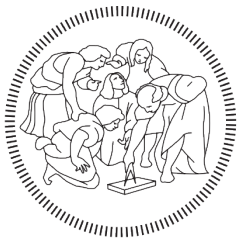

POLITECNICO
MILANO 1863

Project Implementation

Hypermedia Applications

Link to the project

Link to the repository

HyperMeow

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Contents

1 Work Distribution

In our team, we decided to split the work based on individual strengths and areas of interest. Each team member primarily managed specific pages within the project, focusing on the queries and display of content related to those pages.

The subdivision can be described as follow:

- `Featured Projects`, `Projects` and `[projectid]` were managed by Arturo
- `People` and `[personid]` were managed by Maria Stella
- `Areas` and `[areaid]` were managed by Loris
- `About us` and `Contact us` were managed by Francesco

The `Homepage` was the final page we developed, created through a collaborative effort by Maria Stella, Arturo, and Francesco. Maria Stella and Francesco were responsible for the programming aspects of the page.

The CSS styling and responsiveness was primarily handled by Maria Stella, Francesco, and Loris, while Arturo set up the project, establishing the initial connections between different components of the system, handled the backend logic, deployment, and the overall design of the pages. Initially, queries were written collaboratively by Arturo and Francesco, ensuring consistency and coherence across the project. However, as development progressed, each team member had the freedom to modify and add queries as necessary to meet the requirements of their assigned pages. This approach allowed us to have ownership over our respective areas and make necessary adjustments based on specific page functionalities and content requirements. Finally, the design and implementation reports were written by Arturo and Maria Stella.

By dividing the work in this manner, we were able to leverage our individual skills and expertise effectively while ensuring a cohesive and efficient development process. Regular communication and collaboration within the team played a crucial role in coordinating our efforts and ensuring a seamless integration of different components into the final product.

2 Project Description

The implementation project focuses on a Venture Capital (VC) theme, highlighting the key components that define the VC and its operations. The project showcases the following main contents:

- **The VC in general**: This section provides an overview of the Venture Capital, explaining its purpose, mission, and approach to investments. It explores the core values and principles that guide the VC's decision-making process and its role in supporting entrepreneurial ventures.
- **Main People**: This section introduces the key individuals involved in the VC, showcasing their expertise and contributions. Each person is accompanied by a picture and a concise curriculum vitae (CV) that highlights their educational background, past job experiences, and main areas of expertise. This allows readers to understand the diverse skill sets and qualifications of the team driving the VC's success.
- **Projects funded by the VC**: Here, the website presents an extensive list of projects that have received funding from the VC. Each project is accompanied by a detailed and articulate presentation that includes text and pictures. The presentation showcases the start-up or company managing the project, providing insights into their team, the product or service they deliver, and any notable achievements or milestones.
- **Thematic Areas**: The website identifies and categorizes the thematic areas of investment pursued by the VC. These thematic areas represent specific sectors or industries where the VC focuses its investments. Examples of thematic areas could include Healthcare, Technology, Growth, or other relevant sectors. This section provides an understanding of the VC's investment priorities and highlights the diversity of sectors in which it operates.

For this project, we present **HyperMeow** —a global venture capital firm following a minimal and impactful theme. We drive innovation and growth by collaborating with visionary entrepreneurs and disruptive startups. Our theme embodies simplicity and effectiveness, focusing on the essential elements that propel transformative ideas forward. With a global perspective, we reshape opportunities worldwide, empowering the next generation of innovators. Through discerning investments, we catalyze change and propel industries forward.

Figure 1: HyperMeow's logo

3 Project structure

3.1 Frontend

- **About**

  The About page provides information about HyperMeow as a venture capital firm. It highlights the firm's mission, values, and accomplishments, giving users a comprehensive overview.

- **Areas**

  The Areas page showcases different thematic areas or sectors in which HyperMeow invests. It presents a list of areas and their associated projects, providing users with insights into the specific industries or technologies the firm focuses on.

- **Contacts**

  The Contacts page contains contact information and a contact form for users to get in touch with HyperMeow. It serves as a communication channel for inquiries, partnership opportunities, or general feedback.

- **FeaturedProjects**

  The FeaturedProjects page highlights a selection of notable projects that HyperMeow has funded. It presents these projects with a brief description, showcasing their innovative solutions and the impact they have made.

```
C:.
    About.vue
    Areas.vue
    Contacts.vue
    FeaturedProjects.vue
    index.vue
    People.vue
    Projects.vue

├───areas
        [areaid].vue

├───people
        [personid].vue

└───projects
        [projectid].vue
```

Figure 2: Pages' structure

- **index**

  The Index page serves as the homepage of the website. It provides a brief introduction to HyperMeow and highlights key sections such as featured projects, areas of investment, team members, and contact information.

- **People**

  The People page introduces the team members and key personnel at HyperMeow. It presents a list of individuals involved in the venture capital firm, highlighting their roles, expertise, and contributions.

- **Projects**

  The Projects page offers an extensive list of projects funded by HyperMeow. It allows users to explore various projects, providing comprehensive information about each project's background, objectives, achievements, and team members involved.

- **[areaid]**

  The [areaid] pages represent individual thematic areas in detail. Each [areaid] page focuses on a specific area of investment, presenting a more comprehensive overview of the projects, industry insights, and potential opportunities within that area.

- **[personid]**

  The [personid] pages showcase individual team members or key personnel in depth. Each [personid] page provides detailed information about a team member's background, experience, expertise, and contributions to HyperMeow.

- **[projectid]**

  The [projectid] pages offer detailed information about specific projects funded by HyperMeow. Each [projectid] page presents an in-depth analysis of a project's objectives, impact, milestones, team members involved, and future prospects.

3.2 Backend

Endpoint list:

- `/getProjects`

  This endpoint retrieves a list of all projects funded by HyperMeow. It provides all the information that should be displayed in each projectCard, including projectID, title, preview, stage, year of foundation and list of areas concerned.

- `/getFeaturedProjects`

  This endpoint fetches a selection of featured projects funded by HyperMeow, providing the same information described in the previous endpoint.

- `/getProject/<projectid>`

  This dynamic endpoint retrieves detailed information about a specific project based on the provided project ID. It returns all the information about the specific project, including its supervisor and areas of concern.

- `/getProjectsFromArea/<areaid>`

  This endpoint retrieves a list of projects associated with a particular thematic area. It takes the area ID as a parameter and returns project data that should be displayed in each projectCard.

- `/getProjectsSupervisedFromPerson/<personid>`

  This endpoint retrieves a list of projects supervised or managed by a specific team member or person. It takes the person ID as a parameter and returns project data that should be displayed in each projectCard.

- `/getPeople`

  This endpoint retrieves a list of team members and key personnel involved with HyperMeow. It provides detailed information about each person, including their ID, name, surname, role, age, linkedin link, and a brief description.

- `/getPerson/<personid>`

  This dynamic endpoint retrieves detailed information about a specific team member based on the provided person ID. It returns comprehensive data about the person's background, role, expertise, projects supervised, and other pertinent information.

- `/getAreas`

  This endpoint retrieves a list of thematic areas or sectors in which HyperMeow invests. It provides information about each area, including its ID, title, and other relevant details.

- `/getAreaCards`

  This endpoint fetches a list of area cards, which are brief representations of thematic areas. It returns essential information such as the area's ID, title, and associated projects.

- `/getArea/<areaid>`

  This dynamic endpoint retrieves detailed information about a specific thematic area based on the provided area ID. It returns comprehensive data about the area, including its title, projects associated with it, and other relevant details.

- `/getYears`

  This endpoint retrieves a list of years in which projects funded by HyperMeow were founded. It provides a convenient way to access and filter projects based on their foundation year.

- `/getStages`

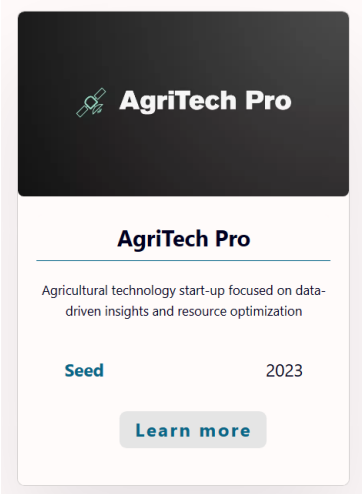
  This endpoint retrieves a list of different stages of project development or maturity. It allows users to filter projects based on their specific stage, providing valuable insights into the growth and progress of funded ventures.

4 Components

4.1 Navbar

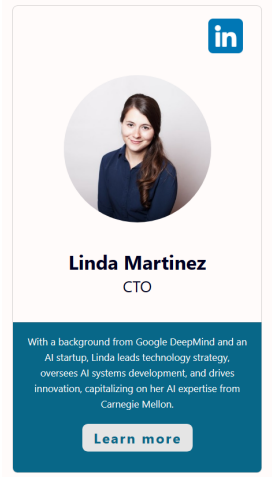
- **Description**: The Navbar component provides navigation links for easy access to different sections of the website. It includes sections such as Home, Projects (with a dropdown showcasing featured projects and all projects), People, Areas, About Us, and Contact Us.
- **Props**: None
- **Emit**: None

4.2 ProjectCard



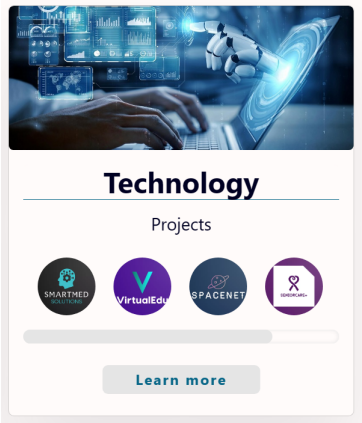
- **Description**: The ProjectCard component displays a card-style representation of individual projects. It includes an image, project title, brief description, current stage, year of foundation, and a "Learn More" button that redirects users to the specific project page for more details.
- **Props**: Project data (id, title, preview, stage, year, areas, featured)
- **Emit**: None

4.3 PeopleCard



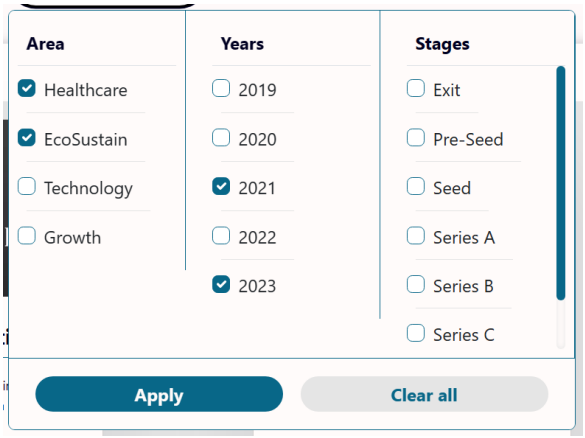
- **Description**: The PeopleCard component showcases the team members or people involved in the venture capital firm. It displays a small portrait, name, surname, role, brief description, LinkedIn link, and a "Learn More" button that leads to the individual's specific page for more information.
- **Props**: Person data (id, name, surname, role, age, LinkedIn link, description)
- **Emit**: None

4.4 AreaCard



- **Description**: The AreaCard component represents different thematic areas of the venture capital firm's investments. It includes an image, title, and a list of projects related to that specific area. Users can explore projects within a particular theme by clicking on the "Learn More" button.
- **Props**: Area data (id, title, projects)
- **Emit**: None

4.5 ProjectFilter

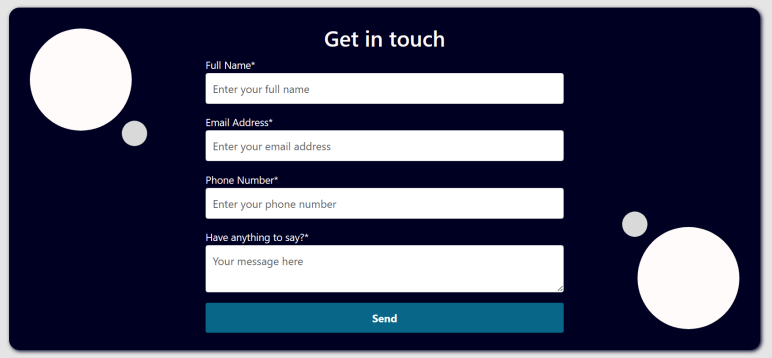


- **Description**: The ProjectFilter component is used in the Projects page and allows users to filter projects based on specific criteria. It provides options to filter projects by areas, year of foundation, and stage.

This filter functionality enhances the user experience by narrowing down the project selection based on their preferences.

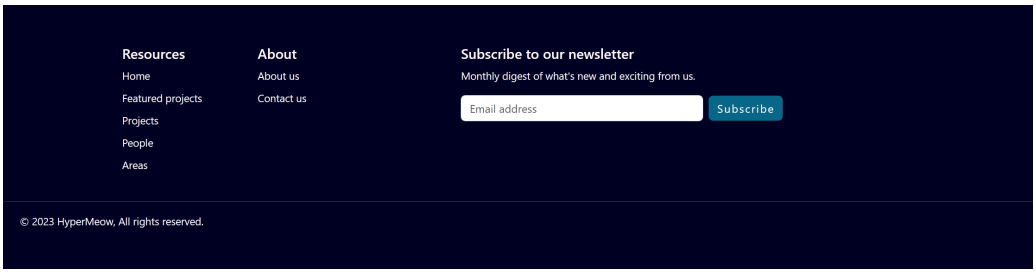
- **Props**: Disabled (boolean set to true if the searchbar is not empty). When disabled, the filter has no effect and cannot be used
- **Emit**: Filters selected criteria (areas, years, stages)

4.6 ContactForm



- **Description**: The ContactForm component provides a simple contact form for users to send inquiries or messages through the Contact Us page. It is also designed as a standalone component for practical reasons, enabling easy reuse across multiple
- **Props**: None
- **Emit**: None

4.7 Footer



- **Description**: The Footer component appears at the bottom of each page and includes sections similar to the Navbar (Home, Projects, People, Areas, About Us, and Contact Us). Additionally, it features a subscription form where users can enter their email to subscribe to the newsletter.
- **Props**: None
- **Emit**: None

5 Extra Modules

In our project, we utilized the Bootstrap framework to enhance the design and responsiveness of our web application. Bootstrap is a widely adopted front-end framework that provides a set of tools and resources for building modern and visually appealing websites. By incorporating Bootstrap into our project, we were able to leverage its powerful grid system, CSS classes, and JavaScript components to structure and style our web pages

effectively. Bootstrap enabled us to create a responsive layout that adapts seamlessly to different screen sizes and devices, ensuring a consistent user experience.

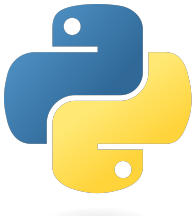
The benefits of utilizing Bootstrap in our project include:

1. **Responsive Layout**: Bootstrap's grid system allowed us to create responsive layouts, ensuring that our web application looks great on various devices and screen sizes. This feature improved usability and accessibility for our users.
2. **CSS Classes and Styling**: Bootstrap provided a wide range of pre-defined CSS classes that we could utilize to style our components and elements. These classes helped maintain a consistent and professional design across our web application.
3. **JavaScript Components**: Bootstrap offers a collection of JavaScript components, such as modals, dropdowns, and tooltips, which enhanced the functionality and interactivity of our web pages. These components improved user engagement and provided a more dynamic user experience.
4. **Customization**: While we didn't import pre-configured components from Bootstrap, we were able to use its underlying implementation and customize it to fit our specific project requirements. This allowed us to achieve the desired visual effects and functionality without relying on pre-built components.

6 Hosting

6.1 Backend Hosting

For the backend, we have developed a Flask server using Python, which is deployed using Gunicorn on a private Virtual Private Server (VPS). This hosting setup offers several advantages for our project. By utilizing a private VPS, we have complete control over the server environment, ensuring enhanced security and privacy for our potentially sensitive data.



We chose to deploy the Flask server with Gunicorn due to its high performance and scalability, allowing us to handle a large number of concurrent requests efficiently. Additionally, Gunicorn simplifies the deployment process and provides robust features for managing server processes and handling traffic spikes.

To store and query the necessary data, we have set up a local MySQL database. By using a local database, we can ensure faster access times and maintain full control over data management. This setup allows us to design and optimize the database schema according to our specific requirements.

To make the Flask server accessible to users over the internet, we have implemented HTTPS support by setting up the necessary SSL certificates. This choice ensures secure communication between the server and clients, safeguarding sensitive data from potential security risks.

6.2 Frontend Hosting

The frontend of our project is deployed on Vercel, a popular platform for hosting static and server-rendered applications. We specifically chose to use Vue3 + Nuxt3 with Server-Side Rendering (SSR) for our frontend. There are several reasons behind this decision.

SSR offers significant benefits for our project. First, SSR allows us to generate dynamic HTML content on the server-side before sending it to the client, resulting in faster initial page loads and improved SEO (Search Engine Optimization). This ensures that search engines can crawl and index our website effectively, enhancing its discoverability. Moreover, SSR provides a more consistent user experience by rendering pages with their data before they are displayed to the user. This eliminates any potential delays caused by client-side rendering, ensuring a smooth user experience while maximizing the benefits of server-side rendering.

Overall, our hosting choices, combining a Flask server with Gunicorn on a private VPS and deploying the frontend on Vercel with SSR rendering mode, provide us with a secure, scalable, and optimized infrastructure for our project.

7 Extra Functionalities

We have implemented additional functionalities in our project to enhance user experience and provide convenient ways to filter and search for projects. These functionalities include a search bar and a project filter component.

- **Searchbar**

  We added a search bar to the "All Projects" page, allowing users to search for specific projects based on keywords or project titles. The search bar functionality is achieved using a computed method called "visibleProjects". This method filters the projects based on the user's input and displays the matching projects dynamically as the user types. It utilizes an "All Projects" array to perform the filtering, which is populated when the user first visits the page. This array stores all the projects available in the system.

- **Project Filter**

  The project filter component provides users with the ability to filter projects based on different criteria, such as thematic area, year of foundation, and stage. The project filter component consists of checkboxes for each filtering option, including areas, years, and stages. When the user applies the filter by selecting checkboxes, the filter component emits an event that triggers a function in the projects page. The emitted event carries the checked checkboxes' references to indicate the filter criteria. The system then compares the projects in the "All Projects" array with the filter criteria and populates another array, specifically for displaying the filtered projects. This allows for seamless and dynamic filtering of projects based on the selected criteria without having to query the backend multiple times.

8 SEO & Accessibility

Search Engine Optimization (SEO) and accessibility are crucial aspects of building a successful and inclusive web application. In our project, we prioritized these considerations to ensure our website is discoverable, user-friendly, and accessible to a wide range of users. Here's how we addressed SEO and accessibility:

- **SEO Best Practices**: We followed SEO best practices to improve the visibility of our website in search engine results. This included:
    1. Utilizing appropriate meta tags, such as `<title>` and `<meta description>`, to provide accurate and concise information about each page's content.
    2. Incorporating relevant keywords into our page content, headings, and image alt attributes to improve search engine indexing and ranking.
    3. Generating clean and semantic HTML markup, ensuring search engine crawlers can easily navigate and understand our website's structure and content.
- **Responsive Design**: We designed our website to be responsive, meaning it adapts seamlessly to different screen sizes and devices. This improves user experience and ensures our website is accessible to users accessing it from various devices, including desktops, tablets, and mobile phones.
- **Alt Text for Images**: We provided descriptive and meaningful alternative text (alt text) for all the relevant images used on our website. Alt text not only improves accessibility for users with visual impairments who rely on screen readers but also helps search engines understand the content of the images.
- **Contrast and Color Accessibility**: We paid attention to contrast ratios and color choices to ensure readability and accessibility for users with visual impairments. We made sure that text and important elements have sufficient contrast with their background colors, allowing users with low vision to perceive the content easily.
- **Accessible Forms**: We implemented accessible forms by providing clear labels, using appropriate form controls, and ensuring proper error messaging. This allows users with disabilities to interact with and submit forms without encountering barriers.

We conducted comprehensive testing using tools like WAVE and Lighthouse to assess the project's SEO and accessibility. The results were excellent, indicating strong performance in both SEO and accessibility aspects. By incorporating these SEO and accessibility considerations into our project, we aimed to create a website that is optimized for search engines, as well as inclusive and accessible to all users, regardless of their abilities or assistive technologies.