Ulysseus R&I Conference 2025

Navigating Pathways: Digital Transformation of Industry

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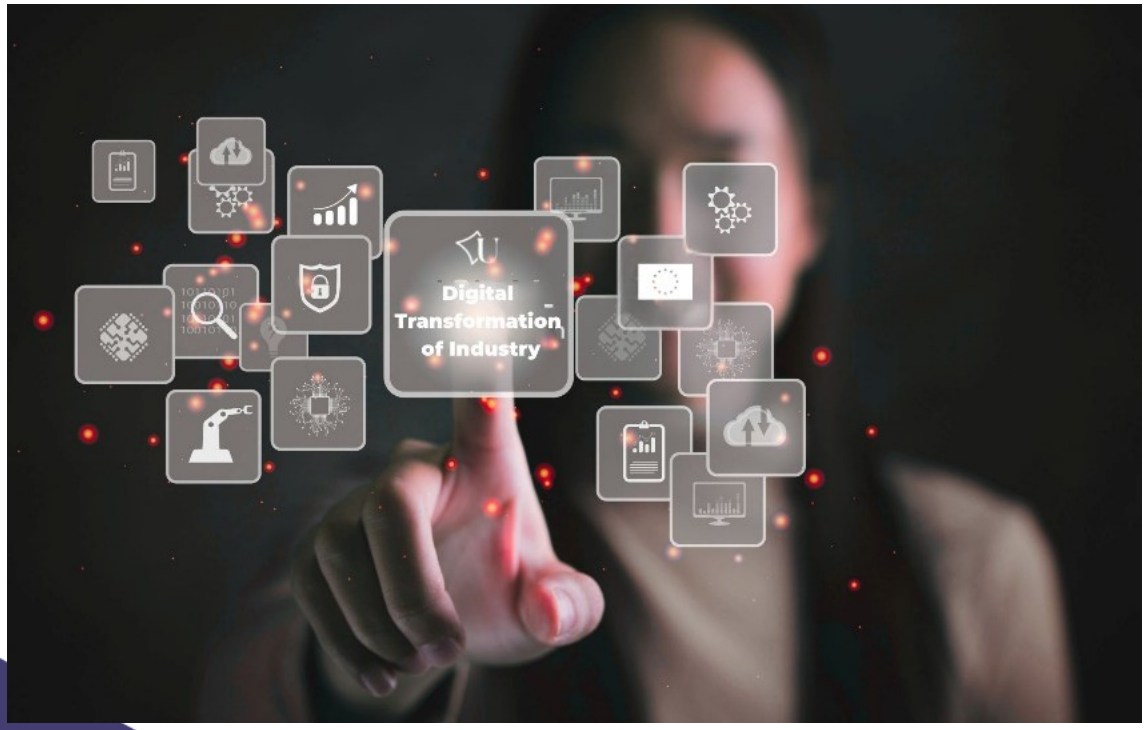

Abstracts for Parallel Sessions

Ulysseus
EUROPEAN UNIVERSITY

Contents

Parallel Sessions

Track 1: Digital Transformation of Industry

Session Chair: Laura Gaggero (University of Genoa)

Leveraging Agentic AI for Automated, Trustworthy Report Generation

Umair Ali Khan (Haaga-Helia University of Applied Sciences)

Abstract: The widespread adoption of AI in businesses has created many opportunities to automate complex business processes. Through our AI consultancy work in the Finnish AI Region (FAIR) project (https://www.fairedih.fi/en/frontpage/) and collaborative research with companies across diverse sectors (https://www.haaga-helia.fi/en/rdi-projects/gaik), we have observed a rapidly growing interest in the use of Generative AI for innovative, high-impact applications. Businesses are increasingly turning to this technology to boost productivity, accelerate workflows, reduce manual effort, and achieve significant competitive advantages.

In particular, over the past year, our interaction with businesses has revealed a growing trend in using AI for the automated creation of business documents, including sales proposals, tender submissions, site inspection reports, order confirmations, and compliance reports. These documents often rely on information from multiple sources, such as customer documents and communication, third-party documents, and the company's internal guidelines, price structures, equipment specifications, and other rules. For simplicity, we call this task "automated report generation," which usually involves collecting information from multiple sources that can be in different formats, such as emails, transcripts, PDFs, spreadsheets, audio recordings, and images. The information is then compiled into a predefined report template. This process is usually laborious and time-consuming, especially for large enterprises that generate multiple reports on a routine basis. While Generative AI holds potential for automating this process, the main challenge lies in ensuring that the generated reports are accurate, reliable, and aligned with internal standards, with minimal editing or correction required by a human expert. In this talk, I will explain a practical example of a Generative AI workflow for automated report generation. This approach uses an agent-based AI framework to parse documents from multiple sources, build data extraction models, and use a large language model for information extraction with these data models. A verification-revision cycle involving generator and reviewer agents ensures the outputs are consistent with predefined templates and standards. The talk will demonstrate how businesses can use AI to automate their report generation processes efficiently and with minimal human involvement, paving the way for smarter, faster, and more agile business operations.

AI Regulation in Motion – Expert Views and Practical Reflections for SMEs

Elisa Laatikainen (Haaga-Helia University of Applied Sciences)

Abstract: This presentation sheds light on the current state of AI regulation through the lens of regulatory experts. Rather than offering a general overview of laws like the AI Act, GDPR, or NIS2, the focus is on real-world insights into why AI regulation is so complex right now, and how small and medium-sized enterprises (SMEs) can still approach it proactively and effectively.

As the regulatory landscape is in motion, several overlapping frameworks are being developed and implemented in parallel, creating uncertainty for those trying to understand their roles, obligations, and risks. Information is scattered, regulatory timelines vary, and interdependencies between legal instruments add to the complexity.

This presentation highlights why these conditions are especially challenging for SMEs, and why responding to them requires not only legal interpretation but also practical judgement, shared understanding, and the ability to act under uncertainty.

Algorithmic Governance and Digital Legitimacy: AI-Driven Strategic Recovery in the Global Airline Industry

Jeisson Alexander Higuera Reina (University of Seville)

Abstract: The post-pandemic era has revealed striking asymmetries in the strategic recovery of global airlines. Firms operating under similar economic conditions have demonstrated radically different resilience trajectories. This research addresses a critical frontier in the digital transformation of industry: how can Artificial Intelligence (AI) evolve beyond operational efficiency to serve as a dynamic capability for strategic decision-making under institutional and cultural constraints? This study introduces the concept of Algorithmic Governance, positioning AI not merely as a technological asset, but as a contextually embedded capability enabling optimized, real-time strategic responses. Using a longitudinal dataset of over 3,400 airlines between 2019 and 2023, the research integrates supervised machine learning with cultural and institutional variables drawn from Hofstede, Schwartz, GLOBE, and World Bank indicators.

A novel framework, "Contextually Embedded Dynamic Capabilities," is developed, demonstrating that AI's strategic value is not universal but is significantly moderated by national contexts. Institutional quality (e.g., regulatory effectiveness, economic openness) and cultural traits (e.g., uncertainty avoidance, collectivism) condition the legitimacy, adoption, and performance outcomes of AI-based strategies. Crucially, this research explores Explainable AI (XAI) as a mechanism for fostering digital legitimacy. In high uncertainty-avoidance cultures, demand for algorithmic transparency is amplified, making XAI essential for stakeholder trust and effective implementation. The study models how explainability enhances cooperation strategies (e.g., codeshare alliances), particularly in regions where digital skepticism is high and regulatory scrutiny is intense. The findings challenge one-size-fits-all paradigms in digital transformation, offering a scalable AI governance model tailored to contextual realities. This work contributes methodologically by combining predictive analytics, social network theory, and institutional analysis, and practically by equipping decision-makers with evidence-based tools to align AI deployment with national governance and cultural logics.

Ultimately, the study bridges digital innovation and institutional theory, showing how intelligent systems can enhance resilience in complex, global industries. It offers a replicable, theory-driven roadmap for embedding AI in strategic recovery processes, making industrial digital transformation not only smarter, but also culturally and institutionally responsive.

The Path to General Intelligence: Understanding Current AI and Its Limits

Juraj Gazda (Technical University of Košice)

Abstract: The talk outlines the evolution of AI from narrow, task-specific systems to self-learning large language models (LLMs), highlighting their uneven "jagged" performance across tasks. It promotes a neuro-symbolic and agentic paradigm, where LLMs act as reasoning cores delegating structured and verifiable computations to specialized tools, improving reliability and precision. It further presents Retrieval-Augmented Generation (RAG) as a key method for grounding models in private and context-specific data, with a reranker refining retrieval results for factual accuracy. Practical business use cases include customer support, data analytics, and decision automation. The talk underscores the importance of our vision for multi-agent systems, where orchestrated, specialized AI agents collaborate to achieve scalable, trustworthy, and adaptive intelligence across enterprise and research domains.

Digital transformation - the Misalignment Between Supply and Demand

Frédéric Mallet (University Côte d'Azur)

Abstract: Artificial Intelligence (AI), whether symbolic or statistical, is rapidly permeating all digital-based decision-making processes across various sectors of society. This trend mirrors the quiet and unnoticed proliferation of digital systems a few decades ago. One major difference is that while deploying a computer program was previously limited to specialists, AI is now widely deployed by non-specialists using tools made available to all, often without necessary explanations on how to use them, what they can do, and most importantly, what they cannot do. AI is essential for managing the vast amounts of data that exact and deterministic methods or manually engineered heuristics cannot usually handle. However, the widespread adoption of these technologies without guarantees of their trustworthiness, optimality, or ethical compliance is a significant concern. Criteria other than decision-making speed must be considered. Our research unit, comprising nearly 300 staff members, covers almost all domains of computer science, with a substantial focus on digital image and signal processing, and applications in many domains such as sports, art, law, health, literature, and politics. Just like in many other scientific fields, AI methods have quickly spread within our unit. This presentation will survey some of these activities while highlighting potential issues that require careful attention.

Track 2: Universities as a Driving Force of Digital Innovations

Session Chair: Constantina Rokos (University of Münster)

Empowering Digital Leaders through BIPs and COILs: Good Practices for Global Skills Development in Higher Education

Juan Luis Blanco Guzmán (University of Seville)

Abstract: In an increasingly interconnected world, higher education institutions are facing the challenge—and the responsibility—of preparing students to thrive in global, digital environments. This proposal explores practical strategies and successful experiences in developing international and interdisciplinary learning ecosystems through Erasmus+ Blended Intensive Programmes (BIPs) and Collaborative Online International Learning (COIL) initiatives.

Based on real examples implemented within the Ulysseus European University alliance, we present how BIPs and COILs serve as powerful platforms to connect students, teachers, and institutions across borders. These projects combine digital tools with international collaboration, enabling learners to develop essential skills such as digital communication, intercultural competence, problem-solving, and teamwork—critical abilities for the next generation of digital leaders and professionals. The session highlights a set of co-designed and project-based experiences developed in fields such as tourism, business, and digital innovation. In each case, students engaged in international teams to solve real-world challenges using emerging technologies, including AI, extended reality, and location-based services. The outcomes show a measurable impact not only in digital literacy but also in fostering inclusive and entrepreneurial mindsets. We will also discuss the pedagogical and institutional frameworks that support the success of these initiatives, including the integration of mobility, flexible assessment, and collaboration with external stakeholders. The presentation offers a practical roadmap for other universities wishing to implement similar models and overcome barriers such as institutional inertia, digital inequality, or lack of international partnerships.

By focusing on the role of universities as drivers of digital innovation and cross-border cooperation, this contribution aligns with Track 2 of the Ulysseus R&I Conference 2025: “Universities as a Driving Force of Digital Innovations.” Ultimately, it seeks to inspire the higher education community to embrace challenge-based, international learning as a cornerstone in shaping the future of education.

Digitalisation as a Driver of Internationalisation in University-Based Teacher Education: Exploring Challenges, Opportunities and Models of Innovation in the Digital Era

Christine Schmider (University Côte d'Azur)

Abstract: Internationalising teacher education is a key challenge in today's globalised world and a strategic responsibility for European universities and political stakeholders. As diversity becomes a defining feature of societies across borders, initial teacher education must integrate international perspectives and transnational experiences into its structures and pedagogical models. Despite national differences in education policy, universities should develop collaborative and digitally supported approaches to prepare future teachers for heterogeneous classrooms and intercultural challenges. While teacher education often remains regionally focused, the post-COVID era has accelerated the emergence of digital pathways for embedding global perspectives. My presentation draws on a series of pedagogical initiatives that use digital tools to promote internationalisation "at home" in an inclusive, scalable, and profession-oriented way.A central element is a modular digital platform specifically designed for transnational virtual teacher education. It combines three interconnected components: 1. An open information portal to support visibility, transparency, and access to international networks and resources. 2. A closed cooperation hub for inter-institutional collaboration, curriculum design, and shared research. 3. A semi-open teaching and learning space to host virtual formats and foster collaboration between teacher educators and student teachers.This platform supports a range of digital international exchange formats such as e-tandems, COIL (Collaborative Online International Learning) projects, and Blended Intensive Programmes (BIPs). It also integrates a digital portfolio, enabling students to document their intercultural and professional learning outcomes and reflect on their development. Together, these tools and formats contribute to developing essential competences for future teachers: intercultural communicative skills, digital literacy, professional reflexivity, and collaborative problem-solving. The platform demonstrates how digital transformation can foster sustainable and practice-oriented internationalisation in university-based teacher education. This presentation will outline the platform's design principles, implementation strategies, and observed pedagogical impacts, offering a replicable model aligned with the goals of Track 2: universities as drivers of digital innovation

Technopolitics of AI: Challenges and Opportunities for Universities after the European AI Act

Jesús Sabariego (University of Seville)

Abstract: The strategic importance of AI for the future of universities is not just a regulatory issue. It is primarily an ontological question that challenges current concepts of knowledge and scientific research, as well as the ethical frameworks within which they are developed. It is necessary to discuss the role of universities in the face of the growing complexity of digital ecosystems and their interconnections. This is the work that several Latin American universities and the University of Seville have been developing, and which is now taking the form of the Erasmus+ Minerva proposal.

University-Led Educational Technology Incubators: Bridging Academic Innovation and Industry Digital Transformation

Belén Cisneros Juárez (University Côte d'Azur)

Abstract: The rapid evolution of digital technologies has created unprecedented opportunities for universities to transition from traditional knowledge production centers to active catalysts of industry transformation. This research presents the emergence and development of LADMI (Audiovisual, Design, and Interactive Media Laboratory) as a paradigmatic case study of university-led educational technology incubation, demonstrating how academic institutions can effectively bridge the gap between theoretical innovation and market-ready digital solutions. LADMI represents a novel model of interdisciplinary collaboration that integrates serious game design, learning analytics, and user experience research within a university-based innovation ecosystem. Emerging from academic coursework, the laboratory evolved from a single serious game project—"Kat & Norm: Guardians of Time"—into a comprehensive educational technology incubator serving Mexico's 34.8 million students. The initiative demonstrates how universities can leverage their inherent strengths in research, pedagogy, and social responsibility to create commercially viable solutions that address real-world educational challenges. The laboratory's approach integrates multiple digital technologies including gamification, interactive media design, and accessibility-focused development to create freely accessible educational resources. Through strategic partnerships with municipal and state governments, LADMI has developed a sustainable funding model that combines public scholarships, crowdfunding, and strategic alliances while maintaining its commitment to universal access to quality education. This research reveals critical insights into the scalability and replication potential of university-led incubators. The LADMI model addresses the Mexican educational technology market, valued at $635.7 million in 2022 and projected to reach $966.2 million by 2026, while simultaneously tackling digital literacy gaps in marginalized communities. The laboratory's interdisciplinary team structure, combining students, graduates, and faculty members, creates a sustainable pipeline for innovation that benefits both academic development and industry advancement. The findings demonstrate that university-led educational technology incubators can successfully balance commercial viability with social impact, creating a replicable framework for other institutions seeking to enhance their role in digital transformation. This model offers significant implications for higher education institutions worldwide, providing a pathway to become active contributors to the digital economy while maintaining their educational and social mission.

Ulysseus Teachers as Co-Creators of Pedagogical Innovation

Irma Kunnari (Haaga-Helia University of Applied Sciences)

Abstract: In today's rapidly evolving digital landscape, Ulysseus European University is committed to empowering learners and educators through transformative, future-oriented pedagogical practices. This presentation explores how Ulysseus fosters digital innovation in higher education by positioning teachers as co-creators of pedagogical transformation within a dynamic, international ecosystem. The Ulysseus Pedagogical Development Steering Group—comprising representatives from each Ulysseus partner university—has co-created the Ulysseus Pedagogical Guidelines, which provide a shared foundation for developing innovative, digitally enriched teaching practices across the alliance. Ulysseus offers educators a unique opportunity to collaboratively design and experiment with new pedagogical approaches. Teachers are encouraged to reflect on their evolving roles—not merely as knowledge transmitters, but as facilitators of active learning, learning designers, and collaborative innovators. This shift supports the creation of student-centred, competence-based, and authentic learning environments that respond to the demands of a globalised and technologically advanced society. The Ulysseus ecosystem provides a robust support structure for this transformation, offering access to international networks, professional development opportunities, and shared best practices. Teachers are invited to join from their unique starting points, contributing their expertise while learning with and from colleagues across institutions. This collaborative approach fosters a strong sense of belonging and inspires more engaging learning experiences for both students and educators. Key concepts such as digital bravery and an entrepreneurial mindset are central to this pedagogical evolution. Digital bravery encourages educators to experiment with emerging technologies, even without full mastery, while the entrepreneurial mindset promotes curiosity, co-creation, and iterative innovation. These qualities empower teachers to design adaptive, relevant, and inclusive learning experiences. Ulysseus pedagogical ecosystem promotes a continuous journey of professional growth, where collective strength emerges from shared expertise and collaboration. By embracing this model, Ulysseus contributes to the development of digital leaders and coaches, supports innovation ecosystems, and strengthens partnerships across academia, industry, and society.

Unlocking the Invisible Museum: Digital Innovation and Policy Advocacy in the Protection of Adriatic Underwater Heritage

Darko Kovacevic (University of Montenegro)

Abstarct: The Adriatic Sea contains a vast collection of historical remains, forming an invisible museum largely inaccessible to the public. Through technological research and multilateral cooperation, universities are emerging as pivotal forces in driving digital innovation and shaping policy for cultural heritage protection. A compelling case study of the University of Montenegro shows how its leadership of the multilateral Interreg-funded Wrecks4All project catalyzed a systematic transformation in the awareness, documentation, and protection of the country's Underwater Cultural Heritage (UCH). Through a comprehensive, methodologically grounded approach, the University of Montenegro team conducted a project focused on digital documentation and public outreach to communicate the value of UCH and the necessity of its preservation. The project leveraged advanced technologies, including remote sensing, 3D photogrammetry, Virtual and Augmented Reality, GIS,

and mobile applications, to create an unprecedented means of engagement with previously inaccessible sites. This process culminated in the establishment of a Virtual Reality showrooms, which made UCH accessible to the public, and the creation of a GIS digital inventory. This inventory serves as a crucial informational and management tool for informed decision-making and the formal legal protection of submerged resources. Through attractive VR scenarios and 3D digital twins of UCH, the Wrecks4All project's strategic objective was to influence policy and institutional behavior. Stakeholder engagement and capacity-building activities empowered national institutions to adopt digital technologies and consider aligning domestic legal frameworks with international standards. This project led to the establishment of a dedicated academic research unit at the university, focused on the digital preservation of heritage sites, thereby ensuring the initiative's sustainability. The project demonstrates how digital tools can be used both for scientific research and as a dynamic mechanism for policy advocacy and the long-term stewardship of cultural resources, fostering a proactive and sustainable system for UCH management.

Track 3: Sustainability of Digitalisation

Session Chair: Tobias Gumbert (University of Münster)

The Ulysseus Pedagogical Framework for Sustainable Digital Education

Djibril Dieng (University Côte d'Azur), Kirsi Korkealehto (Haaga-Helia University of Applied Sciences), Lyuba Stafyeyeva (Management Center of Innsbruck)

Abstract: In the era of rapid technological change, higher education must prepare graduates for real-world innovation. Given the uncoordinated nature of innovation and the varying levels of teacher preparedness, the Ulysseus Pedagogical Guidelines bridge this gap. This presentation introduces the Ulysseus Pedagogical Guidelines, which is a forward-thinking framework co-created by eight European universities forming the Ulysseus University Alliance. These guidelines positions universities as catalysts for the digital transformation of education.

Firmly grounded in practice, the framework supports educators in designing digitally enhanced, sustainability-driven learning environments that develop the competencies most needed in today's education and research ecosystems. Built around four foundational pillars - inclusive student-centredness, competence-based alignment, authentic real-world problem-solving, and ethical digital transformation - the guidelines enable a systemic shift from traditional teaching to innovation-oriented education. At the core of the model is the concept of 'digital bravery,' which empowers educators to responsibly integrate emerging technologies like Generative AI while maintaining a focus on critical thinking, inclusivity, and ethical standards. The framework transforms teaching roles into those of facilitators, learning designers, and co-creators of knowledge, aligning academic learning with the evolving demands of digitally transforming industries. The session highlights how pedagogy, particularly digital pedagogy, is fundamental for immersive, challenge-based learning opportunities where students address sustainability, digitalisation, and social innovation. These collaborations mimic real-world settings, preparing students to navigate complexity and apply interdisciplinary skills directly in professional environments. Attendees will gain insights into our nine-phase learning design process, i.e., a structured and replicable approach that helps educators build and continuously refine digitally aligned courses. Early implementation across the Ulysseus Alliance has resulted in several Collaborative Online International Learning (COIL) experiences, enhancing student engagement and digital fluency across Europe. This presentation will share concrete strategies, real examples, and transferable tools to help build stronger and more engaging learning experiences for higher education students. Educators, researchers, and innovators will leave with actionable ideas to drive educational innovation within the broader agenda of Europe's digital and sustainable transformation.

From Atoms to Algorithms: Predicting Material Lifetime for a Sustainable Energy Transition

Maroš Halama (Technical University of Košice)

Abstract: The prediction of time-dependent and strong non-linear events in material science, where we can achieve high quality, and robust big data belongs to perspective applications of artificial neural networks. Atmospheric corrosion as one of

the major industrial problem in different sectors form architecture, engineering to environmental applications of advanced metallic materials, common used metals and alloys typically exhibits strong non-linear dependence on several factors governed by the type of material, surface morphology, microstructure, chemical composition, type of application, and by a series of climatic and pollution data such as temperature, relative humidity, pH of rainfall, amount of precipitation and concentration of main pollutants in atmosphere and contaminants in soil and rivers. This contribution is part of newly formed joint research and innovation clean smart energy group from TUKE and Uni Sevilla focused on advanced materials and techniques, covering also artificial neural networks (ANN) for modelling scenarios for assessment not only phenomenon of atmospheric corrosion of carbon steel, zinc, copper and aluminium but also for prediction of life-time of metallic materials and coatings used in batteries, fuel cells etc.

Public Acceptance of Renewable Energies: The Case of Battery Technologies

Antonia Graf (University of Münster)

Abstract: Batteries are a key technology for energy storage in the transition from fossil fuels to renewable energies. At the same time, the degree of their social and environmental sustainability is up for discussion and potentially conflicts with the normative goals of the transformation. In other words, the status of batteries is controversial. In addition to the technical challenges and opportunities, questions of political and economic acceptance could tip the scales for or against energy storage technologies. This is not only the case when households decide for an electric car or a heat pump, but also when strong or weak environmental policies are subject to the favor of voters which demand environmentally friendly policies or 'punish' politicians, parties, and governments by withdrawing their individual votes in elections. From the perspective of transformation research, the question arises how citizens view batteries, what perspectives on sustainability exist, and what influence they might have on the acceptance of the energy transition. While here are numerous (empirical) acceptance studies for wind energy, solar energy, or biofuels, there are hardly any studies on battery technologies – although they are a key technology. The present study addresses this research gap and would like to better understand the place of storage technologies in the debate. Based on in-depth focus group interviews conducted with citizens in Germany, results are presented on current assessments, topics and opinions related to the acceptance of battery technologies among citizens. The paper is thus dedicated to a topic that is rarely addressed by social science and aims to provide impetus for the user-centered debate on social ecological transformation.

Discussions and Examples of the Possible Boons of Digitalization for Developing Sustainable Solutions and Increasing Efficiency in Energy and Biodiversity Management

Erwin Franquet (University Côte d'Azur)

Abstract: Though a potential of increased carbon footprint that must be really acknowledged and taken into consideration especially in the final balance on the utility of any solutions digitalization offers a huge potential to further improve the efficiency of energy management or to foster the use of numerical tools allowing the participation of various and diverses types of people and communities. This talk will try to pave the way for innovative and efficient use of digitalization through real examples and perspectives for future research projects. The role of simulations and intelligent systems will be demonstrated at the individual scale and at buildings' scale for both energy managers and maintenance/repair workers/technicians but also on the case of a digital tool supporting the development and dispersion onto market of eco-friendly building materials. Then possible applications and research topics will be proposed and discussed with a specific focus towards the inclusion of social and human sciences as well as artistic approaches to promote more efficient and robust solutions.

Finally all these examples will be accompanied by a sustainability analysis either in term of carbon footprint of life cycle assessment or in term of biodiversity analysis.

Empowering Industry in the Digital and Green Transition: Insights from Innovation Interactions with SMEs

František Janke (Technical University of Košice)

Abstract: The twin transition toward a greener and more digital economy presents both a challenge and an opportunity for small and medium-sized enterprises (SMEs). While many SMEs recognize the urgent need to innovate, they frequently encounter barriers related to knowledge, capacity, and access to appropriate tools. Based on sectoral mappings, surveys, and pilot implementations in the areas of circular design, sustainable business models, material innovations, and increased efficiency, let's gain a clearer understanding of transition dynamics and adoption patterns, as well as inspiration to rethink how impact-driven tools can facilitate meaningful change in the industry.

More Information

Confernce Page: https://ulysseus.eu/events/navigating-pathways-digital-transformation-of-industry-conference-2025/

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