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D5.2– Report on the proposed information system to support dissemination and outreach
Updated version at M18

WP5 – Promoting EU HPC CoEs

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Executive Summary

This deliverable reports on the plans within WP5 to create an information system, in the form of a web-based tool, capable of supporting the dissemination and outreach actions put in place by the project and to federate similar initiatives of the individual CoEs. The deliverable, which is titled D5.2 "Report on the proposed information system to support dissemination and outreach", presents the first analysis of the CoEs' technological and scientific offerings that will feature on this web-based tool (e.g., tools, software, simulation packages, data, portals, infrastructures, codes, …) that are available or scheduled for future development.

Considering the availability of data and information and the requirements formulated by the CoE representatives, the choice was made to abandon the initial idea of a CRM-type solution and to set up an ad-hoc website area where stakeholders, be they from industry, academia/research, or other interested parties, can access information on services, tools, data and expertise made available by the CoEs, and can rapidly identify the correct contact points.

This deliverable presents the initial plans and analysis for the web-based tool, which will then be implemented during the FocusCoE project, along with adequate dissemination and communication outreach actions to support the CoEs. A selection of Key Performance Indicators (KPIs) is indicated to monitor these actions in order to keep the WP5-Task 5.3 activities on track.

In detail, this document describes the activities of analysis of the technological and scientific offerings covered by the CoEs, that were carried out in Task 5.3 (Operational Support for Dissemination and Outreach Infrastructure) using a questionnaire as well as short interviews with CoE representatives. The analysis has shown seven categories of technological and scientific offerings: **1) Access to Computing Resources; 2) Codes & Software Packages; 3) Repository; 4) Data Catalogue; 5) Support to Code Optimization; 6) Consulting; 7) Training.**

Moreover, in order to maximise the success of this analysis, each category has been linked with possible beneficiaries. The beneficiaries have been categorised as follows: **1) Academia & Scientific Organizations; 2) Industry; 3) SMEs; 4) Funding Agencies; 5) Policy Makers; 6) Service & Data Providers.**

The cross-link of these two categories provides a framework for the design of the information system, in the form of a web-based tool. In particular, the deliverable presents the general design approach to the web pages, along with logistical considerations for their creation and management. A synthetic timeline for the construction of the web-based tool and a list of KPIs to monitor the activities and results is presented. Finally, the report covers the communication and support strategy that will be put in place specifically for this web-based tool.

The web-based tool will be implemented and managed by a small team of WP5 partners on the HPC3 website. The long-term management strategy, particularly beyond the lifetime of FocusCoE, will be re-evaluated by Task 5.3 at a later date.

Anticipated recipients of this document include those that are interested in the issue of establishing interactions in the HPC sector, which covers the above list of stakeholders.

Note: This is an update at M18 of the original Deliverable issued at M9, containing a clearer description and/or further elements about some topics and issues. For the sake of readability, these further elements of information are presented in an Addendum at the end of the Deliverable.

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List of Acronyms and Abbreviations

CoE	Centres of Excellence for Computing Applications
CRM	Customer Relationship Management
DoW	Description of Work
EC	European Commission
EOSC	European Open Science Cloud
EXDCI	European Extreme Data & Computing Initiative
HPC	High Performance Computing
HPC3	HPC CoE Council
SME	Small and Medium Enterprise
WP	Work Package

1 Introduction

1.1 Purpose and scope of the document

This document aims at outlining the development of a web-based tool, to be established by FocusCoE, capable of supporting the dissemination and outreach actions put in place by the project and to federate similar initiatives of the individual CoEs.

As stated in the DoA, the web-based tool will be an information system designed to present the technological and scientific offerings made available by the various CoEs. The offerings will be presented under a common "umbrella" in order to aid prospective stakeholders to learn about the services, tools, data and expertise made available by the CoEs, and to quickly identify the correct contact points to develop fruitful interactions and collaborations.

In more detail, with the term "technological and scientific offerings" we refer to the services (e.g., tools, software, simulation packages, data, portals, infrastructures, codes, …) that are currently active in the CoEs, as well as those that are scheduled for future developments. These include, in many cases, those services and tools that were developed during the first round of CoE projects, which were then inherited by the subsequent projects.

The foreseen web-based tool is somewhat different from the one originally described in the DoA. It was initially thought that a tool based on a CRM-type solution would be the most effective in order to collect and present the technological and scientific offerings to perspective stakeholders. A closer analysis has shown that, on one side, this would mean thinking of giving widespread open access to confidential information that each CoE has collected on its "customers", products, ways of operation, etc. On the other side, this sort of product would entail an unrestricted and constant collaboration from all CoEs, which seems quite unfeasible, and presumably not in the CoEs' best interest. This has led to the conclusion that a different solution is required, one that is simpler to manage and more effective in its impact on potential "customers". We have opted therefore to set up, in a dedicated area in the HPC3 Website, a one-stop-shop in which the technological and scientific offerings are categorized and made accessible through appropriate links to services, contact points, and other tools made available by the CoEs. This will allow potential users to quickly navigate through the various options at their disposal, select the one(s) more consistent with their needs and proceed to set up real hands-on experiences.

We describe the design approach to the web pages of the web-based tool, providing mock-ups of how they will be structured, along with logistical considerations of their creation and management. The design shows a leading page that lists the categories of technological and scientific offerings of the CoEs, which then take the visitor to dedicated sub-pages for each category where the resources are listed in detail.

Since the web-based tool that will be developed in FocusCoE will be complementary to other IT services currently available by the European Commission, a brief presentation of the European Open Science Cloud (EOSC) platform is provided in this document in order to clarify the distinction between them.

This document is organized as follows: in Chapter 1, a summary description of the scope and methodology approach is given. Chapter 2 describes the first analysis of the technological and scientific offerings of the CoEs along with their categorization, as well as the analysis of the stakeholders. Chapter 3 describes the design approach to the web pages in the web-based tool,

Chapter 4 gives a synthetic timeline for the construction of the web-based tool. Chapter 5 gives some information on EOSC-Hub, and a comparison with the tool developed here. Finally, Chapter 6 will give an overview on how the communication around the web-based tool can be shaped and how discussion and exchange with interest groups and potential users of the services can be triggered.

Note: This is an update at M18 of the original Deliverable issued at M9, containing a clearer description and/or further elements about some topics and issues. For the sake of readability, these further elements of information are presented in an Addendum at the end of the Deliverable.

1.2 Methodological Approach

In order to develop the design of the most appropriate information system to support the CoEs service offering, a simple methodological approach was adopted:

a) Collection of information on the technological and scientific offerings both available and planned by the individual CoEs;
b) Analysis of the collected information, identification of commonalities, set up of a general framework;
c) Drafting of the most suitable IT solution and designing of the service;
d) Design of the website area showing the 7 categories of technological and scientific offerings (see below Section 2.1).

2 Identifying the CoEs' technological and scientific offerings

Task 5.3 aims at developing a web-based tool capable of supporting the dissemination and outreach actions put in place by the project and to connect in a common area similar initiatives of the individual CoEs. This tool, governed by Task 5.3, should list and categorize the technological and scientific offerings available in the various CoEs in terms of infrastructures, codes, and services, and make it easily accessible to all stakeholders: industry, academic & scientific organizations, and public administrations. The goal of this task is to create a tool that can effectively promote the uptake of extreme-scale HPC applications. The new portal can act as a federated server for the set of CoEs, federating access and requests to the initiatives of the individual CoEs.

The first action of Task 5.3 is to identify the CoEs' technological and scientific offerings in terms of their services (e.g., tools, software, simulation packages, data, portal, infrastructures, codes, services, ...) and to categorize them.

The analysis consists of the presentation of different typologies of services based on the initial interactions with the CoEs – through questionnaires and interviews - and will continue in collaboration with them during the project's lifetime.

The method used to gather the available and foreseen technological and scientific offerings of the individual CoEs, as well as the insight and points of view on how the web-based tool could be optimized to meet needs of the various CoE teams, is based on the following steps:

1. A *questionnaire* (see Annex I) was distributed to all CoEs. The questionnaire-template aims to identify the service areas covered by the CoEs, which are suitable for the interaction between them and their customers. This information was used to draw up a proposal for the web-based tool (as shown in chapter 3). The questionnaires were distributed to the CoEs through the designated contact person for each CoE.
2. Short *interviews* were held with the CoE representative (using teleconference or telephone), based on the questionnaire template. This approach was taken in order to better discuss the essential elements of CoEs' technological offerings and requirements.

From each CoE, we have also collected data based on public sources such as websites. This was used to prepare an initial draft of the CoEs' technological and scientific offerings.

2.1 Analysis and assessing of CoEs services

In this section, we provide a first analysis of the CoEs' technological and scientific offerings, which we categorized in a limited number of items (Figure 1). The goal of this analysis is to show the offering of the CoEs and how they are to be categorized. Moreover, a scenario of these services that are common to at least two CoEs is presented.
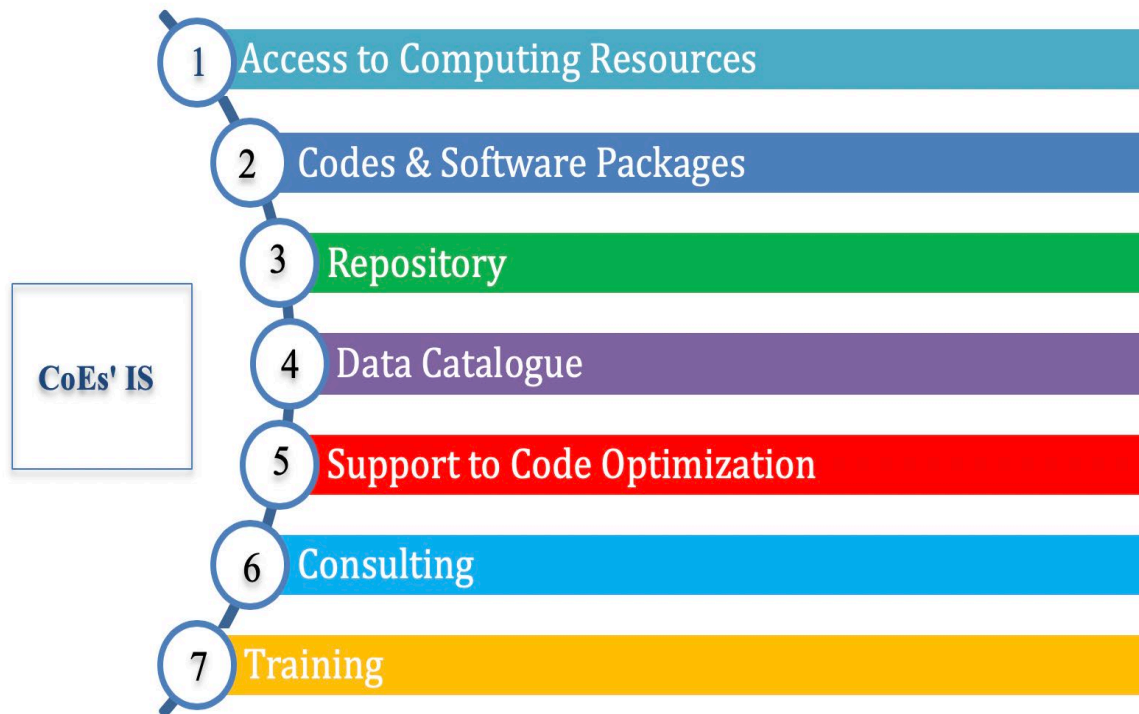
CoEs' IS

1 Access to Computing Resources
2 Codes & Software Packages
3 Repository
4 Data Catalogue
5 Support to Code Optimization
6 Consulting
7 Training

Figure 1 - CoEs' Information Services categories

The description of each of the categories mentioned above is as follows:
1. **Access to Computing Resources:** The CoE provides the community with access to computational infrastructure, along with resources developed, aggregated and coordinated by the CoE.
2. **Codes & Software Packages:** The specific codes, software packages concerning computing and storage aspects, and simulation tools developed and/or supported by the CoE.
3. **Repository:** Various tools including workflows (user-friendly and efficient systems for workflow executions and data processing) provided by the CoEs.
4. **Support to Code Optimization:** The CoE experts offer their expertise to develop and optimize customers' codes and tailored solutions adapted to end-users needs.
5. **Data Catalogue:** Store, share, and access CoE files and their metadata on a global scale.
6. **Consulting:** Personalized support from the CoEs: a) Code auditing and emphasis on end-users; b) Consultancy on cutting-edge numerical tools; c) Consultancy services in modelling and simulation.

7. **Training:** CoE training programmes which could include face-to-face training events, webinars, and a range of online tutorials and courses.

Table 2 summarizes the information collected for the various CoEs.

CoE name	Access to Computing Resources	Codes& Software Packages	Repository	Data Catalogue	Support to Code Optimization	Consulting	Training
BioExcel	X	X		X	X	X	X
ChEESE		X	X				X
CompBioMed	X	X			X	X	X
E-CAM	X	X	X		X	X	X
EoCoE-II	X	X			X	X	X
ESiWACE	X	X		X	X	X	X
HiDALGO	X	X		X		X	X
Max	X	X	X				X
POP2	X	X	X		X	X	X
EXCELLERAT	X	X	X		X	X	X

Table 1 - Analysis of Common CoEs' Information Services

Table 1 shows that the categories of Codes & Software Packages and Training are common to all CoEs; the categories of Access to Computing Resources and Support to Code Optimization represent an added value to the customers and underline the innovative nature of the CoEs. Moreover, the consulting category is indicative of the CoEs addressing the needs of the industrial sector.

Other non-technical services linked with the technological and scientific offering categories are also offered by the CoE projects. These are also related to the interaction from CoEs with industry:
-   Visitor programme;
-   Yellow Pages;
-   Q&A;
-   Support Forum;
-   Chat channel;
-   Matchmaking.

At the time of writing we do not foresee adding these non-technical services to the web-based tool, although this may be reviewed in the future.

2.2 Beneficiaries Categories

In this section, we provide our insight and analysis of the CoE stakeholders. The objective is to identify types of beneficiaries that are common to several CoEs in order to focus our efforts in setting up the IT tool and maximize its impact. Figure 2 shows the identified types of beneficiaries.

Identifying types of beneficiaries provides the following benefits:
- It facilitates the match between the offering and the demand of HPC technologies, services, and expertise;
- It achieves an added value by coordinating and/or federating instruments and tools developed by the CoEs, and promoting the dissemination into a larger community;
- It promotes the CoEs' offerings through the FocusCoE web-based tool to the various types of end users (Figure 2);
- It helps the European Commission's obligations on dissemination in HPC initiatives.
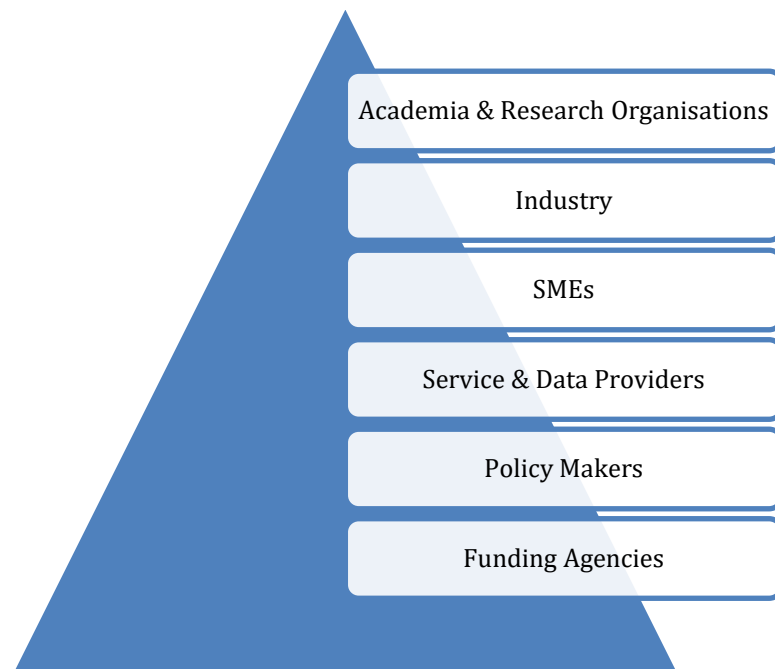
Figure 2 - Analysis of Common CoEs' IS beneficiaries

The types of beneficiaries that will use the web-based tool are as follows:

1. Academia & Scientific Organizations: includes the researchers and scientific experts;
2. Industry: industrial potential customers within large companies that belong to the sectors identified within WP3;
3. SMEs: small to medium sized companies;
4. Service & Data Providers: This includes: a) simulation application developers; b) simulation application service providers; c) HPC resource providers; d) HPC technology providers;
5. Policy Makers: includes public administrations;

6. Funding Agencies: investors in R&D projects and results, such as venture capital agents.

Figure 3 shows a diagram of the types of beneficiaries coupled with the categories of technological and scientific offerings that would likely interest them. This will feed into the communication strategy in Chapter 7 in order to target the beneficiaries effectively.
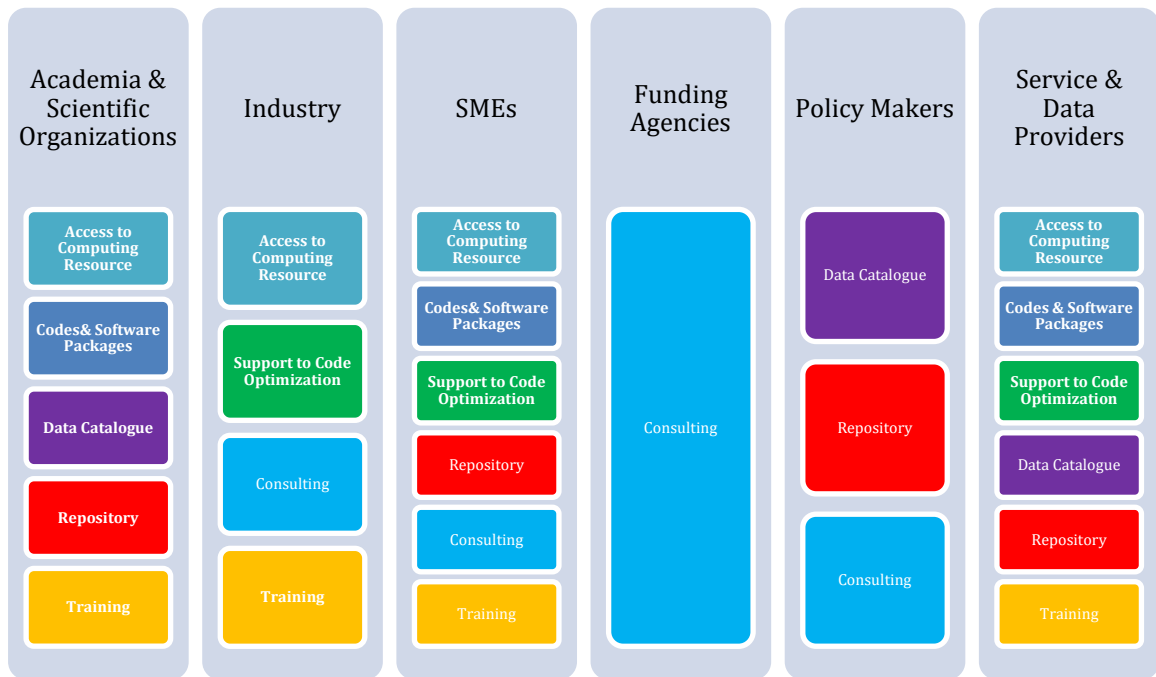

Figure 3 - Correlation diagram of Informaton Services and potential customers

2.3 Gathering the full set of the CoEs' technological and scientific offerings

In this first round of activity carried out to gather information on technological and scientific offerings, several CoEs pointed out that it was still too early to have a definitive answer on which offerings will be actually made available, and which categories of customers will be specifically addressed. Although some CoE projects are the continuation of previous initiatives, some others are brand new, and in any case, there have been turnovers in partners, changes in scope and objectives, etc.

For this reason, it is our opinion that it is necessary to allow a few more months before being confident that a complete picture of the CoEs' technological and scientific offerings can be drawn up. We foresee a period of 6 months to carry out and complete this action.

In our activity to date in task 5.3, we have experienced difficulties in contacting CoE representatives and in getting them to provide the requested information. In the future, more effective strategies will have to be deployed to gather the information, such as taking advantage of meetings and conferences where several CoE representatives congregate, or leveraging contacts and meetings put in place by other WPs of FocusCoE (e.g. in WP3).

Note: The Addendum (Paragraph 11) reports further information on topics presented here.

3 Architecture of the web area

As already previously mentioned, the original idea of a CRM-type solution proved, upon analysis, to be unfeasible and not fitting with the needs and requirements expressed by the CoEs. Therefore the choice fell upon a website area where all stakeholders can access information on services, tools, data and expertise made available by the CoEs, and can rapidly identify the correct contact points.

The web-based tool will take the form of a set of webpages, housed within the HPC3 website, to be developed in the next months in the framework of this project. As for the FocusCoE website, the HPC3 website will be based on the WordPress Content Management System, allowing the straight-forward creation and design of webpages.

The approach to the Portal is that a leading page will show the 7 categories of technological and scientific offerings, as discussed in Chapter 2. By clicking on a category, the visitor will then be taken to a sub-page that shows the offering of each CoE in that category.

Figure 4 - Mock-up of the front page of the Technological and Scientific Offerings of the EU HPC CoEs Portal

Figure 4 shows a mock-up of the design of the leading page. Here there will be a title stating what the page shows, followed by a description to make clear what is being presented. Below that, each of the 7 categories is listed as a clickable button, each with an accompanying icon image that helps to describe what the category contains. The mock-up in
Figure 4 contains placeholder images that demonstrate the kind of icon that might be selected in the final version, so for example the "Access to Computing Resources" category shows a simple drawing of a mainframe and computer storage. By clicking on the icon image or category title, the visitor is then taken to a sub-page dedicated to that particular category.
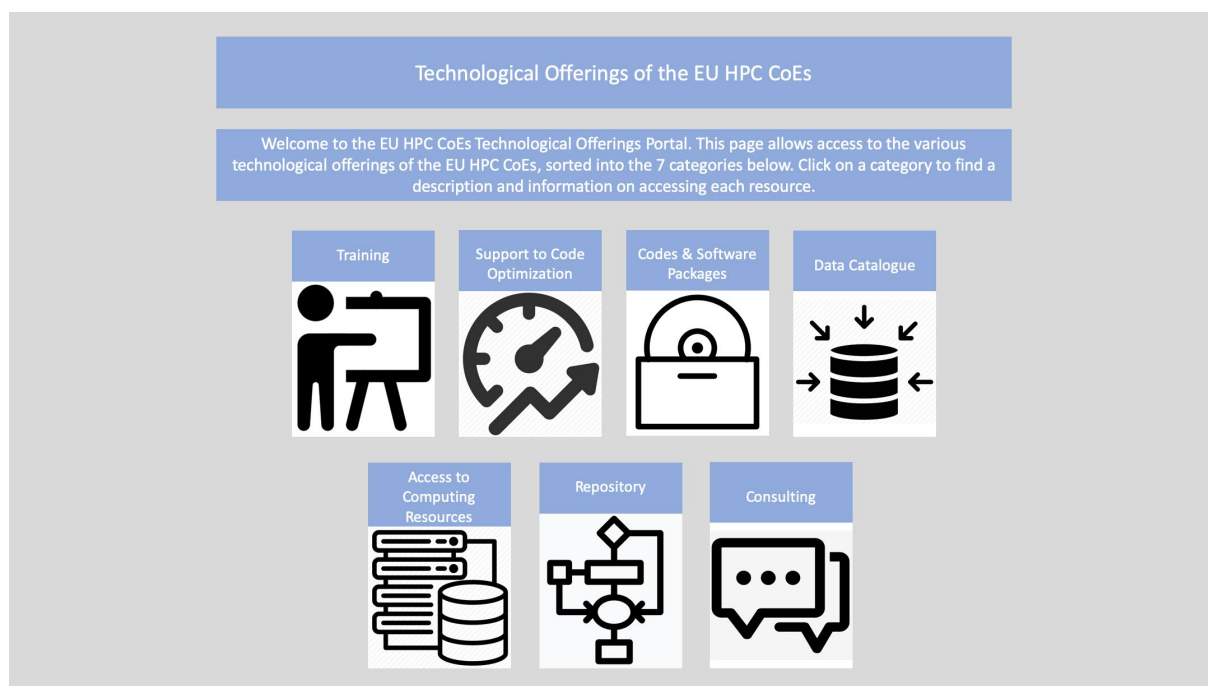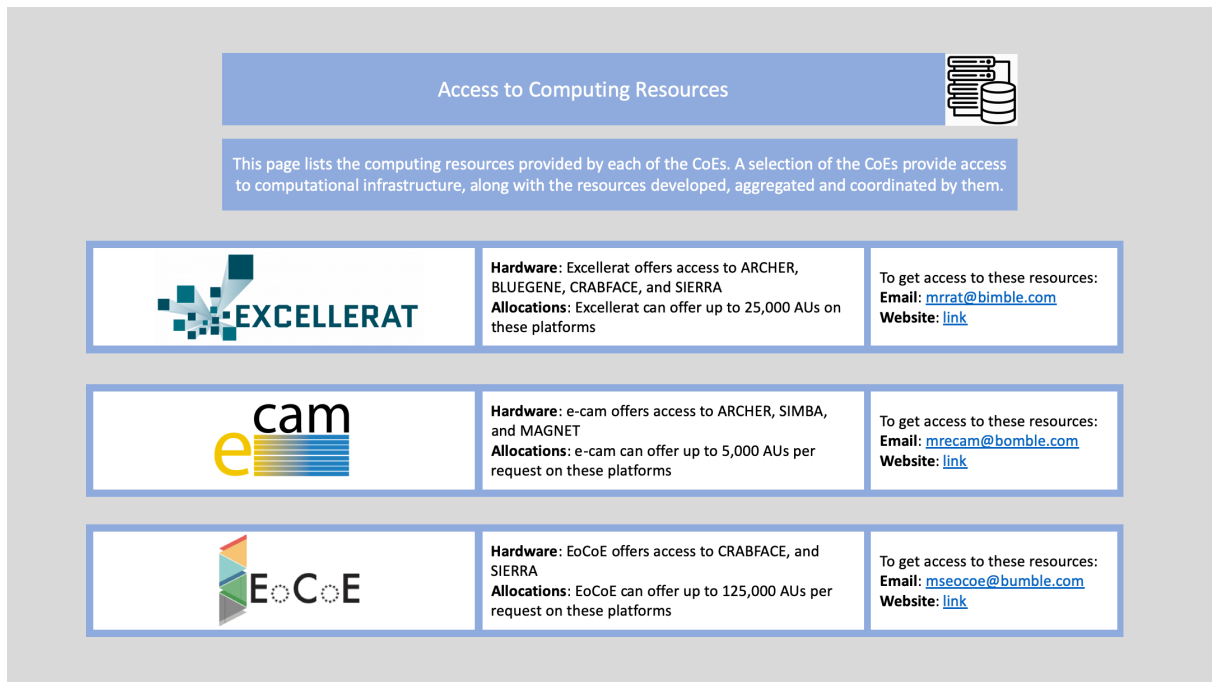
Figure 5 - Mock-up of one of the sub-pages of the Technological and Scientific Offerings of the EU HPC CoEs Portal

Figure 5 shows a mock-up of the design of one of the category sub-pages, in this case for the "Access to Computing Resources" category. Here, the title will state the category, alongside the icon image from the leading page. Below that, the category will be described so that the visitor understands what resources are being offered on the page. Below that, the resources will be listed, described, and linked to, with contact details provided where relevant. In the first instance, this will be organised primarily by CoE, with each CoE listed on the left-hand side of the page, with the resources then listed to the right of that.

Moreover, options for access to the content will be developed, in order to give quick access to selected content for different categories of users, and/or users from various industrial sectors, and/or other sub-categories that might appear to be interested and active during the course of the project.

While Figure 5 shows the general approach, the design of the sub-pages is dependent on the particular category of the technological and scientific offering. Each category will be considered individually, and the design of its sub-page will be adjusted to cater for the demands of that category. For instance:

- For the "Data Catalogue" sub-page, separate to the individual CoE resource listings, an additional link will be provided to EOSC-Hub, which is designed to contain the data of all H2020 projects in the near future.
- For the "Training" sub-page, WP4 of FocusCoE will create its own training portal, or a more general HPC training site will be developed by a larger team of European projects. In either case, these will fulfil the needs of the sub-page, so the Training title and icon image on the leading page will take the visitor directly to this portal.

- Where appropriate, additional columns may be added to the resource listings so that common aspects of the resources across the CoEs may be viewed at a glance, to encourage collaboration and sharing of resources between the CoEs. This may include, for instance, the code language that was used to develop any codes, software or tools.

In the initial phase of the web-based tool's creation and management, a small team of people from WP5 will be given appropriate access rights to the HPC3 website in order to create and manage the pages of the tool. Task 5.3 will need to re-evaluate the ongoing management strategy moving forward, particularly in respect to how the Portal will continue to exist after the lifetime of FocusCoE, since the CoEs themselves may exist long after FocusCoE itself has ended. This will depend on the level of interest in the Portal from the CoEs, since it will require a funded person or persons to provide regular updates in order for the Portal to remain useful.

Note: The Addendum (Paragraph 11) reports further information on topics presented here.

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4   Timeline of construction of the web-based tool

Task 5.3 runs through to the end of FocusCoE, involving the design, construction, and management of the web-based tool. The analysis done in this deliverable has helped define the broad approach to the tool, and allows WP5 to now carry out a complete gathering and analysis of the technological and scientific offerings of the CoEs, which will then allow for the web-area to be fully designed and implemented. Following that, the web-based tool will need to be regularly updated in order to keep up with the progressing CoEs. In Figure 6, the anticipated timeline is shown.

Q4-2019
- Complete gathering and analysis of the technological and scientific offerings of the CoEs

Q2-2020
- Design and implementation of the web-area on the HPC3 Website based on the complete technological and scientific offerings gathered in the previous step

To end of project
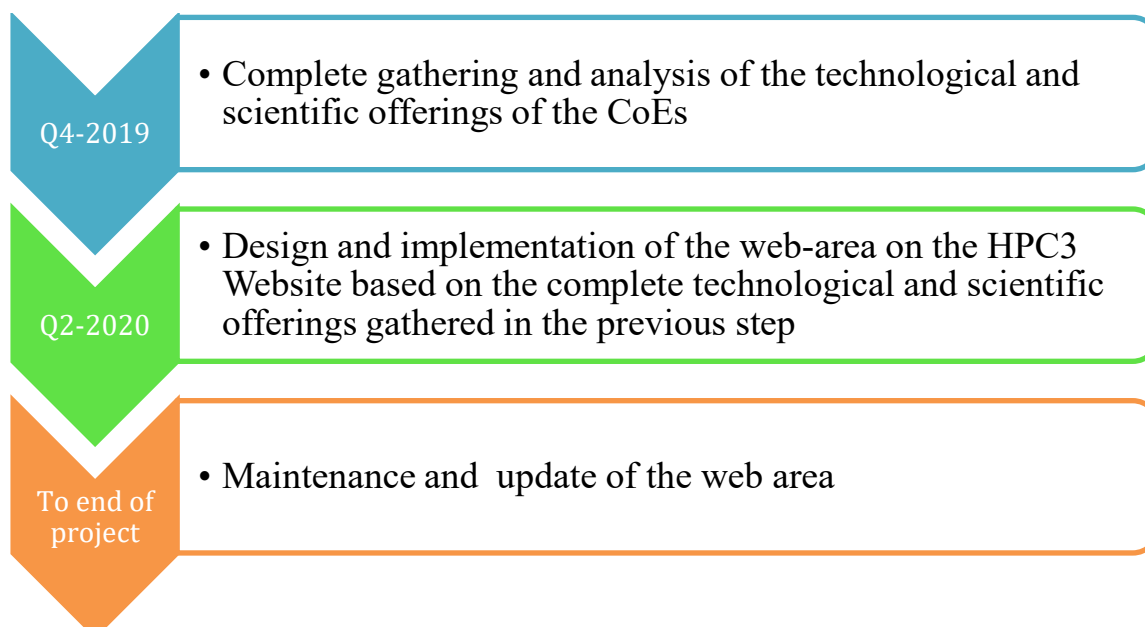- Maintenance and update of the web area

Figure 6 - Timeline for the set up and maintenance of the web service

5 Monitoring and KPIs

The activities listed in the previous section need to be monitored, and the most interesting findings need to be extracted from them. For this reason, a selection of Key Performance Indicators (KPIs) are indicated to monitor the process in order to keep the WP5-Task 5.3 activities on track.

The activities of the WP5-Task 5.3 are to be monitored mainly via the bi-monthly WP5 synchronisation meetings. These meetings are usually held online, with the participation of all WP5 partners. During these meetings, we monitor the work done in the task and plan the actions for the coming months. The overall schedule for task 5.3 will also be discussed to be sure that the activity will be completed promptly on time. However, issues that arise within WP5-Task 5.3 may also be discussed in the Project Coordination Committee (PCC).

A selection of Key Performance Indicators (KPIs) has been made to keep track of the results of Task 5.3. For the time being, the selected KPIs will assess the level of success of the task in three domains:

A. Acquisition of information from CoEs to depict their technological and scientific offerings;

B. Creation of the ad-hoc web-area on the HPC3 website to present information on the CoEs' propositions to potential customers;

C. Dissemination of CoE propositions to the six beneficiary categories presented in section 2.2.

The KPIs selected to measure the activity of WP5-Task 5.3 are summarized in the following table:

WP5-Task 5.3 KPIs	
KPI	Attributes
Number of CoEs' Information Services by category	CoEs' Information Services categories: 1. Access to Computing Resources 2. Codes & Software Packages 3. Repository 4. Support to Code Optimization 5. Data Catalogue 6. Consulting 7. Training
Number of web page visits	a) Time of visits; b) Country; c) Using the criteria a) and b), classification by Information Services category
Number of contacts made thanks to the website by stakeholder type	1. Academia & Research Organisations 2. Industry 3. SMEs 4. Service & Data Providers 5. Policy Makers 6. Funding Agencies

Table 2 - WP5-Task 5.3 KPIs

Note: The Addendum (Paragraph 11) reports further information on topics presented here.

6 EOSC

The Information System that will be developed in FocusCoE will be complementary to other IT services currently available or under development within the various initiatives put in place by the Commission in the realm of High-Performance Computing, Science Cloud, and Data applications and services.

In this section, a brief presentation of the European Open Science Cloud (EOSC) platform is provided, since this is believed to be one of the most comprehensive initiatives, in which several CoEs' partners participate (e.g. CEA, BSC, CINECA, CNRS, Jülich, UCL…) [5].

In the realm of its Open Science strategy, the European Commission (EC) has announced its intentions to promote open access to research data resulting from public funded research under Horizon 2020 to increase the circulation and exploitation of knowledge [4].

The EC strategy set up for making open science happen is based on two major pillars:

1) Data needs to be FAIR (Findable, Accessible, Interoperable, Reusable) to overcome the fragmentation and inefficiencies and thus to increase data reuse effectively.
2) Data needs to be integrated into a European Open Science Cloud (EOSC). By 2020, all European researchers need to be able to deposit, access and analyze European scientific data through the EOSC.

EOSC and FAIR research data are closely related, and the EC is working out phases for implementing EOSC and action plans to make data FAIR.
EOSC initiative was proposed in 2016 by the European Commission as part of the European Cloud Initiative to build a competitive data and knowledge economy in Europe; this, means to give a strong push in Europe towards the FAIR management of research data and to ensure that European researchers and professionals in science and technology reap the full benefits of the data-driven science. The EOSC goal is to set up a virtual environment which federates the handling of research data by existing scientific data infrastructures and provides a one-stop-shop (from the researcher's point of view) for seamless access to services supporting the research community along the data life cycle. Data providers will benefit from services for data annotation, storage, curation and long-term preservation on trusted repositories. Data users will be empowered to discover, access, re-use, combine and analyze research data. Amongst its future service offering, the EOSC would also connect to underpinning high-capacity cloud solutions with super-computing capacity.

The EOSC will be discipline-agnostic. As such, the initiative represents a collective venture of which the implementation must remain inclusive of all stakeholders including research communities, research institutions, research infrastructures, research funding bodies and policy makers. The EOSC platform will progressively expand its catalogues of data and services following a continued survey of data infrastructures in Europe interested in taking part in the development phase of the EOSC. The EOSC portal (https://www.eosc-portal.eu) has been launched and will evolve to become the future universal entry point to the EOSC service and data gateways. The following EOSC services & resources will be available on the portal:

a. Networking
b. Compute

    c. Storage
    d. Sharing & Discovery
    e. Data management
    f. Processing & Analysis
    g. Security & Operations
    h. Training & Support

In summary, the EOSC-Hub has a focus on the storage, transmission, analysis, and use of data across all of Europe, for all researchers engaged in European-funded research. While this may partially overlap with the data catalogue feature of the FocusCoE web-based tool, the FocusCoE tool will be focused only on the EU HPC CoEs data, and provide a dedicated place to find such resources.

7 Communication strategy and support

In order to inform potential users about the web-based tool, encouraging a user community to develop, it is important to establish and execute a communication strategy. As a first step, the categories and connected services have to be described and explained in simple and brief terms. In this process, it is vital that standard terminology is developed, and if changes are necessary in the future, all connected communication measures are aligned to these changes. This will avoid confusion and will add to a coherent picture of the EU HPC CoEs.

For the effective promotion of complex products and services – such as the services provided by the EU HPC CoEs – it is not sufficient to just describe them; in addition, the benefits resulting from using them have to be demonstrated. As the CoEs progress, services will be tested in collaboration with third party companies or organizations that in return will benefit in a tangible way from the partnership. These cases will be collected and edited in a comprehensive manner and used for several communication measures as suggested in the list below.

Finally, as indicated in Figure 3, the technical service offerings address a variety of beneficiaries, which have to be targeted appropriately. Hence, in order to promote this set of services, communication measures will take place through a variety of communication measures and activities, which are described more precisely below.

1. *Print materials*

A wide variety of print products can serve to promote the EU HPC CoE service offerings. In our participation at outreach and industrial events, a Roll-Up will draw passing visitors' attention by listing the technical service categories covered by the CoEs. One pagers can dedicate a Flyer-sized page to each of the service categories, which offers the prospect that parties that are only interested in a part of the service categories can get precise and targeted information. In FocusCoE's yearly appearing Booklets, a variety of success stories can demonstrate which users have already benefitted from the services and how.

2. *Events*

In WP3, roughly 12 visits to events are planned that cover specific industrial domains, with the aim to help develop collaboration opportunities and exchange between the CoEs and potential industrial partners. These events provide a great opportunity for promoting the services of the CoEs to the beneficiary groups of "Industry", "SMEs", and "Service & Data Providers".

Events that specifically address "Academia & Scientific Organizations" are mainly covered by the CoEs and do not constitute a big priority for FocusCoE. Exceptions are HPC-specific events, such as the ISC and SC conferences that FocusCoE will mainly attend in partnership with EXDCI. CoEs can be provided with print material for them to use for promotion purposes when attending events related to their scientific interest.

"Policy Makers" and "Funding Agencies" are beneficiaries that both FocusCoE and the EU HPC CoEs mostly use direct communication through personal relationships. However, event series such as the EuroHPC Summit Week and other events and workshops organized by PRACE, ETP4HPC, or EXDCI are usually also attended by members of FocusCoE, which offers a great opportunity for exchange in larger groups.

3. *Website*

The approach to the web-based tool webpage structure is suggested in Chapter 3. This will ensure that the website's visitors are provided with easy and comprehensive access to information on the services, how they can be used, and how they are linked to the CoEs. In addition to that, FocusCoE will make sure that the collected success stories will be published on the website as well in a blog-like format, to make the services more approachable for potential users. Additionally, the website will offer information on the EU HPC Ecosystem, also linking to resources provided by EXDCI https://exdci.eu/) and an event calendar (already available at https://www.focus-coe.eu/index.php/events/[1]). Specific actions will be put in place to promote the website, such as using appropriate keywords on the search engines, submitting the site to search engine directories, setting up actions for online advertising.

4. Social Media

Social Media will be used for information campaigns on the specific services, as well as to present the categories that are covered by the services. In addition, a second campaign will take the form of the presentation of success stories after they are launched on the website. One big advantage of Social Media is the possibility to link together all relevant parties, such as the respective CoEs and the users of the services, by tagging them. This way, they are encouraged to spread the news as well. The sources of shared tweets will be the @FocusCoE Twitter account, encouraging the respective CoEs to share the success stories throughout their channels as well.

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[1] This information is now available at https://www.hpccoe.eu/index.php/events/

8 Conclusion

In order to design the web-based tool proposed in the DoA, an analysis of the technological and scientific offerings made available or scheduled by the CoEs was carried out. Through the use of questionnaires and interviews, information was gathered and analysed in order to allow the identification of commonalities in terms of the CoEs' IT services. Moreover, within this work, a study was performed to identify various categories of customers that will use the web-based tool.

The results obtained from the analysis, and the discussions among partners of the project, suggested that FocusCoE should opt for a slightly different web-based tool from the one initially described in the DoA. Indeed, as a solution to support the dissemination of the technological and scientific offerings put in place by the CoEs, it was thought best to set up a dedicated area in the EU HPC website. This area will allow potential customers and collaborators to quickly navigate through the CoEs offerings. The design approach used to build the web-based tool will be aimed at maximizing the impact on the stakeholders. A timeline on the construction of the tool has been provided.

Although the specific web-based tool is different from the one initially envisaged, the objectives and expected outcomes of Task 5.3, as presented in the DoA and in the Frankfurt kick-off meeting, remain unchanged.

The HPC scenario in Europe is evolving very fast and a number of initiatives aim at supporting industry and other stakeholders in the uptake of these technologies. The web-based tool will give a contribution to this goal and will be an essential part of the HPC3 website currently under development. The KPIs that were described in Chapter 5 will help in the evaluation of the tool's effectiveness, and in the set-up of possible actions to remedy errors or improve results. In the long run, it will be necessary to address sustainability issues and the coordination of this tool with the general framework of the other initiatives currently under way.

9 References

[1] FocusCoE project, http://www.focus-coe.eu/. This URL now redirects to https://www.hpccoe.eu/

[2] FocusCoE Deliverable D1.2, "Management Report", Project Month 19 (June 2020)

[3] FocusCoE Deliverable D3.1, "Report on the sectorial approach priorities", Project Month 6 (May 2019)

[4] https://ec.europa.eu/info/research-and-innovation_en

[5] https://www.eosc-hub.eu/services

10 Annex I

10.1 Questionnaire

<table>
<tr><td colspan="2">1.Identification & specifications of the information services</td></tr>
<tr>
<td>Which IT based services are currently made available by your CoE, as results of previous CoE Phase 1 projects made available by your partners? Please give a short description specifying access rules.</td>
<td>Possible CoE information services:
- Codes;
- Infrastructures;
- Web portal;
- Database;
- Simulation packages;
- Support system;
- Online training infrastructure;
- Software Repository;
- Best practices;
- Electronic brochures, newsletters;
- …</td>
</tr>
<tr>
<td>Which technology/ies were used / will be used to build your information services? How do you think these could be used/integrated in FocusCoE?</td>
<td></td>
</tr>
<tr><td colspan="2">2. Services & Beneficiaries</td></tr>
<tr>
<td>Who are /will be the beneficiaries of the previous information services?</td>
<td>Please associate to each information service identified in Section 1 possible end users or stakeholder categories:
- Academia;
- Scientific organizations;
- Professionals/consultants;
- Students;
- Industrial users;
- Public administrations;
- …</td>
</tr>
<tr>
<td>Which industrial sectors are specifically addressed and can benefit from your information services?</td>
<td></td>
</tr>
<tr>
<td>Which experiences have you had so far in addressing industry and promoting your services?</td>
<td>Please provide information on:
- Types of interaction
- Contacts already established
- Barriers
- Best practices
- Success stories</td>
</tr>
<tr>
<td>Could be useful a web-based tool for you?</td>
<td>Or something else that could help</td>
</tr>
</table>

10.2 CoE Technological and Scientific Offering (1): ESiWACE

EsiWace **Centre of Excellence in Simulation of Weather and Climate in Europe**	
Consortium Partners	1. Deutsches Klimarechenzentrum GmbH 2. Centre National de la Recherche Scientifique 3. European Centre for Medium-Range Weather Forecasts 4. Barcelona Supercomputing Center 5. Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V./ Max-Planck-Institut für Meteorologie 6. Sveriges meteorologiska och hydrologiska institut 7. Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique 8. National University of Ireland Galway (Irish Centre for High End Computing) 9. Met Office 10. Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici 11. The University of Reading 12. Science and Technology Facilities Council 13. BULL SAS 14. Seagate Systems UK Limited 15. ETH Zürich 16. The University of Manchester 17. Netherlands eScience Center 18. Federal Office of Meteorology and Climatology 19. DataDirect Networks 20. Mercator Océan
Duration and effort	48 months: 1 January 2019- 31 December 2022 Indicative PMs: 808
1.Identification & specifications of the information services	
Which IT based services are currently made available by your CoE, as results of previous CoE Phase 1 projects made available by your partners? Please give a short description specifying access rules.	*The **ESiWACE projects** develop and support specific software packages concerning computing and storage aspects: OASIS-MCT, CYLC, XIOS. Next calls to apply will be issued in September 2019.* *Support system: SPACK developments for weather and climate software, that have directly entered the SPACK repositories.* *Best practices: System administrator handbook for weather and climate software on HPC systems. (Via website)* *Newsletters: several newsletters distributed among ESiWACE community and beyond* *Codes:* *Simulation software (weather & climate models): Improved versions of NEMO, EC-Earth, ICON, openIFS, IFS. The models are being made available by the model owners directly. Different licenses apply, in particular IFS has restricted access.* *Earth System Data Middleware. The middleware for earth system data is a prototype to improve I/O performance for earth system simulation as used in climate and weather applications. ESDM exploits structural information exposed by workflows, applications*

	as well as data description formats such as HDF5 and NetCDF to more efficiently organize metadata and data across a variety of storage backends. Available via github (https://github.com/ESiWACE/esdm)
Which types of IT based services will be developed by your CoE during the project? Please give a short description specifying access rules.	*Services will be developed that support weather and climate communities to make their codes ready for exascale. The exact set up of the services is under development, a first call for service projects is anticipated for 2019. There are no restrictions on whom can apply, but non-ESiWACE groups are to be preferred for being selected.* *Besides, high-performance climate and weather (HPCW) benchmarks will be developed and can be used afterwards by any group/vendor/developer to investigate performance of weather and climate model components on various architectures, considering specifically the ESiWACE2 simulation software under consideration.* *Within the DYAMOND initiative ESiWACE supports inter-comparison studies of leading international very-high-resolution global climate models.*
Which technology/ies were used / will be used to build your information services? How do you think these could be used/integrated in FocusCoE?	*Simulation technology from weather and climate modeling. (Fortran, C++, Python, Domain specific languages).* *The benchmarks mentioned in 2.2 can be used by anybody and can therefore be of relevance for general information services, in particular for hardware vendors.*
2. Services & Beneficiaries	
Who are /will be the beneficiaries of the previous information services? Please associate to each information service identified in Section 2 possible end users or stakeholder categories:	*Concerning the services, academia/scientific organisations and, in this regard particularly, developers of weather and climate models. End users in the long term comprise all services that rely on efficient, high-resolution weather forecasting and climate predictions.* *The beneficiaries of the benchmarks are vendors/scientific organisations and model groups that want to evaluate the performance of their current and potentially future systems for weather and climate applications.*

Which industrial sectors are specifically addressed and can benefit from your information services?	*HPC hardware and software industry (benchmarks).*
Which experiences have you had so far in addressing industry and promoting your services? Please provide information on:	*Two large hardware vendors are represented on the scientific advisory board. Three of the project benificiaries come from industry . Further, good contacts exist to most relevant HPC vendors and industry. Various interactions in terms of hardware-software co-design, hardware procurements, joint sessions on conferences (e.g. birds-of-a-feather ISC sessions) or joint workshops have been happening in the past.* *Barriers typically comprise the very time-consuming and complex interdisciplinary work in co-design which shall be addressed among others through the new ESiWACE service projects.* *Concerning success stories, quite some success was achieved for the NEMO, EC-Earth, IFS and ICON models (and several other software) in the past by various groups interacting and collaboratively developing the code.*
Name of respondent	Joachim Biercamp, Philipp Neumann

11 Addendum

This Addendum contains an update of information about the D5.2 activities described in the previous sections. The Addendum intends to answer questions and clarify a few points and issues, and takes into account developments in the project's life and deployment that occurred after the original document was produced.

The new information is presented below.

11.1 CRM vs Web information area

The activities described in this deliverable address to create an ICT product which effectively supports industries in accessing and using the technologies developed by the CoEs. The initial idea to make this kind of information system based on a Customer Relationship Management System (CRM) was discarded because it implies the existence of a substantial group of "customers", a current list of joint customers to be addressed with "market" proposals. In the network of CoEs there is no such list, no such situation. If a CoE has a contact with a particular company ("customer"), it has no interest to share it with the other CoEs. A CRM is, therefore, inappropriate to address the needs and objectives of the CoEs network. Hence, to pursue this goal, in agreement with the project's PCC, this information has been included on the website. The choice fell on an ad-hoc website area where stakeholders (from industry, academia/research, or other interested parties) can access information on services, tools, data and expertise made available by the CoEs, and can rapidly identify the correct contact points. Thus, a different, more information-oriented solution was targeted, and it was decided to set up a web area on CoEs' Technological Offerings. These web pages allow to disseminate the information to new contacts (potential new "customers"), which is the real need of all CoEs. This is why it was deemed necessary to modify the original task in the DoA.

The web area has been built considering the availability of data and information and the requirements voiced by the CoE representatives. The result is a service registry which contains the CoEs offer, to be updated through regular checks with CoEs (see section 11.2).

Further developments, introduced by activities of the HPC3 Council and the mid-term project review, brought about a consolidation of all websites and web services in a single product. The web information area is now, therefore, part of the https://www.hpccoe.eu/ website, that includes also the information from the former https://www.focus-coe.eu/ site that now re-directs to a sub-section on the new website that is dedicated to the FocusCoE project.

The system is being regularly maintained and updated, taking into account new propositions and information made available by the various CoEs during the course of the projects, and validation procedures with CoEs are put in place (see next paragraph).

11.2 Validation cycles & Timeline

The content of the web information area will regularly be updated. Validation cycles will follow a comprehensive approach:
- validation via CoE websites: people in charge of this task will check the CoE websites on a monthly basis for newly added services and add them to the web information area;

- validation via CoE communication/dissemination officers: people in charge of this task will regularly ask the CoE communication leaders to check the content of their CoE in the registry. This will be asked every two months during the regular FocusCoE WP5 calls with the CoEs. CoEs that have no representative in the call will be reminded via email and / or Slack channel to check their parts of the website;
- further to the regular validation cycles, the task is open to feedback and updates from the CoEs in case they proactively approach FocusCoE with such requests.

At the moment of writing (October 2020) this deliverable, the following timeline can be established for the set up and maintenance of the web area dedicated to the CoEs' Technological Offerings:

Action	Deadline/frequency
Set up of consolidated HPCCOE website	Done
Set up of web area on Technological Offerings	Done
Periodical scanning of CoE websites to collect new information	Every month
Periodical contacts with CoEs to collect new information	Every 2 months

Table 3 - Timeline

11.3 Target group categorisation

Since this deliverable was written, we have found that the approach to the categorisation of beneficiaries needs to be more generalised, rather than focusing on the needs of specific beneficiary types. The reasons for this are two-fold:

1. Each of the beneficiaries identified in this deliverable possess some level of interest in all of the CoE service categories. Academia & Scientific Organizations, Industry, and SME conduct research across all domains and methods, for example, participating in EU funded CoEs, which themselves cover all manner of domains and methods. Funding agencies are interested in the output of the research being conducted by the CoEs, in order to determine their impact, therefore covering all service categories. Policy makers are likely not interested in accessing the CoE services themselves, but they are rather interested in key outcomes of the CoEs, which may indirectly feature the CoE services. Service & Data Providers will be interested in all of the CoE services since every service category can involve the types of services and data that they provide.

2. The CoE's themselves do not offer personalised services/products for the different beneficiary categories, and therefore refining the proposed categorisation does not yield an added value to the process of promoting the CoEs' services to potential users.

11.4 Quantitative measure of KPIs

In the course of the project the need to have available a set of quantitative, measurable KPIs came about. To this end, a partial revision of the KPIs originally selected was performed. This was necessary to select criteria that could surely yield a quantitative measurement. In particular, the criterion "Number of contacts made thanks to the website by stakeholder type" was modified into "Number of promoted visits to CoE website/services". See the Table 2rev below for the updated KPIs.

KPIs	Attributes	Target	Status M20
CoEs' Information Services by category	1. Overall number 2. Number by Service category	20 (global)	34
Visits to Technological Offerings web area	1. Overall number 2. Number by country 3. Number by Service category	100 visits/month	115
Number of Promoted visits to CoE website/services	Number of visitors leaving the Service Registry by clicking on a link to a CoE page	20/month	Not available
Visits to CoEs' websites to gather and update information on Technological Offerings	Number per CoE website	1/month	1

Table 2rev - Revised KPIs