Peter G Kirchschlaeger

Digital Transformation and Ethics

Ethical Considerations on the Robotization
and Automation of Society and the Economy
and the Use of Artificial Intelligence

Nomos

Peter G Kirchschlaeger

Digital Transformation and Ethics

Ethical Considerations on the Robotization and Automation of Society and the Economy and the Use of Artificial Intelligence

Nomos

edition
sigma

Reviews

"In our day, humanity has entered a new era in which our technical prowess, especially digital technological prowess, has brought us to a crossroads (cf. LS, 102), influencing greatly our common good. It is urgent, therefore, to explore the ethical dilemmas around such technological development, and how some basic ethical consensus can help us use, especially again, digital technology for the common good. In this regard, this book 'Digital Transformation and Ethics' makes an invaluable contribution." **Cardinal Peter Kodwo Appiah Turkson, Prefect of the Dicastery for Promoting Integral Human Development**

"The 15th and 16th century explorers used compass and the stars to navigate. Today's digital transformation needs solid scientific analysis and ethical frameworks to charter the way forward in complex territories. Peter G Kirchschlaeger's work offers both rigorous science and practical orientations on key legal and policy issues: this framing is important everywhere and particularly in fragile contexts for vulnerable populations." **Dr Peter Maurer, President of the International Committee of the Red Cross (ICRC)**

"'Digital Transformation and Ethics' is a valuable overview of ethical issues in artificial intelligence, their impact on our daily lives and importance for future applications. With this timely analysis, Peter G Kirchschlaeger highlights fundamental questions pertaining to our relationship with technology and its impact on justice, freedom, and human rights." **Ai Weiwei, Artist**

"Practical, compelling, stimulating. In this outstanding book, Peter G Kirchschlaeger brings new insights to the story of digital transformation and human rights. A superb look at how robotization and automatization is progressing and supporting the transformation from a world in which digitalization has big winners and losers, to one in which digitalization hopefully contributes to more equity and balance for people and planet. An excellent read, filled with personal experiences and reflections on freedom, autonomy, responsibility, conscience and ethical judgement that will engage students, CEOs and politicians alike." **Susanne Giger, Business Presenter, Lecturer, Member of the Board of Directors of the Coop Group**

Reviews

"This remarkable book calls upon us to defend human dignity from the myriad threats of the new digital age. Peter G Kirchschlaeger recognizes that digital technologies can benefit humanity by broadening access to knowledge and to vital services such as healthcare. Yet he shows how digital technologies also threaten human dignity and human rights, through impacts on employment, income distribution, political power, self-esteem and social relations. Most importantly, Peter G Kirchschlaeger argues cogently that humanity must put human rights at the core of our governance of the digital technologies, to ensure that the new machines serve the cause of human dignity rather than humanity becoming the servant of the machines." **Professor Dr Jeffrey D. Sachs, Columbia University, USA; Special Advisor to the UN Secretary-General António Guterres on the objectives of sustainable development**

"This book is about fundamental, yet rarely addressed, aspects of the digital journey – ethics and values. Highly valuable for anyone who ambitions to have a positive impact with technology." **Silvio Napoli, Chairman of Schindler Group**

"Will data-based technologies come to control us, will some humans master them toward manipulating the rest? Peter G Kirchschlaeger's book provides the ethical orientation we urgently need to hold these rapidly advancing technologies consistent with the human rights and dignity of all human beings." **Professor Dr Thomas Pogge, Leitner Professor of Philosophy and International Affairs, Yale University, USA**

"One of the great ethical challenges of our time is the rapid technological change epitomized in the digital transformation of all spheres of life. In this book, an ethicist and human rights expert offers an admirable attempt to help us come to grips with this challenge in an almost encyclopedic, critical as well as constructive, manner." **Professor Dr Hans Joas, Humboldt University of Berlin, Germany / University of Chicago, USA**

"If there was one book I would recommend to any Tech entrepreneur these days, it is this book. Peter G Kirchschlaeger wrote one of the most important and most comprehensive contributions to the current debate on Digital Transformation, Ethics and Artificial Intelligence by covering an enormous breadth on some of the hottest disciplines in tech." **Pascal Kaufmann, Neuroscientist and Entrepreneur; Co-Founder of the Software Company Starmind International; Founder of the Mindfire Foundation**

"As an AI researcher, ethics becomes more and more critical for AI processing and robotics. I have worked in the AI area for material discovery, biomedical engineering, and machine controls. I encountered that ethics and human privacy should be the baseline of AI solutions. This new book written by Peter G Kirchschlaeger is considering such an important issue for various cases and applications. A few example areas in this book include robots, artificial intelligence solutions, data-based systems, and digital transformation. This topic is universally essential since AI is going to be popular everywhere on the earth. I globally recommend this great book to anybody interested in AI ethics." **Sungjin (James) Kim, AI Researcher; Senior Research Fellow, VP, LG Electronics**

"This book is a definitive must for everyone who is interested to learn about the intersection of AI, Ethics and Society. Peter G Kirchschlaeger's thoughts on the digital transformation from an ethical perspective represent a substantial contribution to a debate that we need to pursue on a well informed basis." **Professor Dr Dr h.c. Frank Kirchner, Director Robotics Innovation Center, German Research Center for Artificial Intelligence DFKI, Germany**

"Digital technologies are transforming our lives at a rapidly accelerating pace. Talk of 'artificial moral agents' and 'morality in design' can conceal the abdication of moral responsibility and the enrichment of a few at the expense of the many. While acknowledging the thoroughgoing intertwinement of human beings and technology, Peter G Kirchschlaeger urgently summons his readers to the task of analyzing and assessing artificial intelligence and the robotization and automatization of society. Only by asserting our moral agency can we ensure that digital technologies serve, rather than undermining, the flourishing of all of humankind and of the world. A vital contribution to a critically important undertaking." **Professor Dr Jennifer Herdt, Gilbert L. Stark Professor of Christian Ethics, Yale University Divinity School, USA; President of the Society of Christian Ethics**

"Although there is a plethora of books devoted to the problem area of ethical reasoning on the field of digital technologies, none so far has unfolded the complexity of the questions and the associated challenges to ethical thinking in such a multifaceted and systematic way as this work. It must be regarded not only as a milestone in the ethical debate. Moreover, it is valuable for interdisciplinary research, since the crucial interfaces for interdisciplinary exploration of this terrain, which is so difficult to cope with, are also opened up." **Professor Dr Stefan Boeschen, Chair "Society and**

Reviews

Technology" at Human Technology Center (HumTec), RWTH Aachen University, Germany

"With so much at stake, the need for ethics and AI technology to come together is now more urgent than ever before. With this truly inspiring and exciting masterpiece, Peter G Kirchschlaeger lays out the groundwork for developing the next generation of human-friendly digital technologies." **Professor Dr Benjamin Grewe, Full Professor of Systems and Circuits Neuroinformatics, Institute of Neuroinformatics UZH/ETH Zurich, Department of Electrical Engineering and Information Technology, ETH Zurich**

"For those involved in digital transformation, and almost all of us are, this book is indispensable. The detailed scientific examination of the ethical aspects of digitization, its opportunities, challenges and risks, is long overdue and yet comes at just the right time." **Professor Dr-Ing Thomas Bauernhansl, Director of the Fraunhofer Institute for Manufacturing Engineering and Automation; Director of the Institute of Industrial Manufacturing and Management IFF, University of Stuttgart, Germany**

"A comprehensively researched scientific framework to help consider machine intelligence as an opportunity, rather than a threat, for humanity to engage in an honest, informed, and scientifically grounded dialogue about the values underpinning AI systems design, development, and deployment, and the ethical and moral implications of these values choices." **Professor Dr Maria Angela Ferrario, School of Electronics, Electrical Engineering and Computer Science, Queen's University Belfast, Northern Ireland**

"The ethical considerations of digital transformation are often dismissed with arguments about progress, efficiency, and potential job creation. This is particularly concerning for those of us living in regions where many technological advancements in this area are not even created locally, but simply imported. We find companies taking advantage of the legal loopholes or in some cases, the complete absence of any legal structures and policies addressing these developments. My hope would be that this timely and thought-provoking book prompts further discourse on a topic that requires the urgent and fervent involvement of those for whom digital transformation is having an impact – which today, means all of us." **Akaliza Keza Ntwari, Entrepreneur from Rwanda in the field of technology; one of the founders of "Girls in ICT Rwanda"; Member of the UN High-Level Panel on Digital Cooperation**

"The digital transformation is affecting our societies and lives in unprecedented ways. Thorough ethical reflection on the opportunities and dangers of this change is more important than ever – and is exactly what this thoughtful book provides." **Professor Dr Klaas Enno Stephan, Full Professor for Translational Neuromodeling & Computational Psychiatry at the University of Zurich and ETH Zurich**

"An independent, profound, and all-encompassing ethical evaluation of the contemporary technologies and artificial intelligence which daily revolutionize our lives. The author stands for ethics which is needed so that digital transformation, robotization, and the use of artificial intelligence do not simply happen, but we can consciously shape them. He understands multiple benefits of scientific progress but also reveals the immense threats that the use or abuse of new technologies and machines can pose to our human and humane nature – our minds, virtues, and freedoms, and to democratic and other societal values. He firmly defends homo dignitatis from homo digitalis and stands for social justice and sustainable development, thus reminding us that human dignity, trust, solidarity, and many other values are inalienable from human beings. Great book, a must-read for everyone who wants to be a part of the solution in ethical confrontation with some unprecedented challenges of our time." **Professor Dr Miro Cerar, Law Professor, Faculty of Law of the University of Ljubljana, Slovenia; former Slovenian Prime minister (2014-2018) and Deputy Prime Minister and Minister of Foreign Affairs (2018-2020), Slovenia**

"This is a most timely and comprehensive book on the important, impactful and multi-faceted issues surrounding 'Digital Transformation and Ethics'. From the thought provoking Prologue to the personal Epilogue II I thoroughly enjoyed this tour de force across ethics, philosophy, law, computer science, technology, society and politics." **Professor Dr Felix A. Wichmann, Full Professor and Group Leader "Neural Information Processing Group", Faculty of Science, University of Tuebingen, Germany**

"The digital revolution is full of surprises. We just arrived in the anthropocene, the age of humanity, but very soon, robots are expected to take over. Then, however, at the climax of a materialistic, technology-driven world, we see another turn: ethics and values, which almost seemed to be forgotten, are suddenly back. No doubt, this is the beginning of a new historical age! Peter G Kirchschlaeger's Book 'Digital Transformation and Ethics' places you right in the middle of the debate." **Professor Dr Dirk**

Reviews

Helbing, Professor of Computational Social Science, Department of Humanities, Social and Political Sciences, affiliate of the Computer Science Department, ETH Zurich

"This new book by Peter G Kirchschlaeger offers a must read compilation and analysis of ethical questions about digital transformation, artificial intelligence as well as the changes of daily habits by online services. His issues raised, the ethical solutions offered are a rare and impressive contribution for a future paving this path of technology-based progress with profound non-technical thinking. Peter G Kirchschaeger has written a helpful masterpiece to enrich the unavoidable disruptions caused by digital technologies with Substance beyond the present digital canon." **Professor Dr Dr h.c. Guenter Mueller, Emeritus of Computer Science and Information Systems at the University of Freiburg and former Director of the Institute of Informatics and Society, Germany**

"'This trailblazing book concerns artificial intelligence (AI) and practical ethics. Its author does not much like the term AI. He points out, correctly, that it posits the possibility that machines may 'think intelligently' and 'morally'; whereas that is precisely the threshold problem that has to be resolved. He prefers to describe the automated processes of 'data-based systems'; and to do so empirically and objectively by reference to what machines and systems actually do. He explains why it is impossible to translate the bloodless language and symbols of mathematics and digital programming into the rule-transcending uniqueness of individual ethical judgements. From this starting point, he proposes the creation of an International Data-based Systems Agency (DSA) and 30 principles to govern its potential role and work in a field where the technology is moving with lightning speed. In his view, only humans can be the moral subjects of ethics. Machines and their systems can inflict death, suffering and pain; but they cannot themselves experience the same outcomes and reason to accommodate all of the applicable ethical nuances. At a time of fast moving digital technology, public and private megadata and manipulative algorithms, we are thus confronted with some of the most profound philosophical questions of our age: and the deepest practical question of them all, namely, what the human species can do to uphold the human primacy for which the author so powerfully contends." **Honourable Michael Kirby AC CMG, past Justice of the High Court of Australia (1996-2009) and Chair of the OECD expert groups on the protection of privacy and of security of information systems (1980 and 1992); Co-Chair, In-**

ternational Bar Association, Human Rights Institute (2017-2021), Australia

"A rigorous and updated book on the relationship between ethics and the ever-evolving dimensions of technologies and society – timely underlined also by the current Covid-19 pandemic." **Professor Dr Laura Palazzani, Member of the UNESCO International Bioethics Committee; Member of the European Group on Ethics in Science and New Technologies of the EU Commission; Professor of Philosophy of Law and Biolaw, Lumsa University Rome, Italy**

"This essential book discusses the technological transformation of digitalization from an ethical perspective. In the first part of the book, the necessity and added value of an ethical view of modern technologies is presented in an up-to-date and comprehensive manner.
The second part considers the mutual interactions between modern technologies as well as their application scenarios.
The third part provides up-to-date advice on the implementation of ethical issues in the use of modern technologies. Here, the focus is particularly on the protection of human rights.
Peter G Kirchschlaeger's book goes far beyond an abstract ethical view of modern technologies and gives new impetus to the discussion about the opportunities and risks of using highly efficient but also very powerful technologies.
Due to its clear concept and practical examples, the book is highly recommendable not only for ethicists but especially for engineers and managers.
The book should therefore find a firm place as an important contribution to the discussion of application scenarios of modern technologies from an ethical perspective." **Professor Dr-Ing Stephan Schaefer, Professor at the Institute of Electrical Engineering, Hochschule fuer Technik und Wirtschaft Berlin, Germany**

"Peter G Kirchschlaeger's Digital Transformation and Ethics – Ethical Considerations on the Robotization and Automatization of Society and Economy and the Use of Artificial Intelligence points in an immensely readable and highly instructive way to the critical need to understand that digital technology and AI aren't energy neutral or ecologically benign. It sounds the warning of an evolving global colonization by multinational technology-corporations in an age where technology runs ahead of regulation and technofixes are seen as untouchable silver bullets." **Nnimmo Bassey, Writer/Poet and Director of the Health of Mother Earth Foundation, Nigeria; Winner of the Right Livelihood Award**

Reviews

"We fly without fear. That is only possible because of regulation. Tight regulations make airplanes safe. It is the same for AI: Regulations are required for safe and effective AI. Peter G Kirchschlaeger's book discusses the ethical groundwork. Highly recommended for anyone." **Dr Dorian Selz, Serial Entrepreneur; CEO & Co-Founder of Squirro**

"Peter G Kirchschlaeger's book 'Digital Transformation and Ethics' is a powerful and sophisticated defense of our shared ethical principles and norms as the biggest human achievement of modernity and it demonstrates that they are still valid arsenal for fighting against the widespread naive drive for the sweeping wave of digital transformation. The book will be one of the reference points for surveying and discussing the ethics of digital technology in the future!" **Professor Gunoo Kim, Professor of Law, Gwangju Institute of Science and Technology, South Korea**

"Artificial intelligence ought to be paired with human ethics or else it risks turning into artificial tyranny. Everyone interested in the mature and enlightened interaction with digital technology, one that puts it at the service of human life, rather than the other way around, should read this book. Peter G Kirchschlaeger charts a walkable path into a digital future that belongs to humans, rather than to machines." **Professor Dr Florian Wettstein, Professor of Business Ethics and Director of the Institute for Business Ethics at University of St Gallen; Vice-President of the International Society of Business, Economics and Ethics ISBEE**

"This book is a must for anyone interested in getting a broad overview regarding the far reaching issues of Ethics in our Digital Society. It delivers a profound analysis ranging from the fundamentals of Ethics all the way to its practical implications and their potential impact on humans and our social institutions." **Peter Rudin, Visionary Entrepreneur and CEO of singularity2030.ch**

"History reminds us that many of the horrors of the not-too-distant past were justified as part of the pursuit of scientific innovation and progress. Human rights emerged as an ethical language for challenging and opposing the exploitation of science to justify those atrocities. Peter G Kirchschlaeger's excellent book is a timely caution that ethics and human rights should be at the core of the new technologies now deployed in data collection, surveillance and in risk governance by public as well as private entities, if we are to avoid reproducing the tragedies of the past." **Dr Mutuma Ruteere, Former UN Special Rapporteur on Contemporary Forms of Racism, Racial Discrimination, Xenophobia and Related Intolerance**

"There is a lot of homework to be done for our societies in terms of digitalization. Peter G Kirchschlaeger provides the respective materials and the searching questions we have to deal with. This book gives a profound review of the challenging ethical issues coming up with digitalization, roboterization and artificial intelligence. And it offers stimulating perspectives for constructive dialogue between ethics and technology." **Professor Dr Arne Manzeschke, Professor of Anthropology and Ethics for Health Professions, Evangelische Hochschule Nuernberg, Germany; President of the European Research Society for Ethics Societas Ethica**

"Peter G Kirchschlaeger reflects on a digital world in the making. He comes up with proposals for embedding digitalization in a new blueprint of thoughts and actions. A blueprint geared towards honoring human rights and shaping a more humane world. In a nutshell, advanced thinking in a perpetually changing world. A great help for all those whishing to act responsibly based on clear awareness." **Patrick Hohmann, Founder and Chairman of the Remei AG**

"No digital transformation can succeed without a solid foundation of ethics. The new book by Peter G Kirchschlaeger is a comprehensive and important contribution to help decision-makers root societal applications of Artificial Intelligence in human dignity and agency." **Ambassador Amandeep Gill, Director of the Global Health Centre project on International Digital Health & AI Research Collaborative (I-DAIR)**

"This book is not just a book, it is a call for awareness, overwhelming of humanism. A dynamic synthesis of immanence and transcendence. An ode to ethics." **Robin Cornelius, Founder of Switcher SA; Founder and CEO of Product DNA SA**

"Based on a solid philosophical and ethical discourse, Peter G Kirchschlaeger reviews critically the digital (r)evolution and resulting societal development to date and where the world is heading. It becomes clear that those who drive and shape this transformation neither base their decisions on universal or agreed ethical principles, nor that they are democratically legitimized or controlled to assume and execute the power over everyone of us that they already have. Kirchschlaeger uses a vast range of sources and examples to summarize the risks and grave possible consequences if the actors and their inventions are left unattended and unregulated. He does not stop there but proposes concretely and comprehensively what must be done by governments and the democratic electorate to manage the destructive potential of the ongoing digital transformation. A very relevant

book at a most crucial time." **Christian Goeckenjan, Head of Technology & Cyber Risk Control at a global bank**

"In the tradition of Ancient African, Ethics in Maat has always permeated social relations. The same we must bring to the current relations with technological advances, they need ethics to guarantee powers without violating the humanities, understanding the importance of technology in maintaining future advances, for this, Ethics is the determining element. This stunning, philosophically sharp, and rhetorically superb book by Peter G Kirchschlaeger shows eloquently a humane path forward." **Katiúscia Ribeiro, Researcher and University Lecturer of African Philosophy and Ethics, Women's Thoughts and Community Relations, Federal University of Rio de Janeiro, Brazil**

"In a time of dramatically growing complexity, which is in its cultural dimension accompanied by an era of confusion, nothing is more needed than orientation, explanation and interpretation of presence and future. Peter G Kirchschlaeger delivers this orientation in this book in an impressive way." **Professor Dr Dr h.c. Werner Weidenfeld, Director of the Center for Applied Policy Research (CAP) of the University of Munich, Germany**

"The wide-ranging scope and sheer rapidity of transformations wrought by new digital technologies have left societies unprepared at many levels – including with regard to the ethical dimensions. This important and thought-provoking book unpacks some of the crucial ethical questions that must guide us, if humanity is to benefit from the new opportunities while recognizing the ambivalences they create." **Professor Dr Jayati Ghosh, Professor of Economics, University of Massachusetts at Amherst, USA**

"Everyone needs to read Peter G Kirchschlaeger's new book on digital transformation and ethics. This profound masterpiece of rare conceptual brilliance provides urgent and essential ethical guidance for the present and the future. It offers a groundbreaking and beautifully written analysis of uncomfortable ethical questions about digital transformation and artificial intelligence. Beyond that, it designs in a magisterial way inspiring ethical solutions for this technology-based progress." **Alessio Allegrini, Conductor, Hornist, and Founder of Musicians for Human Rights**

"Peter G Kirchschlaeger, in this extensively researched work, explores the advantages and disadvantages of digital transformation and data-based systems, which has made human existence technologically accessed but ethi-

cally it may be the largest ungoverned space of the world. Being a deep thinker, ethicist, philosopher, speaker, profound writer, and a human rights expert, Peter G Kirchschlaeger contextualizes answers to a plethora of ethical issues, challenges, opportunities and questions to the highly volatile and ambiguous realities of digital transformation distributed unequally in the globe. This ethics of human rights based, critically argued epistemological work has been developed on the strong underpinning of philosophy, ethical principles of responsibility, omni-dynamic social justice and human rights. An epiphany for every reader, a guiding tool for every policy maker, the book is truly empowering." **Shylaja Santosh, Journalist and Human Rights Educator, State of Karnataka, India**

"Greatly familiar with both the world of digital transformation and the depth of ethics, Peter G Kirchschlaeger critically examines the key terms of the debate such as 'artificial intelligence' and 'networks' and highlights the far-reaching relevance of human dignity and internationally recognized human rights for guiding the digital transformation. The book is a persuasive wake-up call to understand and implement the right to privacy and data-protection and the other human rights in the contexts of surveillance capitalism and surveillance totalitarianism." **Professor Dr Georges Enderle, Professor Emeritus of International Business Ethics, University of Notre Dame, USA**

"Developments in Robotics and Artificial Intelligence hold potential, but can also be unsettling. Critical vigilance towards them is as important as human rights-based answers to the ethical concerns. After all – as Peter G Kirchschlaeger points out – Robots and Artificial Intelligence do not represent superhuman forces, but are no better and no worse than how we humans program them and which use we make of them. With this publication, the author fills a gap and makes an indispensable academic contribution to the comprehensive consideration of digital transformation from an ethical standpoint." **Professor Dr Martin M Lintner, Professor for Moral Theology, Philosophisch-Theologische Hochschule Brixen, Italy; former President of the Internationale Vereinigung für Moraltheologie und Sozialethik**

"Will we human beings hold the leach or carry the collar as the dog? Will we take the lead and shape technology to serve human kind rather than being enslaved or subordinated to technology? The book 'Digital Transformation and Ethics' analyses in a profound manner this question from an ethical and human rights-based approach. Peter G Kirchschlaeger takes the reader on an impressive journey through the many dilemmas that we are

confronted with on a daily basis and leaves us empowered to hold the leach. Amid the expanding academic literature on new technology the book 'Digital Transformation and Ethics' stands out and will remain relevant for long." **Adj. Professor Morten Kjaerum, Director of the Raoul Wallenberg Institute of Human Rights and Humanitarian Law, Sweden; former Director of the EU Fundamental Rights Agency**

"An essential resource for all of us to read in our technologically driven world! This book explores the ethical questions related to how technology controls our lives and how humans should advocate for more ethically based approaches to the development of new technologies. This book makes a very important contribution to the discussion of how technological innovation must also consider the ethical and moral dimensions of its impact on our lives. It is essential reading not just for the ordinary citizen but for those who lead our technology driven economy and society." **Assoc. Professor Dr Nina Burridge, Honorary Professional Fellow, School of International Studies and Education, Faculty of Arts and Social Sciences, University of Technology, Sydney, Australia**

"I congratulate Peter G Kirchschlaeger on his ground-breaking book on ethics of artificial intelligence. While the technology of AI is progressing fast inevitably bringing profound changes in the life and livelihood of all people of the earth, this is high time that we consider the ethics of it and try to guide its progress on an ethically acceptable path. Already, AI is promising to be an automated technology minimizing the need of human in not only manufacturing works, but also intellectual works too. While it can solve huge problems, which are troubling us now, it may also totally devalue human labor putting the capital in supreme power. This will carry the current concentration of wealth to an impossible extent. On the other hand, AI can free billions of people from an existence in drudgery and poverty, and allow them the time and opportunity to enjoy the higher things in life. Under a dominance of AI, our existing economic and ethical system may face a totally new situation. A drastic situation like that will need a drastic intervention through a grand human consensus. Ultimately the humanity itself being at stake here, we have to look for the very core of human ethics as the main guiding light of that consensus. Peter G Kirchschlaeger's book, therefore, has not come any earlier than it should. The book has tried to look at every aspect of the ethics involved in AI, and can be instrumental in starting that very important conversation which may make AI a glory of human achievement taking the humanity to a pinnacle, not a mistake taking the humanity to its doom. I congratulate Peter G

Kirchschlaeger again for his timely effort." **Professor Dr Muhammad Ibrahim, Professor Emeritus of Physics, University of Dhaka; Founder and Executive Director of the Centre for Mass Education and Science CMES, Bangladesh**

"A great book! The author combines the best European traditions of human-based ethical thinking in a free civil society with a fine awareness of the challenges in the digital world and in AI development! Having in mind the challenging task of combining ethical values with AI in data-based systems, the author starts from human vulnerability. This goes beyond classical approaches and ends up in promoting human rights as basic principles also in the field of AI and data-based systems.

The advantage of this approach comes with its application to a variety of practical fields such as in health-care or finance. Peter G Kirchschlaeger gains a normative guideline for dealing with a human centered use of databased-systems and artificial intelligence." **Professor Dr Ulrich Hemel, Director of the Global Ethics Institute Tuebingen, Germany; Deputy Spokesperson and Member of the CyberValley Public Advisory Board; President of the Federation of Catholic Entrepreneurs in Germany**

"This amazing book helps us understanding the deep implications that technology is having and will have in our life. Never in the past technology could have shaped and modified our lifestyle and the quality of life that we are used to. This power has grown too fast and too big with no deep understanding of its long term consequences on sustainability, inequality, justice. It's the right moment to pause and reason on how to make technology serve the flourishing of all humans – guided by the illuminating thoughts by Peter G Kirchschlaeger." **Simone Molteni, Scientific Director of LifeGate**

"Peter G Kirchschlaeger provides us with a dense and insightful analysis of the ethical challenges of digital transformation. A worthwile read!" **Professor Dr Melinda Lohmann, Assistant Professor of Business Law, with special emphasis on Information Law, University of St Gallen**

"In our times in which people try to robotize human beings and to 'humanize' robots, Peter G Kirchschlaeger's new book, with its rich content and its careful clarification of concepts, shows clearly a pressing need for a different from the prevailing approach to Ethics." **Professor Dr İoanna Kuçuradi, UNESCO Chair of Philosophy of Human Rights and Director of the Centre for Research and Application of Human Rights at Maltepe University, Turkey; President of the Philosophical Society of Turkey**

Reviews

"This extraordinary book of Peter G Kirchschlaeger impresses with an excellent documentation of issues in the fields of advanced technology and with a deep analysis of their relationship with ethics. He offers the clear proposition that the ethical judgement and the control must be located in humans not in technology as he reassumes in his first epilogue, thinking of a dog on a leash: 'do we humans want to hold the leash or carry the collar?' He bravely discusses opportunities and challenges from an ethical perspective and offers in his wonderful book a personal ethical and legal proposal about technological progress culminating in the 'homo dignitatis' instead of 'homo digitalis'. I dare to assure the readers of this book that they will find in it: how to confront the delicate and inevitable situation of present times in relationship with the future for humans regarding the technological progress; how to get an exhaustive understanding of actual issues of high technology; how the author unveils the serious risks that elements of high technology present to fundamental human values; how the research about the ethical problems in relationship to high technology is based in direct references taken from the more connoted actors of the analyzed problems; how the ethical criteria used by the author to solve the proposed problems are anchored in the most correct actual ethical tradition; how the ethical proposal of the author to handle the complex presented problems is sustained by the most respectable institutions oriented to the common good of all mankind; how the author discovers a very wide field for research not enough approached by ethics and morals in the last decades, but of extraordinary transcendence for the actual times and the next future; how the author brings out the most profound Christian moral principles from their evident rationality and wisdom without any explicit reference to a religious proposal.
I highly recommend this book not only for interested readers but specially for academic institutions centered in Ethics or Moral Theology. Catholic Church scholars should take profit of this wonderful work of Peter G Kirchschlaeger for their teaching and research according with the direction indicated by Pope Francis in his Encyclicals Laudato si' and Fratelli tutti."
Professor Dr Alberto Múnera, S.J., PhD, STD, Tenured Moral Professor, Faculty of Theology, Pontificia Universidad Javeriana, Bogotá, Colombia

"This book makes a valuable contribution to the field by unpacking how ethics can and should guide the digital transformation of society as well as economy." **Professor Dr Surya Deva, Associate Professor at the School of Law, City University of Hong Kong, Hong Kong; Vice-Chair of the UN Working Group on the issue of human rights and transnational corporations and other business enterprises**

"A much needed voice on one of the most relevant topics for the future of humanity. The rampant lack of ethics in the field of digital technology is one of the most dangerous threats to humanity. This much needed and eye-opening book explores methodically how we turn the wheel around." **Jéronimo Calderón, Social Entrepreneur, Co-Explorer Amanitas, Ashoka Fellow, Alumni of the Global Shapers Community of the World Economic Forum WEF**

Table of Contents

Table of Contents

Table of Contents

Prologue

What would a dictator wish for in order to get as many people as possible under his control? He would wish that as many people as possible were connected to each other technologically, everywhere and always, and that he had access to this digital network.

What would a company wish for in order to have as much influence as possible on as many people as possible and turn them into its customers? The company would wish that as many people as possible were connected to each other technologically, everywhere and always, and that it had access to this digital network.

How would humans who would be killed by poverty or poverty-related causes wish that most financial resources were allocated?

What would humans wish for instead of being reduced to algorithms and data?

What would humans wish for instead of being innovated away?

What would humans wish for in order to be respected as bearers of human dignity and human rights?

Would humans wish to be the masters or the slaves of algorithms and data?

1 Introduction

Writing or reading a book about rapidly advancing technology-based progress initially might trigger the suspicion that the approach could be anachronistic.[1] Does the methodical approach of a book not seem to contradict the content? Is there not a danger that the colorful bouquet of arguments starts to wilt even before it starts to blossom, because reality has surpassed and outpaced the writing long before it is written? Is the variety and complexity of technology-based achievements, phenomena, products, and realities even amenable to an ethical approach in the form of a book? Do not worry. It does make sense to continue reading this book. Because neither human curiosity to discover and invent new things nor the human fascination with the questions of what humans want to be, what kind of a world humans dream of, and if everything that humans are technically able to do should really be done, are innovations of the 21st century. Both go far back in the history of humanity, and neither is at all likely to disappear any time soon.

Furthermore, ethical reflection is also distinguished by the fact that it strives to give answers in a justifiably reliable and universally binding manner to questions asking to what end, on what grounds, and why. Ethics is a science, which reflects on morals. As a scientific discipline, ethics strives for knowledge about what ought to be in a rational, logically coherent, methodological-reflective, and systematic way. Ethics aspires to a universally, even intergenerationally, justifiable notion of right and wrong and of good and bad. Universality as a necessary characteristic of ethics, ethical assertions, ethical principles, and ethical norms presupposes the fulfillment of the principle of generalizability by presenting rational and plausible arguments – "good reasons". "Good reasons" means that it must be conceivable that all humans, given their effective freedom and autonomy as well as their full equality, would agree upon these reasons – within a model of thought and not within a real worldwide referendum – on ethical grounds. The ethically required should not change on a day-to-day basis. The ethical principle of human dignity of all humans, for example, which stipulates that all humans are unique, which distinguishes them from ma-

---

1 All verbatim quotations originally written in languages other than English have been translated by the author.

terial objects and other forms of life, and which prohibits in an absolute way putting a price tag on humans, does not lose any of its validity in view of the latest scientific findings or the latest technological developments. Finally, ethics does not react to nor lag behind, but instead interacts with research, development, and technology.

Epistemic modesty is needed when ethically dealing with digitalization, automation, mechanization, robotization of society and of the economy, and the use of artificial intelligence in this book because, obviously, there can be no claim to be able to ethically discuss this technology-based change in its fullness, breadth, and depth.[2] Rather, self-restriction needs to be practiced when writing this book so as to show in an exemplary manner, and only in the sense of presenting an introductory overview of some of the most important aspects, elements, and areas of digital transformation and the use of artificial intelligence and, hopefully, to give some humble ethical impetus for further ethical and interdisciplinary research. It is also hoped that the argumentative radiance of the considerations presented in this book can also enrich the ethical reflection of certain points and fields that unfortunately cannot be addressed in this book.

Epistemic modesty also needs to be cultivated in this book when dealing with digitalization, automation, mechanization, robotization, and the use of artificial intelligence with regard to the certainly intended, but unfortunately by no means successful, comprehensive and complete embedding in the scientific discourse. I ask those colleagues who were not taken into account in an adequate manner within the parameters of this book for their understanding.

The analysis of digitalization, automation, mechanization, robotization, and the use of artificial intelligence is characterized by epistemic modesty from an ethical perspective (a locution used in this book to indicate the scientific analysis striving for the fulfillment of the standards as described above in the definition of ethics) in the shape of this book, concerning the fact that in many cases ethics has no choice but to make conceivable and plausible statements about the future use of the current state of research. Of course, there is the danger that the future will catch up or overtake

---

2 The following topics would also merit attention, which is not possible in this book: among others, the topic of human-robot-sex, see e.g., Cheok et al. 2017; Bołtuć 2017; Mathis 2019; the topic of smart cities and digital construction, see e.g., Kitchin 2016; Calvo 2020; the topic of "smart prisons", see Knight / van de Steene 2017; the topic of robots, artificial intelligence, and space, see Abney 2017; or the topic of artificial creativity, see Rauterberg 2019.

more quickly or more slowly than anticipated or that the future will turn out quite differently than rationally assumed.

Modesty in the ethical assessment of technological progress is also required due to the risk of a "futurological fallacy"[3]. The question arises if ethical principles and norms that can be morally justified still remain valid and adequate for new and future stages of digital transformation. "We humans tend to lack historical perspective, mistaking our own time, place, politics, and culture as normative. (…) Iconic of this tendency is the computer – on which I compose these reflections – and the smartphone and tablet by my side. These devices have become indispensable tools of everyday life, as important as running water and electric lights. Really we should be gobsmacked every time we turn to these devices, which change how we live and also who we are. A mere century ago these now ubiquitous technologies would be seen as magic."[4] It is impossible to present reasons why ethical principles and norms that can be morally justified should no longer remain valid and adequate for new and future stages of digital transformation.[5]

Epistemic modesty is needed because ethics continues to struggle with the following question: "How does ethics withstand the problems of its lack of expertise, consensus and enforceability?"[6].

In all modesty, ethicists must make themselves heard in the discourse of digital transformation, primarily because of the nature of technology as a human creation.[7] "Ethics has a saying in matters related to technique simply because technology is part of the exercise of human power, namely a form of action, and all human actions or conducts are subject to moral assessment."[8] The voice of this scientific discipline is needed in order to answer the ethical questions arising in the context of digitalization, automation, mechanization, robotization, and the use of artificial intelligence and for considering that the "social and ethical problems (..) are not uniform, just because they all require digital technology."[9]

---

3 Sturma 2003: 38.
4 Grassie 2017: v.
5 See Hilgendorf 2012.
6 Wils / Mieth 1989: X.
7 For an overview on the history of ethics of technology, see Ott 2005; Verbeek 2005; Verbeek 2011a: 3-17; Mitcham 2014; Kroes 2014.
8 Jonas 1985a: 42.
9 Ohly 2019a: 25.

1 Introduction

Ethics should speak up because natural sciences and technology possess the power to "anticipate the reality as the epitome of possible products of technology"[10].

Ethics should intervene due to the uniqueness of digital transformation and artificial intelligence compared to earlier technology-based shifts in the history of humanity: "Now machines are learning to learn – and we need more distance to them. We need to understand when machine assistance is useful to us – and in what contexts it hinders us in our thinking. (...) the better machines can make decisions, the more intensively we humans must think about which decisions we want to delegate to artificial intelligence. (...) humans have to be happy with their decisions, computers do not."[11]

Ethics should contribute with justified confidence to digital transformation and the use of artificial intelligence as opportunities and risks of this technology-based era of change must be called by their name. Because only the precise identification of ethical opportunities and ethical risks of artificial intelligence and digital transformation offers the required clarity and eventually allows for using the first and mastering the latter. Both ethics and technology belong to the understanding of humans. "From the very beginning, human existence has been connected with the ability of technical production, and in this sense, technology belongs to the very definition of human"[12] as the moral capability of humans does. This is also necessary in times of anxiety and of euphoric enthusiasm: "The transformations brought about by digital technology will be profoundly beneficial ones. We're heading into an era that won't just be different; it will be better, because we'll be able to increase the variety and the volume of consumption. When we phrase it that way – in the dry vocabulary of economics – it almost sounds unappealing. Who wants to consume more and more all the time? But we don't just consume calories and gasoline. We also consume information from books and friends, entertainment from superstars and amateurs, expertise from teachers and doctors, and countless other things that are not made of atoms. Technology can bring us more choice and even freedom."[13] This is why ethics should also not shy away from the reproach of being hostile towards technology. This reproach can be negated, *inter alia* by pointing out that ethics in the course of this endeavor is in

---

10 Blumerg 2015: 46.
11 Ramge 2019: 28.
12 Wandschneider 1993: 47.
13 Brynjolfsson / McAfee 2014: 9-10.

technology-friendly surroundings. Stephen Hawking – who was able to enrich humanity with his genius thanks to technological progress – uses very clear words: "Unless we learn how to prepare for, and avoid, the potential risks, AI could be the worst event in the history of our civilization. It brings dangers, like powerful autonomous weapons, or new ways for the few to oppress the many. It could bring great disruption to our economy."[14] Elon Musk, who became rich thanks to technology by participating in the creation of the online payment system PayPal and as founder of Tesla and SpaceX – the company that wants to offer private trips to the moon by 2023 – warns: "AI is far more dangerous than nukes [nuclear warheads]. Far."[15]

Ethics with its own complexity is needed, so that digital transformation and artificial intelligence will neither be reduced to economic calculations and increasing efficiency nor to a pure instrument of marketing and "artificial stupidity", but can really rise to its potential.

Ethics is needed because of digital transformation's and artificial intelligence's "potential to substantially increase productivity in a wider variety of sectors"[16].

Ethics is needed because digital transformation and artificial intelligence have ethically relevant implications while the parameter setting for digital transformation and for the creation, design, programming, development, production, training, and use of artificial intelligence includes so far almost always only efficiency and elegance of the code.

Ethics is needed to critically review and balance the particular interests that serve public relations and marketing contributions to the ethical discourse – ethics-poetry[17] – and particular interest-oriented calls for regulations – ethics-fairytales[18] – about digital transformation and artificial intelligence by state and non-state actors.

Ethics is needed because the present situation and status quo in this area are so alarming as well because those who have created the fundamental problems and challenges, those who continue to boost the fundamental problems and challenges, and those who have benefitted and continue to benefit from the fundamental problems and challenges impose themselves

---

14 Kharpal 2017.
15 Clifford 2018.
16 OECD 2019a: 37.
17 See e.g., Pichai 2018; Nadella 2016; Smith / Browne 2019; advertisements by Facebook in newspapers worldwide on artificial intelligence and ethics, see e.g., Heuser / Nezik 2019: 9, 11; Intel 2017.
18 See e.g., Heuser / Nezik 2019.

as voices in the ethical discourse – with pseudo-ethical contributions serving again only their particular self-interests. When Jeff Bezos, Sergey Brin, Tim Cook, Bill Gates, Elon Musk, Satya Nadella, Larry Page, Alex Pentland, Sheryl Sandberg, Eric Schmidt, Brad Smith, Mark Zuckerberg, et al. want to be part of the solution while not changing their actions and continuing to foster the problems and challenges, there is a certain irony in this. This irony turns into a tragedy when people listen to them in this regard or follow their advice. For example, if technology companies were caught cheating and states ask them how they should be regulated while they still are eager to continue cheating, that is probably not a good idea. That would be as wise as a teacher who asks his or her pupils caught cheating during an exam how he or she should supervise them during the exams while they still try to continue cheating.

Ethics is needed so that digital transformation and the use of artificial intelligence does not simply happen, but that we can shape it. "At the moment, the tail is wagging the dog when it comes to digitalization. To let algorithms dictate how one should live reverts humans back to self-inflicted immaturity. One could also say: back to artificial stupidity. A mature society does not view digitalization as fate, but as a creative task."[19] Scientists, politicians, policy-makers, entrepreneurs, civil society representatives, religious and worldview-based communities, and human rights activists[20] urge ethics to provide ethical guidance and principles for an ethical framework and legal regulation of artificial intelligence and digital transformation as well as for the design, development, and production of artificial intelligence and robots in order to save humans from the negative impact of digital transformation and the use of artificial intelligence.[21] "Je ne saurai prévoir mais je saurai fonder. Car l'avenir on le bâtit."[22]

Ethics is needed to pose the question of who we want to be as humans and what should and shouldn't be in this era of "hyperhistory (where) (…) ICTs (…) record, transmit, and above all, process data, increasingly autonomously, and human societies become vitally dependent on them and on information as a fundamental resource. Added-values move from being ICT-related to being ICT-dependent."[23]

---

19 Welzer 2019.
20 See Campaign to Stop Killer Robots 2020; Future of Life Institute 2015.
21 See Russell et al. 2015.
22 De Saint-Exupéry 1948: 115.
23 Floridi 2015a: 38.

Ethics is needed because technology-based innovation is dependent on ethical guidance. Innovation can be understood as "making something new that has ethical implications"[24].

Ethics should speak up although it will be automatically criticized for obstructing, slowing down, or preventing innovation by asking critical questions or for not being up to speed.[25]

Ethics is needed to put an immediate stop to "the surveillance, the destruction of privacy, the lack of control of personal data, the shrinking of the diversity of opinions, the threatening lack of work"[26] that can result in the course of digital transformation and the use of artificial intelligence.

Ethics is needed to counter the spreading of indifference and so that we don't simply get used to everything that seems to overrun us due to the mutual reinforcement between the globalized economy and digital transformation. Comparing the worlds of George Orwell's "1984"[27] and Aldous Huxley's "Brave New World"[28], Neil Postman states: "What Orwell feared were those who would ban books. What Huxley feared was that there would be no reason to ban a book, for there would be no one who wanted to read one. Orwell feared those who would deprive us of information. Huxley feared those who would give us so much that we would be reduced to passivity and egoism. Orwell feared that the truth would be concealed from us. Huxley feared the truth would be drowned in a sea of irrelevance. Orwell feared we would become a captive culture. Huxley feared we would become a trivial culture. In short, Orwell feared that our fear might ruin us. Huxley feared that our desire might ruin us."[29] The present reality leans toward Huxley's position. The present reality makes Dave Eggers' novel "The Circle"[30] more of a documentary than a piece of literature. And this is not due to a mistake by Dave Eggers …

If one compares digital transformation to earlier eras of technological change, especially in view of their effects on humans, it can generally be said that humans' political stances are affected by the previously non-existent ways of analyzing, profiling, and clustering humans into groups,[31] of

---

24 Enderle 2015a: 10.
25 See Zimmer 2019: 43.
26 Hofstetter 2017: 87.
27 See Orwell 1949.
28 See Huxley 1932.
29 Postman 1985: XIX-XX.
30 See Eggers 2013.
31 See Floridi 2012.

recommending goods to buy, routes to take, and persons to contact,[32] of generating data about human behaviors via the "Internet of Things"[33], of bringing about "algorithmic modifications of behavior"[34] and changes of behavior,[35] of influencing the information humans receive,[36] and of marketing (resources, expert knowledge, knowhow, talent, creativity, power)[37]. It can also be said that humans want what is new on the market – no matter whether they benefit from it, whether it really means progress, or whether it is really a convenience. This means that humans are getting used to new things more quickly and more comprehensively than before – even to ethically illegitimate uses of technology, including those that endanger humans and the environment.

Furthermore, the digitalization of research and teachings has powerful effects on human thinking and on science.[38] Digital transformation and the use of artificial intelligence change the way we think.[39] "Digital Modernity in its turn has a major design flaw: the complete algorithmic quantification of the human being – as a result of which our 'mindset' approaches that of intelligent robots, and all other human traits that cannot be turned into cash are left to atrophy."[40]

Research institutes, research projects, even entire universities[41] are funded by a few multinational technology-corporations to promote ideas, which serve their economic benefits and their particular self-interest. For example, "the Singularity is not the great vision for society (…). It is rich people building a lifeboat and getting off the ship."[42] Steven A. Edwards, American Association for the Advancement of Science (AAAS), points out as well that science is moving away from peer-reviews striving for the public's interest in the service of particular preferences and interests.[43]

---

32 See de Vries 2010: 81.
33 See Portmess / Tower 2014.
34 Lanier 2018: 11.
35 See Srivastava 2010; Bavelier et al. 2011.
36 See Newell / Marabelli 2015; Taddeo / Floridi 2015.
37 See Ferrell 2017; Chow 2017; Hinds 2018; Plummer 2017; Hong 2017; Waid 2018; Brodmerkel 2017; de Jesus 2018.
38 See Budde / Oevel 2016.
39 See Prensky 2001.
40 Thun-Hohenstein 2017: 21.
41 E.g. the Singularity University, funded mostly by Bill Gates (founder of Microsoft), Larry Page (co-founder of Google), and Sergey Brin (co-founder of Google).
42 Vance 2010; see also the initiative 2045.com.
43 See Broad 2014.

University-based research is in strong competition with corporate research regarding talents.[44]

Machine translation influences the way we speak and write.[45] The digitalization of texts[46] and entire libraries[47] as well as the literature and information supply associated with it opens up further horizons. From an ethical standpoint, it also raises doubts because it undermines the democratically legitimated power of these institutions to provide knowledge and keep it public. At the same time, it can endanger informational sovereignty in view of the commercialization of knowledge by the Internet, in particular through search engines,[48] because it is not quality that decides what will be found the quickest on the Internet nor what will be shown at the top in search engines, but the quantity of the respective marketing resources used. "Platforms that are profit-driven naturally come to a different answer than non-profit-driven platforms."[49] For this reason, among others, there is a call for public platforms.

Science and human thought are being changed by digital transformation and by the use of artificial intelligence in a more fundamental way as well. "Google's founding philosophy is that we don't know why this page is better than that one: If the statistics of incoming links say it is, that's good enough. No semantic or causal analysis is required."[50] The question "why" seems to become obsolete. The search for reasons seems to become superfluous. "The scientific method is built around testable hypotheses. These models, for the most part, are systems visualized in the minds of scientists. The models are then tested, and experiments confirm or disconfirm theoretical models of how the world works. This is the way science has worked for hundreds of years. Scientists are trained to recognize that correlation is not causation, that no conclusions should be drawn simply on the basis of correlation between X and Y (it could just be a coincidence). Instead, you must understand the underlying mechanisms that connect the two. Once you have a model, you can connect the data sets with confidence. Data without a model is just noise. (…) But faced with massive data, this approach to science – hypothesize, model, test – is becoming obsolete. (…) There is now a better way. Petabytes allow us to say:

---

44 See Wegner 2018.
45 See Gunkel 2021.
46 See Herrmann / Rohlfs 2011.
47 See Eiholzer 2019.
48 See Mittler 2014.
49 Grobner 2018: 25.
50 Anderson 2008.

'Correlation is enough.' We can stop looking for models. We can analyze the data without hypotheses about what it might show. We can throw the numbers into the biggest computing clusters the world has ever seen and let statistical algorithms find patterns where science cannot."[51]

Beyond that, digital transformation and artificial intelligence are taking over our economic system. "In the new kind of data-driven economy we live in, called 'surveillance capitalism', algorithms are the new 'laws of our society'. Even though they increasingly shape people's consumption patterns, opinions, emotions, decisions and overall behavior, the algorithmic de-facto laws do not require any approval by our parliaments. Properly understood, Facebook, Google & Co. are thus the new quasi-royal sovereigns. Their near-absolute – and wholly unchecked – power does not just extend to all spheres of commercial nudging. They are also shaping a new political system: by serving as hirable platforms to manipulate the opinions of people and choices of voters, they undermine democracies as well as the free, unbiased competition of ideas."[52] Are we living in a society of "surveillance capitalism"[53]? Without a doubt, we live in a capitalist society, but is this capitalism based on, nurtured by, and oriented towards "surveillance"? In order to be able to address this question, one needs a clearer conceptual idea of what is meant by "surveillance capitalism": "1. A new economic order that claims that human experience as free raw material for hidden commercial practices of extraction, prediction, and sales; 2. A parasitic economic logic in which the production of goods and services is subordinated to a new global architecture of behavioral modification; 3. A rogue mutation of capitalism marked by concentrations of wealth, knowledge, and power unprecedented in human history; 4. The foundational framework of a surveillance economy; 5. As significant a threat to human nature in the twenty-first century as industrial capitalism was to the natural world in the nineteenth and twentieth; 6. The origin of a new instrumentarian power that asserts dominance over society and presents startling challenges to market democracy; 7. A Movement that aims to impose a new collective order based on total certainty; 8. An expropriation of critical human rights that is best understood as a coup from above: an overthrow of the people's sovereignty."[54] Perhaps the following reflections in

---

51 Anderson 2008.
52 Helbing 2018; see Bajari et al. 2019; Varian 2018.
53 See Zuboff 2019.
54 Zuboff 2019: 1.

this book will help to answer the question of whether this concept of reality is the description of the present reality or an unrealistic dystopia.

Furthermore, the changes induced by digital transformation and artificial intelligence and the far-reaching creative possibilities connected to it demand ethical orientation.

In addition, change happens faster and at shorter intervals and humans are confronted with all-encompassing, multi-faceted insecurity of what the future will bring. Changes are more rapid and happen in shorter intervals, which inspires not only hope, but also insecurity, fear and concern in humans.

Moreover, in the course of digital transformation, the intensity and interaction between humans and machines are different in comparison to earlier technological progress. In 2021, there will be more digital assistants than humans in the US, and half of all US households will be equipped with one or more "smart speakers".[55] The entirety of human life – business, as well as private life – will be permeated by digital transformation. For example, a mobile device accompanies and monitors people seven days a week, twenty-four hours per day – "capable of seeing, hearing, and understanding most of what we do. Everything's recorded. Nothing's forgotten."[56]

Finally, the lingo-political use of terms calls for attention, for example when they speak about "autonomous machines"[57], "moral technologies"[58] or "trustworthy artificial intelligence"[59]. Technology-based innovation leads to new questions in relation to the human understanding of machines: What happens if it becomes possible to develop technological systems with emotions[60] or something similar? Should technological systems be given rights?[61] Do machines become humans? Ginni Rometty, President and CEO of IBM, started to describe the robot "Watson" with "he" instead of "it"[62] …

The growing interaction between humans and machines will change digital things and artificial intelligence as human products, as well as hu-

---

55 See Smith 2018.
56 Hunter 2002: XXII.
57 See, e.g., Bendel 2015.
58 See, e.g., Verbeek 2011a.
59 See, e.g., the High-Level Expert Group on Artificial Intelligence HLEG AI of the European Commission 2019.
60 See Manzeschke et al. 2016; Wolfangel 2019.
61 Kersten 2016.
62 See Wallace-Wells 2015.

5 The Complexity of Ethics

5.1 Ethics Is Not Democracy

In the process of examining, analyzing, evaluating, and assessing digital transformation and data-based systems and its use from an ethical perspective, one has to take into account something, which remains a fundamental conceptual challenge for, e.g., ethics committees[368] as well: Ethics as a science is not democratic. A democratic process *per se* does not guarantee legitimacy. It is conceivable that a democratic opinion-forming and decision-making process may also lead to results that are ethically bad or wrong. Ethics, in a rational and critical way, need to satisfy the principle of generalizability by presenting rational and plausible arguments – "good reasons". "Good reasons" means that it must be conceivable that all humans, given their effective freedom and autonomy as well as their full equality, would agree upon these reasons – within a model of thought and not within a real worldwide referendum – on ethical grounds.

5.2 Ethics Beyond Principles and Norms

Data-based systems are able to follow moral rules and make moral decisions based on these and act accordingly. Data-based systems can be programmed or trained with ethical rules in order to come to ethical legitimate decisions and perform ethically legitimate actions as a machine.[369] In order to do justice to the complexity of reality, it takes much more than rules like "Asimov's Law": "1. A robot may not injure a human being or, through inaction, allow a human being to come to harm. 2. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law. 3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."[370] Isaac Asimov was probably aware of this himself, which he ex-

---

368 See Huriet 2009; Bobbert / Scherzinger 2019; Duewell 2005: 225-274.
369 See on this Misselhorn 2018: 70-135; Wallach / Allen 2009.
370 Asimov 1982: 67. See Tezuka 2009.

pressed, among other things, by choosing the genre of a short story to pub-
lish them.

One could think that data-based systems could just simulate humans in
the domain of ethics. "If the AI can understand human morality, it is hard
to see what is the technical difficulty in getting it to follow that morali-
ty."[371] The first counterargument includes that meaning is created by hu-
mans.[372]

The second counterargument embraces the "value alignment problem"
or the "value-loading-problem"[373] identified by Stuart Russell[374] emphasiz-
ing the complex contexts data-based systems interact with.

The third counterargument against this reductionist view of human
morality[375] consists in the above-mentioned points in chapter 2 The Corre-
lation between Ethics and Technology. "With a computer we can turn al-
most all human problems into statistics, graphs, equations. The really dis-
turbing thing, though, is that in doing so we create the illusion that these
problems can be solved with computers."[376]

The fourth counterargument against this reductionist view of ethics ac-
knowledges the fact that ethics go beyond principles, norms, and rules. In
order to do justice to the complexity of ethics,[377] mathematical or digital
ethics need not be used. It is important to note that ethics in their com-
plexity and in their entirety are not translatable into the language of math-
ematics and programming[378] because of their sensitivity to the rule-tran-
scending uniqueness of the concrete. That is why, among other things,
ethics are not casuistry. Certain aspects of ethics can be programmed or
trained as rules for data-based systems. Some ethical elements, though, can-
not be reached by digital instruments.[379] For example, data-based systems
can learn the principle of human dignity for all, human rights, and ethical
guiding principles (prohibition of lying, stealing etc.). However, even
within the realm of possibilities, it should not be neglected that data-based
systems can learn and follow these rules, but they follow the rules without
knowing about the *ethical* quality of those rules (see above 3 Can Ethical

---

371 Davis 2014: 3; see Agar 2016; Soares / Fallenstein 2017.
372 See Searle 1980; Boden 2016.
373 See Bostrom 2012.
374 See Russell 2015.
375 See also Graves 2017.
376 Yehya 2005: 15.
377 See Kirchschlaeger 2020c.
378 See Klincewicz 2017.
379 See Moor 1995.

Judgment Be Delegated to Technologies?). In other words, data-based systems would respect non-ethical or unethical rules in the same manner. "I do not think that they will end up with a moral or ethical robot. For that, we need to have moral agency. For that, we need to understand others and know what it means to suffer. The robot may be installed with some rules of ethics but it won't really care. It will follow a human designer's idea of ethics."[380] A data-based system cannot pass these limitations. "AI will not share these human traits unless we specifically create them to do so. They operate on a task and goal-oriented manner."[381] These limitations are part of data-based systems because – as elaborated above in chapter 4 Critical Review of Terms – they rely exclusively on data without a theory, they accept a solution without addressing the question "why" and while neglecting the search for reasons. This also applies to ethical rules.

This causes the problematic consequence from an ethical point of view that it can be necessary to convey to data-based systems ethical values, principles, and norms, which one thinks are false just because they are not able to handle the right ones (e.g., consequentialist instead of deontological approach).[382]

Transferring ethics to mathematics or programming becomes difficult or even impossible when guiding principles diverge or collide. Through the increasing complexity of everyday reality, humans are challenged to find insights into norms that are adequate to reality, and to consider in a more differentiated and better manner what would be expecting too much of data-based systems due to their lack of moral capability. In situations and cases where in humans the virtue of *epikeia* and conscience come into play, translating ethics into the language of mathematics, programming, and digitalization is impossible. "Epikeia is the rectification of the law where there are gaps due to its general formulation"[383]. *Epikeia* is "an independent practical judgement that records the moral demands of a concrete situation in the light of moral principles and standards"[384]. *Epikeia* consists in "the search for greater justice"[385], it is "to stimulate and to maintain the search for the justice of meaning"[386]. *Epikeia* accounts for the truth that in a concrete encounter with concrete persons in a concrete situation rules

---

380 Sharkey 2014.
381 Gurkaynak 2016: 756.
382 See Talbot et al. 2017a.
383 Aristotle, Nicomachean Ethics: V, 14, 1137b, 26.
384 Schockenhoff 2014a: 601.
385 Schloegl-Flierl 2016: 29.
386 Schloegl-Flierl 2016: 29-30.

reach their limit, because the concrete in its uniqueness outranks the rule. "The general, concrete ethical, the positive legal and many other norms that are generally applicable, although indispensable, are not sufficient to guarantee the basic humanity which, in the face of diversity, will save this society from disintegration and the terrible consequences which result from it. It is inevitable that we have to cross norms in certain situations in order to act humanely, but this does not mean that we deny the need for norms in general or refute that they are generally applicable."[387] Ethical and legal norms and their validity are of course not questioned by *epikeia*. *Epikeia* "not only directs one to apply norms, but to recognize the more urgent ones."[388] They are re-confirmed by this virtue striving for justice. At the same time, *epikeia* ensures that the ethical and legal norms serve humans and not vice-versa.[389] "With the help of *epikeia*, it is possible to act in a way that is appropriate to the situation and useful to people."[390] *Epikeia* requires, however, ethically critical and constructive participation[391] by "a human as a responsible person who is able to consider and interpret standards and laws creatively."[392]

In this context, humans are expected to take responsibility for designing norms, something that is unattainable for data-based systems because they lack moral capability. This responsibility for designing norms aims at continuously having to critically question these rules and, in the service of a prospective, ethical improvement, they are adapted by humans.

This prospective, creative level also contains a human responsibility to create standards. "Perceiving the moral claim does not mean to merely read normatively defined factual and meaningful behavior, but is always a creative process of seeing and discovering. The process of seeing and discovering becomes creative, because humans are called upon to risk in their phantasy new meaningful moments for their lifestyle, which did not occur in the previous systems of rules. The moral goodness of humans urges them to develop the correct thing, from a human perspective, in the form of models."[393] The responsibility to create standards goes far beyond what can be translated into the language of mathematics or programming and, therefore, cannot be transferred to data-based systems.

---

387 Virt 2007: 42-43.
388 Keenan 2010: 155.
389 See Schloegl-Flierl 2016: 39.
390 Schloegl-Flierl 2016: 39.
391 See Demmer 2010: 110-113.
392 Schloegl-Flierl 2016: 39.
393 Virt 2007: 43.