

HUMANS AND MACHINES: THE REPLACEMENT OF HUMAN LABOR WITH TECHNOLOGY IN INTELLECTUAL ACTIVITIES

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The relationship between humans and machines has evolved dramatically over the past few centuries. From the early days of the Industrial Revolution to the current age of automation and artificial intelligence (AI), machines have played a crucial role in transforming the way we live and work. The Industrial Revolution marked the beginning of a profound transformation in human labor. Mechanized textile manufacturing, steam engines, and other innovations significantly increased productivity and efficiency. However, these advancements also led to the displacement of many workers whose jobs became obsolete.

As technology continued to advance, the scope of automation expanded beyond manual labor to include more complex tasks. The advent of computers and digital technology in the 20th century further accelerated this trend, enabling machines to perform also intellectual tasks. The development of AI has brought us to a new era where machines can analyze data, and make decisions. Advances in AI and machine learning have enabled machines to take on intellectual activities that were once considered the exclusive domain of humans. These activities include not only data analysis, but also decision-making and even creative endeavors like writing and composing music.

Automation and mechanization have fundamentally altered the nature of work, leading to increased efficiency and productivity. This shift has significant economic implications. On one hand, it has led to the creation of new industries and job opportunities in technology and maintenance. On the other hand, it has resulted in job displacement and the need for workers to acquire new skills. The impact on employment varies by sector and region, with some workers finding it easier to adapt than others.

One prominent example is the use of AI in healthcare. Machine learning algorithms can analyze medical data to diagnose diseases, recommend treatments, and predict patient outcomes with a high degree of accuracy. This not only improves the quality of care but also allows healthcare professionals to focus on more complex and human-centric aspects of their work.

In the financial sector, AI algorithms are used for trading, risk assessment, and fraud detection. These systems can process vast amounts of data in real-time, making decisions that would be impossible for humans to achieve at the same speed and accuracy. Similarly, in the legal field, AI can assist with document review, legal research, and even predicting case outcomes.

Despite the benefits of automation, there are significant challenges and concerns associated with the replacement of human labor by machines. One major concern is the potential for widespread job displacement. This is particularly true for jobs that involve routine and repetitive tasks, which are most susceptible to automation. Related to this issue is the potential for increased inequality. The benefits of automation are not evenly distributed, and what is

happening is that those with access to technology (or owning capitals to purchase it) will prosper, while those without it will be left behind. This is leading to increasing economic and social disparities.

The origin of the problem is in the fact that all development models continue to be based on the axiom that the generation and distribution of wealth must be guaranteed by human work. This was substantially valid even after the first and second industrial revolutions, it began to be questioned starting in the 1970s, with the third industrial revolution, and today, with the so-called Industry 4.0 (the fourth industrial revolution), it is clearly showing that the replacement process is probably only at the beginning, with dynamics that are not easily predictable and much less quantifiable in terms of employment impacts. As we are seeing, the process of machine/labor substitution is not limited to manufacturing processes and also involves cognitive processes, with AI representing the frontier (Autor, 2015; Acemoglu et al., 2020; Acemoglu and Restrepo, 2020).

Despite this, positions remain unchanged in current interpretations, even as regards the concept of a knowledge economy still emphasizing the centrality of human labor. Economic and social growth continue to be associated with work, human dignity with work, and individual self-fulfillment with work. However, technology is leading to labor savings given the same levels of value produced. Whether this is harmful and detrimental to human dignity seems more like a cultural legacy than a fact.

In democratic societies, work has always been a means to distribute the wealth generated by value-creation processes. What we witness today, is a response to competitive dynamics and to the threat of substitution of work with automated processes, with work being largely underpaid, fueling new forms of exploitation. This is due to productivity gains and greater efficiency concentrating the value generated towards a few beneficiaries, challenging the model of capitalist and liberal economies, leading to questions about whether a system of rules can ensure value redistribution, as in the case of proposals to impose a technology tax, which pose problems that are not easily solvable:

- What degree of innovation should be considered taxable;
- How to measure the economic benefits produced;
- How to ensure uniform conditions internationally and avoid tax evasion;
- How to avoid discouraging innovation and the adoption of new technologies.

Nevertheless, it is difficult to identify which models might be more appropriate, perhaps needing to go beyond market mechanism regulation and envisioning a sort of democratically based planned economy. But this was already anticipated by Marx, when he spoke of the predominance of "being" over "having," meaning free time for personal and cultural interests, sporting, playful, scientific, erotic, artistic, and political fulfillment, rather than the desire for infinite product possession. But we know how that turned out.

Looking forward, the relationship between humans and machines is likely to continue evolving. Rather than viewing machines as mere substitutes of human labor, there is potential for a collaborative approach, with machines and humans complementing the other's strengths and capabilities. For example, in creative industries, AI can be used as a tool to enhance human creativity. AI algorithms can generate new ideas, suggest improvements, and handle repetitive tasks, allowing human creators to focus on the more nuanced and expressive aspects of their work. Similarly, in fields like engineering and architecture, AI can assist with complex calculations and simulations, enabling professionals to design more innovative and efficient solutions. To achieve this collaborative future, it is essential to invest in education and training programs that provide workers with the skills needed to work alongside machines. This includes

not only technical skills but also critical thinking, creativity, and emotional intelligence, which are areas where humans have a distinct advantage over machines.

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