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List of Abbreviations

API	Application Programming Interface
CLP	Collaborative Learning Platform
CMS	Content Management System
CSD	Citizen Science Data
CSS	Cascade Style Sheets
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transport Protocol
NGO	Non-Governmental Organization
OS	Operating System
PHP	PHP: Hypertext Preprocessor
SQL	Structured Query Language
SSL	Secure Sockets Layer
UI	User Interface

Executive Summary

Description of the work

This deliverable describes the Captor Collaborative Learning Platform (Captor CLP), a CLP based on Web where users share their own experiences and interact with other members of the community, achieving a collaborative learning. The platform allows users to participate in forums, read the latest news, see information about Captor related events and upload stories. The platform automatically shares new information added to it through Twitter social network.

Objectives

The objectives of this deliverable are:

- Describe the Collaborative Learning Platform.
- Describe briefly the technologies used by the platform.
- Show how the UI of the platform looks.

1. Context

A Collaborative Learning Platform (CLP) has been developed with the idea that users share their own experiences and interact with other members of the community, achieving a collaborative learning.

As a part of CAPTOR project, the CLP aims to provide technological support in order to foster collaboration of local communities, citizens, NGOs and scientists to engage them to strength and up-scaling the NGOs actions on social networking building, cross-sectorial collaboration activities and campaigns.

This CLP provides standard tools such as news posts, forums and event’s calendars. Besides these tools, this platform also offers the possibility to publish user’s stories and experiences related with a specific topic proposed by the administrator (for example, air pollution from cars).

Anyone can join the platform, and community members are invited to submit and comment ideas on the different existing topics. The platform has Multilanguage capabilities because it is addressed to users from different countries (Spain, Germany, Austria, Italy, etc.), who do not have to be fluid in English.

The CLP is available at: <http://147.83.118.57/captor>. Existing free and open source tools will be considered for the implementation of the CLP.

2. Technologies

In this section the architecture of the platform is showed, and the technologies used by it are described. It is remarkable to mention that CLP has been implemented with open and free software. Fig. 1 shows the CLP architecture.

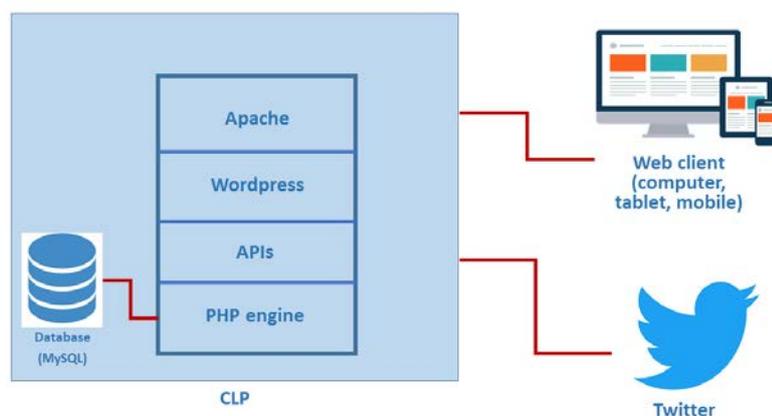


Figure 1. System architecture.

The following subsections contain a briefly description of the used technologies.

2.1. WordPress

WordPress is a freely distributed, standards-compliant, fast, light, and free CMS built on PHP and MySQL, with sensible default settings and features, and an extremely customizable core¹.

WordPress uses themes, which are collections of CSS and PHP files, to create a graphical interface for the webpage and to modify the way the site is displayed on the user's screen. The themes can be responsive, which means that the layout of the page will be adapted and displayed correctly independently of the screen size, resolution and OS of the user's device. One way to achieve this responsiveness is by using Bootstrap.

WordPress also has collections of PHP scripts known as plugins that add new custom functionalities to the site. For example, Polylang is a plugin that allows displaying the page in different languages. The use of plugins is a modular and easy way to add only the necessary features to the page. All the plugins can be found in the official plugin repository.

Regarding user management WordPress uses the concept of roles. Roles are designed to assign a set of tasks a user can perform in the site. For example, a guest user can only read comments but cannot publish new content.

By means of themes and plugins, WordPress is able to create dynamic and responsive web pages in a fast and easy way.

2.2. Bootstrap

Bootstrap is a programming framework of HTML, CSS and JavaScript code that enables you to develop open webs designed for all types of devices². It contains templates for many typical objects that are in the web pages as are forms, buttons or menus, among others.

This framework allows you to easily define the behaviour of objects for different screen sizes. One of the most important is the menu, while in large screens remains horizontal and deployed in the top, on a smartphone we find it hidden and when it is deployed appears from side to side, resembling a lot to a native application.

2.3. PHP

PHP is an HTML-embedded scripting language. Much of its syntax is borrowed from C, Java and Perl with a couple of unique PHP-specific features thrown in. The goal of the language is to allow web developers to write dynamically generated pages quickly³. PHP scripts are executed in the server and the resulting HTML is sent to the client. It also can be inserted inside the HTML code by using the PHP special delimiters “<?php” to open and “?” to close.

¹ Wordpress: <https://wordpress.org/>

² Bootstrap: <http://getbootstrap.com>

³ PHP: <http://php.net>

2.4. Apache

The Apache HTTP Server is an open source HTTP web server for different platforms⁴. This server is developed and maintained by a community of users under the supervision of the Apache Software Foundation. The objective of this project is to provide a secure, efficient and extensible server that provides HTTP services in synchronization with the current HTTP standards.

The addition of SSL allows encrypting connections between the communication of two machines over a network. WordPress uses SSL in the user authentication phase. When a user is authenticated, she or he sends an encrypted password hash to the server, and this information must be encrypted in order to provide security to the system.

2.5. APIs

The following Application Programming Interfaces (APIs) have been used to facilitate tasks such as the use of social networks and Google Maps.

2.5.1. Twitter API

The use of Twitter API has been used in conjunction with WordPress plugins in order to share the contents of the platform with Twitter social network. A new tweet is automatically generated and published in the official platform Twitter account each time new content is published, so users can follow and notice when new content is available.

2.5.2. Google Maps API

The Google Maps API is the most complete API for the use of maps provided by Google. One important drawback regarding this API is that its use is not free. Google restricts the amount of maps loaded in 25,000 per day but, taking into account the needs of this project, this restriction is permissive enough to ensure the platform will not be affected by it.

This API is used in conjunction with an Event Calendar plugin in order to show a map with the location of different events related to CAPTOR project.

3. Features

The CLP offers basic functionalities to manage online communities:

- User management.
- Basic functionalities as forums, news and events.
- User stories.

⁴ Apache HTTP Server: <https://httpd.apache.org>

3.1. User management

The CLP offers basic registration and login functionalities.

LOGIN

Log in	Register
<input type="text" value="Username"/>	
<input type="text" value="E-mail"/>	
<input type="button" value="Register"/>	

Figure 2. Registration form.

LOGIN

Log in	Register
<input type="text" value="Username"/>	
<input type="text" value="Password"/>	
<input type="button" value="Log In"/>	
Lost your password?	

Figure 3. Login form.

As a security measure to identify users, registration process needs a valid electronic mail address. The platform administrates three types of users (roles): administrator user, registered user and guest user. Administrators manage basic functionalities –can publish events and posts– and are in charge of filtering registered users’ publications. Registered users can interact by publishing and commenting other member experiences. Finally, guest users that only are allowed to view contents but cannot participate.

3.2. Basic functionalities

The CLP offers basic social features such as forums, news and events.

Forums

Home > Forums

SEARCH

Forum	Topics	Posts	Freshness
General information General information about CAPTOR project	1	1	4 days, 1 hour ago captor
Pollution forum Pollution forum	2	3	4 days, 1 hour ago captor

Figure 4. Forums.



Forums Posts Events User Stories Login English

Events

< August
< 2016 >
September
October >

Month	List	Week	Day				
Mon	Tue	Wed	Thu	Fri	Sat	Sun	
August	August	August	1	2	3	4	

14-09-2016 - 15-09-2016 All day

<http://www.google.es>

UPC

Barcelona, Spain

Map data ©2016 Google, Inst. Geogr. Nacional | Terms of Use | Report a map error

Description 1

Figure 5. Event's calendar.

3.3. User stories

Individuals or groups of people can upload success stories such as best people practices or best policy practices.

Administrator users can define topics and a story must be about one of those defined topics. Administrators must validate stories in order to be published.

Users can filter user stories by different criteria, such as topic, newest or oldest added stories, uploader type (individual user or community), alphabetical order, etc.

A story has the following characteristics: a title, a description, multimedia content (an image or a video), an external URL with more detailed information about the story and contact information about the uploader. If other members find the story interesting enough, they can contact the author/s of the story for further information or publish a message in the forum. In addition, registered users can assign a score to the stories.

The screenshot shows a user story titled "Car" in a web application. At the top, there is a dark red header with the "CAPTOR" logo on the left and navigation links for "Forums", "Posts", "Events", "User Stories", "Login", and "English" on the right. Below the header, the story title "Car" is displayed with a red underline. To the right of the title are two red buttons: "VALIDATE" and "EDIT STORY". The main content area features a video player showing a pig in a field. Below the video is a paragraph of text: "When a car's engine is **running**, several different types of gasses and particles are emitted that can have detrimental effects on the environment. Of particular concern to the environment are carbon dioxide, a greenhouse gas; hydrocarbons -- any of more than a dozen volatile organic compounds, some of which are known carcinogens; nitrogen oxides; sulfur oxides; and **particulate** matter, tiny particles of solids, such as metal and soot. Other emissions that affect human health and create smog include ozone and carbon monoxide." Below the text, there is contact information: "Url: [Visit page](#)", "Username: Captor", and "Email: captor2016@gmail.com". At the bottom left, there is a red button labeled "GO BACK".

Figure 6. User story pending of validation.

4. Conclusions

In this deliverable we described the Captor Collaborative Learning Platform (Captor CLP), where users share experiences and interact with other members of the community. The platform is ready to be used by users starting October 2016 and will be one of the key tools in the project. Once we obtain feedback from the users, we will introduce modifications and improvements in new releases.