EXPERTISE EXCHANGE PLATFORM

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LIST OF ACRONYMS

- *PUT: Poznan University of Technology*
- *BTU: Brandenburg University of Technology Cottbus-Senftenberg*
- *UC: University of Cantabria*
- *UMONS: University of Mons*
- *UNICT: University of Catania*
- *UPHF: Université Polytechnique Hauts-de-France*
- *UVA: University of Vaasa*

Table of contents

1. Foreword

1.1. Purpose of the document

The purpose of the following document is to provide a detailed description of the process of developing, designing, and implementing the Expertise Exchange Platform as part of the implementation of Task 2.2 under WP2.

1.2. Characteristics of a Task

As part of its tasks, WP2 focuses on the Horizon 2020 transformation module called "Strengthening research and innovation collaboration with other sectors, especially academia and business." The activities carried out under Task 2.2 are intended to allow the EUNICE Alliance to take an active role in the process of establishing cooperation with academia and commercial companies. The main objective of the task is to establish a platform (Expertise Exchange Platform, EEP), which becomes a point of connection between the above-mentioned entities and the EUNICE Alliance, and to establish cooperation in research and innovation. This platform will enable the definition and piloting of solutions that will translate into deeper strategic cooperation between sectors and the participation of all partner universities of EUNICE in the development of the social ecosystem in all its areas.

The creation of the EEP platform will allow both - increase in the availability of human, technological, and financial resources to all members of the EUNICE alliance and also search for potential partners and opening up for completely new markets. Such an approach to project implementation will not only provide the possibility to transfer technologies and solutions, but, above all, to exchange knowledge and skills and to shape best practices based on the experience of all actors involved.

2. Solution design process

This section describes the process of planning the structure of the Expertise Exchange Platform. Best practices are considered for planning IT solutions that enable the implementation of a scalable solution that meets the expectations of the entire EUNICE alliance.

2.1. Analysis of the available systems that perform similar tasks to develop the best possible solutions.

The creation of an EEP should ultimately enable an increase in the level of commercialisation of research, which is a challenge for all research centres worldwide. The best centres in this respect achieve commercialisation and success rates of more than 80% [1]. In Europe, there are five German and four French institutes in the world top 25 according to Reuters [1]. In contrast, according to the European Research Ranking, which assesses centers according to three main criteria: funding and project participation, networking and collaborative activity, and diversity of research areas, the Centre national de la recherche scientifique (France) leads the ranking, followed by Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. Germany. Figure 1 shows the ranking of countries according to the total funding in k€ (approx.) prepared based on http://www.researchranking.org/?-action=ranking.

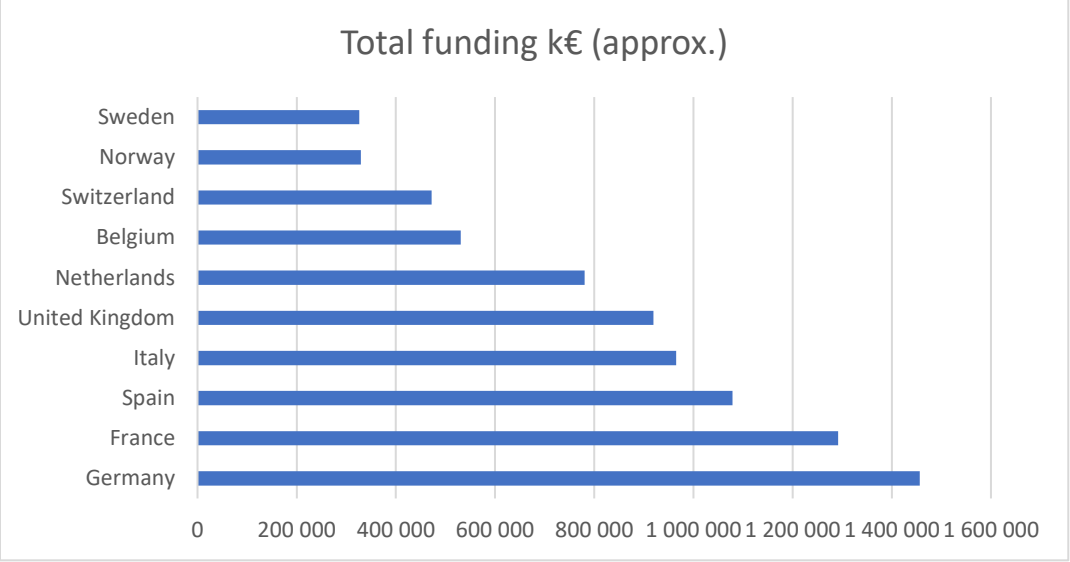

Figure 1 Country classification according to the total funding in 2020 [http://www.researchranking.org/?-action=ranking]

In Table 1, the countries' ranking is presented, based on data from 2020. The table contains the total founding in Euro, No. of projects, No. of coordinated projects and the No. of sole partner projects [4].

Table 1: Country statistics 2020 based on [4]

Country	Total funding k€ (approx.)	No of projects	Coordinated projects	Sole partner projects
Germany	1.457.050	1427	370	233
France	1.292.687	1201	370	246
Spain	1.078.625	1214	352	217
Italy	964.818	1142	256	134
United Kingdom	919.466	1195	471	378
Netherlands	780.076	931	274	202
Belgium	531.635	831	165	103
Switzerland	472.039	627	218	165
Norway	329.049	320	84	54
Sweden	325.894	473	109	84
Greece	311.114	456	53	12
Austria	305.392	463	107	49
Denmark	291.843	440	150	116
Finland	223.458	342	63	36
Portugal	213.663	374	77	56
Israel	212.082	218	93	82
Ireland	189.212	318	101	63
Poland	165.412	292	27	17
Czech Republic	122.836	236	27	15

The largest European research networks performing R&D include France's Carnot and Germany's Fraunhofer [2]. According to the ranking of institutions [4], the best research institute in Europe is the Centre National de la Recherche Scienitique (France), while the second best is the Fraunhofer network. The biggest Polish research network is the Lukasiewicz Research Network [4], [6]. The Fraunhofer association is the most important organization that performs applied research for industry in Germany [4]. The institutes that make up the association have strong links with university centers, which allows academic research to be combined with the needs of industry. According to a report [3], more than 70% of the Fraunhofer Institute's revenue comes from contracts with industry and publicly funded research projects. Carnot is made up of a network of 38 public research centres in France. These centers work together to support innovation in industry. The prestigious Carnot Label is awarded to public research structures, Carnot institutes, that have proven to have high research and innovation skills. The Carnot network is committed to developing relevant and innovative solutions for companies, from small and medium-sized to very large ones [5].

The last of the entities analysed was the Lukasiewicz Research Network, consisting of 26 institutes and 4,500 scientists and engineers. The network focuses primarily on solving technological problems, conducting projects, and creating new products [6].

Based on an analysis of the operation of the three networks described above and the way in which partners are sourced and inquiries are made, an EEP vision was developed with three target groups as its pillars:

- mutual cooperation within the EUNICE alliance,
- Implementing joint research with other academic centres,
- Implementing research for industry.

2.2. Description of the proposed solution

As described in Section 2.1, the EEP platform focuses on three main target groups. In addition to the selection of target groups, three main areas of collaboration have been created on the basis of the research network analysis, that will enable the Horizon 2020 transformation module called "Strengthening research and innovation collaboration with other sectors, especially academia and business."

1. Involvement of the EUNICE alliance in the implementation of specific tasks in projects currently being carried out in different centres
2. Joint development of new projects by the EUNICE alliance and stakeholders from the other sectors and joint application for funding under European Programs
3. Implementation of finished products by the EUNICE alliance to meet the needs of the customer

Brief forms have been created for each area of cooperation to provide an initial outline of the cooperation.

Form 1: Involvement of the EUNICE Alliance in specific tasks of ongoing projects:

I. For when the solution should be ready
II. Research area
III. List of keywords
IV. Description of the task
V. Budget for the task
VI. Contact information:
    a. First and last name
    b. Phone number
    c. E-mail address
    d. Country
    Information about the Company/University

Form 2: Joint development of new projects by the EUNICE alliance and stakeholders from other sectors and joint application for funding under European Programs

I. For when the solution should be ready
II. Research area
III. List of keywords
IV. Information on the percentage of funding of the whole project from company/university funds
V. Forecast budget for the project
VI. Description of the task
VII. Proposed program from which the project will be financed
VIII. Contact Information:
    a. First and last Name
    b. Phone number
    c. E-mail address
    d. Country
    e. Information about the Company/University

Form 3: Implementation by the EUNICE alliance of finished products for customer needs.

I. Deadline in which the ready-made product should be ready prepared?
II. Research area
III. List of keywords
IV. Description of the task
V. Budget for the task
VI. Contact information:
    a. First and last name
    b. Phone number
    c. E-mail address
    d. Country
    e. Information about the Company/University

The forms prepared in this way allow us to briefly identify the needs of stakeholders and expected outcomes of the project and tailor them to specific target groups. They also make it possible, at a later stage, to enable the search for potential opportunities for collaboration between researchers working at different universities of the EUNICE alliance.

2.2.1. Description of objectives regarding the functionalities of the platform

The implementation of the platform assumes the creation of subpages for each area of cooperation and each target group. Users of the platform will be able to easily find relevant forms and submit them to the system. Each submitted form will be appropriately categorised and maintained in the system in order to be available to all EUNICE researchers. This will allow the best matching of subject areas with specialists, which will significantly reduce the time required to present an offer to potential partners.

2.2.2. Description of the functionalities accessible at the platform researcher's view

Researchers active in the EEP will have access to the full database of offers. Each of them will be able to view basic information about submitted requests within each target group and each area of collaboration in their user panel. Basic data will include information such as the identifier (consecutive numbers as added), the date the offer was added, the area of research, keywords, budget, and the country from which the offer came. If the user is interested in particular topic, they will be able to view the offer page that contains all the submitted information and add the offer to their watchlist. In addition, after displaying the list of offers, the user will be able to filter it according to each category available in the brief description, so that it will be easier to find the information about the project.

2.3. Database Description

The database that maintains information about users and offers was created in the free open source MySQL relational database management system. The database maintains tables dedicated to each form, as well as tables dedicated to users maintaining their basic data.
An example of the database structure for one of the project-related tables is shown in Figure 2.

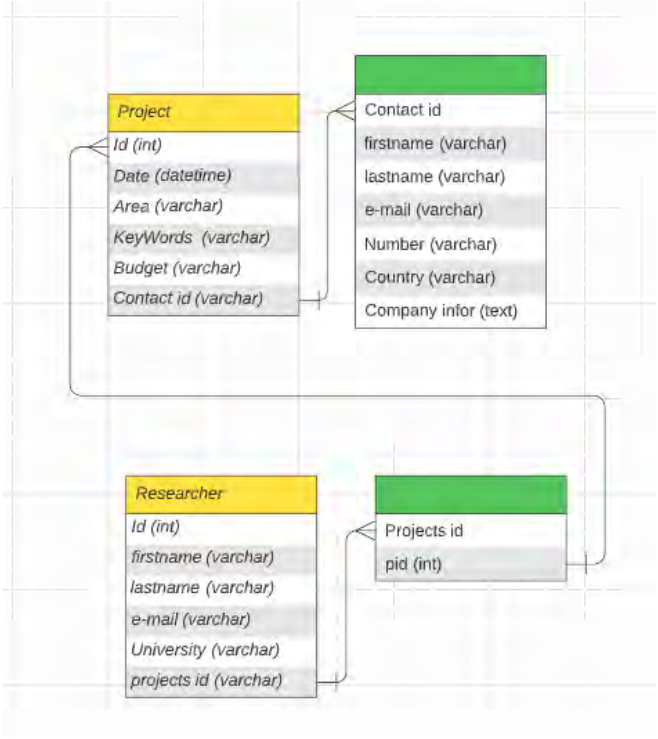

Figure 2 Example of a table structure in a database system

3. Process of solution implementation

This section describes the process of planning the structure of the EEP. Best practices are considered for planning IT solutions that enable the implementation of a scalable solution that meets the expectations of the entire EUNICE alliance.

3.1. Basic information about platform realization

The entire platform was developed in a web format using HTML, PHP, and a MySQL database. To create a scalable platform, the Mobirise solution was used, which is an application that enables easy websites creation. The use of Mobirise made it possible to create a website template very quickly. This solution was then enhanced by the platform's developers with blocks of code dedicated to specific functionalities available in the system.

3.2. Webpage Template

On the platform's homepage, the user has the possibility to obtain basic information about the platform and EUNICE alliance.

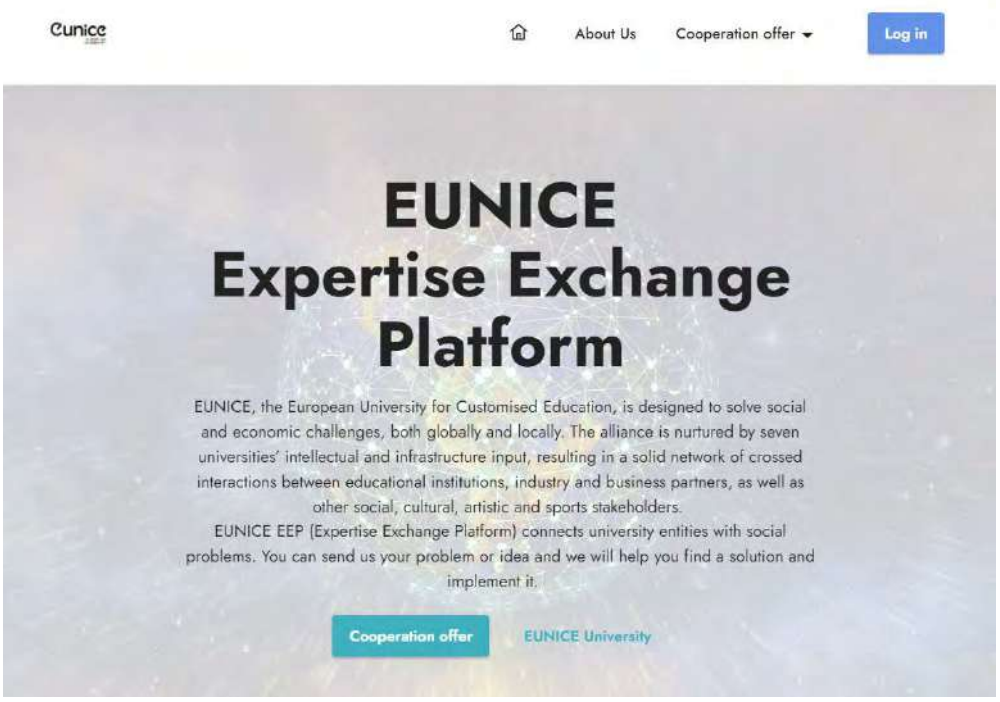

Figure 3 View of the EEP platform homepage

By selecting the 'Cooperation offer' button, users enter a subpage that allows them to select their option of interest. The page shows a breakdown of both target groups and cooperation areas.

Figure 4 View of the Cooperation Offers subpage

As intended, the user is able to select the desired area of cooperation which translates into access to the relevant form described in detail in Subsection 2.2.

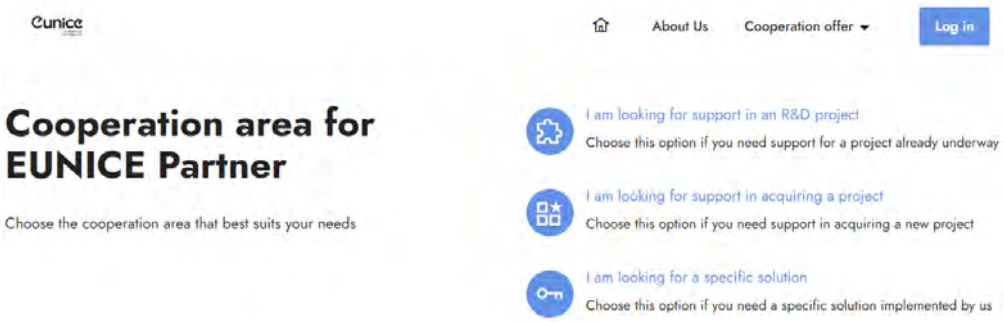

Figure 5 View of the subpage dedicated to the EUNICE alliance cooperation

The interactive form allows users to automatically enter a date or select it from the calendar that appears. Then, user can select the area of study and keywords. Subsequent fields can be filled freely by the user, while their correctness is verified before submission, such as whether the e-mail address is present in the field.

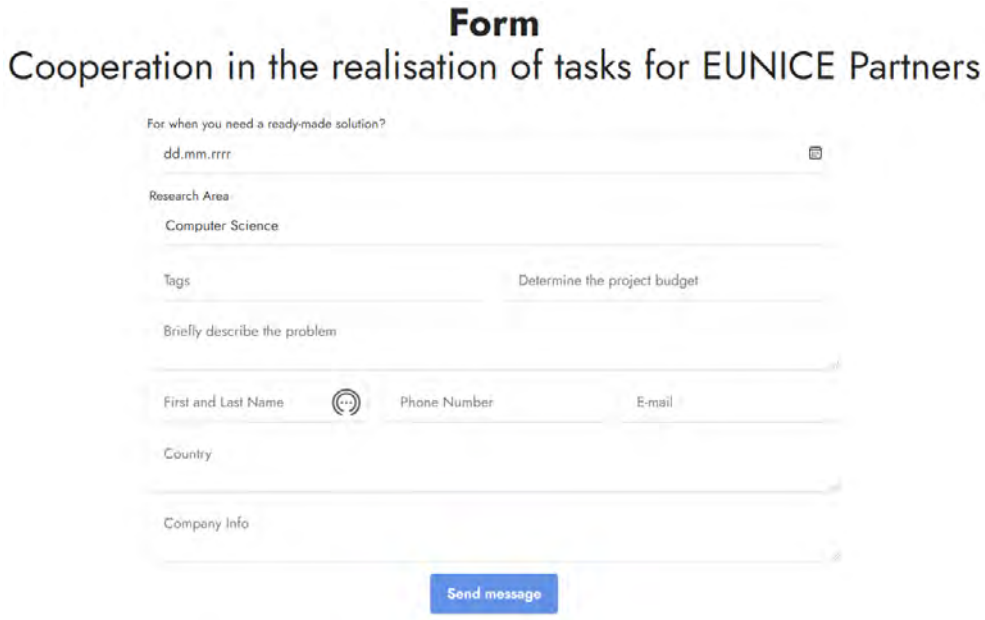

Figure 6 View of a sample form on the EEP platform

Once the form has been submitted, the user is informed that the offer has been added to the EEP database and about next steps to be undertaken.

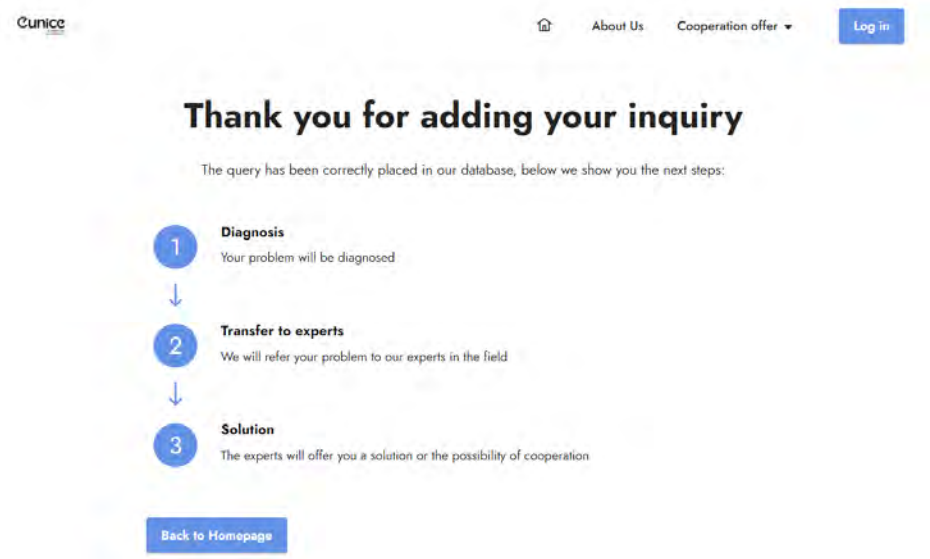

Figure 7 Information for the user after submitting the offer

3.3. View of the user account

The user can log in to the system by providing an individual log-in and password assigned by the platform administrator.

After logging in, users can see their basic data, such as name, email address, and university where they work. In addition, they have access to the full list of offers in the database, as well as to the observed projects

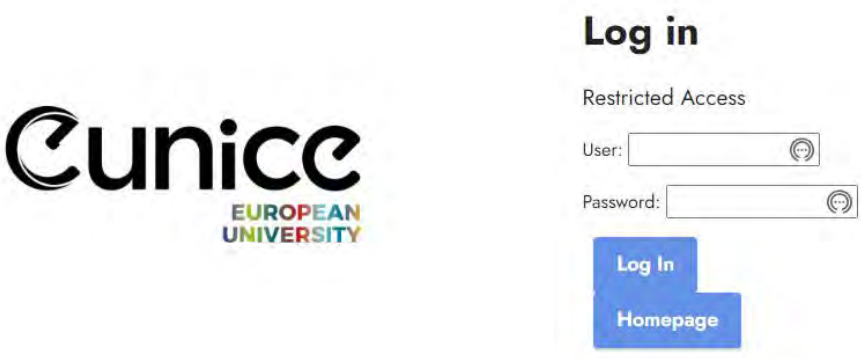

Figure 8 View of a Log in sub-page

Figure 9 View of a user sub-page

Within the offer database, a summary description of each offer is visible, broken down by both the type of cooperating entity and the areas of cooperation. It is also possible to obtain detailed information by clicking on the 'More' button.

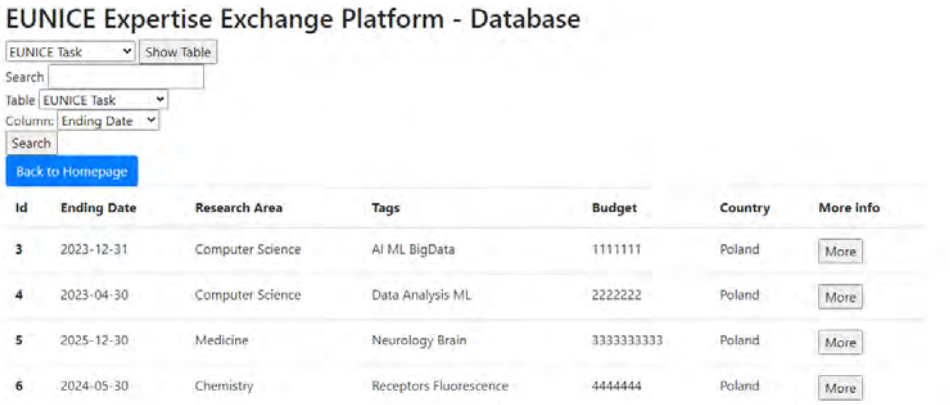

Figure 10 View of a database subpage

Selecting the ‘More’ button allows the user to view all the information about the selected project, as well as to add the project to the list of observed projects available directly in the user panel. Adding the selected project to the watch list results in the user’s contact data being added to the project list so that other people interested in the project can see it and get in touch.

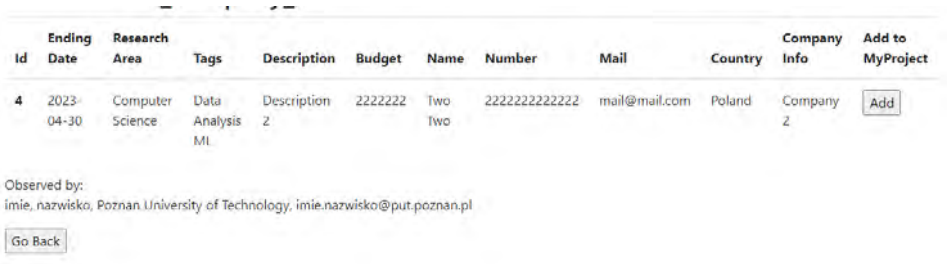

Figure 11 View of a Project Details Subpage

4. Summary

4.1. Summary

The Expertise Exchange Platform is a step towards establishing cooperation in the field of research and the acquisition of joint projects between universities that are part of the EUNICE alliance, as well as attracting brand new cooperation from both universities and commercial companies. At the same time, it is a response to the challenges of the Horizon 2020 transformation module, called "Strengthening research and innovation collaboration with other sectors, especially academia and business." Its main objective is to increase the commercialization of research carried out by EUNICE partners, increase innovation, competitiveness, and develop best practices for the implementation of research projects. Thanks to the created tool, stakeholders interested in cooperation will be able to quickly place in the database both project ideas and specific tasks in which the EUNICE alliance can help.
The platform is available at: https://eep-eunice.put.poznan.pl/

4.2. Future Works

The established platform is the first implementation of the solution, which will be subject to constant modifications to improve its operational capacity and adapt it to the needs of the EUNICE alliance. The platform's performance will be continuously monitored and the suggestions of partners will be taken into consideration in the development process. In addition, work is underway to introduce the possibility of logging into the system using the eduGAIN solution, which has been successfully implemented within the EUNICE Moodle platform. Furthermore, the EEP will be incorporated in the joint, common platform, built on the basis of outputs of the Deliverables 2.1 and 2.3 and piloted in Task 2.4. Such a solution will enable the reduction of to reduce the number of independent platforms, which favours the users and the creation of the best possible and scalable solution.

5. Literature

[1] D.M. Ewalt, Reuters Top 25. The World's Most Innovative Research Institutions 2019, Reuters, 18.09.2019
[2] Dariusz M. Trzmielak, Joanna Krzymianowska-Kozłowska, „Organizacja badawcza z perspektywy rozwoju sieci. Stymulanty i bariery rozwoju nowych technologii w Sieci Badawczej Łukasiewicz" http://slz.sgh.waw.pl/wp-content/uploads/2020/11/2.2.pdf
[3] Gryzik, Instytuty badawcze w nowoczesnej gospodarce, OPI, 2017, s. 50–55.
[4] http://www.researchranking.org/?action=country, access 24.09.2022
[5] https://www.energiesdufutur.eu/1247-the-carnot-network.htm
[6] https://lukasiewicz.gov.pl/