

# **Euro Cordiale 2.0: Optimizing User Interaction in a Custom Design Template for a Modern Website**

## **Bachelor Project Report**

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# Declaration of authorship

**For single-authored work:**

*I hereby declare that I am the sole author of the work entitled*

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*and here enclosed, and that I have compiled it in my own words, that I have not used any other than the cited sources and aids, and that all parts of this work, which I have adopted from other sources, are acknowledged and designated as such. I also confirm that this work has not been submitted previously or elsewhere.*

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## Abstract

In today's digital age, having a modern and interactive website is crucial for non-profit organizations to promote their projects and resources. With the growth of website users and the demand for a simple, intuitive and personalized design, there is a strong need for a new website.

Therefore, we propose Euro Cordiale 2.0 a new and innovative web solution, based on a tailor-made design template.

The aim of the new website is to create a modern design which leads the user more easily to the desired content. Additionally, the new multilingual website should promote the content more internationally. Since Euro Cordial's website is a platform of information and educational materials, the most accessed projects from the previous website were taken into consideration while creating the new design template, which has first been done with Figma.

The aim of this thesis, is firstly to analyse Euro Cordial's old website design, user statistics and find its weaknesses. In order to suggest robust solutions to the existing problems and implement them in the new Euro Cordiale 2.0 website, this thesis will first present the necessary tools and introduce the important concepts on web design, user experience, the used languages and motivate in detail the design and implementation choices.

In conclusion, Euro Cordiale 2.0 is a new modern website that embodies intuition, and simplicity which fulfils all the users needs. By providing a great user experience, it will help Euro Cordiale to promote its work done in European projects and increase their outreach.

**Keywords:** Website, User Interaction, Design Template, User Experience

## Abstrait

À l'ère numérique d'aujourd'hui, il est essentiel pour les organisations à but non lucratif de disposer d'un site web moderne et interactif pour promouvoir leurs projets et leurs ressources. Avec la croissance des utilisateurs des sites web et la demande d'un design simple, intuitif et personnalisé, il existe un fort besoin d'un nouveau site web.

C'est pourquoi nous proposons Euro Cordiale 2.0, une nouvelle solution web innovante, basée sur un modèle de conception sur mesure.

L'objectif du nouveau site web est de créer un design moderne qui guide plus facilement l'utilisateur vers le contenu souhaité. De plus, le nouveau site web multilingue devrait promouvoir davantage le contenu à l'échelle internationale. Étant donné que le site web d'Euro Cordiale est une plateforme d'information et de matériel éducatif, les projets les plus consultés sur l'ancien site web ont été pris en compte lors de la création du nouveau modèle de design, qui a été réalisé en premier lieu avec Figma.

L'objectif de cette thèse est d'analyser le design de l'ancien site web d'Euro Cordiale, les statistiques des utilisateurs et d'identifier ses faiblesses. Afin de proposer des solutions solides aux problèmes existants et de les mettre en œuvre dans le nouveau site web Euro Cordiale 2.0, cette thèse présentera d'abord les outils nécessaires et introduira les concepts importants sur la conception web, l'expérience utilisateur, les langages utilisés et justifiera en détail les choix de design et d'implémentation.

En conclusion, Euro Cordiale 2.0 est un nouveau site web moderne qui incarne l'intuition et la simplicité, répondant à tous les besoins des utilisateurs. En offrant une excellente expérience utilisateur, il aidera Euro Cordiale à promouvoir son travail réalisé dans des projets européens et à accroître sa portée.

**Mots-clés:** Site web, Interaction Utilisateur, Modèle de Design, Expérience utilisateur



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# Chapter 1

## Introduction

Euro Cordiale<sup>1</sup> is a non-profit organization which provides interactive exercises, such as listening, reading and completing different exercises for pupils. Such exercises and tools are created by Euro Cordiale in collaboration with several institutions in Europe during European founded projects. The website provides access to different PDFs, audio files and links to the external projects done in the past.

The rapid growth of the internet has made a big impact on how we use it. Today, websites are fundamental and important when it comes to the digital world. These can be served as a platform for providing information to the public, for e-commerce, for entertainment or to connect the world all together. Therefore, the aim of this internship is to provide Euro Cordiale with a website that can be easily updated in the future and that provides the users an easier way to find all the information about Euro Cordiale, their projects and exercises. It is also important to design the website in a way that allows future employees to update the website easily, without needing to access the source code. Users will also have a much better experience when utilizing the website thanks to an improved design and architecture of the website [1].

The website will also accommodate the users that are non-French speaking, making the website trilingual by including English, French and German [2]. It will have an enhanced architecture, that facilitates the retrieval of desired information and ensures the user's comfort while navigating and interacting with the website and its design.

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<sup>1</sup>euro-cordiale.lu

The contributions of this thesis are the following:

- **First:** Creating a new website in WordPress
- **Second:** Creating a custom design template
- **Third:** Creating documentation for Euro Cordiale

This thesis is divided into multiple parts, starting with the **Introduction** chapter, where we have an overview of the aim of the internship, we will have the contributions of this thesis and the thesis outline.

In the second chapter, which is the **Background** chapter, we will have an overview of what is Euro Cordiale a.s.b.l. and what the organization does. Furthermore, we will analyse the previous old website, by analysing what is wrong with it and also see the data that is behind the website. In the next section, we will have an in-depth look at the identified problems and have an explanation for each of them. In order to fix those problems, the next section introduces a solution to fix all previously identified problems.

In the third chapter, we have the **Design** chapter, which describes how the website looks and how it feels like. We explain the platform used to develop a Prototype of the UI design and the navigability of the website. Additionally, we will explain furthermore the decisions of the chosen UI design and the functionalities of the pages.

In the fourth chapter, we have the **Development & Implementation** chapter, which explains how we integrated the different proposed design prototype and how plugins were developed to build WordPress out. At the end, we have the integration of the translations of the whole website and how it was accomplished.

In the fifth chapter, we have the **Testing** chapter, where we explain how the testing of the website is performed and which test cases were used in the Unit test.

In the sixth chapter, we have the **Results** chapter, in this chapter we show visual and functional differences between the old and the new website.

In the seventh chapter, we discuss the **Limitations & Future Work**, where we address the limitations on the website and in which ways the website can be improved on.

For the last and eight chapter, we have the **Conclusion** chapter, where we conclude and finalize the thesis by giving a small summary of the thesis and the work done.

## Chapter 2

# Background

In this chapter we will explore the activities and functions of the organization to gain a comprehensive understanding of their needs. Firstly, we will explore and introduce various concepts used in the website creation process. Secondly, we will assess the specific requirements of the organization in order to develop a tailor-made website that caters the organization and their users needs. Lastly, we will investigate the weaknesses of the previous website to identify improvements for the new website.



## 2.1 Euro Cordiale a.s.b.l.

Euro Cordiale is a non-profit organization that focuses on producing tools and exercises for educational purposes to be used by teachers and pupils. They offer exercises and tools in different languages mainly in English, French and German. These exercises are created with partners throughout Europe in European projects such as the Erasmus+ program.

By analysing the content that Euro Cordiale creates, which are educational projects and exercises, means that their target population are mainly teachers and pupils, not only for Luxembourg but also in Europe.

## 2.2 Analysis of the old Website

For a more comprehensive evaluation of the present website, an in-depth analysis was done, by adopting the user's and administrator's point of view. Especially, on the old website, when the administrators attempt to access the administrator page to make modifications to the content, they are unable to load the administrator page. This is due to outdated and incompatible PHP versions on the website, thereby hindering future modification.

The website was designed and constructed in the year 2008, utilizing tools and features that were available during that time period. However, significant advancements have been done in web development with a new set of modern and sophisticated tools and ideas. Furthermore, web developers have gained a massive experience in utilizing the aforementioned tools and methodologies. The aim is to optimize the accessibility for an enhanced browsing experience. The upcoming sections will dive into the encountered design and accessibility challenges.

During the time frame of May 2023, the utilization of the pages and bandwidth can be observed on figure 2.1. Notably, it reveals that the main access to the website is done from France, showing substantial access in comparison to other countries. Moreover, the figure illustrates that the minority of users are from outside Europe, except the United States, where a significant access can be observed.

The overall activity throughout the current year shows us that there is about 419 GB of data that has been accessed only this year until May, which can be seen on figure 2.2. The website is therefore a very important communication factor for the organization and provides the tools and exercises to the users throughout the world. If we have a better look at the "Pages" column of figure 2.2, it appears that a high number of pages have been accessed. Therefore, based on the analysis of this figure, we can assume that the users are facing considerable challenges in locating the desired materials, thereby requiring them to walk through more pages than necessary.

The analysis done on the data of the old website led us to an important conclusion. The need for

Visitor countries - full list - www.euro-cordiale.lu - May/2023

Countries		Pages	Hits	Bandwidth	
France	fr	9,657	56,273	35.48 GB	
United States	us	6,771	26,667	5.26 GB	
Russian Federation	ru	2,323	3,266	528.51 MB	
Ireland	ie	1,452	1,619	18.84 MB	
Great Britain	gb	1,060	1,859	3.83 GB	
Japan	jp	695	713	5.06 MB	
Unknown	unknown	586	1,792	352.86 MB	
China	cn	562	1,008	39.61 MB	
Belgium	be	470	2,996	11.28 GB	
Spain	es	397	2,327	582.48 MB	
Germany	de	381	1,784	343.48 MB	
Luxembourg	lu	359	3,141	1.41 GB	
Switzerland	ch	279	1,722	1.25 GB	
Italy	it	214	947	1.81 GB	
Canada	ca	209	1,063	482.96 MB	
Netherlands	nl	207	449	18.47 MB	
Morocco	ma	207	1,604	586.04 MB	
Sweden	se	171	216	14.61 MB	
Ukraine	ua	151	216	17.11 MB	
Poland	pl	147	652	176.45 MB	

Fig. 2.1. Visitors per country

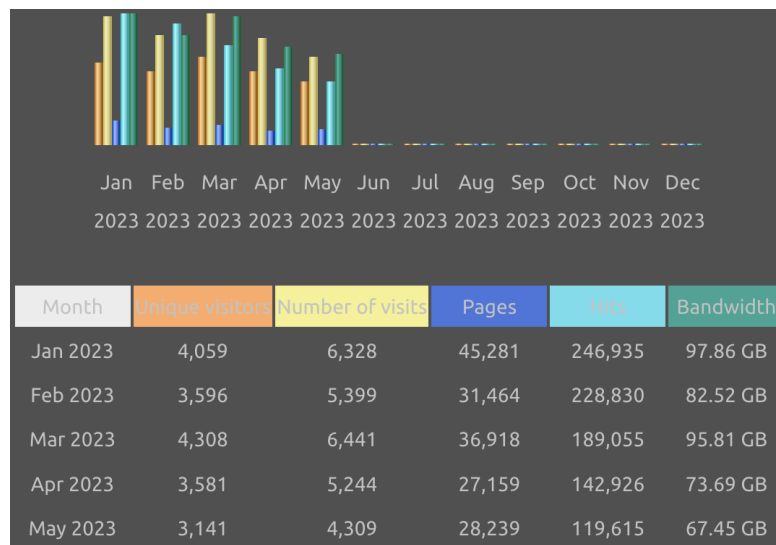


Fig. 2.2. Activity in 2023 (until May)

the development of a new multilingual website. The high fluctuations of the user accessing the website is present and thereby the prioritization of user satisfaction while browsing the website is important. In the next section, a thorough inspection of the weaknesses and limitations of the existing website will be done, thereby pronouncing the need of having a state-of-the-art website that addresses these issues.

## 2.3 Identified Problems

### 2.3.1 Design problems

Upon the initial access to the website, one can quickly observe the outdated layout that predominates the first-page. The navigation bar is not positioned at the header of the website but is rather sitting on the left sidebar. This design decision poses a problem to the user experience, as scrolling down on the pages, the left sidebar vanishes, impeding the user to navigate the website from any position of the page.



**Fig. 2.3.** First page of the old website

The height of the header occupies 30% of the screen and unfortunately the content that is displayed in it fails to captivate users due to the unremarkable and emptiness of the content. It only includes plain text and a hyperlink to the latest news article, as shown on figure 2.3. The visual experience is unengaging and the functionality that is associated to the logo is not conforming the convention. It instead retains us in the current page, rather than leading us to the first-page.

Figure 2.4 highlights the social media presence of Euro Cordiale, particularly on platforms such as Facebook. However, Euro Cordiale does not possess any social media accounts, revealing once more that the functionalities of the website are contradictory.

The navigability of the website is dictated by the sidebar navigation menu, which as mentioned before it is a critical feature to navigate the website. However, in some instances an incomplete submenu is available and sometimes it covers other parts of the menu as shown in figure 2.5. This variety of the existence of submenus disrupts the coherence throughout the website.

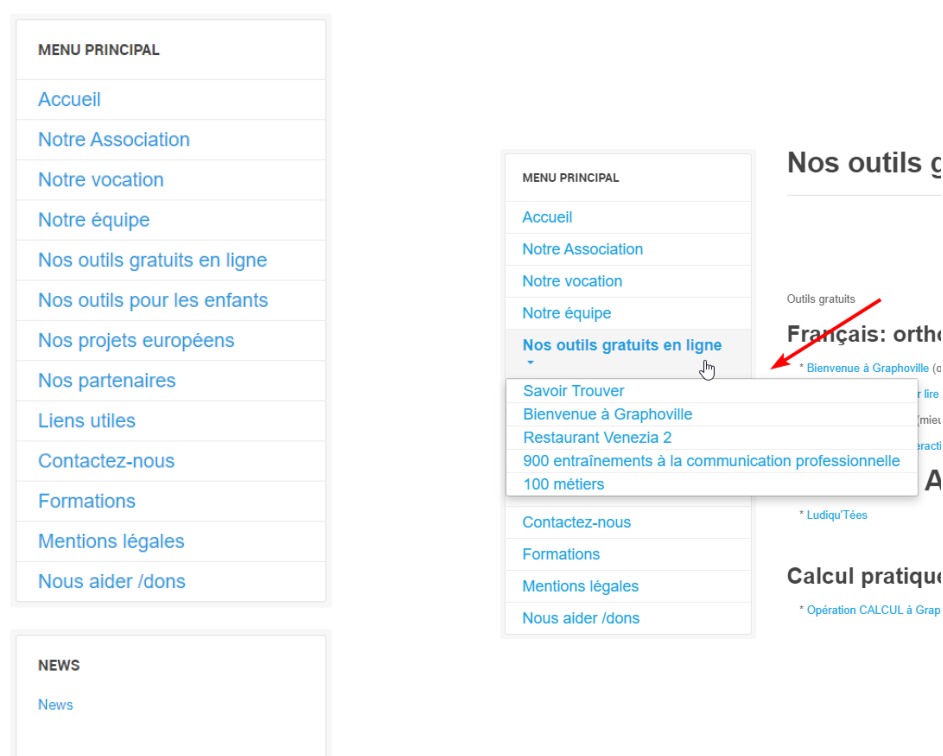
While navigating through Euro Cordiale's website to the projects section, it shows us that

**Euro Cordiale** a été créée en vue de la synergie des compétences et des expériences nationales et européennes de ses membres.

L'ensemble des membres peuvent communiquer dans les langues européennes suivantes : anglais, allemand, français, italien, espagnol et luxembourgeois, ce qui rend possible une large diffusion ultérieure de nouvelles approches pédagogiques et permet une active collaboration et des échanges réguliers et intenses entre les différents pays d'Europe.



**Fig. 2.4.** Social media buttons



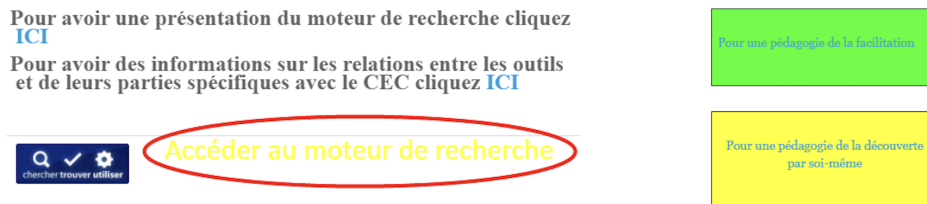
**Fig. 2.5.** Main menu

various links lead to resources such as PDF files, internal pages, external pages and audio files. However, a larger number of these were either broken, resulting in a 404 error page (Not found) or leading us to the resource, that failed to load. This was mainly the case for the aforementioned audio files where an audio bar was present but the actual audio was not audible. Additionally, figure ??, illustrates numerous resources, thus making it difficult to navigate among them. This can lead to the frustration of the user and as discussed in section 2.2, users are mainly teachers and pupils, meaning that when giving courses this can lead to precious time lost when searching for an exercise and/or audio file.

On figure 2.9 on point 2, we can also identify text and colour-related problems hindering the

accessibility for users and impacting the comprehension of the presented information. The texts are overlapping each other and thus making it unreadable and the colours on the same section, makes links not noticeable.

If we continue navigating the website, we can find even more places where the colours are not correctly implemented, thus making them unreadable. On figure 2.6, the yellow colour is used for a link but in reality it makes it unreadable.



**Fig. 2.6.** Colour issues

Euro Cordiale has an active working team but as illustrated on figure 2.7, the description of the team is not up-to-date. When users want to have a quick overview of each team member and see a visual representation, it is impossible due to the presentation format on the page. In order to have an in detail explanation of who works in the organization, we need to go through each team member which is a time-consuming process. This means that potential new partners, will struggle to find out more about the organization and the people involved in it.

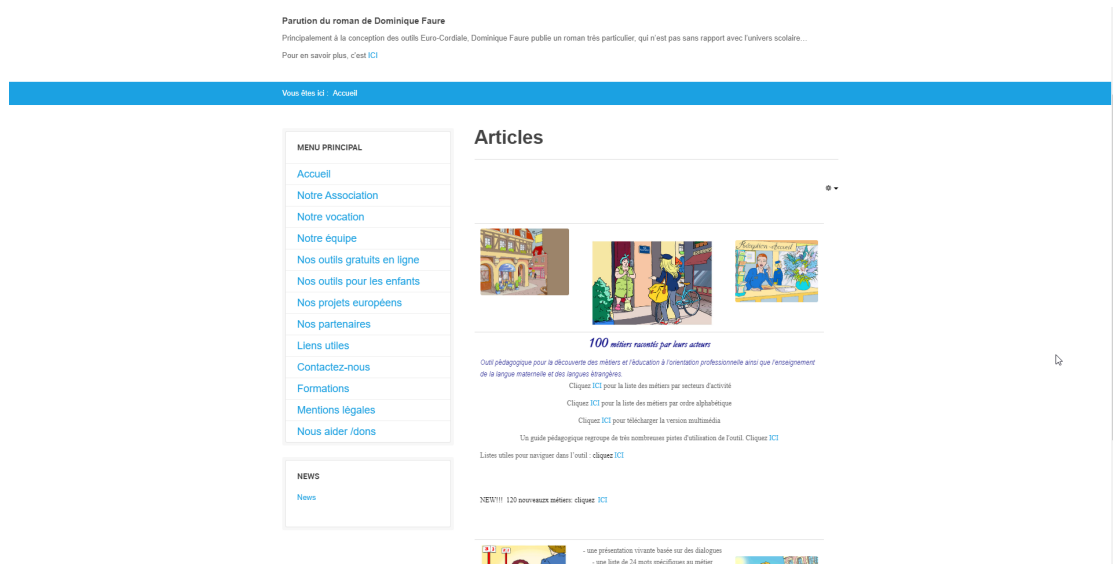
## Notre équipe

- Erny Plein
- Dominique Faure
- Elizabeth Cencetti-Moore
- Catherine Beaumont
- Suzanne Prot
- Alain Stoffen
- Dominique Godet
- Ludovic Sadri-Faure
- Tania Marinelli-Bontems
- Les acteurs Agnès Manoury et Frédéric Popovic
- Laura Plein

**Fig. 2.7.** Euro Cordiale team

On the project description page of "100 job descriptions brought to life", there are multiple

font families used, the links to access the tool are basically described with the following text: "click here". The font size is not adapted to the screen size, making it complicated to read. The full width of the screen is not used, losing important screen real estate and making the page look empty. The title on figure 2.8, states that it is an article and according to Euro Cordiale, it is clearly a project that they accomplished.



**Fig. 2.8.** Project description page

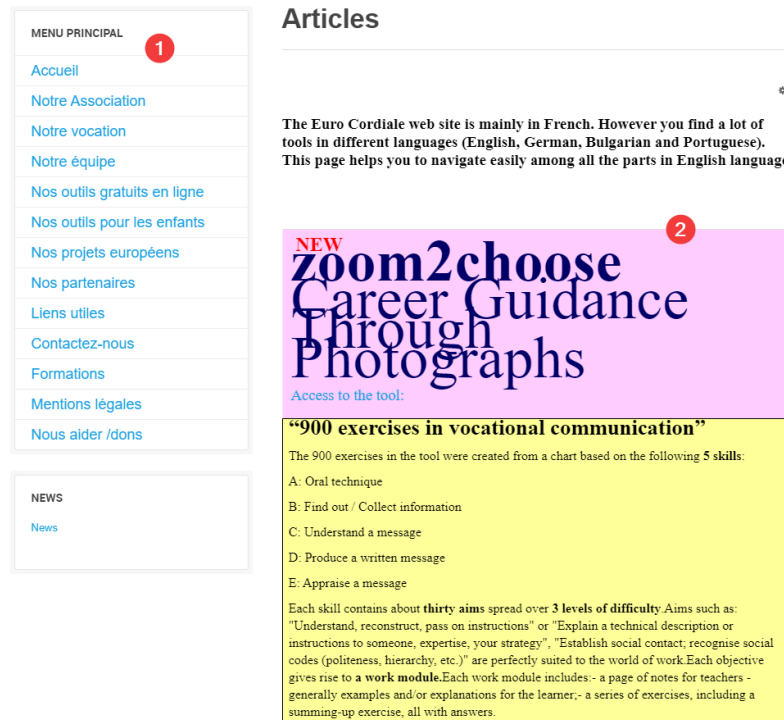
### 2.3.2 Content Management Problem

The old website lacks an easy management of new and existing content of the website, to modify the website, the source code has to be accessed. This makes it harder for the administrator to make new posts and update the content. Euro Cordiale also works with many different media files such as PDF or audio files and only managing them via the source code is a complicated task to accomplish.

### 2.3.3 Translation issues

When we analysed the website, in section 2.2, we concluded that the website is used throughout most of Europe and naturally including other languages. This leads us to the issue that we are confronted that there is no a proper implementation of different translations and mainly the English language is missing, which is the standard when it comes to a language that links us internationally.

Upon analysing figure 2.9, we can make the following observations, when we have selected the English version of the website the translation is not fully implemented. In point 1 of the previous mentioned figure, the main menu is displayed in French, but the rest of the content, which is



**Fig. 2.9.** Translation not fully implemented & design issues

point 2, is displayed in English. Therefore, leading us to believe that users cannot understand the website and leading them to completely abandoning the website and all the resources, including exercises and tools, that Euro Cordiale offers.

Gettext is an open-source framework used to translate webpages. The problem is that we cannot use the gettext framework because it only allows translating static strings that are implemented in the source code. When we utilize predefined functions (such as the ones used with WordPress), these pieces of text cannot be translated because gettext is executed before PHP can parse the different variables. Gettext collects the different strings and simply matches it in the translation files. When the translated string is introduced in the code, then PHP outputs the string by parsing the variables.

## 2.4 Proposed Solutions

In this section, we will explain different technologies used to apply solutions to the problems in chapter 2.3.

### 2.4.1 Design Solution: Tailor-made Design template

As a decision to tackle the issues and problems mentioned in section 2.3.1, we came to the conclusion that a tailor-made design template was needed to resolve the issues. By creating a tailored template, we can address the requirements of Euro Cordiale, thereby offering a visually appealing design to keep the user on the website. In the following chapter 3, we will have a closer look on how such design enhancements can be proposed.

### 2.4.2 Content Management Solution: WordPress

As discussed in section 2.3.2, where a lack of managing all the content in an easy and fast way, the solution would be instead of using plain code to build the different pages using the HyperText Markup Language (HTML), we instead use a content management system (CMS), allowing the administrator to simply change the content of the different pages without ever needing to touch any code at all. For this, we will introduce a popular and easy to use CMS system that can benefit all employees, which is called WordPress. The choice of using WordPress was recommended by the organization.

WordPress<sup>1</sup> is a Content Management System (CMS) where administrators can change the content of a page without needing experience and knowledge about coding. It differentiates 2 types of content, pages and posts. Pages are more for content that over the time does not change. On the other hand, posts are a type of content where the administrator can more easily give additional meta information, so that when designing a page we can specify to show specific posts. Meta information is used to define a post uniquely. Posts can hold a bigger variety of metadata compared to pages, such as dates, categories, custom excerpts and tags. Excerpts are used to have a small summary of a larger text, it is the same principle as the outside back cover of a book. Tags are used for identifying posts with simple keywords, when a word has been added to the tags, this will help a search engine, such as google, to properly find these posts. This metadata can be used to better distinguish between the different posts. When the administrator decides to use only a certain type of posts, categories help to better distinguish them. [3] WordPress also provides a much easier way to store different multimedia files (audio files, video files, PDFs), this allows to easily manage all the multimedia content and can easily replace or update the website and change the settings of how these multimedia files are presented on each page. [4]

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<sup>1</sup><https://wordpress.org/>



For updating the pages, WordPress allows to work with plugins. Plugins are a way to display information (text, files or sections) so that the administrator can easily drag and drop the different sections to design the website according to their needs. [5]

When the administrator of the website adds content to the aforementioned pages or posts, these are stored in a MySQL database. WordPress has predefined tables. When starting to create new pages or posts, these are stored in the different tables provided by WordPress. On the other hand, media files are stored in the directory where WordPress has been installed. When a media file is uploaded, the file is stored in the "contents" folder and a reference to this media file is created in the database. When the administrator inserts the media file in a page, it will reference the media to the entry of the database.

### 2.4.3 Translation Solution: Polylang

In order to address the aforementioned translation issue, we will use a plugin available in the marketplace to translate the website's content. The chosen plugin is called Polylang<sup>2</sup> made for translating website's content on WordPress. It will allow us to create the implementation of a multilingual website, enabling users to effortlessly navigate the website.

After choosing the languages to translate to with Polylang, the chosen languages will appear in a new column on the page where the administrator has the overview of the pages/posts. This column makes it possible to translate each page/post by clicking on a "+" sign to a specific language. When the administrator adds the language, he will be able to change the text as he would create the page/post for the first time. A dropdown menu will be available to change the language.

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<sup>2</sup><https://polylang.pro/>

## Chapter 3

# Design

This chapter will clarify the approach to design the website in accordance to the requirements of Euro Cordiale. The website's design has the objective to optimize the user navigation and a user-friendly environment based on the "Proposed Solutions" from section 2.4. The chapter develops on the tool used for building the prototype, followed by the creation of the prototype with the design ideas from 2.4. In addition, diagrams have been produced to manifest the execution of the European partners map and the contact form.

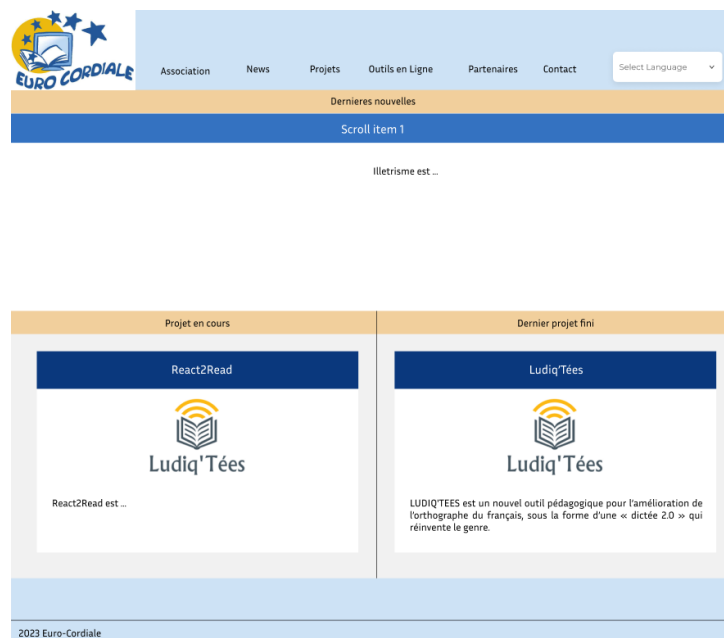
## 3.1 Figma

To effectively present the user interface (UI) design prior to its development, a web-based tool called Figma<sup>1</sup> was utilized. Figma serves to design a website and to create interactions between the elements as a result an emulation can be used to showcase the website. Upon completion of the design, Figma has a unique feature allowing us to inspect the different elements and to retrieve the CSS of the designed elements, facilitating the consistency between the prototype and the website.

## 3.2 UI Design & Functionality

### First-Page

Upon accessing the website, a feature rich front page will present to the users, showcasing the latest news articles through an interactive slideshow as illustrated on figure 3.1. The slideshow serves as a captivating visual element, particularly placed to retain users on the website. To facilitate the navigation between the article, two buttons have been placed on either end. As an alternative the slideshow is equipped with a timer to automatically change the slides. Particularly, the slideshow helps in providing a dynamic aspect to the website with pleasing aesthetics.



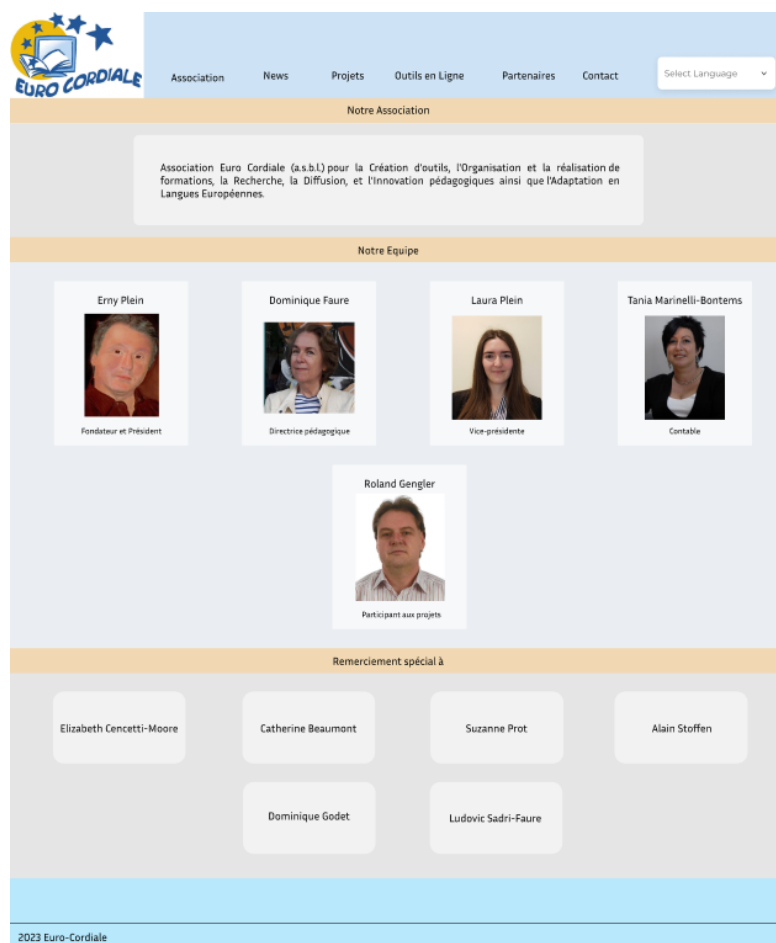
**Fig. 3.1.** First-page

<sup>1</sup><https://www.figma.com/>

## Organization

This page features a dedicated section with a synopsis of the non-profit organization about their mission and dedication, capturing the user's desire to find more details by providing a button to lead them to a detailed description of the association.

The next section presents a display of the active members of Euro Cordiale by visually using a tile-style layout. The design choice has the latest design trends to keep it simple but informative and proven by previous studies done on website aesthetics. [6] Each tile corresponds to one employee with a visual representation of the member and his job title underneath it. By clicking on a tile, users will be redirected to a more detailed profile of the member.

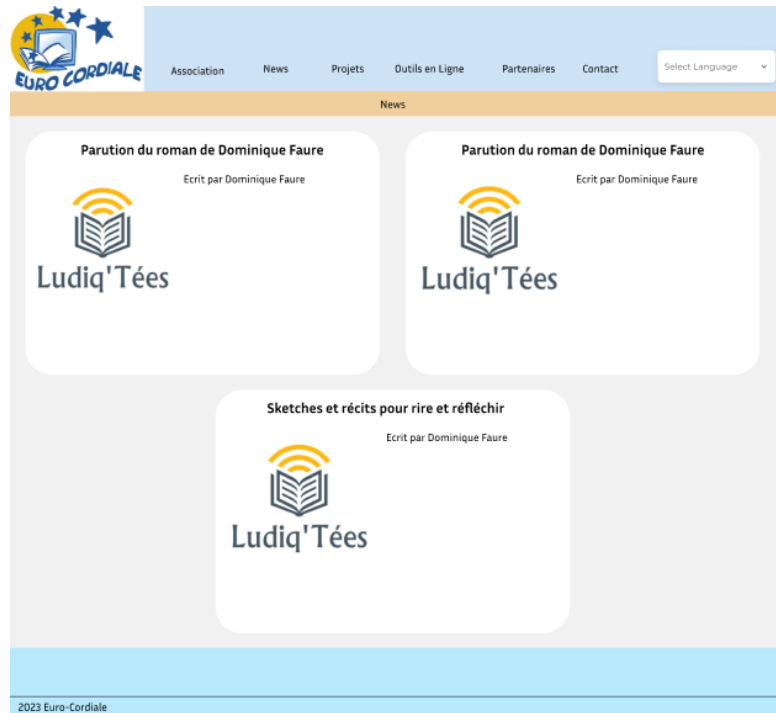


**Fig. 3.2.** Our organization

## News

The news page presents the news articles in a grid-style layout where each row accommodates two articles, therefore displaying more of the article. Given the nature of Euro Cordiale's news content, users will not have the option to click on an article. Each item on the grid includes a title, a description and an accompanying image. Facilitating to manage the news article in the CMS, the chosen type of this content is a "post", allowing the administrator to have a greater

control over the metadata such as the dates and categories. This implies that a news article can be updated, thus moving it to the latest news articles, which is on the top of the grid. In order to only retrieve the news articles, categories are used to correctly mark the posts that correspond to the news section.



**Fig. 3.3.** News

### Projects

The projects page is subdivided into two sections, the "Projects in progress" and the "Projects" section. The first one being the projects that are currently in development and this chosen design decision is to illustrate the project currently in development, allowing to expose them further. The latter section showcases all the finalized projects. Similarly, as the aforementioned news articles, the projects use the "posts" type for the same reasons as the news articles.

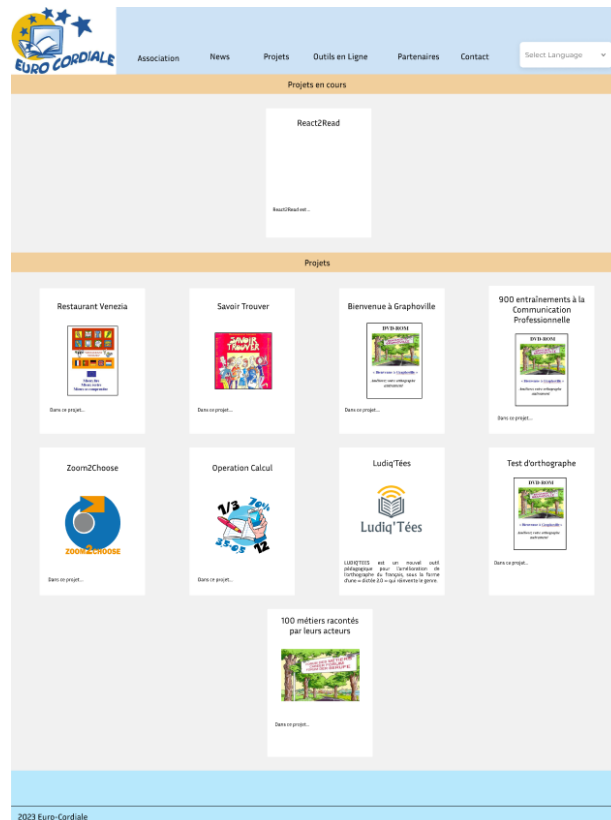


Fig. 3.4. Projects

### Project Description

The project description page encompasses two big sections, the left one being the in detail description and the right one being the navigation button and the language information in which it is available.

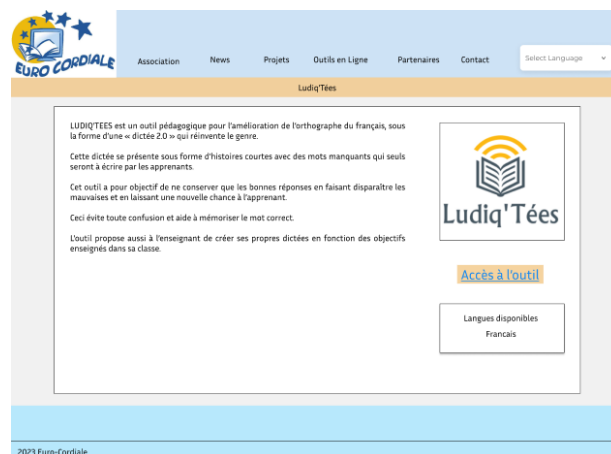
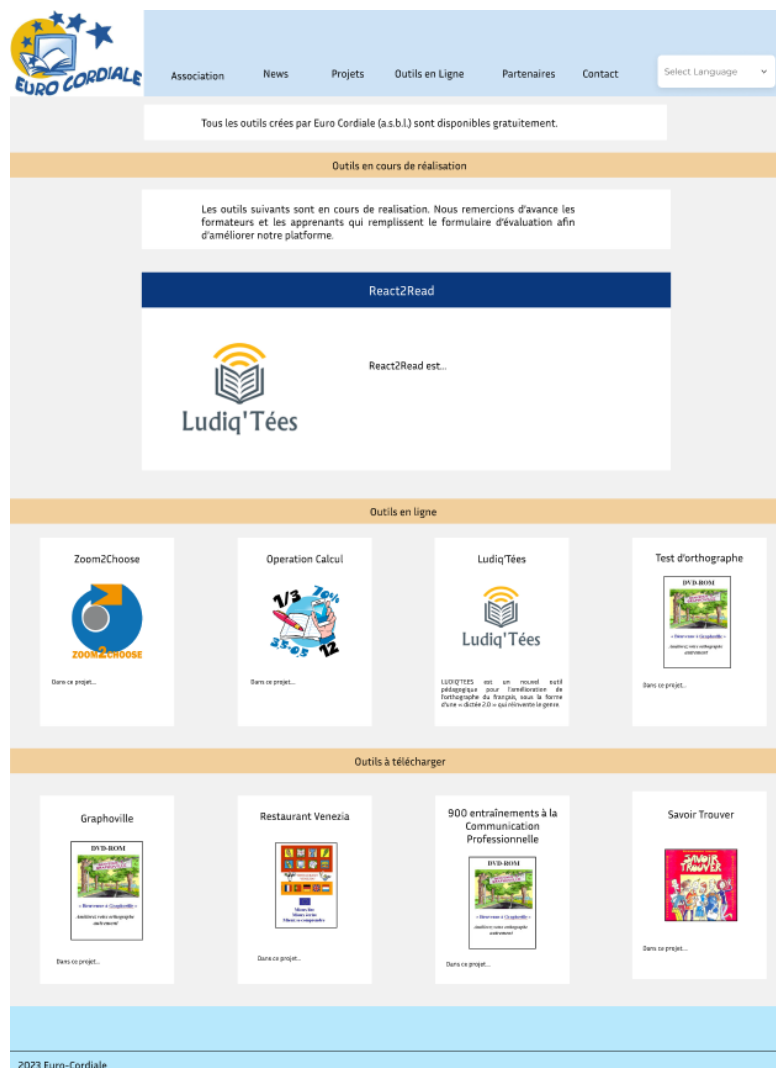


Fig. 3.5. Project description

## Online Tools

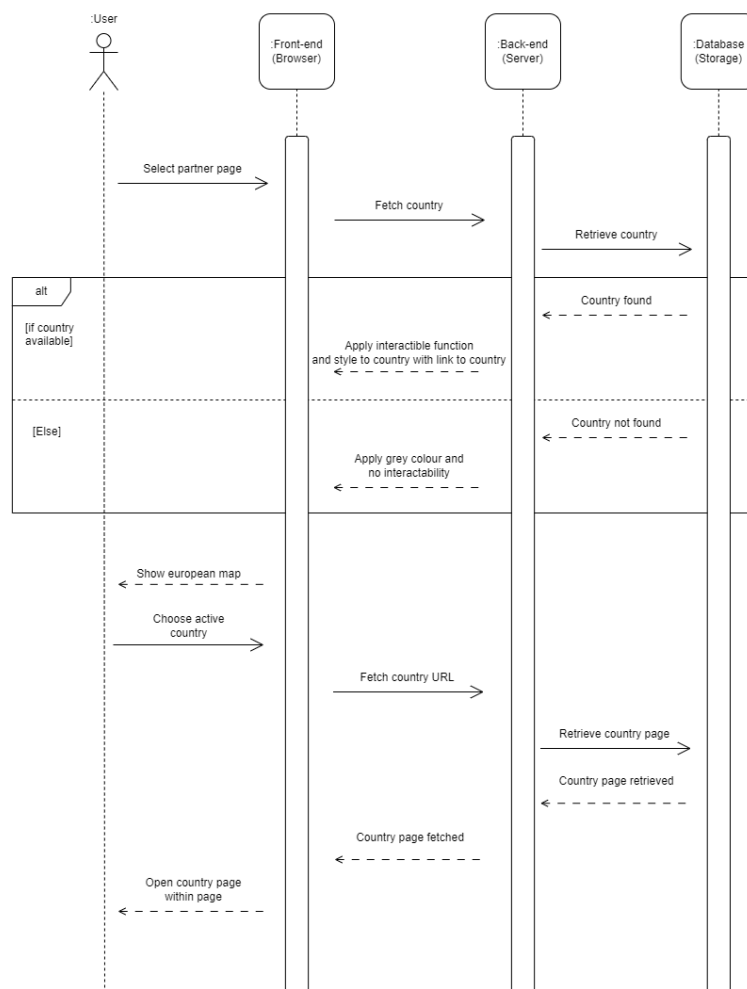
The online tools page has a similar design decision as in the Projects page. In contrast to the projects page, the redirection of the projects will not lead the user to their respective decisions, instead they will be directly redirected to their respective tool/resource. This decision ended up more for users that already have an understanding of who is Euro Cordiale, to access the tools much quicker. There is also educational content, that was created outside European projects can be accessed through the current page.



**Fig. 3.6.** Online tools

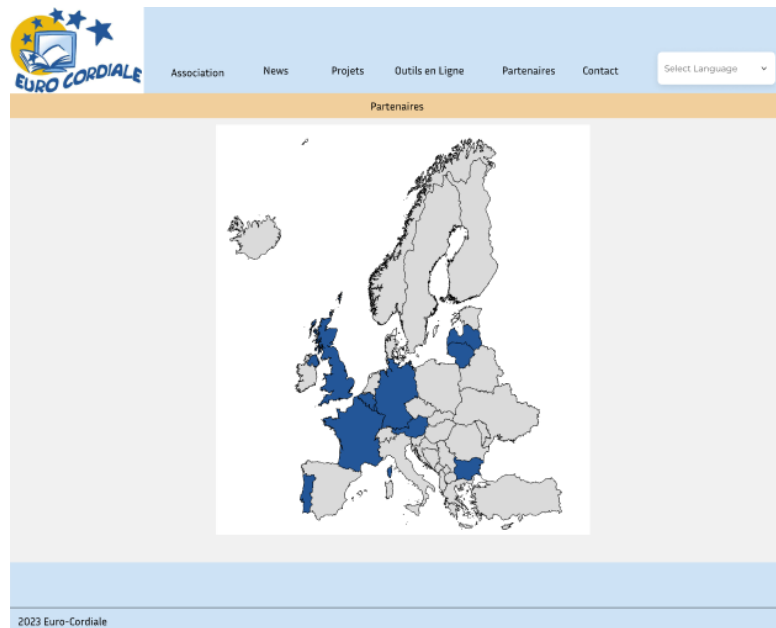
## Partners

In the partners page, a more interactive approach has been decided, instead of having a conventional list with all the partners, a dynamic European map has been implemented with the help of the Scalable Vector Graphics (SVG). SVG allows for a much flexible way to create shapes, enabling to shape the different countries on the map, letting us apply design rules to each form, which the browser sees it as a conventional HTML tag. The countries where the partners are located, are showcased in blue. Hovering a country displays a small tooltip underneath the mouse showing the name of the country, while highlighting the countries' border. Upon clicking on a country, the map slides to the left side of the screen, while on the right side of the screen, the description appears from the right border of the window. The partners are then demonstrated with their respective logo and clicking on the logo opens a new tab redirecting it to the official website of the partner.



**Fig. 3.7.** Sequence diagram for interactive partners map





**Fig. 3.8.** Partners

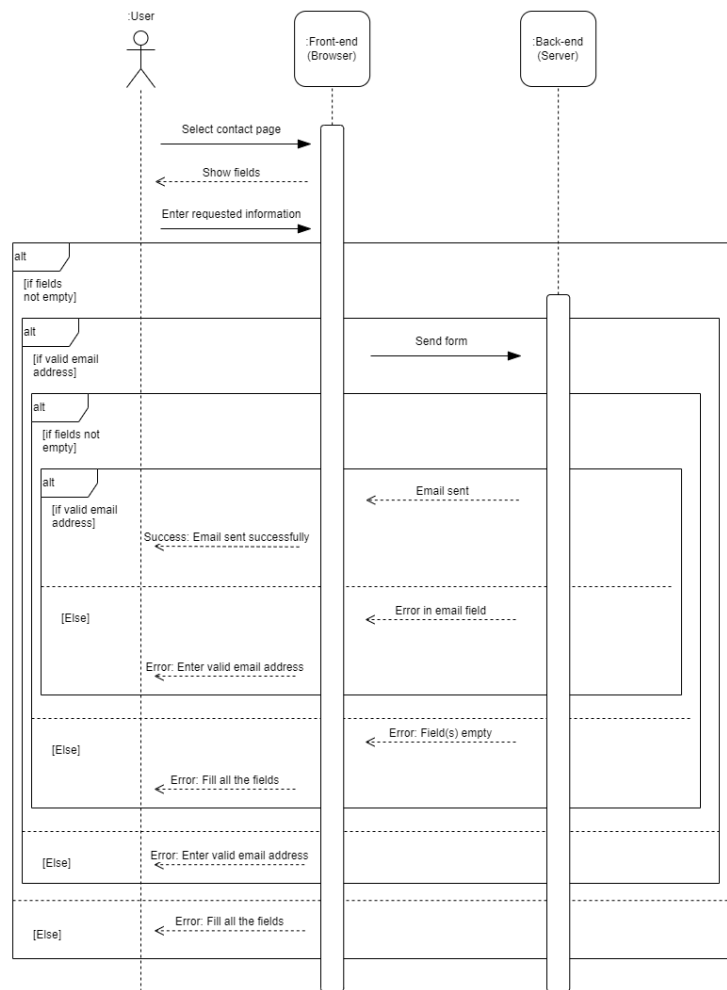
On the figure 3.7, we can analyse how the map is generated. When a user selects the "Partners" page, the front-end will directly fetch the countries from the back-end. The back-end retrieves the countries from the database. In case of the country page being available, it will pass the country to the back-end and the front-end will apply the necessary design rules and functions to make each country clickable. However, if the country is not available, it will apply a grey colour to it. The map will be presented to the user making it interactive. Upon clicking on a blue country, the front-end fetches the URL of the country from the back-end and the back-end retrieves the country's page from the database. The country's page is passed to the back-end. then it hands the page over to the front-end, opening it with all the clickable partners' logo.

### Contact

The contact page serves as a platform for providing to the users a communication channel through a form submission, eliminating unnecessary barriers of engagements between the user and the association.

Upon selecting the contact page, the page presents the necessary fields to establish a communication line by providing the full name, the e-mail, the subject and the corresponding message.

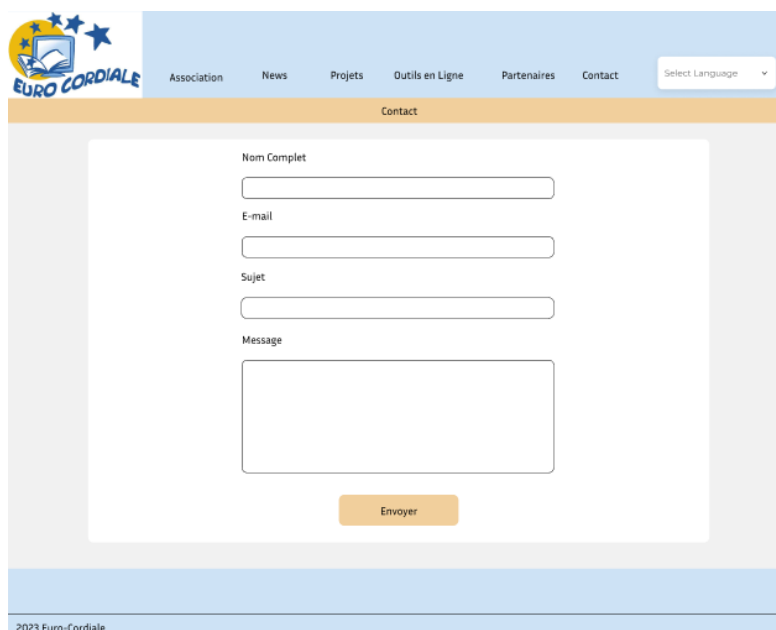
Upon entering the requested information, the browser will process them by performing sanity checks to ensure optimal execution. The sanity checks verify if any of the fields are empty, in case it passes, the next verification verifies, if the provided email address a valid one. If the email address is not valid, an error message appears, advising that the provided email address is not valid. If these two checks pass, the form is submitted to the Back-end (Server) and further checks will be done. On the back-end the same verifications, as in the front-end (Browser), are executed, leading to a good convention, avoiding any misinformation being submitted.



**Fig. 3.9.** Sequence diagram for contact submission

### Responsive for Mobile Devices

The design includes some key differences when it is used on smaller devices. The navigation bar in the header will disappear and it is moved to a side-menu. In order to open the side-menu, a burger-style button is available in the header, as illustrated on figure 3.11. The same button can then be used to close the side-menu, as demonstrated on figure 3.12. Overall for the entire website, the font is smaller and fully utilizing the width of the smaller screens.



The contact form is titled "Contact" and is part of the EURO CORDIALE website. It features a header with the logo and navigation links: Association, News, Projets, Outils en Ligne, Partenaires, and Contact. A language selection dropdown is also present. The form itself contains four input fields: "Nom Complet", "E-mail", "Sujet", and "Message". Below these fields is an "Envoyer" button. The footer indicates the year "2023 Euro-Cordiale".

Fig. 3.10. Contact

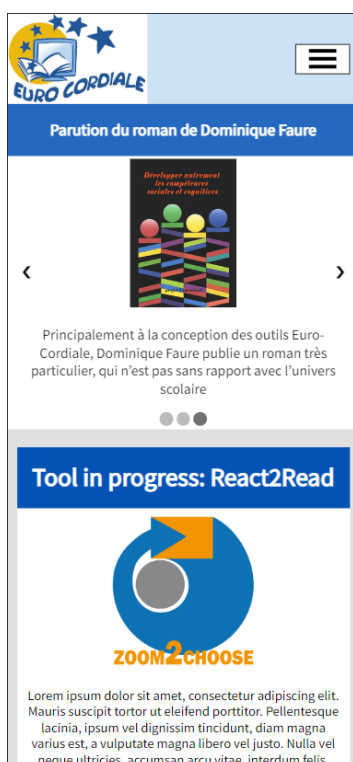


Fig. 3.11. Responsive design

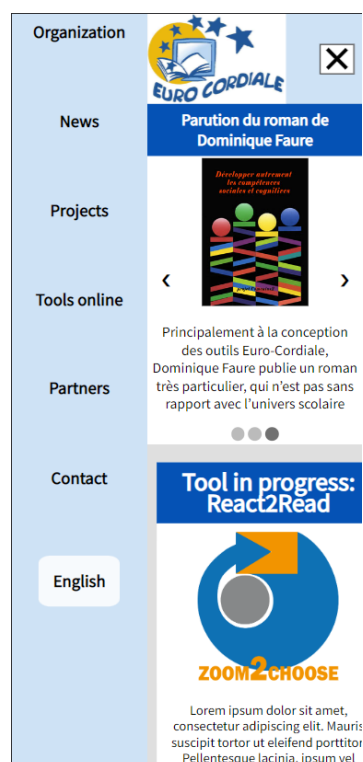


Fig. 3.12. Side-menu

## Chapter 4

# Development & Implementation

This chapter explains how the development and the implementation of the different pages have been created by explaining the methodologies used to create the code based on the documentation provided by WordPress. It consists of adhering to the software development standards to ensure consistency. The UI design is accomplished by using Cascading Style Sheets (CSS) which allows taking the different content in HTML and changing how they look and feel. [7] CSS allows creating the responsive side of a website basing its criteria on the screen size and adapting the visual elements to it to achieve the most out of the smaller devices enabling a richer user experience. [7] The prototype from section 3.2 will be used as a baseline.

The functionality of the website is accomplished using Hypertext Preprocessor (PHP) and JavaScript (JS). PHP is a back-end scripting language enabling the creation of dynamic web content by generating HTML and presenting them to the user. It allows for developers to manipulate data, handle submissions and interact with databases. [8] JavaScript is essential for creating websites, it is run on the client-side (locally) and enabling developers to create dynamic and responsive website, in contrast to PHP, which can do the same is run on the server-side meaning that it takes more bandwidth to execute the functionalities. [9]

## 4.1 Integrating WordPress into PHP

WordPress has its predefined functions to integrate the different pages/posts into the PHP files, therefore a deeper look at the official documentation of WordPress is needed<sup>1</sup>. When we first install WordPress, a number of functionalities do not come active out of the box, however these can be enabled by accessing the file called `functions.php`. This file defines the usability of WordPress by adding functionalities and rules to it. It defines the JavaScript file and the CSS file to be used by WordPress in order to apply them on the website.

In order to add the JavaScript file and CSS file into WordPress, a function to add the CSS file is available called `"wp_enqueue_style"`<sup>2</sup> and for the JavaScript file the function to be used is `"wp_enqueue_script"`<sup>3</sup>, these functions enable to identify the CSS and the JavaScript files to be used on the website. The title-tag support, the custom logo support and activating the excerpt functionality in pages have been enabled. The navigation menu has been enabled in order to be managed on the administrator page of WordPress, furthermore this can be later added to the header of the website.

WordPress uses a template hierarchy so that the administrator can define how the different pages/posts should be integrated. When a file is missing, WordPress will respect the hierarchy and fall-back to the next file in the hierarchy. We worked with posts and pages and in the hierarchy for that we will need to use the `"page.php"` and the `"single.php"` file but in order to further divide these pages down to a specific template file for a given page/post, a template file can be used to have a greater control in showing content differently on each page. In the `"page.php"` and the `"single.php"`, the slug of a page/post can be used to identify a page and therefore to apply a specific template-file. A function is available to correctly define which template file to use, the function is called `"get_template_part"`<sup>4</sup>, which takes two parameters. The first one being the path to the template files and the latter one being, the name of the specific template file.

The header and footer have their own separated files called `"header.php"` and `"footer.php"` respectively. In the header file, we will need to declare the HTML so that the browser knows what type of document to expect. We will also integrate the `"wp_head"`<sup>5</sup> function, which is a predefined function of WordPress and it allows integrating the previously defined CSS files and also the CSS files of the plugins. In the header tag, we will define the navigation menu, which contains the custom logo, the navigation menu and the burger-style button to open the menu for mobile devices.

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<sup>1</sup><https://developer.wordpress.org/>

<sup>2</sup>[https://developer.wordpress.org/reference/functions/wp\\_enqueue\\_style/](https://developer.wordpress.org/reference/functions/wp_enqueue_style/)

<sup>3</sup>[https://developer.wordpress.org/reference/functions/wp\\_enqueue\\_script/](https://developer.wordpress.org/reference/functions/wp_enqueue_script/)

<sup>4</sup>[https://developer.wordpress.org/reference/functions/get\\_template\\_part/](https://developer.wordpress.org/reference/functions/get_template_part/)

<sup>5</sup>[https://developer.wordpress.org/reference/functions/wp\\_head/](https://developer.wordpress.org/reference/functions/wp_head/)

The custom logo is called with its predefined function called `"the_custom_logo"`<sup>6</sup>, it is a function that we have previously enabled and it retrieves the logo defined in the WordPress administrator page. The navigation menu is retrieved by using the predefined function `"wp_nav_menu"`<sup>7</sup>, it takes an array of parameters which contains the menu to use, the container for wrapping the menu items, the location of the menu which is defined in the `"functions.php"` file. The burger-style menu button contains three bars and these change depending on if the side menu is opened or not. The button contains an `"onclick"` event, which defines what the button does when clicked on, the function on it is called `"toggleBurgerMenu()"`. This function handles the opening of the menu on a mobile device on the left and changes the three bars of a burger-style menu into a cross upon opening the side menu, additionally the footer file contains the footer area of the webpage with the integration of the current year, which changes automatically, using PHP and its integration is done with the `"wp_footer"`<sup>8</sup> function, it allows integrating the JavaScript files and the ones from the plugins. It also contains the closing tags of the document so that the browser knows where the HTML document ends.

Within the context of developing each template for pages/posts, we will control over how and when the elements will be displayed. To incorporate the header and the footer respectively, designated functions called `"get_header"`<sup>9</sup> and `"get_footer"`<sup>10</sup> are applied, to consistently display them across each page/post. The incorporation of the title from each page/post is accomplished by using the predefined function `"the_title"`<sup>11</sup>. However before retrieving the content of a page/post, it is necessary to confirm the presence of a specific post/page in the WordPress database using `"have_posts"`<sup>12</sup> as a precautionary measure. Thereupon, a while loop is utilized to iterate through the pages/posts until finding the correct page/post, when found retrieving it is done through the `"the_post"`<sup>13</sup> function. The content is then displayed using the `"the_content"`<sup>14</sup> function, outputting the information entered by the administrator on the administrator page.

## 4.2 Usage of Plugins

Incorporating plugins within the website offers several advantages for the administrator, facilitating the maintenance and customization of the website. The decoupling of the plugins and the direct integration of code enables for the administrator to rearrange pages, granting future

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<sup>6</sup>[https://developer.wordpress.org/reference/functions/the\\_custom\\_logo/](https://developer.wordpress.org/reference/functions/the_custom_logo/)

<sup>7</sup>[https://developer.wordpress.org/reference/functions/wp\\_nav\\_menu/](https://developer.wordpress.org/reference/functions/wp_nav_menu/)

<sup>8</sup>[https://developer.wordpress.org/reference/functions/wp\\_footer/](https://developer.wordpress.org/reference/functions/wp_footer/)

<sup>9</sup>[https://developer.wordpress.org/reference/functions/get\\_header/](https://developer.wordpress.org/reference/functions/get_header/)

<sup>10</sup>[https://developer.wordpress.org/reference/functions/get\\_footer/](https://developer.wordpress.org/reference/functions/get_footer/)

<sup>11</sup>[https://developer.wordpress.org/reference/functions/the\\_title/](https://developer.wordpress.org/reference/functions/the_title/)

<sup>12</sup>[https://developer.wordpress.org/reference/functions/have\\_posts/](https://developer.wordpress.org/reference/functions/have_posts/)

<sup>13</sup>[https://developer.wordpress.org/reference/functions/the\\_post/](https://developer.wordpress.org/reference/functions/the_post/)

<sup>14</sup>[https://developer.wordpress.org/reference/functions/the\\_content/](https://developer.wordpress.org/reference/functions/the_content/)

possibilities of customizations.

#### 4.2.1 Slideshow

The slideshow is implemented with a dynamic functionality that enables the automatic retrieval of the last three news articles. This is achieved by specifying relevant arguments in an array, these ensure how the news articles are retrieved, the desired ordering method for the retrieved news articles, the category name to filter from all the posts, in order to retrieve only the posts under the "news" category and the number of news articles to be displayed. This ensures to automatically retrieve the most up-to-date news articles. For the intention of achieving the desired outcome, the "WP\_Query"<sup>15</sup> class is necessary, it handles the retrieval of pages/posts from the WordPress database through queries. The result of the query is iterated with the "have\_posts"<sup>16</sup> function for the verification of ensuring that these exist. For each post that we retrieved from the database, the HTML is constructed using the content of the post. In addition to the slideshow content itself, two buttons are included to facilitate the control over the slides. Moreover, another section showcasing a series of dots representing an individual slide.

The design choice of the slideshow is accomplished by using a flexbox for each of the slides. The usage of flexboxes enables to define how different elements of each slide can grow or shrink by providing a percentage of space to use. The dots change to a different colour when a specific dot represents an active slide. Meanwhile, in the JavaScript file, the functionality is achieved in how the user interacts with the different elements of the slideshow. The functionality is performed by retrieving the different slides through their classname "slide". To ensure seamless navigation in the slideshow different scenarios need to be handled. When the user achieves the final slide, a mechanism is incorporated to return to the initial slide. To accurately determine the number of dots to be used, the length of the slideshow is retrieved. By obtaining it, it allows us to dynamically generate the appropriate amount of dots. Each dot is assigned the function called "currentSlide" as its "onclick" attribute. This handles the transition of the slides when a dot is clicked. Upon loading the first-page, it is essential to start from the first slide. To achieve this a variable called "slideIndex" is initialized with the value of "1". It serves as a reference point and ensures proper tracking of the position of the slides.

Three functions exist to handle the functionality of the slideshow. The first one called "changeSlide", which handles the changing to the next or previous slide. The second one is called "currentSlide", which handles the direct retrieval of a specific slide based on their position. The third function is called "showSlides", which handles the logic to show the correct slide. The first function and second function makes use of the third function to be able to do their respective

<sup>15</sup>[https://developer.wordpress.org/reference/classes/wp\\_query/](https://developer.wordpress.org/reference/classes/wp_query/)

<sup>16</sup>[https://developer.wordpress.org/reference/functions/have\\_posts/](https://developer.wordpress.org/reference/functions/have_posts/)

functionality. The "showSlides" function takes a number as a parameter. If the parameter is bigger than the number of slides, the slide jumps back to the initial slide. The same is applied for when it is smaller than the index of the first slide, jumping to the last slide. To ensure proper slide and dot visibility, specific attributes are assigned based on the "slideIndex" value. Initially, all slides are hidden, preventing to be seen on the website. When the "slideIndex" value corresponds to a particular slide, it will be displayed using a flexbox, to enable proper arrangement in the slideshow.

Finally, the implementation incorporates a function called "autoChangeSlide", facilitating the automatic transition between the slides. It uses the "changeSlide" function to transition to the next slide. Incorporated into the "autoChangeSlide", the "setInterval" function is used, which consists of two parameters. The first one references the "autoChangeSlide" function, ensuring its invocation. The latter one specifies the time duration to invoke the first parameter.

#### 4.2.2 Retrieval of Posts

The process of retrieving posts serves as an important aspect throughout the various plugins developed. By implementing them, dynamic generation of distinct HTML structures is possible for each plugin. Thus allowing for the individual customization of each plugin with its corresponding CSS styling. The plugins incorporating the post retrieval functionality aim to present the underlying posts as exemplified in figure 3.2.

#### 4.2.3 Contact Form Submission

To facilitate the submission of contact information and enabling efficient communication with the organization, this implementation relies on the "form"<sup>17</sup> element. This element serves to retrieve information from the user allowing them emailing the organization. The contact form necessitates the inclusion of specific information to email the organization, the user needs to give their full name, his email address, a subject and a message.

To ensure that all required information is provided by the user, a validation process is implemented to verify the completeness of the inputs. JavaScript is employed to execute the validation process upon clicking the "Send" button by preventing from submitting the form. The values from the four different input fields are retrieved, ensuring that these fields are not empty. In case of an empty field, an error message is returned "Please fill in all the fields". If fields are populated, the verification process proceeds with the verification of a valid email address. To validate the provided email address and to ensure it is compliant with the appropriate format, the usage of regular expression is employed (regex). A regex is a programming concept to match specific patterns in a text input. Therefore, the email address can be divided into three parts, the first one

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<sup>17</sup><https://developer.mozilla.org/en-US/docs/Web/HTML/Element/form>



being before the "@" sign. The second part being the one between the "@" sign and the "." sign and the final part being after the final "." sign. The first part of an email address is composed of either of lower-case letters or numerical digits or special characters. Subsequently, the presence of an "@" sign is required to separate the first two parts. The second part has the same requirements. Following this a "." sign is mandatory, signifying the start of the last part. It consists solely of at least two lowercase letters. This regex proves the validity of the provided email address. However, in the event of an invalid email address, an error message reading "Please enter a valid email address" is displayed. Otherwise, the next step involves to submit the form to the back-end, while removing any error message previously present on the screen.

In the back-end, the retrieval and processing of the user-submitted data is accomplished and the same verifications, as in the front-end, will be carried out. It will retrieve the fields values from the submit form. To ensure that any special characters are accurately interpreted, a function called "htmlspecialchars"<sup>18</sup> is used. It converts special characters into text that can be comprehended by HTML. Adhering to established conventions, a secondary verification is conducted to ensure that the fields are not empty and the validity of the email address. To validate the fields, the available function "empty" is utilized, while the validity of the email address is verified through the "filter\_var"<sup>19</sup> function. It uses the email address in conjunction with the "FILTER\_VALIDATE\_EMAIL"<sup>20</sup> parameter, to verify the email address. If the validation process succeeds, to send an email, it uses the "mail"<sup>21</sup> function. This allows to define the email information to be sent by passing the destination email address, the subject of the email, the message of the email and the source email address. The user will also receive a confirmation email. In case an error occurs during the sending of the email, an error message will be displayed, informing the user. Otherwise, a message appears informing the user of the success of sending the email.

### 4.3 Redirection directly to the tools

The online tools page includes all the tools to be directly accessed without going through the description of the projects. To enable direct redirection to the tools, the URL of each tool is obtained from its corresponding project description. When a user clicks on a specific tool, JavaScript prevents the redirection to the project description page. Instead, a function will fetch the URL of the tool through the project description. After retrieving the URL, two cases need to be handled, either the tool has an overlay to choose a language or a new tab is opened redirecting to the tool. To determine the presence of an overlay, a class attribute "accessButton" is assigned

<sup>18</sup><https://www.php.net/manual/en/function.htmlspecialchars.php>

<sup>19</sup><https://www.php.net/manual/en/function.filter-var.php>

<sup>20</sup><https://www.php.net/manual/en/filter.filters.validate.php>

<sup>21</sup><https://www.php.net/manual/en/function.mail.php>

to the origin of the URL. Therefore, opening the language overlay. Otherwise, a new tab will open and redirect to the tool. The logic behind the overlay will be discussed in the next section.

## 4.4 Overlay for Language Selection

To enhance the user experience for tools that offer multiple languages, a language selection overlay is implemented. This allows users to choose their preferred language on tools with multiple language support. The identification of such tools is done by assigning to the button that accesses the tool a class name "accessButton". When such a button is interacted with, JavaScript dynamically generates an overlay with the help of an "iframe"<sup>22</sup> element. An "iframe" element embeds a webpage within the current one. Upon interacting with the aforementioned button, the URL to the overlay is attributed to the newly created iframe. It will then be embedded within the webpage and the possibility to close the overlay will be accomplished through a cross. The positioning of the overlay within the webpage is placed in the centre of the screen with the webpage behind it obscured, focusing on the overlay. Within the overlay, the inclusion of country flags along with the respective language name serves as a principle to enhance the accessibility. Furthermore, animation effects, such as fading in and fading out, contributes to a fluid user experience.

## 4.5 European Partner Map

To provide a collaborative partnership by the organization, the decision to incorporate a European map instead of a list has been taken. The map serves to visually represent the various partner locations across Europe. The partner institution situated within a specific country are visually distinguished by a blue colour scheme. In contrast, countries without partner institutions will be represented with a grey colour scheme. To enhance the user experience, while hovering a country with the blue colour scheme, its borders are pronounced. A tooltip displaying the countries name is displayed underneath the cursor. Upon interaction with a specific country, the map will slide over to the left side of the screen, while the partners logo page slides in from the right screen border. The panel includes the partner's logo and the country flag as the background. Each partner logo is interactive, allowing the user to find out more about the partner on their official website.

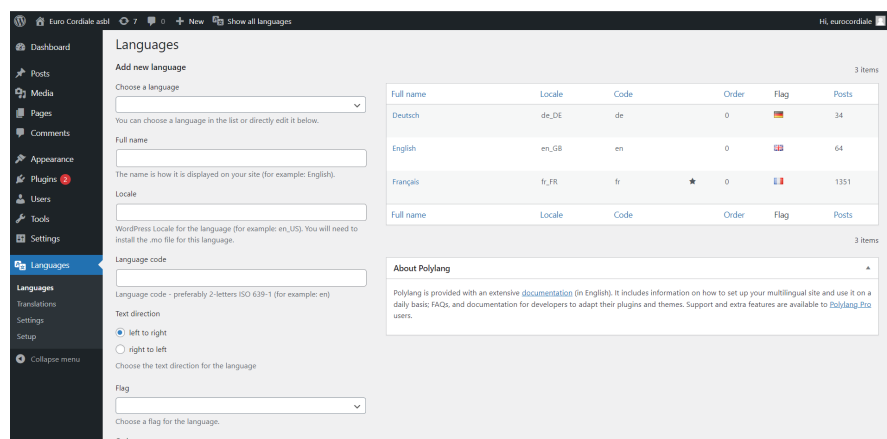
In the event that Euro Cordiale establishes a new partnership with an institution situated in a previously unrepresented country, the administrator possesses the possibility to effortlessly include it on the map. The administrator creates a new page for the new country and sets it as a child page of "Partners", while naming the URL, to the corresponding ISO code. ISO codes, a

<sup>22</sup><https://developer.mozilla.org/en-US/docs/Web/HTML/Element/iframe>

unique two-letter sequence, serve to recognize a specific country. Upon publication of the new page, the map will automatically recognize the presence of the additional subpage. The process of automating the map is established by first retrieving the subpages of the "Partners" page. After retrieving them, the URL (ISO code) will be retrieved and saved to an array. Furthermore, JavaScript will proceed with the automation process. It retrieves the map and the ID of each country. The ID is a unique identification for a specific element. JavaScript iterates through the IDs and compares them to the aforementioned saved URL (ISO code) array. In case of a found match, the invocation of the "applyRulesToCountry()" function is applied on the country element. Within the "applyRulesToCountry()" function, it retrieves the element of the country, the placeholder for the country's representation and the map. Upon clicking the country an event is triggered by verifying if the current opened country is the same. In case of a match the country remains open, otherwise it proceeds to close the country and open the new one.

## 4.6 Translating with Polylang

During the initial configuration of Polylang, it prompts us to specify in which language the website is created. Thereupon, it presents the choice in which additional languages the website will be translated to. Upon completion, the configured languages are displayed on the administrator page as exemplified in figure 4.1.



**Fig. 4.1.** Polylang menu

Polylang enables to translate all the information, including pages, posts and categories. Specifically, through a new emerged column on the administrator page, displaying the languages for translation, such behaviour can be observed on figure 4.2. Upon selecting a specific entry, the plugin allows adding a new page for translation purposes through the aforementioned column. The adding of new pages is the same procedure as adding a normal WordPress page or post.



































<input type="checkbox"/> Title	Author					Date
<input type="checkbox"/> 100 Berufe lebendig in Szene gesetzt	eurocordiale				—	Published 2023/05/12 at 11:59
<input type="checkbox"/> 100 Berufe lebendig in Szene gesetzt	eurocordiale				—	Published 2023/05/12 at 12:00
<input type="checkbox"/> 100 Berufe lebendig in Szene gesetzt	eurocordiale				—	Published 2023/05/10 at 15:55
<input type="checkbox"/> 100 job descriptions brought to life	eurocordiale				—	Published 2023/05/12 at 09:31
<input type="checkbox"/> 100 job descriptions brought to life	eurocordiale				—	Published 2023/05/12 at 09:32
<input type="checkbox"/> 100 job descriptions brought to life	eurocordiale				—	Published 2023/05/11 at 16:57
<input type="checkbox"/> 100 métiers racontés par leurs acteurs	eurocordiale				—	Published 2023/05/12 at 13:21
<input type="checkbox"/> 100 métiers racontés par leurs acteurs	eurocordiale				—	Published 2023/05/12 at 13:21
<input type="checkbox"/> 100 métiers racontés par leurs acteurs	eurocordiale				—	Published 2023/04/25 at 16:18
<input type="checkbox"/> Accueil — Front Page	eurocordiale				—	Published 2023/04/11 at 13:08

Fig. 4.2. Languages column



## Chapter 5

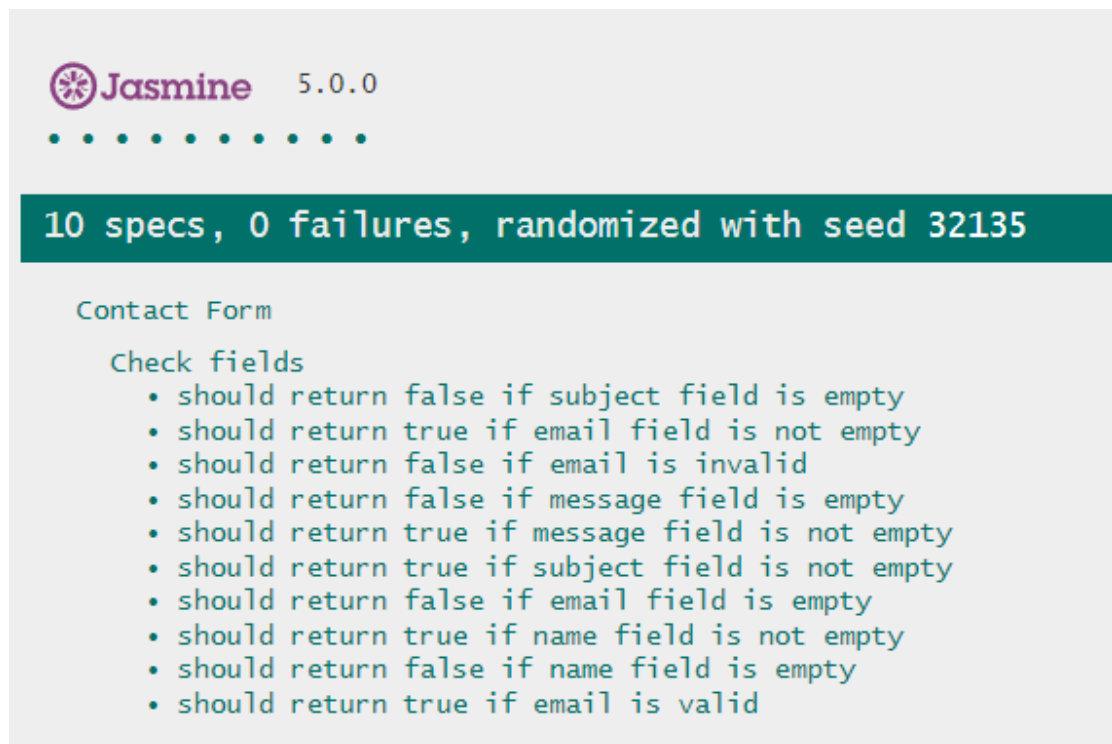
# Testing

This chapter explains the testing phase of the website and is one of the most important part of the development process by providing proof that the code works as intended.

## 5.1 Unit Tests

Unit tests facilitate the verification and validation of the code. As developers make modifications to the code, there is a risk of creating new bugs that were not previously known. In order for developers to prevent this kind of behaviour, they can develop unit tests to test the code automatically, without manual intervention from the developer. When we talk about a unit, we refer to the smallest part of the code, where we can perform a test. After performing changes to the code, they can simply run the tests and see if the different test cases pass. In case of a failed test, the framework for testing the code, tells exactly in which line the test failed and is a good starting point to search for the problem. [10]

On our case, we used unit tests to test the different input fields of the contact submission. This will be done using the Jasmine framework<sup>1</sup>. As shown on figure 5.1, we can see that all the tests passed for submitting a contact form. For our test cases, we have tested if any of the fields are empty, if any of the fields are populated and if the email address given by the user is a valid email address.



**Fig. 5.1.** Unit test for contact submission

---

<sup>1</sup><https://jasmine.github.io/>

## Chapter 6

# Results

This chapter will visually showcase the differences between the old and the new website with an explanation of the adaptive resource recommendation. We will have a closer look to the results received by the topic model.



## 6.1 Comparison between the old and the new Website

### First-Page

On the first-page of the new website as seen on figure 6.2, we first have a new intuitive menu with a language selection. We can see that the new first-page has a slideshow, showcasing the latest three news. Additionally, the first-page shows a tool in progress and the last finished project, while on figure 6.1, which is the old first-page, we only get the latest news article, and an incomplete side-menu and header take most of the space.

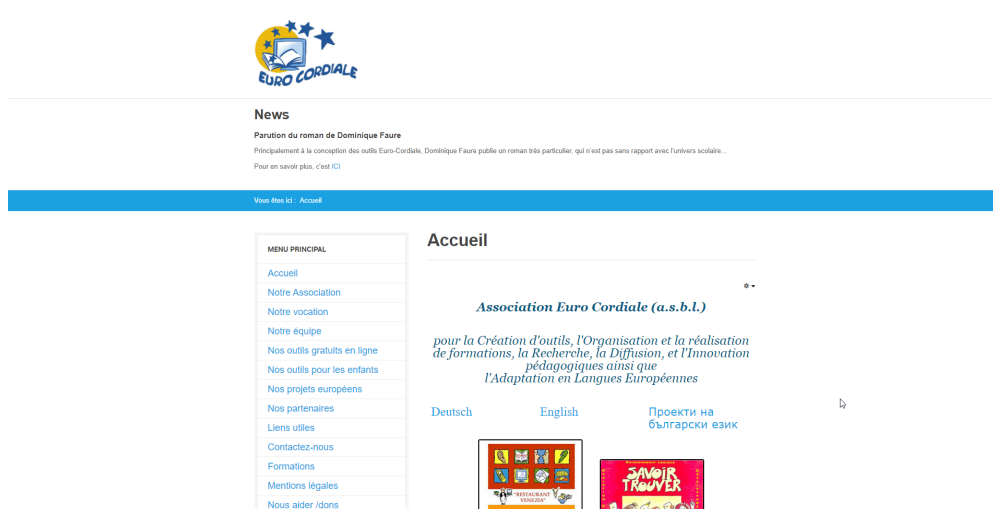


Fig. 6.1. Old Website: first-page

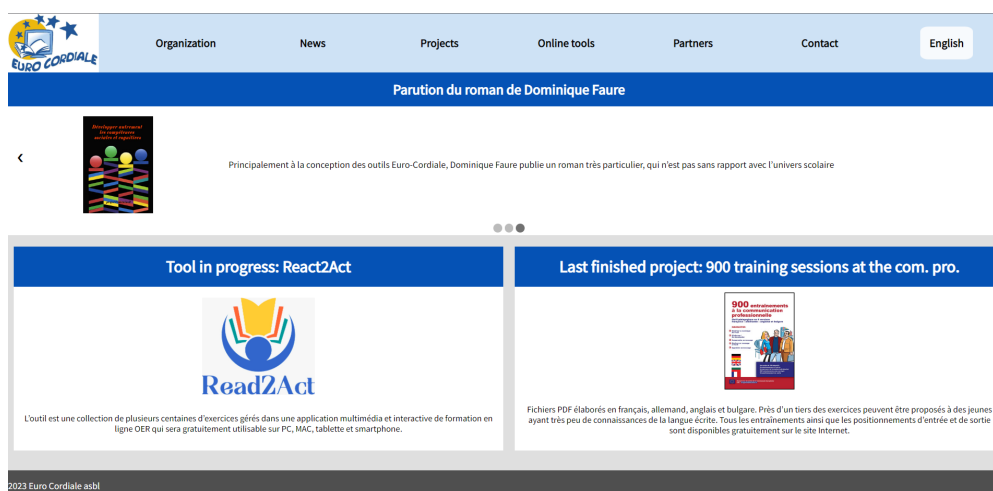


Fig. 6.2. New website: first-page

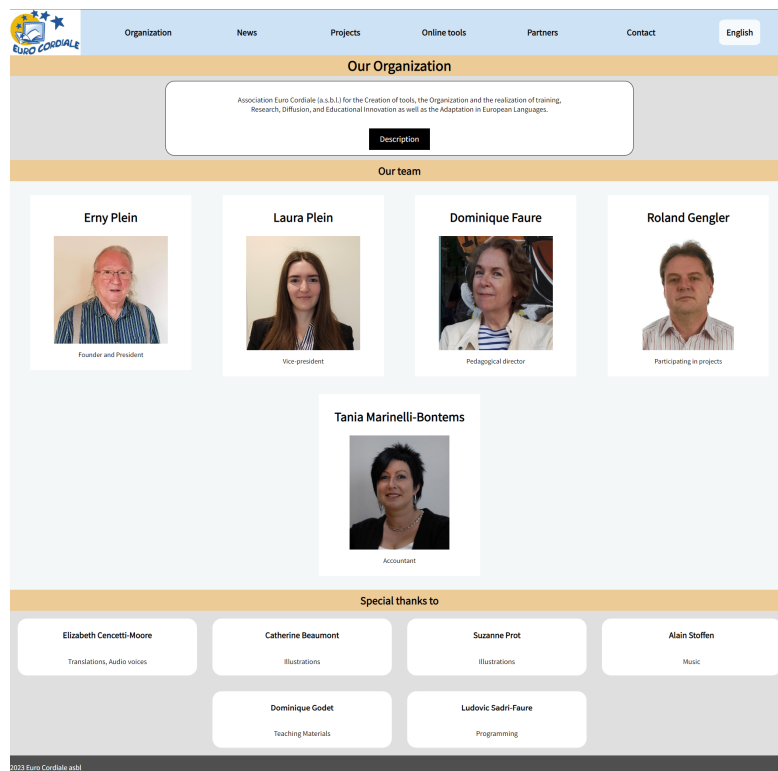
## Organization

On the organization of the team, we can see a big difference, while on figure 6.3, it only has a standard list of the employees and we do not get any extra information about them at a glance. The list is also not up-to-date. On the new website, the differences are night and day, on figure 6.4, we can see that it is not a boring list and we can directly identify the roles of each employee and a picture is also available.

## Notre équipe

- 
- [Erny Plein](#)
  - [Dominique Faure](#)
  - [Elizabeth Cencetti-Moore](#)
  - [Catherine Beaumont](#)
  - [Suzanne Prot](#)
  - [Alain Stoffen](#)
  - [Dominique Godet](#)
  - [Ludovic Sadri-Faure](#)
  - [Tania Marinelli-Bontems](#)
  - [Les acteurs Agnès Manoury et Frédéric Popovic](#)
  - [Laura Plein](#)

**Fig. 6.3.** Old website: organization/team



**Fig. 6.4.** New website: organization/team

## News

The new website (figure 6.6) provides a nice overview of the latest news, containing directly the whole post with picture and description. Previously, the website (figure 6.5) only offered a list of news and displayed metadata that is not supposed to be visible to the users.

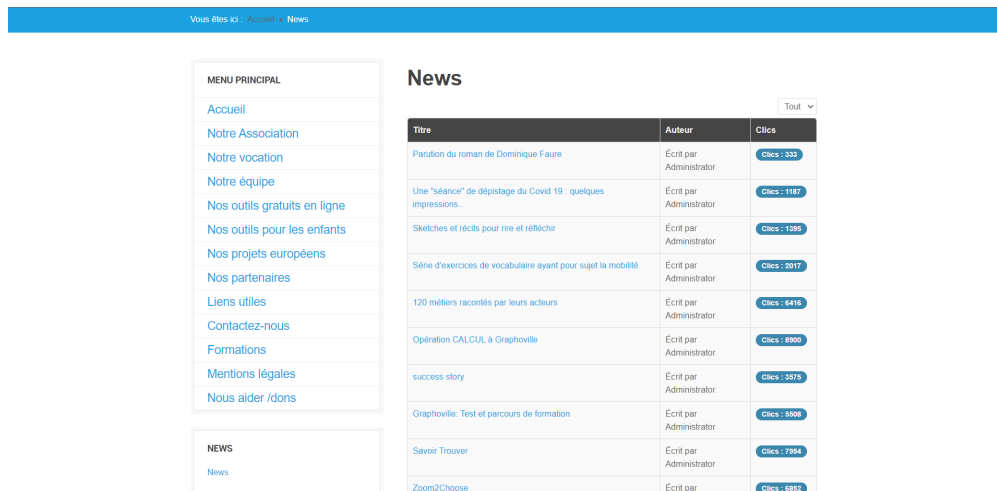


Fig. 6.5. Old website: news

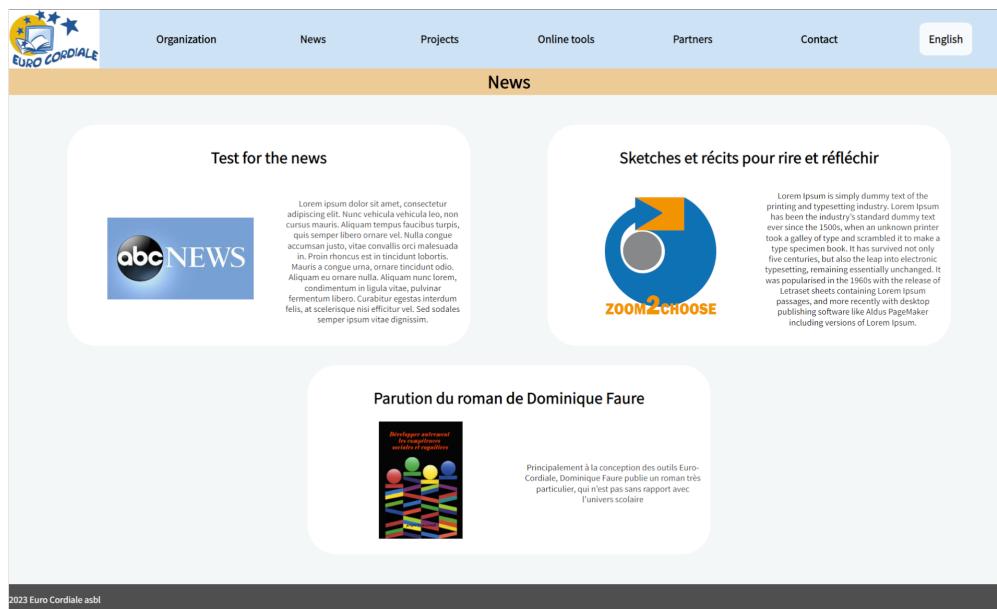


Fig. 6.6. New website: news

## Projects

The projects on figure 6.1 are scattered out on the page and it is on the wrong page, because it is on the first-page. The projects only have their logo shown and to know anything further about them, the user needs to select a project, without an overview about the project. On figures 6.7, we can see that we have a much clearer overview of the projects with the title, description and logo. The projects are also in a grid and they are not scattered around the page.

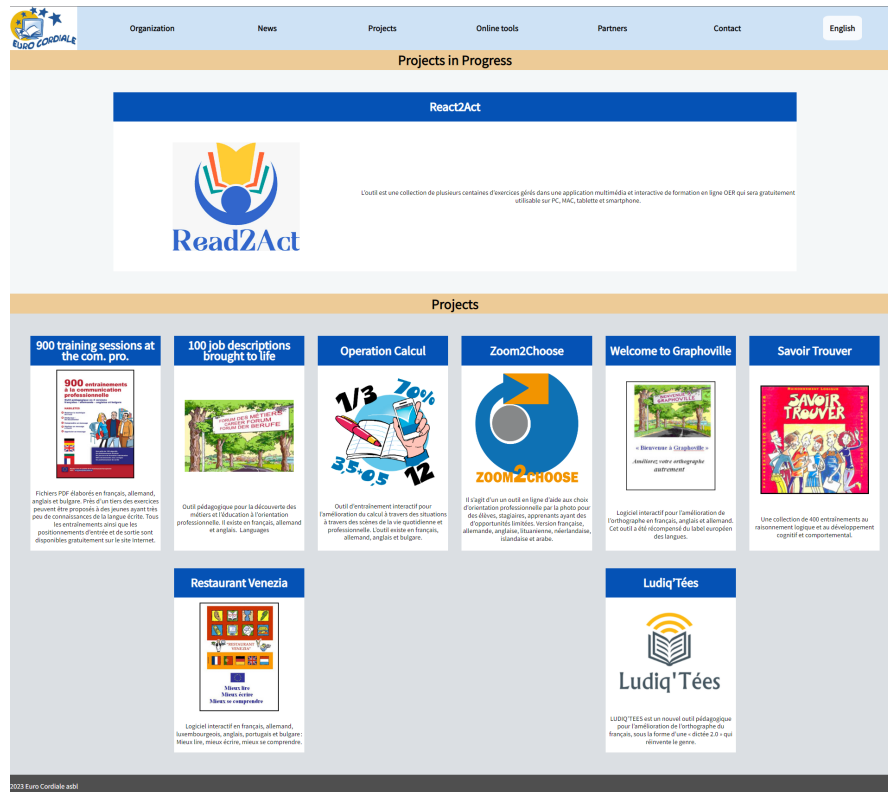


Fig. 6.7. New website: projects

## Project Description

When it comes to each project description, on the old website the structure for each project description changes and mainly the layout also changes, making it really difficult to have a consistent understanding of the website. On figure 6.8, we can observe that the links and layout of the pictures are not coherent as well the font used is not the same throughout the page. The title does not match to the project title. On figure 6.9, the structure and layout is consistent on all project description. On the left, we have the text description of the project, on the right we have the basic information of the project. It includes the logo, a button to access the tool and the available languages of that tool.

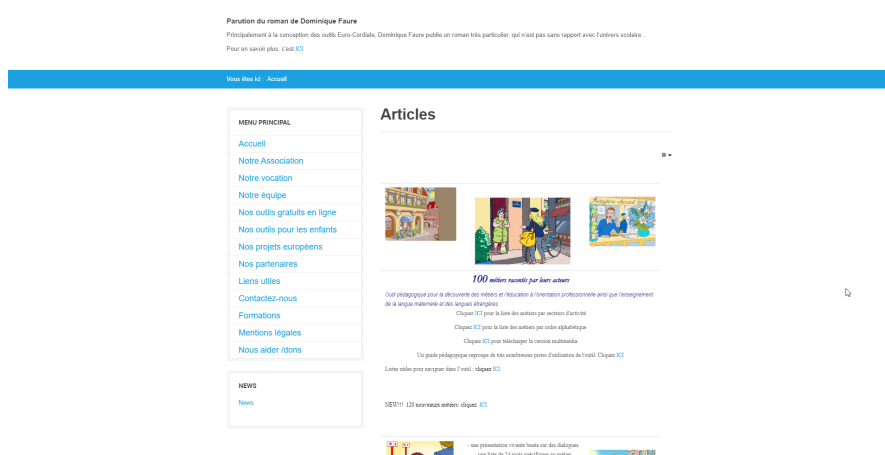


Fig. 6.8. Old website: project description

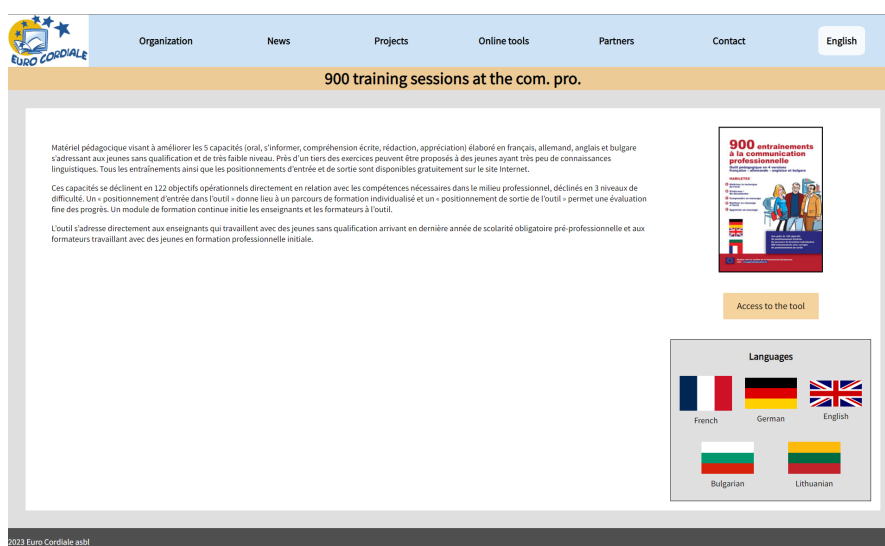


Fig. 6.9. New website: project description

## Online Tools

The Online tools page consists of having direct access to the tools without needing to pass through the project description. On the old website, figure 6.10, it was a simple list, but the different sections did not make any sense at all in contrast with the items in that specific list. On figure 6.11 the page is divided into three major sections, which are "Tools in progress", "Tools online" and "Tools to download". When the user selects a tool, it will lead them directly to the tools.

## Nos outils gratuits en ligne



Fig. 6.10. Old website: online tools

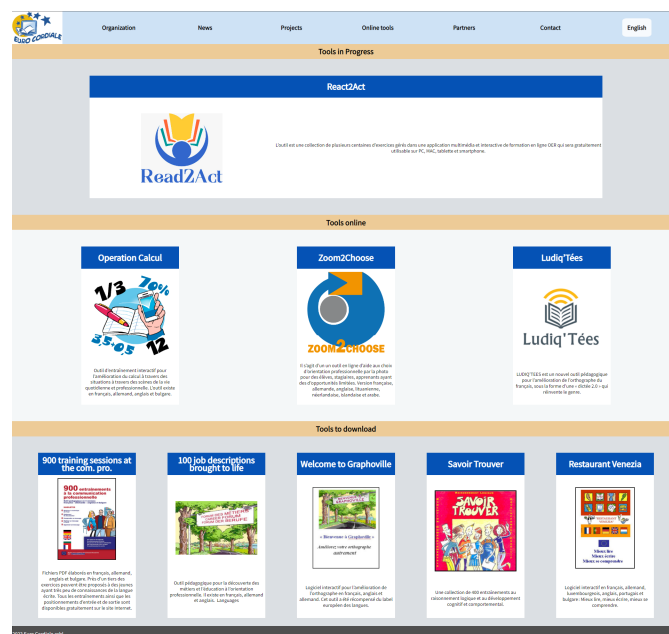


Fig. 6.11. New website: online tools

## Partners

The partners page had a major overhaul in presenting the partners of Euro Cordiale. On the old website, the partners were simply presented as a list which makes it really hard to find a specific partner in that list, as one can see on figure 6.12. On the new website, the act of finding a partner is now more interactive for the user. Now a map is shown and the countries, where the partners are located, are in blue and the rest is in grey, as it can be seen on figure 6.13. At the start, the map is in the middle, but when the user selects a country, the map slides to the left and on the right the country of choice slides in from the right, as seen on figure 6.14. The partners are now shown through their company/institution logos and when clicked, it leads in a new tab to their official website.

### Nos partenaires

#### Luxembourg:

- Centre National de la Formation Professionnelle Continue, Esch
- Chambre des Employés Privés, Luxembourg : [www.cepl.lu](http://www.cepl.lu)
- Institut Supérieur d'Etudes et de Recherches Pédagogiques, Walferdange remplacé aujourd'hui par l'Université : [www.uni.lu](http://www.uni.lu)
- Lycée Technique Esch : [www.lte.lu](http://www.lte.lu)
- Lycée Technique Ettelbruck [www.ltett.lu](http://www.ltett.lu)
- Nordstadlycée Diekirch : [www.nordstadlycee.lu](http://www.nordstadlycee.lu)
- Lycée Technique Joseph Bech, Grevenmacher : [www.ltjb.lu](http://www.ltjb.lu)
- Lycée Technique Mathias Adam, Pétange : [www.ltma.lu](http://www.ltma.lu)
- Service de l'Education en Prison
- Service de la coordination de la scolarité des enfants étrangers
- Service de la formation des adultes (Centre de Langues Luxembourg) : [www.cll.lu](http://www.cll.lu)
- Centre de Technologie de l'Education : [www.cte.lu](http://www.cte.lu)

#### Allemagne:

- Arbeitskreis Orientierungs- und Bildungshilfe, Berlin <http://www.aobberlin.de>
- Bildungswerk Kreuzberg, Berlin <http://www.bwk-berlin.de>
- Dorothea Beckmann Medienbüro, Berlin <http://www.db-medienbuero.de>
- Grund- und Hauptschule Wincheringen
- Institut für schulische Fortbildung und schulpsychologische Beratung des Landes Rheinland-Pfalz, Saarburg <http://ifb.bildung-rp.de/wir-ueber-uns/standorte/regionale->

**Fig. 6.12.** Old website: partners



**Fig. 6.13.** New website: partners



**Fig. 6.14.** New website: partners

## Contact

The differences between the figures 6.15 and 6.16 are not that big but the design has been adapted to the newer design template and utilizing more of the screen space that is available.



## Contactez-nous

### Euro Cordiale a.s.b.l.

Contact

Formulaire de Contact

Envoyer un e-mail. Tous les champs précédés d'un \* sont obligatoires.

Nom \*

E-mail \*


Sujet \*

Message \*

Envoyer une copie à ☐ votre adresse

Envoyer

**Fig. 6.15.** Old website: contact


Organization
News
Projects
Tools online
Partners
Contact
English

Contact

Full name\*

E-mail\*

Subject\*

Message\*

Send

2023 Euro Cordiale asbl

**Fig. 6.16.** New website: contact

## Chapter 7

# Limitations & Future Work

The website disposes of multiple PDF documents, therefore a resource recommendations system could be beneficial. This system would predict the underlying topics of each document through a state-of-the-art technology called topic modeling with BERTopic. [11] We would need to provide a preprocessed dataset to the model. The dataset would be the documents from the project "100 job descriptions brought to life". These documents would need to be preprocessed to reduce the noise present in the dataset. Noise can be classified as stop words, punctuations, numerical values and phrases that do not contribute to the topic prediction. [12]

After the preprocessing, the preprocessed text would be inserted together with their respective document IDs into a dataframe. The next step involves extracting the features from the preprocessed text. This can be accomplished by using a pre-trained model such as "bert-base-uncased" or "bert-base-multilingual-uncased". The first one is only for English text and the latter one is for languages other than English, more specific for one hundred and four languages. These models were trained on a large corpus of text in their respective languages. [13] By extracting features, we mean tokenizing the preprocessed text into numerical data and the result of these are called embeddings. Embeddings are vector representations of documents, used to calculate the distance between each document. These distances will be calculated, in order to get a list of recommendations for each document. [12] The lists of recommendations are inserted together with their respective document in a dataframe. This dataframe can be included on the website. Based on the user's interaction, the recommendation bar would adapt the recommended documents accordingly.

The preliminary results from the topic modeling were unsatisfying. For the English dataset the pretrained model "bert-base-uncased" outputted good results in recommending other documents. On the other hand, for the French and German dataset, these had lackluster results. The pretrained model "bert-base-multilingual-uncased" is trained on one hundred and two languages and these are yet not good models based on our results. On the research paper for the previous pretrained

model, it reports that it can have biased predictions. [13] The previous model is inferior to predict when applied to a dataset and it lacks in comparison to its monolingual counterparts. [14]

All the fields from the contact form submission were tested, but the functionality of sending an email was not, as for future work this has to be tested. Such testing should be done with the help of a local mail server. It is important to assure any input fields present on the website, as these can be a way to exploit. The new website will first be published online under "www.test.euro-cordiale.lu" alongside the old website. This allows for future testing of the website without disrupting users from getting their resources or information.

## Chapter 8

# Conclusion

The primary objective of this internship was to develop a new design template and website for Euro Cordiale. The main challenge of this project was to address the weaknesses of the previous website, while taking into consideration the requirements for the website's audience.

The old website had major design problems, such as text overlappings, font and color related issues that made the text completely unreadable. There were also navigability problems for the user, it was really difficult to find any information. Therefore, when considering solutions, we needed to understand if the proposed fixes were in-line with the needs of Euro Cordiale and if they would really be beneficial for the users experience on the website. Additionally, an analysis of the old website, and the user statistics was helpful in the process of defining solutions.

For the development & implementation of a more modern and sleek design, the first action was to develop the basics and to set up the foundations by understanding how WordPress works and how it is implemented. In order to give more flexibility for the organization when modifying the content of the website, several plugins were created. Finally, we carried over all the resources from the old website, backed everything up and translated all pages into English, French and German.

When we tested the website, we first tested it manually, like a normal user, to see if the feeling and accessibility was improved. Afterwards, we did unit tests for the contact form submission because it is the only way the user can introduce information and this has to be secured. At the end, figures of the old and new website have shown the visual improvement that lead to a better usability.

In summary, the main objective of the internship was to develop a new website and through the feedback received from Euro Cordiale, it can be deemed as a success. Euro Cordiale 2.0 is now a modern, intuitive and interactive website promoting Euro Cordials projects while providing a great and personalized user experience.



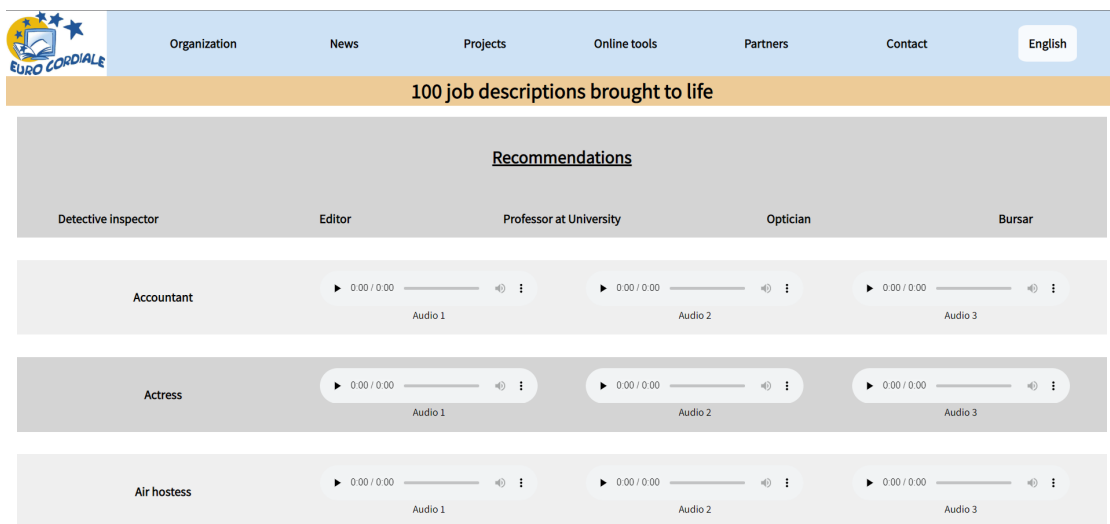
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- [12] Bereket A Yilma and Luis A Leiva. The elements of visual art recommendation: Learning latent semantic representations of paintings. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, pages 1–17, 2023.
- [13] Jacob Devlin, Ming-Wei Chang, Kenton Lee, and Kristina Toutanova. BERT: pre-training of deep bidirectional transformers for language understanding. *CoRR*, abs/1810.04805, 2018.
- [14] Samuel Rönnqvist, Jenna Kanerva, Tapio Salakoski, and Filip Ginter. Is multilingual bert fluent in language generation? *arXiv preprint arXiv:1910.03806*, 2019.

# Appendix

Figure 8.1 exemplifies of how the adaptive resource recommendation bar would look like. It figures five links to documents and these adapt to the user's interaction with the resources underneath it.



**Fig. 8.1.** Recommendation bar



**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

**Bachelor Project**  
Progress Report

Student:

NAME, First name     Da Cruz Pereira João Delfim

Student number       0201831110

Host Institution:

Name                     Euro Cordiale a.s.b.l.

Local responsible:

NAME, First name     Plein Ernest

Academic responsible:

NAME, First name     Bereket Abera Yilma

Period:

From                     20/02/2023

To                         08/03/2023

*This document shall be completed and send to the academic responsible with copy to the local responsible before the end of each period. Each period consists of 3 weeks. Please add pages if provided space on the next page should not be sufficient.*

*All the progress reports must be attached to the final Bachelor project report in an appendix.*



**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

**Bachelor Project**  
Progress Report

Student:

NAME, First name     Da Cruz Pereira João Delfim

Student number       0201831110

Host Institution:

Name                     Euro Cordiale a.s.b.l.

Local responsible:

NAME, First name     Plein Ernest

Academic responsible:

NAME, First name     Bereket Abera Yilma

Period:

From                     13/03/2023

To                         31/03/2023

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**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

Work done during the current period:

In these 3 weeks, I have continued to develop the website in WordPress with the help of plugins created by me. The idea of using self-made plugins for the website instead of implementing it directly into PHP is to allow for future users to move the content around much easier with the WordPress editor, for that I have done research about the development of plugins in WordPress on their official documentation. I also had in-person meetings and online meetings with my local responsible where I showed the website and we talked about possible little modifications that came up during the meeting to the website. The website also has a partner map where the map shows in which country partners are available. I have created the JavaScript in such a way so that when in the future someone adds a new country with a new partner the map gets automatically updated with that new partner. I also have a meeting with my local responsible and with the academic responsible to further talk about the thesis and about the job done until now on the website.

Foreseen work for the following period:

The foreseen work is to finish the website by implementing the translations, to finish the design of the website, to make the mobile and tablet versions and to transfer all the data that is available in the current online website to the new one. I will also continue to have online and in-person meetings with my local responsible to discuss about the work done. I will also then show the website to the local responsible when I have finished it so that we can further see if there are any improvements to be made, if not then I will test the website.

Date: .....31/03/2023.....

.....31/03/2023.....

Signatures: .....  
(Local responsible)

*Sh*

.....  
(Student)

*João*

**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

**Bachelor Project**  
Progress Report

Student:

NAME, First name     Da Cruz Pereira João Delfim

Student number        0201831110

Host Institution:

Name                     Euro Cordiale a.s.b.l.

Local responsible:

NAME, First name     Plein Ernest

Academic responsible:

NAME, First name     Bereket Abera Yilma

Period:

From                     03/04/2023

To                         21/04/2023

*This document shall be completed and send to the academic responsible with copy to the local responsible before the end of each period. Each period consists of 3 weeks. Please add pages if provided space on the next page should not be sufficient.*

*All the progress reports must be attached to the final Bachelor project report in an appendix.*



**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

Work done during the current period:

In these 3 weeks, I have continued to develop and to finish the design of the website. The design needed a little adjusting and to show it to the local responsible for the approval of the design and to change it according to the requests from the local responsible. The functionality of the pages work with their respective animations and with their respective links for interaction. I have also introduced the data of the information given by my local responsible to implement into the website in their respective places, such as the text on each project, the audio files and the PDF documents. I have done some research about the translation of the website and I tried to use gettext for the translation, but it won't work for the content stored in the database by WordPress. There were also some bugs found and I fixed them such as when adding a new partner then the country with a whitespace wouldn't show up on the map. Therefore, I will use a plugin on the marketplace to be able to make the translations into German, French and English. I have also started to write the thesis about my project.

Foreseen work for the following period:

The foreseen work is to finish the website by implementing the translations, to test the mobile and the tablet versions of the website and to test the website as a final user. I will continue to work on the thesis. I will continue having in-person and online meetings with my local responsible.

Date: .....20/04/2023.....

.....20/04/2023.....

Signatures: .....  
(Local responsible)

.....  
(Student)

**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

**Bachelor Project**  
Progress Report

Student:

NAME, First name     Da Cruz Pereira João Delfim

Student number        0201831110

Host Institution:

Name                     Euro Cordiale a.s.b.l.

Local responsible:

NAME, First name     Plein Ernest & Plein Laura

Academic responsible:

NAME, First name     Bereket Abera Yilma

Period:

From                     24/04/2023

To                         12/05/2023

*This document shall be completed and send to the academic responsible with copy to the local responsible before the end of each period. Each period consists of 3 weeks. Please add pages if provided space on the next page should not be sufficient.*

*All the progress reports must be attached to the final Bachelor project report in an appendix.*

**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

Work done during the current period:


In these 3 weeks, I have finished with the design of the website. I have done the design for the different mobile devices for smartphones and tablets. I have carried over all the projects/information of the old website into the new one. These projects include PDF files, audio files and descriptions of the different projects. I have finished with the translation of the website in English, in French and in German. I have tested the website locally and I have continued to write the thesis. I have had meetings with my local responsible and a meeting with my academic responsible.

Foreseen work for the following period:

The foreseen work is to speak with my local responsible to submit the website to the online hosting provider to set the website online. I will be testing the website when the website is online. I will continue writing the thesis and finishing it in the following weeks.

Date: ...12/05/2023.....

.....12/05/2023.....

Signatures: ..........  
(Local responsible)

..........  
(Student)



**University of Luxembourg**  
**Faculty of Science, Technology and Medicine**  
**Bachelor in Applied Information Technology**

**Bachelor Project**  
Progress Report

Student:

NAME, First name     Da Cruz Pereira João Delfim

Student number        0201831110

Host Institution:

Name                     Euro Cordiale a.s.b.l.

Local responsible:

NAME, First name     Plein Ernest & Plein Laura

Academic responsible:

NAME, First name     Bereket Abera Yilma

Period:

From                     15/05/2023

To                         02/06/2023

*This document shall be completed and send to the academic responsible with copy to the local responsible before the end of each period. Each period consists of 3 weeks. Please add pages if provided space on the next page should not be sufficient.*

*All the progress reports must be attached to the final Bachelor project report in an appendix.*

