

The Future of Work
Robots, AI, and Automation

Darrell M. West

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To Jenny Lu Mallamo, Liz Valentini, and Hillary Schaub,

The best assistants an author can ever have

Preface

I realized something noteworthy was happening when my assistant, Hillary, came to me with an unusual experience. I had asked her to reschedule an appointment and she had emailed Amy, the personal assistant of the individual with whom I was to meet. Amy was amazingly prompt in her follow-up, and when she did not get a response from Hillary over the weekend, she emailed my assistant multiple times trying to find a date that would work.

It was only at this point Hillary noticed Amy was a “virtual assistant.” Working for an artificial intelligence (AI) firm that schedules meetings, Amy performed the tasks of a human assistant who read emails, discerned intent, and came up with a relevant response. Other than the AI title buried in her signature line, there was nothing in the exchange that would lead anyone to conclude the correspondent was virtual other than her incredible persistence over a weekend.

In reflecting on this experience, I realized that a digital assistant trained in intelligent response is not a futuristic vision. Rather, it is a current reality that performs quite well. This and other automated tools no longer are alone at the cutting edge of technology. Rather, robots, AI, virtual reality, autonomous vehicles, facial recognition, drones, and mobile sensors are altering numerous sectors and leading us to an automated society.

In this book, I explore the impact of these emerging technologies on work, education, politics, and public policy. If companies need fewer workers as a result of automation and robotics, but most societal benefits are delivered through full-time jobs, how are people outside the workforce for a lengthy period of time going to get income, health care, and retirement pensions? In this situation, it is important to rethink work and move toward lifetime learning so that people are trained for a world of dislocation. There are reforms in the social contract that would ease the transition difficulties, but it is not clear the U.S. political system is up to the task of adopting relevant policies. If leaders don't make the right choices, developed nations could end up facing serious economic and political disruptions.

The plan of this book is as follows. Chapter 1 looks at the growing use of robots. These devices are increasing in sophistication and dropping in price. In the process, they are transforming commerce and ushering in new business models. The reality of a large workforce with full-time jobs and benefits is giving way to an economy based on temporary employees, partial or no benefits, and widespread automation.

Chapter 2 reviews advances in AI, machine learning, facial recognition, driverless cars, drones, and virtual reality. Rather than requiring human intervention, improvements in software design make it possible to perform complex tasks using sophisticated algorithms. The result is an increase in economic activity but limited full-time employment opportunities other than for fields such as coders, computer experts, designers, and data scientists. These innovations are changing the way companies operate and altering the relationship between managers and employees.

Chapter 3 explores the growing reliance on sensors and the emerging network known as the Internet of Things. Digital devices are spreading in number and enabling important advances in finance, health care, transportation, public safety, and resource management. With the coming 5G network, homes and businesses will be connected through high-speed broadband, and that will make possible a dramatic expansion of digital services. That will transform commerce and communications.

Chapter 4 argues that at a time of accelerating technology, we need to consider the ramifications for the labor force and the concept of work itself. In thinking about the future, we must broaden the notion of employment to include volunteering, parenting, and mentoring, and also pay greater attention to leisure-time activities. New forms of identity will be possible when the “job” no longer defines people’s personal meaning and those in the workforce have time to engage in hobbies, personal interests, and community projects.

Chapter 5 examines the need for a new social contract and the implications of changing employment for income provision, health care benefits, and retirement support. Right now, many social benefits are tied to jobs, which limits them to those who are fully employed. However, as the business

model changes, more people will find themselves underemployed or in positions that don't provide benefits. In this situation, social benefits will need to become portable and flexible as workers move in and out of jobs. Unless there are innovative service delivery models, there may arise a large and permanent underclass that does not receive job benefits and is trapped in poverty.

Chapter 6 calls for lifetime education to help workers and employers deal better with digital disruptions. The world is going through an extraordinary period of large-scale change driven by technology innovation and changing business models. Outsourcing has become prevalent, and the emerging economy necessitates education and training programs throughout adulthood. People will need to acquire additional skills in order to remain competitive in the twenty-first-century economy.

Chapter 7 asks whether American politics is up to the challenge of a transition to a digital economy. It is difficult for business and government to redefine work, develop a new social contract, and help people gain the skills they will need. Society is fragmented, governance systems are polarized, news coverage is not very substantive, and it is hard for people to have meaningful conversations about how to reimagine the social contract. Figuring out ways to facilitate productive discussions and address the resulting political tensions will be a major challenge in coming decades.

Chapter 8 summarizes the major recommendations of the book. I argue that to cope with automation, we need to undertake a number of economic and political reforms. These include enacting paid family and medical leave, expanding the earned income tax credit; building a Republic 2.0 with political institutions capable of dealing with economic dislocations, passing universal voting to reduce political polarization, abolishing the Electoral College, reforming campaign finance, and adopting a solidarity tax to fund needed social programs.

An early version of this project was presented in 2015 through my Brookings Institution paper titled "What Happens If Robots Take the Jobs? The Impact of Emerging Technologies on Employment and Public Policy." In it, I looked at the accelerating nature of technology innovation and the ramifications for employment, workforce development, and public policy. I appreciate the help of Gisele Huff, Gerald

Huff, and Jerry Hume in supporting that project. This book also draws on publications I wrote exploring AI, the Internet of Things, driverless cars, digital education, mobile technology, smart transportation, megachange, news media, and inequality.

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