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Artificial Intelligence and Social Transformation: Energy, Human Dignity, and the Future of Work

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Abstract

Artificial intelligence is not merely a technological advance: it may become the catalyst of a far-reaching transformation in energy, labor, finance, and social organization. This article examines the contradiction between capital as a driver of innovation and an economic order still anchored in fossil fuels, monetary solvency, unequal access to essential goods, and conflicts sustained by financial power. It argues that the expansion of AI and humanoid robotics will require abundant and progressively cleaner energy, while raising fundamental questions about employment, human oversight, safety, and the social acceptance of artificial agents. The gradual integration of humanoid robots into domestic and professional settings is therefore examined as a long-term process shaped by trust, regulation, and intergenerational adaptation. The analysis also considers, as a deliberately cautious hypothesis, whether abundant energy and automated production might eventually support forms of social organization less dependent on monetary allocation. Looking at the immediate technological transition, the analysis explores whether rising productivity and automation could weaken the centrality of money and solvency, broaden access to essential resources, and reduce the economic foundations of war. These outcomes are neither automatic nor technologically predetermined. They depend on political and institutional choices capable of directing innovation towards social equality, fundamental rights, and human dignity. The article therefore presents AI as a decisive test of collective governance: it may deepen existing inequalities or help open a new social order in which technological progress serves humanity rather than financial power.

Keywords

Artificial Intelligence, Energy Transition, Humanoid Robotics, Future of Work, Monetary Solvency, Human Dignity, Social Transformation

1. Introduction

Artificial intelligence is emerging not only as a new technological tool, but as a transformative force capable of redefining economic structures, working methods, energy demand and the conditions of human development. However, the extent of this change will not depend exclusively on the technical capabilities of the new systems, but also on the economic, political and institutional choices that will guide their development and distribution of benefits. In a broader perspective, it will depend above all on the ability of peoples to participate in the definition of their own future and to express, through the new generations, a shared vision of political, economic and social life. This responsibility is accompanied by the need to exclude war as an instrument of coercion and oppression. In this context, one could also hypothesize the introduction, in national systems and at the UN, of particularly strict rules against those who promote wars, battles and clashes responsible for deaths and injuries. For now, these are hypotheses; However, the future sometimes seems to proceed faster than thought, driven to a large extent by a human creativity that tends to set no limits (Cossiga, 2022).

It should be added that, in the future, the need to combat mendacity could be more strongly affirmed, in line with the constitutional principle according to which the dignity of every human being, woman or man, must always be respected. These are principles already recognized by universal law and by the constitutions of States, but which too often remain only nominal, suffocated by a society in which the primacy of money tends to weaken the effectiveness of universal rights.

Unfortunately, although often silently, the contemporary world seems to be going through a deterioration that can also be traced back to the predominance of capital, which not only imposes its own rules on solvency, but in countries at war can contribute to compressing human dignity. At the same time, the tension that has sustained the prices of the main companies for many years favors the development of the economy (Dozon & Atlani-Duault, 2008) both through the processes of industrialization that extend to the different continents, and through the new phase opened by artificial intelligence.

These dynamics can, however, accentuate the prevalence of capital over labor rights and human dignity, while the opportunities for adaptation that they generate are more easily accessible to the holders of large incomes and wealth (Gittleman & Wolff, 2004). This consideration does not prevent us from recognizing the role played in past centuries by wealth, the use of which has made it possible to create monuments and works of art capable of giving expression to humanity.

One can therefore wonder whether the historical role played by wealth is not undergoing a profound change. On the one hand, the upward tensions affecting the capital markets and the stock exchanges signal the persistent centrality of financial wealth; on the other hand, the support that capital has offered for decades to technological transformation, and today to the development of artificial intelligence, contributes to opening a new economic and social phase (Cossiga, 2022). However, it remains to be seen whether this transformation will be able to move towards a more balanced development, compatible with human dignity and a

more equitable distribution of essential goods, or whether it will end up accentuating the already existing inequalities. Unfortunately, the rise of capital, which accompanies our history in a commendable way, and the selfishness that, with a few exceptions, moves capital linked to oil do not allow, for a few more years, to be optimistic on the issue of human dignity and on the abandonment of the hatchet.

In this context, the current instability of financial wealth appears to reflect the broader uncertainty surrounding the evolution of global society. This uncertainty also affects oil- and natural-gas-producing countries, which must contend with an energy transition that is gradually calling the role of fossil fuels into question. Their efforts to preserve existing economic balances remain closely linked to rules of solvency that often give insufficient consideration to human dignity and to a fairer distribution of the essential goods that nature makes available without distinction. The future of oil, moreover, appears to depend not only on political and economic choices but also on the need to limit global warming. It is therefore understandable that producing countries should view the increasing uncertainty surrounding fossil-fuel use with concern and seek to manage its economic and social consequences, while hoping that these resources will remain necessary for long enough to permit a gradual rebalancing of capital and of the economies that depend on their production (Cossiga, 2023).

There is therefore a double consequence. On the one hand, capital is partly carrying the future on the skin, which promises to be full of novelties. On the other hand, it plunges into the past, almost regretting the unhappy era of the black gold of its possibilities, even negative ones. There is no doubt that the perspective of those who think they can survive on the proceeds of fossil energy is false. The duel is won by the new sources of energy. And in the meantime, the boat goes in different directions with prospects that are impossible between them. But the stubborn will to survive alters the status quo, as if the unstoppable has a chance.

We are thus faced with a contradiction comparable to that narrated by Robert Louis Stevenson in Dr. Jekyll and Mr. Hyde. In fact, it does not seem possible to permanently reconcile the capital that finances innovation and supports the development of artificial intelligence with the wealth deriving from black gold, which can help maintain active war conditions in different areas of the world. The conflict is therefore between two opposing uses of financial resources: fueling violence or supporting economic and technological transformation.

We can wait for the owners of oil to realize the ambiguity of their beliefs and commit suicide as in Stevenson's story. But I don't believe it and we wait for almost a generation to struggle around this ambiguity. Now, if the part of Jekyll, of the good researcher, falls to capital which has been the financial foundation of the current world and its prospects for decades, we can still define even if not magnificent we can define them generously. The part of the failure of the man Jekyll must be understood as having reached the goal of the cessation of the improper alternative on the basis of black gold. An alternative that coincidentally will end up as in the story of the English author with the eradication of oil from the Earth, if only

for the depletion of natural reserves.

For us of this generation, the limit between the innovations that AI (Agrawal, Gans, & Goldfarb, 2018) will bring to society, probably in the name of respect for fundamental rights and the necessity of social life that today are partly concealed by solvency that excludes millions of living beings, which are not solvent and drags the most measurable to arms in order to get out of the world (Cossiga, 2021) of moral and social inconsistency. If we could put the end of world hunger and the triumph of human dignity over solvency into the count, it would finally be the implementation that the Savior had preached (Kissinger, 2022).

Artificial intelligence knows how to produce well-written texts and questions the idea that writing is exclusively human ability. However, it should be remembered that writers have always used rules, models and ideas inherited from culture. According to this vision, AI does not eliminate the author but shows that his creativity also arises from the reworking of what already exists (Brynjolfsson, Agrawal, & Korinek, 2025).

2. Between the Decline of Fossil Fuels and the Development of Artificial Intelligence

We are therefore faced with two developments whose future interaction remains difficult to assess: the possible gradual reduction in the role of fossil fuels and the continuing expansion of artificial intelligence, who's potential and limitations are still only partly understood. **Figure 1** provides a conceptual illustration of the interdependencies among energy systems, technological innovation, and the development of artificial intelligence. Any forecast must consequently remain provisional, since expectations, political choices, technological advances and economic conditions may influence both direction and the pace of change. It is also uncertain whether policymakers in the major Western and Asian economies will facilitate, slow or redirect these transformations over the next decade or beyond (Gereffi, Humphrey, & Sturgeon, 2005).



Figure 1. Transition from fossil fuels to renewable energy and digital infrastructure: a representation of the interdependencies among energy systems, technological innovation, and the development of artificial intelligence.

Although this period may reveal some emerging tendencies, it would be premature to regard them as definitive. The continued reliance on oil could indicate the persistence of an economic model that may face increasing constraints, rather than a transition whose outcome has already been determined. Within this broader context, the reported understanding between the United States and Russia concerning the introduction of diesel into international trade appears intended to help contain prices in the American market. Its wider consequences for Europe, Ukraine and Russia remain uncertain and would depend on the terms, duration and implementation of the arrangement.

From the point of view of this article, oil interests seem to outweigh any other aspect of mutual relations between continents. Therefore, apart from the "smoky" quality of the agreement, what matters is the relative importance assigned to oil so that it enters as an unlikely value to try to influence the Midterm votes in America. The fact is that Western leadership, with different gradations, places an almost eternal value on oil, as if the generations of the world were ending and that our perspective is a few years and not as long as the duration of our world.

Contemporary geopolitics is undergoing a period of change involving several interconnected dimensions: energy interests, technological competition, and relations among the United States, Europe, China, Russia, and the Middle East. Electoral cycles and changes in political leadership may shape the pace and direction of these shifts, although their effects remain uncertain. Against this backdrop, the article examines whether the gradual decline of fossil fuels and the expansion of artificial intelligence will intensify existing rivalries or foster a different allocation of financial and technological resources (Gordon, 2016).

Robots could gradually become more visible in everyday life in the near future. These human-like machines would communicate in understandable language, probably English and major European languages, but would lack autonomous consciousness and rely solely on functional coordination systems. Initially, they would probably perform mainly learned tasks stored in memory and refined through practice. Humanoid robots would represent a significant innovation (Bobbio, 2011); however, their adoption in streets, large industrial facilities and workplaces would probably require human cooperation and a lengthy adjustment period. Over the next ten years or so, their presence and impact on daily life could remain limited. This phase might extend over several decades as society gradually becomes accustomed to humanoid robots, particularly in domestic care for large families, very elderly people and those with walking difficulties who cannot live alone.

According to the timing of our article, we are already beyond 2050, and we have passed the time in which a new generation is taking the place of the elderly who have retired or left the scene. A change of generation at the top of institutions and companies which, however, does not yet know the great changes in the economic and social horizon. The appearance of robots is still without consciousness or with a primitive cerebellum, therefore still almost without awareness of themselves, do not yet have the possibility of playing the role of professionals applied to compa-

nies and public administrations. The possibility that a clash between civil servants or professionals and competing humanoid robots will take place at a social level is not plausible, because although humanoid and almost resembling human beings, the latency of self-consciousness still makes replacement limited. To the point that human society, having accepted the presence of a few humanoids for home services for the elderly and for repetitive exercises with children, does not seem shaken by the innovations that are approaching a few decades ahead.

The main problem lies in the distrust of human beings towards robots which, due to errors or malfunctions, could occasionally cause damage, especially to the elderly. Similar caution emerges in companies and craft activities with regard to the use of robots in repetitive tasks, since there remains a certain resistance to accepting the replacement of the worker by a humanoid creature. This process will therefore be neither rapid nor easy. Although, in the current phase, there do not seem to be immediate and generalized consequences on employment, it cannot be excluded that the progressive entry of robots into offices and other workplaces will produce, over time, significant effects on the structure and organization of work.

It could be hypothesized that, despite the initial distrust of humanoid robots, discussions are already underway between institutions, with the participation of trade unions and labor law experts. In fact, the concern could grow over time, if robots with characteristics increasingly similar to those of humans become capable, in the still undetermined future, of replacing workers even in professional or managerial tasks, both in the public and private sectors. This is, however, a scenario still being studied and nothing that was not foreseen in the end. There is still no self-awareness in sight, but only humanoid software capable of performing operations, accessing sensitive information and interacting with other services without continuous human supervision[1].

The probability of error may be limited, but it cannot be considered substantially different from that associated with human action. However, it will take time for companies and workers to fully accept the use of lifeless humanoid entities, apparently limited to the execution of predetermined tasks and, in any case, subject to human control. With the progressive consolidation of shared experience in the workplace, it is plausible that the mutual distrust between humans and robots will diminish. However, this process could profoundly change the traditional forms of collaboration between people and machines, with significant consequences on the organization of work.

[1]Nadella proposes a **prudent and "zero trust"** approach to the security of artificial intelligence: each model should be considered potentially compromised and therefore designed with adequate containment systems. In particular, he believes it is necessary to:
1) allow an authorized person to **immediately stop or suspend** the operation of the model;
2) ensure **transparency and independent verification**; promptly report any incidents;
3) keep comprehensible and tamper-resistant records of operations;
4) introduce stricter security standards for increasingly autonomous systems.
The central principle is that trustworthy AI must not only perform its tasks correctly but must also **be able to be controlled and stopped when something is not working.**

3. Energy Transition, Humanoid Robotics and Socio-Economic Transformations

We have arrived by pushing the imagination (but also common sense) to a changing scenario that is strengthened with the progressive acceptance of humanoids in factories and when robots improve the qualities in dealing with human beings, that is, becoming very sensitive to feelings such as friendliness, affection, sympathy. We are at the time when the acquisition of renewable energy and the gradual abandonment of fossil fuels should be combined. Figure 2 provides a conceptual illustration of this possible energy transition, including the role of nuclear fission.



Figure 2. Renewable energy gradually replaces oil and natural gas, while nuclear fission develops as a potential alternative to renewables.

A possible turning point could derive from the availability of progressively greater quantities of energy, capable of responding at least in part to the growing demand associated with artificial intelligence and the use of humanoid robots. In this perspective, the expansion of electricity production capacity and the increase in consumption of new technological systems should proceed in a sufficiently coordinated way, although the timing, costs and environmental effects of this process remain uncertain. On an even more distant horizon, abundant energy availability could also support more ambitious space programs; however, the hypothesis of interstellar travel and the search for potentially habitable worlds remains, at present, highly conjectural and linked to times that are difficult to predict. The development outlined here would therefore depend on the convergence, by no means guaranteed, between energy innovation, robotization and progress in space technologies.

These are developments which, in the scenario of future generations, should converge relatively soon so that the new horizon can be outlined more clearly.

However, many unknowns remain linked both to the progress of research on nuclear fission energy and to the possibility of creating humanoids with a form, perhaps still elementary, of self-awareness and coordination systems inspired by the human cerebellum. Since we are still in the distant future, it is not possible to describe precisely the extent of the transformations that could affect our grandchildren or great-grandchildren. The reasoning must therefore remain on the ground of hypotheses, based on research that is still in a preliminary or predominantly academic phase. The different directions of research can thus be considered as paths that are still uncertain, through which to try to understand innovations that humanity could develop and discover. Ultimately, it is an effort aimed at cautiously imagining a future that, at present, largely escapes our understanding.

Shifting our attention now to the level of economic and social policy, it seems particularly complex to assess the extent of the changes that, in the coming decades, could affect families and daily life. Elon Musk has proposed the hypothesis that, within ten years, society could overcome the role of money. This is probably an emphatic formulation, which considerably anticipates the advent of a society without money. A social order no longer based on money would in fact be so distant from our current model of life, based on solvency[2], that it would be extremely difficult even to imagine its characteristics, if not in a still rudimentary form (Cossiga, 2018).

Yet, it is not a question of a distant future, but of a horizon that could involve the next generation and therefore be placed within a century. In the time that separates us from the future of our grandchildren, financial and social policies could be established that would make the current economic order incompatible with a social order destined to change, gradually or suddenly. Perhaps, within fifty years or more, the hatchet will be definitively buried and the era of conflicts and aggressive figures—dictators and manipulators who have marked our long history—can be considered over. In this perspective, attention must be turned to economic and social policy, which could offer tools, even if not fully conscious, to ban war of aggression.

Even in the contemporary era, wars of aggression require substantial financial resources to support both soldiers and command structures. The same was true of Caesar's campaigns in Gaul, where maintaining the army depended on a regular supply of funds. Caesar did not personally pay each cohort: public finances were administered by the quaestor assigned to the commander, who oversaw the military treasury and its accounts. Under the supervision of legates and military tribunes, the legions' administrative personnel compiled the rolls, calculated the amounts due, and distributed payments to the units. Within each century, the *signiferi* guarded the standards and could also hold soldiers' deposits and savings, but they were not primarily responsible for paying the entire legion. The *stipendium*, paid in coin, came from public funds allocated to the war, sometimes supplemented by resources obtained by the commander, levies imposed on con-

[2]**Solvency**: state the intended meaning at first use and apply it consistently.

quered territories, and proceeds from booty. Expenses on food and equipment could also be deducted from the sums owed to soldiers. Regular pay, together with the distribution of booty and promised rewards, was therefore essential to maintaining discipline and loyalty during lengthy campaigns far from home (Brynjolfsson & McAfee, 2014).

Future generations may therefore be called upon to consider the possibility of a society in which money plays a less central role in access to essential resources. In such a scenario, a diminished dependence on monetary wealth might also limit certain forms of economic coercion and the concentration of power associated with authoritarian rule, provided that this transformation is accompanied by institutions committed to fundamental rights and human dignity. Moving beyond solvency as a criterion for access to resources and reducing the influence of fortunes accumulated through selfishness and arrogance could create opportunities to replace rules based on financial means with principles of friendship, empathy, solidarity and goodwill (Cicerone, 1990). Such a transformation might reduce restrictions on access to essential goods and give greater practical expression to the equal dignity of every person. Those currently excluded from social life might gain access to the resources they need, if the Earth's potential to feed its inhabitants were translated into equitable provision, wherever they live. This remains a conjectural scenario: a reduced role for monetary wealth might help limit conflicts fueled by money, pride, hatred and the pursuit of power, but would not in itself eliminate them (Mearsheimer, 2014). These possibilities would depend not only on energy abundance and automation, but also on the political, legal and ethical choices of future generations. As shown in **Figure 3**, the pastoral landscape serves as a symbolic reference to the prospect explored in Chapter 2: a society in which energy abundance and automation might support equitable access to essential goods, solidarity, and human dignity beyond monetary solvency.



Figure 3. Asher Brown Durand, *Pastoral Landscape* (1861): a wide green and idealized view.

4. Conclusion

The relationship between human beings and increasingly capable robots remains one of the central unresolved questions of the technological transition. Their possible substitution for human labor could affect employment, economic policy, social organization, and the role that money and solvency play in allocating resources. At the same time, the convergence between technological development, human dignity, and social equality may open possibilities that cannot yet be described with certainty. Whether humanoid robots become an ordinary component of a new social order will depend not only on their technical capabilities, but also on the political, legal, and ethical choices made by future generations. Artificial intelligence therefore does not determine a single future: it confronts society with the responsibility of deciding whether innovation will reinforce financial power and exclusion or serve a more equitable model of human development[3].

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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[3]**Conscious policymakers**

The **EU**-funded TECHNEQUALITY **project studies the economic and social effects of automation**, working with institutions, businesses and trade unions to inform education, retraining and welfare policies.

In **eight Dutch municipalities**, it is evaluating new forms of income support to contribute empirical evidence to the public debate.

Preliminary results show that automation can **foster economic growth, but also increase inequalities and employment risks**, with a possible loss of 5% - 44% of European jobs, indicated as an uncertain forecast.

The central message is that **timely and research-based public policies can manage these risks** and foster a wider distribution of the benefits of automation.

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