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BrAIn

BRinging Artificial INtelligence towards SMEs

Catalogue of sustainable policy instruments and business solutions

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Executive Summary

Artificial Intelligence (AI) has the potential to radically transform businesses, industries, and other sectors. It enables automation, real-time data analysis, and smarter decision-making, improving products and processes. This handbook, published as part of the Interreg Danube Region project "BrAIn – Bringing Artificial Intelligence towards SMEs", summarizes and describes policy instruments and successful business cases from several countries, focusing on the agri-food, manufacturing and healthcare sectors.

Policy instruments to promote AI include tools, regulations, and incentives that support the adoption and responsible use of AI, especially for SMEs. The handbook highlights successful strategies such as funding programs, educational initiatives, and public-private partnerships, which have enabled SMEs to leverage AI for growth and efficiency while mitigating risks. By analysing regional and national examples, it provides policymakers with valuable insights and lessons for shaping future AI strategies.

The second part of the handbook comprises best practices and concrete business solutions where AI plays a central role in addressing challenges and optimizing processes. It showcases AI applications and potential in the agri-food, manufacturing, and healthcare sectors in Hungary, Slovenia, Germany, and other countries in the Danube Region, emphasizing contributions from SMEs, research organizations, and industry experts. These examples offer a comprehensive overview of how AI enhances productivity, fosters growth, and addresses unique business challenges through collaboration and innovation.

The Danube Region, with its diverse countries and regions, faces shared challenges and must navigate significant changes from Industry 4.0, automation, digitization, energy crises, supply chain disruptions, and more. In this context, the use of AI presents both challenges and opportunities. By addressing these challenges and leveraging AI, the Danube Region can drive growth and boost its global competitiveness.

1. Introduction

The Danube Region is formed by a heterogeneous and complex pool of countries and regions with respect to population, geographical size, business and innovation-maturity, and development level.

Nonetheless, the Danube Region countries share many common challenges that can be addressed through well-targeted transnational interventions.

Over the past two decades those countries' economies were predominantly working towards integrating themselves into European value chains, particularly in the automotive and machinery sectors. This shift has led to a strong emphasis on cost-efficient manufacturing. However, factors such as brain drain, an aging population, declining demographics resulted in a constant increase in labour costs, thus, decreasing this key advantage for them.

The region was further impacted by the transformation of the manufacturing and industrial landscape with i4.0, automation, digitalization, energy crisis, collapse of international supply chains, disruptive artificial intelligence (AI), all leading to dramatic shifts in the ecosystem. However, by proactively addressing and taking advantage of the transformation, especially in crucial sectors such as food industry, health sector, also manufacturing, and sustainable energy, new opportunities can be discovered, and substantial growth can be achieved.

This handbook is published through the Interreg Danube Region Project "**BrAIn – Bringing Artificial Intelligence towards SMEs**" (small and medium-sized enterprises). It compiles the policy instruments and best practices contributed by eleven project partners from Austria, Bulgaria, Czech Republic, Germany, Republic of Moldova, Romania, Republic of Serbia, Slovakia and Slovenia. These contributions were made possible with the support of enterprises, government bodies, and organizations across these countries.

The handbook emphasizes best practices and policy instruments in three key sectors: agri-food, manufacturing, and healthcare. These sectors were chosen, because AI is increasingly becoming a part of their operations and processes, leading to significant changes and improvements.

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2. Key Sectors

Artificial Intelligence (AI) is transforming production by optimizing processes, boosting efficiency, and driving innovation. With AI-powered tools, businesses can automate repetitive tasks, analyse large datasets in real time, and make smart decisions that enhance product quality and cut costs. AI applications range from predictive maintenance and inventory management to personalized manufacturing and supply chain optimization, allowing companies to quickly adapt to market demands while reducing waste. As industries adopt AI, the production landscape is becoming smarter, more agile, and highly competitive, paving the way for sustainable growth and technological progress. In a globalized and increasingly data-driven economy, AI is therefore a key to remaining competitive and adapting to rapidly changing market conditions. This makes AI indispensable for many industries.

This handbook looks at three important sectors: agri-food, manufacturing, and healthcare. Current trends, challenges, and innovations within these three sectors will be addressed here.

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In **agriculture**, AI is expected to transform how crops and livestock are managed, leading to higher productivity and less environmental impact. AI is a great tool, which offers smart solutions to face the challenges in the agri-food sector. AI technologies enhance productivity, efficiency and sustainability in agriculture. Key implementations include precision agriculture, crop monitoring, agricultural robotics and predictive analysis. Additionally, AI supports optimization of supply chains, food processing, food safety and quality control.

AI will improve resource use and climate adaptation, aiding environmental conservation and carbon sequestration. It will also change labour dynamics, requiring new skills.

New roles such as AI Agricultural Consultants, Agricultural Data Scientists, Precision Farming Specialists, and Food Supply Chain Analysts will emerge, which means that educational changes

to prepare the future workforce are needed. Therefore, investment in education, research, and infrastructure to support innovation are required.

Certainly, there are benefits and challenges of AI applications. However, it needs to be highlighted that the potential of AI might revolutionize the agri-food sector. Nevertheless, more research and development are still necessary in this area.

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In the **manufacturing** sector, an intensive growth of AI technology is expected. AI excels in task automation, leading to heightened efficiency and significant cost reductions. This advanced technology has the potential to boost profits, decrease expenses, reduce risks and revolutionize the manufacturing industry.

Although AI technologies can enhance manufacturing systems, successful integration depends on effective collaboration between humans and AI. AI robotics assist human workers with difficult tasks, boosting their efficiency and enhancing their safety. Furthermore, it involves training workers, assisting them with their tasks and improving overall working conditions.

AI optimizes processes, manages supply chains, and enhances quality control through advanced technologies like computer vision, deep learning, and image processing. It also predicts machinery failures, reducing downtime and maintenance costs. In sustainable manufacturing, AI minimizes waste, optimizes energy use, and supports environmental goals.

Key AI technologies in manufacturing include Digital Twins, Brain-Computer Interfaces/Deep Brain Stimulation and Deep Reinforcement Learning.

Digital Twins create virtual models to simulate real systems and improve accuracy. Brain-Computer Interfaces (BCI) and Deep Brain Stimulation (DBS) use implants to communicate with the brain but face ethical and social issues. Deep Reinforcement Learning (DRL) helps improve decision-making in complex industries, requiring large amount of data and careful balancing of learning strategies.

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In the **healthcare** sector, AI is making significant advances, transforming various aspects of the field through innovative solutions.

The aging population, changing lifestyles, and rising prevalence of chronic conditions are driving the need for earlier disease detection and a deeper understanding of diseases in their initial stages. Advanced technologies, such as predictive analytics, machine learning, and natural language processing, are proving highly effective in identifying and diagnosing diseases early, particularly in fields like radiology, pathology, ophthalmology, and dermatology.

Robotic surgery and AI-powered devices enhance surgical precision and patient care through minimally invasive methods, though challenges include ensuring safety, controlling costs, and training surgeons. AI also expands remote patient monitoring and telehealth, improving access for underserved populations, with hurdles such as data privacy, the digital divide, and system integration. Blockchain technology aims to secure and transparently exchange health data, but faces issues with scalability, adoption, and compatibility with current IT systems.

AI-driven wearable health tech and virtual health assistants offer continuous health monitoring and immediate healthcare guidance, enhancing patient engagement and self-care through real-time insights and proactive condition management.

Despite these benefits, ethical concerns, resource demands, and data management challenges remain significant.

3. Policy Instruments

Policy instruments to foster AI are the various tools, regulations, incentives, and frameworks implemented by governments or organizations to encourage the development, adoption, and responsible use of artificial intelligence technologies.

This chapter explores successful policy frameworks and strategies that have supported SMEs in adopting and benefiting from AI technologies. Effective policy instruments are crucial for guiding SMEs through the challenges of adopting AI technologies, allowing them to capitalize on AI's potential for growth and efficiency while mitigating associated risks.

The aim is to provide a comprehensive overview of how policies have facilitated AI adoption among SMEs, illustrating successful approaches and offering valuable lessons for future policy developments.

This chapter presents a collection of tools and solutions designed to help policymakers broaden their perspectives. The specific policy instruments are outlined in the following sub-chapters:

- Regional Strategy
- Funding Programmes
- Entrepreneurial Support Programs
- Education / Skills Development
- Public-Private-Partnerships
- Initiatives / Clusters
- International Collaborations
- Regulatory Framework

Project partners collaborated closely to gather a diverse range of regional and national policy instruments. By examining the findings, the aim is to present a clear picture of examples from stakeholders.

3.1. Regional Strategy

Regional strategies are action plans or initiatives developed by governments, organizations or businesses to address the specific needs and opportunities of a particular area, aiming to foster growth and development. All project partners shared their regional AI strategies, which are relevant for all three key sectors.

Based on the EU's Coordinated Action Plan on AI, the necessary basic principles for trustworthy AI are defined in Artificial Intelligence Mission **Austria** 2030 (*AIM AT 2030*)[1]. In order to develop the potential of trustworthy AI, concrete measures for a functioning AI ecosystem are laid down. AI technologies and their applications are developing very quickly. For this reason, AIM AT 2030 sets the guidelines within which the use of AI can and should develop in Austria. At the same time, AIM AT 2030 relies on agile, interdisciplinary and participatory implementation and further development.

This strategy is the result of a broad stakeholder process in which over 160 experts from various disciplines were involved. Coordination with the various specialist disciplines, departments involved, companies and the involvement of the general public will also be at the heart of the implementation of AIM AT 2030 and has the following goals:

- The aim is for a broad use of AI that is oriented towards the common good and is carried out in a responsible manner on the basis of fundamental and human rights, basic European values and the upcoming European legal framework.
- Austria should position itself as a research and innovation location for artificial intelligence in key areas and areas of strength.
- The competitiveness of Austria's technology and business location should be secured through the development and use of AI.

In 2022, the State Government of **Baden-Württemberg (Germany)** introduced *digital.LÄND*[2], its digitalisation strategy consolidating various forward-looking projects aimed at strengthening the digital capabilities of the region, thereby setting the course for digital transformation in the coming years. It builds on the 2017 digital@bw strategy, through which the state invested one billion euros by 2021 in a wide range of projects to enhance digitalisation.

One chapter of digital.LÄND is dedicated to artificial intelligence (AI) and its role as a key technology for innovation in Baden-Württemberg. The objective is to create the necessary conditions to fully exploit the potential of AI across different sectors, focusing on an opportunity-driven approach.

Another significant initiative under this chapter is the establishment of the AI Innovation Park in Heilbronn, which is set to become an AI value creation center by the end of 2025, providing infrastructure and support for SMEs, large international companies, start-ups, founders,

[1] https://www.digitalaustria.gv.at/eng/strategy/strategy-AI-AIM-AT-2030.html

[2] https://digital-laend.de/digitalisierungsstrategie/ (unfortunately only available in German)

international talents and researchers. Furthermore, Regional AI Centers of Excellence have been initiated, aiming to develop at least 100 projects with industry partners by 2025. The strategy also includes a two-year AI in healthcare real-world laboratory, designed to facilitate collaboration between healthcare providers, researchers, and industry to test and develop new AI applications in real-world settings.

Through these measures, Baden-Württemberg aims to foster AI-driven innovation and ensure the state's competitiveness in the digital age.

Concept for the *development of artificial intelligence*[3] in **Bulgaria** until 2030, placed emphasis and on promoting efforts in the development and implementation of systems with artificial intelligence to enable digital transformation of the economy. The main areas of impact and specific measures have been identified: building a reliable infrastructure for AI development, including data infrastructure; development of research capacity for scientific excellence; creation of knowledge and skills for the development and use of AI; support for innovation to implement AI in practice; raising awareness and building trust in society; creating a regulatory framework for the development and use of reliable AI in accordance with international regulatory and ethical standards

Strategy for Digitization of Agriculture and Rural Areas of the Republic of Bulgaria[4], which identifies areas of impact and measures for accelerated digitization including measures based on AI and Blockchain. The strategy envisages the use of AI to track production, protect against pests, create a continuous farm-to-table chain, and ease farmers' administrative burden.

The Ministry of *Agriculture's strategy for 2030*[5] of **Czech Republic** is centred on promoting sustainable agriculture, environmental stewardship, and rural development, with a clear focus on adapting to the challenges posed by climate change. The strategy emphasizes the reduction of greenhouse gas emissions, increased efficiency in water resource management, and the integration of innovative technologies to boost the competitiveness of Czech agriculture.

A key component is improving food security by increasing domestic production while supporting biodiversity and sustainable land use. The ministry aims to promote practices that ensure the health of ecosystems, the resilience of agriculture to climate risks, and the protection of natural resources. This includes initiatives to enhance soil health, conserve water, and maintain biodiversity, thus contributing to long-term food sustainability.

Another priority of the strategy is ensuring the socio-economic vitality of rural areas. The ministry seeks to stimulate job creation and entrepreneurship in agriculture and related sectors while improving the quality of life in rural communities. Support for young farmers,

[3] https://www.mtc.government.bg/sites/default/files/conceptforthedevelopmentofaiinbulgariauntil2030.pdf

[4] https://faolex.fao.org/docs/pdf/bul222469.pdf

[5] https://mze.gov.cz/public/portal/en; https://www.dataplan.info/img_upload/7bdb1584e3b8a53d337518d988763f8d/strategie-resortu-ministerstva-zemedelstvi-s-vyhledem-do-2030.pdf

modernization of agricultural infrastructure, and development of non-agricultural activities in rural areas are all emphasized as pathways to strengthening rural economies.

The strategic plan also recognizes the importance of international cooperation, aligning with broader EU policies on agriculture and environmental protection, especially concerning the European Green Deal. This includes promoting knowledge exchange, research, and education in sustainable farming practices.

The integration of AI is an important element of the Ministry's long-term plan. AI is expected to optimize resource management, automate agricultural processes, and support decision-making in the face of climate uncertainties. By utilizing AI and data analytics, the Ministry seeks to ensure more efficient production, better climate resilience, and a greater contribution to sustainable development.

The *National Artificial Intelligence Strategy 2019-2035*[6] of the Czech Republic focuses on establishing the country as a European AI leader by 2030. This involves developing key AI research and innovation centers, supporting SMEs and startups, and promoting digital transformation. The strategy emphasizes creating a European Centre of Excellence for AI and advancing cybersecurity and ethical AI. Education and lifelong learning are critical, with goals to retrain workers in response to automation, ensuring economic competitiveness and job security. International collaboration is a priority, aligning closely with EU AI initiatives.

The government aims to boost research funding and attract top talent to develop cutting-edge AI applications, particularly in healthcare, transport, and security. This will be done through increased investment and the establishment of digital innovation hubs. In addition, the Czech Republic seeks to create a friendly regulatory environment, ensuring data protection, privacy, and consumer rights while supporting the safe deployment of AI technologies.

Efforts also focus on AI ethics and reducing risks such as discrimination and manipulation by AI systems. The government's broader vision includes supporting AI-powered automation in industries like manufacturing, improving public services, and transforming the education system to prepare the workforce for AI-driven economies.

Key elements of the strategy include creating AI standards, strengthening R&D funding, promoting startups, and ensuring international cooperation to keep the Czech Republic at the forefront of AI development in Europe.

By leveraging its industrial base, skilled workforce, and strategic partnerships, the Czech Republic aims to be a model country in AI research, development, and implementation, contributing significantly to the EU's global AI competitiveness.

The Information Concept of Digital Czech Republic[7] outlines the country's strategy for building and supporting eGovernment systems from 2018 and beyond. The concept is designed for a 5-year period and is mandatory for all state and municipal authorities.

[6] https://www.dataplan.info/img_upload/7bdb1584e3b8a53d337518d988763f8d/nais_eng_1.pd; https://www.mpo.gov.cz/en/business/grants-and-business-support/; https://www.mpo.gov.cz/en/

[7] https://archi.gov.cz/en:ikcr

Main Objectives:

- eGovernment Goals: The concept defines the Czech Republic's goals for public administration information systems. It aims to create user-friendly, effective digital services that are secure, accessible, and interconnected.
- Architectural Principles: It emphasizes architectural principles for designing public information systems, such as efficiency, security, and adherence to EU regulations.
- Life Cycle Management: The document details the management of the information systems' life cycle, ensuring continual improvements and updates.
- Digital Transformation and Internal Efficiency: A focus on improving the internal operations of public institutions is included, aiming for a significant increase in efficiency, primarily by digitizing internal documents and modernizing operational information systems.
- Strategic Coordination: It describes the synergy with broader national strategies, including cybersecurity, and ensures coordination with the European Commission's Digital Economy and Society Index (DESI).

The document outlines plans to enhance digital services, support digitalization through legislation, and boost the digital skills of public employees. It emphasizes public-private collaboration for effective eGovernment implementation.

Key focus areas are delivering digital services for citizens and businesses, improving public sector digital skills, and ensuring secure & accessible services in line with EU standards.

This reflects the Czech government's commitment to leading in digital public services and creating an efficient, user-focused administration system.

Szombathely's, **Hungary**, healthcare sector faced challenges of overburdened systems, a shortage of qualified medical personnel, and limited accessibility to quality healthcare, particularly in remote and disadvantaged areas. Additionally, the need for modern healthcare solutions to keep pace with rapid advancements in medical technology was pressing.

Szombathely2030's strategy (*SZOMBATHELY2030 FOR A RESILIENT KNOWLEDGE ECONOMY*[8]*)* addressed these challenges by integrating advanced technological solutions, focusing on telehealth, robotic surgery, wearable health tech, and virtual health assistants. The approach involved developing robust telemedicine infrastructure for remote consultations and monitoring, partnering with universities to advance robotic and AI-driven surgical procedures, and equipping healthcare providers with smart diagnostic tools. These initiatives aimed to enhance continuous patient monitoring, especially for chronic conditions, and promote proactive healthcare management.

The integration of these technologies has significantly improved healthcare delivery in Szombathely. Telehealth services increased access to medical consultations, reducing the strain on healthcare facilities and enhancing patient convenience. Robotic surgery has brought precision and innovation to surgical procedures, building a skilled workforce and positioning

[8] https://szombathely2030.hu/en/

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Szombathely as a hub for medical excellence. Wearable health tech enabled early detection of health issues and empowered patients to manage their health proactively, leading to cost reductions by minimizing hospital visits. Virtual health assistants facilitated continuous health monitoring, improved chronic disease management, and increased patient engagement.

Overall, these advancements have led to a more efficient, accessible, and high-quality healthcare system, making Szombathely a leader in medical innovation and technology. The proactive integration of these solutions ensures that the city's healthcare system remains resilient, adaptable, and capable of meeting future challenges effectively.

"Agriculture 4.0" represents a technological and managerial revolution in modern agriculture, heavily reliant on data. This approach utilizes vast quantities of data generated by precision agriculture technologies and sensors, which are then processed using artificial intelligence. Decisions are automated, often executed by machines or, in the future, robots. "Agriculture 4.0" not only reforms production but also transforms farm management and the business models of entire product chains.

Digital agricultural solutions have evolved beyond mere convenience; they have become competitive factors. The European Union's Common Agricultural Policy emphasizes environmental protection, with precision agriculture being a key tool to achieve this.

Developed within the framework of the Digital Prosperity Program, Hungary's *Digital Agriculture Strategy (DAS)*[9] aims to enhance agricultural productivity through information gathering, processing, and automating technological operations. It seeks to optimize the use of available environmental resources.

The Digital Prosperity Program 2.0[10] aims to significantly enhance the well-being, health, and quality of life of Hungarian citizens through the widespread adoption of digital solutions, tools, and services and by focusing on prevention, early detection, and personalized care, the strategy aims to create a more resilient and healthier society. A cornerstone of this initiative is the development of Hungary's *Digital Health Development Strategy (DEFS),* which prioritizes the health benefits of citizens.

In September 2020, the Hungarian Government published its National AI strategy, outlining the strategic vision and actions for the development of AI in the period 2020-2030 (Hungary, 2020). The strategy *Digital Prosperity Capital Programme*[11] has been released by the Ministry of Innovation and Technology and developed by the Artificial Intelligence Coalition. In October 2018, the AI Coalition has been formed upon the initiative of the Ministry as a partnership between governmental institutions, prominent academics and practitioners from leading IT businesses. Made up of more than 320 members1, the AI Coalition released an AI Action Plan in October 2019, and in 2020 it drew up Hungary's AI Strategy for the Hungarian Government.

Hungary's AI strategy aims to support and boost all relevant sections of the AI value chain from data generation and management, through basic and applied research, to utilisation of the technology and raising awareness of the possibilities inherent in practical AI applications. Through a multi-layered set of goals the strategy aims to:

[9] https://neum.hu/en/das/

[10] https://digitalisjoletprogram.hu/hu/tartalom/djp20-strategiai-tanulmany

[11] https://digitalisjoletprogram.hu/hu/tartalom/digitalis-jolet-tokeprogram

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- Strengthen the foundation pillars of the Hungarian AI ecosystem: data economy, research development and innovation (R&D&I), AI uptake, education and competence development, infrastructure deployment, and regulatory and ethical framework
- Focus on specific sectors and technology fields with the highest acceleration potential for Hungary: manufacturing, healthcare, agriculture, public administration, transportation, logistics and energy
- Initiate transformative programmes with long term ambitious goals that offer direct benefits to citizens: autonomous systems and self-driving vehicles, health-consciousness in a digital world, climate-driven agriculture, data-wallet and personalised services, AI-supported development of personal competencies, automated administration procedures in Hungarian, and energy networks focused on renewable sources of energy.

The **Republic of Serbia** introduced their strategy for *Development of Artificial Intelligence for Period 2020-2025*[12]. With the Fourth Industrial, i.e. the Digital Revolution, we have a chance to make up for lagging behind and catch up with more developed countries. The digitisation process will enhance the standard and quality of life for hundreds of thousands of Serbian citizens. Efficiency will be increased, costs will be reduced and new value will be created in almost all areas of life and work. The digitisation process is the most important catalyst of innovations, competitiveness and growth.

The *Strategic Plan 2023-2027*[13] contains the key strategic orientations for the implementation of the Common Agricultural Policy in the **Republic of Slovenia** and presents a range of proposed interventions for their effective and efficient implementation in practice. Furthermore, with the *Slovenian smart specialization strategy (S4)*[14] the government wants to facilitate the shift to high-productivity economy.

The *Smart Specialisation Strategy of the West Region*[15] in **Romania** is an enabling condition for being granted funds on innovation, including Digitalisation and Artificial Intelligence at regional level for SMEs. The strategy prioritizes investments in innovation and focuses on six sectors of smart specialization (Health, Agrofood, Energy Efficiency&Sustainable Constructions, Cultural&Creative Industries, ITC&Automotive, Manufacturing, Tourism, Health&Quality of Life), considered strategic from the perspective of potential for innovation and generation of added value.

The strategy focuses on several priorities, underlying the importance of adoption of new technologies (including artificial intelligence), based on different trends, advantages,

[12] https://www.srbija.gov.rs/tekst/en/149169/strategy-for-the-development-of-artificial-intelligence-in-the-republic-of-serbia-for-the-period-2020-2025.php
[13] https://skp.si/en/cap-2023-2027
[14] https://www.gov.si/zbirke/projekti-in-programi/izvajanje-slovenske-strategije-pametne-specializacije/
[15] https://adrvest.ro/wp-content/uploads/2021/01/Strategia-Regionala-de-Specializare-Inteligenta-a-Regiunii-Vest-2021-2027-RIS3-.pdf

recommendations, stakeholder consultations etc analysed. Nine priority areas are defined, three of them including measures, actions & investments in new technologies.

Technological advancements together with skilled/competent human resources for the future contribute to significantly improved new products, solutions, new businesses, systems, public services etc and ensure regions' competitiveness in the digital age.

Timișoara Smart City and Digital Transformation Strategy 2022-2027[16]is the first digital strategy adopted by a local municipality in Romania. This has several implications: first, it is a pilot approach that is subject for further feedback and correction, there is an ongoing benchmarking process including with one city from the Danube Region, Vienna; second, it is a model for other municipalities to embark on the digitalization path; third, it is the policy framework for operationalizing a local digital hub connecting all relevant stakeholders from public and private sectors. All this combined should trigger further digitalization processes in the benefit of the citizens. This policy instrument is based on the following:

- The opportunity created by the accelerating global digital transformation, and therefore by the existence of supporting tools for cities to seize this opportunity
- Favourable context of EU policies for sustainability and digitalisation, accompanied by EU funding for cities
- The chance to prepare and implement significant and decisive investment projects for the development of the city
- Launching and piloting participatory consultation and decision-making tools for citizens, which will subsequently become a constant in the life of the city
- Envisioning a gradual, structured and inclusive digital transformation, during which, through digital education, the vast majority of citizens will be able to become users.

The strategy sets out a comprehensive vision and several ambitions including the adoption of new technologies (AI, Blockchain, Big Data, IoT etc) and digital development, as one of the main challenges for organizations being the full digitalization of interactions with public institutions.

Moreover, the new Regional Program had created the opportunity for the public administration in larger cities to fund Smart City Initiatives. The role of the intervention logic is to steer digitalisation for the benefit of citizens, companies and research organisation.

3.2. Funding Programs

Funding programs are essential for accelerating the adoption of artificial intelligence (AI) in companies, as they help overcome financial, technical, and strategic barriers. These programs enable businesses to unlock the potential of AI technologies and integrate them into operations, fostering innovation and competitiveness.

[16] https://www.primariatm.ro/ ; https://smartcity.primariatm.ro/

One of the key initiatives in **Europe** is *The European Digital Innovation Hubs (EDIH)*[17], which is co-financed with *DIGITAL Europe Programme (DIGITAL)*[18] and national funds. The funding program aims to boost digitalization and innovation, particularly for small and medium-sized enterprises (SMEs), as well as local communities. EDIHs provide their services across Europe, including the possibility of testing before investing, skill enhancement, support in finding investors and strengthening the innovation ecosystem and supporting networking. Another key funding programme is *Horizon Europe*[19], which provides substantial funding for research and innovation in the period 2021 – 2027. It addresses climate change, supports the UN's Sustainable Development Goals and enhances EU competitiveness and growth by fostering collaboration and amplifying the impact of research and innovation in EU policy and global challenges.

Upper Austria provides significant support for SMEs through various funding programs aimed at fostering AI and digital innovation. The strategic initiative *AI Region Upper Austria 2024*[20] was established under the *#upperVISION20230 strategy*[21]. It focuses on leveraging artificial intelligence (AI) in order to boost digital transformation of Upper Austria's economy and industry. In 2024, Upper Austria is positioning itself as a key player in AI research and development with significant initiatives and funding. The region has allocated €5.75 million to Cooperative Research and Development Projects, focusing on AI applications in crucial sectors like healthcare, energy, and traffic management. The goal is to make these sectors more efficient, resource-conserving, and ecologically friendly.

The primary goal of #upperVISION2030 is to future-proof the region through continuous adaptation to emerging trends. It emphasizes leveraging local strengths in technology and industry while promoting sustainability and improving quality of life.

Furthermore, the Austrian government introduced the strategy AIM AT 2030[22]. Under AIM AT 2030 different funding and incentives are provided for AI research, startups and educational programs. Furthermore, through this programme the public will be become more aware of AI und also get an understanding. AIM AT 2030 also supports pilot projects for key sectors such as healthcare, transportation and manufacturing. Lastly, it is relevant to monitor and evaluate the progress and impact of AI initiatives to meet the goals and adjust the strategies when necessary.

The initiative *digital.LÄND*[23], of **Baden-Württemberg** includes the expansion and sustainable funding of Cyber Valley, Europe's largest AI and robotics research hub, to ensure its continued growth and impact. Additionally, the AI Innovation Center "Learning Systems and Cognitive

[17] https://european-digital-innovation-hubs.ec.europa.eu/home
[18] https://digital-strategy.ec.europa.eu/en/activities/digital-programme
[19] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en
[20] https://www.ffg.at/AI-Region-UpperAustria
[21] https://www.uppervision.at/
[22] https://www.digitalaustria.gv.at/eng/strategy/strategy-AI-AIM-AT-2030.html
[23] https://digital-laend.de/digitalisierungsstrategie/

Robotics" has been expanded to promote technology transfer to SMEs, supported by €250 million in public and private funding over a ten-year period.

The open call "*Innovation vouchers*"[24] outlines a grant program under the *Operational Programme Technology and Applications for Competitiveness (OP TAK) 2021-2027*, led by the **Czech Ministry** of Industry and Trade.

The objective of this program is to boost collaboration between businesses and research institutions to drive innovation, particularly for small and medium-sized enterprises (SMEs), in line with the National S3 Strategy.

SMEs can apply for funding to purchase innovation-related consulting and expert services from research organizations or accredited laboratories. These services include testing, diagnostics, certification, and development of products, processes, or services.

Grant Details:

- 75% coverage of eligible costs for grants ranging from CZK 50.000 to CZK 500.000.
- 50% coverage for grants between CZK 500.001 to CZK 1.000.000.

Eligible companies include SMEs located outside of Prague meeting legal and financial criteria. Projects must comply with EU policies on non-discrimination and sustainable development.

The *Digital Prosperity Capital Program*[25] part of the broader Digital Prosperity Financial Program, offers **Hungarian** micro, small, and medium-sized enterprises (SMEs), as well as startups, equity investments ranging from 10 to 500 million forints to support their digital product and service development projects.

Key Objectives and Benefits:

- Boosting Digital Innovation: The program aims to stimulate innovation and foster a more competitive business landscape in Hungary.
- Enhancing Export Capabilities: By supporting digital development, the program helps businesses increase their export potential.
- Developing Digital Skills: The program contributes to the upskilling of the workforce in digital competencies.
- Improving Sectoral Technology: It elevates the technological advancement of relevant industries.
- Strengthening National Competitiveness: Ultimately, the program aims to enhance Hungary's overall competitiveness on the global stage.
- Eligibility and Focus

[24] https://www.agentura-api.org/cs/podporovane-aktivity-optak/inovacni-vouchery-optak/
[25] https://digitalisjoletprogram.hu/hu/tartalom/digitalis-jolet-tokeprogram

- Geographical Scope: Companies operating outside the Central Hungarian region (in convergence regions) can apply for the program.
- Project Alignment: Projects must align with the strategic goals of the Digital Prosperity Program, focusing on innovative digital solutions.
- Company Stage: The program supports companies at various stages of development, from pre-seed to more mature businesses.

The Digital Prosperity Program's overarching objective is to ensure that all Hungarian citizens and businesses benefit from digitalization. By providing financial support to innovative digital projects, the program aims to drive economic growth and improve the quality of life in Hungary.

The *Program for Development of Projects in the Field of Artificial Intelligence*[26] is implemented under two sub-programs, one intended for fundamental and the other for applied research in the field of artificial intelligence.

The Program aims to enhance excellence and relevance of the scientific research in the domain of artificial intelligence in the **Republic of Serbia**, as well as to support implementation of the scientific results in economic development of the Republic of Serbia, enhancement of human resources development and improvement of international development in the field of artificial intelligence.

The main thematic areas of the Program: General artificial intelligence, Machine learning, Natural language processing, Planning, Knowledge reasoning, Computer vision and speech communication and Intelligent systems.

The Regional Programme West 2021-2027[27] of **Romania** is a dedicated instrument that offers funding at regional level for SMEs.

Within the funding opportunities available under this programme, funding for AI/other technologies, will be under specific actions, such as:

- Investments in acquiring specific ITC equipment, acquisition of software programs/applications, migration of data and applications, procurement of specialized consultancy services in the field of ditization, procurement of consultancy services for the identification of technical solutions for digitization
- Supporting innovation activities and RDI departments within SMEs by development and/or uptake of advanced technologies: block-chain, big data, cloud computing, IoT,

[26] https://fondzanauku.gov.rs/program-for-development-of-projects-in-the-field-of-artificial-intelligence-ai/
[27] https://www.vest.ro/home

advanced manufacturing, robotics, artificial intelligence, cybersecurity, supporting SMEs in digital transformation by using advanced technologies.

A dedicated call on Digitalization for SMEs will be launched, where SMEs looking to implement AI solutions, services or products in their activities will be eligible to apply in order to become more digital, competitive, optimize their processes, etc.

In **Slovakia**, *Innovation Vouchers Funding Mechanism*[28] was created and it aims to stimulate collaboration between business entities and research institutions. Its primary goal is to foster the development and application of innovative solutions and technologies, particularly in the field of artificial intelligence (AI), to enhance the competitiveness of the Slovak economy and support sustainable growth. This tool employs innovation vouchers as a form of financial support. These vouchers are provided through a call for applications, which is part of the Recovery and Resilience Plan of the Slovak Republic. Business entities can apply for financial resources to implement projects in collaboration with research institutions.

Eligible activities include:

- Development and implementation of new technologies and products in the field of AI.
- Collaboration on research and development projects focused on AI.
- Testing and validation of innovative solutions in real-world conditions.

Applicants benefit from access to financial resources for implementing innovative projects, opportunities for collaboration with renowned research institutions, support in developing and commercializing new technologies and products, and increased expertise and competencies in AI.

Evaluation criteria for applications encompass the innovativeness and technological contribution of the project, the quality and feasibility of the project plan, the potential for commercialization and economic impact, and the qualifications and experience of the applicant and their partners.

3.3. Entrepreneurial Support Programs

Entrepreneurial support programs play a critical role in encouraging companies to adopt and utilize artificial intelligence (AI). These programs provide resources, knowledge, and connections that help businesses navigate the complexities of AI technologies, driving innovation and competitiveness. By addressing the financial, technical, and strategic challenges

[28] https://vaia.gov.sk/sk/2023/07/14/vyzva-inovacne-vouchery

associated with AI adoption, entrepreneurial support programs empower companies to leverage AI for growth and efficiency, strengthening their position in an increasingly digital economy.

The AI Action Program for SMEs (*„Aktionsprogramm KI für den Mittelstand"*)[29] by the Ministry of Economy, Labor, and Tourism of **Baden-Württemberg**, aims to support AI value creation and application across all sectors. The program's goal is to position Baden-Württemberg as a leading AI region not only in research but, more importantly, in AI-driven innovation and value creation, both nationally and in Europe. It is important that companies in the state not only apply AI technologies developed elsewhere but also become key players in developing AI products, services, and business models.

To achieve this, the Ministry has implemented several targeted measures to provide effective support: The AI Champions Baden-Württemberg initiative, launched in 2020, showcases successful AI solutions with 36 companies already recognized for their contributions. The AI Innovation Contest, which started in 2019, provides direct funding to SMEs, supporting 89 projects to date in the development and commercialization of AI innovations. The program also focuses on infrastructure, with the establishment of the AI Innovation Park in Heilbronn, which is set to become Europe's largest AI ecosystem, bringing together companies, start-ups, talents, and public-sector players. Additionally, 16 Regional AI-Labs serve as the first point of contact for companies, supported by €3.1 million in funding to speed up the implementation of AI solutions. Further support includes a dedicated SME center in Cyber Valley, linking top AI research with businesses, and a Research and Transfer Center for AI Engineering, designed to accelerate AI adoption in engineering, a key sector in Baden-Württemberg.

Through these initiatives, the AI Action Program for SMEs seeks to enhance the region's competitiveness in AI and ensure that local companies play a leading role in AI innovation on both national and European levels.

3.4. Education / Skills development

As AI becomes increasingly integrated into business processes, ensuring that the workforce has the right skills is essential for unlocking AI's full potential. By ensuring that employees possess the right mix of technical, ethical, and problem-solving skills, businesses can drive innovation, maintain a competitive edge, and create a workforce capable of navigating the AI-driven future.

[29] https://www.wirtschaft-digital-bw.de/ki-made-in-bw/ki-made-in-bw

RISC AI Academy[30] is initiated by RISC Software Gmbh, which is an established nationally and internationally research and development company in **Upper Austria**. RISC AI Academy organizes workshops focusing on the topic of Artificial Intelligence. These in-house workshops are tailored to individual issues of an organization or a company.

These workshops are designed to prepare employees with the skills and knowledge needed to tackle AI-related challenges. Moreover, the participants can how to take advantage of future innovations and opportunities successfully.

As they collaborate with other research organizations and enterprises on projects, they can draw from an extensive network of experience and best practices. Thus, the participants do not only learn the basics of AI, but also daily use cases, language models, agile working methods, data engineering and machine learning methods, industrial AI and computer vision, trustworthy AI, time series models as well as risks and ethics of AI.

RISC AI Academy offer a 5-day AI Innovators bootcamp, which is especially interesting for leaders, employees of bigger and medium enterprises, who would like to gain and foster their knowledge about AI. The bootcamp should inspire everyone who is interested in the topic and help them optimize internal processes and develop innovative solutions with AI. Furthermore, this bootcamp offers the possibility to be intensively involved in current and upcoming AI technologies for future implementation.

INSAIT – Institute for Computer Science, Artificial Intelligence and Technology[31], located in Sofia, **Bulgaria**, is the first of its kind in Eastern Europe to offer world-class research facilities and *conditions.INSAIT* was founded in April 2022, in partnership with Switzerland's ETH Zurich and EPFL, two of the world's best technical universities, and is closely advised and supervised by top academics from some of the most elite U.S., European, and Israeli universities and research labs. INSAIT is also generously supported by donations from Google, Amazon Web Services, DeepMind, SiteGround, VMware as well as many tech entrepreneurs.

The *"Digital Enterprise"* [32]is part of the 2021–2027 Operational Program for Technology and Applications for Competitiveness (OP TAK). Its goal is to support the digital transformation of SMEs in the **Czech Republic** through the adoption of advanced non-manufacturing digital technologies. This initiative aims to improve production processes, establish new operations, expand capacities or introduce new products. Key focuses include automation, data digitization, and enhanced connectivity for efficient process management.

Eligible activities include investments in ICT products and services, such as hardware, software, and cybersecurity solutions. Projects may involve the integration of management software (MES, MIS), warehouse management systems (WMS) or company-wide connectivity (LAN, smart sensors). Other eligible activities include cybersecurity improvements, training in digital skills, and the creation of digital twins for process verification. AI technologies are also considered

[30] https://www.risc-software.at/ai-academy/

[31] https://insait.ai/

[32] https://www.agentura-api.org/cs/podporovane-aktivity-optak/digitalni-podnik-optak/

within the broader framework of supporting digital transformation, as outlined in the National Strategy for Artificial Intelligence in the Czech Republic.

Ineligible projects include investments in manufacturing technologies, cryptocurrency mining, and projects that do not result in significant new functionalities. Projects aimed at reducing greenhouse gas emissions from sectors in the European Emission Trading System are also excluded.

This call targets SMEs in the Czech Republic (excluding Prague), focusing on digitalization efforts to enhance competitiveness. Applicants must submit detailed documentation, including financial statements and business plans. The program addresses low digitalization rates in Czech SMEs and aims to foster technological transformation in key industries, helping companies capitalize on digital technologies for growth and innovation, including AI.

Slovenian *smart specialization strategy (S4)*[33] is an operational plan facilitating the shift to high-productivity economy. For the purpose of achieving high-productivity economy, nine priority domains with corresponding focus areas and technologies are defined. Thus, 9 Strategic research and innovation partnerships (SRIP) were established. SRIP HRANA covers the domain of sustainable food production.

The *CAP Strategic Plan 2023-2027*[34] contains the key strategic orientations for the implementation of the Common Agricultural Policy in the Republic of Slovenia and presents a range of proposed interventions for their effective and efficient implementation in practice.

3.5. Public-private-partnerships

These collaborations between governments and private sector companies leverage the strengths of both sides: the public sector's regulatory, financial, and infrastructural support, and the private sector's innovation, technical expertise, and commercial focus. By combining the resources, expertise, and capabilities of both sectors, these collaborations create an environment where AI can thrive, benefiting businesses, economies, and society at large.

The **Baden-Württemberg** *AI Alliance*[35] serves as a crucial link between business, science, and politics, aiming to secure and enhance economic success in the region. By facilitating targeted networking among stakeholders, promoting knowledge transfer, and ensuring transparency, the alliance makes the potential of AI technologies accessible to all. Officially launched in early 2024, the alliance strives to provide a cooperative framework based on a public-private

[33] https://www.gov.si/zbirke/projekti-in-programi/izvajanje-slovenske-strategije-pametne-specializacije/
[34] https://skp.si/en/cap-2023-2027
[35] https://ki-allianz.de/en/

partnership (PPP) model, ensuring that the development and application of AI solutions are conducted in a trustworthy manner for the benefit of society.

This initiative, which encompasses the regions of Karlsruhe, Stuttgart, Neckar-Alb, Freiburg, Northern Black Forest, and Ostalbkreis, aims to establish an internationally competitive ecosystem for AI. The ambitious goals of the AI Alliance are supported by funding of €11.5 million from the Ministry of Economic Affairs, Labour and Tourism Baden-Württemberg. A key focus of the alliance is to promote innovation, particularly for SMEs, bridging the gap between theoretical knowledge and practical application.

Innovation projects such as the AI Innovation Lab, the AI Challenge, and the FRAI Accelerator are designed to help SMEs successfully implement AI solutions. The structure of the AI Alliance is based on close collaboration among its member regions, each supported by community managers who facilitate efficient cooperation and exchange within the network.

The AI Alliance emphasizes accessibility and inclusivity in the use of AI technologies, advocating for responsible practices in harnessing this key technology. By fostering collaboration among various stakeholders, the Alliance aims to create an ecosystem that promotes innovation while ensuring that advancements in AI are utilized for the greater benefit of society.

The National Program for Smart Specialization of the **Republic of Moldova** for 2024-2027 *"SMART MOLDOVA"*[36] aims to modernize and diversify economic sectors through innovation, boosting competitiveness and productivity, and aligning Moldova with EU cohesion policies. The initiative includes collaboration with the European Union, building on the European Association Agreement and the National Development Strategy "European Moldova 2030."

By focusing on clusters, industrial hubs, and public-private partnerships, the initiative aims to stimulate research and development while promoting entrepreneurship and digitalization in various sectors, including agriculture and energy. It is tied closely to broader EU objectives such as sustainable economic growth, technological innovation, and access to quality services.

Moldova faces significant challenges, including a declining population, low productivity in sectors like agriculture, and a weak alignment between education and labour market needs. The program seeks to address these through improved innovation ecosystems, increased digitalization, and better integration of research with industry needs. It also aims to tackle demographic and economic constraints by leveraging international partnerships and promoting sustainable development through policies that align with the EU's framework.

Among the main goals of the programme, there are: development of the innovational entrepreneurship, wide use of innovations for the attenuation of social problems, ensuring a smart, sustainable and inclusive economic growth. Also, emphasis will be put on enhancing the capacities of the human resources involved in research, innovation activities, as well as in the innovational entrepreneurship.

The focus sectors are agriculture, information and communication technology, energy, biomedicine and biopharmaceutics. Thus, the niches of smart development deal with the use

[36] https://cancelaria.gov.md/sites/default/files/document/attachments/nu-135-mec-2024.pdf

of advanced biotechnologies in the agriculture, macro/nano-materials and the electronic engineering, alternative energy, personalized medicine, etc.

3.6. Initiatives / Clusters

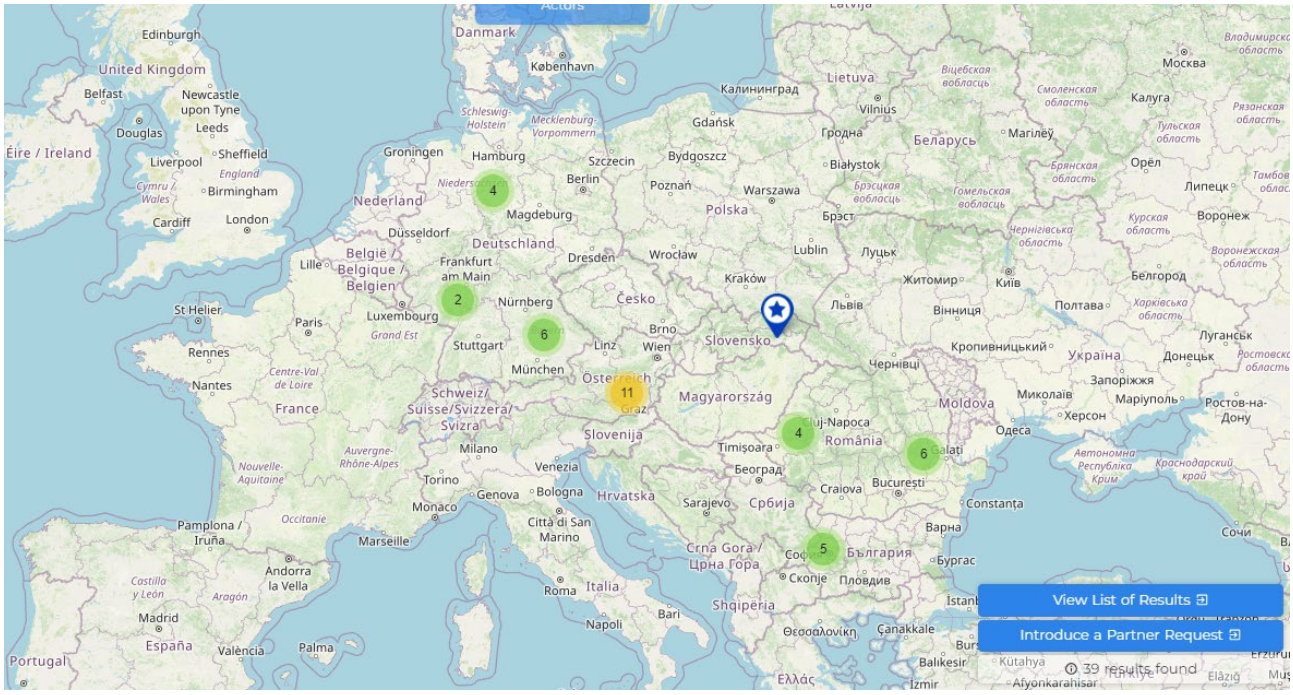
Artificial Intelligence plays a crucial role in **European cluster initiatives** by driving innovation and competitiveness across industries. Clusters, which are regional concentrations of interconnected businesses, research institutions, and other stakeholders, leverage AI to enhance collaboration, optimize resource use, and foster technological development.

AI is integrated into cluster strategies to accelerate innovation in sectors like manufacturing, healthcare, and energy. By adopting AI, clusters can automate processes, improve decision-making, and develop cutting-edge products and services. AI supports the digital transformation of industries within clusters by providing tools for data analytics, predictive maintenance, and intelligent automation. This transformation aligns with the EU's broader goals of achieving technological sovereignty and sustainable growth. Such AI-powered platforms facilitate better communication and cooperation among cluster members, enabling real-time data sharing and collaborative problem-solving. This is particularly beneficial in complex, multidisciplinary projects. Clusters are also instrumental in applying AI to tackle societal issues, such as environmental sustainability and healthcare accessibility. AI models developed within clusters often focus on these areas, reflecting EU policy priorities. Overall, AI is seen as a catalyst for enhancing the strategic objectives of European cluster initiatives, fostering technological advancements while aligning with EU goals for digital and green transitions.[37]

In the regions of the participating project partners alone, there are more than 35 cluster initiatives focussing on the topic of Artificial Intelligence.[38]

[37] Harnessing the potential of Artificial Intelligence in science to boost Europe's global competitiveness - European Commission

[38] ECCP Visual Reporting Site



3.7. International Collaboration

Governments, research institutions, and international organizations are working together to address both the benefits and risks of AI technologies and to tackle the complex, global challenges posed by AI advancements. These partnerships aim to foster innovation, ensure safety, and promote inclusivity in AI development.

For instance, the European Union, the United States, and other global players have initiated various bilateral and multilateral efforts. Notably, the U.S. and EU have worked on aligning AI governance frameworks, with the EU proposing a Transatlantic AI Agenda to enhance regulatory convergence and data sharing. This approach is based on shared values such as human rights, privacy, and inclusivity, which are pivotal to the responsible development and deployment of AI.[39]

Moreover, countries like those involved in the AI Seoul Summit have also made significant strides. The 2024 AI Seoul Summit resulted in the "Seoul Declaration," a collective statement from leaders and ministers of ten countries and the EU, underscoring the importance of safe, innovative, and inclusive AI. This declaration emphasizes the need for interoperability in AI governance, promoting cross-border collaboration and ensuring that AI can address global challenges such as climate change, health, and the UN Sustainable Development Goals. In these international settings, AI research and safety are critical areas of cooperation. Countries are

[39] Strengthening international cooperation on artificial intelligence

establishing safety institutes and research networks to share best practices and ensure that AI systems are developed in a manner that is secure and human-centric. Multilateral engagements like the G7 and G20 are also crucial platforms where global norms and guidelines for AI governance are being shaped.[40]

DIGIVEST[41] is the West Region's EDIH located in Timisoara, **Romania**, aiming to empower companies to uptake digital technologies boosting the regional innovation and competitiveness. The services align around the core objectives to foster digital transformation, support access to finance, leverage international business partnerships, grow digital competences, enable innovation and multi-stakeholder projects.

As part of this programme, they provide SMEs with Digital Maturity Assessments, an analysis on the DESI indicators and a digitalisation plan which includes recommendations for AI solutions and services.

3.8. Regulatory Framework

Requirements are currently being discussed at European level in particular and translated into specific regulations. The **European Union (EU)** has recently finalized the world's first comprehensive regulation for artificial intelligence, known as the *AI Act*[42], which will officially take effect on August 1, 2024. This framework is designed to balance innovation with risk management, focusing on protecting citizens' health, safety, and fundamental rights while fostering AI development.

The AI Act employs a risk-based approach to classify AI systems into four categories:

- Minimal Risk: Most AI applications, such as spam filters, require no specific regulation but may adhere to voluntary codes of conduct.
- Specific Transparency Risk: AI systems like chatbots or deepfake generators must disclose their artificial nature and ensure transparency in use.
- High Risk: Systems used in sensitive areas, such as medical diagnosis or recruitment, are subject to stringent requirements, including rigorous testing, human oversight, and robust risk management.
- Unacceptable Risk: Systems threatening fundamental rights, such as social scoring or manipulative AI targeting vulnerable users, are banned.

[40] The Seoul Declaration by countries attending the AI Seoul Summit, 21-22 May 2024 | Department of Industry Science and Resources

[41] https://www.digivest.ro/

[42] "AI Act" der EU: Weltweit erstes staatenübergreifendes Regelwerk in Kraft - Bundeskanzleramt Österreich; EU Artificial Intelligence Act | Up-to-date developments and analyses of the EU AI Act

Additionally, the Act introduces specific rules for general-purpose AI (GPAI) models, like large language models. These must meet requirements for transparency, intellectual property compliance, and risk mitigation. A voluntary Code of Conduct for GPAI providers is currently under consultation, with mandatory compliance set for August 2025.

The regulation also mandates the creation of national supervisory authorities and the European AI Office, which will oversee compliance and enforcement across member states. This harmonized framework aims to position the EU as a global leader in trustworthy and safe AI development, supporting innovation while addressing potential societal risks.[43]

The *Strategic framework for the development of healthcare* in the **Czech Republic** to 2030[44] outlines a comprehensive strategy for the development of healthcare until 2030. It was approved by the Czech government and aligns with international frameworks such as the UN's Sustainable Development Goals and the World Health Organization's policies.

The primary goals of the framework are divided into three strategic areas:

- Protection and Improvement of Public Health:

Focus on preventive measures, health promotion, and enhancing health literacy. There is a significant emphasis on disease prevention and improving the quality of life for all citizens, regardless of social or geographical background. Reforms in primary care are also highlighted, with a special focus on strengthening the role of general practitioners.

- Optimization of the Healthcare System:

The strategy aims to ensure the sustainability and efficiency of the healthcare system. This includes addressing the shortage of healthcare professionals, integrating health and social care, and advancing digitalization within the healthcare sector. Moreover, the framework stresses the importance of financial sustainability and equal access to healthcare services across all regions.

- Support for Science and Research:

Promotes innovation in medical research to improve healthcare outcomes. The strategy encourages the adoption of new diagnostic and therapeutic methods and the integration of research results into clinical practice.

The framework also emphasizes adapting to future challenges such as the aging population, the increasing need for long-term care, and the preparedness for public health emergencies like pandemics. The digitalization of healthcare, including telemedicine and electronic health records, plays a vital role in this vision.

The Czech Republic aims to boost AI adoption, targeting 16% (from the current 5%) of businesses using AI by 2030. The National Artificial Intelligence Strategy supports this growth, focusing on AI-driven automation and analytics, while ensuring regulations promote innovation. The country is also involved in European initiatives like the AI-MATTERS consortium to strengthen its AI ecosystem.

[43] EU Artificial Intelligence Act | Up-to-date developments and analyses of the EU AI Act

[44] https://zdravi2030.mzcr.cz

Digital Transformation Strategy 2023-2030[45] of **Republic of Moldova** sets out a comprehensive vision for the country's digital development. The strategy centres on alignment with the European integration agenda and focuses on citizens' needs.

The main objectives of this strategy focus on promoting the sustainable development of the country:

- Develop a digital society
- Grow a robust and competitive ICT environment
- Create an innovative and resilient digital economy
- Establish an efficient, smart, and transparent digital state
- Create a secure digital accessible and inclusive environment
- Make Moldova a trusted and reliable digital nation

The strategy will serve as a guiding and orientation document for the central and local public authorities, the business community, academia, civil society, strategic development partners and for targeting, planning, financing, implementing, and monitoring digital transformation agendas until 2030.

By 2030, due to implementation of the strategy, Moldova will have an innovative and inclusive digital society with digital competences based on a modern digital infrastructure, with digital governance and a business community that makes full use of digital opportunities.

The *White Book on Data Governance and Artificial Intelligence*[46] presents the vision of accelerating the creation of a data governance ecosystem and the adoption of AI for the development of the Republic of Moldova, stated as follows: An ecosystem of data governance and artificial intelligence for sustainable and durable growth, centred on human needs.

The fundamental features of the vision are the commitment to sustainability, durable development and economic and social prosperity. This implies trust in the security and reliability of AI, emphasizing the role of the state in overseeing the ethical and responsible use of this technology. The focus is on excellence in the adoption of innovative technologies and in communicating the transformative impact of AI on economic growth and social well-being in the context of the Republic of Moldova's alignment with technological progress and the transition to a data and knowledge-based economy.

The White Book defines the following general objectives, aligned with the priority axes of action included in the EU strategic documents and the development needs and opportunities at the national level:

- Consolidation of the system of education, research and development and training of skills specific to data governance and AI
- Development of a resilient infrastructure and usable and reusable datasets (integrated data ecosystem)

[45] https://mded.gov.md/wp-content/uploads/2023/11/STD_EN.pdf

[46] https://particip.gov.md/ro/download_attachment/22059

- Supporting measures to encourage the adoption of AI in society
- Establishing an appropriate data governance and AI and regulatory environment.

The White Book represents the preliminary instrument through which the actions of government institutions will align, connect and intensify to produce results, later outlined in a national policy document, action plan and governance framework assumed at the political level.

3.9. Conclusion on Policy Instruments in AI

The chapter on **Policy Instruments** highlights the importance of various strategies and frameworks implemented by governments and organizations to foster the development, adoption, and responsible use of artificial intelligence (AI). It emphasizes that effective policy instruments are key to guiding small and medium-sized enterprises (SMEs) through AI adoption challenges, helping them capitalize on AI's potential for growth and efficiency, while managing associated risks.

Essential are **regional strategies**, which tailor action plans to local needs, aiming to drive AI innovation and ensure competitiveness. For instance, Austria's AIM AT 2030 and Hungary's National AI Strategy set clear directions for AI adoption, emphasizing responsible and human-centred AI use. **Funding programs**, such as the European Digital Innovation Hubs and Horizon Europe, support SMEs by alleviating financial barriers and encouraging innovation. **Entrepreneurial support programs** are also crucial, helping businesses adopt AI through resources, guidance, and funding, exemplified by programs like AI Champions Baden-Württemberg.

Additionally, **education and skills development programs** are crucial for preparing the workforce to navigate AI-driven environments. **Public-private partnerships (PPPs)**, such as the Baden-Württemberg AI Alliance, bring together the strengths of both sectors to foster innovation and AI implementation, especially for SMEs. **AI-driven cluster initiatives** play a significant role in regional innovation, optimizing collaboration and fostering technological advancements in various industries, like healthcare and manufacturing.

On an international scale, the text underscores the importance of **international collaborations**, such as the AI Seoul Summit and EU-US efforts, which work towards aligning AI governance and addressing global challenges. Finally, **regulatory frameworks**, including the EU AI Act, provide the necessary legal guidelines for AI development, focusing on innovation while ensuring safety, transparency, and ethical use.

The chapter concludes that these diverse policy instruments are all interconnected and essential for accelerating AI adoption and ensuring that it benefits businesses and societies responsibly and sustainably.

4. Best Practices

Best practices and effective business solutions are grounded in a combination of experience, comprehensive research, and a collective consensus among professionals within a specific field. In the contemporary business landscape, leveraging artificial intelligence (AI) has emerged as a transformative strategy. This approach entails the integration of advanced AI techniques and technologies to tackle complex challenges and optimize operational processes within organizations. The primary objectives of employing AI include enhancing decision-making capabilities, automating repetitive tasks, and extracting valuable insights from data, ultimately leading to improved efficiency and effectiveness across various business functions.

This chapter presents a compilation of best practices derived from diverse companies and organizations operating in Hungary, Slovenia, Germany, Bulgaria, Romania, Slovakia, Austria, the Czech Republic, Serbia, and Moldova. These business solutions give valuable insights into how AI is currently utilized or has the potential to be harnessed across these three sectors: the agri-food sector, the manufacturing sector and the healthcare sector.

The information and insights shared in this chapter have been generously contributed by a range of stakeholders, including small and medium-sized enterprises (SMEs), research organizations, and industry experts. Their collective expertise not only highlights successful AI applications but also underscores the collaborative efforts necessary for driving innovation and progress in these sectors. Through this exploration, the aim is to provide a comprehensive overview of the opportunities AI presents for enhancing productivity, fostering growth, and addressing the unique challenges faced by businesses today.

Note: the collection makes no claim to be exhaustive but shows that many AI-based business solutions already exist!

4.1. Agri-food sector

Overall, the use of AI in the agriculture and food sectors is growing rapidly and transforming the industry. In precision farming, AI helps predict yields, optimize irrigation, and make the use of fertilizers and pesticides more efficient. Drones and robots take on monitoring and harvesting tasks, while AI is also used in logistics and supply chains to optimize transport routes and reduce food waste. In food processing, AI-powered machines automate quality control and improve food safety. Additionally, AI promotes sustainable practices through resource efficiency and climate-friendly solutions. Consumers benefit from personalized recommendations and smarter devices. However, challenges such as high costs, data privacy, and job displacement need to be addressed. The future of AI in agriculture and food industries promises innovations in sustainability, resource usage, and regenerative farming.

This chapter presents innovative business solutions in the agriculture sector, compiled from contributions by all project partners. The solutions cover a variety of applications, including smart farming techniques and AI integration in winemaking and beekeeping.

4.1.1. Austria

AlpinIO – Preparation, processing and evaluation of alpine vegetation

FH OÖ Forschungs und Entwicklungs GmbH

The AlpinIO research cooperation deals with methods from the field of computer vision for the supported preparation, processing and evaluation of alpine vegetation. The main focus is on the accurate recognition and further on the segmentation of the vegetation. With this information, statements can be made about the development over the years and thus also possible influences of a climate warming. In the course of this, photographs from several years are available, which record the development of these areas. This vegetation zone allows a look into the past and thus into the development of other zones thousands of years ago.

More information:
https://aist.fh-hagenberg.at/

BAMBI – Biodiversity Airborne Monitoring Based on Intelligent UAV sampling

FH OÖ Forschungs und Entwicklungs GmbH

Healthy and intact forests, rich in biodiversity, are essential for the well-being of humans, the health of the entire planet, and play an important role in the fight against climate change. Sustainable wild-life-management strategies to keep forests intact rely on wildlife monitoring for decisions, such as protecting or regulating certain species. Existing monitoring techniques, however, are either labour-intensive, suffer from severe inaccuracies, or cannot be applied in dense vegetation. Within the project BAMBI (Biodiversity Airborne Monitoring Based on Intelligent UAV sampling) a novel airborne-light-field-sampling technology and an advanced AI classification system for accurate and reliable animal monitoring should be developed, with the potential to fill this gap. BAMBI's advantage over alternatives should be its innovative occlusion removal algorithm which makes it possible to identify and classify animals in forests by using uncrewed aerial vehicles (UAVs).

More information:
https://aist.fh-hagenberg.at/

Woodmaster+ - Automated, image-based analysis of wooden piles on mobile devices

FH OÖ Forschungs und Entwicklungs GmbH

The Woodmaster Plus research project deals with methods from the field of computer vision for automated, image-based analysis of wooden piles on mobile devices. The main focus is on the accurate segmentation of wood cross sections in order to determine the volume based on this information in combination with the known log length. Besides segmentation, the project also includes quality classification and tree species determination of the individual logs. With the help of the collected information (volume, quality, species) the value of the respective logs can be estimated.

More information:
https://aist.fh-hagenberg.at/

4.1.2. Bulgaria

AI Garden - AI System for Greenhouse Management and Optimization

AI Garden

AI Garden addresses the need for effective environmental control in greenhouses, including temperature, humidity, CO_2 levels, soil moisture, and lighting management. It aims to help users, from small-scale domestic gardeners to large producers, optimize their growing conditions and improve yield. The AI Garden system integrates both software and hardware to monitor and manage greenhouse parameters. It uses AI for environmental optimization and early issue detection, such as pest infestations. The system allows for remote monitoring and control, providing real-time insights to enhance productivity and reduce operational costs.

The main benefits include improved plant health and productivity, reduced labour through automation, and efficient use of resources such as water and lighting. The system also provides security features and enables users to remotely monitor their greenhouse conditions, making it convenient for both small and large-scale operations.

More information:
https://aigarden.bg/

AgroVAR - AI Software Solution for Smart Regenerative Agriculture

AgroVAR CC

AgroVAR addresses the challenges farmers face when implementing regenerative agriculture practices, including soil health management and risk reduction in choosing appropriate crops and practices. AgroVAR uses AI technology to analyse over 2 million data points for each field, providing tailored recommendations for crop and practice selection based on historical climate data, soil analyses, and microclimatic conditions. It helps farmers make informed decisions for soil regeneration and crop health. The software provides actionable insights for selecting cover crops, optimizing soil health, and reducing environmental impact while maintaining productivity. It helps minimize risks associated with regenerative agriculture, especially during the initial implementation phase.

More information:
https://agrovar.bg/en/

RoboAiWeeder – Solution for effective weed control

Smart Farm Robotix Ltd.

Smart Farm Robotix Ltd.'s solution helps farmers address one of their most difficult challenges – effective weed control. This is a particularly acute problem for farms following organic and eco-friendly practices due to the very limited permitted use of herbicides. This leaves only mechanical weeding, which is rather imprecise, involves heavy machines with high CO_2 imprint and fuel consumption, and manual labour, which is expensive, in ever shorter supply and with global warming ever more dangerous to farm working in the open field. In addition, farmers in Southern Europe face even higher hurdles, having to deal with hilly and mountainous terrains, with dry, rocky or sandy soils and increased risk of fires. Their solution is meticulously designed to address all of these specific problems at the same time.

The solution is in the form of a light-weighted (70-80 kg) 4-wheeled rover, which is best suited to treat high value row crops (herbs, vegetables, roots, berries, etc.). It goes into the row of plants, with the wheels moving in the inter-row distance. On-board cameras take pictures of the plants below the robot in the intra-row section and the pre-trained AI hosted on the robot computer distinguishes the crops and the weeds. Then various weeding mechanisms (depending on the weeds type & size and soil conditions) destroy the identified unwanted vegetation securely and effectively. The robot then moves further down the row of crops repeating the process until it reaches the end of the row, when it turns autonomously into the next one. Solar panels on top and a large on-board battery provide for uninterrupted 24/7 work in the field. A select set of communication technologies (GPS, WiFi, ETL, LoRa) enable constant communication to and from the robot and data transfers to a remote hub, even in hilly and mountainous terrains.

Thus, the weeding robot offers a fully autonomous, highly precise, energy-independent, cost-effective and reliable weeding solution.

More information:
https://smartfarmrobotix.eu/en

4.1.3. Czech Republic

Smart sensors for farming

Agdata, s.r.o.

Agdata s.r.o. is a Czech agtech company founded in 2016, headquartered in Brno, that focuses on developing digital tools for agriculture and smart city management. Their mission is to use data and technology to help farmers and municipalities operate more efficiently and sustainably. Agdata leverages GPS, sensors, and AI to improve decision-making in farming, while also helping cities optimize resource use and improve environmental monitoring.

© Agdata, s.r.o.

The company's primary product, also called Agdata, is a comprehensive software platform that integrates data from various sources, such as weather stations, soil probes, and GPS units. This platform allows farmers to monitor crop health, soil conditions, and other environmental factors in real-time, leading to more precise farming practices like optimized irrigation and planting schedules. Agdata's technology also supports smart city applications, providing cities with tools to monitor air quality, manage communal services like road maintenance, and optimize resource usage, leading to cost savings and improved sustainability.

For farmers, Agdata offers precision farming capabilities by collecting real-time data on weather conditions, soil quality, and crop health through sensors and GPS units. This allows for optimized decision-making regarding planting, irrigation, and fertilization, leading to increased yields, reduced waste, and better resource management. By utilizing these insights, farmers can cut costs, save time, and enhance sustainability. In smart cities, Agdata helps municipalities manage resources more effectively. It provides tools for monitoring air quality, managing communal services like road maintenance, and optimizing green space irrigation, which leads to cost savings on materials, fuel, and labour.

More information:
https://agdata.ag/en/

Precision farming

CleverFarm, a.s.

CleverFarm, a.s. is a Czech agtech company founded in 2016 and based in Brno. The company focuses on providing cutting-edge solutions for precision agriculture, helping farmers enhance efficiency while promoting sustainability. By leveraging IoT sensors, satellite data, and machine learning, CleverFarm aims to reduce farming costs, increase yields, and minimize environmental impacts. Their vision is to be the world's leading software platform for agriculture, facilitating better decision-making and sustainability across the agricultural sector.

CleverFarm's products include a comprehensive suite for precision farming, such as IoT-based sensors that monitor soil moisture, temperature, and weather conditions in real-time, enabling optimized irrigation and fertilization strategies. They also offer CleverIrrigation to automate and enhance water management, and a farm management platform that integrates data to help farmers plan, monitor, and adjust their operations efficiently. The platform's ability to combine satellite data with on-site sensor inputs allows farmers to make data-driven decisions that improve yields, save costs, and reduce the use of chemicals, thereby contributing to more sustainable agricultural practices.

The company's platform helps farmers optimize their operations by providing real-time data from IoT sensors and satellite imagery, allowing for efficient resource management. This technology enables farmers to precisely adjust irrigation, fertilization, and pest control, resulting in cost savings—up to 50% on materials such as water and fertilizers—and higher yields. Additionally, CleverFarm promotes environmental sustainability by reducing the overuse of chemicals and conserving water, which contributes to less pollution and better soil health.

More information:
https://www.cleverfarm.ag/

AI-driven solutions across multiple industries

Datamole s.r.o.

Datamole is a Prague-based company specializing in artificial intelligence (AI), data science, and IoT solutions, founded in 2015. The company focuses on helping industries, including agriculture, manufacturing, biotech, and foodtech, become more sustainable and efficient. With a team of over 80 professionals, Datamole has successfully implemented more than 100 data and AI projects, making them a leader in Industry 4.0 digital transformation. They work closely with companies to create custom and pre-made AI solutions that optimize processes, reduce costs, and increase efficiency across various sectors.

Datamole offers a range of products across various industries, each leveraging AI and data for optimization and sustainability. In agriculture, their product Lely's AI Milking System automates and personalizes the milking process for each cow. This system processes data from over 35,000 milking robots worldwide, improving animal welfare and milk production through personalized treatments. Another product, FruitAI, uses AI-powered sensors for the non-invasive evaluation of fruit ripeness and internal quality, predicting shelf life. For precision farming, Datamole provides SmartSpray, which gathers telemetry data from agricultural machines to optimize the application of fertilizers and pesticides, reducing waste and enhancing crop yields. Beyond agriculture, Datamole's TelemetryAI collects and stores data from over 750 precision farming machines to monitor key performance indicators (KPIs) and optimize machine usage. In the food tech industry, their CoffeeCloud system ensures premium coffee machine performance through predictive maintenance, guaranteeing a consistent experience in coffee shops.

Datamole's AI-driven solutions offer significant benefits across multiple industries. They optimize processes like milking, spraying, and machinery operations, which leads to reduced operational costs, improved efficiency, and better resource management. Their products, such as Lely's AI Milking System and SmartSpray, help reduce waste, improve productivity, and enhance sustainability by personalizing treatments and optimizing the use of resources like water, chemicals, and energy. Additionally, their predictive maintenance solutions, such as CoffeeCloud, ensure the continuous and efficient operation of machinery, further reducing downtime and operational expenses.

More information:
https://www.datamole.ai/

NEWMAN weeding machine – AI-driven solutions for sustainable agriculture

ULLMANNA s.r.o.

Ullmanna is a Czech agritech startup founded in Opava, specializing in AI-driven solutions for sustainable agriculture. The company focuses on developing smart farming technologies that reduce the need for chemical herbicides and manual labour. Their flagship product, the NEWMAN weeding machine, uses artificial intelligence and robotics to accurately identify and remove weeds without damaging crops, making organic farming more efficient and scalable. Ullmanna's innovative technology helps farmers increase productivity while significantly reducing the use of pesticides, contributing to more eco-friendly farming practices.

The NEWMAN machine is equipped with cameras and machine learning algorithms that distinguish between crops and weeds, even in dense or irregularly planted fields. It can be used for a variety of crops, such as sugar beets, cabbage, and corn. The machine offers a chemical-

free weeding solution, which prevents soil contamination and reduces water evaporation. By automating weed control, it eliminates the need for extensive manual labour, saving up to 90% of weeding costs and allowing organic farmers to cultivate larger areas more efficiently.

By eliminating the need for chemical herbicides, the NEWMAN machine helps reduce environmental contamination and promotes healthier soil and crops. It also saves farmers significant costs by reducing manual labour—up to 90%—which is typically one of the most expensive aspects of organic farming. Additionally, Ullmanna's technology increases agricultural efficiency by using machine learning to precisely target and remove weeds, leading to higher crop yields and better resource utilization. The machine can work in various conditions, including night or windy environments, and is adaptable to multiple crops, further supporting large-scale organic farming efforts.

More information:
https://www.ullmanna.eu/

4.1.1. Hungary

AgroVIR Farm Management System

AgroVIR

Farmers often struggle with managing agricultural processes efficiently due to a lack of centralized data, leading to suboptimal crop yields, resource wastage, and difficulty in meeting sustainability goals.

AgroVIR provides an AI-powered farm management system that integrates data from various sources (soil, weather, machinery) to offer real-time insights. It supports precision farming, crop monitoring, and supply chain optimization to improve decision-making and operational efficiency.

The solution enhances productivity, reduces resource waste, and promotes sustainable farming practices, ultimately improving both profitability and environmental impact for farmers and agribusinesses.

More information:
www.agrovir.com

Support system for vineyards

Cseri Pincészet

The project goal is to develop a system that supports viticultural practices by predicting the optimal timing for spraying considering rain, temperature, sunlight, and wind. The system aims to suggest the best period for spraying, the only preventive method against powdery mildew. To achieve this, it is necessary to install a weather station that collects data on the local microclimate of vineyards. Using this data and forecasts, they can determine whether the conditions are conducive to the development of powdery mildew and determine the most optimal timing for spraying. This implementation has long term sustainable and economic benefits beside the improvement of everyday grape cultivation.

Their ambitions to develop AI technologies for their winery are extremely high, as they believe these solutions can revolutionize production efficiency and improve grape and wine quality. They are currently deploying multiple generative AI solutions and are in the early stages of AI integration. As a first step, they are installing a weather station to collect local microclimate data on their vineyard.

With the possibilities offered by AI, they will be able to predict weather changes more accurately, optimize winegrowing processes, and promote sustainable farming. With their vision, they hope to implement AI solutions in agribusiness that can make a significant contribution to increasing efficiency and improving quality, taking their growing and winemaking processes to a new level.

More information:
https://cseripinceszet.hu/

PlantCT Monitoring System

PlantCT

Farmers need to optimize crop health and yield while using resources efficiently, but often struggle with the time and tools required to monitor plant conditions in real-time.

PlantCT uses AI-driven monitoring systems, integrating data from sensors to track plant health, detect diseases early, and optimize resource use (water, nutrients). The platform uses real-time data to ensure the optimal growing environment, supporting precision farming practices.

This system improves crop yield, reduces resource waste, and promotes sustainable agricultural practices, benefiting both small and large-scale farming operations.

More information:
https://plantct.com/

4.1.2. Republic of Moldova

BioClass - Spatio-temporal multi-criteria classification system

Ecoconsult SRL

BioClass is a GIS tool for solving multi-criteria classification and optimization problems, combining fuzzy logic, rough sets, and level set methods. It uses the AI-driven Preference-Ordered Fuzzy Sets approach to quantify relationships between classes, representing fuzzy subsets through crisp level sets for precise classification. This enhances decision-making in complex, multi-objective resource allocation.

By forecasting outcomes, evaluating impacts, and resolving conflicts, BioClass supports informed, data-driven decisions. Its AI framework reveals tradeoffs, assesses risks, and optimizes resource distribution, making it essential for scenarios requiring accurate, adaptive, and optimal solutions.

More information:
http://ecobionet.com/

OptimClass – Interactive System for Multi-criteria Decision Making and Evolutionary Optimization

Ecoconsult SRL

OptimClass is an interactive system for Multi-criteria Decision Making and Evolutionary Optimization, using fuzzy logic and Preference-Ordered Fuzzy Sets (POFS) to address complex problems. It introduces response and membership functions to quantify satisfaction and capture fuzziness in decision-making.

The AI-driven framework integrates user expertise with advanced algorithms, enabling dynamic evaluation and optimal solutions in multi-objective scenarios. OptimClass ensures precision, adaptability, and effective resource allocation through its innovative approach.

More information:
http://ecobionet.com/

GreenO – climate AgTech

GreenoSoil SRL

GreenO is a pioneering Climate AgTech company dedicated to creating the largest geospatial digital data platform in agriculture. It is dedicated to connecting farmers with pivotal players across the food value chain. The company offers tools for monitoring farming practices, analysing soil health, and facilitating sustainably grown crops sourcing.

GreenO helps identify areas for regenerative practices and fields with high decarbonization potential, providing regenerative techniques advice and promoting incentives for farmers. GreenO provides extensive customization options, allowing users to adjust algorithms, utilize or modify AI and ML models, personalize the interface, and integrate efficient data management through the API.

More information:
www.greeno.ag

AgroDron – integrated agrodrone solutions

Spin Integrated Solutions SRL

AgroDron offers smart farming solutions including crop monitoring, soil analysis, and precise spraying with DJI drones. Their solutions improve crop health and optimize the use of agricultural resources. The solution increases agricultural efficiency and profitability through the use of drones and precision technologies. By integrating drones and data analysis for monitoring and managing crops, optimization of agricultural resources, cost reduction, and increased crop yield are achieved.

More information:
https://agrodron.md

AI-Generated Moldovan Wine (by Chelaris)

Wine of Moldova

Moldovan winemakers have leveraged artificial intelligence to innovate wine production, creating two unique wines (a white and a red) with AI involved in every stage, from grape harvesting to fermentation, blending, bottling, label creation, and even the marketing campaign. The AI, named "Chelaris," was provided with data accumulated over the past five years from the National Office of Vine and Wine's pilot lots. It utilized this data to oversee all

production stages. The wines were introduced at international exhibitions, raising the global profile of Moldovan wines. Among the benefits of the solution are:

- Enhanced wine production processes using AI
- Increased international recognition for Moldovan wines
- Competitive advantage in the global wine industry
- Innovation and sustainability in viticulture
- Collaboration between the viticulture and IT industries

More information:
https://ai.wineofmoldova.com/

Dron Agro Assistance – Drones and advanced solutions for modern agriculture

Dron Assistance SRL

Dron Agro Assistance, an innovative company specialized in providing advanced agricultural assistance solutions based on drone technology, is dedicated to helping farmers and agricultural producers optimize production, reduce costs and achieve superior results in a sustainable way.

With an experienced team passionate about technology, they are driven by the desire to revolutionize the agricultural industry through advanced technology. Dron Agro Assistance combines technologies, AI and biological plant protections methods, to provide accurate and detailed information about crop conditions, helping farmers make more informed decisions and act in a timely manner.

More information:
https://droneagro.md

Gustos Life GWMR

Gustos Life

Global Wine Medal Rating (GWMR) is a wine rating system based on medals won in professional competitions and on indices of competition notoriety. AI-powered machine learning algorithms analyse open data from more than 500 wine contests and recalculate these results into an aggregated 100-points rating.

This system benefits both consumers and producers, allowing consumers to make informed purchases of medal-winning wines, and giving producers a tool to assess the quality of their wines and improve their marketing strategies.

Gustos Life is a winetasting SaaS, winerating and wintech platform that provides producers and other actors in the wine industry market with a vast variety of instruments to promote and sell their wine.

More information:
https://gwmr.gustos.life/

4.1.1. Republic of Serbia

Agremo – AI-powered agricultural analytics platform

Agremo Ltd.

Agremo Ltd., based in Serbia, offers an AI-powered agricultural analytics platform that uses drone and satellite imagery to provide insights on crop health, field conditions, and plant counting. The platform supports precision agriculture by helping farmers make informed decisions based on real-time data.

More information:
https://www.agremo.com/

Agrosense – AI-driven platform for farmers

Biosense Institute

AgroSense is an AI-driven platform developed by the BioSense Institute that provides farmers with real-time data on crop conditions, weather forecasts, and soil health. The platform supports precision farming and sustainable agricultural practices.

More information:
https://biosense.rs/

Beekeepers' Digital Assistant

Beehold d.o.o.

Beehold do.o. is developing digital assistants that help beekeepers do their job, ultimately making the planet a better place to live. Our lives depend on bees. Every day we consume crops that rely significantly on pollinators, especially honeybees. Most of what we eat, drink or wear is closely linked to these small creatures, which transport pollen on their bodies and facilitate plant reproduction.

Bee Care is a unique digital service for beekeepers and honey gourmets created. But bees are in danger. Climate change, pesticides and diseases are having a negative impact on bee populations, affecting the production and cost of vitamin-rich crops. The loss of bee colonies will also have serious social, economic and ecological consequences for us.

The process of yield inspection remains unchanged for over 200 years. Current practices cause bee losses, driving beekeepers away due to low profits.

How does Beehold work?

- Hive Monitoring: Sensors gather real-time information from hone - monitor conditions, temperature, and activity every moment of the day.
- Data Collection: Their app automates data collection, ensuring accurate hive information from health to honey production.
- Stats at Your Fingertips: Access intuitive stats on your dashboard - hive analytics, trends and recommendations. Make the right decision at the right time.

Unique Features:

- Over the Air Connectivity
- Task Manager
- Notification features
- Weight, temperature and humidity tracking
- Uninterrupted Insight: Experience 24/7 hive monitoring with the AI technology, ensuring that the bees are always under watchful eyes, day and night.
- Saves your time: Reducing on-site management by 80%. Our AI beehive tracking allows you to relax and let the assistant do the monitoring.
- Seamless Integration: Compatible with standard hives, our AI system effortlessly adapts to your beekeeping setup, bringing advanced tracking capabilities to your familiar environment.
- Precision Redefined: Receive more accurate and detailed instructions than ever before.

The AI-driven beehive tracking provides unparalleled precision for optimal beekeeping practices.

More information:
https://www.beehold.tech/solution

Winessense – Monitoring tool for wine industry

Atfield Technologies d.o.o.

Atfield Technologies d.o.o. solves the problem of the influence of microclimatic factors on the wine industry, which still relies on traditional ways of preventing plant diseases and organizing work, periodic spraying and personal experiences. Agronomists lack good tools to monitor useful data in a timely manner and make decisions in light of new climate challenges. With a focus on the above, Atfield Technologies d.o.o. has successfully created a well-rounded hardware-software product Winessense®. Winessense is based on proprietary technology of dense measurement of conditions within the vineyard trellis coupled with mechanistic models for disease development and vine growth.

More information:
www.atfield.tech

4.1.1. Slovakia

Detailed soil diagnostics, precision agriculture consulting, land reclamation projects

Nitroterra Technology j. s. a.

Nitroterra specializes in advanced soil analysis and sustainable land management using AI. They offer services such as soil diagnostics, precision agriculture consulting and land reclamation. Their AI solution can analyse soil data for more accurate predictions of soil health, nutrient management, and crop yields. Nitroterra addresses soil degradation, which affects agricultural productivity and environmental stability by providing faster, cost-effective, and precise soil analysis. Their AI-driven solutions include real-time soil monitoring, automated nutrient recommendations and disease detection, benefitting farmers with optimized resource use and contributing to sustainable agriculture and environmental conservation.

More information:
https://nitroterratechnology.com/
https://nitroterratechnology.com/#our-solutions

AI-powered crop monitoring tools

Veles Farming j. s. a.

Veles Farming revolutionizes agriculture by integrating advanced technology, particularly AI, into farming practices. They offer a range of products, including precision farming equipment, smart irrigation systems, and AI-powered crop monitoring tools. All designed to enhance productivity, sustainability, and efficiency. Their precision farming tools utilize GPS and sensors for accurate planting and harvesting, while AI-driven crop monitoring analyses data such as crop health, soil conditions and weather patterns to provide real-time insights and help farmers make the optimal decisions. These innovations reduce resource consumption, lower operational costs, and address climate-related challenges, leading to increased crop yields, environmental sustainability and improved food security.

More information:
https://www.velesfarming.com/
https://www.velesfarming.com/products

4.1.2. Slovenia

Automation of greenhouses and irrigation systems

Avtomatika Gašpirc d.o.o.

Their core activities are the automation of greenhouses and irrigation systems. The first beginnings of our development work date back to the 1980s. AI is used in their solutions for remote monitoring and control, enabling data analysis and visualization to optimize climate regulation, irrigation, and automation in greenhouses. It also supports predictive features, such as alarms and analytics, to enhance the efficiency and reliability of agricultural systems.

More information:
http://www.avtomatikagaspirc.si/

Drone-powered services

Onedrone d.o.o.

OneDrone provides comprehensive services in the field of unmanned aviation for businesses and individuals. They equip one from head to toe. They take care of everything, from purchasing your first drone, through training, insurance, and servicing, to software and the establishment of a safe flying system. Company also offers services of AI introduction, where AI is used to

processes data from the drones to provide actionable insights, such as detecting diseases, optimizing irrigation schedules, and improving yield forecasts. By integrating drones with AI, farmers can automate data analysis, enhance decision-making, and implement targeted interventions, making farming more efficient and sustainable.

More information:
https://onedrone.si/

eVineyard – Smart vineyard management software

Elmibit d.o.o.

eVineyard is a smart vineyard management software developed by the Slovenian company Elmibit. The product is designed to help vineyard managers optimize their operations through the use of technology and data-driven insights.

More information:
https://www.evineyardapp.com

Trapview – Agricultural pest monitoring and management system

EFOS d.o.o.

Trapview is an advanced agricultural pest monitoring and management system developed by the Slovenian company EFOS. The system is designed to help farmers and agricultural professionals monitor, predict, and manage pest populations more effectively, ultimately reducing crop damage and improving yields. Trapview integrates artificial intelligence (AI) with IoT technologies to offer real-time insights and automated pest control recommendations.

More information:
https://trapview.com/

Slopehelper – autonomous electric agricultural systems

PeK Automotive

PeK Automotive specializes in developing a wide range of low-voltage autonomous electric vehicles, along with advanced technologies and applications for use in agriculture, rescue operations, and defense. Their purely electric and hybrid autonomous vehicles are designed to

save time and human resources while significantly reducing mission readiness time. This concept is exemplified by our flagship products, the Slopehelper and Agilehelper autonomous electric agricultural systems. Featuring zero emissions, highly intelligent radar systems, and no need for GNSS navigation, Their agrosystems offer an innovative and unique approach to creating truly autonomous solutions. AI in the Slopehelper enables autonomous navigation using radar and GNSS systems, while optimizing agricultural tasks through real-time data analysis. This improves efficiency, reduces manual labor, and supports sustainable farming by minimizing resource waste and enabling eco-friendly practices.

More information:
https://slopehelper.com/

Tomappo – Digital gardening assistent

Proventus d.o.o.

Tomappo is a digital gardening assistant developed by the Slovenian company Prospeh, designed to help home gardeners and small-scale farmers manage their gardens more effectively. The app combines traditional gardening knowledge with modern technology, including AI, to provide personalized advice and tools for successful gardening.

More information:
https://tomappo.com/

Run chicken – Smart and automated solutions for managing chicken coops

Run tiger d.o.o.

Run-Chicken is a unique, innovative product developed by the Slovenian company Run-Tiger, designed specifically for poultry farming. The Run-Chicken product focuses on creating smart, automated solutions that enhance the efficiency and convenience of managing chicken coops.

More information:
https://run-chicken.eu/

IoT sensors

Senzemo d.o.o.

As a B2B company, Senzemo has been providing customers with hardware for a number of IoT use cases since 2017. Through its expertise and sensor experience, the customer creates solutions that helps protect the environment, save resources and positively impacts the planet. Senzemo's agricultural products, such as their soil moisture and microclimate sensors, integrate AI to analyse the data collected from fields and provide actionable insights for farmers. AI algorithms process this data to optimize irrigation schedules, predict crop health, and improve resource efficiency. By leveraging advanced IoT and machine learning models, their solutions enable precision agriculture, helping farmers make data-driven decisions to enhance productivity and sustainability.

More information:
https://senzemo.com/

IT Solutions, Smart City and IoT solutions, Agritech Solutions

TeleGroup

In a constellation of our solutions and services – from development and implementation of business IT solutions, Cybersecurity, AgriTech, IoT, and Smart city solutions to design and construction of optical infrastructure – you can find everything you need to navigate your business processes to the next level, innovate your business model and provide your users with a truly unique experience. TeleGroup agricultural products, such as the *Agrobyte* smart greenhouse solution and *Agrolife* software, utilize AI to optimize farming processes. These solutions collect and analyse data from environmental sensors, weather stations, and other IoT devices to monitor crop health, soil conditions, and climate variables. AI algorithms process this data to provide actionable insights for precise irrigation management, climate control in greenhouses, and crop yield prediction. This automation helps farmers make informed decisions, reduce resource use, and improve productivity.

More information:
https://telegroup.si/sl/agrobyte-resitev-za-pametni-rastlinjak/

Precision farming

Termodron d.o.o.

Termodron d.o.o. has developed a solution for precision monitoring of agricultural land using unmanned aerial vehicles, known as drones, combined with state-of-the-art technologies and algorithms. The company specializes in the use of drones and thermographic cameras to identify temperature anomalies in agricultural fields, which can indicate areas requiring attention for better crop management. By analysing these thermal images, AI-based systems can identify patterns of crop stress, helping farmers optimize water usage, fertilizer application, and overall crop care.

More information:
https://termodron.si/

Origintrail – Decentralized knowledge graph platform

Tracelabs d.o.o.

OriginTrail is a decentralized knowledge graph platform that plays a significant role in enhancing transparency, traceability, and trust in the agrifood industry. Developed by a Slovenian-based team, OriginTrail leverages blockchain technology alongside artificial intelligence (AI) to create a more reliable and efficient supply chain for agrifood products.

More information:
https://origintrail.io/

4.2. Health care sector

Artificial intelligence (AI) is changing the healthcare industry by improving patient care, making operations more efficient, and enhancing diagnostic accuracy. As healthcare providers face challenges like growing patient numbers and complex medical data, AI technologies—such as machine learning, natural language processing, and computer vision—are becoming essential tools for doctors and medical staff.

AI is used in various ways within healthcare. For example, predictive analytics can help identify patients at risk of health issues, allowing for earlier interventions. Advanced algorithms can analyse medical images to detect conditions like cancer earlier, which increases the chances of successful treatment. AI-driven chatbots and virtual assistants improve patient communication, offer quick support, and help manage administrative tasks, freeing up healthcare workers to focus more on patient care.

AI also plays a significant role in drug discovery and clinical trials. It can analyse large amounts of data to find potential new treatments and streamline the design of clinical trials, making the process faster and more efficient. By adopting AI technologies, healthcare organizations can make better decisions, allocate resources more effectively, and ultimately improve patient outcomes. As AI continues to develop, its integration into healthcare holds the promise of creating a more efficient and patient-centred system, leading to a healthier future for everyone.

4.2.1. Austria

MOVE – Modeling Orthosses for Vitality Enhancement

FH OÖ Forschungs und Entwicklungs GmbH

In the research project M.O.V.E. (Modeling Orthosses for Vitality Enhancement), the field of orthopedics is to be digitized in the sense of Industry 4.0. An AI-based, self-learning suggestion system is to be created which, with automated patient-specific orthosis designs, will lead to significant process automation in the field of orthopaedics with the aid of 3D printing. The digitized orthosis as the objective of this project can precisely measure the pressure exerted during the entire therapy and thus objectify the course of treatment and form an enormous added value as a basis for medical research as well as for the control of the treatment process.

More information:
https://aist.fh-hagenberg.at/

Treetop Medical – Digital ecosystem for medical knowledge and evidence-based patient care

FH OÖ Forschungs und Entwicklungs GmbH

The overall goal of Treetop Medical is to digitally model medical knowledge in order to make it available for patient care by means of digital applications. The company is convinced that digitally processed locally available and concrete knowledge in combination with hybrid, AI-supported intelligent services can create a great benefit for all stakeholders. Treetop Medical has identified clinical guidelines as a key element for digitally modelling clinically relevant medical knowledge. In terms of content, these are based on the results of clinical studies and include recommendations for the classification and definition as well as the diagnosis and treatment of diseases. The goal of the project is to implement digital, machine-readable target treatment paths as part of digital medical guidelines as well as the machine-readable mapping of medical semantics.

More information:
https://aist.fh-hagenberg.at/

birthAI – Pregnant thanks to artificial intelligence

Software Competence Center Hagenberg GmbH

The Kinderwunsch Zentrum at Kepler University Hospital and the Software Competence Center Hagenberg (SCCH) are working on improving the quality assessment of blastocysts (early-stage embryos) with the help of artificial intelligence (AI) as part of a project funded by the state of Upper Austria via the economic and research strategy (#upperVISION2030), thereby increasing the chances of a successful pregnancy. The aim of the project is to improve the quality assessment of blastocysts using AI methods so that the probability of becoming pregnant during a transfer increases significantly.

A major challenge when using AI methods is the large amount of training data that is required. Especially in the medical field, suitable training data for classification networks can only be generated with great effort, as there is a lack of data from patients, the expertise required for data acquisition and much more. In this project, Generative Adversarial Networks (GANs) are used for the first time to generate synthetic image data of blastocysts and thus increase the amount of data many times over.

More information:
https://www.tech2b.at/startup/birthai-3/
https://www.scch.at/scch/presse-medien/detail/schwanger-dank-kuenstlicher-intelligenz

4.2.2. Bulgaria

Barin Sports 360 – AI-Driven Wearable Technology for Sports Performance Optimization

Barin Sports

Barin Sports provides solutions to optimize athlete performance, prevent injuries, and manage workload effectively using AI and wearable technology. Their system captures a massive amount of data per second to analyse players' physical condition and performance in real-time, aiming to improve training outcomes and reduce injury risk.

The Barin Sports Pro 3 system uses wearable technology and advanced analytics to capture 12,000 data points per second. This data is processed in real-time and provided through a tablet interface, helping coaches and sports scientists make informed decisions. Data is securely stored in the cloud for further analysis and long-term monitoring.

Barin Sports helps enhance athlete performance through precise data analysis, enabling better training personalization, injury prevention, and effective workload management. Their AI-driven insights provide real-time feedback to ensure athletes perform at their peak while minimizing injury risks.

More information:
https://barinsports.com/product

Momfident - AI Assistant and Mental Health Support App for New Mothers

Momfident

Momfident addresses the challenges faced by new mothers in the postpartum period, focusing on self-care, mental health, parenting support, and community engagement. The app provides a safe space for new mothers to access resources, schedule appointments, and receive mental health support tailored to their needs.

The Momfident app combines artificial intelligence with expert research to offer personalized virtual support. It features an AI assistant for answering questions, a community for peer support, and tools for mental health guidance, including a virtual psychologist currently under development. This technology ensures mothers have access to comprehensive, convenient, and timely support for their wellbeing.

Momfident offers new mothers accessible mental health and parenting support at any time, reducing feelings of isolation and stress during the postpartum period. The AI-powered virtual assistant provides personalized responses, while community features foster connection and

shared experiences among mothers. This approach helps mothers better manage their health and parenting challenges.

More information:
https://momfident.io/

Artificial General Intelligence and Spiking Neural Network Solutions

Neuromorphica Ltd.

Neuromorphica Ltd. aims to make the world more efficient and enhance human capacity by developing Artificial General Intelligence (AGI). They focus on building systems with the capability to learn quickly and adapt, thereby extending the boundaries of current technologies. Their solutions cater to diverse sectors like healthcare, manufacturing, and agriculture.

Neuromorphica uses neuromorphic computing and spiking neural networks to replicate the 100 billion neurons of a human brain, aiming to create Fast Learning Machines. They emphasize research, innovation, and ethical practices, ensuring the systems developed are advanced yet responsible. By integrating new skills into these intelligent systems, Neuromorphica strives for transformative, long-term outcomes.

The benefits include the creation of AGI systems that can efficiently learn and adapt to new tasks, supporting industries in optimizing their processes. Their technology is designed to operate with a high level of ethics, ensuring safety and community benefit. This approach contributes to a significant increase in efficiency, knowledge replication, and the reduction of human limitations in productivity.

More information:
https://neuromorphica.com/

4.2.3. Czech Republic

AI-powered diagnostic tools for medical imaging

Carebot, s.r.o.

Carebot s.r.o. is a Czech startup founded in 2021 that focuses on developing AI-powered diagnostic tools for medical imaging. Their core product assists doctors in analysing X-rays, particularly for lung diseases, and significantly enhances diagnostic accuracy. The system uses advanced AI and machine learning algorithms to detect abnormalities in medical images,

helping to identify conditions like pneumonia, lung cancer, and even COVID-19, often with 99% accuracy.

The Carebot uses advanced machine learning and computer vision algorithms to detect and flag abnormalities, helping physicians identify conditions like lung diseases, cancer, and pneumonia with a high degree of accuracy. The system integrates directly into existing hospital workflows via platforms like PACS, ensuring that doctors can benefit from AI insights without having to learn new software. Originally developed during the COVID-19 pandemic, Carebot has been recognized for its potential to improve diagnostic precision globally and plans to expand its application to other imaging modalities, such as MRI and CT scans.

By using AI and machine learning, it enhances diagnostic accuracy and detecting conditions. This helps doctors catch issues that might be missed in traditional X-ray evaluations, leading to earlier and more reliable diagnoses, which can save lives. Additionally, Carebot integrates smoothly into existing hospital systems like PACS. The system also helps reduce the burden on medical professionals by quickly analysing large volumes of images, improving efficiency and enabling faster decision-making in critical healthcare environments.

More information:
https://www.carebot.com/en/carebot
https://3seaseurope.com/carebot-czech-healthtech-startup/
https://pilulkalab.com/pilulka-lab-invests-in-czech-medical-startup-carebot/

AI-driven tools for precision medicine and detection of diseases

Channel Lab, s.r.o.

Channel Lab, s.r.o., founded in 2020 and based in Prague, specializes in developing AI-driven tools for precision medicine. Their primary focus is on early detection of severe diseases, using certified telemedicine applications that support healthcare professionals in providing timely and accurate diagnoses.

Their portfolio includes tools like Aireen, a telemedicine device that screens for diabetic retinopathy, glaucoma, and age-related macular degeneration (AMD), improving the detection of eye-related diseases. Additionally, Neurona is a diagnostic tool designed to aid in the early detection of Alzheimer's disease and other neurological disorders. Complementing this is Neurona VOX, a mobile application developed for detecting neurological diseases through advanced AI-driven analysis. These tools aim to integrate seamlessly into existing healthcare systems, enhancing the accuracy and speed of diagnoses, thus supporting precision medicine.

These tools are designed to integrate seamlessly into existing medical workflows, allowing for effortless adoption by hospitals and clinics without disrupting current systems. They utilize

robust datasets and machine learning models to deliver precise and early diagnoses, particularly for conditions like diabetic retinopathy and Alzheimer's disease. This precision in early detection can significantly improve patient outcomes by enabling timely interventions. Furthermore, Channel Lab collaborates closely with research institutions and hospitals to ensure that its products are clinically tested and certified, ensuring reliability and accuracy. Their goal is to make advanced diagnostics widely accessible, enhancing the quality of care globally.

More information:
https://www.channel-lab.com/en
https://www.neurona-lab.com/en

Monitoring and managing mental health

Mindpax

Mindpax is a Czech digital therapeutics company founded in 2015 that focuses on developing solutions for severe mental health conditions, such as bipolar disorder, schizophrenia, and major depression. Their core offering is a health monitoring platform that combines wearable technology with data analytics to track long-term mental and physical health patterns, particularly in sleep and activity. This data helps predict relapses into depressive or manic episodes, allowing for earlier intervention and better management of conditions.

Mindpax offers a range of digital therapeutics products primarily focused on monitoring and managing severe mental health conditions. Their flagship product, Mindpax M1, is a wearable device that tracks sleep and activity patterns, providing clinically relevant feedback to help predict relapses and support early intervention. In addition, they offer the Mindpax Digital Therapeutics platform, which integrates data from their wearables to offer continuous monitoring and analytics for long-term mental health management. They also provide tools like the Mindpax M0 for data collection in clinical studies, as well as a specialized platform used by pharmaceutical companies and research institutions to gather real-time insights during clinical trials.

This early warning system benefits both patients and healthcare providers by helping to prevent relapses and improving long-term treatment outcomes. Additionally, Mindpax's platform integrates AI and data analytics to offer clinically relevant insights, which have been validated through studies conducted in collaboration with global clinical and research institutions. This partnership, combined with their presence in Prague, Munich, and Boston, enhances their ability to support personalized mental health care and advance clinical research.

More information:
https://mindpax.me/
https://mindpax.me/for-providers/
https://mindpax.me/for-patients/

4.2.4. Germany

MIRA AI Platform – Biomedical image analysis

MIRA Vision Microscopy GmbH

Biomedical image analysis, particularly in digital pathology, often requires specialized skills and extensive manual effort, making it challenging for professionals to efficiently manage and analyse large datasets. Traditional methods can be time-consuming and prone to bias, which can adversely affect research outcomes and diagnostic accuracy.

The MIRA AI Platform is a web-based and collaborative tool designed to streamline biomedical image analysis through state-of-the-art AI technology. It enables users to upload and manage giga-pixel whole slide image (WSI) datasets without needing programming or AI expertise. The platform allows users to explore images, annotate regions of interest, and collaborate seamlessly with team members. MIRA offers three specialized AI solutions for automated image analysis: one for Hematoxylin and Eosin (H&E)-stained histopathology images of murine and human skeletal muscle cross-sections, another for Myosin Heavy Chain (MHC)-stained images, and a third for immunofluorescence-stained histopathology images.

© MIRA Vision Microscopy GmbH

Using the MIRA AI Platform significantly boosts efficiency and collaboration in image analysis. Its user-friendly interface lowers the barrier to entry, empowering more professionals to leverage AI technology in their work. The platform ensures unbiased and reproducible results, enhancing the quality of analyses in biomedical research and diagnostics. The capability to quickly upload, manage, and analyse extensive datasets allows teams to focus on deriving insights rather than grappling with technical hurdles. By enabling automated image analysis for various applications in microscopy, MIRA is at the forefront of enhancing research and clinical outcomes in biomedicine and digital pathology.

More information:
https://www.mira.vision/

Dataome – Proprietary bioinformatics platform

Molecular Health

Dataome addresses the growing challenge of processing vast amounts of medical and molecular biological data. In healthcare, understanding complex diseases and improving patient care require the integration of clinical and molecular knowledge, which is often fragmented and difficult to analyse effectively.

Dataome uses AI and machine learning to structure and integrate clinical and molecular data into a unified knowledge base. This proprietary system intelligently processes biomedical information, expanding analytical capabilities. Experts then curate and validate the data to ensure accuracy. The platform enables oncologists, pathologists, and drug developers to securely evaluate sensitive patient data, while advanced encryption and pseudonymization techniques protect patient privacy.

Dataome enhances disease understanding, improves patient care, and streamlines drug development. Its high-quality data integration provides deeper insights, making clinical decisions more informed and efficient. By ensuring compliance with strict data privacy standards and medical regulations, Dataome offers a secure and reliable solution for healthcare professionals and drug developers.

More information:
https://molecularhealth.com/eu/
https://molecularhealth.com/eu/solutions/dataome/

4.2.5. Hungary

Teledermatology service – Digital healthcare platform for remote dermatological care

AIP Derm

Access to dermatological care can be limited by geographical barriers, long waiting times, and lack of specialists, especially in rural areas.

AIP Labs offers a teledermatology service where patients upload images of their skin conditions for analysis by dermatologists. The platform uses AI-driven solutions to assist doctors in diagnosing and recommending treatment remotely, making consultations more accessible.

This service reduces wait times, increases access to specialist care, and enables efficient diagnosis and treatment, improving patient outcomes and optimizing healthcare resources.

More information:
https://www.aip.ai/hu

MedInnoScan Diagnostic Platform

MedInnoScan

Chronic diseases like diabetes and cardiovascular conditions require continuous monitoring and early diagnosis. MedInnoScan provides an AI-powered diagnostic platform that analyses medical images and patient data to detect early signs of these diseases. The system uses machine learning algorithms to deliver fast and accurate diagnoses, helping healthcare providers offer timely and personalized care.

MedInnoScan enhances diagnostic precision, reduces the workload for healthcare professionals, and improves patient outcomes by enabling early detection and personalized treatment.

More information:
https://medinnoscan.com/

4.2.1. Republic of Moldova

selftalk.space

SELFTALK SRL

On a mission to transform 1 billion minds – one Selftalk audio at a time. Selftalk is a mental health platform designed to provide personalized support to individuals grappling with mental health challenges. Utilizing AI-driven chatbots and mood tracking tools, Selftalk empowers users to proactively manage their mental well-being.
For businesses, Selftalk provides more than just access to the app, also conducting workshops focused on emotional intelligence to boost team performance. Selftalk approach is based on 12 years of scientific research in the field of positive psychology, conducted by Harvard researcher Shawn Achor. Combining a specific type of cognitive behavioural therapy (CBT), called Rational Emotive Behaviour Therapy (REBT), with self-talk science from sport psychology, Selftalk makes well-being and optimal performance just a few clicks away for everyone.
More information:
https://selftalk.space/

4.2.2. Republic of Serbia

Motimove – AI-driven restoration of gait

3F-Fit Fabricando Faber

Motimove is a non-invasive functional electrical stimulator that is the core technology behind the NeuroSkin system for AI-driven restoration of gait after injury or illness of Central Nervous System (CNS). NeuroSkin uses fusion of signals from wearable sensors to control muscle activation in real time to bring back mobility to those who have lost it. NeuroSkin is a product of French startup Kurage.

More information:
www.3f-company.com
Www.kurage.fr

4.2.3. Romania

TENDERLY.AI – Digital Platform for Europe's home care providers

THE CARE HUB

Europe is facing an aging crisis, with an estimated 38 million people requiring long-term care by 2050. The majority prefer to age at home, yet the current home care service sector, comprising over 65,000 fragmented local SMEs, lacks the capacity to meet this escalating demand. Most available digital solutions cater to large medical institutions, leaving home care providers to rely on inefficient, disconnected systems or undertake costly development of custom apps. This fragmentation poses serious challenges to the quality of care, sustainability of healthcare resources, and economic stability.

Tenderly.ai offers a comprehensive digital platform tailored specifically for Europe's home care providers. It addresses the core issues of fragmentation and inefficiency by providing:

- Streamlined Care Coordination: A central dashboard automates the creation of care plans, visit scheduling, invoicing, and compliance reporting, easing the administrative burden on providers and allowing them to focus on care delivery.
- Age-Inclusive Client App: Designed for older adults and their families, this app allows them to engage with their care plans, request visits, review carer profiles, and provide feedback, fostering a person-centred approach that enhances client satisfaction.
- Efficient Staff App: This app equips caregivers with tools to manage their schedules, document visits, and communicate seamlessly with care teams, improving workflow efficiency and ensuring accurate care delivery.
- On-Demand Video Recruitment: Streamlining the hiring process through on-demand video interviews, the platform helps providers quickly identify qualified candidates, reducing recruitment time and addressing workforce shortages.
- Ecosystem Integration: Tenderly.ai integrates with existing local systems, such as invoicing providers and sensor technologies, allowing home care providers to enhance their operations without overhauling their infrastructure.

By uniting fragmented care providers under a single, user-friendly digital ecosystem, Tenderly.ai boosts operational efficiency, improves care quality, and empowers older adults to participate in their care journey. This solution addresses the critical gaps in Europe's home care system, ensuring dignified aging while mitigating pressure on healthcare systems.

More information:
https://tenderly.ai/

Rayscape

Mindfully Technologies SRL

The number of medical images worldwide is constantly growing, while the number of radiologists is roughly the same or even decreasing in some markets. This leads to misdiagnosis and long diagnostic times.

They solve this problem by assisting radiologists with AI, making them faster and more precise.

More information:
https://rayscape.ai

Onchochain Platform

Oncochain

Onchochain empowers oncology professionals through the provision of an intuitive and user-centric platform designed to facilitate comprehensive access to granular patient-level data visualization. This sophisticated interface not only enhances the usability of complex datasets but also integrates advanced analytical tools that enable practitioners to delve deeply into their own institutional data repositories. The Oncochain Platform is engineered to generate actionable insights that are pivotal for informing clinical decision-making, thereby augmenting daily practice with evidence-based recommendations. By harnessing the power of this platform, oncology professionals can systematically analyse treatment outcomes, identify patterns in patient responses, and optimize therapeutic strategies tailored to individual patient profiles. Furthermore, the Oncochain Platform significantly expands the research capabilities of oncology centers by providing a robust framework for data aggregation and analysis. It facilitates collaborative research efforts, enabling clinicians and researchers to engage in hypothesis-driven studies that advance the understanding of oncological phenomena. Through its innovative design and functionality, the platform not only enhances operational efficiency but also fosters a culture of continuous learning and improvement within the oncology community. In essence, the Oncochain Platform serves as a transformative tool that bridges the gap between clinical practice and research, empowering oncology professionals to leverage data-driven insights for improved patient outcomes and pioneering advancements in cancer care. This version elaborates on the features and benefits of the Oncochain Platform while employing more sophisticated language and structure.

Its primary offering, OncoAbstrakt, focuses on creating operational patient data repositories, which are essential for real-world data (RWD) studies. Below is a detailed review of the product, covering its features, benefits, compliance, and overall impact on oncology research.

OncoAbstrakt serves as a comprehensive tool for healthcare providers and researchers by facilitating the curation and analysis of retrospective patient data. The platform is particularly tailored for oncology studies, where access to accurate and complete patient information is crucial for developing effective treatments and understanding disease progression.

More information:
https://www.oncochain.com/

4.2.4. Slovakia

AI:Dental – AI technologies for dental care

AID s.r.o.

AI Dental, a pioneering Slovak company, revolutionizes dental care through advanced artificial intelligence technologies. Their innovative services focus on enhancing diagnostic accuracy, streamlining treatment processes, and improving overall patient care in dentistry. AI Dental's core offerings include AI-powered dental imaging analysis, predictive diagnostics, and personalized treatment planning. The primary problem AI Dental addresses is the inefficiency and potential inaccuracies in traditional dental diagnostics and treatment planning. Dentists often rely on manual interpretation of X-rays and other imaging techniques, which can be time-consuming and prone to human error. This challenge is further compounded by the increasing demand for dental services, which places pressure on dental professionals to deliver high-quality care swiftly and accurately. AI Dental's solution leverages cutting-edge AI algorithms to analyse dental images with remarkable precision. Their AI systems can identify cavities, fractures, and other dental issues with higher accuracy than conventional methods. This technology not only enhances the diagnostic process but also aids in early detection of problems, potentially preventing more severe conditions. Additionally, AI Dental provides predictive diagnostics that forecast potential dental issues, allowing for proactive and preventive care. The benefits of AI Dental's solutions are manifold. By utilizing AI-driven diagnostics, dentists can significantly reduce the time spent on image analysis, thereby increasing efficiency and allowing for more focus on patient interaction and treatment. The enhanced accuracy of AI diagnostics leads to better patient outcomes, reducing the likelihood of misdiagnosis and ensuring that treatments are tailored to the specific needs of each patient. Moreover, the predictive capabilities of their AI systems enable dentists to implement preventive measures, ultimately improving long-term dental health and reducing the need for extensive future treatments.

More information:
https://www.aidental.ai/

DNA testing – Genetic testing and personalized health solutions

DNA ERA s.r.o.

DNA ERA is a pioneering Slovak company specializing in genetic testing and personalized health solutions. Their core services include DNA testing that provides insights into an individual's genetic predispositions related to health, nutrition, and lifestyle. By analysing specific genetic markers, DNA ERA offers tailored recommendations that help users optimize their health and well-being. The company leverages advanced artificial intelligence (AI) algorithms to enhance the accuracy and relevance of their genetic analyses. AI plays a critical role in interpreting vast amounts of genetic data, identifying patterns, and providing actionable insights. This integration of AI allows DNA ERA to deliver precise and personalized recommendations efficiently. The primary problem DNA ERA addresses is the gap in personalized health and preventative care. Traditional healthcare often takes a one-size-fits-all approach, which may not be effective for everyone due to individual genetic differences. DNA ERA's solutions focus on bridging this gap by offering customized health insights based on genetic profiles. DNA ERA's solutions include comprehensive genetic testing kits that users can easily administer at home. After submitting their samples, users receive detailed reports that cover a wide range of health aspects, including predispositions to certain diseases, dietary needs, and fitness recommendations. These reports are generated using AI to ensure high accuracy and personalization. The benefits of DNA ERA's solutions are multifaceted. Firstly, users gain a deeper understanding of their genetic makeup, which empowers them to make informed decisions about their health and lifestyle. Secondly, the personalized recommendations can lead to better health outcomes by enabling proactive measures to prevent potential health issues. Additionally, the convenience of home testing and the clarity of AI-driven reports make it accessible and user-friendly.+

More information:
https://dnaera.com/

ClaustrOFF – Therapeutic application for treating phobias and anxiety

GAMETHERAPY s.r.o.

Product revolutionizes mental health therapy by combining Virtual Reality Exposure Therapy (VRET) with AI-driven personalization, offering a unique, effective, and accessible solution for managing claustrophobia and agoraphobia. This immersive self-help tool provides rapid anxiety symptom reduction within just five hours, allowing users to control their therapeutic process from the comfort of their homes. By integrating gamified elements, ClaustrOFF enhances user engagement and motivation, making therapy enjoyable and effective. This

innovative approach addresses the global shortage of mental health professionals, making high-quality care more accessible and reducing the stigma associated with seeking help.

More information:
https://www.gametherapy.eu/

MultiplexDX – Cancer detection and monitoring tool

MultiplexDX s.r.o.

MultiplexDX is a Slovak biotechnology company specializing in molecular diagnostics with a focus on providing precise and reliable cancer diagnostic tools. The company offers a range of services including the development of advanced diagnostic tests that aim to improve the accuracy of cancer detection and monitoring, which is crucial for effective treatment and patient care. One of the core areas where MultiplexDX excels is in the integration of artificial intelligence (AI) into their diagnostic processes. By leveraging AI and machine learning algorithms, the company enhances the analysis of complex biological data, thereby improving the sensitivity and specificity of their tests. This application of AI helps in identifying cancer biomarkers more accurately and swiftly, which is vital for early detection and personalized treatment strategies. The main problem MultiplexDX addresses is the high rate of misdiagnosis and the lack of precise diagnostic tools in oncology. Traditional diagnostic methods often fall short in providing the necessary accuracy, leading to ineffective treatment plans and poor patient outcomes. MultiplexDX's solution lies in their innovative approach to molecular diagnostics, where they combine cutting-edge technology with robust AI systems to develop highly accurate diagnostic tests. Their solutions include multiplex assays that can detect multiple biomarkers simultaneously, and digital PCR (Polymerase Chain Reaction) platforms that provide high sensitivity and quantitative data. The incorporation of AI enables the analysis of large datasets from these assays, facilitating the identification of patterns and correlations that might be missed by conventional methods. The benefits of MultiplexDX's solutions are multifold. Firstly, the increased accuracy in diagnostics leads to better treatment decisions and improved patient outcomes. Early and precise detection of cancer biomarkers can significantly enhance the effectiveness of treatment protocols, reducing the mortality rate associated with cancer. Additionally, their AI-powered diagnostics reduce the likelihood of false positives and negatives, minimizing the emotional and financial burden on patients. Furthermore, the ability to personalize treatment plans based on accurate diagnostic data means that patients receive therapies tailored to their specific genetic makeup and disease profile, which is a key component in the era of personalized medicine. This not only enhances the efficacy of treatments but also reduces the occurrence of adverse side effects. In summary, MultiplexDX stands at the forefront of molecular diagnostics by merging advanced biotechnology with artificial intelligence. Their innovative solutions address critical challenges in cancer diagnostics,

offering significant benefits in terms of accuracy, early detection, and personalized patient care. This positions them as a crucial player in the fight against cancer, providing tools that are not only technologically advanced but also immensely beneficial for patient health and well-being.

More information:
https://www.multiplexdx.com/

PMcardio – Assistant for cardiologists in diagnosing and treating cardiovascular diseases

POWERFUL MEDICAL s. r. o.

Powerful Medical, a Slovak company, specializes in leveraging artificial intelligence (AI) to revolutionize healthcare. Their primary focus is on developing advanced AI-driven tools designed to enhance medical diagnostics and treatment planning. By integrating cutting-edge technology with clinical expertise, Powerful Medical aims to tackle some of the most pressing challenges in healthcare, including the timely and accurate diagnosis of complex conditions. The core services provided by Powerful Medical include AI-powered diagnostic support and personalized treatment recommendations. Their flagship product, PMcardio, is an AI-based platform that assists cardiologists in diagnosing and treating cardiovascular diseases. PMcardio analyses electrocardiograms (ECGs) and other patient data to identify abnormalities and suggest potential diagnoses and treatment options with high accuracy. This tool significantly reduces the diagnostic time and improves the precision of treatment plans, ultimately leading to better patient outcomes. Powerful Medical applies AI through sophisticated algorithms and machine learning models trained on vast datasets of medical records and clinical studies. These models can identify patterns and correlations that might be missed by human eyes, offering a level of analytical depth and speed that enhances the decision-making process for healthcare professionals. The main problem Powerful Medical addresses is the inefficiency and inaccuracy often present in traditional diagnostic processes. Misdiagnoses and delayed diagnoses can lead to ineffective treatments and poorer health outcomes. By providing AI-driven solutions, Powerful Medical aims to reduce these risks, ensuring that patients receive timely and accurate diagnoses and appropriate treatments. Their solutions offer numerous benefits. Firstly, they enhance diagnostic accuracy, reducing the incidence of misdiagnosis and ensuring patients receive the correct treatment sooner. Secondly, they improve efficiency, allowing healthcare providers to manage their time and resources more effectively. This leads to better patient care and can alleviate the workload on medical staff. Additionally, their technology is designed to be user-friendly, making it accessible for various healthcare settings, from large hospitals to smaller clinics.

More information:
https://www.powerfulmedical.com/

Synthetic biology products, focusing on innovative gene and cell therapies

Sensible Biotechnologies s.r.o.

Sensible Biotechnologies, a pioneering Slovak company, specializes in the development and application of cutting-edge biotechnological solutions. Their primary services encompass the creation of synthetic biology products, focusing on innovative gene and cell therapies. By leveraging advanced biotechnology, they aim to revolutionize the medical and pharmaceutical landscapes, addressing critical challenges in disease treatment and genetic engineering. Central to Sensible Biotechnologies' offerings is the integration of Artificial Intelligence (AI) in their processes. AI is employed to enhance the precision and efficiency of gene editing and cellular engineering. Through sophisticated algorithms and machine learning models, the company can predict and optimize genetic modifications, ensuring higher success rates and minimizing potential risks. This application of AI accelerates the research and development phase, enabling quicker translation of laboratory findings into viable therapeutic solutions. The primary problem Sensible Biotechnologies addresses is the inefficiency and high cost associated with traditional gene and cell therapy development. Conventional methods often involve lengthy trial-and-error processes, significant resource expenditure, and extended timeframes to achieve desired outcomes. Sensible Biotechnologies' AI-driven approach mitigates these issues by streamlining the discovery and development pipeline, reducing both time and costs. Their solution lies in the AI-enhanced platform that facilitates rapid prototyping and testing of genetic modifications. This platform not only improves the accuracy of genetic edits but also allows for the creation of more effective and personalized therapies. By harnessing the power of AI, Sensible Biotechnologies can predict cellular responses to genetic changes, thereby refining therapeutic strategies before clinical implementation. The benefits of Sensible Biotechnologies' solutions are manifold. Firstly, they offer accelerated development timelines, bringing life-saving therapies to market more swiftly. Secondly, the precision of AI-driven genetic modifications enhances the efficacy and safety of treatments, leading to better patient outcomes. Lastly, the cost-effectiveness of their approach makes advanced therapies more accessible, potentially transforming the healthcare landscape by providing affordable treatment options for previously intractable conditions.

More information:
https://www.sensible.bio/#news

4.2.5. Slovenia

GenePlanet – AI-driven genetic testing

GenePlanet d.o.o.
Slovenia

GenEplanet is a Slovenian biotech company that provides personalized health insights through AI-driven genetic testing. Their platform analyses an individual's genetic data to offer recommendations on diet, exercise, and disease prevention. The AI algorithms help identify genetic predispositions and provide tailored health plans.

More information:
https://geneplanet.com/eu

4.3. Manufacturing sector

Artificial intelligence (AI) is transforming the manufacturing industry by enhancing efficiency, improving product quality, and streamlining operations. With the increasing complexity of manufacturing processes and the demand for customization, AI technologies such as machine learning, robotics, and predictive analytics are becoming essential tools for manufacturers.

AI applications in manufacturing include predictive maintenance, where algorithms analyse equipment performance data to anticipate failures before they occur, reducing downtime and maintenance costs. Smart factories utilize AI-driven automation to optimize production workflows, improve inventory management, and enhance supply chain efficiency. Additionally, AI-powered quality control systems can analyse products in real-time, identifying defects and ensuring consistent quality.

Furthermore, AI is enabling advanced robotics to work alongside human operators, enhancing precision and safety in tasks ranging from assembly to packaging. By integrating AI into their operations, manufacturers can achieve greater flexibility, reduce operational costs, and respond more effectively to market demands. As AI technologies continue to evolve, their impact on the manufacturing sector will only grow, paving the way for a more efficient and innovative future.

4.3.1. Austria

Intelligent plug-and-play sensor and software

COISS GmbH

COISS develops sensor technology that records various parameters and simply tracks the activity of the machines. This allows them to obtain non-invasive data from the machine. Their solutions work independently of machine age, manufacturer and type and deliver real-time data immediately and everywhere. With their plug and play sensor technology and their intelligent software they optimize production quickly and easily. In addition, it provides stable data for predictive maintenance or anomaly detection.

More information:
https://www.coiss.at
https://www.coiss.at/references

auros - Intelligent Edge Computing

Danube Dynamics Embedded Solutions GmbH

Their AI-ready edge computing solution enables their customers to easily realize AI automation and digitization integration. Danube Dynamics delivers a high-performance edge computing device including a powerful software toolchain to realize different AI applications, such as optical quality control, robotic automation, predictive maintenance, and many more. State-of-the-art IoT- and fleet management enables secure and robust system architectures. Users can also develop and deploy their own software and AI applications.

More information:
https://www.danube-dynamics.at/en/

Dynatrace Davis CoPilot

Dynatrace

Hypermodal AI, which combines predictive AI, causal AI, and generative AI, boosts productivity across operations, security, development, and business teams.

This expansion of Davis AI complements the proven Dynatrace predictive AI model (for example, forecasting and anomalies) and their causal AI model (for example, determination of a problem's root cause, security risks, user impact, and steering automation), which are at the core of the Dynatrace platform.

Davis CoPilot empowers users to effortlessly create queries, data dashboards, and data notebooks using natural language and provides coding suggestions for workflow automation, reflecting the unique attributes of each customer's hybrid and multicloud ecosystem. It also simplifies and accelerates onboarding, configuration, and adoption of the Dynatrace platform.

Dynatrace applies these techniques to the broadest set of modalities in the market, including the data types of metrics, traces, logs, behaviour, topology, dependencies, events, and more, with unmatched precision for precise predictions, accurate determinations, and meaningful insights.

Davis AI transforms and augments data to enable more useful analysis, perform automatic tasks, and respond to user requests:

Predictive AI uses machine learning (ML) and statistical methods to recommend future actions based on data from the past. Dynatrace uses the various data types across metrics, logs, traces, behaviour, events, and more in its Grail™ data lakehouse and causal dependencies from Dynatrace Smartscape® to provide continuous forecasting and anomaly prediction, including

cloud application health, infrastructure needs, sales, and customer experience trends, seasonality, and other historical behaviours.

- Causal AI processes observability, security, and business data in the context of causal dependencies from Dynatrace Smartscape topology to precisely determine the needle in the haystack in continuously and dynamically updated software services. It groups anomalies, pinpoints root causes, ranks security risks, enables precise attack investigation, and provides business impact assessments, all automatically. This AI also triggers automated remediation actions. It further enables teams to explore trends or patterns with built-in domain and topology context.
- Generative AI drives productivity through AI-powered analytics and automation for all members of your organization. Davis CoPilot interprets natural language to create queries, dashboards, and notebooks and provides suggested code for automation workflows. It further simplifies access to best practices for observability and security use cases and answers "how-to" questions precisely. It also guides users who want to observe new technologies or apply advanced configurations.

More information:
https://www.dynatrace.com/
https://www.dynatrace.com/news/blog/hypermodal-ai-dynatrace-expands-davis-ai-with-davis-copilot/

AI Extension module - For AI applications in the industrial sector

KEBA AG

As high-performance hardware in a miniature form factor, the AI extension module has been specially developed for AI applications in the industrial sector in compliance with all relevant standards. Its longevity and ruggedness are among the features that set it apart from electronics products in the consumer sector.

The AI extension module includes a sophisticated toolchain with all tools needed to collect, process and interpret data, allowing industrial customers to get started quickly with AI.

More information:
https://www.keba.com/en/industrial-automation/products/controls-ipc/ai-extension-module

Digital unloading assistant

Profactor GmbH together with Company RK Metalltechnik

RK Metalltechnik, a contract manufacturer in the field of sheet metal processing, aims to increase its competitiveness and shorten delivery times by using an augmented reality system. The system is intended to support the efficient unloading of laser-cut parts, with a focus on the technical feasibility of active visualization projected directly onto the sheet metal parts.

PROFACTOR GmbH therefore dealt with active visualization by means of a multi-projector setup, technical feasibility, digital integration for dynamic operator guidance, a laboratory demonstrator for concept verification and the evaluation of system integration.

The project included the investigation of the existing process, the selection of suitable projection hardware, the development of data interfaces, the construction of a functional model, the adaptation of existing technologies and validation in a real environment.

The system implemented by PROFACTOR GmbH for RK Metalltechnik can lead to a reduced workload for employees, eliminate paper-based processes and provide clear visual instructions for part selection, significantly improving operational efficiency and working conditions.

More information:
https://www.profactor.at/en/
https://ai5production.at/success-story/ (Nr 25)

Software and AI systems based on latest technologies for various business units

RISC Software GmbH

RISC Software GmbH performs research and development for industrial partners since the company's foundation by Prof. Bruno Buchberger in 1992. The core competences symbolic computation, mathematics and computer science are applied to develop remarkable software solutions in the business units logistics informatics, medical informatics, industrial software applications and domain-specific applications.

More information:
https://www.risc-software.at/

RISC AI Academy

RISC Software GmbH

RISC Software's “AI Innovators Bootcamp” offers the opportunity to familiarize yourself intensively with current and future AI technologies and to gain the necessary knowledge for safe use. We offer 3 to 5-day workshops.

The workshop aims to impart both theoretical knowledge and practical skills in dealing with AI. Participants will not only learn about different facets of AI (from basics to advanced applications), but also what components and processes it takes to implement a trustworthy AI application. With interactive learning methods, hands-on exercises and real-life case studies, the workshop is designed to enable participants to better understand the potential of AI and to be able to realistically assess the associated opportunities and challenges in application and implementation.

More information:
https://www.risc-software.at/risc-ai-academy-ai-innovators-bootcamp/

Advanced data science and software science solutions

Software Competence Center Hagenberg GmbH

The Software Competence Center Hagenberg addresses various challenges in data science and software engineering, mainly in areas such as artificial intelligence, machine learning, data analytics, software architecture, engineering, and testing. Within the projects advanced methodologies and innovative approaches are used to optimize not only industrial processes, enhance decision-making, and develop robust software solutions. By collaborating with scientific and industry partners, SCCH drives technological advancements, boosts innovation, and contributes to economic growth. With its projects it improves efficiency, reduces costs, and enhanced competitiveness for businesses by enabling innovations through cutting-edge research and practical applications.

More information:
https://www.scch.at
https://www.scch.at/data-science/projekte
https://www.scch.at/software-science/projekte

winkk AI – Holistic knowledge base of information

winkk GmbH

In the ever-growing chaos of documents, it is often difficult for companies to maintain an overview. Information is often lost or cannot be efficiently linked or compared due to the volume.

winkk AI keeps track of all information and, like a digital team member, provides the right input when it is needed. All data is handled securely and in compliance with GDPR.

And how? The integration of internal and external sources of information (documentation, contracts, meetings, websites, etc.) creates a holistic knowledge base for your AI team member. By intelligently linking all these knowledge sources, new information can be created quickly and easily in your corporate language.

And why? Many office tasks can be completed faster or even automated. More time for your employees in turn means more motivation, more creativity and more time for the really important tasks in your company.

More information:
www.winkk.ai
www.winkk.com

4.3.2. Bulgaria

AI Services and Solutions for Manufacturing and Business Optimization

Cosmos Thrace Ltd.

Cosmos Thrace Ltd. provides AI-driven services aimed at optimizing manufacturing processes and enhancing business performance. The solutions are designed to tackle challenges like inefficiencies in assembly lines, quality control issues, and the need for better predictive maintenance to avoid unexpected downtimes.

The company offers customized AI solutions, including robotics & automation for assembly lines, digital twin technologies for process optimization, and predictive analytics for maintenance scheduling. Their expertise in smart manufacturing allows businesses to integrate intelligent systems that improve safety, quality, and productivity.

The key benefits include increased efficiency, reduced operational costs, enhanced product quality, and improved safety standards in manufacturing. Additionally, Cosmos Thrace's

services help companies stay competitive by implementing cutting-edge AI technologies tailored to specific industrial needs.

More information:
https://cosmosthrace.com/ai-services/

AI Solutions for Business Transformation through Consultation, Custom Development, and Data Services

Ethera Technologies

Ethera Technologies provides end-to-end AI solutions tailored to meet the needs of various industries, such as manufacturing, healthcare, and agri-food. They address challenges like the identification of AI opportunities, inefficiencies in processes, data security, and the need for ethical AI implementation.

Ethera's approach involves initial consultations to identify suitable AI use cases, followed by developing custom AI solutions, integrating existing advanced tools, and providing comprehensive data services. They focus on ethical AI practices, ensuring all solutions meet legal and regulatory standards. Their services also include pilot-to-full-scale projects and ongoing support to ensure effective AI adoption.

The benefits of Ethera's solutions include enhanced decision-making capabilities through advanced analytics, operational efficiency, supply chain optimization, predictive maintenance, and improved customer engagement via customized AI tools. Their AI legal and ethical advisory ensures compliance, fostering responsible AI use.

More information:
https://ethera-tech.com/

Angie IoT

Loren Networks

Angie IoT addresses key business challenges by improving operational efficiency, inventory management, and supply chain visibility through real-time tracking of packages, containers, and assets. It enables the continuous monitoring of critical parameters like temperature, humidity, and other environmental parameters, ensuring optimal conditions and reducing waste. IoT also enhances customer experience by enabling personalized services and ensuring compliance with safety regulations through real-time monitoring. This data-driven approach

empowers businesses to make informed decisions, optimize resources, and boost overall performance.

The solution approach involves deploying high-precision sensors that collect different data, even in harsh environments. With up to 5 years of battery life and up to IP67 rating, the devices are low-maintenance and reliable. Utilizing LoRaWAN technology, the system supports wide-area deployment, offering real-time data for proactive management. Angie IoT enhances this with a comprehensive cloud platform for real-time data visualization, customizable alerts, and integration with other systems, ensuring optimized decision-making and efficient operations across industries.

It enables scalable deployment across large areas, from agriculture to industrial applications, offers reduced maintenance needs and operating costs, has the ability to make Data driven decisions based on real-time data insights and data analysis and provides opportunity for data collection and analysis.

They already have more than 100 customers who rely on IoT for improving their business processes – from farms and industrial buildings to laboratories and office buildings.

More information:
https://lorennetworks.com/en/home/

AI-Powered Business Intelligence and Data Analytics Solutions

Quentox

Quentox focuses on leveraging AI to provide advanced business intelligence and data analytics solutions. They address challenges such as ineffective decision-making due to fragmented data, lack of predictive insights, and the need for real-time information to optimize business processes.

Quentox uses AI algorithms to process and analyse large volumes of data, offering predictive analytics, real-time business insights, and custom dashboards for data visualization. Their services help businesses across sectors like manufacturing, healthcare, and agriculture to optimize their supply chains, improve decision-making, and enhance operational efficiency.

The benefits of Quentox's solutions include improved decision-making capabilities through real-time insights, optimized supply chain and manufacturing processes, and enhanced data security in healthcare applications. Their AI-driven approach helps organizations harness their data effectively for sustainable growth and competitive advantage.

More information:
https://quentox.com/

4.3.3. Czech Republic

Predictive manufacturing systems with the highest security standards

Inference Tech, s.r.o.

Inference Technologies s.r.o., founded in 2015 and headquartered in Prague, Czech Republic, specializes in advanced predictive systems and data analysis solutions specifically for the semiconductor industry. Their focus is on leveraging historical and real-time data to improve manufacturing processes, reduce costs, and enhance reliability.

The company's core technology, called DeepFab, consists of several key systems that address various challenges in semiconductor manufacturing. These include inLab, which offers advanced analytics for identifying the root causes of yield issues through root cause analysis and pattern recognition. Additionally, inProbe is a system for smart product routing that optimizes the production process by predicting wafer yield in real-time, allowing the skipping of unnecessary stages to save costs. They also offer inSure, a system for reliability control that helps screen out defective components through latent defect detection and early warning systems before they reach the market.

© Inference Tech, s.r.o.

Inference Technologies serves integrated device manufacturers (IDMs), foundries, and fabless semiconductor companies, helping them predict yield and reliability outcomes and make real-time adjustments during production. Together, these systems provide manufacturers with tools to improve yield, cut costs, and ensure high product reliability.

More information:
https://inferencetech.com/

New generation MES – Transformation of video patterns into machine states

Inovec Technology, s.r.o.

Inovec Technology specializes in integrating AI into manufacturing to enhance efficiency and productivity. The core expertise is computer vision, human-in-the-loop AI and hybrid cloud-edge computing. The rapidly growing ecosystem of partners provides a wide range of other related services, such as digital diagnostics, setting up company BI, consulting or support for complete digital transformations of manufacturing companies.

By using computer vision and analysis of video the company can transform this video patterns into machine states like working, idle, tool open, tool closed. The AI algorithm than automatically searches the machine cycles. From all those data other indicators like OEE or scrap rate are calculated. Everything is visualized in the form of online dashboards. All the data is available in google sheets for further processing.

By observation of machines and other processes progress the company has a perfect overview of actual performance and can find loses. Getting rid of those losses brings significant operational improvements.

More information:
https://www.inovec.tech/

Smart grids and energy management

Mycroft Mind, a.s.

Mycroft Mind, a.s., founded in 2007 in Brno, Czech Republic, specializes in AI-driven software solutions for smart grids, energy management, and data analytics. Their core focus is on utilizing data collected from smart meters and sensors to provide actionable insights that help keep power grids stable in the face of decentralization and the transition to renewable energy. Mycroft Mind's technology processes massive amounts of data to detect patterns, predict grid behaviour, and adapt to changing energy dynamics in real-time.

Mycroft Mind offers several cutting-edge AI-based solutions for the energy and utility industries, particularly in the areas of smart grid management and renewable energy. Their DataGenie system is a third generation Meter Data Management System (MDMS) that uses big data and machine learning to process and analyse data from various grid devices such as smart meters and substations. This system helps with everything from monitoring consumption to detecting anomalies in the network and predicting future behaviour, ensuring efficient energy management.

Their Visual Grid Analytics tool provides utilities with a 3D digital twin of the power grid and visualizes complex data such as power flows, voltage levels and consumption patterns. This solution enables the detection of issues such as non-technical losses, voltage imbalance and phase asymmetry, helping to optimize grid operations in real time.
Last but not least, Mycroft Mind's Energy Portfolio Manager application is designed to optimise the modelling and management of energy consumption, helping users to maximise the benefits of energy production and consumption. They also provide Smart Maintenance tools for solar power plants to detect issues that could affect power generation. In addition, they offer Tailored Grid Analytics, which ensures a more secure and cost-effective grid operation by focusing on identifying and solving specific grid problems.

Mycroft Mind, a.s. develops AI-driven software solutions for the energy sector, focusing on smart grid management and optimization. Their systems leverage advanced data processing and machine learning to handle the massive data streams from smart meters and sensors, enabling real-time monitoring, prediction, and adaptation of grid behaviour. This helps energy companies optimize grid operations, reduce risks, and improve overall efficiency. The company has collaborated with major energy distributors like ČEZ and Pražská Energetika on smart grid modelling, data collection, and field installations.

More information:
https://www.mycroftmind.com/
https://www.mycroftmind.com/projects/

4.3.4. Germany

MSX-AI-5000 – Automated quality control

Addi Data GmbH

The MSX-AI-5000 tackles the need for automating quality control tasks in manufacturing, where manual inspections can be error-prone and inefficient, risking undetected defects and slowing down production processes. The MSX-AI-5000 is an AI-powered industrial edge vision system that integrates hardware modules, industrial cameras, and AI-assisted processing. Its autonomous MSX-AIRIS software runs real-time AI algorithms without cloud connectivity, ensuring greater resilience to disturbances and environmental changes. Users can customize applications, called "Skills," using development tools, enabling easy reconfiguration for specific use cases like visual inspections, surface checks, and 3D measurements.

© Addi Data GmbH: MSX-AI-5000

This versatile system increases inspection speed and accuracy, reducing errors while enhancing process transparency. Its user-friendly interface simplifies setup, making it efficient and adaptable for multiple applications. MSX-AI-5000 supports various industrial tasks, from quality control to predictive maintenance, providing a cost-effective, flexible solution for diverse industries.

More information:
https://www.addi-data.com/
https://www.addi-data.com/product/machine-vision-system-msx-ai-5000

Assemblio – Solution for generating assembly instructions

Assemblio GmbH

Creating detailed and accurate assembly instructions is a time-consuming process for manufacturers, often taking weeks to complete. Traditional methods require extensive manual effort and expertise, leading to delays in product launches and inefficiencies in assembly workflows.

Assemblio provides a fast, AI-powered solution for generating assembly instructions in just minutes. Users upload a STEP file, and with an intuitive drag-and-drop interface, they can adjust assembly sequences, directions, and other details in real-time. The platform generates assembly guides in various formats, including PDFs, videos, and digital step-by-step instructions, without the need for specialized engineering knowledge.

Assemblio dramatically reduces the time required to create assembly instructions by over 92%, as evidenced by client data. The real-time adjustments mean no downtime when making changes, and the ability to generate different formats ensures versatile and clear communication for assembly teams. This solution improves efficiency, speeds up production cycles, and eliminates the complexity typically associated with generating technical documentation.

More information:
https://www.assemblio.com/en

AI Starter Kit 2 Go –Solution for IO-Link-supported machine monitoring

Bytefabrik.AI GmbH

Monitoring machine conditions and predicting maintenance needs are essential for optimizing industrial processes. Many companies struggle with outdated systems that lack real-time data insights, leading to inefficient operations, unplanned downtimes, and costly retrofits.

The AI Starter Kit 2 Go offers a plug-and-play solution for IO-Link-supported machine monitoring. It combines an Edge IO-Link master, selected sensors, and IIoT analysis software, enabling real-time data acquisition and condition monitoring. The system supports long-term monitoring, predictive maintenance, and anomaly detection, with easy installation directly on machines due to its IP67 compliance. The edge computer upgrades new and existing systems with IIoT functions, and its compatibility with thousands of IO-Link sensors makes it highly versatile.

This starter kit enables real-time machine monitoring and predictive maintenance, reducing downtime and increasing productivity. It is cost-effective, especially for retrofitting older systems, and provides valuable insights into production processes, allowing for optimized throughput times. For research purposes, the kit allows quick prototyping, data collection, and AI model testing, making innovation faster and more efficient. The fully configurable solution simplifies data-driven improvements and accelerates implementation across industrial environments.

More information:
https://bytefabrik.ai/en/

https://bytefabrik.ai/en/product-io-link-starter-kit

optimyzer.ai – AI-powered assistant for optimizing production lines

Gauss Machine Learning GmbH

Optimyzer tackles the issue of machine efficiency in manufacturing, where production output heavily depends on the expertise of operators configuring machines. Suboptimal settings can lead to reduced productivity, increased costs, or wasted resources.

Optimyzer is an AI-powered assistant that helps operators find the best machine settings for their production lines. Depending on the priority—whether speed, cost efficiency, or resource conservation—the AI quickly delivers optimized settings for any situation. The solution is easy to implement, requiring only an internet-connected device without additional sensors or hardware. It also maintains a historical settings database, preserving valuable operational knowledge within the company.

By using Optimyzer, companies can increase machine productivity by up to 60%, achieving faster setups and more efficient production. The system adapts to varying demands, ensuring the best results for different manufacturing goals. Its ability to provide AI-driven optimization within minutes ensures quick returns on investment, streamlining operations and reducing reliance on individual expertise.

More information:
https://gauss-ml.com/en/
https://www.optimyzer.ai/

Smart Monitoring

Incontext Technology GmbH

INCTEC Smart Monitoring addresses the challenges of inefficiencies in production, machine defects, high energy consumption, delivery delays, and the shortage of skilled workers in manufacturing. Traditional systems often lack transparency, making it difficult to detect anomalies or optimize resource use.

INCTEC Smart Monitoring automates data flows from operational systems and IIoT platforms to digital twins and AI services, creating a "smart twin." This AI-driven system continuously monitors production lines, detecting and predicting anomalies, simulating potential causes, and revealing inefficiencies. It offers real-time transparency of processes and enables faster

evaluation of operational data. Through data-driven analysis, it supports precise planning of resources and maintenance.

This system optimizes productivity, energy efficiency, and resource planning, reducing production costs and avoiding delivery delays. The ability to predict machine defects lowers downtime, while AI-supported tracking improves process transparency. By automating these functions, INCTEC Smart Monitoring helps manufacturers tackle the skilled labour shortage and enhances overall operational efficiency.

More information:
https://incontext.technology/en/
https://incontext.technology/en/smart-monitoring

NODE.OS – Advanced autonomy operating system for mobile robots

NODE Robotics GmbH

Mobile robot manufacturers face challenges with integrating reliable localization, navigation, and fleet management systems, which often limit operational efficiency, increase costs, and complicate scalability. Traditional solutions can be hardware-dependent and difficult to adapt to new use cases, causing delays and inefficiencies in robotic operations.

NODE Robotics addresses these challenges with NODE.OS, an advanced autonomy operating system for mobile robots. This plug-and-play software employs self-learning algorithms for precise localization, navigation, and fleet management in real time. Its modular design allows for seamless integration and customization across various robot types and applications, ensuring quick deployment without the need for extensive hardware changes. The user-friendly interface minimizes setup and operational effort, facilitating easy installation and maintenance.

NODE.OS significantly enhances operational efficiency and productivity by providing flexible and reliable robotic solutions. Companies can achieve greater scalability and adaptability in their operations, reducing both time and costs. The real-time capabilities of NODE.OS enable consistent performance in demanding environments, leading to minimized errors and downtime. With over 1,000 robots successfully operating globally, NODE.OS has established itself as a dependable choice for improving robotic mobility and automation. By enabling manufacturers to unlock the full potential of their mobile robots, NODE.OS contributes to more sustainable and efficient operations, setting new standards in the industry.

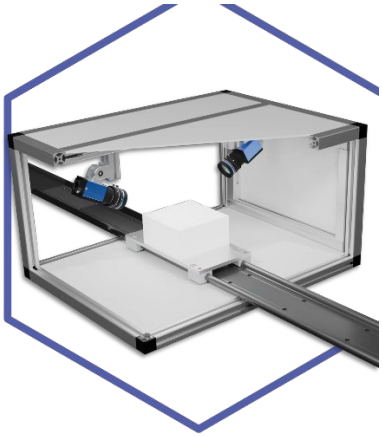
More information:
https://node-robotics.com/

preml – Automated visual quality inspections

preML GmbH

Manufacturing companies face challenges in automating their visual quality inspections efficiently and cost-effectively. Traditional methods often miss defects, delay production, or require significant human labour, increasing costs and risks for employees in dangerous environments.

This AI-based solution uses advanced image processing algorithms and machine vision techniques to automate defect detection, completeness checks, and vehicle tracking across various industries. The flexible software is customized to meet each company's specific production and quality needs. It provides real-time identification and qualification of defective components through image acquisition, processing, object detection, anomaly detection, and error classification. A robust edge device ensures high performance, even in challenging conditions, while live view and dashboard analytics allow remote monitoring of quality metrics.



© preML GmbH

The solution enhances product quality, reduces costs, and enables faster production cycles. It ensures real-time defect tracking, maintains traceability, and minimizes risks to employees by automating dangerous tasks. By providing constant quality monitoring and documentation, it boosts efficiency and guarantees that high standards are met consistently.

More information:
https://www.preml.io/

prenode – Edge AI solutions

prenode GmbH

Many businesses struggle with deploying machine learning models effectively, particularly in maintaining data control and achieving real-time processing capabilities. Traditional cloud-based solutions can lead to delays, increased costs, and security concerns, especially when operations require constant connectivity. Additionally, organizations often lack the necessary understanding of AI and IoT technologies to leverage their full potential.

© prenode GmbH

prenode offers a comprehensive suite of solutions for all three types: technology, consulting, and training. The technology aspect focuses on Edge AI, allowing businesses to build and manage machine learning models at the edge of their networks. This enables real-time data processing, predictive maintenance, anomaly detection, and process control while keeping data on-premises. The federated learning approach ensures AI optimization across facilities without compromising raw data. Additionally, prenode provides consulting services to guide organizations through the entire data pipeline, from preparation to implementation of AI models. Their training courses equip managers and teams with essential knowledge and best practices in AI and IoT, fostering innovative thinking and decision-making.

The implementation of prenode's Edge AI solutions leads to reduced reliance on cloud services, enabling immediate data analysis and decision-making even in offline environments. This not only enhances security and privacy but also significantly cuts costs associated with data processing, transfer, and infrastructure. By fine-tuning AI models locally, businesses achieve improved accuracy tailored to specific operational needs. The consulting services further empower organizations to unlock the full potential of their data, leading to successful digital innovation. Overall, prenode's offerings enhance operational efficiency, streamline processes, and support strategic growth through advanced technology and expert guidance.

More information:
https://www.prenode.de/en

4.3.5. Hungary

Optimalization of pultrusion processes in composite material production using AI

Avius Kft.

Avius Kft. specializes in the production of advanced composite materials such as fibreglass and carbon fibre plastics using pultrusion technology. This process involves the impregnation, moulding and heat treatment of fibres with resin to create strong, lightweight and corrosion-resistant profiles for various industries.

The project aims to optimize pultrusion processes in composite material production using AI. By analysing data from temperature sensors, the company would predict optimal settings, reducing defects and waste.

This development aims to optimize the pultrusion process, which is currently not fully documented or parameterized. Often, product defects are only found during later stages, causing waste and extra costs. By adding more temperature sensors and analysing data with AI, we can predict the best settings and prevent defects.

This enhances reliability, efficiency, and new product Introduction, yielding 40% less waste annually and minimizing human errors.

More information:
https://www.avius.hu/
https://www.youtube.com/watch?v=BH-T_2Fp7ts

AI-based pallet inspection project

Sebestyén Wood Kft.

The AI-powered pallet inspection and classification system aims to revolutionize the way pallets are managed within manufacturing and logistics operations. This innovative application leverages AI to automatically inspect, classify, and ensure the compliance of pallets with industry standards and regulations. By detecting defects, damage, or wear, and making precise classification decisions, this system enhances the overall efficiency and reliability of pallet management.

The AI-based pallet inspection project revolutionizes manufacturing processes, enhancing efficiency and reducing costs. This innovative system uses artificial intelligence to automatically inspect pallets, detecting defects and damage, and determining compliance. With support, the project aims to achieve these results through advancements in data management, technical robustness, and human-machine interaction. This development is set to transform pallet inspection, driving higher revenue and customer satisfaction.

Automated pallet inspections increase production speed by 67%, improve quality control accuracy by 25%, and reduce manual inspection costs by 20%.

More information:
https://sebestyenwood.hu/
https://www.youtube.com/watch?v=x6nseqe_M-Q

Quality control of parts for automotive companies

Simon Trans Ltd. (am-LAB)

Simon Trans Ltd. carries out quality control of parts for automotive companies before delivery. The problem that needs support is that cast iron parts can rust due to overseas transportation and this corrosion of parts can be caused by inadequate packaging (poor quality pallets, non-vacuum packing). Rusty parts should not be allowed to enter into production and sorting during production or setting aside rusty parts would significantly affect production efficiency and

would entail additional storage and handling costs. To reduce these costs, sorting before production is necessary.

The aim is to replace repackaging workers currently working with visual inspection with an AI solution using image recognition to improve the quality, speed and accuracy of pre-production quality control.

Pre-production quality control, sorting and reworking of incoming parts reduces waste, energy used and also our and our partners' carbon footprint in the following process:

- by increasing the efficiency of the production line through quality control, there will be no unusable raw material on the production line, which can then run continuously, resulting in no energy wastage
- after reprocessing, the unusable product becomes usable, thus eliminating the waste of raw materials
- there is no need to return reject products

More information:
https://simontrans.hu/hu/

4.3.1. Republic of Serbia

IO-Recycle – AI-powered waste management

Bitgear Wireless Design Services

Waste management faces significant challenges worldwide, from inefficient collection processes to the rising costs associated with overflowing bins and poorly timed waste collection routes.

Traditional methods often rely on fixed schedules and manual inspection, leading to unnecessary collections, increased operational expenses, and higher CO_2 emissions due to excessive truck routes. Furthermore, improper waste separation and recycling contamination contribute to environmental harm.

Bitgear addressed these issues by developing the IO-Recycle solution, powered by an IO-Eye - a camera-based multisensor IoT device for monitoring waste containers. The challenge was to create a system that could intelligently assess fill levels, detect improper waste disposal, and provide real-time insights to optimize waste collection processes.

Their approach involves using advanced AI algorithms for image processing on the server side (of photos captured by the IO-Eye). The device takes high-quality snapshots of waste containers,

and our AI automatically analyses the fill levels and even assesses the quality of recycling efforts. This enables waste management companies to move away from fixed schedules and adopt dynamic, data-driven collection strategies, improving operational efficiency and significantly reducing unnecessary collections.

The results of implementing IO-Recycle are clear: optimized collection routes, reduced operational costs, and lower environmental impact. Waste management companies using IO-Recycle benefit from fewer truck rolls, reduced fuel consumption, and a more efficient use of resources.

Additionally, the system helps in improving recycling rates and reducing contamination by providing actionable insights on the quality of waste separation.

With IO-Recycle, Bitgear has proven that smart, AI-powered waste monitoring not only solves logistical challenges but also supports sustainability efforts, making waste management more efficient and eco-friendly.

More information:
www.bitgear.com

Intelligent design and construction of self-sustaining houses

Cosmic Buildings D.O.O.

The problem of designing and constructing self-sustaining houses is driven by the need to reduce environmental impact, minimize resource consumption, and create resilient, efficient living spaces. Traditional homes are often dependent on non-renewable energy sources, inefficient resource management, and outdated construction techniques, contributing to high carbon emissions and unsustainable practices. As climate change and resource scarcity become more pressing, there is an urgent need to integrate advanced technologies like robotics and artificial intelligence (AI) into the design and construction process to create intelligent, self-sustaining homes.

The approach involves a combination of smart design, robotics, and AI to optimize every aspect of home construction and operation. AI-driven systems can manage energy use by learning patterns of usage and adjusting heating, cooling, and lighting to minimize waste. Robots can be used for precision construction, reducing material waste and speeding up the building process while ensuring high-quality results. These homes integrate renewable energy sources, such as solar panels. Water management systems can also be optimized by AI, ensuring efficient use of collected rainwater and greywater recycling.

The value achieved by integrating robots and AI into the construction and operation of self-sustaining homes is substantial. Homes become more energy-efficient, leading to significant reductions in utility costs and carbon emissions. The use of robotics in construction increases precision, reducing waste and lowering overall construction costs. AI enhances the living experience by creating a home that learns and adapts to the occupants' habits, providing both comfort and efficiency. Ultimately, this approach not only contributes to environmental sustainability but also improves the quality of life for residents by offering intelligent, responsive, and efficient living environments.

More information:
https://www.cosmicbuildings.com/

Neuroergonomic workstation – Optimizing working conditions

ICEF - Innovation Center of the School of Electrical Engineering in Belgrade ltd

The solution enables better predictability and human-centred optimization of processes which include human labour. It includes modules for:

- Assessment of workers' physical states
- Assessment of workers' psychological (mental) states
- Physical support
- Non-physical support
- Strategic support based on domain expert systems, data analytics and IoT technologies.

These modules feature functionalities which enable worker to have optimal working conditions, while simultaneously serving for faster training and skill upgrade. Monitoring stress levels of workers while performing their tasks enables engagement in work activities based on their individual capacities and capabilities. To the company, these functionalities enable predictability of the production indices and better management of their resources.

More information:
https://www.ic.etf.bg.ac.rs/

4.3.2. Slovakia

brAIn – Intelligent energy management systems

FUERGY Industries j.s.a.

Fuergy is a Slovak company focused on optimizing energy usage and increasing efficiency through advanced technology. They offer innovative solutions for smart energy management, leveraging artificial intelligence (AI) to tackle pressing challenges in the energy sector. Fuergy specializes in providing intelligent energy management systems. Their flagship product, brAIn, is an AI-powered platform designed to optimize energy consumption, storage, and distribution. They offer solutions for both businesses and residential users, aiming to reduce energy costs, maximize the use of renewable energy sources, and improve grid stability. AI plays a crucial role in Fuergy's services. Their AI algorithms analyse real-time data on energy consumption, weather conditions, and market prices to predict energy needs and optimize usage. The brAIn platform integrates with various energy sources, including solar panels and batteries, to ensure efficient energy distribution and storage. By continuously learning and adapting, the AI system helps users achieve optimal energy efficiency and cost savings. Fuergy is at the forefront of smart energy management, using AI to create sustainable, cost-effective, and efficient energy solutions. Their innovative approach is helping to transform the energy landscape in Slovakia and beyond.

More information:
https://www.fuergy.com/
https://www.fuergy.com/references

Premium custom-designed electric batteries and specialist OEMs within the automotive, commceical vehicle, motorsport and aerospace sector

InoBat j.s.a.

InoBat is a Slovak company specializing in advanced battery technology and energy storage solutions, catering to industries such as automotive, aerospace, and energy systems. Their primary product, the InoBat 1 battery, exemplifies their innovative approach. InoBat's services include custom battery design, battery production, R&D, and testing and validation. They leverage artificial intelligence (AI) to enhance these services, optimizing battery design, improving manufacturing processes, and predicting battery performance under various conditions. InoBat addresses critical issues in the energy sector, including limited battery performance, high production costs, environmental impact, and the need for customized solutions. They enhance battery energy density, lifespan, and safety through advanced

chemistry and AI-driven processes. AI helps reduce production costs by optimizing manufacturing efficiency and precision. Their focus on sustainability ensures environmentally friendly battery technologies, reducing the carbon footprint. InoBat also provides tailored battery solutions to meet the specific needs of diverse industries. The benefits of InoBat's innovative solutions include enhanced battery performance with higher energy density and longer lifespan. Cost efficiency is achieved through AI-optimized production, leading to more affordable batteries. Their commitment to sustainability reduces environmental impact by using green technologies and materials. Customized battery solutions ensure optimal performance for specific applications, delivering better outcomes for clients. InoBat's integration of AI and dedication to innovation positions them as a leader in the energy storage industry, driving advancements that promise to transform the sector.

More Information:
https://www.inobat.eu/
https://www.inobat.eu/newsroom/

Robotic guidance and automation: Bin picking solutions

Photoneo s.r.o.

Photoneo is a leading provider of robotic vision and intelligence. Based on a patented 3D technology, Photoneo developed the world's highest-resolution and highest-accuracy 3D camera, thus unlocking the full potential of powerful, reliable, and fast machine learning and also reducing the training and deployment time. By bringing intelligent robots into the field, Photoneo helps companies mainly in the automotive, logistics, e-commerce, food, and medical industries to improve the performance and efficiency of their manufacturing, fulfilment, and assembly processes. Photoneo integrates artificial intelligence into its services to enhance the performance and capabilities of its products. AI algorithms are employed to analyse and interpret the data captured by 3D scanners, enabling more accurate and reliable object recognition and positioning. In robotic guidance, AI enhances the robots' ability to adapt to dynamic environments and perform tasks with minimal human intervention. The use of machine learning allows Photoneo's systems to improve over time, continuously refining their performance based on accumulated data.

More information:
https://www.photoneo.com/
https://www.photoneo.com/testimonials

MicroWire sensing system

RVmagnetics, a.s.

RV Magnetics is a Slovak company specializing in the development and application of magnetic sensor technologies. The company focuses on providing advanced solutions for various industries, leveraging their expertise in micro- and nano-magnetic sensors. Their key services include the design and production of magnetic sensors that offer precise measurement and monitoring capabilities for applications in healthcare, automotive, aerospace, and industrial automation. A core aspect of RV Magnetics' services is the integration of Artificial Intelligence (AI) to enhance their sensor technology. AI algorithms are utilized to process and analyse the vast amounts of data collected by the sensors, enabling real-time monitoring and predictive maintenance. This integration allows for more accurate diagnostics and efficient decision-making processes, addressing critical challenges in various sectors. The primary problem RV Magnetics addresses is the need for highly sensitive, reliable, and accurate sensing solutions in environments where traditional sensors fall short. Their sensors are designed to operate in extreme conditions, providing essential data on parameters such as temperature, pressure, and magnetic fields. These capabilities are crucial for applications requiring high precision and reliability, such as monitoring the structural integrity of aircraft, ensuring the safety of automotive systems, or optimizing the performance of industrial machinery. RV Magnetics' solutions include their flagship magnetic sensors, which are embedded into materials or devices to continuously monitor critical parameters. The data from these sensors is then analysed using AI-driven software, offering insights that help predict failures, optimize performance, and reduce downtime. This predictive maintenance approach is particularly beneficial in industrial settings, where it can prevent costly breakdowns and extend the lifespan of equipment. The benefits of RV Magnetics' solutions are manifold. Their sensors provide unmatched sensitivity and accuracy, even in harsh conditions, making them ideal for demanding applications. The AI integration allows for proactive maintenance strategies, reducing the likelihood of unexpected failures and enhancing overall operational efficiency. Additionally, the use of these advanced sensors leads to significant cost savings by minimizing downtime and maintenance expenses.

More information:
https://www.rvmagnetics.com
https://www.rvmagnetics.com/partners

Advanced digital twin technology with AI-driven analytics

SOVA Digital a.s.

Sova Digital is a Slovak company specializing in digital transformation and Industry 4.0 solutions. They offer a wide range of services designed to enhance the efficiency and productivity of manufacturing and industrial processes. Their core services include digital twin technology, industrial automation, and smart manufacturing solutions. One of the key areas where Sova Digital excels is in the application of Artificial Intelligence (AI) to their services. They leverage AI to solve complex industrial problems, such as predictive maintenance, quality control, and process optimization. By integrating AI, Sova Digital helps companies predict equipment failures before they occur, thus minimizing downtime and maintenance costs. Sova Digital's solutions are centred around the creation and utilization of digital twins - virtual replicas of physical assets. These digital twins allow for real-time monitoring and simulation, providing valuable insights into the performance and potential issues of machinery and processes. By using AI to analyse data from these digital twins, Sova Digital can optimize production processes, improve resource allocation, and enhance overall operational efficiency. The benefits of Sova Digital's solutions are substantial. Companies adopting their services experience reduced operational costs, increased productivity, and improved product quality. Additionally, the predictive maintenance capabilities significantly extend the lifespan of equipment and reduce unplanned downtime. Overall, Sova Digital's innovative application of AI in industrial settings positions them as a leader in the digital transformation landscape, driving forward the efficiency and competitiveness of their clients.

More information:
https://sova.sk
https://sova.sk/referencie/

4.3.3. Slovenia

Kolektor digital – AI-driven predictive maintenance solutions

Kolektor d.d.

Kolektor Digital, part of the larger Kolektor Group, offers AI-driven predictive maintenance solutions for manufacturing. Their platform uses machine learning to analyse data from sensors embedded in industrial equipment, predicting failures before they occur and optimizing maintenance schedules. This reduces downtime, lowers costs, and extends the life of machinery.

More information:
https://www.kolektor.com/digitalizacija

5. Conclusion

The Danube Region, encompassing parts of Central and Eastern Europe, is witnessing a transformative wave driven by Artificial Intelligence (AI). This technological advancement is reshaping various sectors, including health, manufacturing, and agri-food. The integration of AI in these fields promises enhanced efficiency, innovation, and sustainability. However, it also brings forth challenges that need to be addressed to fully harness its potential.

The diverse AI and digital transformation efforts across Europe all share the following goals: establishing technology for sustainable growth, creating societal well-being, and ensuring economic competitiveness. These initiatives focus on transforming healthcare, promoting sustainable agriculture, and driving innovation in manufacturing. Countries are making significant investments in AI to boost productivity, innovation, and competitiveness, particularly in the sectors already mentioned in this project.

Advanced technological solutions are also revolutionizing healthcare delivery, improving patient engagement, increasing accessibility, and optimizing resources, thereby ensuring resilient and adaptable healthcare systems. Thus, Artificial Intelligence is significantly transforming the health sector in the Danube Region. AI applications in healthcare include diagnostics, personalized medicine, and patient care management. AI algorithms are being used to analyse medical images, predict patient outcomes, and optimize treatment plans. However, the integration of AI in healthcare must prioritize ethical considerations and data privacy to ensure trust and effectiveness.

In agriculture, the integration of AI, IoT, and automation is empowering farmers to enhance productivity, conserve resources, and better adapt to climate challenges. These advancements are crucial for establishing sustainable agricultural practices and aligning with environmental goals at the European level. AI is being used to improve crop management, livestock monitoring, and supply chain efficiency. Technologies such as precision farming, which utilize AI for data-driven decision-making, are helping to increase productivity and sustainability.

Similarly, the manufacturing sector is embracing these technologies to improve real-time monitoring, predictive analytics, and resource allocation. AI technologies such as machine learning and collaborative robotics are being employed to enhance production processes, improve quality control, and reduce operational costs. The adoption of AI in manufacturing is leading to smarter factories with predictive maintenance, automated quality inspections, and optimized supply chains. This also supports sustainable production practices and enables manufacturers to remain competitive in the global market.

A strong focus is placed on supporting small and medium-sized enterprises (SMEs) and improving digital skills. Funding programs and educational initiatives enable SMEs to adopt

advanced technologies and upskill their workforce, preparing them for an AI-driven future. Additionally, cross-border collaborations are fostering innovation ecosystems and aligning regional strategies with broader EU objectives, strengthening Europe's position as a leader in technological advancement.

Overall, the introduction and use of AI in these sectors in the Danube region are promising, as they offer significant benefits in terms of efficiency, productivity, and innovation. However, it is essential to address ethical, data privacy, and regulatory challenges to fully realize the potential of AI.