

## Infra Tech Guideline – Workshop (18-19/07/2023)

### 1- Call's expected outcome

<ul style="list-style-type: none"> <li>- Expected outcome :             <ul style="list-style-type: none"> <li>➤ enhanced scientific competitiveness of European research infrastructures</li> <li>➤ enhanced RI capacities to address research challenges and EU policy priorities;</li> <li>➤ foundations for the development of innovative companies;</li> <li>➤ increased collaboration of research infrastructures with universities, research organisations and industry;</li> <li>➤ increase of the technological level of industries through the co-development of advanced technologies for research infrastructures and creation of potential new markets;</li> <li>➤ integration of research infrastructures into local, regional and global innovation systems and promotion of entrepreneurial culture.</li> </ul> </li> </ul>
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### 2- Main aspects to identify for your working group (WG) :

- Objectives and ambition :
  - What are the objectives ? Are they SMART (Specific, Measurable, Achievable, Relevant, Time-bound) objectives ?
  - To what extent the proposed work is ambitious ? (any relevant ground-breaking methodology, approaches, concepts)

<u>Background Knowledge</u>	<u>Specific needs</u>	<u>Expected results</u>	<u>Timeframe</u>
<b>Training 1.1</b>	MOOCs on Data Science, ML/AI	Generate short Movies explaining how accelerator can benefit from ML/AI	Month 18 with regular updates thereafter
<b>Training 1.2</b>	MOOCs on SYSTEMATIC THINKING ML/AI	Generate short Movies explaining how to communicate between experts : Staff Training (SME, RI, Accelerator User communities, etc..)	Month 18 with regular updates thereafter
<b>Training 1.3</b>	Scientific Workshops	Operate Workshops (online and in-person) to connect communities  Dissemination of advanced technologies to industries	Throughout project duration, at least one per year

<b>Training 1.4</b>	Hackathon (distributed from each WP)	Connect European Accelerator and User communities	Annual event
<b>Training 1.5</b>	Simulations & Data (distributed from each WP)	Languages (MC, Tango, EPICS) and methodologies (Optimisation, process variables, characteristic time/space, etc..)  Impact on environment (sustainability, footprint, matching against SDGs, reducing downtime, enhancing resolution)	Month 36
<b>Training 1.6</b>	DITA@home	2-3 new hands-on experiments on ML/AI	Month 24
<b>Training 1.7</b>	Summer schools to foster applications of ML to Medical Accelerators and its User communities (road trips : Austria/MedAUSTRON; UK ; DK/Aarhus ; FR/ESRF; IT ; etc ?	Disseminate academic knowledge and improving efficiency of Accelerator for Medical Applications	Throughout project duration, One per year
<b>Training 1.8</b>	Summer schools to foster applications of ML to Accelerators for Environment and its User communities (road trips : Austria/MedAUSTRON; UK ; DK/Aarhus ; IT ; FR ; etc ?	Disseminate academic knowledge and improving efficiency of Accelerators for Environmental Applications	Throughout project duration, One per year
<b>Training 1.9</b>	<i>Possible Marie-Curie network follow-up</i>	<i>Disseminate academic knowledge and improving efficiency of Accelerators for Environmental Applications</i>	<i>After Month 24</i>
<b><u>Background Knowledge</u></b>	<b><u>Specific needs</u></b>	<b><u>Expected results</u></b>	<b><u>Timeframe</u></b>
<b>Outreach 2.1</b>	Engagement with general public : <ul style="list-style-type: none"> <li>– Open Days across project partners</li> <li>– School visits supported by</li> </ul>		Throughout project duration

	centrally developed and provided material – Symposium on <i>AI for Accelerators</i> as major public engagement event		Month 30
<b>Outreach 2.2</b>	Coordinate strategy and communicate importance of data-driven research	Create SMART tools - Web page and sites gathering PoC, programs, DB	Month 3, with updates throughout project duration
<b>Outreach 2.3</b>	Defragmentation of communities and public engagement	Short movies showing the impact of AI/ML via examples for Awareness	
<b>Outreach 2.4</b>	Bridge with existing European programs (Accelerator Your Teaching)	Educational materials for science teachers on AI applied to Accelerators	Month 36
<b>Outreach 2.5</b>	Life events in RI using kit (accelerator for high-school, e.g. AcceleratAR)	Create a more inclusive approach to outreach	Month 12
<b>Outreach 2.6</b>	Facilitate and coordinate expert projects by developing and implementing/disseminating tools	Applied ML using RI Internal report → identify persons using NLP Email sent to person with finding → « google-like » Mediator,	
<b>Outreach 2.7</b>	Define common Methodologies and WoW	Enhanced intra-communities e.g. SLACK for different tools - FORUM (e.g. PYTHON, optimize Acc. ) book, paper, person, language	
<b><u>Background Knowledge</u></b>	<b><u>Specific needs</u></b>	<b><u>Expected results</u></b>	<b><u>Timeframe</u></b>
<b>Communication 3.0</b>	<b>Communication - people</b>		
<b>Communication 3.1</b>	Exploration of synergies	Fine-grained database of published work of the community and	Month 3, 9, 15, ...

		interfacing scientific fields. Database creation and updates through web searches and natural language processing. Yields identification of relevant affiliations and scientists working on these interfacial research areas.	
<b>Communication 3.2</b>	Identifying proper and common language	«Dictionaries» of the relevant (common and distinct) vocabularies and terminology in identified research areas. .	Month 6, 12, 24, ...
<b>Communication 3.3</b>	Facilitating connections between academia, RI and industry	Identifying the fields where all three of the actors are present, but have little to no collaboration (using Natural language processing (NLP) ; identifying gaps and RoI for EU)	Month 24
<b>Communication 3.4</b>	Dissemination using scientific publications	Enhance future synergies Increase collaboration	Throughout project duration
<b>Communication 3.5</b>	Dissemination of tools to International community	google, CERN, etc..	Month 36
<b>Communication 3.6</b>	Multi-disciplinary oriented on specific goal (env.) and ML, accelerator ? e.g. a follow-up from I-FAST/CBI and SEED – complement to Training 1.7 and 1.8)	Specific syllabus via universities (Liverpool, EIDD, DTU, Uni Copenhagen),	Month 36
<b>Communication 3.7</b>	Physical center - off line gathering concrete example	Distributed in RI CERN Microcosm? DK ?	Month 36
<b>Communication 3.8</b>	On-line Center / forum	In complement to Physical center - @ other RI (via KIT for On-line)	Month 36
<b>Communication 3.9</b>	Create one hour course in RI	Teaching people HOW to SPEAK/LANGUAGE describe in SYSTEMATIC approach	Month 36

<b>Communication 3.10</b>	<b>Communication - DATA</b>		
<b>Communication 3.11</b>	Connect data - from diff. group (EPICS, Tango, MC, Python)	WG Data / Comparative Simulations Cosylab activities	Month 36
<b>Communication 3.12</b>	Communication showing Accelerator communities Database	Equivalent to <a href="#">SciCAT</a> , as a common platform created by ESS, MAXIV and PSI to support scattering community.	Month 36
<b>Industries and Entrepreneurship 4.1</b>	Tool for AI-optimisation of Control Hardware Layout and Computational Complexity for Energy-Efficient and Sustainable Accelerators - Cosylab	Enhance connection with 3.11 Cosyliab long term Rol	Month 36
<b>Industries and Entrepreneurship 4.2</b>	SMART tools for Software and Hardware suitable for Accelerators operation	Identified x ? industry	Month 36
<b>Industries and Entrepreneurship 4.3</b>	Involve co. (e.g. Google) and NLP applied to Medical accelerators, etc..	Co. long term Rol	Month 36
<b>Science 5.1</b>	Detailed schematics of sample environments for neutron scattering	ML model for background identification in simulated data	Month 12

- Impacts :

- What are the main impacts of your work ? What do you expect to generate by the end of the project ?
- Try to find impact in every field (scientific, economic, societal)
- Identify the target groups that would benefit from this impacts ?
- Try to link your WG impacts with the call's expected impacts :
  - development of new scientific instrumentation, tools and methods for research infrastructures taking into due account resource efficiency
  - training of RI staff for the operation and use of these new solutions
  - the innovative potential for industrial exploitation of the solutions and/or for the benefits of the society
- What are the wider impacts ? (in longer term)
- Try to identify some potential industrial partners

	<b>Specific needs</b> <i>What are the specific needs that triggered this project ?</i>	<b>Expected results</b> <i>What do you expect to generate by the end of the project ?</i>	<b>Dissemination, exploitation and communication measures</b> <i>What dissemination, exploitation and communication measures will you apply to the results ?</i>
Task 1.1	Need to educate the diverse experts communities on Data Science, ML/AI applied to Accelerator user Communities and associated Technologies using MOOCs	Short films targeting SMEs on data science, ML/AI for accelerators incl use cases  Accelerator User communities  Upskilling of existing staff and training of ECRs	<i>dissemination measure</i> : MOOC available on common platform (coursera, EDX) and a more abstract version of that course available (?)  <i>exploitation measure</i> : Number of MOOC users, user feedback  <i>communication measure</i> : Number of publications (?)
Task 1.2.1	Need for Common language for communication between different stakeholder (e.g. WP, RI, Experts, etc...)  MOOCs on Data Science, ML/AI	Short films on specific aspects of data science, ML/AI for accelerators  Effective communication and project coordination for each RI by SYSTEMATIC THINKING.  Staff trained to implement an effective upgrade of accelerator (using ML method)  Upskilling of existing staff and training of ECRs  Systematic THINKING as a SPECification ref by Mina	<i>dissemination measure</i> : MOOC available on common platform (coursera, EDX) and a more abstract version of that course available  <i>exploitation measure</i> : Dissemination to benefit Multidisciplinary Projects institutes (e.g. ESS, CERN, DTU/Univ. of Copen., SME)  <i>communication measure</i> : Number of MOOC students, number of views, rate of time to read report via survey  Course integrated in academic syllabus, staff trainings in SME, usage across different user communities
Task 1.2.2	Identified in specific survey from IT, the use of meeting rooms - Generate a DataBase (See Mina)		Compare effectivity of meetings (duration, etc..)
Task 2...			
Task 3.1	Need for understanding of the main research directions and identification of the areas which could benefit from the application of ML/AI	Infographics describing the individual research areas and their development trends.	<i>dissemination measure</i> : research community will be informed about the results via mailing lists, social media and the project website <i>exploitation measure</i> : research community feedback will be requested and collected via mailing lists

			<i>communication measure : findings highlights will be shared on social media and published on the project website</i>
Task 3.2	Need for identifying affiliations and individuals involved in the research areas found in task 3.1	Infographics describing showing the distribution of the research community around the globe and the evolution of the community over time	<i>dissemination measure : research community will be informed about the results via mailing lists, social media and the project website exploitation measure : research community feedback will be requested and collected via mailing lists communication measure : findings highlights will be shared on social media and published on the project website</i>
Task 3.3	Need for understanding the language used within individual research areas	A natural language processing topic model of the published research. The model will outline common vocabulary used in the research field and highlight the most relevant terminology used within individual research areas.	<i>dissemination measure : research community will be informed about the results via mailing lists, social media and the project website exploitation measure : research community feedback will be requested and collected via mailing lists communication measure : findings highlights will be shared on social media and published on the project website</i>
Task 3.4	Need for collaboration between RI, academia and industry	A graph model of affiliations involved in the research will be created. All individual affiliations will be classified into three categories – RI, academia, or industry. Successful collaborations of all three types of affiliations will be identified and examined.	<i>dissemination measure : research community will be informed about the results via mailing lists, social media and the project website exploitation measure : research community feedback will be requested and collected via mailing lists communication measure : findings highlights will be shared on social media and published on the project website</i>
Task 3.5	Need for increased awareness about the advantages of applications of ML/AI	Several specific success stories from applications of ML/AI in resolving some research challenges. (Short movies?)	<i>dissemination measure : research community will be informed about the results via mailing lists, social media and the project website exploitation measure : research community feedback will be requested and collected via mailing lists communication measure : findings highlights will be shared on social media and published on the project website</i>
Task 3.6	<i>Need to inform via Newsletters</i>	<i>Prepare monthly(or quaterly) Newsletter to inform and share information about progress and event within the communties.</i>	<i>dissemination measure : research community will be informed about the results via mailing lists, Complement to task 3.4?)</i>
	<b>Target groups</b> <i>Who will use or further up-take the results of the project? Who will benefit from the results of the project?</i>	<i>* Enhanced scientific competitiveness of RI ; - *Enhanced RI capacities to address research challenges EU policy priorities ; *Increased collaboration of research infrastructures</i>	<b>Impacts</b> <i>What are the expected wider scientific, economic and societal effects of the project contributing to the expected impacts outlined in the respective destination in the work programme?</i>

		<p><i>with universities, research organisation and industry ;</i></p> <p><i>*Increase of technological level of industries through the co-development of advanced technologies of research infrastructures and creation of potential new markets ;</i></p> <p><i>*Integration of research infrastructures into local, regional and global innovation systems and promotion of entrepreneurial culture.</i></p>	
Task 1...			
Task 2...			
Task 3.1	Scientific community	Increased awareness of the scientific community about the research being done at RI and the current challenges it faces.	
Task 3.2	Scientific community	Increased awareness of RI and scientific community about the individual players involved in research.	
Task 3.3	Scientific community, broad public	Facilitation of the communication between different stakeholders. Increase of potential for integration of research infrastructures into local, regional and global innovation systems and promotion of entrepreneurial culture	
Task 3.4	RI, academic and industrial research community	<i>Increased collaboration of research infrastructures with universities, research organisation and industry</i>	
Task 3.5	Scientific community, RI	Enhanced RI capacities to address research challenges EU policy priorities	
Task 3.6	Public, Scientific community, RI	<i>Enhanced scientific competitiveness of RI ; -</i> <i>*Enhanced RI capacities to address research challenges EU policy priorities ;</i>	

- Implementation :

- Explain how does each member contribute to the WG ?

<b>Name of the participant</b>	<b>Role in the WG</b>
Christine	
Carsten	
Evgenii	
Mina	
Mads	
Camille	
Jo Lewis	

- Try to organize your WG into work packages (name of the WP, main tasks, WP's objectives, WP's leader...)

- Describe how the members complement one another in your WG ?

	<b>Work Packages</b>	<b>WP's objectives</b>	<b>WP's leader</b>	<b>Expected deliverables/results</b>
<b>WP1</b>	<b>Training</b>	The project will provide open access to a foundations in AI for particle accelerators course through a MOOC and other online resources; science workshops will connect different communities, establish a reference for the latest research advances, and help upskills staff and students; DITA@home training will give the unique opportunity to learn about ML/AI at accelerators from the comfort of one's home. Synergies with existing MSCA networks and other doctoral training initiatives will be exploited throughout the project duration.		
<b>WP2</b>	<b>Outreach</b>	Partners will carry out an inclusive outreach programme incl. Open Days, outreach videos, a science symposium and social media campaigns to fascinate target		

		audiences around the world. Impact will be recorded and assessed via established techniques.		
<b>WP3</b>	<b>Communication</b>	<p>A project web site will be set up containing information about the project, all partners, position vacancies, R&amp;D, dissemination, upcoming events and general news.</p> <p>XXXX's secure platform will be used as a safe online tool to share and promote information within the project. A wider communication plan will be setup between the partners under the lead from XXX. Contacts with PR offices from all beneficiaries and the project partners have been established and will ensure timely communication of all news.</p>		
<b>WP4</b>	<b>Industry and Entrepreneurship</b>	The project will promote cross-sector innovation and upskill staff at SMEs and larger companies, creating better awareness of the opportunities that are in ML/AI.		

- Try to organize your WG into work packages (name of the WP, main tasks, WP's objectives, WP's leader...)