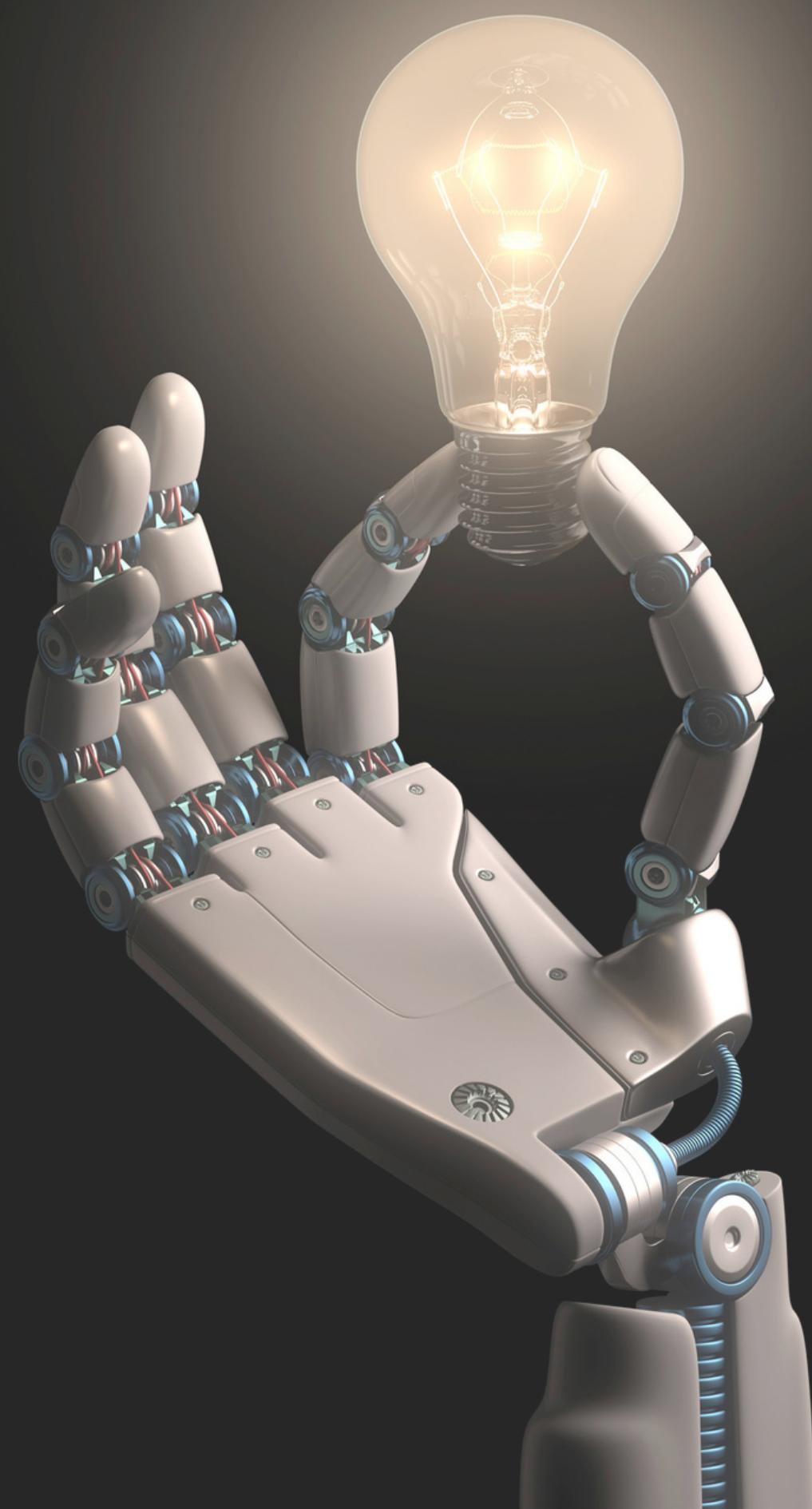


CEUP2030



Interreg 
CENTRAL EUROPE

European Union
European Regional
Development Fund

CEUP 2030

ARTIFICIAL INTELLIGENCE

Project co-funded by European Regional Development Fund.

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INTRODUCTION

Despite the promise that AI is showing and the realization in many companies that AI will be the steam engine of digitalisation, progress is slow. Why? The decision-makers too often view AI as a plug-and-play technology that provides an immediate return on investment and don't give enough consideration to AI requirements. It requires not only technologies and talent, but also for a company's culture, structure and way of working to be harmonised. This is the only way to achieve a broad acceptance of AI. This applies to companies and groups that weren't founded in the digital age in particular. They often exhibit traditional ways of thinking and working that contradict what companies need to implement AI applications. In our view, there are three helpful steps companies can take to transform and overcome these hurdles: 1. Work still viewed in isolation today should become interdisciplinary collaboration. 2. Data and AI-driven insights broaden the relevant decision basis and enable the decision-making process to be a more informed one. 3. It requires a mindset that's open to change and agility, as well as experimental approaches.

In this research we highlight 24 AI-related emerging technologies and four overarching trends.

The four overarching trends include:

- Artificial intelligence (AI) developer toolkits, services, marketplaces and easy-to-use APIs are beginning to “democratize” AI.
- Growing AI adoption is beginning to shift business automation from process automation to intelligent business automation.
- Advanced hardware, innovative software techniques and micro-AI are accelerating Edge AI adoption moving more and more processing from the cloud to the edge.
- AI (advanced NLP) is actually starting to transform how humans and machines interact.
-

In the Artificial intelligence Trends Impact Radar, the rings represent the Range. Range estimates the distance (in years) that the technology or trend is from “crossing the chasm” from early-adopter to early majority adoption. The size and color of the emerging technology or trend radar blip represents its Mass. This indicates how substantial an impact the technology or trend will have on existing products and markets.

Let's look at a few that seem to be especially interesting. We'll examine a few that are right around the corner (AI developer and teaching kits, transformer-based language models, intelligent applications) and one that is further out (AI-Generated Composable Applications).



AI Developer and Teaching Kits

Artificial intelligence (AI) developer and teaching kits are instructions, examples, tools and software development kits (SDKs). They provide an abstraction layer on top of data science platforms, frameworks, analytic libraries and devices. And so they make it faster and easier for software engineers to build AI into applications.

These kits are 1 to 3 Years from early majority because they address a subset of needs including kits for virtual assistants, AI design kits, and AI-mobile-serving SDKs. Also, dependencies associated with vendor specific toolkit offerings limit usability. Additionally, there are challenges with scaling outputs and the cost of integrating different formats and interfaces across the stack.

Their impact mass is high because AI developer and teaching kits are a significant accelerator to AI adoption. This enables a much larger set of software developers to more effectively and efficiently contribute to AI development and implementation. Over the next three years, AI developer and teaching kits will provide a strong foundation for the expansion of more complex AI-enabled capabilities.

Transformer-Based Language Models

Transformer-based language models are DNNs that process words as sequences in a sentence. This approach preserves the context or meaning surrounding terms. It also substantially improves translation, transcription and natural language generation. These models are trained on enormous data sets of billions of phrases. Example transformer-based models include BERT, BART and GPT-3.

The 1-3 year range is driven by the effectiveness of the training tools, the runtime efficiency and the ease of deployment. Transformer-based language models such as GPT-3 have the capability to generate paragraphs of text that are indistinguishable from those written by a well-educated human.

The impact mass of transformer-based language models is very high because they are displacing RNN systems at a surprising rate. And new tools deliver substantial improvements in advanced text analytics and all the related applications such as conversational user interfaces, intelligent virtual assistants and automated text generation.

Intelligent Applications

Intelligent applications are enterprise business applications with embedded or integrated artificial intelligence technologies, such as intelligent automation, data-driven insights and guided recommendations. They represent a transformational shift in business applications from primarily procedural tools that help execute tasks to intelligent software that also assists in acquiring knowledge, visualizing key data and advising on relevant decisions.

Intelligent applications are 1-3 years from crossing the chasm because many of the large software vendors are now embedding AI into their products. And their efforts will create competitive momentum further driving adoption across application domains such as enterprise resource planning (ERP), sales force automation (SFA), HR and customer relationship management (CRM). Intelligent applications are the next major battleground for enterprise application providers and it will be many years before we hit the top of this s-curve.

The impact on existing technologies is high because it refactors enterprise applications. This is a competitive opportunity for new entrants into the market. It also creates potential for existing players to gain, or lose, market share as competitive advantage shifts to intelligent application capabilities.

AI-Generated Composable Applications

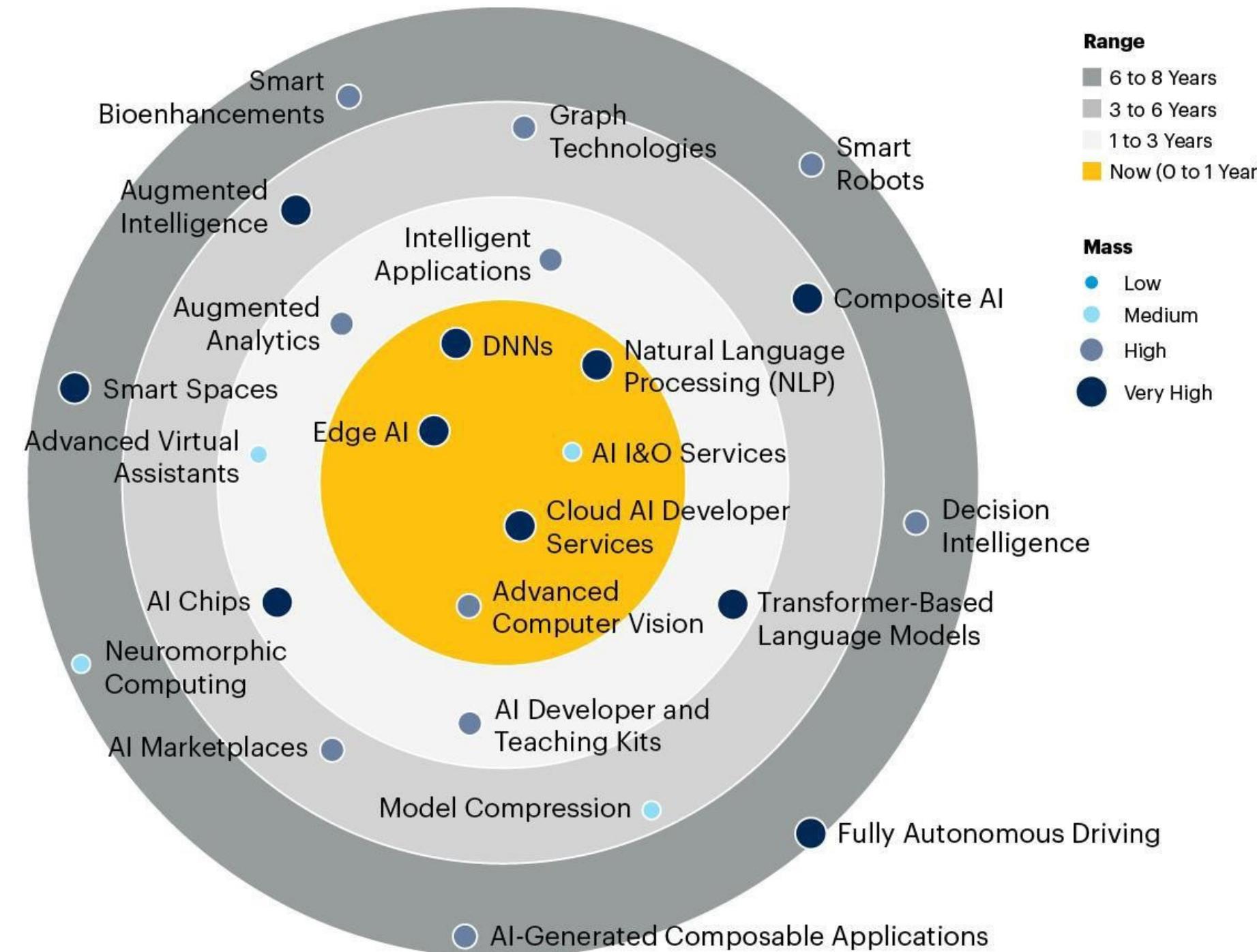
AI-generated composite applications build business applications using artificial intelligence to assemble application components (without human developer involvement) to meet new and even ad hoc business needs. Context-aware AI will detect a specific business need in response to a business situation and automatically assemble the application using packaged business capabilities (PBCs) as building blocks.

This technological capability is 6 to 8 Years from crossing the chasm because it is dependent on the emerging trend where technology providers shift from delivering large and mostly static business applications to offering smaller PBCs with robust application programming interfaces (API). Most of the technology already exists (e.g., APIs, microservices, self-integration, containerized software). But pulling it all together into a composable applications ecosystem with standards that facilitate interoperability is still a long way off. In this instance AI technology advancement is not the primary inhibitor.

AI-generated composable applications will have a high impact on the entire application software market and businesses across industries and geographies. They represent a substantial improvement in business agility allowing businesses to respond more quickly to changing technology and business situations. The entire business world will be able to move faster which can lead to even more rapid change across business and society.

IMPACT RADAR

Impact Radar for Emerging Technologies and Trends: Artificial Intelligence



Source: Gartner (October 2020)

DNNs = deep neural networks, I&O = implementation and operations

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POLICY INTELLIGENT DASHBOARD

The CEUP 2030 Partnership would like to invite all interested stakeholders to explore Policy Intelligence Dashboard - policy tool to streamline, process and manage the knowledge for improved policy decision making, in a practicable and sustainable manner.

Policy Intelligent Dashboard is the most complete one-stop-shop for policy makers and policy influencing stakeholders as research technology organizations and enterprises operating around Advanced Manufacturing and Industry 4.0 topics.

PID gathers in one place practical and streamlined knowledge and insight on technology trends and potential industry impact for the entire innovation eco-system. Each CAMI4.0 area: Intelligent Production Systems, Automation and Robotics, Smart Materials and Artificial Intelligence represents a Tech Radar, where policy-relevant data sources as use cases, financial instruments, flagships and organizations are presented with a goal to support, transfer and enrich policy decision making processes in the area of key technologies.

PID is located on the <http://ceup2030pid.eu/> -website and integrate knowledge and insight developed from dialogue occurring within the Partnership's workshop series includes the following elements for each CAMI4.0 topics :

1

INTERESTING USE-CASES

Each project partner provided contributions of thematic use cases/developments from regional companies/DIHs in connection with every thematic topic identified in the CEUP project.

2

SUMMARY OF THE FLAGSHIPS

Flagships are significant initiatives which clearly add value or deliver enhanced competitive advantage to the innovation eco-system surrounding advanced manufacturing and industry 4.0

3

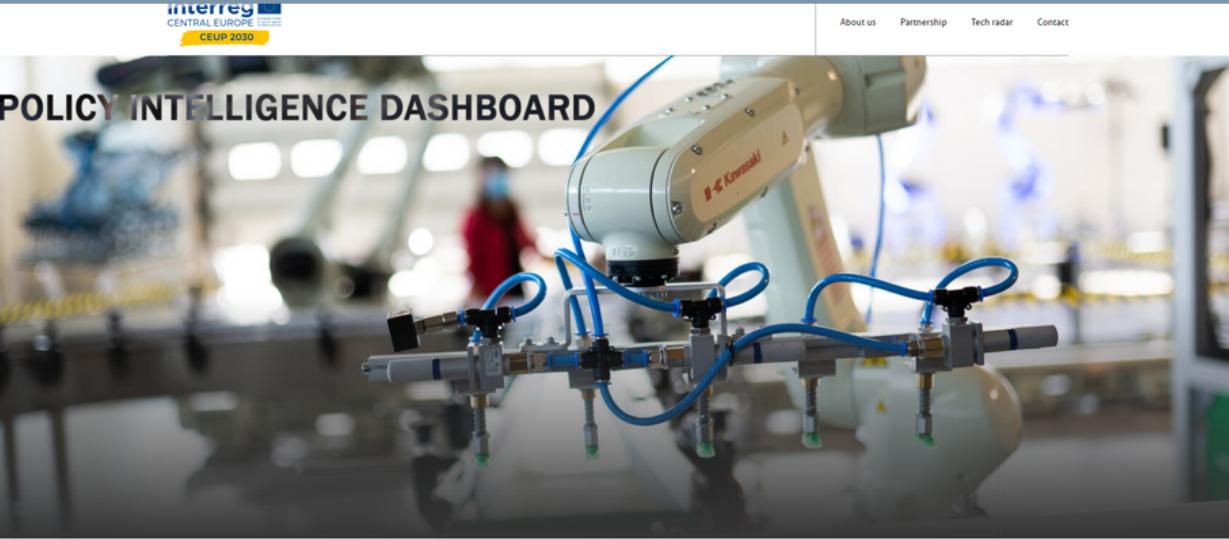
POLICY INSTRUMENTS

One of CEUP 2030's main goals is to exchange information and good practice examples regarding policy instruments that are being used and deployed in Central Europe.

4

ANALYSIS OF THE TECH RADAR

The Tech Radar and Risk Heat Map offer open access to policy-relevant data sources as use cases, policy instruments, organisations and networks, technology trends in the most convenient, practicable and efficient way.



POLICY INTELLIGENCE DASHBOARD

Refocusing Technology Trend Insights for Policy Makers in Central Europe Advanced Manufacturing and Industry 4.0

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Synergies and Capitalization

Are you interested in connecting with innovation actors from your field of expertise and working together on collaborative crowd innovation solutions in the fields of Intelligent Production System, Automation and robotics, Artificial Intelligence and Smart Materials?

Policy Intelligent Dashboard offers access to the most effective and inspiring tools that have been created, developed and successfully tested by the consortium of CEUP2030 projects partners and beyond it – under the sister projects carried out.

Here we recommend you to deep dive into the most effective tools created under Interreg Central Europe programme: **Synergy, S3HubsinCE and 3DCentral**. Discover the **SYNERGY Platform**, the integrated **SYNERGY Profiling Tool**, moodle platform with hypertree tool and dihnet.eu community for industry and academia with newly designed services for crowdfunding for research, crowdsourcing for innovation, infrastructure sharing and stakeholder matchmaking.

OPEN INNOVATION TOOLS

LEARNING TOOLS

PROFILING TOOLS

NETWORKING AND EXCHANGE TOOLS

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Check the
Policy Intelligent
Dashboard now!



<http://ceup2030pid.eu/>

FLAGSHIPS

An integral part of the CEUP 2030 project is the development of so-called Flagships. Flagships are projects that the CEUP 2030 project partners have designed throughout the project. Ideally, the Flagships will soon be implemented - provided the necessary funding for most of the projects materializes. On the topic of Artificial Intelligence, 4 Flagships have been provided by the project partners.



AI ROADMAP

The roadmap identifies and collects the needs, the priorities and the barriers faced by stakeholders dealing with AI-driven solutions, particularly enterprises on several manufacturing sectors approaching AI solutions, technology providers and research centres developing and integrating them.



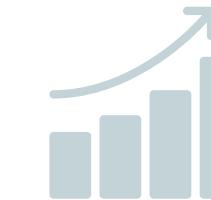
CROBOHUB++

It will offer a mix of business, technology services, access to funding, skills and training to its users, provided by the different partners in the CROBOHUB++ consortium. Services are based on detected needs thru already established DIH CROBOHUB and survey of the Croatian Digital Index (HDI) that had 300 companies in their questionnaire.



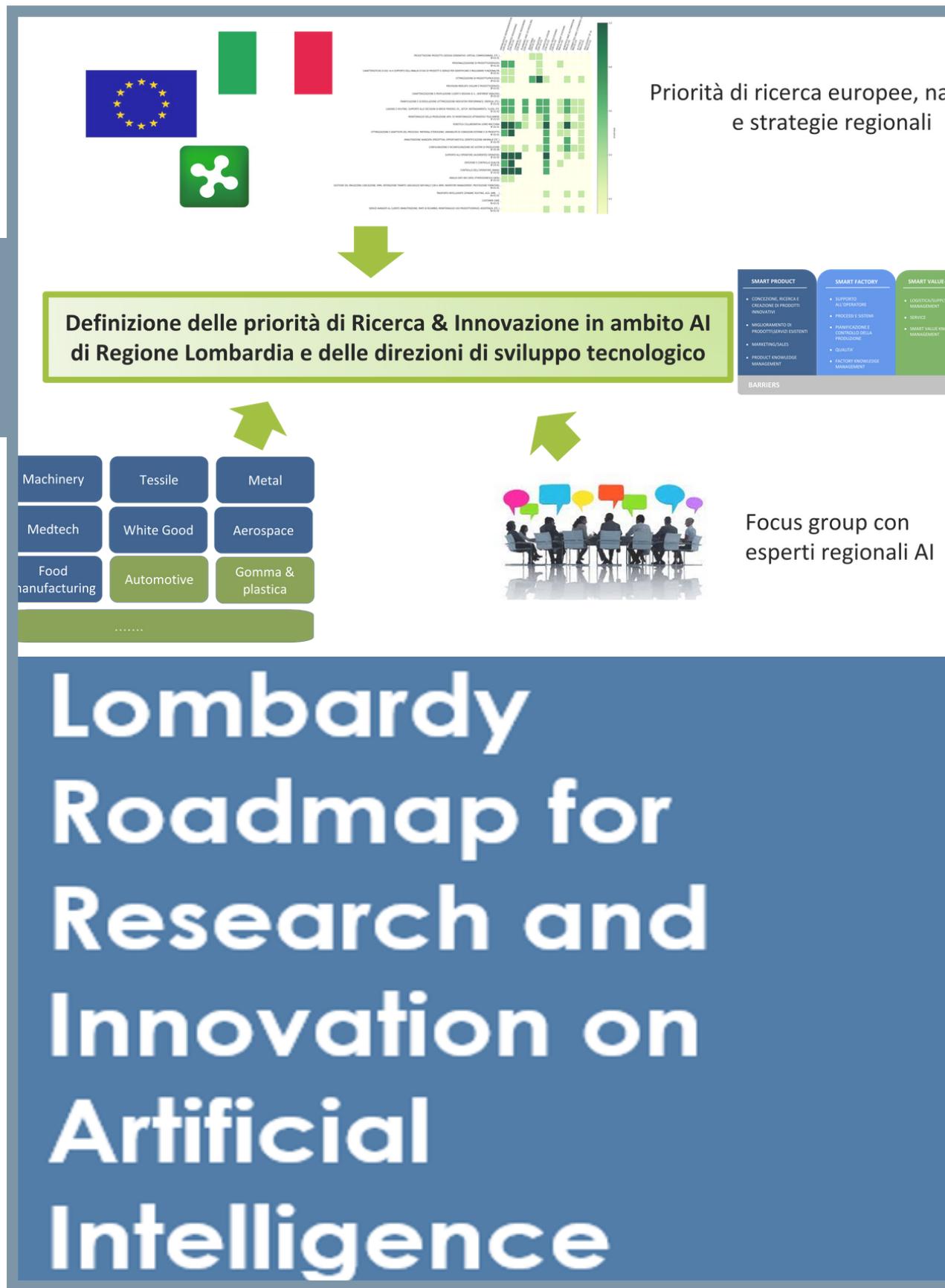
SMART SENIOR ROOM

The main aim of the smart senior room is to contribute to the improvement of the standard of living in Szombathely and its region by focusing on education and research and development by promoting industrial transformation and specializing on complex rehabilitation within the health industry.



FORGING

With FORGING we propose a new methodology based on a value-sensitive innovation journey that breaks linear innovation trajectories to stimulate new technological visions and pathways attentive to the environment and society, and human-centred in alignment with Industry 5.0. technological frameworks.



AI Roadmap

AFIL promotes the identification and collection of industrial needs within its AI Strategic Community, where academic and research actors, SME, LE, startups and associations periodically meet and discuss on AI topics. Through the organization of Innovation Labs, webinar and workshops, the AI Strategic Community increases the awareness on the potential applications and benefits of AI-driven solutions and fosters the collaborations among the relevant stakeholders, particularly between industrial users and technology providers. The Community also works to transform the innovation interests and topics in concrete actions, through the submission of projects and the collaborations with different regional, national and European initiative (e.g., Vanguard Initiative). Although lots of actions are running and regional stakeholders are involved and commit in these, additional supporting tools and mechanisms could be activated in next years to favor the implementation of AI-driven solution at industrial scale. To do that, AFIL wants to develop a structured AI Roadmap to highlight the current barriers and priorities to be shared at regional level with Lombardy Region.



CROBOHUB++

In align to the Digital Europe Program, Croatian Ministry of Economy released the call in November 2020 to elect the best consortium which will be established as a digital hub for the North Croatia region. CROBOHUB++ vision is to act as a major digital innovation center in the North Croatia. It will offer a mix of business, technology services, access to funding, skills and training to its users, provided by the different partners in the CROBOHUB++ consortium. Services are based on detected needs thru already established DIH CROBOHUB and survey of the Croatian Digital Index (HDI) that had 300 companies in their questionnaire. Based on this we have defined main needs for services as improvement of organization and business model for implementation of digital transformation, improving operational efficiency and reducing cost, ensuring the quality of manufactured products, responding faster to the changing market requirements and customer demands, sustainable use of resources, data driven public administration, sustainable and clean energy, networking for exchange of digital technologies, opening markets, precision farming, transforming services, engaging stakeholders, enabling employees.

The CROBOHUB++ consortium gathers all key triple helix eco innovation system stakeholders. Namely they are: University of Zagreb, Faculty of Electrical Engineering and Computing (FER) which is a leading partner; Innovation center Nikola Tesla; SRCE (University Computing Centre); HAMAG-BICRO (Croatian Agency for SMEs, Innovations and Investments); Croatian Chamber of Economy (HGK) and University College ALGEBRA, specialized in IT programmes.

It is specialized in three key areas:

1. Artificial intelligence,
2. High Performance Computing,
3. Cyber security and robotics, and their application in the fields of agriculture,



Smart senior room

Szombathely City - and Western Hungary - are dominantly oriented on automotive industry. It results in a one-legged, labour-intensive positioning, that makes the region vulnerable. With the lead of PBN efforts were made to exploit the potential of digitalization to achieve paradigm shift. These actions were supported by universities, companies and the municipality, and after a 6-months preparation the work was culminated in a strategic program, called Szombathely2030.

As first step, analysis was provided by PBN to care organizations, including seniors, formal and informal caregivers. It was concluded that complex and integrated solutions are needed. As a result, PBN elaborated and communicated a concept of smart senior room. Social care educational institutes - secondary and university level, as well -, social care organization also expressed their motivation to utilize the infrastructure for demonstration and training use, and questionnaires also confirmed the societal need for such a possibility to learn. The physical smart senior room being established, can serve as a potential vision for the citizens and inspiration for companies. It includes elements based on preliminary research. The key areas will be senior safety, socializing, self-monitoring and communication.

Call: HORIZON-CL4-2021-DIGITAL-EMERGING-01

(Digital and emerging technologies for competitiveness and fit for the green deal)

Topic: HORIZON-CL4-2021-DIGITAL-EMERGING-01-13

Type of Action: HORIZON-CSA

Proposal number: 101070200

Proposal acronym: FORGING

Type of Model Grant Agreement: HORIZON Action Grant Budget-Based

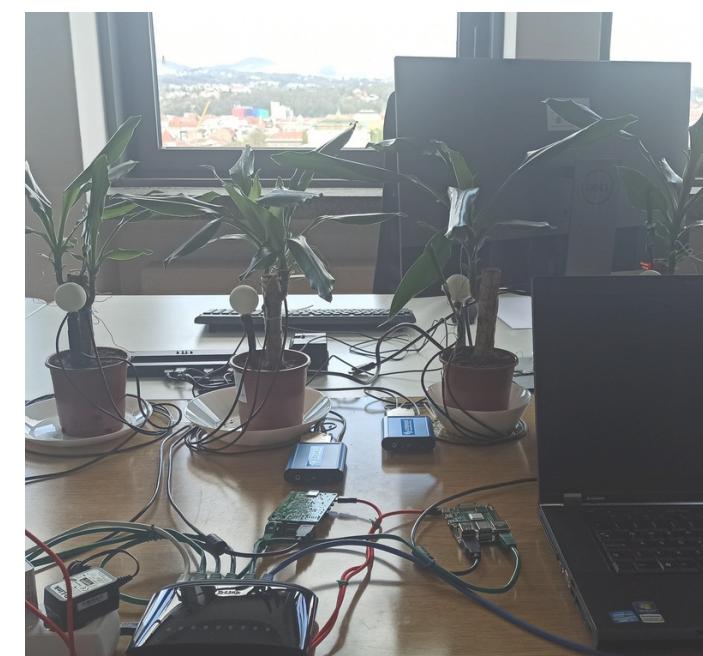
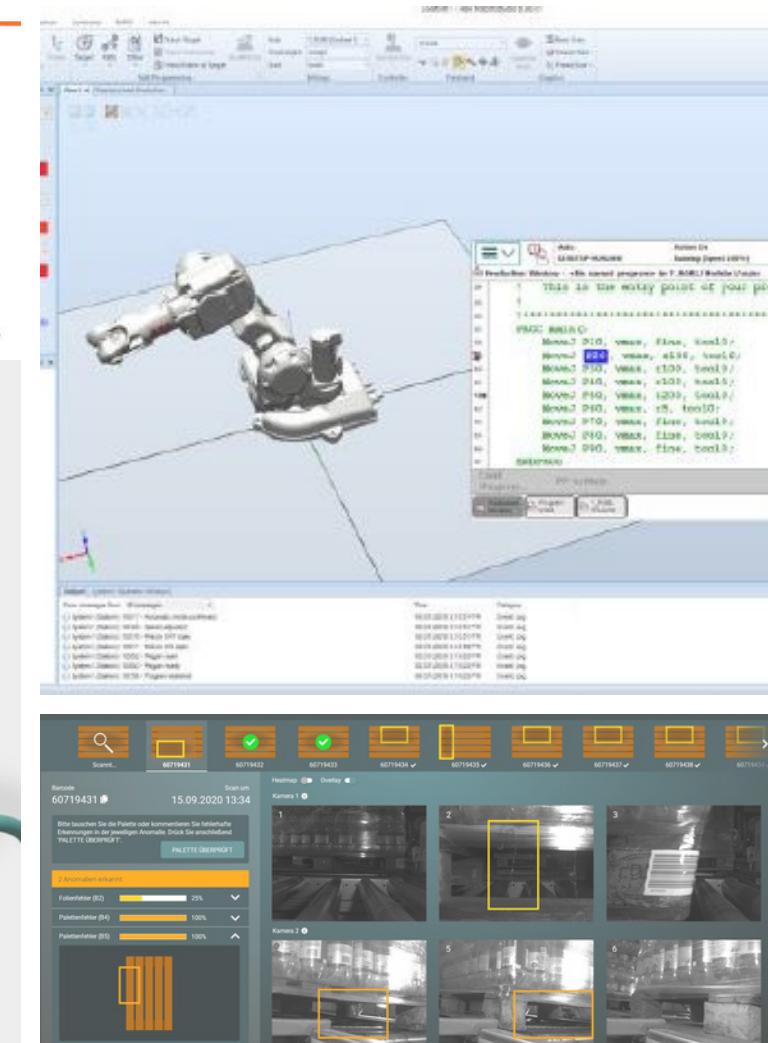
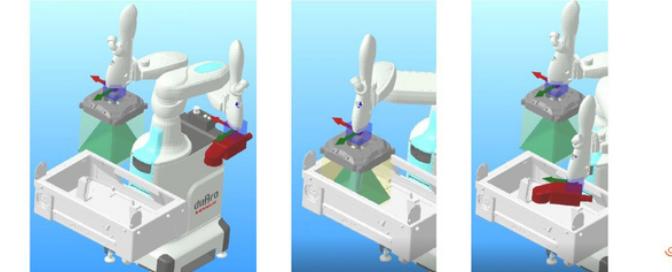


FORGING

Technological breakthroughs empowered by enabling technologies hold a transformation potential that can be funneled to address industrial and societal grand challenges, like greening and digitalisation. To exploit this transformative potential, the innovation journey that leads new emerging technologies to their market-uptake shall embed since its early value-sensitive considerations, such as environmental and societal implications. With FORGING we propose a new methodology based on a value-sensitive innovation journey that breaks linear innovation trajectories to stimulate new technological visions and pathways attentive to the environment and society, and human-centred in alignment with Industry 5.0. technological frameworks.

USE CASES

ILLUSTRATION FOR VISION SYSTEM OPERATION

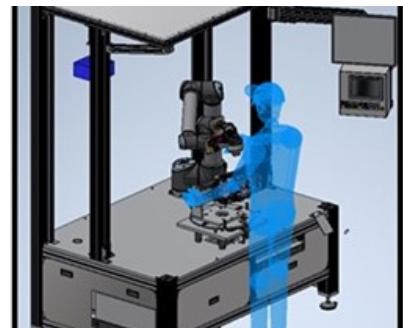


1. Watchman project, Lombardy

WATCHMAN (Workload-reduction machine vision-based technology Hub for manufacturing) project aims to develop a hub of expertise and experimentation on the application of Artificial Intelligence techniques in Machine Vision in manufacturing. In particular, two use-cases has been developed, the first one concerning pharma industry and the second related to automotive sector:

- SALF demonstrator: creation of a flexible and easily configurable system capable of detecting print defects and specific parts in bags of saline. The challenges are related to different shapes of the saline bags, the hard-to-identify printed text, the reflection of the liquid inside the bag and other issues related to the presence of bubbles and other artifacts inside the bag. The developed AI solution is related to machine vision and image analysis, in order to analyse the shape and presence of all the parts that make up the bag and to verify the correctness and legibility of the printed information.
- BREMBO demonstrator: detection of paint or mechanical defects at the end of the painting or oxidation process of the brake callipers to ensure the quality of the products. The goal is to create a flexible and easily configurable computer vision system capable of detecting surface defects, or painting brake callipers. The developed solution should face several challenges, such as the high geometric, dimensional and colour variability, the different types of defects and the emergence of possible problems related to the development of new parts.

The solution is based on two approaches of deep learning techniques: a semi-supervised machine learning detection algorithm and the Few Shot Learning model that allows to classify different types of anomalies using a small amount of images in the initial training phase.



2. WatchPlant project

WatchPlant is a HORIZON four-year project started in January 2021. It will develop a new biohybrid system technology, a wireless wearable self-powered sensor for in-situ monitoring of urban environments.

This system equips urban biological organisms -plants- with Artificial Intelligence (AI) to create a smart sensor for measuring both, environmental parameters and the responding physiological state of plants, in a very early stage by the use of a barely explored fluid, phloem sap, in combination with chemical, and physical sensors.

The aim is to measure several plants initially in the same room under the same conditions such as temperature, light or geomagnetic field. For this purpose, 4 prototypes were built, each consisting of a plant and a measuring unit. The measuring unit contains the sensors, which are attached to the plant, and a Raspberry Pi controller, which cyclically receives the data from the sensors and controls and monitors the entire measuring process.

It will be integrated into complex network that allows performing distributed information processing, decision making, modeling and data fitting, paving the way for the self-awareness or self-adaptation. Additionally, it will constitute a clean energy self-powered device due to the novel use of sap, not only for transforming plants into living sensors, but also for clean energy generation.

Croatian project partner is University of Zagreb, Faculty of electrical engineering and computing.

Other partners are: Instituto Tecnológico de la Energía, Spain; KTH Royal Institute of Technology, Sweden, CYBRES GmbH, Germany, CIM-mes Projekt sp. z o.o. Poland; The Spanish National Research Council (CSIC) and UzL Lübeck, Germany. The project budget is 3,744,192.50 EUR.



3. Decreasing maintenance costs with Deep Learning

Costs for maintenance are a very relevant factor in manufacturing, typically they make up 15% to 40% of total costs. Approximately 30% of maintenance costs occur because of early, maybe unnecessary replacement of machine parts or delayed maintenance work and an increase in unplanned machine outages. The Austrian project COGNITUS aims at decreasing maintenance costs through a combination of data-driven maintenance planning and Deep Learning.

One use case within the project focuses on the detection of anomalous pallets in a high-bay warehouse. The use case is conducted together with SPAR Austria, one of the country's major retailers.

Through Exploratory Data Analysis (EDA) the sources for errors in the warehouse were analysed. After finding out, where and when errors occur, cameras with different viewpoints were installed at the crucial sites. The stream of pictures coming from the cameras was progressed with the help of Machine Learning, focusing on the different kinds of errors pallets could potentially arrive with at the warehouse.

Through the clustering of pictures and with the help of "fuzzy rules" operators should now be able to choose the necessary quality of the pallets coming into the warehouse. Through a dashboard, the employees can directly observe faulty pallets and the kind of anomalies the pallets are arriving with. This approach should lead to the reduction of maintenance costs in the warehouse.

The COGNITUS project will be completed and evaluated in the third quarter of 2022.



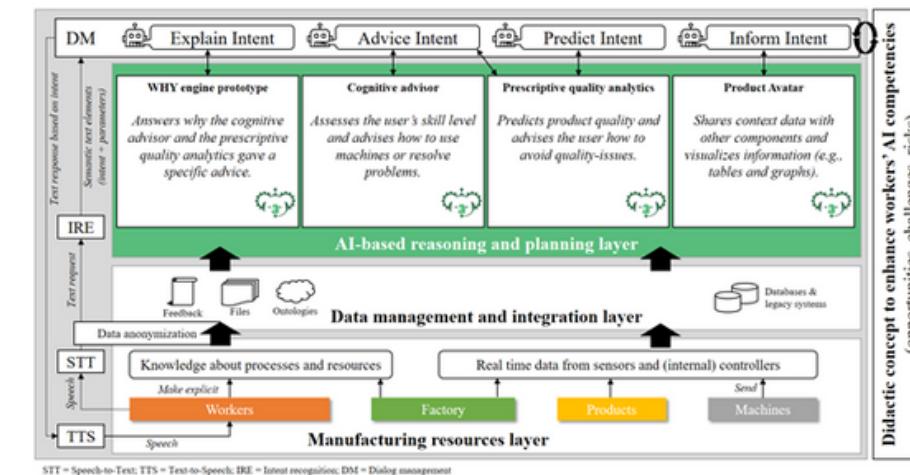
4.TEAMING.AI project

The international research project teaming.ai with 15 partners, deals with the interaction of man and machine as a team. The goal is to achieve true teaming through a novel software framework. For example, AI systems can very easily perform repetitive tasks with high accuracy, while humans find it easier to understand interrelationships. If both team partners compensate for each other's weaknesses, efficient, symbiotic working is possible. Technologically, the project is concerned with the combination of knowledge graphs and deep-learning-based machine learning. Here, too, the advantages of both worlds are to be combined. Explicit knowledge representation with fast, generalizable processing. In this project, PROFACTOR's product AssemblyEye enables the digitization of human work in the high-precision manufacturing of large wind turbine parts. The intended enrichment of the Profactor technology with the aspect of teaming capability is a valuable extension in this context.



5.COALA project, Horizon 2020

The EU-funded COALA project will design and develop a cutting-edge Digital Intelligent Assistant for the manufacturing sector. At its core is the privacy-focused, open-source voice assistant, Mycroft. COALA will integrate, for instance, augmented quality analytics, an experimental mechanism for explainable AI, and features for the assistance of on-the-job training. An AI-focused change management process and guidelines for professional worker education will complement the technical work. The project will significantly decrease the costs of failures in manufacturing and will reduce training time for workers.

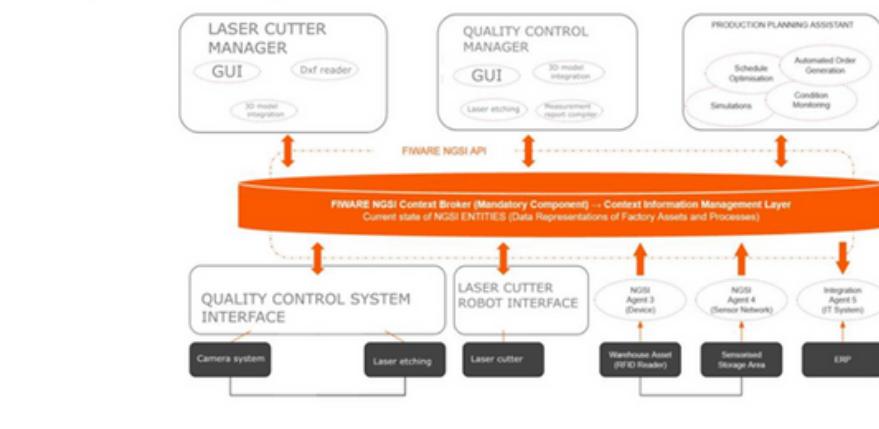


6.Customized quality control for medical device manufacturers

Creating a flexible, but reliable production line is an important aspiration for all manufacturers. This is especially the case for the manufacturers in the medical technology sector, since the quality standards are high (EU 745 2017 and ISO 13485 which can be challenging to maintain for SMEs because they tend to manufacture multiple products in a smaller scale.

Proposed Platform Design (1/2)

System of Systems View



POLICY INSTRUMENTS

WHICH MIGHT INFLUENCE THE DEVELOPMENT OF THE FLAGSHIPS

One of CEUP 2030's main goals is to exchange information and good practice examples regarding policy instruments that are being used and deployed in Central Europe. The CEUP 2030 project partners have provided examples for policy instruments that have the potential to influence the development of the CEUP 2030 Flagship projects.

1. PUBLIC TENDER FOR THE DIGITAL TRANSFORMATION OF LARGE COMPANIES.

Announcer: MGRT - Ministry of Economic Development and Technology

Amount of funds: EUR 44 million (EUR 34 million for large companies and EUR 10 million for SMEs), 20 supported consortia

Subsidy amount: up to EUR 2.2 million / project

Amount of co-financing: under the De minimis scheme: up to and including 70% of eligible costs,
under the RDI scheme: up to and including 60% of eligible costs depending on the size of the recipient
under the temporary framework scheme (3.13) up to and including 35% of eligible costs

Estimated deadline: Q2 2024

Purpose of the public tender:

- raising and growing productivity
- Optimization and reduction of production costs and costs of services and operations
- Greater competitiveness and a more open market, as well as greater opportunities for the commercialization of innovative solutions
- The key document that is the foundation for carrying out the digital transformation of a company or individual business function is the digital strategy.

If the applicant does not have a digital strategy prepared by the time of applying for the public tender, he must produce it no later than six (6) months from the deadline for submission of applications for this public tender or within three (3) months after receiving the selection decision. Projects to be co-financed by consortia must meet at least the following basic requirements:

- envisage technological empowerment for the digital transformation through the use of advanced technologies that will at the same time contribute to reducing greenhouse gas emissions and address climate change accordingly,
- represent the integration of large companies with SMEs, which will create an open innovation business environment and accelerate the introduction of digital innovation, transfer of digital competencies and increase companies' access to an appropriate test environment for innovation and adaptability of technologies and business processes. introduction of advanced digital technologies and their introduction into business processes.

The introduction of advanced digital technologies can also support changes in the organizational structure and business functions. At least three of the advanced digital technologies must be used for the digital transformation that is the subject of the project:

- robotics and / or process automation,
- internet of things
- artificial intelligence to transform decision-making systems5 (including cyber security),
- blockchain / distributed record technology,
- platforms for connecting advanced technologies and synchronizing their use and optimal implementation of digital twins (internal and external integration platforms),
- big data and / or quantum computing,
- virtual reality (VR) or augmented reality (AR) or augmented reality (XR),
- 3D printing.

Application deadline: April 28, 2022

2. “AI FOR GREEN” - UTILIZING AI TO ADDRESS ENVIRONMENTAL CHALLENGES 17

The national Austrian funding scheme “AI for Green” supports the development of research-intensive technology in the field of artificial intelligence. To receive funding, the application fields of research projects need to include both the areas of environmental, climate, nature and species protection (mitigation) and the adaptation to the consequences of climate change (adaptation). The approaches and methods that are researched within the funding scheme must make a concrete contribution to achieving Austria's climate goals by 2040 at the latest and contribute to solving ecological challenges. “AI for Green” aims to connect the expertise of the climate/environmental research community and the expertise of the AI community.

The first call for tenders was conducted in 2021. Eligible projects could last up until three years and needed to apply for funding between 100.000€ and 2.000.000€.

In the first call, the technology focus areas to be addressed, researched and further developed by the R&D projects were:

- 1. Adaptable AI models and situational learning
- 2. Trustworthy AI: explanatory models for algorithms and predictions
- 3. Data and data ecosystems
- 4. Large-scale simulations
- 5. Federated learning

Details of the funding scheme can be found here (in German): <https://www.ffg.at/ai>

Fostering the development of Trustworthy AI

The responsible use of AI enables the technology to be used for the benefit of society and has the potential to become a significant international competitive advantage for Austrian companies, especially in manufacturing. For achieving that, it is necessary to further develop and promote the international standardisation of AI.

Together, the Austria Wirtschaftsservice (aws) and the Platform Industry 4.0 Austria (PIA) are supporting domestic Austrian companies in the development of trustworthy AI norms and standards with a specific module as part of the “aws Digitalisation - Trustworthy Artificial Intelligence” funding scheme.

The aim of the cooperation between aws and PIA is to enable Austrian companies to participate in standardisation bodies such as ISO, Austrian Standards or the Institute of Electrical and Electronics Engineers (IEEE) and to support them through providing relevant content.

Details of the initiative can be found here (in German): <https://plattformindustrie40.at/services/#vertrauen>

3. SZOMBATHELY2030 STRATEGY

Szombathely 2030 envisages several measures to be taken in the city of Szombathely in the following 10 years.

The flagship project defined by PBN in the AI topic, is compatible with the recently approved (September 2021) local strategy, called SZOMBATHELY2030 since the vision of the strategy is to contributing to the improvement of the standard of living in Szombathely and its region by focusing on education and research-and-development by promoting industrial transformation and specializing on complex rehabilitation within the health industry. Regarding the key elements, the strategy consists the followings which are relevant to the AI flagship defined by PBN:

- Complex rehabilitation focus for new companies
- Strengthening R&D and education to increase added value
- Building on Óbuda University in manufacturing technology with a focus on health industry
- Building on the health competences of the University of Pécs
- Building common inclusive research and test infrastructure to facilitate synergies
- Involving international actors to attract knowledge
- Development of a test environment in the field of complex rehabilitation

4. FONDAZIONE COMPAGNIA DI SAN PAOLO: BANDO "INTELLIGENZA ARTIFICIALE"

The Compagnia di San Paolo and the CDP Foundation are promoting the second edition of the Call dedicated to Artificial Intelligence with the aim of supporting innovative research projects, aimed at advancing scientific knowledge in the field of AI, with a concrete impact on territory in economic and social terms. The commitment to a topic of great importance such as that of Artificial Intelligence is reflected in the European agenda, in programs such as the Digital Europe Program, Horizon Europe and Next Generation EU.

The Call intends to investigate the opportunities offered by AI in four areas:

- Health and wellness;
- Environment and green transition;
- Risk protection and insurance;
- Education and training.

The goal is to stimulate reflection and planning oriented towards pilot projects capable of using AI in the four identified areas.

The applications of the projects will have the general objective of responding to needs expressed by the territories, with the aim of bringing significant benefits to the community both in economic and above all social terms. The project proposals, therefore, must be able to collect data and process analyzes on the territory, experiment with innovative solutions and encourage collaboration between universities, research bodies, companies and the third sector.

The following can participate in the call:

- Lead partner: departmental structures of the five universities affiliated with the Compagnia di San Paolo (University of Turin and Polytechnic University, Eastern Piedmont University, University of Genoa and Federico II University of Naples);
- Research and development partners: Universities and national and international public and private non-profit research bodies;
- Territorial partner: entities and companies based in Italy;
- Assessment body: bodies with proven expertise and experience in evaluating the impact of projects.
- Leaders and research and development partners must possess the subjective eligibility requirements pursuant to the Statute, the Regulations for Institutional Activities and the Application Lines of the Regulations for Institutional Activities of the Compagnia di San Paolo.
- The Instrumental Bodies of the Compagnia di San Paolo can participate in the Call exclusively in the role of territorial partner or evaluation body.

The submission of projects by partnerships composed of at least 7 subjects is required: a leader, an evaluation body, two research and development partners and at least two territorial partners.

Deadline: May 2022

5. MANIFESTAZIONE DI INTERESSE REGIONE LOMBARDIA E UNIOPCAMERE

The regional initiative Manifestazione di Interesse per lo sviluppo di filiere produttivi ed ecosistemi industriali in Lombardia will support projects aimed at:

- enhancing and consolidating the productive chains, services and industrial, productive, and economic ecosystems existing in Lombardy
 - identify new supply chains and new ecosystems emerging in the region
 - stimulating business combinations and synergies by encouraging the exchange of skills and the achievement of common objectives for consolidation and development of industrial ecosystems and supply chains
 - innovate and improve the quality of the production process of the supply chain and increase the competitiveness and attractiveness of industrial, productive, and economic sectors and ecosystems on national and international markets
- Priority areas for project proposals where CEUP2030 CAM4.0 topics could be involved are sustainability and circularity, innovation and technology transfer, digitisation, research and intellectual property and training.

PNRR

The Italian national COVID-19 recovery plan is called Piano Nazionale di Ripresa e Resilienza (PNRR) and it is aligned with the European Next Generation EU (NGEU) programme to facilitate Recovery and Resilience after pandemic. The plan consists in a set of actions on three main strategic axes: digitisation and innovation, ecological transition, and social inclusion. The short-term objective is to address the economic and social disruption caused by the pandemic crisis. In the medium-long term, the Plan intends to remove structural weaknesses of the Italian economy, namely innovation, territorial, generational and gender gaps. Finally, PNRR will lead the country along a path of ecological and environmental transition.

The Plan has six specific missions. The most connected to Advanced manufacturing are:

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1. Mission 1 "Digitalisation, Innovation, Competitiveness, Culture" (à IPS, AI and A&R flagship and related activities) aimed at relaunching the competitiveness and productivity of the country through a digital revolution, with a total budget of €40,29 billion. In particular, Component 2 "Digitalisation, Innovation, Competitiveness in production systems" supports technological innovation and digitalization of SMEs and large enterprises on international market for made in Italy products with different investments:

- Transition 4.0 recognizes three funding lines, namely tangible and intangible assets for digital transition of production processes, training activities and investments in research and innovation.
- High-tech investments for the purchase of machines, equipment and systems for Advanced Manufacturing.
- Industrial value-chain policies and internationalization, mainly addressed to SMEs, to decrease value-chain fragmentation and to support industrial competitiveness on international markets through feasibility studies, participation to fairs, consultancy services, etc.

2. Mission 2 "Green Revolution and Ecological Transition" (à SM flagship and related activities) allocates a total of €68,6 billion to improve the sustainability and resilience of economic system and to ensure a fair and inclusive environmental transition.

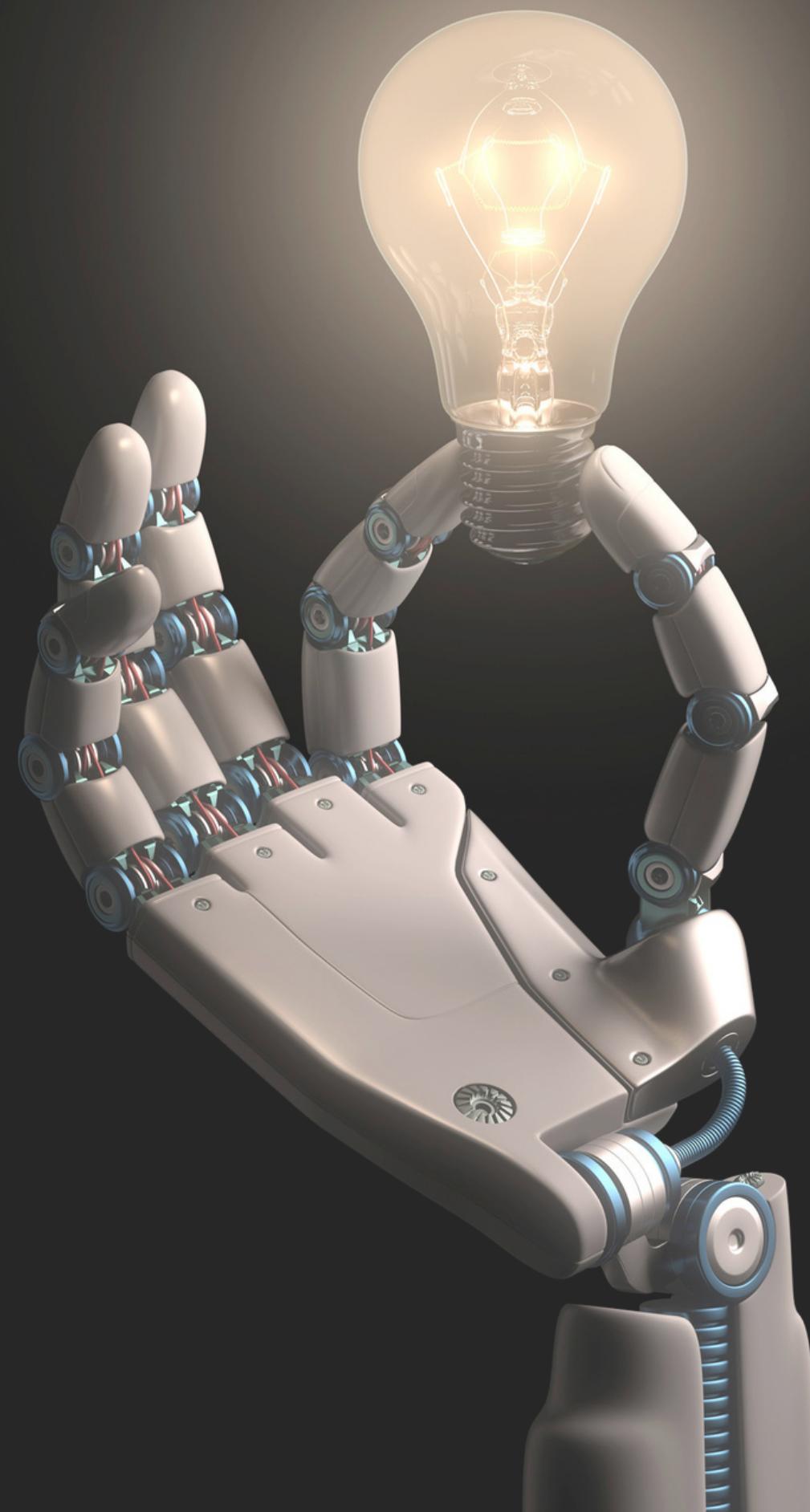
3. Mission 4 "Education and Research" (à all CEUP CAMI4.0 topics) aimed at strengthening the educational system, the digital and techno-economic skills, the research, and the technological transfer with a total budget of €30,88 billion. In particular, Component 2 "From research to Enterprises" supports the dissemination of innovative models for the applied research in synergy between universities and industrial stakeholders, favours processes for the innovation and technological transfer and strengthens the research infrastructures and the competences boosting innovation.

The Plan also includes an ambitious programme of reforms to facilitate the implementation phase, contributing to the modernisation of the country and making the economic environment more favourable to the development of business activities.

S3 Strategy

The Smart Specialization Strategy (S3) of Lombardy Region for the period 2021-2027 continues the path taken with the previous 2014-2020 of declination of an "integrated trajectory" of development of its territory. The objective is the identification of areas of competences and innovative potential priorities in terms of industrial transformation and resilience of the Lombardy economic and productive system, as well as emerging technological areas to focus regional investment over the next seven years. In particular, the priorities of Lombardy identified on Advanced Manufacturing area are:

- Integration and development of AI technologies for Manufacturing à AI flagship and related activities
- Sensorization of machines and processes, collection and management of big data and IT security interventions, development of hybrid production processes, collaborative robotics, control and automation technologies of machines, systems, and production processes à A&R flagship and related activities
- Development of innovative technologies and methods for product dynamic management, process, systems and environmental monitoring, from the design phase to the production
- Development of industrial systems and solutions for the Circular Economy (e.g. eco-design, recycling, remanufacturing, sorting, disassembly testing, Reverse logistics, Valorisation of industrial waste, etc.)
- Support for the development of innovative production processes and technologies (e.g., direct energy deposition, bio-manufacturing) à IPS flagship and related activities
- Developing production technologies and validating advanced materials/ smart materials à SM flagship and related activities
- Technologies and methods for flexible, proactive, resilient, and robust management of supply chains and production systems à IPS flagship and related activities
- Developing innovative technologies for human inclusion and enhancement in the factory
- Developing virtual reality and augmented reality technologies to foster virtual mentoring paths à A&R flagship and related activities
- Developing digital platforms for Advanced Manufacturing
- New tools and technologies for industrial design, co-design, and end customer interaction.



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 <https://www.interreg-central.eu/Content.Node/CEUP-2030.html>

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