



ARTIFICIAL INTELLIGENCE AND BIG DATA CSA FOR PROCESS INDUSTRY USERS, BUSINESS DEVELOPMENT AND EXPLOITATION



MEET THE CONSORTIUM

AI-CUBE (Artificial Intelligence and Big Data CSA for Process Industry Users, Business Development and Exploitation) is a project funded under the European Union's Horizon 2020 Research and Innovation Programme, which aims to enhance the understanding of digital technologies related to artificial intelligence (AI) and big data (BD) applied in process industries for eight SPIRE industrial sectors: cement, ceramics, chemicals, engineering, minerals and ores, non-ferrous metals, steel, water.

AI-CUBE will define roadmaps that will serve as guidance for researchers, managers, and operators, and include specific recommendations for all involved industrial sectors and organizations' functions and processes.

The project, started on September 1st, 2020, is run by a consortium composed by 5 experienced partners from 3 different European countries, which will cooperate for two years in order to achieve the objectives of this initiative.

Let's get to know them better!

CIAOTECH S.R.L / PNO GROUP B.V.

ITALY

<https://www.pnoconsultants.com/it/>



CIAOTECH s.r.l., a company 100% owned by the **PNO Group B.V.** (hereafter PNO), is the largest independent public funding and innovation consultancy in Europe, with 30 years of hands-on expertise with more than 600 innovation projects funded per year in most EU countries, annually raising approximately 1 Billion Euro for its clients. Created in 1985, PNO is a high-growth knowledge-intensive company, supporting over 2.000 clients throughout Europe, annually developing over 250 European consortia.

In the frame of AI-CUBE, PNO is the coordinator of the AI-CUBE project and will contribute to several tasks related to the stakeholder analysis and engagement, dissemination, communication, and exploitation activities. PNO will run the definition and implementation of the stakeholder engagement strategy. The goal will be to gather organizations of different sizes and typologies and collect their input on the state of the art, drivers, and barriers of digital technologies development and application in the process industry. Furthermore, PNO will manage the activities of WP5: Dissemination, Communication and Exploitation. The purpose of this work package is to develop and implement a multitude of measures to communicate project findings and facilitate the industry engagement in their implementation. The goal is to maximize awareness around the project results and create a sustainable dissemination and exploitation, based on stakeholder involvement at regional, national, and European levels. Moreover, PNO will keep providing direct support to the project D&C by promoting the project in relevant events with EU relevance that the company usually attends. Furthermore, PNO will continuously update the AI-CUBE project website with interesting news and relevant events, which will be also spread on corporate website, social media channels and newsletters, reaching up 7 countries in EU and Israel.

ZARAGOZA LOGISTICS CENTER

SPAIN

<https://www.zlc.edu.es>



Zaragoza Logistics Center (ZLC) is an international center of excellence for research and education in logistics and Supply Chain Management that actively engages with industry and the public sector to develop and disseminate knowledge to accomplish its mission. ZLC acts as a catalyst for innovation and research in the area of logistics and SCM. A core purpose of ZLC is to integrate supply chain

management into the business enterprise. ZLC was established by the Government of Aragon in Spain, in partnership with the MIT Center for Transportation and Logistics (CTL-MIT) and the University of Zaragoza.

Within the project, ZLC coordinates the activities of WP4, which will define a roadmap on AI and BD of application in process industries for all the SPIRE industrial sectors with specific recommendations to guide researchers, managers, and operators in the implantation of these technologies. ZLC will leverage its expertise in 30+ European-funded research projects, where, among others, research and innovation roadmaps for supply chain management and logistics were shaped.

FRAUNHOFER INSTITUTE FOR MATERIAL FLOW AND LOGISTICS (IML)

GERMANY

<https://www.iml.fraunhofer.de/en.html>



Fraunhofer IML was founded in 1981 in Dortmund, Germany, and currently occupies 315 employees as well as 250 post-graduates and students to work in all fields of internal and external logistics. The expertise of IML is twofold: Once it provides strong expertise in material stock management and supply chain for the process industry. Secondly, IML does research in new fields of application on the use of AI within the field of supply chain management. With its expertise for AI and knowledge about the process industry, Fraunhofer IML guides the maturity evaluation of current AI and BD technologies.

In the AI-CUBE framework, Fraunhofer IML will lead the activities of the work package 3, which main goal is to fill the Cube Concept with life, considering current AI and BD technologies per sector and per process type, taking into consideration the actual level of maturity regarding their application possibilities in industrial environments. The list of the individual technologies will enable the systematic identification and further development of application areas and possible uses of AI and BD technologies in the process industry, in accordance to their current level of penetration.

IRIS TECHNOLOGY SOLUTIONS S.L.

SPAIN

<http://www.iris technologygroup.com/>



IRIS Technology Group is an advanced engineering group, established in Barcelona in 2007, which is specialized in the manufacture and integration of Process Analytical Technology (PAT)-based real time quality monitoring solutions for the process industries and IoT systems for smart manufacturing, predominantly targeted at the food, pharmaceutical and chemical industries. IRIS has an interdisciplinary team of engineers, scientists and IT personnel, with a strong know-how in AI solutions development and deployment, applied in a diversity of H2020 EC funded projects as well as B2B initiatives over the last decade.

In AI-CUBE, IRIS is leading Work Package 1, whose aim is to establish the current technological and industrial landscape regarding AI and BD technologies and process industry sectors in Europe, setting the basis for the other WPs work in defining mapping tools and the roadmap for AI and BD.

As part of WP1, IRIS lead the organization and successful realization of the first (online) AI-CUBE industrial workshop, held on the 2nd February 2021, which counted on 6 industry invited speakers and over 30 attendees. The feedback from the workshop and stakeholder contacts are being used as part of the content for WP1 deliverables.

CNR-IEIIT

ITALY

<http://www.ieiit.cnr.it>



CNR-IEIIT is the Institute of Electronics, Computer and Telecommunication Engineering of the National Council of Research and carries out advanced research in the area of industrial and information engineering covering fields such as telecommunication, electronics, systems engineering and system modelling and networking achieving levels of national and international excellence.

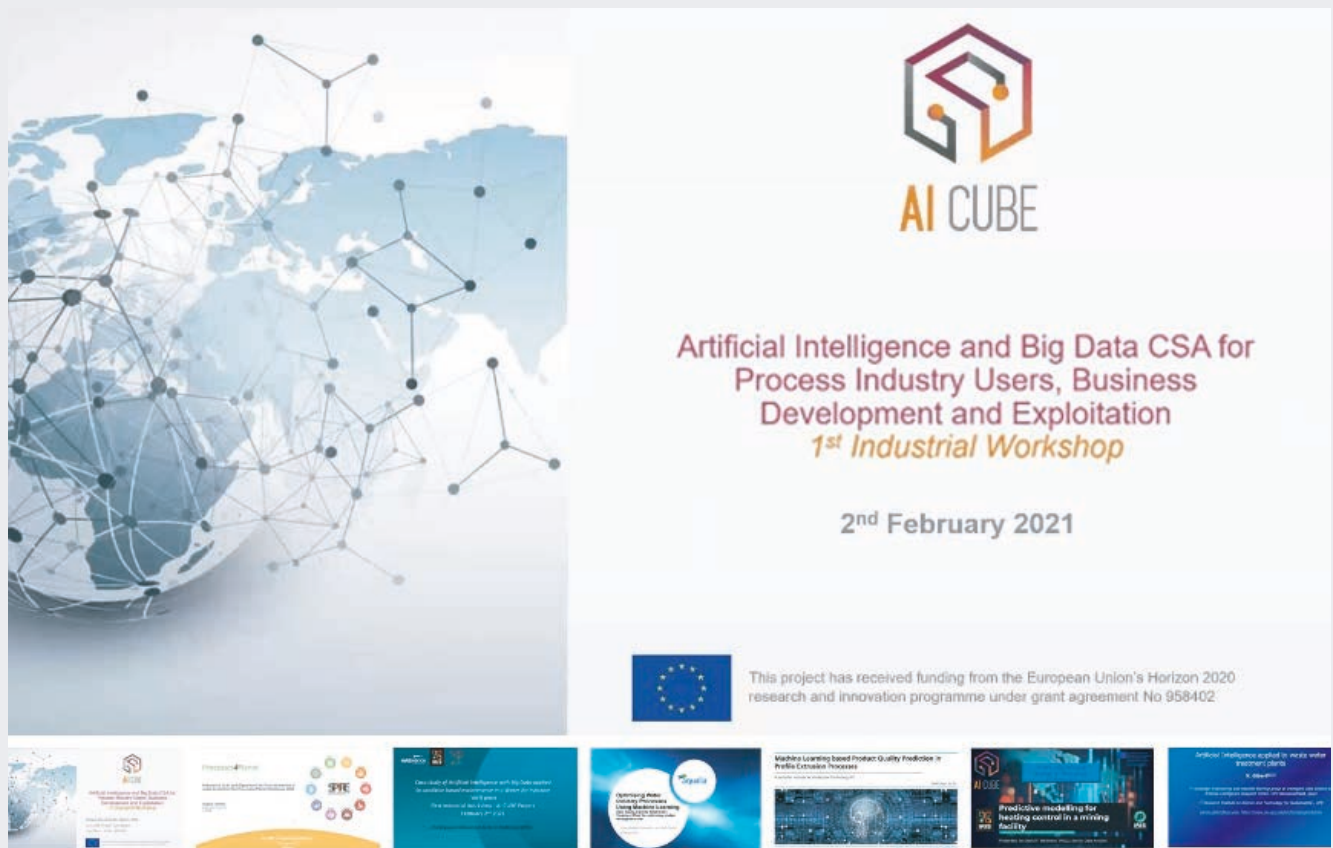
CNR-IEIIT which coordinate the activities of WP2, which goal is twofold: i) set a strategy to work in a continuous way with the stakeholders and ii) design a framework to categorize current AI and BD technologies' applications in consideration of the actual use and knowledge of their application possibilities in industrial environments.

First engagement with the stakeholders!

One of the aims of the AI-CUBE project is to involve in its activities and events organizations, managers, researchers, scientists, and experts in the Artificial Intelligence and Big Data technologies and/or Process Industries fields.

The consortium has already defined a **timeline** for workshops, focus groups and consultations to share ideas, knowledge and best practices with experts in the field, which has started in February 2021 with the first Industrial Workshop of the project.

The **webinar**, virtually hosted by IRIS, took place on February 2nd, 2021, and brought together representatives from SPIRE2030, Mabxience, Aqualia, Fraunhofer IPT and Universitat Politecnica de Catalunya which shared their experiences, vision, objectives, and challenges faced in the journey towards the process industry of the future, while presenting case studies related to the involvement of the AI and BD technologies in the SPIRE 2030 industries.



The webinar started with an overview of AI-CUBE provided by Chiara Eleonora De Marco, from PNO - the coordinator, with special emphasis on the three “dimensions” (thus the cube) of the project analysis: sectors, processes and technologies, the 8 SPIRE process industry sectors considered, and the stakeholder involvement.

This was followed by a presentation by Mrs. Angels Orduña, Executive Director of SPIRE 2030, on the relevance of AI and Digital tools for the process industries in order to achieve the Processes4Planet Roadmap 2050.

Next, five case studies were presented for different process sectors. Mr. Javier Rodriguez, Engineering and Maintenance Manager Mabxience (Spain) presented a case study of artificial intelligence with big data applied to condition-based maintenance in a Water for Injection (WFI) plant. Next, Mrs. Leticia Pereira, Project Manager at the Innovation and Technology Department FCC Aqualia (Spain), presented the case study “Optimising Water Industry Processes Using Machine Learning: Case Study at Lleida Wastewater Treatment Plant for optimising sludge management line”. This was followed by the presentation of Mr. Maik Frye, Research Associate of Fraunhofer IPT (Germany) entitled “Machine learning based product quality prediction in profile extrusion processes”. Next, Prof. Karina Gibert of the Universitat Politècnica de Catalunya (Spain) presented a case study of “AI applied to a waste water treatment plant”, and finally Dr. David Nettleton of IRIS presented a case study of “Predictive modeling for heating control in a mining facility” on behalf of LKAB and Outotec who participated in the study.

The presentations were followed by a question/answer session and discussion where the attendees shared their thoughts with the speakers, during which issues such as the need for quality data (i.e. from sensor data capture), the incorporation of expert human knowledge to support data driven models, and deployment were raised. From initial feedback, several organizations have confirmed their interest in participating and becoming stakeholders of the project and an online survey questionnaire was made available to all attendees to obtain further feedback.



Figure 1: Lleida wastewater treatment plant



Figure 2: Mining/materials sector: thermal image of mill cylinder with four interest areas defined

Do you want to be engaged in the digital transformation of the process industries and be involved in the next events organized by the project? [Contact us!](#)

Visit the [project website](#) to know more about AI-CUBE and to be always updated about the latest results and progresses achieved by the consortium!

Take a look at the Dissemination & Communication materials of AI-CUBE, available on the [download page](#) of the project website!

[Brochure](#)  | [Poster](#)  | [Rollup](#) 

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