django
- JavaScript with AngularJS
- Ruby with Ruby on rails
- Java with Spring

Finally, Python was selected because the clean syntax and the philosophy of Django framework to avoid repetition in the most used web tasks and their solid community.

TODO: Django logo

The documentation site of Django framework is clear and well structured and provides API's for all the common needs for every web development like an ORM for database mapping or security features, moreover, is possible to build your own custom functionalities on top of them.

Mobile application

For providing a native environment to Auzonet in mobile platforms the native SDK of each platfor was desestimated due the limited resources for developing the project, thanks to web technologies and the responsive user interface designed in the web application, Apache Cordova framework has been used for provide a native look and feel on the common mobile operating systems.

Apache Cordova is a framework for create mobile applications using HTML, CSS and JavaScript gaining access to native features of the hardware like accelerometer or camera, as project from Apache Foundation, is licensed under Apache license that authorizes to use free of charge the software.

TODO: Apache logo

Apache Cordova allows to get advantage of all the existing software written in the web application and port the experience to a native application distributable via mobile stores and porting to Android, iOS or Windows Phone.

For creating the application, has been necessary create artworks for different screen sizes and device orientations of the icon and splash screen.

TODO: Put Apache Cordova logo.

6.4. TOOLS

6.4.1 Code editor

TODO: Put an image of atom The code editor used along the project for writing Python code and HTML front-end is Atom by GitHub.

Atom is an application built with web technologies and open source that allow to be modified by the community, because of that, the wide variety of plug-ins such as language syntax support or Git integrations is huge.

Before this project, the student had experience with other privative tools like Sublime Text but at the beginning of the development, the student made a small research for a new tool to learn for improve productivity in the programming phase.

Atom features like embedded browser and terminal, has become a huge productivity boost during the development.

6.4.2 Image editor

Though most of the visual assets are provided by Twitter Bootstrap, others like logo and mobile icons and splash screens has been created using a image editor.

TODO: Pixelmator image

Pixelmator is a Mac application based on the popular Adobe Photoshop with less features but enough to design and prepare the visual assets used in Auzonet. Was selected because the student already owned a license and is easy to use.

6.4.3 Operating system

TODO: FOTO OSX All the development process has take place on an Apple MacBook Pro of early 2011, property of the student with OS X El Capitan version 10.11, the UNIX solid architec-

6. DEVELOPMENT

ture and good user experience became the perfect choice for being the main computer used for programming.

The UNIX-like capabilities of this operating system has become an advantage for running almost every tool involved in a web development process.

6.4.4 Version control

TODO: LOGO GIT Git has been the software responsible of keep version control of all the files of the application. Git is an open-source software developed by Linus Torvalds widely used in the industry, allows to keep a central repository and create branches separated from the main development code.

TODO: GITHUB LOGO GitHub is a service created for hosting Git repositories and allow store public and private code, thanks to the student pack offered by the company, code has been hosted in a private repository for free that, otherwise would be needed a paid subscription.

6.4.5 Testing

All the tests performed has been focused y the end user perspective, along two weeks the application was released under beta status to a closed group of people closer to the student for making a simulation of real usage.

The proposed tests starts with the creation of a new account by the user without any assistance watching the usability problems that the user have, and taking notes of how the user navigate through the app.

The proposed workflow for the test are always the same:

1. Register a new account.
2. Register a new community with password.
3. Create a new offer in the community.
4. Create a new request in the community.
5. Post a new advice on the community board.
6. Post a new info message on community board.
7. Logout
8. Create another account
9. Joining to the previously created community
10. Hire the offer created by the previous user and finish the agreement voting each other
11. Attend the request created by the previous user and finish the agreement voting each other
12. Enter in profile view and check the recent activity and karma.
13. Logout.

Same process with the mobile application.

All faults and user experience suggestions were gathered in the task manager software and tagged for fixing as soon as possible.

7. CONCLUSIONS AND FUTURE WORK

This project has developed a full-stack platform for citizens using Open Data very similar to already existing, well-known applications of every day life, in this chapter some conclusions and future lines of work will be presented.

7.1. DATA MINING

7.2. CONCLUSIONS

Today, we are surrounded by services that centralize the logic and data on cloud servers, smart-phones quickly became the angular piece for interacting with them, having the knowledge of creating the full-stack technologies involved in these solutions is essential for every computer engineer.

The aim of learning a full stack technologies creating a real application based on social interaction and Open Data has achieved successfully, today, more than ever, we have a huge variety of technologies available, select the appropriate ones for a service a provide a good user experience is more difficult.

As can be seen, this project ended successfully achieving all the major objectives proposed from the beginning and implemented all the MORElab requested requirements with WeLive platform. A mobile application has been created at the same time, bringing all the core functionality to different mobile operating systems and only latest web technologies has been used for proving the maturity of these solutions.

Both applications, mobile and web are fully functional, running on servers hosted in DeustoTech and ready to deploy in bigger environment with small tweaks. In the other hand, data mining purposes of user's data could not be tested or developed, due time limitations but the software architecture is totally prepared for future data analytics features.

7.3. FUTURE LINES OF WORK

Although the application is fully functional and complete, there are some features that could be interesting to develop in further releases:

- User profile customization by the end user.
- Facebook, Twitter and Google login integration.
- Native mobile apps.
- Public REST Api for allowing third party integrations.

7. CONCLUSIONS AND FUTURE WORK

- Full featured data analysis portal for public institutions.
- Automatic community detection using HTML5 geolocation API.
- Implement a search field for offers and requests.
- Add support for more cities and extend the scope of the posts.

All these features are really plausible to implement due the actual architecture of the platform.

8. BIBLIOGRAPHY

9. ACRONYMS

label description

10. ACKNOWLEDGMENTS

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A. PLANNING2

A.1. PRECEDENCE DIAGRAM2

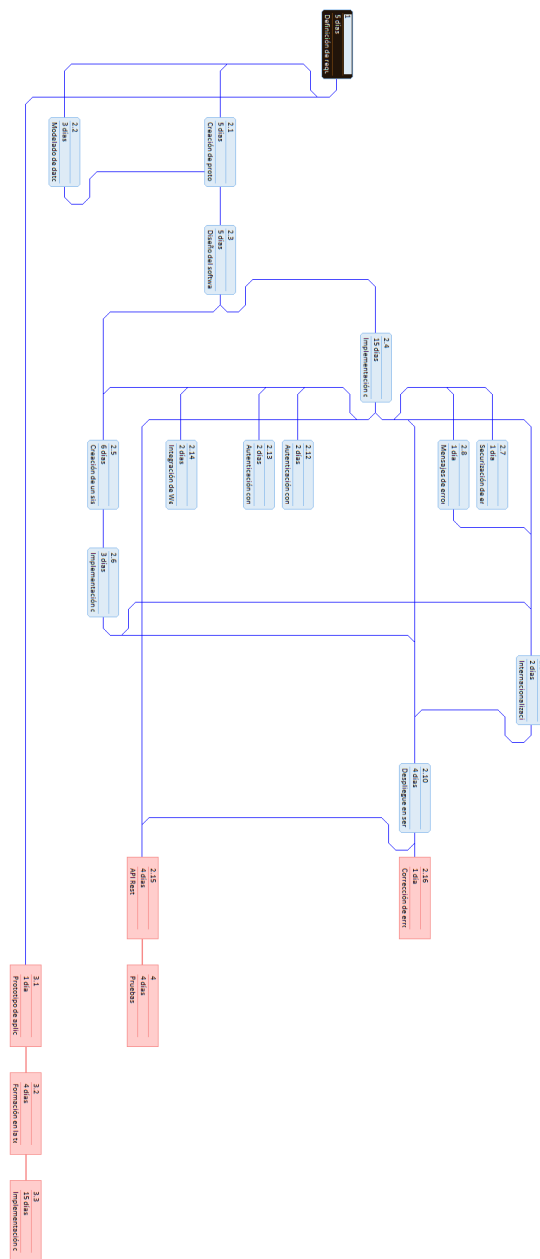


Figure A.1: Precedence diagram