



Over- Automation: Are we losing skills because of Artificial Intelligence

The use of AI tools in workplaces from education to medical systems is becoming common. Sometimes these tools are being used by users in performing their tasks as in radiotherapy. Where therapists use AI tools for searching abnormalities in radiographic images. The use of artificial intelligence brings a wealth of efficiency in work, but the concern is that how automated tools are effecting the user's cognitive skills. In this article we will discuss how automation decays our skills.

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Introduction

In this era software professionals and developers no longer write each line of boilerplate code. They just prompt to AI and rely totally over automated tools even for complex systems. Such decision support systems are common in medical, education, finance, marketing and other areas (Magrabi et al., 2019). For example a radiologist uses an automated tool for examining the radiographic images to get the knowledge about the symptoms of disease. This tool receives the image, read or examine it thoroughly and gives the expected results to the therapist. It is increasingly likely that the doctors will be aided by an artificial intelligence (AI) assistants (Hosny et al., 2018). These AI assistants are trained on machine learning models over a thousand of radiographic images. That's why they can help out the therapist in his work without or least interaction.

Another example is the use of robots in surgical operations over almost thirty years ago (Gomes, 2011). Computer scientists trying to train the model in thus way that will help the surgeons to use appropriate tools or in specific location. This saves the time a lot but due to automation we become so dependent on black box of it that we are no longer able to fix the problems without AI use in our daily life. This automation works as a double edge sword as if developers just know how to use tools accurately without utilizing their own skills, we risk building a foundation on shifting sand.

"True innovation requires a deep understanding of the first principles; when automation replaces understanding, we aren't just saving time—we're losing our ability to invent."

Technology Overview

In past people used to work manually without using automated tools or less use of it. Like children used to count on their fingers to solve basic addition or subtraction problems (Bajic & Rickard, 2011). With this they increase their skills by practice and the use of un efficient algorithms. But the adults directly access the efficient algorithms for calculation beside using rules (Ackerman & Woltz, 1994; Logan, 1988).

There are many more advantages of the technology or automation in our daily life such as:



1. It gives higher productivity as increase output by making continuous decisions without any fatigue or break.
2. It reduces the cost in areas where initial investment is high. Automation reduces long term expenses by minimizing human errors and giving high productivity.
3. It ensures accuracy, persistency and efficiency in tasks by improving product standards.
4. It also gives a safe environment without the risk of losing any kind of data for the lifetime.

Although automation gives efficiency and reliability, totally dependency on AI without reliance on manual and mental efforts lead to reduce capability and eventually decay of skills. Use of technology is not bad or denied but total reliance on it is. It's like "use it or loss it" scenario for manual skills because automated tools are going to be so common that they really kill the need of workers for physically. We know that automated agents like robots used in different firms as in auto-driven cars cleaning purpose or in restaurants work to cook food for the customers. But they work on the same prompt on which they are trained. They cannot beat the skills of master chef as they cannot smell or taste the food. So the concept that AI will totally overtake jobs is not totally true.

Let's discuss some key technologies that are commonly used:

1-AI assistant and generative AI: These tools write codes, make decisions work on the base of critical thinking and encourage passive engagement. Their common examples are chat bots.

2-Automated decision systems: These tools are used in finance, hiring and healthcare as they get information about the environment, make planning and then perform their tasks.

3-Auto drive assistants: these assistance are used in cars and plans where a driver or a pilot can take a break during its work when get fatigued or tired by handing over their system to automation.



Figure 1: The present and future of American manufacturing (at Tesla)

Key Findings & Impact

As we know, there is always another side of the picture, automation also has side effects if not handling properly. Recent empirical research shows that the developers that develop the project using AI assistants only utilize 17%



of their skills or less as compared to those who write codes and manage project manually. Those who rely on automated tools are barely enabled to solve the errors when occur or when AI generated project fails as they don't have much knowledge about white box of their system.

Therac-C is the cancer diagnose process in which the doctor gives waves to the patients for treatment. But there was a problem in the system in 2025 as mostly patients complaint about high waves than needed but doctors pay no attention on them. As a result mostly patients died or some were extremely burnt. The main problem was with the interface of the machine that showed normal waves but they were not and doctors rely on the interface not on reviews. This example clearly explains the side effects of totally reliance on technology and the loss of skills.

Jobs will be lost

Automation is transferring industries, but it also carries the risk of losing worker's skills for routine tasks. They clearly see their abilities becoming irrelevant as tools are performing same tasks continuously. Some jobs will be totally eliminated when robots will become dominant. Continuing with the example of cooking bots in kitchens and it is more likely chances that they will occupy the overall tasks that keeps a kitchen functioning.

Displacement of workers

As technology advances more and more economic sectors adopt AI, heat pump system innovations, other kind of digital automation more jobs of today have potential to be automated in future. And due to this workers not only be displaced from their current work but also have to move geographically to find other jobs. This add financial stress to workers who just lost their livelihood.

Income inequality

Economists and researchers made the study about the impact of job automation on skills and income inequality. They found that the job automation always lead the harmful impact on worker skills. High skill workers like doctors and engineers got benefits of the technology but the lab technicians suffer due to skill based technology. In short highly skilled of professionals will be able to take jobs in other sectors or have the mean to reskill their abilities, but a blue-collar worker with lower abilities will have a financial crunch on their hands.

- Generative AI could replace 270 million full-time jobs by 2030.
- 60% of jobs in advanced economies are exposed to some degree of AI automation.
- 26% of jobs in low income countries are exposed to some degree of automation.
- One in four workers worry that AI could make their jobs obsolete with even more concern among workers of color and younger employees.
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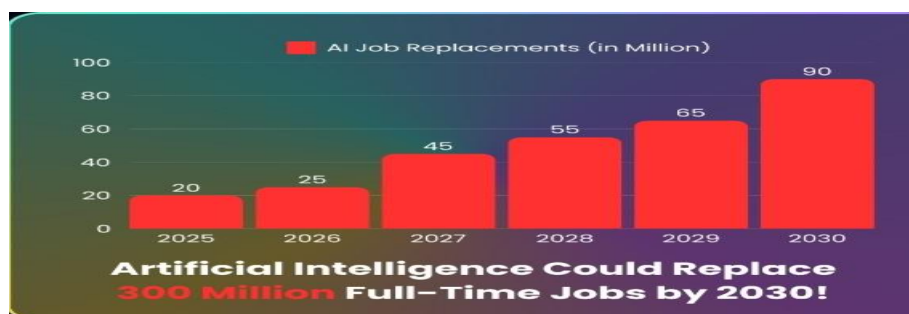


Fig 2: survey about job automaton

What's Next?

So to mitigate the risk of over automation we should focus on deliberative practice and active oversight. This will improve workers mental skills and help the organizations to handle the situation when tools become fail or reach their limit. We should also focus on soft skills as the students must have proper mastery of structure and insight knowledge before getting access of any tool for coding. Engineering managers should have the complete knowledge about white box of the program so if they want any change or receive any error, they can handle it. As



we see in the example of therac-c, we cannot totally trust on tools. Need of human intelligence to handle these tools can never be ended.

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References

- [1] Magrabi F, Ammenwerth E, McNair JB, De Keizer NF, Hyppönen H, Nykänen P, Rigby M, Scott PJ, Vehko T, Wong ZS-Y, Georgiou A. Artificial intelligence in clinical decision support: Challenges for evaluating AI and practical implications. Yearbook of Medical Informatics. 2019;28(01):128–134. doi: 10.1055/s-0039-1677903.
- [2] Hosny A, Parmar C, Quackenbush J, Schwartz LH, Aerts HJWL. Artificial intelligence in radiology. Nature Reviews Cancer. 2018;18:500–518. doi: 10.1038/s41568-018-0016-5.
- [3] Bajic D, Rickard TC. Toward a generalized theory of the shift to retrieval in cognitive skill learning. Memory & Cognition. 2011;39:1147–1161. doi: 10.3758/s13421-011-0114-z.
- [4] Ackerman PL. Individual differences in information processing: An investigation of intellectual abilities and task performance during practice. Intelligence. 1986;10:101–139. doi: 10.1016/0160-2896(86)90010-3.
- [5] Gomes P. Surgical robotics: Reviewing the past, analysing the present, imagining the future. Robotics and Computer-Integrated Manufacturing. 2011;27(2):261–266. doi: 10.1016/j.rcim.2010.06.009.