

Patterns

Patterns

Theory of the Digital Society

Armin Nassehi

Translated by Mirko Wittwar

polity

Originally published in German as *Muster. Theorie der digitalen Gesellschaft* © Verlag C. H. Beck oHG, München 2021

This English edition © Polity Press, 2024

Vera Molnar, *Hypertransformation*, 74,338, 1974 © ADAGP, Paris and DACS, London 2023.

Vera Molnar, *Aleatory Division of 4 Elements*, 1959 © ADAGP, Paris and DACS, London 2023.

The translation of this book was made possible through funding from the Fritz Thyssen Foundation, Cologne.

Polity Press
65 Bridge Street
Cambridge CB2 1UR, UK

Polity Press
111 River Street
Hoboken, NJ 07030, USA

All rights reserved. Except for the quotation of short passages for the purpose of criticism and review, no part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publisher.

ISBN-13: 978-1-5095-5821-6 (hardback)

ISBN-13: 978-1-5095-5822-3 (paperback)

A catalogue record for this book is available from the British Library.

Library of Congress Control Number: 2023936983

Typeset in 10.5 on 12 pt Times New Roman MT
by Fakenham Prepress Solutions, Fakenham, Norfolk NR21 8NL
Printed and bound in Great Britain by TJ Books Ltd, Padstow, Cornwall

The publisher has used its best endeavours to ensure that the URLs for external websites referred to in this book are correct and active at the time of going to press. However, the publisher has no responsibility for the websites and can make no guarantee that a site will remain live or that the content is or will remain appropriate.

Every effort has been made to trace all copyright holders, but if any have been overlooked the publisher will be pleased to include any necessary credits in any subsequent reprint or edition.

For further information on Polity, visit our website:
politybooks.com

Contents

Preface to the German edition	ix
Preface to the English edition	xi
Introduction	1
How to think about digitalization	2
A technological–sociological intuition	4
Early technology pushes	7
Original and copy	10
Productively wrong and predetermined breaking point	11
1. The Reference Problem of Digitalization	15
Functionalist questions	16
Connecting data: offline	17
What is the problem?	20
The discomfort with digital culture	25
The digital discovery of ‘society’	27
Empirical social research as pattern recognition	34
‘Society’ as digitalization material	37
The cyborg as a means of overcoming society?	41
2. The Idiosyncrasy of the Digital	44
The inexact exactness of the world	46
The particular idiosyncrasy of data	52
Cybernetics and the feedback of information	55
The digitalization of communication	61
The dynamic of closure	68
The self-referentiality of the data world	73

3. Multiple Duplications of the World	75
Data as observers	76
Duplications	79
Disruptions	84
Transverse data-like duplications	95
The trace of the trace and discrete duplications	99
Traces, patterns, networks	102
4. Simplicity and Diversity	107
Medium and form	109
Coding and programming	114
The digital simplicity of society	123
Increased options	126
<i>Sapere aude</i> – dare to know – as reflected in digitalization	132
Excursus: Digital Metabolism	134
5. Functioning Technology	140
The function of the technological	141
Digital technology	143
Communicating technology	145
The function of functioning	146
Low-level technology	148
Demonized technology	152
Invisible technology and the Turing test	154
The privilege of making mistakes	159
6. Learning Technology	164
Decisions	165
Abductive machines?	168
Distributed intelligence?	170
Anthropological and technological questions	175
Experiencing and acting machines	179
Incompleteness, temporariness, systemic paradoxes	181
Artificial, bodily, and incomplete intelligence	185
7. The Internet as Mass Media	190
Surplus of meaning businesses	191
The function of synchronization	195
Synchronization and socialization	196
Selectivity, mediality, and voice on the Internet	199

Watching the watching	204
Complexity and overheating	206
The Internet as an archive of all possible statements	209
Intelligence in the mode of Future 2.0	211
8. Endangered Privacy	213
The improbability of informational self-determination	214
A new structural change in the public sphere?	218
Hazards	220
Privacy 1.0	222
Privacy 1.0 as a result of big data?	224
Big data and privacy 2.0	226
Rescuing privacy?	229
9. Debug: Sociology Reborn from the Spirit of Digitalization	232
Digital dynamic and social complexity	234
An opportunity for sociology	237
<i>Notes</i>	240
<i>Index</i>	259

Preface to the German edition

I wrote this book in the winter of 2018/19. The manuscript was completed in April 2019. It makes the somewhat presumptuous attempt to fill in a gap, namely to think beyond the consequences of digitalization in general and beyond the consequences of concrete technologies or practices introduced by them. A great deal of work is being done on these topics, and although quite a few scholars predict disruptions, transformations, and even catastrophic shifts, the reactions of the academic community to these diagnoses are fairly bland. Initially they accepted digitalization as a reality, then harnessed all the fireworks – the concepts normally available to cultural studies and the social sciences – but disruptions and transformations were muted and routine forms of thinking took their place, along with the discovery of a new field of criticism, accompanied by the typically uncritical adoption of terms such as ‘artificial intelligence’, ‘data self-determination’, or ‘protection of privacy’.

The approach I take here is different. This book does not presuppose digitality and digitalization but asks why such a phenomenon could come into being, why it is obviously plausible for our society, in other words why it is not perceived as a disruption, and why it persists. Had it not suited this society, digitality would have never come into being or would have disappeared long ago. But, since it – whatever ‘it’ is – shows no tendency to vanish, it is worth asking, in a systematic manner, what problem is solved by digitalization. Hence I have not attempted to cram between these covers everything that I, or anyone, know or could hope to know about digitalization. The book should contain instead everything one needs to know in order to answer this question: what problem does digitalization solve?

The text is framed by two pictures by Vera Molnar, a Hungarian-born French artist who created art with the help of the computer as early as the late 1950s. This pioneer of computer

art, now a nonagenarian, experimented early with digitalizing her hand drawings, for example of squares, and with calculating other shapes from them or expanding them via computer-controlled random generators. Her entire art is marked by the depiction of her fascination with patterns and by constant reference to patterns through their alienation or change, their variation and refraction. Two of her pictures are used here: at the beginning of the book, *Hypertransformation*, a plotter drawing from 1974; at the end, *Aleatory Division of 4 Elements*, from 1959, almost a parable of how patterns can emerge from very simple elements, strictly matched, as it were, through loosely matched recombinations. This will be one of the theses of the present book: how simple media generate complex forms. I thank Vera Molnar for granting me permission to use these images, which are about the same thing as the book itself: patterns and their variation range.

The book follows up on works from recent years. Although these hardly deal with matters of digitalization, they are in many respects preliminary research for this book. My thanks go to many participants in lectures and congresses where I had numerous opportunities to test the arguments presented here. Some critical questions helped in refining things. The same applies to those who attended my various lectures and seminars.

I have particularly benefitted, as always, from the very lively discussions at my chair in Munich. Most of all, the readings and critical comments from Gina Atzeni, Niklas Barth, Magdalena Göbl, and Julian Müller have been very helpful. I express my thanks to Till Ernstsohn and Christina Behler for help with my research. Christina Behler also contributed to proofreading and to compiling the index.

Irmhild Saake constantly shared with me her thoughts on the topic, and our long years of cooperation have left on this project more traces than can be seen. I cannot thank her enough.

I thank the C. H. Beck publishing house for their assistance with the publication of the German edition, in particular Matthias Hansl for editing.

Munich, Easter Monday, 2019
Armin Nassehi

Preface to the English edition

I am very pleased that my theory of digital society, published in German by C. H. Beck Verlag, Munich, in 2019, is now being published in an English-language version.

My ambition was to fill a void, namely not only to make a sociological observation and analysis of digital technology, but to answer the question why digital technology is related fundamentally to the structure of modern society.

I am very grateful to Mirko Wittwar for translating the German text into English, to Polity Press for including the book in its programme, and especially to Manuela Tecusan for her thorough review of the English text. I would also like to thank my students Katharina Berger and Lukas Müller, who compiled the English-language material (translations and original versions) for the German-language quotations used in the German edition.

Without the generous support of the Fritz Thyssen Foundation, Cologne, this English-language edition would not have been possible.

Munich, November 2023
Armin Nassehi

Introduction

This book presents a sociological theory of the digital society. If I were to see a book of this title, I would probably be sceptical – had I not written it myself. There is a long tradition of pinning societal diagnoses on *one* aspect only. Yet we know that in a *risk society* there is more than risk, that in an *experience society* action takes place too (if we pay heed to the distinction between action and experience), that even in an *automobile society* people sometimes fly or take the underground, that even in an *accelerated society* one must sometimes wait, and that even in a *multi-option society* there is often no choice. It has never really helped to define society by just one feature. In most cases this is only a makeshift solution or an attention grabber. In any event, tuning the diagnosis to a true feature makes things easier only at first sight; often it is not the authors themselves who invent such striking names, but those who understand a thing or two about how the economics of attention works in the book market.

This is now different. Of course, the society we live in is no digital society in the sense that everything happening within it can be explained by the digital nature of a kind of technology labelled ‘digital’. Nevertheless, in the course of the book I am going to claim that modern society is, in a way, *digital* even without digital technology, or that it can be understood only by applying digital means. I am going to go even further: I am going to claim that social modernity has always been digital, and hence that the digital technology is, after all, just the logical consequence of a society that is *digital* by its fundamental structure.

The first time I tested this idea was during the Hegel Lecture of 7 December 2017, at the Free University of Berlin.¹ To understand digitalization – that cultural phenomenon that can be compared perhaps only with two other great inventions: the letterpress and the steam engine – we must not simply presuppose digitalization. Most discourses on digitalization always know already what it is about. In

this book I would like to start by excluding this knowledge in order to answer the following crucial question:

What problem does digitalization solve?

The wording of this question is methodologically precise. It is a question about the function of digitalization. It does not define what digitality and digitalization are, but approaches the phenomenon by asking about the problem that digitalization is a *societal* solution for. So we are dealing with its *societal* function. Once this question has been answered, we are also going to unlock the technological dimensions of digitalization. If we do not want to talk about something that, after all, we know only through its user interface, we must begin with a methodically controlled question like this one.

How to think about digitalization

If we look at discourses on the digital, it is conspicuous that they already presuppose the digital in a quite knowledgeable way. Either these are technological discourses that explain what the digital world can do – and then they clarify notions like search engine optimization, big data, augmented reality, or Internet of things as technological phenomena – or they slave away on the consequences of digitalization for labour markets, product markets, and attention markets; they diagnose shifts in the capitalist (re)production of value and of the concentration of economic power; and they venture prognoses of stronger or weaker disruption.² Or else they focus on the practical everyday consequences of how digitalization affects its users.

Apart from a general thematic of anti-capitalist critique directed at the digitalized economy, scholars in social sciences, and especially in cultural studies, seem to be interested in a mixture of critical attitudes and descriptions of everyday life – which is, anyway, one of the most connectable forms of development and stabilization of topics, especially for sociology. It is not as if one could claim that the same thematic, let alone topical consensus, prevails everywhere, but obviously a sociological approach to digitalization is taking place under the keywords ‘subjectivation’, ‘self-techniques’, ‘optimization’, and ‘self-control’. The starting point, then, is that practices of self-tracking, for example, or of visual and textual presentation of one’s own self or control of it obey the rule of staging oneself. These approaches are thoroughly linked to the data processing

of those traces that we leave behind through individual practices and that make us stage ourselves according to numerical practices, mostly metrical and comparative. It is particularly attractive to identify a neoliberal regime of technologies of the self that are designed to optimize the interface between self and world and to transform public control into self-control while concomitantly you become visible to public, official actors as well as to private market-based ones.

I would like to avail myself of some examples to explain these popular reflections on digitalization, based as they are on the social sciences – or rather cultural studies. More than twenty years ago Sherry Turkle had already raised the identity question, in light of the new ways of communicating on the Internet.³ Today Deborah Lupton's *Digital Sociology* explores the significance of digitalization for sociology and takes up the challenge for sociology of a completely new way of accessing the data; but in the end she stumbles again upon its consequences for our way of life and our security.⁴ *Data Revolution*, by Rob Kitchin, focuses mostly on data infrastructure and its political, organizational, and technological constitution.⁵ Shoshana Zuboff's *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier*, a study rich in material, reflects above all on the control surplus that comes along with digital media.⁶ And *Digital Societies*, too, a volume edited by Jessie Daniels, Karen Gregory, and Tressie McMillan Cottom, focuses on the consequences of digitalization on specific aspects of the narrative.⁷ German counterparts such as Steffen Mau's *The Metric Society*, with its wealth of informative material, take a similar line.⁸ There digitalization is presented as an aspect of behaviour that, after all, also works at the surplus of control. This holds even for technologically outstandingly informed works such as those by Dirk Helbing.⁹ Not even media theory works such as *There Is No Software*, by Friedrich Kittler,¹⁰ which has become almost a classic, or Sybille Krämer's study *Symbolische Maschinen*¹¹ perceive any of the social-structural radicality of the digital, according to which the place where we should look for a reference point for such culture-changing practices is the complexity of society; and neither do cultural studies' dissociations from the technological infrastructure and its practices as ways of modelling, of collecting, imaging, and quantifying.¹² To this series belongs also the very readable *The Digital Condition*, by Felix Stalder, which takes a media theory perspective.¹³

Such perspectives will not be denied at all – at least not yet, at this stage of elaboration, and not in principle. However, these are perspectives that ultimately take no interest in digitalization

as such, but presuppose it as a technological, social, and cultural infrastructure. We should recall here, if only in passing, that in the pre-digital world western middle-class lifestyles were already characterized by various kinds of self-tracking, self-controlling behaviours, and disciplining. It looks as if many social sciences perspectives on digitalization do not let themselves be disturbed by digitalization itself. Rather they identify all other social aspects also as digitalization phenomena – from gender issues¹⁴ through inequality issues¹⁵ to the critique (already mentioned) of strategies of self-optimization.

Things are different with science and technology studies (STS). The French sociologist Dominique Cardon describes as simple-minded the disapproval of the power of algorithms that comes from interest-driven, especially economy-led critiques; and he does so on the grounds that ultimately they fail to see how the production of algorithms creates a new way of thinking. By referring to Gilbert Simondon, Cardon emphasizes that technology must be taken seriously on its own, if we want to be able to understand the algorithmization of social processes. Then the most criticized practices turn out to be secondary consequences rather than the starting point of the problem.¹⁶ This is the view I follow – but without restricting the enquiry to practices, as is commonly done in most STS works, mainly for ethnographic reasons. My motivation is shaped by the question of the social function of what is meant by digitalization.

A technological–sociological intuition

Here it must be stated from the start that it is possible to ponder over issues of digitalization without considering digitalization itself, that is, without asking what it is that we are talking about when we speak of digitalization. Here I should point out that something similar occurs also in a different area: we think about society without asking what it is that we are talking about when we speak of society. I assume that these two conditions are systematically connected. *Forgetting about society when talking about society runs parallel with forgetting about digitalization when talking about digitalization.*

It is precisely this connection that I would like to unfold here, in systematic fashion, by which I mean explicitly sociologically; and this is no surprise, since making society our standard already introduces a sociological perspective. At any rate, I would like to emphasize, for starters, that I do not intend to ask the sociological question about digitalization just by way of presupposing ‘digitalization’ as

an independent variable, only to answer, then, which other variables are affected by it.

This is not yet another contribution to the debate on the disruptions caused by digitalization and the practices supported by the digital infrastructure. Rather I would like to conceptualize the reference problem – the problem of the social reference of the digital. What I am interested in is why a technology that, quite obviously, was not designed for what it is currently doing was able to become so successful so extremely fast and ultimately to penetrate almost all parts of society. It will turn out that one of the success factors of this technology is indeed its technicity.

Structuring the problem around how digitalization affects, has affected, and will affect society would really make digitalization into an independent variable. I let myself be guided instead by a techno-sociological intuition: an idea that technology and society are not different entities, but that technologies and techniques can be successful only if they are compatible with the structure of a society. In other words, the fact that digitalization could be so successful – just like printing, the railway, the car, the radio, the nuclear bomb, or the technologization of medicine in earlier periods – is to be explained only by the structure of expectations – or rather the processing power – of the society in which it happens. To give just one example: the establishment of radio and of broadcasting technology already presupposes societies with potential listeners; it presupposes the idea of accessibility, as well as the appropriate centralist power structures of modern statehood. Radio and broadcasting technology requires a reservoir of what can be said; and it deals with the heterogeneity of a pluralist audience by assuming the homogeneity of addressees or addressees. It expects that what is spread via the radio will make a difference that attracts enough attention and – not least – motivates millions of people to buy a radio receiver. Mind you, the audience is not there yet, but there must be an amalgam of situations whose inner complexity makes something like an accessible audience not completely improbable. So the steam engine was not implemented only when its industrial conditions had come to exist: some accommodative conditions were already there. And the role the railway played in opening up North America gives a telling indication that technology can meet a demand that it itself creates, but that has requirements of its own.

It should be possible to provide evidence for something of this kind in the case of digitalization, too. Then the question will be: *Which dispositions of modernity sensitize it to a technology such as digitalization (if anything like digitalization can be considered a reliable concept at all)? What is it about modernity, about social*

modernity, that was perhaps already 'digital', even before digitalization, to allow digital technology to start this triumphal procession, which actually is not in line with the intentions of its creators – just as the triumph of earlier technologies can never be explained as an intentional outcome either? The causal chain from idea to realization is too short-sighted, even if long causal chains are established.

This is not the place to lecture on the history and shallows of functionalism.¹⁷ Let me say just this: I am not dealing here with a set of clearly defined problems, to which we need to find solutions. The point is rather to understand better and determine both *the problem* and *the solution*. Concretely, I can define the problem that digitalization is a solution for only if I am aware of both solutions and problems – and, most of all, of how these two aspects relate to each other.

To repeat, one must extend considerably the functionalist frame of mind if one is to answer the question I have already indicated: *What problem is digitalization meant to solve?* And the question must be asked in such a way as to presuppose neither the problem nor the solution – so that there may be neither an existing list of problems nor an all-too-clear list of solutions for comparing the items to each other. A proper functionalist method must take both sides to be contingent; they must be of interest for the configuration itself. From a formal point of view, functionalism tells us that, if y is a function of x ($y=f(x)$), then both y and x must be taken to be contingent; and this rules out the possibility of taking one of them as an absolute value. This is exactly the problem that the critique of functionalism wrestles with.

For our topic, this means that, if the reference problem – that is, the problem–solution configuration of the digital – is to be determined, one must really start on both sides. If my initial intuition that technologies get implemented only if they are compatible with their social contexts is correct, this means that they solve a problem. So then, we should take both sides to be undetermined: *what* problem and *what* solution? By the way, solution means only that the process may go on, that compatibility has been created; hence it is not about what digitalization is, but about what it does and how it relates problem and solution.

This is exactly the beginning of the first chapter, which presents perhaps the most important thesis of the book: *that digitalization is immediately related to the social structure*. For this makes digitalization into a strange sort of disturbance – strange because it refers to the familiar with a radicalism that was not known previously. I am even going to claim that digitalization is not only a social phenomenon but *a sociological project*. Much of what digitalization

does embody a really sociological kind of thought: it makes use of social structures, it renders social dynamics visible, and out of these ways of recognizing patterns it creates added value. Of course, its actors are no sociological actors – they are enterprises and states, prosecuting authorities and media providers, communication agencies and the military, urban and social planning as well as the sciences. Yet what makes it sociological is that it recognizes or generates latent patterns and does something with them.

Early technology pushes

I am going to demonstrate that modern society was provided with a digital structure even before the use of digital computer technologies. What this means I am going to explain at a later stage. But the unmediated use of digital technology is a rather recent phenomenon. This piece of information probably makes a very modest contribution to knowledge, but, born as I was in 1960, I probably belong to one of the last promotions to have completed a university degree without any digital instruction. I passed my *Abiturprüfung* – my high school or baccalaureate exam – in Gelsenkirchen in 1979, to then study at the University of Münster, where I read educational sciences in parallel with philosophy, both with sociology as the secondary subject. I had to write a lot during my studies, as was (and still is) appropriate for university studies. Initially I had a mechanical typewriter from my parents, and working on it was pretty laborious. I think it was in my third semester, I don't remember exactly when, that my studies received a first technological push. I bought a used Robotron 202, an electric typewriter made in East Germany by VEB Robotron Buchungsmaschinenwerk in Karl-Marx-Stadt. Calling this machine robust would be a blatant understatement. It was very heavy, the chassis extravagantly made of metal that was at least two millimetres thick. The engine of this machine had certainly not been developed for typewriters; you could command with it even more solid cultural goods than philosophical, educational, psychological, and sociological seminar papers. It was a very loud machine, which certainly shouldn't come as a surprise. This held for both the engine and the typebars, which hit the paper and the platen roller with enormous power. I remember very well how the carriage return made the side table next to my desk sway. And I remember even more vividly how any keyboard mistake immediately affected what was written, corrections being almost impossible. This is what we call analogous technology – that is, a kind of technology designed for something like a one-on-one transfer of cause and effect, signal

and reaction, control and implementation. Even corrections of mistakes with Tipp-Ex were always visible. The written text on the paper had healed, but the scars could be seen by everyone.

In 1985 I passed my examinations in educational sciences. For this purpose I had to write a thesis on sociology. It had about 350 pages – in those days we were still given that much time for our first qualification paper – handwritten to begin with, then copied out on my Robotron machine. Copying out meant giving it a form that was good enough for a professional office to make it into a paper that could be submitted. The master I had produced was not really bad but, in true analogous fashion, it contained all those irregularities, mistakes, and corrections that I had made during typing – indeed scars that bore testimony to the laborious process of tinkering with thoughts to make them into a text that could be read in a linear way. What was interesting was the office whose service I had employed: it advertised that, before the final printing, the client would be given a preliminary copy so that any remaining mistakes may be corrected, provided that the corrections did not alter the pagination. Technologically, this correction process was carried out on a very modern typewriter, which was very expensive – I could afford it only because my parents made a financial contribution. All of a sudden a printed text – that is, an analogous record of a one-on-one relation of production and product – not only became repeatable but could even be changed. And this change remained invisible! No scars! This had an effect on the reality status of the text, which suddenly was something else. What remained analogous was just the result, no longer the process of producing it.

After having completed my studies, I made efforts to be granted a PhD scholarship and imagined that in the future I would do precisely what I have been doing for three decades now: work as a sociologist and turn the results of this activity in particular into texts. All my studies (at least on the technological side of the means of production) could be conducted exclusively with analogous technology. Even the search for literature was still done without databases, with the help of a catalogue system whose materiality was similar to that of my Robotron machine. I still remember the sound at the university library in Münster when the box with the index cards was pushed back into the register – a veritable bang. By the way, taking the train to Bielefeld, which was about 100 kilometres away, was worth the effort in spite of the bad connection: Bielefeld had not only a much better stocked social science library but even a microfiche system that made research much easier. But even this feature was radically analogous – though at least it remained invisible without a device that consumed electricity.

Immediately after having completed my studies, my desired profession in mind, I started looking for an affordable computer that, unlike the very successful C64 Commodore computers, would not be for recreational use but would be a proper work tool. What I needed, then, was what even in those days was called ‘the industry standard’, namely a device compatible with the Microsoft Disc Operating System (MS-DOS), which was roughly equivalent in technology with the classic IBM PC. At the time, however, there was only one IBM branch in Münster; and a real IBM PC, as it was on the market since 1981, would have been completely unaffordable. For this reason one also had to go to Bielefeld, where some computer wizards were running a shop that offered reasonably priced components for an IBM-compatible computer like the first IBM PC – with an 8088 processor and 4.77 megacycles. My first device had no hard disc but just two floppy disk drives, one of which had always to be used with floppy disks for the operating system and the application programs. While the first disk was uploading the DOS, you inserted a floppy disk with a text-processing system; I was using Word Perfect then. When you wanted to use for the first time a special feature, for example italics, you had to insert another floppy disk, which supplied this tool. And when the text was finished you used another floppy disk, on which the finished document had to be stored.

This device had a dot matrix printer whose noise was in no way inferior to that of the Robotron machine. The whole device was expensive, although still cheaper than an IBM ball-head typewriter, which was the world-class standard at the time; hence it was something of a Cadillac by comparison with the Wartburg car represented by my Robotron. These ball-head typewriters were no longer the industrial standard but could be found in every university institute office, where they served a generation of professors who used to write almost everything by hand, because their text-processing program sat in front of the IBM typewriter and was not compatible with any kind of software, but with the idiosyncratic handwritings of the gentlemen professors (for once this is not a generic masculine!).

One year later I bought a hard disk – you could do this even in Münster those days – and faced the difficult choice between one with a capacity of 1 MB and one with a capacity of 5 MB. I opted for 1 MB because one could hardly imagine filling 5 MB of storage capacity in the course of a human life. From then on my digital biography was like everybody else’s: Windows appeared, then computers with greater capacity, more efficient peripheral devices, the Internet; my data became permanently accessible, no

matter where I was. The transition from the download Internet to the upload Internet was very significant, then the transition from the stationary to the mobile Internet. With the Internet research possibilities emerged that made the Bielefeld microfiche period look antediluvian. And so on and so on. I wrote and completed this book (and earlier ones, too) in the form of files that were stored by the commercial cloud of a text-processing provider and that I was able to consult and edit to their current state on all my devices as well as on other people's – from stationary computers to smartphones.

During my first semesters of studying, that is, between 1979 and 1981, when the first IBM PC appeared on the market – I made much money by repairing cars: the Volkswagen Beetle and the VW minibus, the Citroen 2CV and GX, the Renault 4 and 5, the Opel Kadett, the VW Polo and Golf I, and even the old Stroke 8 Mercedes diesel. That was as illegal as could be (though time-barred by now), because in those days cars were indeed analogous machines that could be tinkered together. For a little while cars were still devices that converted fossil into kinetic energy; but the processes were increasingly controlled, first through electric circuits and then through computer technology. Today I could at most change the tyres and the windscreen wipers on my automobile (a rather digitalized successor of the old Stroke 8). Consequently in 2001 the profession of car mechanic – probably the most desired apprenticeship, at least among boys – was renamed 'mechatronics engineer'; the training profile had been changed even earlier.

Original and copy

What I'm getting at is probably clear by now: I, along with those born in the 1960s, can perhaps be described as the first digital generation.¹⁸ Indeed, the first PC was more than just some improved kind of typewriter. It was a medium that in fact changed the reality status of work results. In his famous 1936 essay 'The Work of Art in the Age of Mechanical Reproduction', Walter Benjamin supported the thesis that the experience of art had radically changed because it was possible to reproduce artistic exhibits: now the work of art had to prove its worth to a quite different kind of audience – and also to an audience no longer embedded in the bourgeois practices of enjoying art.¹⁹ The result was a sort of enjoyment of art *en passant* – which of course can be deplored only if the only thing one appreciates in art is its function of creating distinctiveness. But what mattered to

Benjamin was what he called the ‘loss of aura’, that is, the loss of that cairiological uniqueness that could extend into the chronological precisely through the repeatability of experience. Whoever quotes Benjamin certainly has in mind Adorno’s vitriolic accusation that Benjamin made the work of art into a fetish. But in my view this is a typical reaction to new kinds of media – be it Socrates’s praise of conversation in contrast to the distancing effect of writing, or the criticism of television as levelling things by comparison with real-world experience: an attempt to ennoble older forms with the help of semantics, in order to cope with the enormity of modern technology and its consequences.

The everyday use of digital technology has created something very similar – and, expressly, I am not talking here about the great cultural changes of the digital age, but about minor changes in the text production of a young scientist – or rather a youth who wanted to become a scientist. As a writing tool, the computer has not simply dematerialized writing. Before a text is brought to paper in the analogous way, it exists virtually. Its virtuality consists in remaining permanently open to change without having to change as a whole. Insertions, reformulations, revisions do not leave traces any longer; one would probably say, with Benjamin, that the text has lost its *aura*. Everything remains open to revision until the very end, and at the same time even preliminary versions seem aesthetically ready. Thanks to the functions of a text-processing software, absolutely incomplete texts could be presented all at once as if the text were indeed a text. One would not have done this in the past, on a Robotron 202, because that would have involved the considerable additional effort of rewriting everything all the time. Now, my concern in the present book is not to tell one of those popular stories about the impact of digitalization on everyday practices that make up the bulk of sociological literature on the topic. The example is intended only to show how digital technology is diffused into society – how small-scale it is and how suitable for daily use, how almost invisible yet effective, how unspectacular yet radical – and how swiftly the shift from an analog to a digital society has happened.

Productively wrong and predetermined breaking point

By itself, this book is not an immune reaction to digitalization, even if digitalization undoubtedly leads to disruptions of social routines that need our attention. I have already indicated what makes it interesting to social science scholars. Perhaps the most important

discourse is the one about the future of work. It is highly likely that the digitalization of both production and products will have an impact on employment and on the continuity of professional biographies. But there is blatant disagreement on how digitalization will affect these issues. A lot is simply unknown. Also, there is little doubt that the accessibility of voluminous data sets will affect scientific insights. Fear of a theory-free science, which only looks for traces in data sets, looms everywhere;²⁰ and there is the conundrum of whom to attribute knowledge to when intelligent algorithms conduct epistemic processes.²¹ It is definitely to be expected that there will be problems with adapting individual lifestyles to the mechanisms of control, by oneself or others, that will arise from the availability of growing masses of data. Likewise, there is little doubt that the pricing structure in many sectors will change as a result of completely new transparency and comparison models. Equally undisputed is a tendency towards the concentration of capital that runs parallel to the concentration of data.²² This is due to both economic and genuinely technological reasons. It is also certain that the debate on artificial intelligence will influence the self-understanding of human intelligence, which we label 'natural'.²³ And nobody will be able to ignore that new constellations and concentrations of power will appear along with digitalization.²⁴ All this has been discussed for a long time: this is how society adjusts to such (self-imposed) disturbances. In this respect, digitalization is not really an exciting theme.

Although many of the topics mentioned here occur quite explicitly in the present book, they do not constitute the core of its content. To put it another way, they are not the starting point of my reflections, but feature *only* as epiphenomena of the actual object of investigation. For all these discussions about the disruption of social routines by an encroaching digital technology ultimately get by without any grounded theory of digitalization – they just presuppose digitalization as a phenomenon. This book will attempt to close this gap.

It may not be an exaggeration to claim that a gap is being filled here. The plan is no less than to present the first social theory of the digital society. This is a scholarly endeavour and not a superficially diagnostic one, let alone one that generates instructions for action. It is an attempt to understand digitalization as a social-cultural phenomenon.

Here digitalization is not simply applied to modern society as one topic among others. The theoretical claim is far more ambitious. For, according to my techno-sociological intuition, an appropriate theory of digitalization would not have to present a colonial or

disruptive history of digitalization, but would have to be capable of identifying the reference problem of digitalization within society and its structure. In this respect, the subtitle has been chosen with great precision. We are dealing not with a *theory of digitalization*, but with a *theory of digital society*.

The Reference Problem of Digitalization

What problem does digitalization solve? If I am right, this question about the reference problem of digitalization has not yet been asked; and how you ask makes a difference. I do not ask, ‘What is digitalization?’ Nor do I ask, ‘What is the problem with digitalization?’, or ‘What problems does digitalization cause?’. Particularly about this last one, we sometimes know more than we do about my main question, on the reference problem. We know for example that digitalization is a threat to privacy, that it destroys jobs through its efficiency, especially in repetitive activities, that it can also be an economic opportunity, that it opens up possibilities of control that did not exist before, and so on. In a way, such statements presuppose digitalization as an independent variable, in order to enquire about its consequences. My question starts at a completely different point. *What problem does it solve?*

My answer is going to be as follows: *the reference problem of digitalization is the complexity and, above all, the regularity of society itself.* The argument is that modern society, especially through its digital kind of self-observation, encounters only those regularities, that stubbornness and resistance that make up social relations. True, society is a fluid, fast-moving, accelerated object, yet it is enormously stable, regular, and indeed predictable in many respects. This object contains patterns that are not recognizable at first sight. The second glance, which of course reveals them, is increasingly a digital one.

Should this thesis prove to be sustainable, it has considerable consequences for a sociological theory of digitalization that does not simply examine the consequences of digitalization and the manner of disruption attached to a certain kind of technology and technique but rather starts with the foundations of modern society itself. And this means that we do not see digitalization, but crucial parts of society are already seeing in digital fashion. Digitality is one