



Written by [Bob Adelman](#) on January 29, 2016

## Robots Are Taking Over Agriculture

The Fourth Industrial Revolution will soon [allow a single factory](#) to produce more than 30,000 heads of lettuce every day, using 98 percent less water, 30 percent less energy, and 50 percent fewer humans.



The Japanese grower Spread will open its Vegetable Factory next year using robots instead of humans not only to plant the seeds but to water them, monitor them, adjust their feeding if necessary, and then trim the mature plants prior to being packaged by other robots for shipping.

Using “vertical” farming, the factory will also take up much less space (about half the size of a Walmart), and will virtually eliminate runoff from pesticides and herbicides because they won’t be necessary. J.J. Price, a company spokesman, said that all this “means that we will ... make it affordable for everyone ... and grow staple crops and plant protein” with vastly fewer humans involved. It also will almost completely eliminate biological “invaders” like *Salmonella*, *E.coli* and *Listeria* while growing lettuce year round.

The factory model will shortly be expanded to include other crops such as basil, mint, and kale. And by shipping to local merchants, the factories will reduce transportation costs and pollution.

On the surface, it appears to be win-win-win: The farmers plant more crops more cheaply, the consumers get better produce at lower costs, and the environment is cleaner. But what about those humans the robots are replacing? A recent study by Forrester, a Boston-based technology research firm, estimates that approximately nine million American jobs will be automated in less than 10 years. But more than half that many jobs will be added in the high-tech industry, as computer programmers, software engineers, and application designers will increasingly be needed to manage the robots.

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There’s another advantage: The jobs robots are replacing are those that are “dirty, dangerous or dull,” said Matthew Taylor, a computer scientist at Washington State University. This will free them up to take on work that is more interesting and pays better.

The revolution is simply an extension of factory robots building cars in Detroit and mobile-phone components in China. Stepping away from the minutiae, the Fourth Industrial Revolution will have positive and accelerating impacts on standards of living worldwide. As economics professor John Nye wrote in the paper “Standards of Living and Modern Economic Growth,”

The last few centuries have seen us banish starvation and famine from a large part of the earth. In the most successful countries, the average citizen now enjoys a material standard of living that would have made the greatest king of two hundred years ago turn green with envy....

The average American’s annual income in 2000 was five times as high as the annual income of his counterpart in 1890, and twelve times as high as the average American’s income in the middle of the nineteenth century.



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That astonishing improvement hasn't been limited to America by any means. Wrote Nye:

Even for the poorer areas of the Earth, the growth of the last fifty years has been quite remarkable. Excluding the developed nations of North America, Western Europe, and Japan and focusing only on the so-called Third World, we find that per capita economic growth, improvements in life expectancy, and declines in mortality from disease and malnutrition outstripped the performance of the most advanced nations of Europe, Britain, and France, during the Industrial Revolution of 1760-1860.

Indeed, the economic growth of China, South Korea, and Taiwan has been so rapid since the 1960s that their people have seen material improvements in thirty or forty years that took the British, French, and Germans a century or more to attain.

The revolution taking place has another unanticipated advantage: As humans are increasingly freed from the humdrum, mundane, mind-numbing jobs that robots are taking over, they will unleash an explosion of new ideas, creations, inventions, and technologies that can scarcely be imagined. Not only will human beings live longer and better, they will also stay more productive in the latter years of their lives. The Fourth Industrial Revolution will also teach those enamored with government and its inevitable attempted interventions the foolishness and counterproductivity of those interventions.

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