Considering the Future of Work

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Abstract

Software developers and engineers have a moral obligation to consider the impact of their projects on the future of work and society. Recent advances in artificial intelligence (AI), machine learning (ML), along with increasing processing capabilities are enabling developers and engineers to create programs to perform many jobs previously only performed by humans. Many workers will be replaced and fired. Their skills will no longer be in demand. New jobs will be created but reskilling and upskilling may be a challenge for many. Governments and societies may face a greater number of unemployed and unemployable who need support. This will result in a greater burden on the taxpayers and potentially cause resentment between different segments of society. Software developers and engineers need to consider the displaced workers, how to best ensure training for new jobs is accessible to the most people possible, and how to lessen the negative societal impacts of integration of the job replacing technology.

Considering the Future of Work

In 1985 James Moor published a remarkably prescient discussion of computer ethics. He predicted the value and definition of work would need to change in response to the accelerating capabilities of computer technology (Moor, 2019). Over 35 years later, Rosie the Robot may not be scuttling about cleaning up after the Jetsons (yet), but a surprising number of jobs previously performed by humans are now done by automation and robots. This is changing the workforce, displacing many workers, and inspiring a societal re-examination of the value and definition of work. Many express concern that the development and application of these innovative technologies is being implemented recklessly, without regard for the impact on human workers, the workplace, and society. The creators of the new computer technology need to be aware of the ramifications of its use. Software developers and engineers have a moral obligation to consider the impact of their projects on the future of work and society.

Literature Review or Background

The Future of Work (FoW) is a blanket term used to describe the future workforce, workplace, and work roles. The ever-increasing compute power, coupled with the increased use of machine learning (ML) and artificial intelligence (AI), may create, as many hope, a utopia where machines do most of the work and humans enjoy a life of socializing, playing, creating, and learning (Klinova & Korinek, 2021). But there is also the very real potential for the increased technology to exacerbate existing social and financial inequities. Research cited by Mahdavimoghaddam et al. (2021b) predicts “mass unemployment happening in the next 10 to 20 years” due to the advances in computer technology, combined with workers lacking the new sought-after skills. (p. 367).

Will workers become divided into the upskilled and relevant group and the mis-skilled and irrelevant group? And what will societies do with the people who cannot find work and are not able, for whatever reasons, to train for an in-demand job? In the United States, technology has already caused inequality in the workforce. Klinova and Korinek (2021) point to studies of the US economy demonstrating "since the 1980s, technological progress has been accompanied by a significant increase in inequality" (p. 645). Given the current shift towards cashier less checkouts, self-driving pizza delivery cars, and AI x-ray interpretations replacing radiologist readings, it is easy to hypothesize that many of today's jobs will disappear. Mahdavimoghaddam et al. (2021b) cites research indicating "by 2030, up to 14 percent (75 M to 375 M) of the global workforce should change their job category and acquire new skills to be able to survive in the new job market" (367:2).

How can humanity steer the application of computer technology towards a humane and equitable utopia and away from an increasingly inequitable world? As Sako (2020) points out, the decisions current software designers and ML/AI engineers make today will affect the workplace possibilities available to our children and grandchildren. It is a pivotal time and there is vast potential to craft a future where all humanity shares in the wealth and spoils of the fourth Industrial Revolution. Unfortunately, we might not have enough time. Given the breakneck speed of technological advances and the market demand to implement efficiency increasing applications as soon as possible, there is no motivation to examine the interplay of technology, humanity, and work. However, Klinova and Korinek (2021) argue that "AI developers have a moral responsibility to think about the economic impact of their creations, whom they might benefit and whom they might harm" (p.650)

Discussion

Software developers and engineers need to consider the displaced workers that will result from implementing their projects. Just as many factory jobs have been replaced with automation technology, many of the professions once thought stable and secure are being replaced or eroded by AI (Klinova and Korinek, 2021). AI has made progress in performing many of the tasks as well, or better than, human therapists, teachers, doctors, lawyers, personnel managers, and programmers. Are there jobs that are invulnerable to replacement? Not likely. As Sako (2020) points out, AI approaches tasks differently than a human. When AI combines with ML and enormous compute power, there is a true potential for replacing any human endeavor, even the creative ones like writing a song or a book. For example, the AI powering a self-driving car does not use the same algorithms and methodology as a human driver. Yet, it can accomplish the task. Therefore, since we cannot anticipate how AI/ML will approach a task, we cannot say for certain it will not be able to do it, eventually.

Software developers and engineers should create free learning platforms that will level up those without the technical background and allow everyone to train for the jobs their software and technology are creating. With the rampant implementation of computer technology and the resulting labor displacement, it may be challenging for individuals to secure employment, and this will further entrench inequities. They will need to train in a new skill, and many may not have the prerequisite knowledge to succeed in the training, leading to greater division between the haves (the base knowledge and the means to acquire the in-demand skills) and the have nots (Klinova and Korinek, 2021). Another question becomes: which skill to select. Mahdavimoghaddam et al. (2021b) suggest job/skill seekers apply data mining techniques on reddit posts to predict the most in demand skills for the next months. This may be useful, but only to those who already know how to mine a social network for data.

Software developers and engineers must become aware of how their projects may affect society. In an impactful paragraph, Klinova and Korinek (2021) summarize the nefarious impact thoughtless application of the latest and greatest technologies may have:

> If it is considered fair game for the developers and deployers of AI to disrupt labor markets and impose losses on millions of workers, then the burden of adjustment is on workers: it is their duty to face their losses, and they must continuously upskill in order to remain relevant in the labor market that is being reshaped by AI advancement. The implication for governments is that they are well-advised to strengthen social safety nets, expand training programs and prepare for benefits like a Universal Basic Income, all financed by taxpayers, not the perpetrators of the disruptions. In other words, it is society and its people, not the AI developers, who are expected to bear the burden of ensuring that AI advancement does not cut people off their sources of income. (p. 646)

Clearly, the changes that will occur as AI/ML change the future of work involve taxpayers, governments, and has the potential to stratify society in damaging ways. Developers and engineers must become aware of how their projects affect society. Even the code of ethics compels developers to consider societal impact. As Sako (2020) points out, “the ACM Code of Ethics and Professional Conduct obliges computing professionals to ’monitor the level of integration of their systems into the infrastructure of society’” (p. 27).

Conclusion

Software developers and engineers have a moral obligation to consider the impact of their projects on the future of work and society. They must consider the many jobs that will be lost or altered, how to make training for in-demand jobs as fair and accessible as possible, and how

integration of the technology into society will affect governments, welfare, taxes, and group dynamics within societies. With greater understanding of the ramifications, modifications can be made to lessen the deleterious societal effects and increase the beneficial ones.

References

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