



# *Technology, Automation, and the Future of Work*

*Annotated Bibliography*

## Annotations

- Adler, Paul S., ed. 1992. *Technology and the Future of Work*. New York: Oxford University Press.
- Bostrom, Nick. 2014. *Superintelligence: Paths, Dangers, Strategies*. Oxford, United Kingdom: Oxford University Press.
- Bregman, Rutger. 2016. *Utopia for Realists : The Case for a Universal Basic Income, Open Borders, and a 15-Hour Workweek*. First edition. Netherlands: The Correspondent.
- Carr, Nicholas G. 2014. *The Glass Cage : Automation and Us* / Nicholas Carr. First edition. New York: W.W. Norton & Company.

This is a book “about automation’s human consequences.” As Cage notes in the introduction, “We run apps. We consult screens...We defer to the wisdom of algorithms...Automation can take a toll on our work, our talents, and our lives...As computers become our constant companions, our familiar, obliging helpmates, it seems wise to take a closer look at exactly how they’re changing what we do and who we are.”

Until recently, there has been an important distinction between explicit and tacit knowledge, and computers have been useful when we can break down a task into its explicit steps, but fall far short when a great deal of tacit knowledge and analysis is required, such as knowing whether it is safe to make a left-hand turn in a car. Advances in machine learning exemplified by Google’s (and others’) self-driving cars are disrupting this distinction.

- Catholic Church and Francis. *Laudato Si’* (“On Care for Our Common Home”) “Given in Rome at Saint Peter’s on 24 May, the Solemnity of Pentecost, in the Year 2015.” Accessed August 9, 2018. [http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco\\_20150524\\_enciclica-laudato-si.html](http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html).

Pope Francis speaks powerfully about the rapid pace of change in the modern world (§18) and the need for a human and integral ecology, which acknowledges that “everything is connected” (§91 and §117) and that our relationship with the environment is not distinct from our relationships with each other. “Concern for the environment thus needs to be joined to a sincere love for our fellow human beings and an unwavering commitment to resolving the problems of society.” (§91) Thus such wide-ranging issues as our digital lives (§47), biotechnology (§130 - §137), employment (§124 - §129), and consumerism (§144, §203 - §208) are all addressed.

He addresses technology explicitly in the encyclical, saying, for example, “. He also departs in an important way from the commonly-articulated idea that technology is only an indifferent tool. He writes, “Science and technology are not neutral; from the beginning to the end of a process, various intentions and possibilities are in play and can take on distinct shapes.” (§114) The systems we design have real tendencies, for good

and ill, and impact real people. “We have to accept that technological products are not neutral, for they create a framework which ends up conditioning lifestyles and shaping social possibilities...Decisions which may seem purely instrumental are in reality decisions about the kind of society we want to build.” (107)

Two important themes are the rejection of progress as inevitable and the necessity of respecting human dignity as we pursue economic and technological advances. Of the former, he says, “The goals of this rapid and constant human change are not necessarily geared to the common good or to integral and sustainable human development,” (18) and later he writes, “Never has humanity had such power over itself, yet nothing ensures that it will be used widely, particularly when we consider how it is currently being used.” (104) He continues, “There is a tendency to believe that every increase in power means ‘an increase of “progress” itself’...as if reality, goodness and truth automatically flow from technological and economic power as such.” (105) Technology is incredibly embedded in our culture now, “employing technology as a mere instrument is nowadays inconceivable,” Regarding the latter, he says, “The economy accepts every advance in technology with a view to profit, without concern for its potentially negative impact on human beings.” (109)

On matters of economics, he recalls and restates the standard pillars of Catholic social teaching, including the common good (§156 - §158), subsidiarity (196), solidarity (§159 - §162, §172), and the common destination of goods (§93 - §95).

For all its many cautions, the message at the core of *Laudato Si* is suffused with Christian hope. he says, “Technology has remedied countless evils which used to harm and limit human beings. How can we not feel gratitude and appreciation for this progress, especially in the fields of medicine, engineering and communications?” (§102) and, “We have the freedom needed to limit and direct technology; we can put it at the service of another type of progress, one which is healthier, more human, more social, more integral.” (§112) He ends by contemplating joy, rest and prayers for the earth and union with creation.

Domingos, Pedro. 2015. *The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World*. New York: Basic Books.

Eichhorst, Werner, Otto Kaufmann, and Regina Konle-Seidl. 2008. *Bringing the Jobless into Work? Experiences with Activation Schemes in Europe and the US / Edited by Werner Eichhorst, Otto Kaufmann, Regina Konle-Seidl*. Berlin, Heidelberg: Springer Berlin Heidelberg.

Ford, Martin. 2015. *Rise of the Robots: Technology and the Threat of a Jobless Future*. New York: Basic Books.

Frank, Malcolm, Ben Pring, and Paul Roehrig. 2017. *What to Do When Machines Do Everything : Five Ways Your Business Can Thrive in an Economy of Bots, AI, and Data*. New York: John Wiley & Sons, Incorporated.

Frey, Carl Benedikt, and Michael A. Osborne. 2017. "The Future of Employment: How Susceptible Are Jobs to Computerisation?" *Technological Forecasting & Social Change* 114 (C): 254–80. <https://doi.org/10.1016/j.techfore.2016.08.019>.

Harari, Yuval Noah. 2017. *Homo Deus*. Vintage: London.

Yuval writes a book of sweeping scope and wrestles with important questions, but his philosophical and historical analysis leave much to be desired. For example, chapter 5 describes the relationship between science and religion, with religion defined broadly so as to be able to encompass Buddhism, communism and liberalism. He asserts religion is concerned with order, and science is concerned with power, and neither is principally concerned with truth. In one specific claim, he writes that Catholicism "demands blind obedience to a pope 'who never makes mistakes.'" (222) The result is a not-especially-compelling argument addressed to a popular audience, and it is the popularity of the book rather than its particular merits that warrant its inclusion here.

The chapter with the greatest relevance to this bibliography is chapter 9. Yuval discusses several technological developments, such as IBM's Watson AI, which is being applied to medical diagnosis, and Google's AlphaGo, which has succeeded in beating the best humans in world. The chapter works satisfactorily as an introduction to developments in the last decade without much added value in terms of analysis. The book as a whole raises questions without providing, or even really claiming to provide, answers.

Head, Simon. 2005. *The New Ruthless Economy : Work & Power in the Digital Age*. New York: Oxford University Press.

Hughes, John. 2007. *The End of Work: Theological Critiques of Capitalism*. Malden, MA: Wiley-Blackwell.

Kotler, Steven, and Peter H Diamandis. 2014. *Abundance: The Future Is Better than You Think / Peter H. Diamandis and Steven Kotler*. New York: Free Press.

Malinvaud, Edmond, Margaret Scotford Archer, and Pontificia Accademia delle scienze sociali. 2003. *Work & Human Fulfillment*. Work and Human Fulfillment. Ypsilanti, Mich.: Sapientia Press of Ave Maria College.

Müller, Wolfgang. 2014. *Does an Unconditional Basic Income Provide Higher Effectiveness and Efficiency? : An Analysis of the Social Security Systems of Germany, Sweden and the United Kingdom*. Hamburg, Germany: Anchor Academic Publishing.

Murray, Charles. 2006. *In Our Hands: A Plan To Replace The Welfare State*. Washington, DC: AEI Press.

Painter, Anthony. 2016. "A Universal Basic Income: The Answer to Poverty, Insecurity, and Health Inequality?" *BMJ (Clinical Research Ed.)* 355: i6473. <https://doi.org/10.1136/bmj.i6473>.

Piketty, Thomas. 2014. *Capital in the Twenty-First Century*. Cambridge Massachusetts: The Belknap Press of Harvard University Press.

Schwab, Klaus. 2016. *The Fourth Industrial Revolution*. First U.S. edition. New York: New York : Crown Business.

Shell, Ellen Ruppel. 2018. *The Job: Work and Its Future in a Time of Radical Change*. New York: Currency.

Sousa-Pinto, Bernardo. 2017. "Universal Basic Income May Be a Trojan Horse." *BMJ (Clinical Research Ed.)* 356: j190. <https://doi.org/10.1136/bmj.j190>.

Peter Stone, and et al. 2016. "'Artificial Intelligence and Life in 2030.' One Hundred Year Study on Artificial Intelligence: Report of the 2015-2016 Study Panel." Stanford, CA: Stanford University.

Susskind, Richard E. 2015. *The Future of the Professions: How Technology Will Transform the Work of Human Experts / Richard Susskind and Daniel Susskind*. First edition. Oxford, United Kingdom: Oxford University Press.

Susskind and Susskind analyze technological developments in the professions, jobs like accountants, architects and lawyers, which have proven resistant to automation in the past, and conclude that they are already facing significant pressure from technology and that this will increase.

They describe many of the trends and forces involved in this shift, such as the evolution of professional work, which tends towards commoditization, starting from a place of exclusivity as craft, and moving through a process from standardization to incorporation into systems and finally externalized in a way that makes professional expertise available online at lower cost or even free. (197) Critically, it is not necessary for an entire profession to be equally subject to these effects, since the tasks of a professional can be de-composed into sub-tasks. The pressure of automation increases even as particular aspects of a job prove difficult to fully automate. (198)

The benefits and risks of these developments are nuanced and many-sided. For example, the substantial benefits include the realization of the latent demand of the many who would benefit from professional services but cannot afford it (133) and the replacement of a model for creating and sharing knowledge that is often very antiquated and inefficient. (34) There are also costs and challenges—most obviously to those who are employed in the professions, often at great expense in time and money—but also how to establish trust in the absence of trustworthy cultural institutions (233) or how to weigh the possible loss of personal interactions. (248)

Chapter 7 and the Conclusion deal with questions related to the consequences of increasing automation in the professions, with particular consideration of the possibilities for technological unemployment. On balance, they advocate in favor of the removal of gatekeepers and increased access to collective knowledge, bringing in philosophy and invoking the Rawlsian idea of a “veil of ignorance.” (303, 306) Regarding technological unemployment, they contend that it will come to the professions, but on the scale of “decades, rather than overnight.” (291) Their analysis reins in certain excesses of anxiety with considerations about the possibilities of bundling new tasks into redefined jobs. (287) At some level, though, they say that they are raising questions that will have to be addressed by society in general, (295) and so they begin, or continue, to wrestle with these questions, rather than answer them definitively.

Turkle, Sherry. 2015. *Reclaiming Conversation: The Power of Talk in a Digital Age*. New York: Penguin Press. This annotation refers to Chapters 2, 6 and 9.

Turkle examines the psychology and sociology of modern conversation with a particular emphasis on how it has been and is being changed by technology. She argues that technology should not be considered neutral, but should be examined in light of its affordances and how they interact with human vulnerabilities. She ultimately appreciates technology but believes it must be both designed and used with greater intentionality and awareness of human weaknesses.

Chapter 9 specifically examines conversation in the context of the work environment. She observes that at many firms “meetings are performances of what meetings used to be,” as individuals multi-task, answer emails and engage in other activities instead of being truly present to others. She finds this is often true in-person as well as when one or more people join virtually. Turning to the possibilities and limitations of email, she notes that it works well when it serves a clear, instrumental purpose, but that, quoting one of her subjects, “Technology filters things out...Breathing the same air matters.” Finally, she critically considers the phenomena of work-from-home and “hoteling,” where there are no fixed workspaces for individuals or teams. These arrangements, so plausibly-beneficial in the abstract, negatively affect relationships and informal conversation, which turn out to be essential to productivity and quality of life.

Van Donselaar, Gijs. 2009. *The Right to Exploit: Parasitism, Scarcity, and Basic Income*. Oxford, United Kingdom: Oxford University Press.

Waber, Ben. 2013. *People Analytics: How Social Sensing Technology Will Transform Business and What It Tells Us about the Future of Work / Ben Waber*. Upper Saddle River, NJ: FT Press.