

Chapter 9

Development Trends in Automation

ABSTRACT

This chapter analyzes current development trends in automation. The chapter begins by discussing the history of automation in the 21st century, beginning with Honda's creation of ASIMO. Next, the chapter analyzes how automation gave rise to the relocating of many Western manufacturing centers to Asia, particularly those in the United States. The chapter then analyzes trends in the development of autonomous vehicles. This section includes a detailed projection of likely developments over the next several decades, such as the impact of autonomous vehicles on private vehicle ownership. The chapter concludes with a brief summary of these trends.

INTRODUCTION

Automation in production has been occurring since the 1930s and found its apogee in the development of car assembly lines in the Detroit area after World War II. Automation was then aimed at meeting the demand for cars and cheapening their production. Over time, production began to move from Detroit and other cities to China. This ignited automation in the United States to compete with low-cost labor in Asia. It was only when President Donald Trump began to introduce a policy of re-industrialization for the country in 2017 that these factories began to be brought back to the U.S.; however, production is automated because it is cheaper. Automation processes have also begun to be enriched with artificial intelligence engineering to minimize human labor needed to operate such factories, sometimes called “dark factories” because they do not need lighting without people. The focus on human labor savings has now shifted to designing autonomous vehicles to save on hiring drivers. These types of dilemmas will be strategically analyzed in this chapter.

AUTOMATION IN THE 21ST CENTURY

The development of automation discovered room for growth with the development of technology in the early 2000s. After Honda's creation of ASIMO in 2000 (which is considered "the most advanced humanoid robot in the world"), the development of automation temporarily subsided. Negative reviews of business process management (for which business process automation is an invaluable tool) have shown that the number of searches for this term more than halved between 2004 and 2011. In 2011, however, the launch of Apple's Siri interrupted a period of marketing silence about breakthroughs in automation. Siri ushered in a new era of automation and AI-based assistants. It embodied the shift away from physical robots to the development of computer automation and AI software, which, although it began in the late 1980s and early 1990s, became prominent with the effectiveness of its proposed solutions only after 20 years.¹

The automation of business processes known by the acronym BPA (business process automation)—recently recognized as robotic process automation (RPA)—is becoming more sophisticated and enhanced by the application of robots. Nowadays, automation software has become a necessity, not a luxury. Its widespread use optimizes the labor of employees and leads to considerable savings in resources such as time, labor, materials, and machines. Every day we experience the miracle of AI, whether on Twitter, in emails, in our video games, or elsewhere. We have artificial intelligence assistants in our phones, cars, and homes. It is not perfect. Siri doesn't always have an answer, and the Alexa assistant sometimes doesn't hear us. NPCs (Non-Player Characters, i.e., a player role taken over by an AI) in video games sometimes do stupid (and hilarious) things, and back in 2016, we saw the failure of a talking AI released by Microsoft called "Tay" (Tay = Talking About You). The company had to "silence" its talk, which made inflammatory remarks about specific people on Twitter; however, despite these shortcomings, AI and automation are now more comprehensive than ever before. Today, they continually developing and improving.

RELOCATING PRODUCTION TO ASIA AND AUTOMATION

At the end of the 20th century, Western developed economies were losing manufacturing jobs because companies noticed that labor costs in emerging markets were so favorable that it was more profitable to hire a large number of employees in those locations than implementing even basic automation in the U.S. or Europe. However, trends in automation and robotics technologies are rapidly changing this equation, so much so that over the next 15-20 years, there may be a significant shift in production towards the concentration of end-user resources and markets in developed countries.

Within the context of rising labor costs and inflation in the economy as well as other economic trends, automation is becoming cost-competitive with the alternative of hiring a large number of workers. This ultimately reduces the importance of labor costs as a critical factor in deciding the location for new production. As the growth of computing power, advanced sensor technology, AI control systems, and other technological advances drive the next generation of automated manufacturing, the future of manufacturing seems ready for dramatic changes in many industries. Ultimately, companies that see the intersection of technology and geography as a strategic manufacturing opportunity are likely to be in a better position as automation changes the game.

Over the past ten years, the United States has had a poor attitude towards production. Many U.S. manufacturers, as well as manufacturers from other developed countries, have sought cost reductions

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