

# Towards Digital Enlightenment

Dirk Helbing

Editor

# Towards Digital Enlightenment

Essays on the Dark and Light Sides  
of the Digital Revolution

 Springer

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ISBN 978-3-319-90868-7      ISBN 978-3-319-90869-4 (eBook)  
<https://doi.org/10.1007/978-3-319-90869-4>

Library of Congress Control Number: 2018951408

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# Preface

When my book *Thinking Ahead* was published, our societies were on a path toward data dictatorship<sup>1</sup> or, as some people call it, technological totalitarianism.<sup>2</sup> Mass surveillance, as reported by Edward Snowden and others, was just the beginning. With the Digital Manifesto published in *Spektrum der Wissenschaft*,<sup>3</sup> it became increasingly clear that more and more areas of our lives were increasingly influenced by algorithms and often in such subtle ways that we had not even noticed this. Secretly, cookies used by our Internet browsers as well as our smartphones had delivered data to little known companies such as Axiom<sup>4</sup> or Axon Global,<sup>5</sup> which create detailed profiles about everyone living in the modern world—profiles that can predict our behavior better than our friends, family members, or even partners.<sup>6</sup> These profiles reveal more or less every relevant detail of our lives, including those that we consider highly private (such as the friends we have, our religious beliefs, sexual preferences, political inclination, and voting behavior). The company Crystal Knows<sup>7</sup> even runs a platform, which advertised for some time with the slogan “See anyone’s

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<sup>1</sup>Das DigitalManifest: Digitale Demokratie statt Datendiktatur, <http://www.spektrum.de/pdf/digital-manifest/1376682>; English translation: Will Democracy Survive Big Data and Artificial Intelligence? <https://www.scientificamerican.com/article/will-democracy-survive-big-data-and-artificial-intelligence/>

<sup>2</sup>F. Schirmacher (ed.) *Technologischer Totalitarismus: Eine Debatte* (Suhrkamp, 2015) <https://www.amazon.de/Technologischer-Totalitarismus-Eine-Debatte-suhrkamp/dp/3518074342>; M. Schulz, *Technologischer Totalitarismus: Warum wir jetzt kämpfen müssen* (FAZ, 6.2.2014) <http://www.faz.net/aktuell/feuilleton/debatten/die-digital-debatte/politik-in-der-digitalen-welt/technologischer-totalitarismus-warum-wir-jetzt-kaempfen-muessen-12786805.html>

<sup>3</sup>See footnote 1.

<sup>4</sup><https://www.axiom.com>

<sup>5</sup><https://axoncyber.com>

<sup>6</sup>Diese Firma weiss, was Sie denken (Tagesanzeiger, 3.12.2016) <https://www.tagesanzeiger.ch/ausland/amerika/diese-firma-weiss-was-sie-denken/story/25805157>

<sup>7</sup><https://www.crystalknows.com>

personality.” In fact, it allowed everybody to study the personality traits of other people—neighbors, friends, colleagues, and even strangers, competitors, and enemies.

Google and Facebook are the best-known companies that realized early on how personalized information can be used to influence our attention and, with this, our opinions, emotions, decision-making, and behavior.<sup>8</sup> One might call this mass mind manipulation, and secret services can do this, too (see the JTRIG program).

But that’s not all. Apple started to collect our activity data and set up a partnership with IBM to let their Cognitive Computer “Watson” determine our health status and diseases.<sup>9</sup> Microsoft’s Windows 10 was spying on users.<sup>10</sup> Amazon’s Echo is listening our conversations.<sup>11</sup> Game stations are spying on us.<sup>12</sup> And Cambridge Analytica produces psychological profiles of hundreds of millions of citizens to manipulate, for example, people’s voting behaviors. The company claims that the Brexit and the outcome of the US election were largely their success.<sup>13</sup> “Has the “atomic bomb” of the digital age exploded?”, people started to ask. Or was it rather a “digital Fukushima”?<sup>14</sup>

Was Elon Musk right that artificial intelligence (AI) was potentially more dangerous than nuclear bombs—considering the fact that it was used for cyberattacks on critical infrastructures such as hospitals, nuclear power stations, the electricity grid, and the Internet? Are we “summoning the demon”?<sup>15</sup>

At least, it eventually becomes clear that we were heading toward a cybernetic society, in which algorithms increasingly control society and individual behaviors. By revealing our personality traits, we have become vulnerable to manipulation. This has been used not only by the marketing industry, but also by politics, where one speaks of “social engineering” and “nudging” (and when combined with Big Data, of “big nudging”).<sup>16</sup> Probably since the Arab Spring, or even before, social bots were used to influence social media and, by this, people’s opinions and

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<sup>8</sup>R. Epstein, R.E. Robertson: The search engine manipulation effect (SEME) and its possible impact on the outcome of elections, *PNAS* 112, E4512-E4521 (2015); R.M. Bond et al. A 61-million-person experiment in social influence and political mobilization, *Nature* 489, 295-298 (2012); A.D. I.Kramer, J.E.Guillori, J.T.Hancock, Experimental evidence of massive-scale emotional contagion through social networks, *PNAS* 111, 8788-8790 (2014).

<sup>9</sup>IBM forms new health data analytics unit, extends Apple partnership, <http://www.zdnet.com/article/ibm-forms-new-health-data-analytics-unit-extends-apple-partnership/>

<sup>10</sup>Microsoft was just ordered to stop Windows 10 from spying on users, <http://bgr.com/2016/07/22/microsoft-windows-10-data-collection-france/>

<sup>11</sup>Alexa and Google Home record what you say. But what happens to that data? <https://www.wired.com/2016/12/alexa-and-google-record-your-voice/>

<sup>12</sup>Our game consoles are likely spying on us, and this is business as usual, <https://www.polygon.com/2014/2/28/5456940/our-game-consoles-are-likely-spying-on-us-and-this-is-business-as-usual>

<sup>13</sup>Ich habe nur gezeigt, dass es die Bombe gibt, <https://www.dasmagazin.ch/2016/12/03/ich-habe-nur-gezeigt-dass-es-die-bombe-gibt/>

<sup>14</sup>Carsten Könneker, Fukushima der Künstlichen Intelligenz, <http://www.spektrum.de/news/interview-die-unterschaetzten-risiken-der-kuenstlichen-intelligenz/1377620>

<sup>15</sup>[https://www.youtube.com/watch?v=\\_rFHNvHu8OE](https://www.youtube.com/watch?v=_rFHNvHu8OE)

<sup>16</sup>See footnote 1.

decisions. As algorithms determine news feeds, i.e., the number and kinds of people who receive particular messages, social media have become a powerful tool for propaganda and censorship, instruments of disinformation, and hybrid warfare.<sup>17</sup>

In the end, president Obama himself warned the public in his last Correspondents' dinner speech:<sup>18</sup> "... this is also a time around the world when some of the fundamental ideals of liberal democracies are under attack and when notions of objectively and of a free press and of facts and of evidence are trying to be undermined or in some cases ignored entirely. And in such a climate it's not enough just to give people a megaphone. And that's why your power and your responsibility to dig and to question and to counter distortions and untruths is more important than . . . ever."

With my books *Thinking Ahead*<sup>19</sup> and *The Automation of Society Is Next*<sup>20</sup> as well as the various FuturICT Blogs and the science fiction *iGod*<sup>21</sup> (jointly written with Willemijn Dicke), I have tried to follow this request to dig deeper. I believe that this—together with the many dozens of talks I have given on digital issues to more than 10,000 people and the weekly news articles in various countries—has eventually had some impact on the international debate about where we should be heading in the digital age ahead of us. I have fundamentally challenged the idea of a data-driven "benevolent dictatorship" with the *Nature* article "Build Digital Democracy,"<sup>22</sup> the Digital Manifesto,<sup>23</sup> and my article "Why we need democracy 2.0 and capitalism 2.0 to survive."<sup>24</sup> Now, a new game is about to begin.<sup>25</sup> To get there, it was important to not only criticize mass surveillance and manipulation, but to come up with an alternative, better model for our future—a world in which capitalism and democracy would not fight with each other, but where they would be married together to unleash the benefits of both. Such a new socioeconomic framework, which could dramatically improve our future prospects in a world of limited material resources, can now be built by combining Internet of Things with Blockchain Technology and Complexity Science.<sup>26</sup>

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<sup>17</sup>Notwehr against the Machine, <http://www.zeit.de/digital/internet/2017-12/34c3-chaos-computer-club-kuenstliche-intelligenz>

<sup>18</sup>The complete transcript of President Obama's 2016 White House correspondents' dinner speech, <https://www.washingtonpost.com/news/reliable-source/wp/2016/05/01/the-complete-transcript-of-president-obamas-2016-white-house-correspondents-dinner-speech/>

<sup>19</sup><https://www.amazon.com/Thinking-Ahead-Digital-Revolution-Participatory/dp/3319150774>

<sup>20</sup><https://www.amazon.com/Automation-Society-Next-Survive-Revolution/dp/1518835414/>

<sup>21</sup><https://www.amazon.com/iGod-Willemijn-Dicke/dp/1544271573/>

<sup>22</sup>D. Helbing and E. Pournaras, Build Digital Democracy, *Nature* 527, 33-34 (2015) <https://www.nature.com/news/society-build-digital-democracy-1.18690>

<sup>23</sup>See footnote 1.

<sup>24</sup>D. Helbing, Why we need democracy 2.0 and capitalism 2.0 to survive, Jusletter IT (25 May 2016) [https://www.researchgate.net/publication/301620104\\_Why\\_we\\_need\\_democracy\\_20\\_and\\_capitalism\\_20\\_to\\_survive](https://www.researchgate.net/publication/301620104_Why_we_need_democracy_20_and_capitalism_20_to_survive)

<sup>25</sup>D. Helbing, Digitization 2.0: A New Game Begins, [https://www.researchgate.net/publication/317279118\\_Digitization\\_20\\_A\\_New\\_Game\\_Begins](https://www.researchgate.net/publication/317279118_Digitization_20_A_New_Game_Begins)

<sup>26</sup>D. Helbing, An Urgent Appeal to Save the Planet, 7-part series in *The Globalist*, <https://www.theglobalist.com/population-environment-technology-society-climate-change-disaster/>

Particularly in its second part, this book offers an encouraging vision, how a better future could look like. In the past years, to those who were studying statistics and forecasts about our world, it appeared that we would eventually run into a situation of serious scarcity as well as economic and population collapse, as described by the Limits to Growth<sup>27</sup> and Global 2000<sup>28</sup> studies. Moreover, it seemed that we would lose our privacy, democracy, and human rights in an increasingly top-down controlled world trying to respond to these crises and disasters. But now there is a chance that we will take a different path into an alternative digital future characterized by peace and prosperity, which would be based on a digitally upgraded democracy supporting collective intelligence, jointly with a socio-ecological finance system (“finance 4.0”) boosting the evolution of a circular and sharing economy or, in other words, a participatory information and innovation ecosystem.

Why am I getting more optimistic? Because an open letter has been calling for another kind of digital economy, recently.<sup>29</sup> Europe has come up with a Data Protection Directive. The highest European Court has forbidden today’s kind of mass surveillance. Governments have started to worry about the dual use of artificially intelligent systems such as social bots. The White House has pushed for bottom-up approaches such as “Citizen Science” and “A Nation of Makers.”<sup>30</sup> The IEEE has worked on guidelines for “Ethically Aligned Design,”<sup>31</sup> and leading IT companies have decided to collaborate in order to break the filter bubble<sup>32</sup> and develop accountable and moral AI systems, which “should be an extension of individual human wills and, in the spirit of liberty, as broadly and evenly distributed as possible.”<sup>33</sup> An age of digital enlightenment, as it was called for by the Digital Manifesto,<sup>34</sup> seems to be on its way. It’s now your turn to contribute this better future, which is just around the corner!

Zürich, Switzerland  
February 14, 2018

Dirk Helbing

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<sup>27</sup>D.H. Meadows, *Limits to Growth* (Signet, 1972).

<sup>28</sup>The Global 2000 Report to the President, <http://www.geraldbarney.com/G2000Page.html>

<sup>29</sup>Open Letter on the Digital Economy, <https://www.technologyreview.com/s/538091/open-letter-on-the-digital-economy/>; <http://openletteronthedigitaleconomy.org>

<sup>30</sup><https://obamawhitehouse.archives.gov/blog/2016/04/14/collaboration-gives-federal-government-citizen-science-and-crowdsourcing-new-home>; <https://obamawhitehouse.archives.gov/node/316486>

<sup>31</sup>Ethically Aligned Design, [http://standards.ieee.org/develop/indconn/ec/ead\\_v1.pdf](http://standards.ieee.org/develop/indconn/ec/ead_v1.pdf)

<sup>32</sup><http://www.independent.co.uk/life-style/gadgets-and-tech/news/computer-simulation-world-matrix-scientists-elon-musk-artificial-intelligence-ai-a7347526.html>; <http://www.businessinsider.de/tech-billionaires-want-to-break-humans-out-of-a-computer-simulation-2016-10>

<sup>33</sup><https://blog.openai.com/introducing-openai/>

<sup>34</sup>See footnote 1.

# Acknowledgments

The work presented in this book has benefited largely from the support by my teams and colleagues at ETH Zurich and TU Delft, from many discussions with people around the world, including the Complexity Science Hub Vienna, and from the following projects: ERC MOMENTUM (Advanced Investigator Grant No. 324247), CIMPLEX (EC Grant. No. 641191), SoBigData (EC grant no. 654024), ASSET (EC Grant No. 688364), and FuturICT 2.0 (ERANET/SNF grant no. 20FE-1\_170226). Thank you all!



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