Grace Van Farowe

Professor Randall Pruim

Data 303

April 22, 2023

The Second Machine Age Book Report

Introduction

"When technology advances too quickly for education to keep up, inequality generally rises." – Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age*.

This New York Times bestseller from 2014 examines the digital revolution though an economic lens. The authors are Erik Brynjolfsson, who at the time of publication was the director of the MIT Initiative on the Digital Economy, and Andrew McAfee, a principal researcher at this initiative. According to Brynjolfsson's website, he was "among the first researchers to measure productivity contributions of IT."

Brynjolfsson and McAfee weave mathematical and economic theories throughout *The Second Machine Age*. They explore how the digitization of information and Moore's Law affect the economy. Looking back to the first machine age, the Industrial Revolution, they seek insight into the digital age.

Summary

The book begins with an overview of the history of human progress, illustrated in a quintessentially data science-inspired manner with a graph. This graph juxtaposes human social development and population growth, showing that both increased slowly until about 1775 when

the steam engine was invented. At this point, both shot up exponentially. The book treats readers to a feast from this bounty of human progress, including functional self-driving cars and Watson, the computer Jeopardy! champion. Still, this type of book becomes out of date quickly, and my reading experience felt incomplete without a discussion of ChatGPT.

The authors approach the economics of the digital age from a fundamentally positive viewpoint. Moore's Law (which has led to cheap technology that allows billions to generate cheap data,) and the digitization of that data make formerly complicated tasks like navigation easy. Moore's law also allows for astonishing economic growth. The authors combat the idea that there must be a plateau when innovation stops, arguing that innovation doesn't have to be entirely new. Recombination is innovation; most ideas simply utilize existing technologies in a new way. They give the example of Instagram, which must have seemed like a simple Facebook clone when proposed.

Another central theme of the book is job loss caused by technological innovation. For instance, the camera company Kodak once employed 145,000, whereas at the time the book was written, Instagram only employed 4,600. Both companies serve the human desire to share memories through photos, and both found a large customer base. But because of the digital age, Instagram needs a lot less employees, who are generally higher skilled workers. This phenomenon has contributed to wage stagnation for many Americans while a lucky few skyrocket in wealth. The digital age is a time of superstars. We have access to the very best products the world has to offer, and oftentimes other vendors simply can't compete with the highest rated software or equipment. Monopolies can develop when one product corners a market.

The world of digital photography is an example of another key concept in the book. The proliferation of good cameras allows people around the world to take photos, which the authors call the "bounty" of the digital age. They argue that the many free products and cheap products available today because of digitization represent a hidden net positive good that is hard to measure but very real. The human experience has gotten better even if that's not immediately apparent in economic measures. Still, the "spread" of these benefits is not equal.

The authors acknowledge the reality of income inequality and that it has gotten much worse over time. But they remain optimistic. Recounting the tale of the Luddites, who vandalized mills and machines that they believed threatened their jobs, the authors draw parallels between these 18th century reactionaries and more modern economic pessimists who believe automation will lead to net job loss. They quote a panel of economists who argue that technical change will lead to more output demand, increased production, and thus greater labor needs.

In the final chapters of the book, the authors tackle the question of how the digital bounty can be spread more equally. They want better education, fueled by technology and research-backed teaching methods. They expect that many schools will "flip the classroom," with students watching lectures at home and receiving homework support while at school. As someone interested in the field of technology education, I'm wary about this proposal. I fear that economic utility will lead to overreliance on technology in the classroom and a decline in human social connectedness. For the business world, the authors champion entrepreneurship, which they say seems to be the only factor creating American jobs. As they demonstrate earlier in the book, praising Kaggle competitions, the authors are fans of crowd-sourced solutions to scientific problems.

In their section on long-term proposals, the authors argue against universal basic income, emphasizing the importance of work. The propose a negative income tax giving back to low-income earners, less taxes on work in general, taxes to penalize pollution, and a value-added tax. They are flexible in their thinking, and their general philosophy is one of "welcoming wild ideas" which can come from many unexpected sources.

Finally, the authors address dystopian fears for the future. Although they admit that exponential technology growth will bring challenges, they authors remain optimistic, paraphrasing MLK: "the arc of history is long, but it bends towards justice." However, they aren't determinist, believing that we have an important responsibility to make the right choices with our new technologies. They reiterate that value goes beyond economics, and hope the future will provide more opportunities for human creativity and connection. They conclude, "technology is not destiny. We shape our destiny."

Response

In its examination of economic justice and data science, I think this book fits in with our class themes, although I found myself thinking, "what about sin?" I do truly hope economic arguments can convince the people who lead our world to work towards a more equal society. I appreciated that instead of trying to make grand predictions for the future, the authors acknowledged the role of our choices. This philosophy is in line with Calvin's focus on ethics in our approach to technology. However, the authors' idea of shaping our own destiny ignores the role of a creator in shaping human history.

One critique I had of the book is that it didn't sufficiently address the problem of data privacy, instead praising the mass collection of data for its economic benefits. I'm also skeptical about their notion that growth and expansion are always a good thing. I believe that the economic growth the authors champion is unsustainable. At some point, we need to scale back to reconnect with nature and each other. Technology can support us on that journey, but our current level of oblivious consumption needs to decline massively. The authors praise recombination as innovation, but recombination is currently creating a massive number of low-quality products.

The book's perspective is somewhat utilitarian, with economic growth and human progress seen as the ultimate good. However, from a value ethics perspective, I think contentment is an important virtue we need to incorporate into our world views. As Jesus said in Luke 12:15, "Take care, and be on your guard against all covetousness, for one's life does not consist in the abundance of his possessions."

Works Cited

Brynjolfsson, Erik, and Andrew McAfee. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies.* W.W Norton and Company, Inc. 2016.

"About." *Erik Brynjolfsson*, https://www.brynjolfsson.com/about.

The ESV Bible. Crossway, 2001, www.esv.org/.