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Are We Prepared for the Artificial Intelligence Revolution?

Jerry Haar

Imagine a future where homes will be able to use the most efficient, cost-effective electronic technology where sensors in dishwashers can determine the optimum amount of water to be used to clean a certain number of dishes and regulate the intensity of the water jets based on the dirtiness of the material. That future is closer than we think—ushered in by the "fourth industrial revolution". Coined such by Klaus Schwab, founder to the World Economic Forum, this technological revolution is fundamentally changing how we live, work and relate to one another. It is exponential, unlike the linear pace of previous ones, and includes the Internet of Things, robotics, 3D printing, biotech and nanotech, autonomous vehicles, quantum computing and, especially, artificial intelligence (AI).

AI touches all of us now in a myriad of ways and has several dimensions: (1) reactive machines which make predictions—chess algorithms are a good example; (2) limited memory that looks into the past to find patterns; self-driving cars are a case in point; (3) theory of mind whereby people, creatures and objects can have thoughts and emotions that effect their own behavior (humanoids); and self-awareness, machines with human consciousness (we are not there yet).

In a survey by MIT's Slo*an Management Review* and the Boston Consulting Group, 85% of the firms surveyed expressed the belief that AI will provide a competitive advantage. And no wonder. AI eases business operations and processes and boosts efficiency. In the financial realm it is used by finance, credit and insurance companies as lie detectors. JPMorgan Chase's Contract Intelligence (COiN) platform uses image recognition software to analyze legal documents and extract important data points and clauses in seconds. FICO uses AI to build credit risk models.

Supply chain and logistics have the largest possibilities in terms of value creation after marketing and sales. Inventory management, delivery and distribution have been improving dramatically thanks to AI. Note: UPS saves $50 million a year through process management using AI and tracking in real time optimum delivery routes. Any consumer who buys online knows how AI custom tailors marketing. For example, looking for a CD on Amazon of composer Gustav Holst's "The Planets," up will pop a message indicating that people who bought that CD also purchased other discs of similar early 20th century British classical composers such as Edward Elgar, Ralph Vaughan-Williams, William Walton and Arnold Bax.

The social and communication impacts of AI are not only promising but limitless. Siri, Alex and Amazon Echo are the most relatable while household chores, performed by cleaning robots, such as the Roomba vacuum cleaner, are another case in point. AI will impact transportation as well. Imagine owning a car that is out Ubering for you while you are working your regular job. In government services, AI is heavily employed in public safety, including parole screenings, crime prevention, and widespread applications in smart cities. And in health care patient monitoring is becoming far more efficient and effective, freeing up medical staff time for other tasks and research. Britain's National Health Service is using computer vision algorithms to detect cancerous issues, and IBM is working with CVS health and Johnson and Johnson on analysis of scientific papers to find new connections on drug development.

None of this should imply that there are no downsides or dangers from artificial intelligence. For there clearly are--mainly losing control of AI operations due to a malfunction. A finance company can lose all its money in a fraction of a second if the machine learning algorithm it relies on for its investments malfunctions. An out of control AI automotive vehicle or a robot can be fatal, and malfunctioning medical equipment or an equipment fed with insufficient data can lead to a disaster. And since AI does not understand morality, we could wind up with lethal autonomous weapons and disappear as a species.

The most immediate threat, or rather challenge from AI, is to ensure that those whose jobs will be replaced by machines (banking, apparel, mining, low-skilled machine operators) will be retrained or "skilled up" to remain employed. While, entire occupations are destined to be eliminated, research reports from Gartner and MIT estimate that rather than destroying jobs, AI will create over 500,000 jobs over the next three years. BMW in Spartanburg, South Carolina, is illustrative. Their workforce more than doubled during the last decade, as cars that once had 3,000 parts now have 15,000. More and more workers are assigned to upgraded, higher-paying work checking the final output of robots. As lower-level tech workers upgrade their skills, middle-level and higher skilled jobs will be open to them. Welding torches and hammers will be traded in for manuals that teach the basics of software coding skills.

Although AI is very expensive to implement on a large scale and costs billions of dollars and considerable time to develop and maintain, according to McKinsey, it will become a dominant feature of our 21st century economy. It behooves of us all to prepare to survive and thrive in the brave new world of artificial intelligence.

Jerry Haar is a professor and interim director of Executive and Professional Education in the College of Business at Florida International University and a global fellow of the Woodrow Wilson International Center for Scholars in Washington, D.C.