Human-Centered Technology & Innovation for a Sustainable World

Special Issue: Technological Forecasting and Social Change (TFSC)

Call for Papers

The topic of this Special Issue is the theme of the 33rd Annual Conference of the International Association for the Management of Technology (IAMOT), which takes place in July 6-11, 2024, in Porto, Portugal. The Special Issue Guest Editor will run a track on this topic. Accepted and presented papers for the conference will be eligible for publication in the Special Issue provided that these papers have been prepared and written for the TFSC readership.

Initial selection and review of submitted papers will be performed by the Conference Scientific Committee. Papers that do not meet the standards of quality and rigor will not be accepted for presentation at the Conference. After the first review, selected papers will be reviewed by the IAMOT Best paper Award Committee and decisions will be taken by the Guest Editor of the TFSC Special Issue. Papers should aim to fit the journal's scope and research focus.

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Prof. Gita Surie, Adelphi University, Garden City, NY, USA (Lead Guest Editor)

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Professor Steve Walsh, University of New Mexico, Albuquerque, New Mexico

Dr Geerten Van de Kaa, TU Delft, Netherlands

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Authors are invited to submit a SHORTER VERSION of their papers on "**Human-Centered Technology & Innovation for a Sustainable World"** on the IAMOT Conference website and agree that they would like to have the paper considered for the special issue. At this stage, the manuscripts will have to follow the conference paper format and guidelines.

Participation in the IAMOT Conference (2024) or acceptance of a paper for presentation does not guarantee that the paper will be selected for the TFSC Special Issue.

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Kindly submit your paper to the Special Issue category (VSI: Human-centered Innovation for a Sustainable World) through the online submission system of Technological Forecasting and Social Change. All submissions should follow the author guidelines of Technological Forecasting and Social Change available at:

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Please direct questions about the appropriateness of a topic and other requirements to the Special Issue Guest Editors (email: surie@adelphi.edu; B.NUNES@aston.ac.uk).

Topic: Human-Centered Technology & Innovation for a Sustainable World

There has been a very rapid development and adoption of new digital technologies such as social media platforms, virtual communication infrastructure, internet-of-things, 3-D printing, cloud services, big data analytics, and lately artificial intelligence, by individual, firms, and government since the pandemic in 2020 (Zuiderwijk et al., 2016). While benefits such as increased productivity and dematerialization are claimed, a host of social issues are raised too. These range from who has access to technology to unemployment, ethical and human rights, and threats to privacy (Sun et al., 2020). Other authors concerns include bias and discrimination, safety and security, economic distribution, political participation, or the changing nature of warfare (Stahl et al., 2023).

The tensions between technology and human needs are not new. Basic human needs can influence but are also influenced by the development of new technologies. Maslow (1943) and Max-Neef (1991) have studied and elected physiological, safety, and social needs as essential (or basic) for human survival. Several technologies that are associated with health, nutrition, mobility, sheltering, clothing could potentially be strongly linked to basic human needs. However, further studies investigating at how emerging technologies address and have an impact on basic human needs remain scarce. The development of superfluous technologies or over-featuring products (Marzi, 2022) can also be seen as a waste of human talent and natural resources in times of crises (Nunes et al, 2023).

Digital technologies are used to gather, store and analyze data in real time and improve decision making and save cost in various applications (Wang et al., 2015; Frank et al., 2019). Advances in AI and other digital technologies have made it a major area of research focus in fields as varied as engineering, medicine, business management, innovation, law and marketing (Johnson et.al, 2022; Zeba et al., 2021; Mukul and Büyüközka, 2023; Marchesani et.al., 2023). AI systems have the ability to act intelligently, correctly interpret external data, and execute particular tasks to the extent of reproducing human behaviors with cognitive, social and emotional intelligence (Di Viao et al., 2020). AI refers to machines performing cognitive functions usually associated with human minds, such as learning, interacting and problem-solving (Nilsson,

1971). AI is applied for organizational tasks including those that were previously only reserved for humans, such as cognitive and non-routine work (Brynjolfsson and Mitchell, 2017). However, it has now progressed from solving narrow tasks to broader ones. Advances in computational capabilities, increased availability of data and new machine learning techniques have increased the capability of AI systems to the point of becoming a "general purpose" technology. Moreover, as the cost reduces and technology improves, AI is becoming increasingly more accessible to both individuals and companies.

Examples of applications of AI solutions include processes in customer selection, human resources, risk assessment in banking and insurance. Such solutions are embedded in Unilever's talent acquisition process, Netflix's personalized movie suggestions, and Pfizer's drug discovery process (Raisch and Krakowski, 2021). Other examples include speech-based assistants, smart cars, drones or modern computer games. New language models such as Chat-GPT or Bard are able to create and edit text for general purposes including marketing advertisement, internal corporate communication, and other tasks that require even more creative input (e.g. song writing, book editing, etc.). Johnson et. Al (2022) note that AI is primarily adopted to augment human activities (55%) in research and development rather than automation (11%). Also, AI is primarily adopted for exploration research and development (64%) rather than exploitation (5%).

While the focus has been on technology to increase efficiency and save time and money, it is increasingly evident that human factors must be considered when adopting these technologies (Marinakis et al., 2021). Different stakeholders are variously affected (increasing unemployment potentially faced by under-skilled workers not trained in using data; displacement of knowledge workers by AI; increasing digital divide resulting from lack of access and capabilities e.g. elderly workers and those off-the-grid). Similarly, addressing climate change through new technologies requires addressing issues such as affordability, energy and mobility poverty during the green transition. Thus, it is necessary to focus on responsible digital transformation and Responsible Artificial Intelligence (RAI) (Pappas et al, 2023) as well as to enable change in governance structures to orient research, development, innovation and standardization towards societal needs and mitigate negative effects of socio-technical change (Gudowsky and Peissl, 2016). Similarly, Harari (2019) also argues for the need to update institutions and regulate ownership of data to enable trust and alleviate the potentially deleterious effects of AI technologies on those left behind due to lack of access or lack knowledge and capabilities.

Given its importance, technologies and innovations for sustainability (Surie, 2020), including emerging digital technologies, must be examined at various levels: global, national – i.e. national innovation systems and institutions (Nelson, 1993; Lundvall, 2016; 2010; North, 1991), industry (industrial ecosystems; Adner, 2017; Iansiti and Richards, 2006) and finally at the firm level. Several issues can be addressed; hence, the list below is illustrative and not exhaustive.

1. How should the global governance system be developed to promote use of digital technologies to enable collaboration, sustainability and address human needs such as employment, protection of environment, etc.?

2. How should national innovation systems change to incorporate digital innovation and, at the same time, enable system level sustainability and inclusiveness including employment?
3. How do institutions need to be changed to include the basic values and social needs of citizens? What types of regulations need to be adopted to facilitate responsible innovation and/or standardization?
4. How should industrial ecosystems be designed to enable digital innovation and transformation while keeping the focus on inclusiveness and sustainability at the forefront?
5. At the level of the firm, how should strategies, business models and organizational structures evolve to enable human-machine interaction in ways that technology is a tool for decision-making rather than the decision maker?
6. How should the standardization process of emerging digital technologies (related to standards development, market selection and firm adoption) be organized in a responsible manner so that human needs (citizens' values) are taken into consideration? For example, what factors affect the dominance and adoption of standards for Human-Centered Technology & Innovation and what is the influence of responsible innovation in standards selection and adoption.
7. In the race to Net Zero as well as climate change mitigation and adaptation policies, how are basic human needs being considered in the development of greener digital technologies (e.g. issues of affordability, energy and mobility poverty)?
8. How can the digital divide arising from digital transformation and adoption of AI be addressed (e.g. elderly people, "out-of-the-grid" people, those who lack skills and access to digital technologies)?
9. Is job loss inevitable? To what extent is employment affected and how (e.g. quality of jobs, loss versus creation of jobs, etc.)?
10. What kinds of changes (e.g. institutional, policy changes) at the national, regional and/or organizational levels are necessary to develop skills for the digital economy?

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