

## **HOW ARTIFICIAL INTELLIGENCE AND ROBOTS WILL RADICALLY TRANSFORM THE ECONOMY**

BY **KEVIN MANEY** ON 11/30/16 AT 8:10 AM

Next time you stop for gas at a self-serve pump, say hello to the robot in front of you. Its life story can tell you a lot about the robot economy roaring toward us like an EF5 tornado on the prairie.

Yeah, your automated gas pump killed a lot of jobs over the years, but its biography might give you hope that the coming wave of automation driven by artificial intelligence (AI) will turn out better for almost all of us than a lot of people seem to think.

The first crude version of an automated gas-delivering robot appeared in 1964 at a station in Westminster, Colorado. Short Stop convenience store owner John Roscoe bought an electric box that let a clerk inside activate any of the pumps outside. Self-serve pumps didn't catch on until the 1970s, when pump-makers added automation that let customers pay at the pump, and over the next 30 years, stations across the nation installed these task-specific robots and fired attendants. By the 2000s, the gas attendant job had all but disappeared. (Two states, New Jersey and Oregon, protect full-service gas by law.)

That's hundreds of thousands of jobs vaporized—there are now 168,000 gas stations in the U.S. The loss of those jobs was undoubtedly devastating for the individuals who had them, but the broader impact has been pretty positive for the rest of us.

As has happened throughout the history of automation, some jobs got destroyed by automated gas pumps, but new and often better jobs were created. Attendants went away, but to make the sophisticated pumps, companies like Wayne Fueling Systems in Texas, Bennett Pump Co. in Michigan and Gilbarco Veeder-Root in North Carolina hired software coders, engineers, sales staff and project managers. Station owners took their extra profits and turned their stations into mini-marts, which needed clerks, and built more gas stations, which needed more pumps from Wayne, Bennett or Gilbarco, and those companies then hired more people.

Consumers spent less money on gas because they weren't paying for someone else to pump it. That left them more money for iPhones or fish tacos ordered on Seamless, creating more new kinds of employment.

A generation of gas station attendants got smoked, but the automation sent some clear signals that relying on such unskilled jobs isn't a great career plan. Those signals led to more parents

encouraging their kids to go to college. In 1970, 14 percent of men held four-year college degrees, and 8 percent of women did. By 2015, that was up to 32 percent of men *and* women. So over time, we took hundreds of thousands of people out of the pool of those who might want a gas station attendant job and pushed them up, toward the professional job market, adding a lot of value to society and their wallets. While technology is partly responsible for years of middle-class wage stagnation, it has mostly hurt the less educated and helped the more educated.

Economists have shown time and again that automation helps overall standards of living rise, literacy rates improve, average life span lengthen and crime rates fall. After waves of automation—the Industrial Revolution, mechanization, computerization—we’re way better off in almost every way. As Matt Ridley details in his book *The Rational Optimist*, in 1900, the average American spent \$76 out of every \$100 on food, clothing and shelter; today, he or she spends \$37. To buy a Model T in 1908 took about 4,700 hours of work; today, the average person has to work about 1,000 hours to buy a car that’s a thousand times better than a Model T. The United Nations estimates that poverty was reduced more in the past 50 years than in the previous 500. If progress has been less kind to the lower end of the workforce, it still helps that segment live better than before, at least by making products more affordable and better at the same time.

And now, even with software automating all kinds of work, there are signs that the technology is creating more jobs than it destroys. U.S. census data released in September showed the largest annual drop in poverty since 1999. Nearly 3 million jobs were created from 2014 to 2015. Donald Trump won the presidential election by promising to bring jobs “back” to America—a promise believed by many who feel left behind by technology-driven shifts. Yet all evidence suggests that the jobs lie ahead, created by moving forward.

It’s hard to see how anyone could argue that we’d be better off today if Roscoe had never installed his automated device.