

Musings on Automation, Jobs and the Future

Tom Sheridan*

Massachusetts Institute of Technology, Cambridge, MA 02139-4307, USA

*Corresponding author: Tom Sheridan, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-4307, USA, Tel: +6172532228; E-mail: sheridan@mit.edu

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Opinion Article

Jeder nach seinen Fähigkeiten, jedem nach seinen Bedürfnissen was a slogan popularized by Karl Marx in his 1875 Critique of the Gotha Program: "From each according to his ability (to produce), to each according to his need (to consume)"—a socialist ideal that has not worked so well in implementation. Does this dictum have relevance for our future? One cynical wag commented some years ago (I don't recall his name) that a better slogan for a hi-tech capitalist future might be "From each according to his need to produce, to each according to his ability to consume." He was referring, perhaps not completely seriously, to a brave new world where a managerial class of people would own robots and artificial intelligence that would replace workers, automatically producing a plethora of "stuff". These would increasingly slurp up energy and natural resources, while ordinary citizens would be urged on, by ever more intrusive advertising, to consume as much as possible to keep the economy going.

Are we approaching that nightmare? Certainly not in many parts of the world. Many nations remain poor, much in need of healthy food and clean water, adequate shelter, electricity, sanitation, transportation, etc. Very gradually and when costs are in reach, technology and education are correcting these obvious deficiencies—which we all applaud. Meanwhile, however, the rich nations are getting richer by comparison. And the managerial class is getting richer while worker wages are stagnant, widening the gap between rich and poor.

However the long-term trend in the industrialized nations is unmistakable. Computers and automation ARE replacing jobs. This happened in agriculture decades ago and, more recently, is happening in manufacturing and routine desk jobs. Some economists have asserted that jobs are just being upgraded, so that by re-education workers can become supervisors of computerized robots and automation—but still retain their jobs. That is true to some extent. But automating routine tasks is far more efficient than doing those tasks manually, so not as many humans are necessary to supervise the automation.

My MIT lab was involved in comparing the basic capabilities of robots and automation to those of humans starting in 1960. So I profess a keen and long-term interest in watching these trends (though my specific expertise is well past its "sell-by" date). In the beginning robots and automation were only good at executing simple tasks that were programmed by smart humans, but now automatic sensors can gather information far more quickly and efficiently than can humans. They can feed information to computers that perform the necessary analyses, make decisions on what to do, and control the robots and automation in performing much more sophisticated tasks. The computers that do the controlling are also getting good at learning (beating human world champions at sophisticated games like chess and "go"). Computers now can even program themselves. The trend

continues, even to the point of provoking serious articles on whether computers can be conscious and have souls, but we need not go there (for now).

Jobs are being replaced by automation in all the industrialized nations, and the required human technical talent is being increased. Actually this is happening faster in China and many other Asian and European countries than it is in the US. America is now well down the list for investment in STEM (science, technology, engineering and math) education. Other nations still have some distance to make up, compared to the current leading status of the US in science and technology, but how long can that last? Meanwhile the developed nations can and should help supply the under-developed nations with what they need, and that will help sustain the US for the immediate future. But even here, China and Germany are doing better than the US is, e.g., in making many deals for projects in Africa.

By having to rebuild after World War II, and by borrowing money and being generous with Europe (the Marshall Plan), technology AND jobs flourished during that period. But the US future is now more murky. As my mother-in-law used to say, we are living "high on the hog" as compared to earlier times. We continue to run up federal debt (increasing faster than GDP, that ratio being what is critical). And when other nations gain in capabilities they can no longer be dominated. Earlier the British lost their empire and recently we seem to be losing ours, at least our influence on the rest of the world. Thomas Friedman's book *The World is Flat* nicely points out that as long as wages are lower elsewhere, and folks in other nations are becoming just as smart as we are, we in the US may have to get used to living a bit more modestly—with less "stuff".

Surely technology is making life easier in many respects, but are we really happier? Does standing the old Marxist dictum on its head: "From each according to his need to produce, to each according to his ability to consume", specify a desirable approach? It depends on what is meant. Is production of more material "stuff" what we really want? Surely it is human nature to want to produce, to be productive. Psychologist-writer Erich Fromm emphasizes the human need to be and feel productive in life. From his perspective, one's "productive orientation" finds its greatest personal satisfaction in terms of doing things for other human beings—not a novel idea. Some futurists predict an ever greater need for jobs in serving other people, teaching the young, and caring for the elderly. Ability to consume that kind of production should come naturally to people. How best to shape a thriving economy around such jobs is an open and challenging question. What is clear is that educating and serving other people are tasks that are least amenable to computers and automation. They are the hardest in terms of what computers and automation can do, and the most satisfying in terms of what the human brain can do. Some economists already see a future with fewer jobs in manufacturing and more in the service sector.

The long-term trends seem clear enough. Automation will increasingly provide many of our needs for the material essentials. Perhaps we can celebrate a future where we are called upon to live more for each other rather than focus on making and cluttering our lives with more non-essential “stuff”.