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How Automation Will Impact Human Job Markets

In an increasingly automated world where machines and intelligent systems can complete many tasks that could previously only be done by humans, the value of the human laborer has come into question. Automation, the delegation of repetitive or low-skill work to automatic systems, is not a new force in economics. With the rise of an industrial revolution many low-skill production-based jobs were lost in factories and mills to machines. Those jobs would then be replaced with service-based jobs in customer relations and advising. The current generation of smart devices and processes however has an unprecedented capacity to take over even skilled service jobs. Humans will either need to once again transition to new job markets or risk finally being replaced by automation. The current position of economic research and market analytics is that this new wave of automation will not leave humans jobless, but will instead create increased socioeconomic stratification.

In 2013 Carl Frey and Michael Osborne of the Oxford Martin School released a study “The Future of Employment” that analyzed how susceptible certain fields were to computerisation. The final result of computerisation, as they put it, being an effective end to a human future in that career field. Frey and Osborne’s work belies an idea that this new wave of automation will be able to take over jobs that were what were once considered skilled labor.

Specifically with a rise in Artificial Intelligence and Machine Learning, they predict that any job that does not have a backbone of creativity and social relation forming will be at high risk to be automated. Specific jobs Frey and Osborne name with a high probability of being computerisable are all jobs that are mostly blue-collar like management, clerical services, sales, and transportation. Positions like these use highly repetitive and learnable procedures and algorithms that a well tuned system can reproduce. Such a reproduction could be done by intelligent agents that do not get tired or make mistakes. Blue-collar jobs also demand large monetary investments into humans that could be realistically shifted into automated systems that would work on the cost of energy and maintenance. Frey and Osborne's study does not however explore or attempt to explain how economical it is to eliminate low wage, low initial investment jobs such as security, food preparation, and sanitation. Thus their judgments on how probable it is that a low-skill job can be automated do not align to any model of whether or not it is worth the investment to automate them. In other words, there are situations when it makes more sense to hire a cheap human on demand than to buy an expensive machine one time.

Two years later, Darrell West, director of the Center for Technology Innovation at Brookings, picks up with an analysis of how automating jobs will resultingly affect the workforce in "Four Fundamentals of Workplace Automation". Two upcoming areas of concern that West expresses are the shifts of current business hiring and the availability of jobs based on skill level. The number of workers that new major businesses require to provide existing services is decreasing. One key example is that a company with a worldwide impact such as Google has an evaluation of \$370 billion but only has 55,000 employees. Likewise, Netflix with a worth of \$62 billion only employs 4,700 people. In contrast, the much older Coca-Cola has a net worth of

\$188 billion and hires 146,000 people. When new companies require fewer employees, they will seek to hire extremely educated and technical employees. West predicts that this trend will lead to high skill and high wage jobs which are increasingly lucrative and difficult to obtain. When coupled with the eradication of middle class jobs previously predicted, he extrapolates an overall shift away from jobs that currently provide a livable wage but do not require a higher technical education. Furthermore, this cut would remove a lot of social mobility for low skill workers to move into more traditionally middle class jobs. He concludingly posits that these changes will likely create a society of inequality, social hierarchy, and economic frustration.

Chui, Manyika, and Miremadi of McKinsey & Company examine how this kind of shift to the removal of repetitive and learnable tasks will impact jobs which currently exist. The two main tasks that they identify as being difficult to automate or emulate are human interaction and creativity. They calculate that in the pipeline of a modern work process, 29% of the workload is interpersonal, or requiring human interaction, and only 4% is creative. When the other 77% of the process is effectively automated it will leave a lot more time for humans to work on these soft and innovative skills. While this presents a positive change in the mundanity for human workers it also poses the issue of requiring higher skilled employees who are capable of working in a high mental output environment. The skills for such a job the McKinsey group laments can only be learned in higher education. Jobs that were previously more accessible will now become more human at the cost of being harder to obtain. Now career tracks once meant for a moderately skilled employee are reserved for those with a much higher education. The same way new middle and upper class jobs are disappearing, our current job market will no longer be conducive to social mobility and income equality.

To summarize, our near future is automating outdated jobs and creating technical, high level careers. Yet automation can also create jobs: it increases production, which leads to more money to spend on real humans in the form of new human jobs. Lawrence Summers, the 71st Treasury Secretary of the United States and now Harvard economics professor in “... on the Economic Challenge of the Future: Jobs” endorses this logical reasoning. Summers postulates that, as with every other technological automation, an increase of production in the future means more jobs will be created to support that production. He worries that the race between traditional style jobs and our ability to automate them will be a losing battle. The kinds of jobs which will be created still have the same markers for removal as our current jobs. Summers notes that well-paying human jobs such as agriculture and transportation will inevitably fall victim to irreversible automation at a rate greater than we will be able to create them. Summers expresses concern that in an increasingly information based economy it will be inconceivable for traditional middle class jobs to sufficiently provide for human workers. He does not speculate, and very few can, the new kinds of jobs that emerging technologies will give rise to, which will not be so easily automatable.

Works from Trinity College’s Institute for Ethics and Emerging Technologies “Are Technological Unemployment and a Basic Income Guarantee Inevitable or Desirable?” by James J. Hughes can serve to paint a dystopian resolution of new automation. His sentiments of a society doomed to a ruling class and a subservient class arise from his beliefs that the automation of all but a few jobs is inevitable. If Hughes’ scenario arises he states that it will be necessary for governments to supplement human needs with a basic income and other financial guarantees to maintain any semblance of equality for humans.

A more optimistic view from MIT Professor, David Autor “Why Are There Still So Many Jobs? ” presents a case of a future that is necessarily unpredictable. Autor surmises that automation based inequality is not an insurmountable task. He concludes that the future will require the same solution used in the past: we will need to invest into humans again. Just as with the push for people to complete a high school equivalent and beyond, we will once again need to further invest in giving all humans a higher education. Autor states that this new movement will enable workers to take on high skill jobs which require even more education, experience, training, and academic rigor than we require today. He makes a point that anyone who claims they can anticipate the flow of emerging technologies and concludes that it is impossible for jobs to be safe from automation has made an arrogant judgment. A belief that jobs will not exist in the future is an assumption that the predictor’s own lack of ingenuity in solving the problem implies that all of humanity’s creativity cannot persevere the upcoming socioeconomic climate. Autor puts it like this: if you asked a farmer what his children would do when only 2% of Americans farmed instead of 50%, you couldn’t expect the farmer to say that they would be app developers.

The research now shows us that low wage jobs will be safe due to the need for cheap labor on demand. Middle class jobs however will disappear due to being repetitive and expensive to employ. The remaining jobs in our current system will be high wage high skill jobs that are scarce and require a very high degree of education. This will create a stretch in the socioeconomic spectrum, with fewer people in the middle class and fewer opportunities for the even larger lower class to transition upwards. In sum, automation will not remove the human job market, but it will instead amplify inequality, now we must determine how humans will prepare.

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