

***Balancing innovation and humanity:  
Ethical reflections on technological advancements  
in organizations.  
Introduction to the special section.***

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*For progress there is no cure.  
Any attempt to find automatically safe channels for the present explosive  
variety of progress must lead to frustration.  
The only safety possible is relative,  
and it lies in an intelligent exercise of day-to-day judgment.  
(von Neumann, 1955: 672)*

In 1955, one of the most renowned mathematicians of the twentieth century, John von Neumann, posed the question, “Can we survive technology?” This question stemmed from his recognition that the ever-increasing pace of technological progress was bound to transform society, bringing with it benefits and unknown risks in the long term. While we can foresee the immediate advantages of progress, the potential threats that may arise from its global proliferation remain speculative.

In 2024, nearly 70 years later, technologies have evolved significantly, but von Neumann’s question remains as fundamental as ever. While his reflections centred on climate control, automation, and nuclear technologies, our modern concerns are focused on artificial intelligence (AI) and its profound yet enigmatic impact on our way of life (The Economist, 2023).

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This question is especially crucial for researchers in the fields of business and organizational sciences, where technology and innovation find fertile ground for development and application (Martinez, 2020; Scarbrough, Chen, and Patriotta, 2024). As observers of these phenomena within markets and organizations, we often contend with an unclear vision of their evolution and impact. However, there are times when this ambiguity becomes particularly unsettling, as the unknown begins to overshadow the known, and the uncertainty associated with innovation feels too overwhelming to be easily tolerated.

It was with this sense of urgency that, during the 2nd Conference of Research in Entrepreneurship, Education, and Technology (CREET), held on May 23–24, 2024, at the University of Cagliari (Sardinia), we organized a symposium titled “Ethical Issues in Technology: Implications for Entrepreneurship and Education.” The CREET Conference is designed to foster global academic collaborations across regions, continents, and disciplines, focusing on the intersection of three vital topics: entrepreneurship, education, and technology. It provides an ideal international forum for researchers and educators to engage in scholarly debates on issues that traverse these interconnected fields. In this case, we have highlighted a set of relevant organizational implications stemming from technological advancements, which will be addressed by all contributions selected for this symposium.

The focus of this year’s symposium was to explore the implications of technological advancements on entrepreneurship and organizations. The aim was not merely to highlight critical issues but to build bridges that guide these advancements toward ethical and acceptable frameworks and projects. In doing so, we drew inspiration from Butera’s (2017) argument to shift the focus from technology itself to the design of organizations and work systems. Accordingly, we aimed to address the challenge of embracing technology without succumbing to fear or anxiety about transformation, striving to find a balance between two dominant perspectives: optimism and alarmism (Bruni, Miele, Pittino, and Tirabeni, 2020; Martinez, 2020).

Our approach involved initiating a multidisciplinary debate with experts from various fields. Specifically, we gathered four contributions from researchers who engage with technology to develop new opportunities and possibilities. Informaticians help us understand the technical frontiers technologies based on AI are opening to our future as individuals and organizations. Conversely, philosophers helped us reflect on the meaning of acceptable frameworks and projects, while organizational scholars examined how new technologies could be integrated with human systems. This

exploration proved invaluable, as it allowed us to consider how, day by day, we can use and integrate technological tools in ways that are meaningful and relevant to humanity and within boundaries that allow us to preserve the essence of what it means to be human.

In their work, Boi and Reforgiato, examine the integration of Large Language Models (LLMs), such as GPT-4, into humanoid robotics to enhance human-robot interaction. LLMs have transformed the field by enabling robots to process natural language, execute complex commands, and adapt to various user contexts. The proposed system leverages LLMs, robotic ontologies, and programmable platforms, with the NAO humanoid robot serving as a primary example. This integration allows robots to interpret natural language for specific actions, like “raise your left arm,” and to respond to general questions. It ensures real-time responsiveness and seamless communication, supported by ontologies that map linguistic inputs to robotic actions with precision. The system is designed to be scalable, making it applicable across fields such as healthcare, education, and eldercare. The document addresses challenges such as understanding nuanced language, maintaining context, and adapting to diverse scenarios. Future improvements include expanding ontologies, integrating advanced sensors, and further optimizing response times. This work highlights the potential for robots to evolve from task-specific tools into cognitive assistants, enhancing accessibility and usability for non-technical users. These changes and new opportunities will challenge organizational structures and cultures, prompting a rethinking of workspaces, procedures, and professional roles.

On the other hand, while opening new possibilities, it is essential to increase our awareness of the risks and challenges that also arise from technological advancements. Specifically, in the second contribution to this special section, Operto and Veruggio focus on the ethical, legal, and societal challenges posed by the rapid development of AI and robotics. As intelligent machines integrate into various aspects of life and organizations, they raise critical issues, from data privacy and bias to societal impacts like job displacement and organizational structure and design. The field of Roboethics, first proposed in 2002, seeks to address these challenges by applying ethical frameworks to robotics, focusing on human-centered principles such as transparency, accountability, and respect for human agency. The text highlights key developments, including the integration of deep learning and machine learning, which enhance robots’ decision-making and adaptability. However, this progress raises concerns about biases in AI, privacy risks, and the ethical implications of robots’ autonomy and human-

like behaviour. The document also outlines international responses, such as the European AI Act and ethical guidelines like ALTAI, aimed at ensuring trustworthy AI. These initiatives emphasize principles like fairness, transparency, and data governance. The importance of early ethical consideration in the design process - "Ethics by Design"- is emphasized to prevent harm and foster societal trust. Looking ahead, the Operto and Veruggio's work underscores the need for collaborative efforts across disciplines to establish a shared ethical framework for robotics, balancing innovation with the protection of fundamental human rights within organizational contexts.

In their work, Modarelli, Todisco, Rainero, and Mangia investigate the impact of emerging technologies, including Big Data, AI, and the Internet of Things (IoT), on public sector organizations, emphasizing the need to balance technological advancement with human-centric values. The authors introduce a framework inspired by personalism and generative grammar to examine the implications of these technologies on knowledge management, professional judgment, and organizational change. Specifically, they surveyed public sector employees to understand perceptions of financial and non-financial reporting systems and their informational value. Their findings reveal optimism about the positive influence of AI and Big Data on reporting but highlight concerns over comprehensibility and accessibility. Terms like "humanization," "simplification," and "transparency" emerge as critical for bridging the gap between data overload and meaningful information. Their result shows that emerging technologies are transforming the relationship between individuals and organizations, enabling automation and data-driven decision-making while raising the challenges of dehumanization. The study argues for a "new humanism" to redefine roles, promote ethical use of technology, and preserve human interpretative power. Big Data's increasing prevalence highlights the need for transparency, accessibility, and the humanization of data to create actionable insights. The paper emphasizes integrating human judgment into technological systems to ensure data supports decision-making effectively. It proposes using generative grammar as a theoretical lens to structure and interpret data meaningfully. The study concludes with a call for ethical frameworks that balance technological efficiency with human creativity and judgment, ensuring public sector organizations remain equitable and empathetic amidst digital transformation.

Finally, Callari, Operto, Hubbard and Lohse explore the ethical and societal challenges of integrating AI and collaborative robotics in Industry 5.0 and Society 5.0. They use the fictional personas of two entrepreneurs to illustrate the dilemmas faced in deploying these technologies, including

compliance with regulations, workforce adaptation, and ethical governance. Industry 5.0 shifts from pure automation to a human-centric approach, emphasizing complementarity between humans and robots to enhance meaningful work and societal well-being. AI and collaborative robots are transforming industries by improving operational efficiency and enabling human-robot interaction in shared environments. However, this progress raises concerns about job displacement, skill gaps, and surveillance. The European AI Act imposes stringent compliance requirements to ensure safety and fairness, demanding transparent AI operations and robust data governance. The research emphasizes ethical governance, advocating for integrating ethical principles into business strategies. Concepts like “trustworthy AI” and frameworks like ALTAI guide companies in aligning technological innovation with human values. Additionally, the paper highlights the need for educational initiatives to prepare the workforce for the evolving technological landscape. By addressing these challenges, entrepreneurs can navigate the complexities of AI adoption while fostering inclusivity and societal responsibility.

All these contributions highlight a counterintuitive aspect of technological advancement, reminding us of our fundamental human needs: we must be more human than ever. This reflection builds on a special issue published in 2020 to celebrate the 50th anniversary of the journal *Studi Organizzativi* (Butera, 2020), which brought together numerous contributions exploring the connection between technology and organizational transformations. Continuing that conversation, this special section aims to contribute to the debate by suggesting that a possible way to balance post-modernist and critical approaches to technological advancement is to emphasize human specificities, needs, and rights.

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