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# Technology for Humanity

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## 1 Motivation for the Special Issue

With the number of smartphone users reaching a whopping 5.3 billion in 2023 (Statista 2023a), digital technologies permeate almost every aspect of human life. In 2022, the average daily time spent on social media amounted to 2 h and 31 min (Statista 2023b), with social media platforms representing an important source of news and social information for billions of users worldwide (Statista 2022). In a similar vein, work practices witness dramatic transformation. For example, the number of Zoom users soared to 300 million in April 2020, as the pandemic hit (Evans 2022). Furthermore, advancements in Artificial Intelligence (AI) bring about various changes to the workforce and are estimated to increase overall productivity (Brynjolfsson et al. 2023). From work and private life to healthcare,

education, government institutions, and society as a whole, this new era has been defined and transformed by digital communication, automation, new information sources, emerging digital markets, social networks, and innovative digital practices. However, despite their promise and initial optimism, these sweeping changes enabled by digitalization have sparked a myriad of ethical and value-related challenges that hold immense significance on individual, organizational, and societal levels.

For example, whereas smartphones have fundamentally revolutionized our communication, information consumption, travel, banking, shopping, and leisure, their excessive usage has been linked to a multitude of adverse effects, including detrimental influence on users' sleep, mental health, academic performance (e.g., Eide et al. 2018), and social relationships (Kushlev and Heintzelman 2018). In a similar vein, while social media platforms help users to establish and maintain social connections, thereby contributing to the accumulation of social capital (Ellison et al. 2007; Weiler et al. 2022), they have also been shown to fuel feelings of envy (Krasnova et al. 2015), distort body perceptions (Köster et al. 2022), as well as provide an outlet for the spread of fake news (Moravec et al. 2019), political propaganda (Wattal et al. 2010), societal polarization (Allcott and Gentzkow 2017), and hate speech (Mondal et al. 2017). As technology becomes ubiquitous, feelings of privacy and control deprivation (Günther and Spiekermann 2005), as well as new forms of technology paternalism (Spiekermann and Pallas 2005), increasingly permeate our daily experiences. On the organizational level, videoconferencing platforms allow companies to bring together geographically dispersed teams, promote workers' work-life balance, and save office space; however, at the same time, their use has been contributing to workers' fatigue and alienation (e.g., Nesher Shoshan and

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Wehrt 2022). Against the background of these conflicting effects and unintended consequences, it becomes crucial to set priorities and principles that can guide the design, development, and use of digital services. Specifically, in this special issue, we advocate fostering a human-centric approach to IT design to ensure that our technological advancements align with the overarching values of humanity, including well-being, inclusivity, and sustainability. This goal, however, can only be achieved by engaging in collaborative efforts with IT developers and corporate innovation managers as well as researchers, policymakers, technology experts, researchers, and the society at large working together to navigate these rising complexities. Against this background, the goal of this special issue is to intensify and promote progress in this direction.

## 2 The Impact of Digitalization at Societal, Organizational, and Individual Levels

Historically, research in Information Systems has predominantly focused on understanding the implementation, adoption, and usage of information systems in organizational contexts (Vodanovich et al. 2010). However, as technologies and their applications have evolved, the field has progressively shifted its focus also toward the examination of private technology use and its implications for users' daily lives, spurring studies on users' emotional and cognitive states (e.g., Stein et al. 2015; Maier et al. 2015), technology addiction (e.g., Turel et al. 2011), and implications of digital engagement for users' health and well-being (e.g., Krasnova et al. 2015; James et al. 2019). Importantly, changes at the individual level may accumulate over time to collectively contribute to major societal issues. Hence, it is not surprising that the last decade has been particularly marked by an upsurge in studies that explore implications of digital transformation at the level of society (e.g., Baum et al. 2020; Allcott and Gentzkow 2017; Kim and Dennis 2019). As changes at the individual, organizational, and societal levels accumulate and become evident, they can, over time, call for adjustments in technology design and use, resulting in a reciprocal cycle of effects and actions.

Summarizing these effects, Fig. 1 abstractly presents the intricate web of interdependencies between technology design and use with the triad of individual, organizational, and societal needs, mediated by the regulatory framework and technology standards. It illustrates the impact technologies have on these domains and, conversely, how technology's design and use are affected by them. In this cycle of causes, effects, and actions, companies and users are increasingly subject to legislative initiatives that

prescribe how technology can be developed and used (e.g., General Data Protection Regulation, AI regulation). To shed more light on this interplay of connections, we will briefly review a selection of exemplary areas that illustrate these interactions with a specific focus on the conflicting effects of technology on societal, organizational, and individual levels.

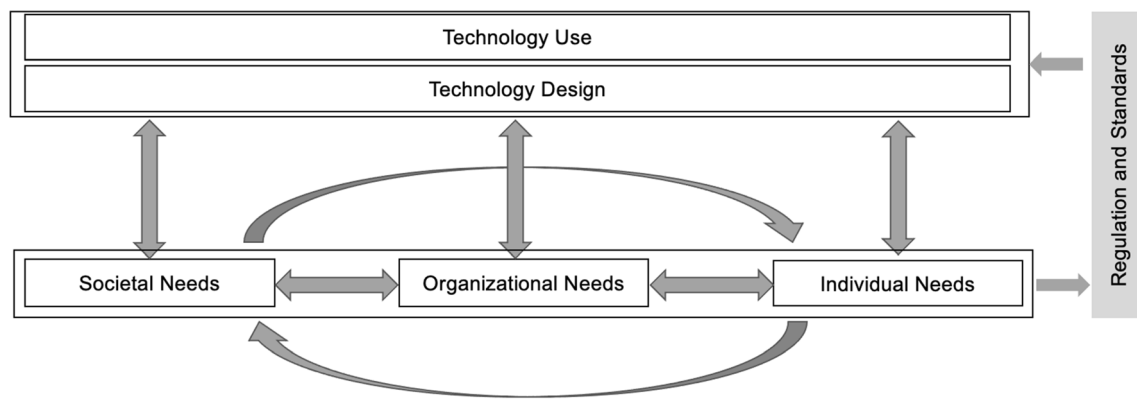
## 3 Exploring the Conflicting Effects of Technology

In recent years, an increasing number of studies have shown that information and communication technologies can have a wide range of desirable and undesirable societal effects in terms of societal cohesion, fostering freedom of speech, and cultivating an informed society (e.g., Tarafdar et al. 2013; Majchrzak et al. 2016; Qureshi et al. 2020). Similarly, ambiguous effects of technological advancement have also been observed at both organizational and individual levels, with organizational productivity and social connectedness serving as respective examples of these complex dynamics. In the following, we will briefly demonstrate the ongoing complexities across these exemplary domains.

### 3.1 Societal Level: Societal Cohesion

Creating a cohesive society is an important societal goal. A cohesive society strives for the well-being of its members, works towards social inclusion, fosters a sense of belonging, cultivates trust among its members, and provides avenues for upward social mobility (OECD 2011). Regulators have also recognized the pressing nature of ensuring and promoting social cohesion. An example of this commitment is the agenda for Sustainable Development, adopted by all United Nations member states (United Nations 2015). This agenda outlines shared objectives, including reducing inequality and providing quality education, which contribute to societal cohesion (United Nations 2019).

So far, research has provided conflicting evidence on the role of technology in promoting social cohesion. On the one hand, by facilitating the creation and maintenance of social bonds online (e.g., Liu et al. 2016), enabling information sharing and access, technologies, such as the Internet and social media, have the potential to enhance social capital, social inclusion, as well as promote social and economic mobility (Andrade and Doolin 2016; Chetty et al. 2022). Regular users and especially marginalized groups are given the opportunity to share their views with others (Andrade and Doolin 2016; AbuJarour et al. 2021), have better access to education (e.g., online wikis, e-learning platforms), employment (e.g., online job portals,



**Fig. 1** Schematic representation of the complex interplay of technology and societal, organizational and individual needs

crowd working, remote working), and are also stimulated to engage in civic participation online. Indeed, social media play a vital role in mobilizing people for various social causes, thereby promoting solidarity among like-minded individuals (Leong et al. 2015; Chen et al. 2020; Syed and Silva 2023). Additionally, online communities provide a sense of belonging and support to individuals with shared interests, hobbies, and identities, strengthening social cohesion (Blanchard and Markus 2004).

On the other hand, providers of social media platforms have been increasingly accused of promoting echo chambers and filter bubbles that affect individual viewpoints and fuel societal polarization (Qureshi et al. 2020). For example, a field experiment demonstrated that Americans who deactivated their Facebook account for four weeks became less politically polarized (Allcott et al. 2020). Furthermore, excessive technology use may lead to loneliness and weaker social bonds, suggesting equivocal effects of digital media on social cohesion (Nowland et al. 2018). Additionally, closing the digital divide – providing everyone with equal access to technology and adequate digital skills – remains challenging (Trauth and Howcroft 2006). For example, Lee et al. (2018) raise the question of whether information and communication technologies contribute to closing or widening the gap in inequality.

### 3.2 Societal Level: Freedom of Speech

Modern democracies traditionally view freedom of speech as a fundamental human right. Technologies such as social media and other platforms help users exercise this right by allowing the free expression of opinions and knowledge sharing in private and public spaces (Zhang et al. 2022b). This, in turn, may facilitate activism-related activities (Valenzuela 2013). Especially for traditionally marginalized groups, these technological affordances can be empowering, providing them with a virtual stage and preventing their opinions from being stifled (Nemer 2016).

Ultimately, every voice on the Internet has the potential to have relevance and gain traction.

Despite this positive potential, there is a growing concern over the extent to which social media platforms mediate the exercise of the right to free speech and whether all users are given equal opportunities to express their ideas and reach desired audiences. Indeed, algorithmic curation inherent in the design of social media platforms aims to optimize user engagement. Therefore, specific content users share might be favored by algorithms. For example, harmful emotional content involving anger and hate has been shown to get promoted more as it elicits stronger user reactions (Merrill and Oremus 2021), thereby keeping users more involved with the content and promoting time viewers spend on the site. This, however, interferes with the idea of free speech since selected opinions and positions expressed in the public discourse may get algorithmically stifled or amplified (Riemer and Peter 2021). To mitigate these concerns, the regulations based on the Digital Services Act require platforms to offer users an option to switch to a non-curated feed that is not based on algorithmic selection (Algorithmwatch 2022), thereby prescribing elements of platforms' design and shaping platforms' use.

Additionally, with the arrival of social media sites, the limitations of the right to free speech have become particularly evident, often causing tensions with other societal priorities and values (e.g., free vs. hate speech). Indeed, growing research provides evidence for the increasing toxicity of social media spaces, with users frequently becoming subjects of various forms of antisocial behavior online (Oh et al. 2018). At the same time, exposure to online antisocial behavior can be detrimental to individual and collective well-being, as it may, for example, contribute to depression, substance abuse inclination, and even suicidal ideation (e.g., Kowalski et al. 2014).

### 3.3 Societal Level: Informed Society

Citizens' ability to access accurate and unbiased information is one of the cornerstones of a democratic society. In this context, online platforms (e.g., search engines, social media) have emerged as the primary conduits through which information is accessed and disseminated. For example, users have been shown to especially rely on social media for their news consumption, with half of US adults getting news at least sometimes from social media (Pew Research Center 2022). However, despite their potential to support users with information and knowledge, social media platforms increasingly turn into information-limiting environments (Chou and Edge 2012; Holland and Tiggemann 2016; Kitchens et al. 2020) that provide space for false and misleading information (Moravec et al. 2019; Nasery et al. 2023).

In a New York Times article, Manjoo (2016) states that “social networks are helping to fundamentally rewire human society” and that “its effects are now beginning to alter the course of global events”. Indeed, the course of multiple political events, potential harms to public health, and risks for the economy and financial markets have now been (at least partially) attributed to users' manipulation on popular social media platforms (e.g., Allcott and Gentzkow 2017; Laato et al. 2020; Liberini et al. 2020; Clarke et al. 2020). This is because algorithmic management common for social media platforms (Shore et al. 2018; Kitchens et al. 2020), integrated social bots (Salge et al. 2022), targeted political advertisements (Baum et al. 2021), and the spread of fake news (Moravec et al. 2019; Wei et al. 2019) may all skew public opinions, interfering with users' ability to make informed decisions. Facing these risks and the potential for damage, platform providers and interested stakeholders, however, struggle to develop and implement effective measures to contain fake news (e.g., Sharma et al. 2019). This is because the proposed countermeasures, like content moderation or account tracing and removal, often conflict with such competing fundamental values as freedom of speech and personal privacy. In view of these complexities, there is a growing need to promote measures that support users' resilience to targeted manipulation. Primarily, this can be achieved by enhancing users' digital skills and media literacy to navigate today's online information ecosystem (Bryanov and Vziatysheva 2021). Further, while ongoing research has already made first strides in unraveling the intricate interplay between technology, content, and human factors in fostering a (mis)informed society, more studies are needed to better understand how users interact with information they encounter online (Nasery et al. 2023) (Table 1).

### 3.4 Organizational Level: Organizational Performance

Digitalization also has the potential to transform organizations, exerting a profound impact on their performance (Vial 2019). Hence, adopting and exploiting digital technologies is a strategic priority for many companies across different industries (Matt et al. 2015; Hess et al. 2020). In fact, 97% of respondents of a global survey stated that the outbreak of the COVID-19 pandemic sped up digital transformation processes in their organization (Statista 2023c). Indeed, technologies can affect value-creation processes and even lead to the replacement of entire business models (Downes and Nunes 2013). Additionally, they can contribute to the achievement of performance goals companies consider relevant. This includes their financial bottom line, innovation potential, environmental footprint, and workers' well-being, to name a few.

For example, digitalization can boost financial performance by improving productivity (e.g., via the automation of routine tasks), allowing for advanced data analytics, enabling access to global markets, as well as contributing to the new forms of customer interaction, such as personalized experiences and real-time interaction. Further, technologies, such as enterprise social networks, have been widely recognized as a booster of collaboration between employees, supporting knowledge sharing and, ultimately, innovation (e.g., Günther et al. 2009). Additionally, by relying on videoconferencing, companies can potentially decrease employees' travel-related emissions (Dao et al. 2011) and, thereby, the overall carbon footprint. Furthermore, as technology is transforming labor markets, creating new forms of work, it allows employees greater flexibility over their schedules, improving their work-life balance (e.g., Shahzadi et al. 2022) and, potentially, well-being. However, as digital transformation progresses rapidly, companies are increasingly facing new challenges. For example, many organizations find themselves vulnerable to cybersecurity threats, a problem with severe repercussions for companies' operations, processes, and image (Chertoff 2023). Similarly, while useful across many contexts, videoconferencing may inhibit the production of creative ideas (Brucks and Levav 2022), which may potentially undermine organizational innovation potential. Also, in the environmental context, the role of technology has become increasingly controversial, with rising concerns around e-waste and the substantial power usage of large AI models (Vinuesa et al. 2020). In a similar vein, the technology-enabled flexibility of a new generation of gig works often goes at the expense of intensified surveillance, intrusive algorithmic control, and heightened performance monitoring (e.g., Benlian et al. 2022; Hödl and Myrach 2023). Taken together, the benefits of technology in terms of organizational performance need to be carefully weighed

**Table 1** Selected areas of technology influence

Selected areas	Selected desirable consequences	Selected undesirable consequences
<i>Societal level</i>		
Societal cohesion	Social media have enabled people to connect and communicate with each other and form online communities	Social media have been associated with increased polarization in society, with individuals becoming more isolated from diverse perspectives (Moravec et al. 2019), more entrenched in their own beliefs, and less open to opposing viewpoints (Qureshi et al. 2020)
	Social media play a vital role in mobilizing people for various social causes (Leong et al. 2015; Chen et al. 2020; Syed and Silva 2023) Online platforms provide avenues for education, (remote) employment, and participation, allowing for greater social mobility and inclusion (e.g., Andrade and Doolin 2016; Köster et al. 2018)	Technologies can create digital divides as not everyone has equal access to technology and digital skills (Trauth and Howcroft 2006)
Freedom of speech	Technology is a tool for sharing opinions, experiences, and knowledge (Zhang et al. 2022b)	Antisocial behavior is common on social media (Oh et al. 2018), which negatively impacts users' well-being (Kowalski et al. 2014)
	The organization and coordination of activism-related activities can be facilitated by technology (Valenzuela 2013) Social media can provide marginalized groups a stage (Nemer 2016)	Algorithmic curation on the Internet interferes with fair and free speech (Riemer and Peter 2021)
Informed society	Technology provides access to education, news, research, and knowledge that empowers individuals to make well-informed decisions (Internet Society 2017)	Social media platforms have been conduits for the rapid spread of false or misleading information, which can contribute to the division and distrust among different groups (Nasery et al. 2023; Roberts and Qahri-Saremi forthcoming)
	Digital literacy skills enable individuals to navigate technology effectively and safely (UNESCO 2016). Media literacy is essential in distinguishing reliable sources from misinformation and disinformation (Nasery et al. 2023)	
<i>Organizational level</i>		
Organizational performance	Investments in information technology increase profitability (Mithas et al. 2012)	Cybersecurity threats are increasing (Chertoff 2023)
	E-learning tools or creativity software enhances employees' skills (Massetti 1996)	Technologies, like videoconferencing, may inhibit idea generation (Brucks and Levay 2022) and lead to rising levels of fatigue (Fauville et al. 2021)
	Online labor platforms provide more autonomy to workers (Möhlmann et al. 2021) and enable efficient matching of demand and supply (De Reuver et al. 2018)	Online labor platform workers might experience tensions associated with work execution, compensation, and belonging (Möhlmann et al. 2021)
<i>Individual level</i>		
Social connectedness	Social media give access to social capital and enable one to find social support (e.g., Liu et al. 2018)	The mere presence of devices can negatively impact social relationships (Przybylski and Weinstein 2013)
	Finding support groups, e.g., for medical conditions, can be facilitated through social networks (Oh et al. 2013)	Social media may cause social overload, leading to technology fatigue and discontinued use (Maier et al. 2015)
	Smartphones help users to feel close despite being physically separated (Diaz Andrade 2014)	Social media use has been linked to mental health declines, such as increased loneliness (Zhang et al. 2022a)

against the risks these technologies carry with them. In this context, taking a broader human-centric perspective may offer useful guidance to navigate the complex trade-offs.

### 3.5 Individual Level: Social Connectedness

With the number of social media users reaching 4.12 billion globally in 2023 (Statista 2022), social media

platforms have profoundly changed the way we build social connections, allowing users to build social capital as well as receive and provide support (Ellison et al. 2007; Liu et al. 2018). In a similar vein, with an estimated 5.3 billion smartphone users worldwide (Statista 2023a), mobile devices help us reach out to anyone around the globe anytime and make us feel closer to those we communicate with, imitating the feeling of being co-present



despite being physically separated (Diaz Andrade 2014). As a result, we are now interwoven more than ever, with digital tools fostering social relationships with colleagues, friends, family, acquaintances, and even strangers. However, with a rising body of research reporting mixed findings (e.g., Meier and Reinecke 2021), there is a growing recognition that the relationship between technology use and social connectedness is fairly complex.

Paradoxically, in stark contrast to the technological possibilities to establish or maintain social relationships, we seem lonelier than ever (Buecker et al. 2021). In a recent survey, around 52% of US respondents reported feeling lonely, with 73% of Gen Z feeling lonely, making them the loneliest generation (Hartman 2023). Moreover, meta-reviews show that global social networking site use is linked to increases in the feelings of loneliness (Liu and Baumeister 2016). Also, while technological advances seem to bring us closer to those, who are not physically near us, several studies outline that the same does not appear valid for those within our proximity. For example, the mere presence of smartphones in a social setup hinders connecting with others well (Przybylski and Weinstein 2013) and, therefore, may disconnect us from people. Since the persuasiveness and ubiquity of technological devices draw our attention away from those who are physically with us, such devices might also hinder casual social interactions and therefore reap us from increased emotional benefits we might gain from such (random) offline encounters (Kushlev et al. 2019). In addition, connecting ourselves through online social networks might cause feelings of social overload, leading to feelings of fatigue and even intensifying the desire to discontinue the use of the service (Maier et al. 2015). Overall, a lot of factors can interfere with these relationships. For example, how the use of social media affects an individual depends, amongst others, not only on whom someone is interacting with or on the underlying motive of use but also on the activity someone engages in Yang et al. (2021). Therefore, research needs to further investigate within-person effects to disentangle the tension between connectedness and disconnection in relation to technology use to design platforms that adhere to individual needs. Also, on the policy side, we see readiness for action. Indeed, more and more countries have established ministry posts (e.g., GOV.UK 2021) dedicated to combating the issue of loneliness among their population.

#### 4 Overview of the Contributions to the Special Issue

The six contributions to this Special Issue tackle the topic of “Technology for Humanity” from different points of view and contexts, ranging from healthcare and green

information systems, to algorithmic control on platforms, as well as digital data and labor markets.

Tatjana Hödl and Thomas Myrach shed light on the tension between control and autonomy that content creators face (Hödl and Myrach 2023). Based on semi-structured interviews, the authors aim to understand how algorithmic control utilized by social media platforms impacts the autonomy and behavior of content creators. The study develops a theoretical lens that provides helpful guidance and strategies for platform owners and content creators to release the tension caused by algorithmic control affecting content creators’ autonomy.

Building upon design science research, Valerie Graf-Drasch, Robert Keller, Oliver Meindl, and Felix Röhrich offer guidelines for designing green information systems (Graf-Drasch et al. 2023). Using semi-structured interviews to evaluate the seven design principles suggested and developing a mobile app prototype for a citizen-centric green information system, the study reveals the principles’ suitability for research and practice. By incorporating a citizen-centric lens, the authors highlight the role of citizen participation in building a more sustainable future.

Eileen Doctor, Torsten Eymann, Daniel Fürstenau, Martin Gersch, Kristina Hall, Anna Lina Kauffmann, Matthias Schulte-Althoff, Hannes Schlieter, Jeannette Stark, and Katrin Wyrтки develop the Public Health Agency Maturity Model (PHAMM) aimed at assessing and improving the level of digital maturity of public health agencies with a focus on the involvement of employees in the transformation process (Doctor et al. 2023). Involving multiple stakeholders and a mixed-method approach to develop the PHAMM, the model is now being used nationally in practice and offers valuable foundation for research in this area. The paper’s insights constitute an essential step toward a more resilient public health system.

Focusing on digital labor markets, Lisa Gussek and Manuel Wiesche investigate the success factors of IT professionals within the gig economy (Gussek and Wiesche 2023). Using digital trace data, the author team investigates how different signals provided by IT freelancers on the platform lead to objective career success as measured by 1-year earnings. Differentiating between activating, pointing, and supporting signals, the results of the negative binomial regression reveal the importance of each signal type in contributing to the career success of IT freelancers on digital labor platforms.

The General Data Protection Regulation strongly focuses on the data protection of individuals, while not explicitly addressing their potential claims for economic participation based on their data. Simon Scheider, Florian Lauf, Frederik Möller, and Boris Otto close this research gap by developing a reference system architecture following a design science approach (Scheider et al. 2023).

Combining several methodological approaches, the authors build and evaluate the architecture aimed at data sovereignty considering the manifold legal, ethical, economic, and technical boundary conditions.

Finally, the *Catchword* written by Johann Kranz, Sophie Kuebler-Wachendorff, Emmanuel Symoudis, Jens Grossklags, Stefan Mager, Robert Luzsa, and Susanne Mayr describes the important phenomenon of data portability, which constitutes an essential component of the General Data Protection Regulation (Kranz et al. 2023). The authors provide a valuable summary of relevant aspects of data portability by focusing on the characteristics of its regulation, the status quo, and portability architectures. Finally, the authors close the catchword by critically discussing and reflecting on the issue by proposing suitable key questions to be addressed by research in the future.

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