



D2.1 Dissemination and exploitation plan Version 1.0

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Change Log

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V 0.4	Zeba Shamshad Chowdhury	Fourth draft with contributions of Xavier Salazar and Anna Escoda
V 0.5	Zeba Shamshad Chowdhury & Renata Giménez	Fifth draft with Appentra´s feedback
V 1.0	Zeba Shamshad Chowdhury & Renata Giménez	Accepted final version ready for EC evaluation

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Executive Summary

This document defines the dissemination and exploitation plan for the EPEEC project. The aim of this document is to raise awareness and interest in the developed programming environment among the target groups such as the users, the scientific community, the industry and, whenever possible, the general public. The presence of European institutions and individuals with the highest expertise in their field, including not only leading research centres and universities but also SME/start-up companies, all of them recognised as high-tech innovators worldwide, ensures the wider dissemination and exploitation potential. Therefore, this document will also focus on initial exploitation strategy, IP management and organizing Scientific Industrial Advisory board, so that it can provide maximum impact to the society. It is a “live” document that should be updated periodically by the WP2 team, as the project flows.

Most of the results will be published via academic and industrial channels by submitting scientific papers, and by holding workshops and trainings related to the new programming environment developed.

1. Introduction

The main purpose of the Dissemination and Exploitation work package (WP2) is to maximise the visibility of the project and to support the partners involved in the exploitation of its results. This document comprises dissemination and initial exploitation plan.

The structure of this dissemination plan is divided in three big blocks. After the general objectives and the definition of the dissemination team, the plan is distributed in the dissemination strategy (audience, channels, KPIs, dissemination actions and monitoring through the dissemination register), the brand (which includes the main elements of EPEEC branding) and the dissemination materials (the different tools developed in order to help disseminate the brand).

As the project is in very early stage, an initial exploitation and IPR management strategy has been included in this document. The exploitation and IPR management strategy has been categorized into three main sections: exploitation plan, IPR management and coordination of scientific industrial advisory board and promotion of end users group.

2. General objectives

Please find below the general objectives of this work package:

- Identify and perform communication and dissemination activities in order to maximise the impact of the project, in collaboration with other EU research activities, scientific audiences, and industry forums.
- Identify the exploitable results of the project, analysis of exploitation context (analysis of actual market situation, potential target market/ target users, early adopters) and strategies for commercialization for these results to reach the market.

- o Identify and perform training activities in order to engage interested parties in the usage of the EPEEC results.

3. Dissemination and Exploitation team

The WP2 team includes ten organisations, which are represented in **Table 1**. The total number of personal months from each partner is included in the list below.

Role	Name	Responsible people	Email address	PMs
1 WP Leader	BSC	Renata Giménez / Zeba Shamshad Chowdhury	renata.gimenez@bsc.es zeba.chowdhury@bsc.es	14
2 Participant	Appentra	Manuel Arenaz	manuel.arenaz@appentra.com	1
3 Participant	CERFACS	Gabriel Staffelbach	Gabriel.Staffelbach@cerfacs.fr	1
4 Participant	CINECA	Andrew Emerson	a.emerson@cineca.it	1
5 Participant	Fraunhofer	Valeria Bartsch	valeria.bartsch@itwm.fraunhofer.de	1
6 Participant	IMEC	Tom Vander Aa	Tom.VanderAa@imec.be	1
7 Participant	INESC-ID	José Monteiro João Barreto	jcm@inesc-id.pt joao.barreto@tecnico.ulisboa.pt	1
8 Participant	INRIA	Stephane Lanteri	stephane.lanteri@inria.fr	1
9 Participant	Uppsala	Stefanos Kaxiras	stefanos.kaxiras@it.uu.se	1
10 Participant	Eta Scale	Kostis Sagonas	kostis@etascale.com	1

Table 1. Members of the WP2 team

4. Dissemination strategy

The aim of this dissemination and exploitation plan is to define the strategy for disseminating and exploiting the project results taking into account the big social impact that this project will have on society. This plan intends to raise awareness and interest in the developed technologies and solutions among the target groups.

4.1 Target audience

As mentioned before, the strategy includes the description of the different target audiences of the project (**Table 2**), as well as the key messages, dissemination channels and value of each audience defined.

Target audience	Key messages	Dissemination channel and activities	Value to target audience
Scientific community and industrial stakeholders	EPEEC's approach	EPEEC website. EPEEC publications. Factsheet and infographics.	Understand EPEEC's approach and its benefits. Acknowledge EPEEC as a fertile research area.
Industrial stakeholders and policy makers	EPEEC's benefits	Technology transfer sessions. Events and conferences. Industrial days. Trainings.	Understand the potential benefits of EPEEC and its inclusion in their roadmap.
General public	EPEEC impact for society and industry	Press releases and interviews, factsheet, video, open day at BSC to visit the supercomputer Mare Nostrum.	Understand how tax payer money is invested and how EPEEC will benefit European society.
Scientific community	EPEEC's technology and portfolio	Publication in scientific journals, conference proceedings, symposia, and workshops. Trainings, website and partner's social media channels.	Understand EPEEC's approach and the underlying technology to attain EPEEC's goals. To be able to contribute and build upon it.
Young researchers	EPEEC as a promising research career	Training courses in summer schools, partner's social media channels.	Understand EPEEC's approach and the potential benefits it offers, potentially devising a promising research area of interest. Promote HPC careers in future.
Scientists from other related projects	EPEEC's impact in other projects	Invited talks in other project meetings. Social media channels. Related projects: POP2, EuroExa, PRACE, DEEP-EST, AXIOM, EPiGRAM, Montblanc2020, etc.	Identify potential ways in which EPEEC's approach may be applied to their projects.

Table 2. Target audiences table

4.2 Key performance indicators

The following table (**Table 3**) summarises the Key Performance Indicators (KPIs) for this work package:

KPI name	Description	Total target (by the end of the project)
Press releases	At least 1 in a year	3
Press impacts	EPEEC presence in mainly technical and scientific (and, if possible in generic) media	25
Project flyer	General information flyer (to be updated regularly)	1

Website sessions	Number of sessions (Google analytics)	1000 sessions/year
Presentations	Presentation of EPEEC results at conferences	4
Workshop	Organisation of a workshops	2
Tutorial/webinar	Organization of a tutorial or webinar	2
Scientific publications	Peer-reviewed journals and conference proceedings	12
Project presentation	General overview regularly updated	1
Project video	Final video highlighting projects results with infography to highlight main scientific outcomes	1

Table 3. Key performance indicators

The above mentioned Key Performance Indicators (KPI) will be carefully monitored and revised yearly, as they might change or evolve based on the progress of the project.

4.3 Dissemination channels

In order to efficiently reach the targets for dissemination and to maximise the visibility of the project, a broad spectrum of dissemination channels will be used. The public website will play the central role in dissemination as it is the most important channel for disseminating information.

4.3.1 Website

The public website (www.epeec-project.eu) plays the central role as it is the main media for disseminating all EPEEC's results and activities.

It provides general information about the objectives of the project, the main components and applications used, and the tools for the programming environment developed, which will be available to download in the **public repository tool**. The website is updated with news, events and trainings related to EPEEC, as well as the publications generated during the project, which will be also available in the **public paper repository**. The home page is shown in **Figure 1**.

The WP2 team is the primary responsible for editing the website content, website deliverables, feedback and statistics. The **intranet** (internal repository), which is embedded in the website, is responsibility of the WP1 leader, as a tool for internal communication. The EPEEC website is developed with the Drupal 8 system, and managed by the BSC webmaster. The domain has been acquired by BSC for three years, renewable.

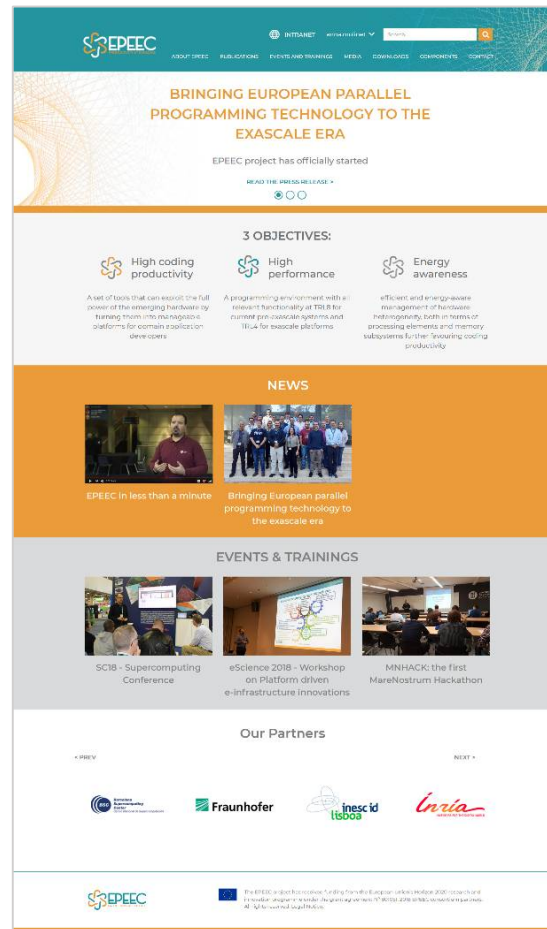


Figure 1. Website's home page

The EPEEC webpage also uses a visitor **statistics monitoring system** from Google Analytics. The WP2 leader will monitor the statistics and based on these will take the corresponding actions in order to increase the visibility of the website. The results will be included in the deliverables D2.5 and D2.6.

4.3.2 Social Media

Nowadays social media can be considered to be a good dissemination channel to reach the [above mentioned target audiences](#). As EPEEC counts with partners that have a good network of contacts in their fields in social media, as well as with the aim to building a community around the project, the dissemination team has decided to use the partners' channels, which already have the critical mass achieved. The EPEEC team will then ask the partners to always help to disseminate the news on their own social media channels focusing mainly on Twitter and LinkedIn. In particular, for the final video highlighting the results of the project we will make use of the BSC Youtube channel.

Finally, we will also ask the EC Project Officer and communication responsible associated to EPEEC to help us disseminate the EPEEC related news on their own social media channels and news services such as CORDIS, and others such as Digital Single Market Twitter account.

4.3.3 Press

Press releases are one of the most effective ways of communicating particular activities of EPEEC project to a specific target audience. Press releases attract attention to the project's progress and its achievements. The idea is to launch yearly a minimum of one press release, but it will be agreed among all partners whenever an important achievement needs to be announced.

The procedure for launching a press release should be as follows:

1. The Dissemination team (or any other partner informing previously the WP2 leader or the coordinator) prepares a first draft of the press release. This text has to be validated by all partners as well as by the Management Team (WP1).
2. Once these steps have been agreed, all partners have to agree on the launch date and time. Partners are encouraged to translate the EPEEC press releases to their languages, where possible. The adequate translation of the materials is responsibility of each partner. Translation funding is not included in the dissemination budget.

All press releases will be included in the EPEEC media corner of the project website (www.epeec-project.eu/media/news). The EPEEC website has to include all press releases in all languages as well as all press impacts. Furthermore, the dissemination team will encourage all EPEEC partners to include it on their own partner websites (for example: BSC added the first press release adapted on its news section on page <https://www.bsc.es/news/bsc-news/bsc-will-lead-the-development-programming-environment-the-exascale-era>) in order to increase the click rates and referrals.

During the project, the dissemination team plans to launch at least three press releases:

- An initial press release launched 22nd November 2018 whose aim was to present EPEEC objectives and its major expected objectives. This press release is available on page <https://epeec-project.eu/media/news/bringing-european-parallel-programming-technology-exascale-era>.
- Towards the middle of the project, WP2 plans to launch a second press release in order to explain its progress.
- Finally, at the end of the project, a press release will be developed describing the scientific results and its impact, and will be accompanied with a video summarising the outcomes. It is important to highlight that the media used to reach the target audiences will be mainly technical and scientific media.

4.3.4 Events

Another important dissemination channel will be the attendance and presentations at high-level peer-reviewed conferences in the field. Presenting the latest updates of the project at such events, meetings or workshops will be an effective means of involving industry leaders. All events with EPEEC's participation will be previously announced on the "[Events and training](#)" page and, if necessary, highlighted in the website and disseminated through partner's social media accounts.

The table below (**Table 4**) summarises a proposal of strategical events that EPEEC plans to participate. Note: this table does not include the training activities, as this will be defined in the D2.2 Training Plan.

Event name	Date	Action	Target Audience
SC18	November 2018	Booth presentation	Scientific community and industry
ICPP	March 2019	Workshop organisation	Scientific community
DATE 2019	March 2019	Workshop organisation	Scientific community
IPDPS	May 2019	Workshop organisation	Scientific community
EuroHPC Summit Week 2019	May 2019	Application for a presentation or workshop	Scientific community and industry
ISC 2019	June 2019	Application for a presentation or workshop	Scientific community and HPC related industry
PASC20	June 2020	Mini-symposium organisation	Scientific community
SC19	November 2019	Poster	Scientific community and HPC related industry
ICCS 2020	June 2020	Workshop organisation	R&D community

Table 4. Strategic events for EPEEC

4.4 Publications

All scientific publications will be published at the EPEEC website (<https://epeec-project.eu/publications>) providing at least “green” open access publications following the [“The Guidelines on Open Access to Scientific Publications and Research Data”](#) in Horizon 2020. All resulting publications (publications, white papers, technical reports, etc.) will include the following acknowledgement sentence:

The research leading to these results has received funding from the European Union's Horizon 2020 Programme under the EPEEC Project (www.epeec-project.eu), grant agreement n° 801051.

5. EPEEC brand

A common graphic identity has been developed in order to create a recognisable brand associated to the project. This image should be consistently applied by all partners and in all dissemination materials.

5.1 Brand guide

The brand guide (**Figure 2**) will serve as a manual to refer as a consensual image to disseminate the EPEEC brand, and includes key branding resources: colour palette, logo variants, typefaces, etc.

The brand guide has been distributed to all partners to ensure coherence and consistency, and it is available on the intranet. The WP2 leader will make sure that this brand will be applied correctly.

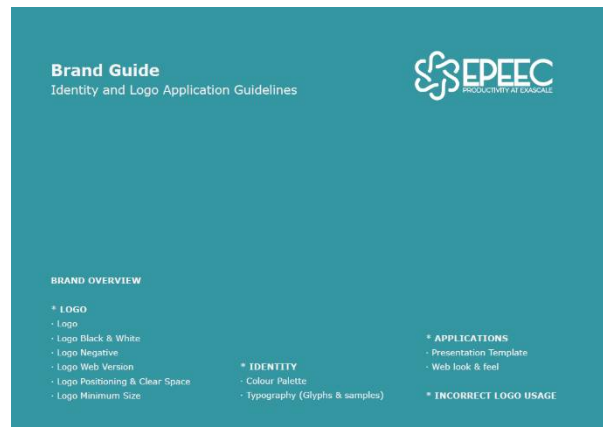


Figure 2. Brand guide cover

5.2 Logo

The main image of the project is the design of the logo, as follows:

	Positive	Negative	With dark background
Logo with slogan			
Logo with URL			

Table 5. EPEEC logo in all formats

The logo is available in the main image formats (eps, jpg, png) so it can be used in all online and offline platforms such as web or printed materials, respectively. This logo, approved by all EPEEC partners, should be included in all EPEEC related documents. All versions of this logo can be downloaded in different formats from the media corner of the website (www.epeec-project.eu/media/branding) as well as from the intranet.

5.3 Font

The font defined is ALPACA. This font has a strong character and it is used in the logo and the headlines of the different EPEEC materials. However, as its use is only in capital letters, the team has also included two additional fonts: Montserrat and Verdana.

The following image (**Figure 3**) shows the brand guide page with the specifications on how to use the three different EPEEC fonts:

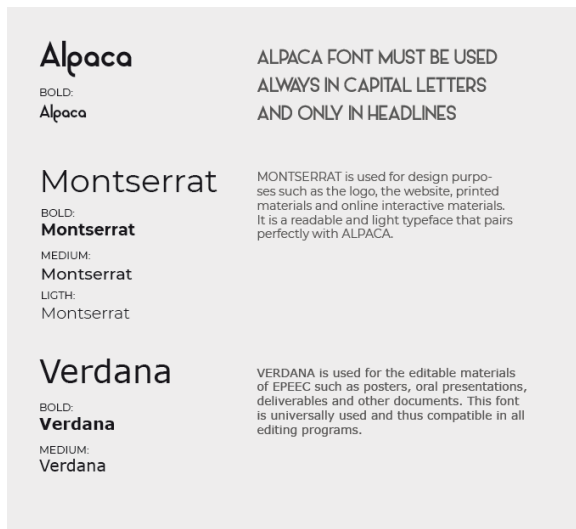


Figure 3. Typeface guidelines from the brand guide

5.4 Colours

Following the brand guide, a **colour palette** has been defined and will be used in all the dissemination activities. The secondary colours can be used in all the dissemination materials.

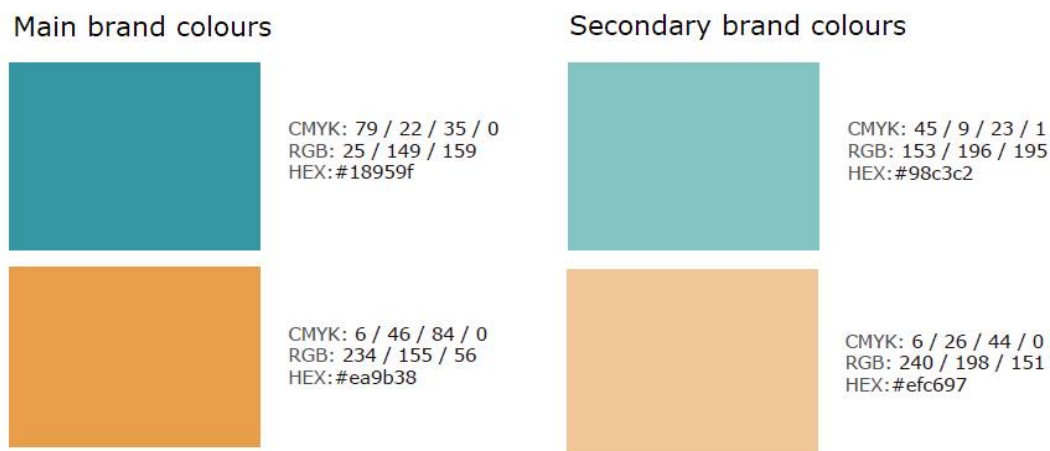


Figure 4. EPEEC brand colour palette

5.5 Language

The official language of the EPEEC project is British English for all dissemination materials, as the funding is European. However, the dissemination material should be translated into the different partners' languages, where possible. Each partner should ensure that the materials are adequately translated into the local languages, e.g. in the case of the press releases for the local media. Funding for this is not included in the dissemination budget.

5.6 Project templates

A set of templates to be used in the main dissemination activities of the project (workshops, conferences, training courses, etc.) have been designed.

5.6.1 Presentation template

The presentation template will be used in all presentations done by the project partners. It is available to all partners in several formats (such as Open Office and Power Point formats), and can be downloaded from the intranet.

The template gives some design guidelines by defining common layouts, font sizes, etc. **Figure 5** shows the first slide of the template.

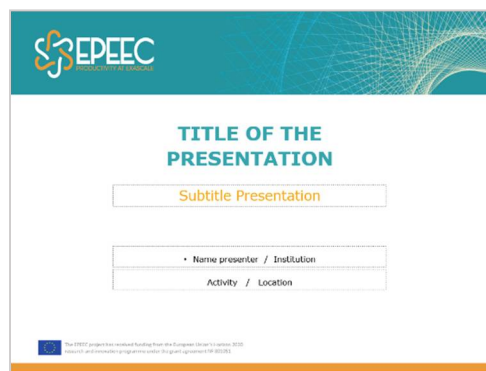


Figure 5. First slide of the presentation template

5.6.2 Deliverable template

In collaboration with WP1 team, the dissemination team has prepared a deliverable template based on the style guide described above. The font used is the EPEEC secondary typeface Verdana. It is available to all partners in several formats (such as Word document and Open Office), and can be downloaded from the intranet.

5.6.3 Poster template

A poster template has been developed to use in all events, whenever applicable. This material will reinforce the EPEEC brand in events, together with the presentation template, see figure 6 below. It is available to all partners in several formats (such as Power Point and Open Office), and can be downloaded from the intranet.



Figure 6. Poster template

6. Dissemination materials

The role of the dissemination materials is to ensure that the different target audiences are aware of the EPEEC project and the strategic relevance and impact of this project for Europe. All dissemination materials will include the name, website, logo, and disclaimer of the EPEEC project:

The EPEEC project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement N° 801051.

6.1 EPEEC leaflet

During the first year of the project, an EPEEC leaflet will be designed to provide information about EPEEC: its objectives, the applications and components used and the characteristics of the programming environment that will be developed and deployed during the project. The brochure will be uploaded both to the intranet and to the website, so all partners can download it in PDF format and print it locally. Once developed, it will be used to hand out in events where EPEEC will have a particular presence, and will be downloadable from the project website.

6.2 EPEEC Poster

During the first year of the project, an EPEEC poster template will be designed to include the updated information of the project. The first version will contain a general description of the project and its aims. However, it will be updated periodically including the project results, when applicable. It will be used in all events where EPEEC needs to be promoted. This poster will be available on the EPEEC website in PDF format.

6.3 EPEEC presentation

A presentation with a general overview of the project will be developed. It will be used by all partners for its dissemination activities. This presentation will be useful in order to transmit the project's objectives, key messages and KPIs. The presentation will be periodically updated. This presentation will use the template developed in Open Office and Power Point. This presentation will be available on the internal repository available to all partners.

6.4 Video

Towards the end of the project, the dissemination team will produce an EPEEC video that will highlight the most relevant EPEEC results. The video will be in English with subtitles and it will be released together with a final press release addressed to technical media. It will highlight the major EPEEC achievements and the programming environment developed. All partners will help to disseminate this video, as well as it will be not only sent to media and will also be used in events.

7. Training

The WP2 has a training task (T2.3) that will include the organisation and logistical support of training courses. Such trainings will be performed in collaboration with other European projects and initiatives, identifying the training needs of the target audience or any other defined targets. The training activities and the strategy will be defined in the deliverable D2.2 Training plan.

8. Data Management

Another important task in the Dissemination and Exploitation work package is data management. The aim of this task is to comply with EC's objective of making research data findable, accessible, interoperable, and reusable (FAIR). This will be defined in the deliverable D2.3 Data Management Plan (DMP). The DMP will be updated during the lifespan of the project. The DMP will describe the life cycle for all data sets that will be collected, processed, or generated by the project. It is a document outlining how research data will be handled during a research project, and even after the project is completed, describing what data will be collected, processed, or generated, and following which methodology and standards, whether and how this data will be shared and/or made open, and how it will be curated and preserved.

9. Exploitation & IPR Management Strategy

The objective of exploitation is to ensure that the results of EPEEC will not remain limited in academic or research laboratories, rather to promote it to the potential market. Therefore, to conduct exploitation it is necessary to identify the potential exploitable assets, day-to-day management of knowledge and IPR issues, explore possible target market and users, analyze competitive environment, identify the main exploitation routes for the consortium and develop a sustainable exploitation plan and strategy.

The exploitation plan will be divided into 3 main segments: Exploitation Plan, strategy for IPR management, Coordination of Scientific Industrial Advisory Board (SIAB) and promotion of End Users Group (EUG)

As we are at the early stage of the project, this exploitation plan is focused on providing information about the ways in which the exploitation and IPR management activities will be executing within the project, rather than providing specific information about exploitable assets and market opportunities.

9.1 Exploitation Plan

The aim of this section is to plan for the context analysis, identify the stakeholders and value chain, identify the project exploitable assets, exploitation activities and sustainability.

9.1.1 Exploitation context

The main objective of EPEEC is to develop and deploy a production-ready parallel programming environment, which will turn upcoming overwhelmingly-heterogeneous exascale supercomputers into manageable platforms for domain application developers. The consortium will significantly develop and integrate existing state-of-the-art components based on European technology (programming models, runtime systems, and tools) with key features enabling 3 main goals: high coding productivity, high performance, and energy awareness. The target is to achieve TRL4 for exascale platforms i.e., validating the advanced technology in controlled pre-exascale environments and extrapolating its performance to exascale systems. Therefore, HPC users such as high-tech innovators, research centers, universities as well as SME/ start-up companies could be benefitted with the results of EPEEC.

9.1.1.1 Initial Market analysis

In the digital age the High Performance computing (HPC) has become an interdisciplinary resource, which changes the approach of research, business and even our daily life. The global HPC market was valued USD 27.28 billion in 2017 and is projected to reach a value of USD 39.58 billion by 2023, at a CAGR of 6.40% over the forecast period, 2018-2023.ⁱ As explained in the proposal the industrial sectors currently using HPC technologies are expected to contribute 2%-3% to the European gross domestic product (GDP) by 2020 if they succeed to improve their products and servicesⁱⁱ. The worldwide High Performance Data Analysis (HPDA) market is expected to grow at CAGR of 27.8% from 2015 which was USD 17.8 billion to USD 99.6 billion by 2022ⁱⁱⁱ. The HPDA market is the convergence of HPC data-intensive simulation and analytics, with methodologies machine learning (M/L), deep learning (D/L), and other artificial intelligence (AI). EPEEC aims to develop (pre-)exascale demonstrations of application codes selected to cover HPDA and M/L for various HPC market verticals.

In the upcoming deliverable D2.4, "First exploitation report" a detailed analysis of market trends and challenges, competitive environment analysis, SWOT analysis and exploration of business opportunity will be included.

9.1.2 Initial Value Chain and stakeholder identifications

The primary value chain and stakeholders will be identified in this section. This is a “live” document, so it will be updated as the project progresses. However, the detailed analysis will be provided based on individual exploitation plans in the future deliverable as the project and its outcomes will be more mature. The following figure has been considered as starting point.

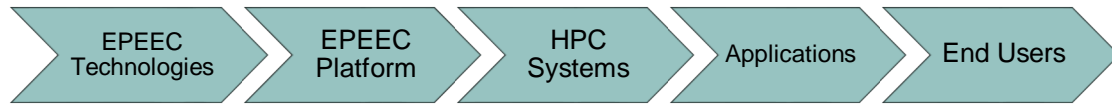


Figure 7. Value Chain

Thereby, the main components involved in the production-ready parallel programming environment, based on what we have identified with the primary stakeholders in relation with EPEEC environment, are depicted in the next figure:

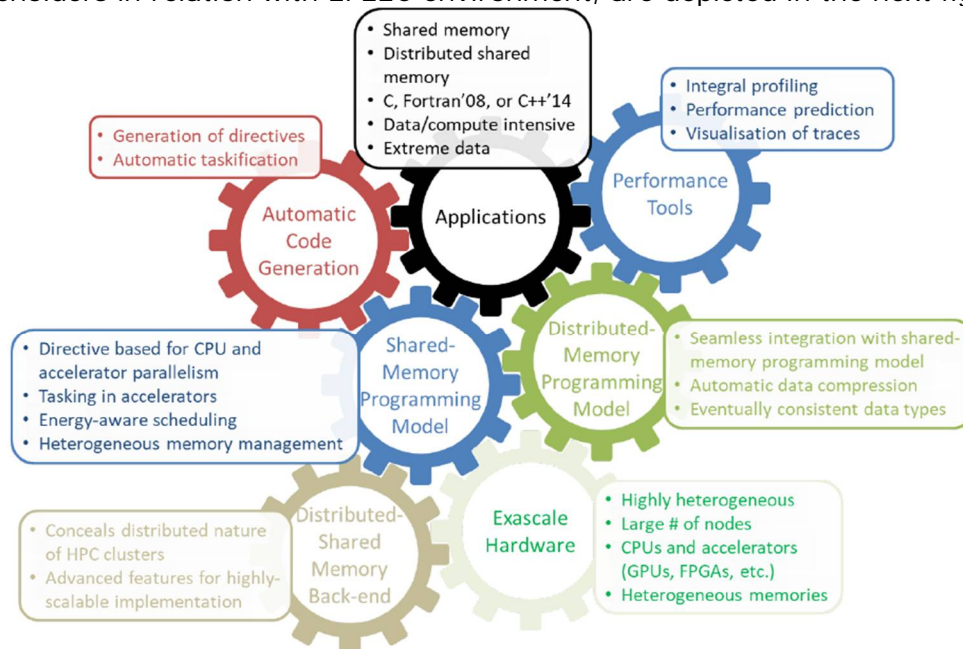


Figure 8: Abstract overview of the components involved in the EPEEC project

Based on these, we have identified two kind of stakeholders who will be benefitted with EPEEC’s results:

- Direct users of EPEEC programming environment: Direct users are those who will use EPEEC’s parallel programming environment for the development of applications in supercomputers. For example: application developers of HPC, universities, research centers, SME/start-up companies targeting high-tech innovations, etc.
- Indirect user and beneficiary: Indirect users are the ultimate beneficiary of EPEEC programming platform. Critical technology or solution provider, who require simulating experiments in HPC environment, e.g. airplane designer, drug discover experts, etc. will be the ultimate beneficiary of using EPEEC results.

9.1.3 Identification of project exploitable assets

Identification of project exploitable assets is very important not only for exploitation purpose but also for sustainability. Depending on the project results, the potential business models and exploitation paths could be identified. As the project gets more mature there will be more possibility to identify more exploitable results.

However, at this early stage we are considering the partners' background exploitable assets that will be used during the project as stated at the Description of Action of the Project (see Table 6 below).

Partner	Background	Exploitation intentions/plans
BSC	OmpSs, intra-node parallelism.	OmpSs is open source. Commercial licenses are granted to commercial applications. BSC is going to work for the adaptation of BSC tools to EXASCALE.
FRAUN	GPI, inter-node parallelism; implementation owned by Fraunhofer ITWM.	<p>The outcomes of the EPEEC project will be included in the GPL3 licensed software stack of GPI. Extensions to the GASPI standard resulting from EPEEC will be proposed to be standardised. Fraunhofer plans to exploit GPI by offering commercial licenses for commercial applications using GPI.</p> <p>To Fraunhofer, the GPI implementation of the GASPI standard is an ongoing topic of research to support its clients. Fraunhofer currently sees an increasing adoption of GASPI in the industry, since it provides superior strong scalability for a wide range of applications. It is used in the main European aerodynamics code from DLR and the basis for the HPDA software from a European SME called Sharp Reflections. GPI is used in a variety of commercial oil&gas software.</p> <p>In addition to commercial exploitation, Fraunhofer participates in collaborative research (on national and European level) and intends to remain active in this field.</p>
INESC	OSIRIS, owned by the Osiris Consortium ^{IV} is accessible to INESC through a signed memorandum of understanding.	<p>INESC will exploit the high-productivity tools resulting from EPEEC to build a new version of OSIRIS.</p> <p>The new PIC application will be open source and highly disseminated.</p>
Inria	DIOGENeS software suite dedicated to numerical modelling of nanoscale light/matter interactions.	<p>The DIOGENeS software suite is currently developed and used in the context of collaborations with physicists from academic institutions who are key players in the scientific research in the nanophotonics field.</p> <p>Ongoing initiatives are concerned with specific studies in partnership with companies from various sectors in relation with renewable energy production, smart connected devices, communications, and all-optical processing, among others.</p> <p>A first milestone for the group at Inria developing this software suite is to release a stable version of</p>

		DIOGENeS, and to set up long-term partnerships with these private sector companies. Depending upon the success of these initiatives, Inria may plan to launch a spin-off to reach a wider market in the nanophotonics realm.
APPENTRA	<p>Static analysis of sequential codes to exploit intra-node parallelisation.</p> <p>Parallware's new support for OpenMP 4.5, OpenACC 2.5, and OmpSs directives.</p> <p>Parallware's new support for the Fortran programming language.</p> <p>Parallware's new capabilities for taskification of sequential codes.</p>	Appentra will exploit these innovations in its suite of products for high-productivity parallel programming environments targeting the High-Performance Technical Computing (HPTC) market segment (i.e., Parallware Trainer). The developments within EPEEC are driven by end-user's market needs and are expected to cover (1) the exascale recommendations to exploit directive-based intra-node parallelism through OpenMP, OpenACC, and OmpSs, since these are widely used within the HPC community; (2) Fortran, the most popular programming language in HPTC and a key feature for the adoption of Appentra's products by the HPC community; and (3) the asynchronous tasking programming paradigm, which is attracting increasing interest by the HPC community (e.g., astrophysics) as a highly productive mechanism to exploit future exascale systems more efficiently.
CINECA	Quantum ESPRESSO application suite for the calculation of ground state electronic properties.	Implementation, test, and release of new programming paradigms and license it to user's community of Quantum ESPRESSO.
Eta Scale	<p>ArgoDSM, scalable distributed coherent shared memory system.</p> <p>ArgoBigMemory, an ArgoDSM variant for big data processing.</p> <p>Patent portfolio on coherence and synchronisation mechanisms.</p>	Eta Scale will promptly release an open-source research and evaluation version of EPEEC's ArgoDSM to the large task-based programming community, in order to create a user base that contributes to its popularity and further development. At the same time, Eta Scale will seek to establish evaluation projects with commercial entities with the intention of custom licensing. Eta Scale also offers its patent portfolio for licensing.
CERFACS	AVBP is an application used in industry and academia with an HPC workflow in mind.	CERFACS is a research entity devoted to training and development of HPC solutions for research. Although not open source, the code is distributed free of charge for research purposes in Europe and Canada. All developments will be included in a new release of the code and will be disseminated to student training, fostering better understanding of HPC and exascale.
IMEC	SMURFF, a machine learning software framework for large scale matrix factorisation.	Although the main users of SMURFF are currently in the pharmaceutical sector, SMURFF is a software package with wide-ranging machine-learning applications. SMURFF is available as open source on GitHub.
UU	Includes patents on novel coherence mechanisms, queue	Uppsala will channel all its IP to Eta Scale for commercialisation.

	delegation locking, prefetching, and caching techniques, as planned to be developed in the project.	
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Table 6: Exploitable Assets and Exploitation Plans by Partner

9.1.4 Exploitation activities & sustainability

9.1.4.1 Plan for Exploitation Activities

At this initial stage of the project to collect information about project exploitable assets and plan for exploitation activities, an “Exploitation Plan” template (attached in Annex) has been prepared by the innovation manager. All the partners of the consortium require to fill it during the execution of the project. At this early phase of the project, the feedback gathered from the partners about the plan for exploitation activities were considered into two main categories with several sub-categories. They are provided below:

Exploitation in Scientific Community:

- Further Internal Research
- Collaborative Research
- Standardization Activities
- Service Creation
- Licensing (For research purpose)
- Academic / Educational Use
- Others

Exploitation in Industrial Sector:

- Licensing (For commercial purpose)
- Product Development
- Service Creation
- Research with industrial partners
- Others

A repository table to collect all the exploitation activities of the project has been created. The sample table has been provided below:

Exploitable Assets	Owner	Exploitation Activity
[Exploitable Asset Name]	[Project Partner]	[List of Exploitation Activity]

Table 7: Repository for Exploitation activities related to Exploitable Assets

All industrial dissemination activities that can lead to future exploitation will also be collected. The sample table has been provided below:

Partner	Event	Further Details	Place	Date
[Project Partner]	[Event Name]	[Any Future Exploitation Opportunity or Feedback Related to Project Results]	[Place of the Event]	[Date of the Event]

Table 8: Repository for industrial dissemination activities

9.1.4.2 Sustainability

The exploitation plan will also address the sustainability of how the results will be used or further develop after the end of the project. It will entail the evaluation of project achievements including their acceptance by the business world. It will address: (1) IPR management issues, (2) leveraging open source communities for project promotion, (3) the definition of any necessary exploitation agreements, etc.

9.2 IPR Analysis and Strategy

9.2.1 IPR Strategy

Management of Intellectual Property Rights (IPR) is very important for a sustainable project. Therefore, it is important to follow certain strategy to obtain maximum results by minimizing definite conflicts.

Below is the IP management flow chart proposed for the IPR strategy, which has been prepared by BSC for European project IP management.

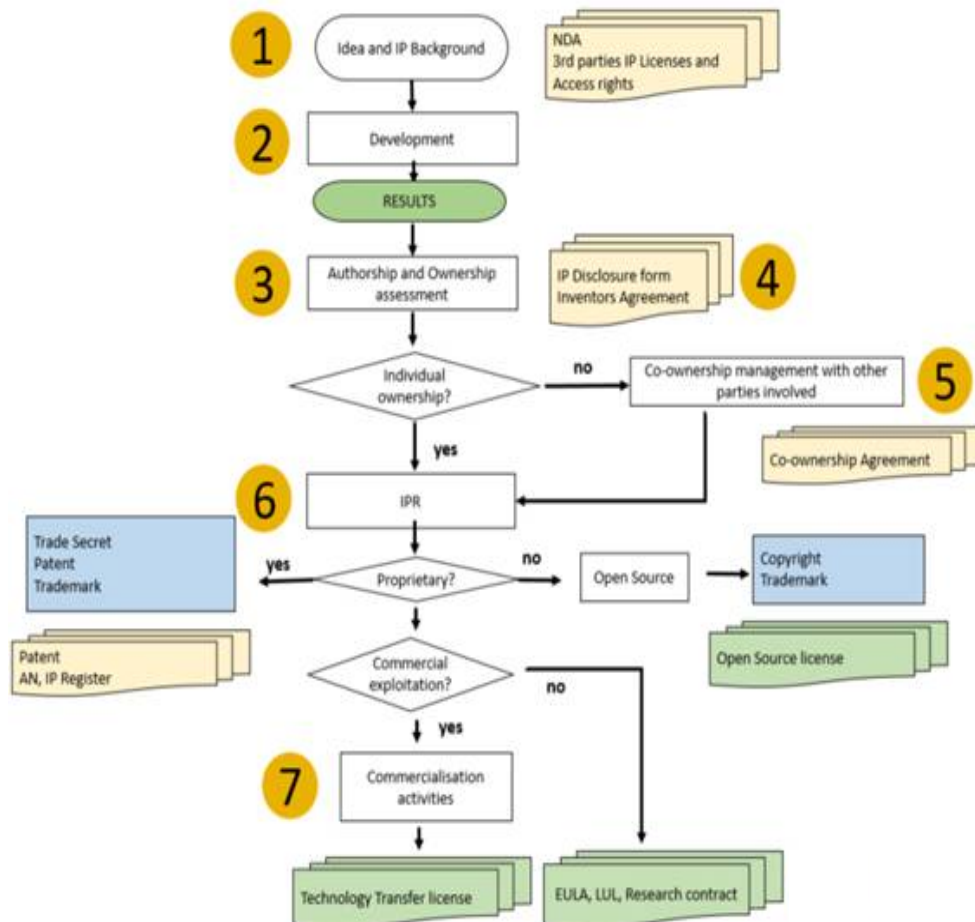


Figure 9: IP Management Flow

1. Idea and Background:

As a result of the activity of the project, scientific results are generated and also there are existing technologies to be improved and incorporated that have to be

considered (Idea and IP Background). The research staff will be responsible for detecting, together with the Innovation Manager and other personnel involved, those technologies. Also, they will raise a hand when there is the need to sign NDAs to share sensitive information in the execution of research activities. The NDA will be managed with the support of our legal services in negotiation with the other party.

2. Development

The research staff will be responsible for diligently managing the use of third party IP and ensuring that they have the rights to such use.

3. Authorship and ownership assessment

Research staff and the innovation manager, will be responsible for authorship and ownership assessment, and to fill the IP disclosure form and inventor's agreement.

4. Disclosure Form

The first step will be to fill out the IP Disclosure form identifying the inventor team, the projects where it has been developed, intentions, protection and sign if appropriate an agreement of inventors which establishes the percentages of contribution to the invention of each researcher as well as their institutions of origin.

5. Co-ownership

In the case of a shared invention, the co-authorship will be coordinated with the rest of the institutions and an agreement will be signed to that effect.

6. Protection and IPR

At the same time, the best protection strategy will be studied, whether the invention is to be conserved as owner or to be opened as Open Source. Once the appropriate option has been established, the necessary steps will be taken to this end.

7. Commercialisation

In order to enhance exploitation of the Consortium Results, each partner shall have full own freedom of action to exploit the joint IP according with the agreements set up in the CA.

9.2.2 IPR Analysis

A repository table to collect all the different IP assets of the project has been created - including all Software Components, its ownership, licence type and TRL level (at the start and at the end of the project). The following table summarizes such information:

Software Component	Owner	IP Protection or Licence Type	TRL
[Name]	[Project Partner]	[Licence Type / Open Source / Proprietary, etc.]	[1-9]

Table 9: IP Repository and Software components

The subsequent deliverables will include elaborated list with the libraries used. As this is a live document, the IPR analysis will be updated.

9.3 Coordination of Scientific Industrial Advisory Board (SIAB) and promotion of End Users Group (EUG)

The Scientific Industrial Advisory Board (SIAB) and End Users Group are well described at the Description of Action and their main objective is to provide the necessary real-world feedback on the progress and results of the project.

The SIAB members have been chosen by the General Assembly in the first months of the project in order to meet two main objectives:

1. Balance academia-industry.
2. Expertise in state-of-the-art HPC programming environments and standards, covering a wide range of those involved in EPEEC.

Our SIAB committee is composed of 3 members from academia and 2 from industry. 3 of them belong actively to different standard bodies relevant to EPEEC.

The current composition of the SIAB is as follows

Name	Institution	Country	Std. Bodies	Academia	Industry
Sunita Chandrasekaran	Open MP ARB / University of Delaware	USA	x	x	
Stefano Markidis	KTH	Sweden		x	
Frederic Pariente	NVIDIA	Italy			x
Michael Klemm	Intel & OpenMP ARB CEO	Germany	x		x
Pavan Balaji	MPI Forum / ANL	USA	x	x	

Table 10: List of Scientific Industrial Advisory Board (SIAB)

They will provide input on an annual basis. To this end their feedback will be collected via specific technical SIAB meetings during the F2F meetings in the first and second year of the project.

The main contribution of the SIAB will focus on the feature requirements formulated by the project team, offering suggestions for prioritization based on current industry roadmap planning, as well as helping to reassess and reprioritize based on implementation status and promising preliminary results. In the final phase of the project, the SIAB will be induced to the initial results and will assist in the dissemination of these results.

The End-Users Group (EUG) will be an advisory body made of industrial and academic end-users of HPC development environments in areas as diverse as those leveraged by EPEEC's applications. We will define the group in month thirty once technologies developed during the project are mature enough. The feedback from the EUG will be very important as they will be able to assess the technology based on the needs of the user communities.

The SIAB and EUG are also potential sources for future project results.

10. Next steps and upcoming deliverables of Exploitation

As the project progresses the exploitation plan will be updated. The aim of this deliverable D2.1 is to prepare an initial dissemination and exploitation plan for the project.

In the upcoming deliverable D2.4 a detailed market analysis will be conducted, exploitable assets with concrete exploitation plan will be analysed, exploitable activities will be reported. In addition, the first SIAB feedback will be included.

Finally, in the deliverable D2.7 an updated exploitation plan will be delivered, considering the results of the project, SIAB feedback and EUG feedback. Also it will update the information of exploitation activities and will include a concrete sustainability plan.

Deliverable Number	Title	Due (in months)	Status
D2.1	Dissemination and Exploitation Plan	4	Current Document
D2.4	First Exploitation Report	18	To be submitted
D2.7	Final exploitation plan and sustainability	36	To be submitted

Table 11: List of deliverables

Acronyms and Abbreviations

Each term should be bulleted with a definition.

Below is an initial list that should be adapted to the given deliverable.

- BSC – Barcelona Supercomputing Center
- D - Deliverable
- EC – European Commission
- EPEEC - European Joint Effort toward a Highly Productive Programming Environment for Heterogeneous Exascale Computing
- KPI – Key Performance Indicator
- M - Month
- PM – Person month / Project manager
- PU - Public
- R - Report
- WP – Work Package

References

ⁱ [Online]. Available: <https://www.marketwatch.com/press-release/global-high-performance-computing-hpc-market-2018-07-17>

ⁱⁱ [Online]. Available: <https://ec.europa.eu/digital-single-market/en/news/high-performance-computing-europe>

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^{iv} [Online]. Available: <http://epp.ist.utl.pt/wp/osiris>

ANNEX 1: Exploitation Plan Template

Name of the Organization:						
Brief description of your role in the project:						
BACKGROUND						
<p>(Please provide detail information if previous own technology will be used by you or any other partner for the development of the project or if any previous IP is going to be further developed e.g. OmpSs for BSC)</p>						
Exploitable Assets & IP Management (individual and/or collective)						
<p>Please provide the information on exploitable assets, type of results (whether it is SW or HW or services). How you aim to protect it, e.g. license agreement: Open source (please provide type), close/ proprietary, patent, trademark, industrial secret, etc.. Also please mention the TRL level of your assets,</p>						
	Type of Results (SW/HW/Service)	Protection Type	License Type	TRL Level*		
Exploitable Assets						
Exploitation Plan						
<p>Please specify the plan for exploitation activities. For example: further internal research, collaborative research, internal product development, internal service creation, licensing, joint venture, spin-off, Standardization activities, etc.</p>						
	Type of Results (SW/HW/Service)	Expected Exploitation Activities				
Exploitable Assets						
Market and Target Audience						
<p>Please specify the target industrial sector with size of the market the project can make impact on. Also please include the potential users, customers and competitors.</p>						
Type	Exploitable Assets	Target Industrial Sector	Market Size	Potential Customers	Competitors	End Users
SW						
HW						
Service						
Others						
Value Proposition						

Please indicate the values that would be offered to our target customers			
What benefits the customers expect to gain?			
What obstacles/ problems the customers expect to avoid?			
Key Partners			
Please indicate who are the potential partners, which key activities the partners can perform and which key target resources can be acquired from the partners.			
Type	Potential Partners	Key Activities Partners Perform	Key Target Resources Acquired from Partners
SW			
HW			
Service			
Others			
Expected Benefit for Society:			
Follow-Up of the project? If yes, how and what will you need?			
* Technology readiness level			