The race against machines

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Economists have reassured workers that new jobs would be created even as old ones were eliminated. For more than 200 years, the economists were right. Despite massive automation of millions of jobs, more workers had jobs at the end of each decade up through the end of the 20th century. No law says that everyone, or even most people, automatically benefit from technological advancement. Erik Brynjolfsson, professor at MIT's Sloan School of Management, says these changes are due to rapidly advancing technology. Some people will lose and some will win. The question is who will win and who will not win?

In his 1950 book The Human Use of Human Beings, Weiner described automation as “the precise economic equivalent of slave labor.” Thus, he said, any labor that competes with machines will have to accept the economic conditions of slave labor. As unpleasant as this might be for the slaves, it often serves the ambitions of their masters. “Those who suffer from a power complex,” Wiener wrote, “find the mechanisation of man a simple way to realize their ambitions.”

We have designed jobs that are "tightly scripted" and "highly standardised" and that leaves no room for "individual initiative or creativity." These are the types of jobs that machines can perform much better than human beings. That is how we have put a giant target sign on the backs of workers, Hagel says. We need to reframe the race against the machine as a race with the machine. In other words, we need to look at how machines can augment human labour rather than replace it. So then, the problem is not really about technology, but rather, "how do we innovate our institutions and our work practices?"

Where people still win

Although computers are encroaching into territory that used to be occupied by people alone, like advanced pattern recognition and complex communication, for now, humans still hold the high ground in each of these areas. Experienced doctors.

For example, make diagnoses by comparing the body of medical knowledge they have accumulated against patients’ lab results and descriptions of symptoms, and by employing the advanced subconscious pattern recognition abilities we label “intuition.” (Does this patient seem like they are holding something back? Do they look healthy, or is something off about their skin tone or energy level?’) Similarly, the best therapists, managers, and salespeople excel at interacting and communicating with others and their strategies for gathering information and influencing behaviour can be amazingly complex.

Digital technologies change rapidly, but organizations and skills aren’t keeping pace. As a result, millions of people are being left behind. Their incomes and jobs are being destroyed, leaving them worse off in absolute purchasing power than before the digital revolution. While the foundation of our economic system presumes a strong link between value creation and job creation, the Great Recession

reveals the weakening or breakage of that link.

A study by economists Steven J. Davis, Jason Faberman, and John Haltiwanger found that recruiting intensity per job opening has plummeted during the past decade as well. Employers just don't seem to have the same demand for labor that they once did

As we move deeper into the second half of the chessboard, computers are rapidly getting better at both of these skills. We are starting to see evidence that this digital progress is affecting the business world. New York Times (2011) highlighted how heavily computers' pattern recognition abilities are already being exploited by the legal industry where, according to one estimate, moving from human to digital labour during the discovery process could let one lawyer do the work of 500. In January, for example, Blackstone Discovery of Palo Alto, Calif., helped analyze 1.5 million documents for less than $100,000.

From a legal staffing viewpoint, it means that a lot of people who used to be allocated to conduct document review are no longer able to be billed out," said Bill Herr, who as a lawyer at a major chemical company used to muster auditoriums of lawyers to read documents for weeks on end. "People get bored, people get headaches. Computers don't."

Virtual assistants are taking the place of customer service representatives. Kiosks and self-service machines are reducing the need for checkout clerks. Vending machines now sell iPods, bathing suits, gold coins, sunglasses, and razors; some will even dispense prescription drugs and medical marijuana to consumers willing to submit to a fingerprint scan. Besides, shoppers are finding information on touch screen kiosks, rather than talking to attendants.

The threat of technological unemployment is real. To understand this threat, we'll define three overlapping sets of winners and losers that technical change creates: (1) high-skilled vs. low-skilled workers, (2) superstars vs. everyone else, and (3) capital vs. labor.

High-skilled vs. low-skilled workers

This technical change increases the relative demand for high-skill labour while reducing or eliminating the demand for low-skill labour. A lot of factory automation falls into this category, as routine drudgery is turned over to machines while more complex programming, management, and marketing decisions remain the purview of humans. A recent paper by economists Daron Acemoglu and David Autor highlight the growing divergence in earnings between the most-educated and least-educated workers.

Over the past 40 years, weekly wages for those with a high school degree have fallen and wages for those with a high school degree and some college have stagnated. On the other hand, college-educated workers have seen significant gains, with the biggest gains going to those who have completed graduate training

Superstars vs. Everyone Else

Many industries are winner-take-all or winner-take-most competitions, in which a few individuals get

the lion's share of the rewards. Think of pop music, professional athletics, and the market for CEOs. Digital technologies increase the size and scope of these markets. These technologies replicate not only information goods but increasingly business processes as well. As a result, the talents, insights, or decisions of a single person can now dominate a national or even global market. Meanwhile good, but not great, local competitors are increasingly crowded out of their markets. The superstars in each field can now earn much larger rewards than they did in earlier decades.

The effects are evident at the top of the income distribution. The top 10% of the wage distribution has done much better than the rest of the labour force, but even within this group, there has been growing inequality. Income has grown faster for the top 1% than the rest of the top decile. In turn, the top 0.1% and top 0.01% have seen their income grow even faster.

Sherwin Rosen, himself a superstar economist, laid out the economics of superstars in a seminal 1981 article. In many markets, consumers are willing to pay a premium for the very best. If the technology exists for a single seller to replicate his or her services at a cheap cost, then the top-quality provider can capture most or all—of the market. The next-best provider might be almost as good yet get only a tiny fraction of the revenue.

Capital vs. Labour

The third division is between capital and labor. Most types of production require both machinery and human labor. According to the bargaining theory, the wealth they generate is divided according to relative bargaining power, which in turn typically reflects the contribution of each input. If the technology decreases the relative importance of human labour in a particular production process, the owners of capital equipment will be able to capture a bigger share of income from the goods and services produced.

To be sure, capital owners are also humans—so it is not as if the wealth disappears from society—but capital owners are typically a very different and smaller group than the ones doing most of the labour, so the distribution of income will be affected. In particular, if technology replaces labour, you might expect that the shares of income earned by equipment owners would rise relative to labourers—the classic bargaining battle between capital and labour this has been happening increasingly in recent years. As noted by Kathleen Madigan, since the recession ended, real spending on equipment and software has soared by 26% while payrolls have remained essentially flat.

Computers and networks fuel the third industrial revolution, which is unfolding now. Like both of the previous ones, it will take decades to fully play out. Besides, like each of the first two, it will lead to sharp changes in the path of human development and history. The twists and disruptions will not always be easy to navigate. However, we are confident that most of these changes will be beneficial ones, and that we and our world will prosper on the digital frontier

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