Digital Humanism: The Time Is Now

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Digital humanism highlights the complex relationships between people, society, nature, and machines. It has been embraced by a growing community of individuals and groups who are setting directions that may change current paradigms. Here we focus on the initiatives generated by the Vienna Manifesto.

T he digital transformation—a complex technical and socioeconomic process—has changed our world, creating a cyberphysical reality where the boundary between the physical and the cyber is blurred; we experience the coevolution of man–machine.[1] Just as the industrial revolution fundamentally changed the way society was constructed, the digital transformation has prompted an expansion of our understanding of informatics and IT from a mere engineering discipline to a worldwide endeavor that touches on every aspect of our lives. (In the following we do not distinguish between computer science and informatics.) The global COVID-19 pandemic has only further underscored information technology's role as the "operating system" of our data-driven world.

As early as the 1980s, Turing Award winner Kristen Nygaard defined *informatics* as "the science that has as its domain information processes and related phenomena in artifacts, society and nature."[2] Obviously, informatics not only studies these phenomena but also actively influences information processes in all of these areas. Informatics is thus obliged to take a holistic view of

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its developments, acknowledging the consequences, and taking responsibility for them. This introduces a social and political dimension and a need for fundamental values beyond algorithmic optimization, efficiency, or profitability.

THE DOWNSIDE OF INFORMATICS

Despite all of its successes and achievements, the development of informatics comes with downsides. We briefly discuss a number of such issues that motivate the need for a paradigm shift in the way digital systems are conceived, used, applied, and regulated.

In 2018, Tim Berners-Lee proclaimed: "The system is failing."[3] Other web pioneers, such as Jaron Lanier, have apologized for their actions and failure to establish democratic structures based on the web.[4] The development into a worldwide megasystem with massive instances of monopolization has led to dominance and control on technical, economic, military, and political levels. This encounter is taking place not only between companies, but also between nations and geopolitical blocs of power. Those who are better at informatics are going to take the lead.

In "How the Hippies Destroyed the Internet," Vardi[5] connects the Internet to the hippie culture in the United States. The idea of information as a free public good and free information sharing led to a huge amount of freely available information and, consequently, the rise of new electronic intermediaries, such as search engines. Their business model is based on advertising, similar to newspapers, but extended by personalization and recommendations. Both personalization and recommendations are essential to "find something" in this exploding information universe, and they also change user behavior—users adapt

and follow recommendations. The web is free for users, who pay "only" with their data, which are bought by advertisers, leading to the well-described surveillance capitalism.[6] Instead of being citizens of the web, we became users, products, and producers all at the same time.

In the following, we list further very critical issues that are mutually dependent, or different sides of the same coin:

› Concentration and monopolies exist in the web, where a small number of online platforms dominate the market. They are based on network effects as well as on the increase in market efficiency through the reduction of transaction costs. These companies focus on market transactions, where concrete products play almost no role. Informatics virtualizes not only products and companies but also entire markets and societies.

› In addition, the power of multinational technology companies far exceeds the capabilities of national democratic governments to control them through traditional regulatory approaches. These companies offer crucial services to citizens that states don't provide. These services have become so vital that this has become an issue of geopolitical sovereignty (for example, the recent Twitter acquisition by Elon Musk).

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› Artificial intelligence (AI) and automated decision making may result in autonomous systems with substantial legal and ethical implications. What makes it worse is that, in many cases (when AI is based on black-box algorithms), we do not understand the outcome, that is, why certain decisions are proposed and taken. In addition, the outputs produced often contain bias, providing unfair results.[7]

› Further automation will have a massive impact on employment and jobs—in both qualitative and quantitative terms. How are and will these "new" jobs be designed? What is the role of the human in the loop? In many cases, does the IT industry reproduce the postcolonial division of labor as described by Casilli?[8]

› We see violations of privacy on a massive scale by both private companies and states. This requires both legal and technical control measures but also an increased awareness of the importance of privacy, both as an individual and as a social good, protecting human autonomy and democracy.

› A further issue is the governance of social media platforms, which affects the behavior of individuals and may lead to serious political threats. This is evident with the intentional fabrication of fake news and the creation of opinion bubbles. A

socially accepted notion of "fair use" of these systems is needed, especially in view of future political (online) decision-making processes.

› AI is moving to warfare, resulting in autonomous weapons. United Nations Secretary-General António Guterres has

in April 2019, with approximately 100 participants from the university sector, public institutions, business, and civil society, representing a diverse range of disciplines from political science, legal science, sociology, history, anthropology, philosophy, management science, and informatics. The workshop's point of departure was our

it is necessary to influence technological developments and that it is our responsibility to do so. Technological progress is not automatic or a "divine gift." We as individuals and as a society must shape it, putting democratic and humanistic values first.

A concrete result was the "Vienna Manifesto on Digital Humanism" (dighum.ec.tuwien.ac.at/dighum-manifesto, available in eight languages), which has since been endorsed by signatories from 45 countries as a step toward a blueprint for shared principles. The Manifesto is primarily a call to act collectively and mobilize support that transcends national borders and continents to build a more humane common future. Although digital humanism is rooted in the spirit of Renaissance humanism, which flourished in Europe at the end of the 15th century, embarking on this endeavor requires collaboration across the globe with input from many different cultures.

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already stated that "Autonomous machines with the power to …. take lives without human involvement…. should be prohibited by international law" (António Guterres on Twitter, 25 March 2019; 6:28 p.m.).

› The notion of sustainability needs to be reshaped with the advent of digital technologies. On the one hand, digital technologies represent an opportunity to achieve sustainable development; on the other hand, processing and elaborating large amounts of data and the disposal of digital devices have a strong negative impact on the environment.

All of these issues show the necessity of a paradigm shift in the way we develop IT technology. We need to conceive and adopt a broader framework where other perspectives (ethical, social, legal, political, economic, and so on) are included when we conceive and develop systems that have an impact on individuals and society.

THE VIENNA MANIFESTO

With these and other issues in mind, the first international workshop on "Digital Humanism" was held in Vienna

responsibility as scientists,[9] calling upon us to shape technologies according to human values and needs, rather than allowing technologies to shape humans. The workshop was inspired by the tradition of the Vienna Circle, a multidisciplinary effort of the early 20th century to reflect on the revolutionary implications of science, and physics in particular, for our understanding of the empirical world.[10]

The term *digital humanism* was chosen to refer to the concepts of *humanism* and *enlightenment*, according to which humans are responsible for their own thinking and actions.[11] We understand the term as describing, analyzing, and, predominantly, influencing the complex interplay of technology and humankind for a more humane and fair society, respecting universal human rights and dignities. We are the authors of our own lives, and personal autonomy and freedom to make decisions are the prerequisites for an open, democratic society.

The discussion at the workshop focused on technical, political, economic, social, ethical and legal issues and showed that informatics alone is insufficient to provide comprehensive answers; a broader, more interdisciplinary approach is required. One conclusion of the workshop was that

The Vienna Manifesto supports democracy, inclusion, the right to privacy, and free societies. It calls for regulation and public oversight of technology monopolies. Both science and academia have critical roles to play in upholding and defending human values, especially in the realm of education. Interdisciplinary curricula that span the sciences and humanities as well as digital literacy and Internet access for all citizens are prerequisites for sustaining democratic values. More specifically, the principles of the Vienna Manifesto include the following:

› *Privacy, democracy, and inclusion*

  o Digital technologies should be designed to promote democracy and inclusion.
  o Privacy and freedom of speech are basic values that should be at the center of our activities; they should always be considered in the processes of designing and developing information technologies.

› *Regulation and public oversight*

  o The regulatory authorities must intervene to break up technology monopolies.
  o Decisions whose consequences could affect individual or collective human rights must be made by humans.

› *The specific role of science and the academic sector*

  o Scientific approaches integrating various disciplines, eliminating discipline-specific silos, and adapting how we reward academic endeavor are prerequisites for mastering our challenges.
  o Universities are the places where new knowledge is created and critical thinking is nurtured. They have a crucial role to play in bridging the boundaries among disciplines and fostering their collaboration, taking a holistic view of technological development.

› *Education and training*

  o New curricula are required that integrate the humanities, social sciences, and technical and engineering sciences.
  o Education in information technologies together with the ethical and societal impacts of IT must begin as early as possible in the education process.

The workshop and the Vienna Manifesto were merely a starting point for a variety of activities and the formation of an international intellectual community of researchers across disciplines. The need to move activities online because of COVID also provided an opportunity: to scale up outreach and expand the ongoing discussions by fostering inclusion with respect to further internationalization and diversification, further scientific disciplines and viewpoints taken into account, and awareness of further areas and communities affected by digital transformation processes. This led to the Lecture Series on Digital Human-

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ism (dighum.ec.tuwien.ac.at), comprising more than 30 online lectures as of 2022 and three subsequent workshops held online or in a hybrid fashion, covering topics such as efficiency versus resilience, AI and ethics, sovereignty, privacy, AI regulation (with a focus on Europe), automation and work, and the impact of IT on democracy and geopolitics. In total, this amounts to more than 80 h of created video content and online-accessible shared knowledge (https://www.youtube.com/c/Digital Humanism). Also, the book *Perspectives on Digital Humanism*[12] presents 46 short essays by digital humanists from a variety of disciplines, including informatics, philosophy, law, economics, history, anthropology, political science, and sociology (up to now it has more than 240,000 downloads).

In March 2022 our fourth Vienna workshop on Digital Humanism produced the "Research, Innovation, and Education Roadmap for Digital Humanism,"[13] providing guidelines to realize the vision of digital humanism and integrate its ideals into society. In September 2022, we organized the first Summer School on Digital Humanism in Vienna with 65 participants from 22 countries. These outputs of our initiative show the overwhelmingly positive reception to digital humanism as well as the high demand for further activities.

THE TIMES THEY ARE A-CHANGIN'

The digital humanism initiative is not "alone." Across countries, many initiatives share our goals and values—often rooted in academia or civil society: Human-Centered Artificial Intelligence and the Responsible Hybrid Intelligence Initiative at Stanford University, the Center for Humane Technology, the Dutch Digital Society, the Weizenbaum Institute, and the Digital Enlightenment Forum (see https://hai.stanford.edu/, https://www.humanetech.com/, https://www.thedigitalsociety.info/, https://www.weizenbaum-institut.de/, and https://www.digitalenlightenment.org/) are but a few prominent examples. As one of the spearheads with a direct impact on the IT industry, IEEE itself has initiated the IEEE Standard Model Process for Addressing Ethical Concerns during System Design (IEEE Standard 7000) to highlight the responsibility of system engineers in a larger societal context.[14]

On a political level, digital humanism plays an increasingly important role at various levels. In the Austrian government's Program for 2020–2024, digital humanism is mentioned as a relevant contribution to the development of an AI strategy, and the Viennese communal government program designates digital humanism as its leitmotif for digitization. The trilateral Poysdorf Declaration on Digital Humanism, signed by Austria, Slovakia, and the Czech Republic, lays a foundation for research programs and fellowships as well as other activities on the European level. In terms of policies, the European Union General Data Protection Regulation is complemented by the Market Act, the Service Act, and the AI Act to ensure a basic level of regulation and accountability of market participants. Recommendations and ethical guidelines have been issued by various organizations—such

as the Association for Computing Machinery's Code of Ethics, the Organisation for Economic Co-operation and Development Artificial Intelligence Principles, the G20 AI Principles, and the United Nations Educational, Scientific and Cultural Organization Recommendation on the Ethics of Artificial Intelligence—all in response to the potential of AI as well as the dangers that arise from irresponsible use. In the United States, ongoing efforts to regulate big tech companies follow a tradition of antitrust cases. The underlying concerns of market monopolization, surveillance of individuals, and loss of primacy of politics are, however, common across countries, making this an international fight against harmful technological advancements.

Technological innovation and the development of Informatics will continue—as will the changes it induces. IT will not stop! We will experience further disruptive technology and service waves, and the "laws" of the networks, monopolization, and innovation will retain their impact. While AI will not keep all of its promises, it will keep many of them (for better and for worse). This raises the very valid question of the role of the human in this complex scenario. We should not only reflect and observe but also defend what we value. The Vienna Manifesto provides a point of departure for seizing the opportunity to shape human progress in both practical and scientific terms. We are at a crossroads in development, and much is at stake. C

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