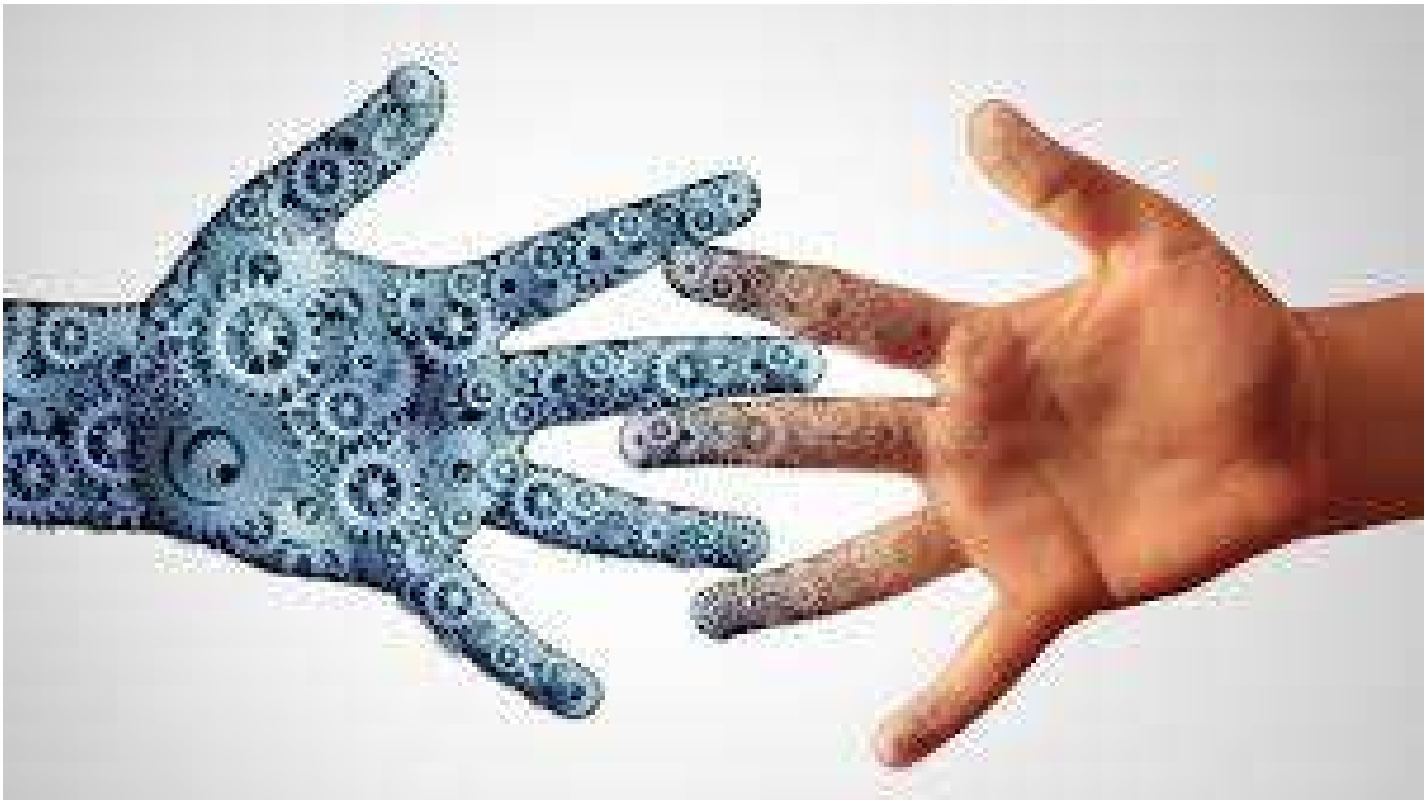

Future of Work

Man-Machine Interplay & Risks in a Complex World

Regenerative Futures, Inc

Thought Leadership Compendium.

REGENERATIVE FUTURES

Human labour and its replacement

In 1930, the prominent British economist John Maynard Keynes had warned that we were "being afflicted with a new disease" called technological unemployment. Labour-saving advances, he wrote, were "outrunning the pace at which we can find new uses for labour." There seemed to be examples everywhere. New machinery was transforming factories and farms. Were the impressive technological achievements that were making life easier for many also destroying jobs and wreaking havoc on the economy?

To make sense of it all, Karl T. Compton, the president of MIT from 1930 to 1948 and one of the leading scientists of the day, wrote in the December 1938 issue of this publication about the "Bogey of Technological Unemployment." He asked two pertinent questions: (a) should we think about the debate over technological unemployment as the loss of work due to obsolescence of an industry or use of machines to replace workmen or increase their per capita production"? and (b) Are machines the genii which spring from Aladdin's Lamp of Science to supply every need and desire of man, or are they Frankenstein monsters which will destroy man who created them?[1]

Such questions have plagued the industrial world since in various forms and manners, with the common underlying theme that advanced technologies and machines were and continue to replace human labour. Some leading Silicon Valley techno-optimists even postulate that we're headed toward a jobless future where everything can be done by AI. In such scenarios, it is crucial to appreciate the poignance with Shoshana Zuboff's articulation about "behavioral surplus" is yet another substantial manifestation of replacing human labour as a new means of enhancing productivity[2].

With this reorientation from knowledge to power, it is no longer enough to automate information flows about us; the goal is to automate us.

It is however a foregone conclusion that all doomsday predictions of mass unemployment have almost always been unfounded. Growth continued to be derived through optimal deployment of humans and machines, resulting in discrete disappearance of certain jobs but not catastrophic unemployment altogether where industries themselves disappeared. Is it therefore pertinent to continue deliberating about job replacements and losses anymore, even with the advent of artificial intelligence – which is being termed the most significant evolution of mankind after industrialization – or is there a need to discern the underlying complexities and nuances that seem to be getting lost in translation within the narrow context of capital and labour[3]?

[1] Source: https://www.technologyreview.com/2024/01/27/1087041/technological-unemployment-elon-musk-jobs-ai/

[2] Source: "The Age of Surveillance Capitalism – The Fight for a Human Future at the New Frontier of Power", Shoshana Zuboff; Hachette Book Group, 2020.

[3] I refer to the word "labour" throughout this paper to indicate "human endeavor" alone.

Artificial Intelligence as a Capital Asset

Human intelligence has and continues to be complemented by the increasing complexity and sophistry of machines – industrial and consumer – in more pervasive ways than was ever envisaged at the turn of the last century. However, with all the grandeur associated, the world has seen a net increase in productivity and significantly increased yield from each ounce of human labour. While many believe that such gains can be had forever, there does come a point when value derived becomes marginal and commoditized. Continued increases to efficiencies have at some point plateaued out, thereby necessitating either an upheaval or a fundamental shift in input sophistication, with the goal to obtain greater productivities at lower price points. Faster, cheaper, easier are the three mantras we continue to profess to as justifications for all innovations/ improvements. Over time however, most such endeavors lose their sheen and become utilities in themselves. In such scenarios, there is no longer "innovation". Instead, they are just myriad new ways of accomplishing the same goals. This is a crucial factor to appreciate when assessing the "value" of a new technology/ machine in the context of human endeavor.

The general argument is that AI is distinctly different from all other technological inventions we have built over the past century. The answer lies in understanding the word "intelligence" in itself. For the unversed, let's delve into what is collectively known as "human intelligence"[4]. It is the sum of mental capacities such as abstract thinking, understanding, communication, reasoning, learning and memory formation, action planning, and problem solving. Essentially, it involves gathering, storing, retrieving and analyzing information, making decisions and taking actions. Interestingly, underlying experiences driven by exposure to culture, education, location, social circumstances, past incidents, hopes and feelings all contribute to such decisions and actions (collectively known as Human Biases)[5].

Meanwhile "artificial intelligence" is defined as the science of making machines that can think like humans. Manifestly however, AI refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems.

We believe AI is a replica of humans – with all its intelligence traits embedded. However, it remains a faster replica of human endeavor, but not a replacement for human competencies, yet.

It is pertinent to appreciate a fundamental difference we witness to today as we evaluate assets – particularly labour and machines/ technologies. For a long time, machines have complemented labour competencies relating to tasks, with speed, efficiency, and accuracy guiding decisions around leveraging a machine instead of a human.

[4] For greater insights on what Human Intelligence is, please review **https://www.clickworker.com/customer-blog/human-intelligence-vs-artificial-intelligence-human-ai/**

[5] Specifics around the multiple types of cognitive biases that distort or influence human mind are found at **https://www.verywellmind.com/cognitive-biases-distort-thinking-2794763**

This industrial logic that has long been pervasive, leading to machines being treated as "capital assets", while labour itself was considered an expense item. Interestingly, we have finally come around to revisiting this logic. It has now been fundamentally altered with discussions around the constituent element comprising both humans and machines – intelligence.

Now that the machines are perceived as "as intelligent if not better"[6] than human intelligence, the entire conversation around treating machines as just capital assets is no longer sufficient. In this context, labour has moved down the pecking order of importance, with current trends indicating a sanguinity toward calling it an asset, because it never was treated thus. Consequently however, for the first time in human history, labour as an input factor to production is being perceived as no longer necessary, and some even go to the extent that labour only complicates productive endeavors and therefore its complete replacement/elimination may be better for humanity[7].

Workplaces and Artificial Intelligence

The concept of meaningful work has recently received increased attention in philosophy and other disciplines. Doing work that is meaningful leads to higher job satisfaction and increased worker well-being, and some argue for a right to access to meaningful work. Recent research on the impact of robotization on meaningful work was undertaken, through identifying five key aspects of meaningful work - pursuing a purpose, social relationships, exercising skills and self-development, self-esteem and recognition, and autonomy – and concluded that there are significant positive and negative impacts to robotization, alongside ambiguity with ethical issues[8].

The summary arguments that there is need for meaningful work to be distinguished from robotic/ transactional work are generally clustered around job satisfaction, worker well-being, general sense of justice, value of goods tied to social contribution and community. Since the burdens and benefits connected to work are regulated by our public institutions, a just society should protect people's access to meaningful work.

On the other hand, a relentless and unyielding pursuit of garnering, deciphering and understanding myriad complexities with information have resulted in transformation of automated technologies from being enablers of transactional rigor (read efficiencies, speed, accuracy) to harbingers of new information, manifestly on display in many economic sectors like healthcare, astrophysics, geology, pharmaceuticals, medicine et al. Summarily put, artificial intelligence is beginning to do what human intelligence is unable to (any longer).

[6] We are not delving into the specifics around the eight types of intelligence that comprise human cognizance, in comparison to the one intelligence type (logico-mathematical) that defines AI. For specifics, please refer to **https://www.clickworker.com/customer-blog/human-intelligence-vs-artificial-intelligence-human-ai/**

[7] This gives rise to other significant concerns, particularly around incomes, sustenance, survival of the species etc., and consequential discussions around Universal Basic Income, collapse of the capitalistic world, rise of decentralized structures, and many more topics that are considered out of scope for this paper. For details, please reach out to the author.

[8] Greater details around this research and analysis are found at **https://shorturl.at/Cvhc3**

How then would the workplace of the future look like? In just the past few years, we have gone from treating bots as input resources (and thereby needing to be treated as such on balance sheets – resulting in deliberations around taxing such deployments) to equality of rights alongside humans (and consequently included into the ambit of HR policies in enterprises, as unsuccessfully tried by HR consulting firm Lattice)[9].

There are significant questions around not just integrating AI into the workforce, but around how one can successfully manage co-existence (if any) between humans and intelligent machines. The argument that algorithms would replace humans where transactional rigor is needed seems rather simplistic. Instead, the positing that workplace AI applications would have an indirect influence through the development of new, modified, or unmodified worker routines (rather than having a direct influence on worker productivity itself) seems logical and acceptable.

Further, while AI integration into organizational strategy brings 'deep' changes to jobs and the workforce, we are yet to understand the magnitude of such changes. AI-powered technologies associated with losing human skills, such as driverless vehicles and flying drones are yet to work independently of human supervision. Even if such projected perfection of workplace AI is finally achieved, it is unclear whether a complete replacement of human workers with workplace AI is politically, socially, and economically feasible.

AI solutions working independently of human oversight are not yet pervasively deployed. Endeavors toward that end will unleash new issues that our current policy and economic constructs are not aligned to deal with.

On the other hand, human workers are doubtful about AI decisions, recommendations, and responses and might perceive AI augmenting their abilities as being observed by intelligent systems and spied on. Also, the empirical literature[10] around workers' trust in workplace AI relies on short-term, small sample, and experimental studies. Further, longer-term or when the extent of AI replacing workers in the workplace is known, the development of workers' trust in workplace AI is likely to change[11].

Ethics & a Nebulous Future in a Virreal World

Digital tools - increasingly sophisticated AI applications, interoperable edge computing and Internet of Things (IOT) devices, autonomous technologies - underpin the functioning of cities and critical infrastructure today and will play a key role in developing resilient solutions for tomorrow's crises. Yet these developments also give rise to new challenges for states trying to manage the existing physical world and this rapidly expanding digital domain. Large and complex issues like commercialized piracy, data-enabled anocracies, misinformation and

[9] The HR consulting firm LATTICE had on 9th July 2024 tried to treat AI bots like humans, by giving these digital workers "official employee records" in the organization. Such digital workers would be securely onboarded, trained, and assigned goals, performance metrics, appropriate systems accesses, and even a manager, just as any person would be. This policy was withdrawn after significant backlash from employees a few days later. Will this remain an isolated failed endeavor, or become the norm going forward?

[10] Empirical literature by Gilksons and Wooley; **https://journals.aom.org/doi/10.5465/annals.2018.0057**

[11] Detailed analyses and research are found at **Worker and workplace Artificial Intelligence (AI) coexistence: Emerging themes and research agenda - ScienceDirect**

disinformation, adverse use of frontier technologies are becoming mainstream[12]. In this context, conversations around ethical use and deployment of frontier technologies – particularly artificial intelligence – have become mainstream, crossing from the domain of corporations into parliaments and multilateral institutions alike. Fast forward, today owing to the advent to generative AI, and consequences with general AI deployment, seen particularly in the manifestation of emergent risks around deep fakes, misinformation/ disinformation, geopolitical interferences and narratives permeated through AI - have all led to a reassessment of ethics with AI deployment, thereby debunking the long-held belief that self-governance is the best way to enable and enhance economic endeavors. It is fast being replaced by governments and multilateral stakeholders demanding accountability from large corporations that own data and leverage technologies for purely capitalist pursuits.

In 2017, the first deliberation on AI[13] and its ethical implications was held on lines similar to the 1975 Conference on recombinant DNA[14]. The 23 principles laid down the foundation for ethical institution of AI in various endeavors worldwide. However, the quest for building new digital revenues in a hyper-connected world resulted – unfortunately – in pushing commitments toward ethical implementation of AI technologies onto the backburner. However, the world realized the need for international standards to govern AI, building on the Asilomar agreement. Led by UNESCO, 193 member nations embarked on formulating the first global normative instrument[15] on the ethics of artificial intelligence in 2021 and that the OECD states that AI systems should be robust, secure and safe throughout their entire life cycle to function appropriately and avoid posing unreasonable risks to safety. However, they have been more advocative than action/ compliance oriented, given the complexity with combining a variegated set of standards across industries and countries (and particularly in nations where privacy protection laws are either onerous or poor).

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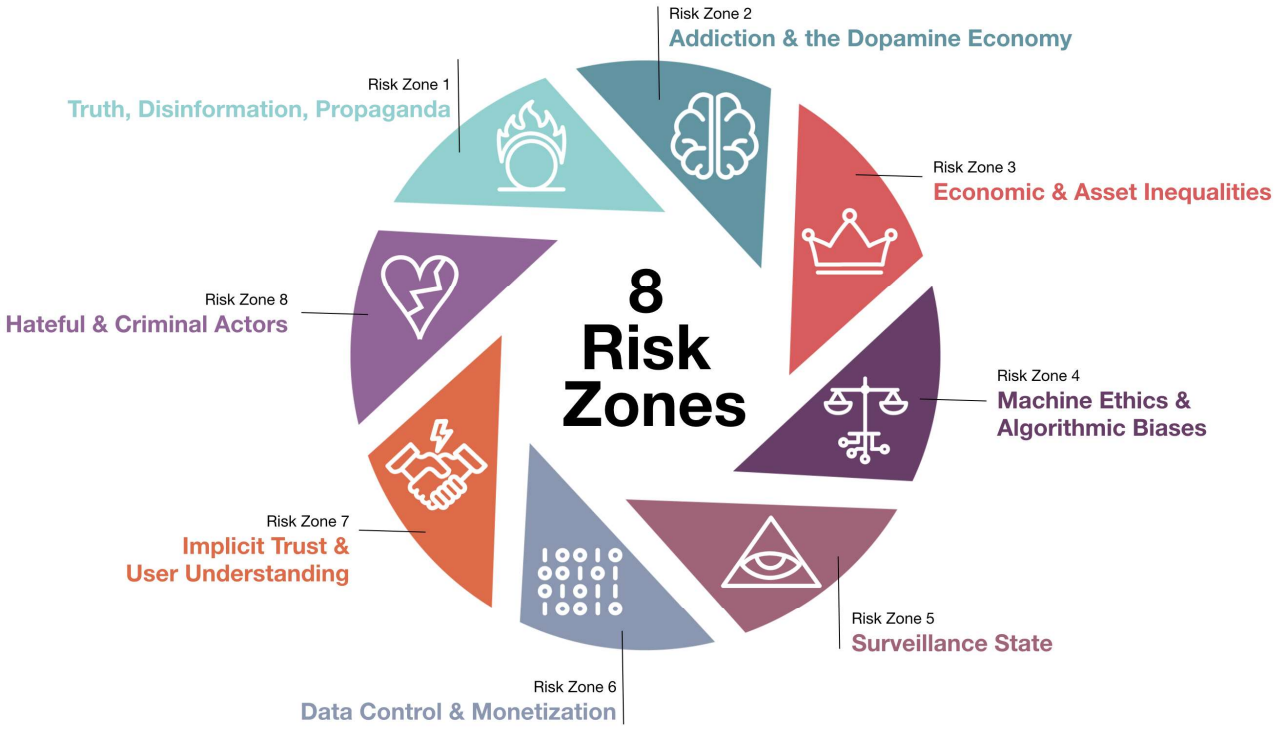
[12] Please refer to our knowledge paper titled "Future of Work – Reimagining a New World Order", 2023.

[13] The Asilomar Conference on Beneficial AI was a conference organized by the Future of Life Institute, held January 5–8, 2017, at the Asilomar Conference Grounds in California. More than 100 thought leaders and researchers in economics, law, ethics, and philosophy met at the conference, to address and formulate principles of beneficial AI. Its outcome was the creation of a set of guidelines for AI research – the 23 Asilomar AI Principles. Greater information on their activities, programs et al can be found at **www.partnershiponai.org**.

[14] The Asilomar Conference on Recombinant DNA was an influential conference organized by Paul Berg, Maxine Singer, and colleagues to discuss the potential biohazards and regulation of biotechnology, held in February 1975 at a conference center at Asilomar State Beach, California. A group of about 140 professionals (primarily biologists, but also including lawyers and physicians) participated in the conference to draw up voluntary guidelines to ensure the safety of recombinant DNA technology (simply put, mixing DNA from different species to build new ones). The conference also placed scientific research more into the public domain, and can be seen as applying a version of the precautionary principle (**https://en.wikipedia.org/wiki/Precautionary_principle**).

[15] Complete details of this instrument are available via link **https://unesdoc.unesco.org/ark:/48223/pf0000381137**. It is a result of three standards bodies – International Telecoms Union (**www.itu.int**), International Electrotechnical Commission (**www.iec.ch**), and International Organization for Standards (**www.iso.org**) – that came together to form the World Standards Cooperation (**www.worldstandardscooperation.org**).

Multilateral institutions like ASEAN and the EU are already building governance principles around ethical use of AI, alongside nations that are looking to institute their own versions of AI Governance rules and acts[16]. In 2022, the World Economic Forum[17] had laid down eight key risk zones, emanating from use and deployment of frontier technologies (as in graphic below).



Emphasis is now being placed significantly on not just use cases for AI across all economic and geopolitical endeavors, but on the consequences – unintended and purpose-driven – of such deployments, as articulated above.

Private sector-led development of powerful dual-use (both civilian and military) technologies makes regulatory guardrails even more essential. However, commercial incentives and national security-driven "tech wars" may outstrip regulatory efforts to curb adverse societal and security outcomes.

The production of AI technologies is highly concentrated, in a singular, globally integrated supply chain that favors a few companies and countries. This creates significant supply-chain risks that may unfold over the coming decade. For example, export controls over the early stages of the supply chain (including minerals), could raise overall costs and lead to persistent inflationary pressures. Restricted access to more complex inputs

[16] There are a range of AI and Ethics legal frameworks and guidelines in play today. Some examples are: Artificial Intelligence Act, EU (**https://artificialintelligenceact.eu/**); Model AI Governance Framework, Singapore (**https://www.imda.gov.sg/resources/press-releases-factsheets-and-speeches/press-releases/2024/public-consult-model-ai-governance-framework-genai**); AI Governance & Ethics Guidelines, Malaysia (**https://justai.in/malaysias-national-ai-governance-and-ethics-guidelines-28-09-24/**); and many more. Some of these are intrinsically woven within the fabric of data protection and cybersecurity frameworks/ acts, while others are independently deployed.

[17] Source: Global Risks Report 2022; **www.weforum.org**

(such as semiconductors) could radically alter the trajectory of advanced technological deployment within a country. The extensive deployment of a small set of AI foundation models, including finance and the public sector, or overreliance on a single cloud provider, could give rise to systemic cyber vulnerabilities, paralyzing critical infrastructure[18].

In Conclusion

The debate around job replacements, diminishing value of human labour (with inabilities to handle complexities), and consequential woes with policy and corporate behavior that limit maximization of value through intelligent machines needs to be tempered with detailed and specific thought processes and research, actions and policy constructs that include all stakeholders – corporations, civil societies, governments, and transnational contributors – in a meaningful manner where morals and ethical obligations need to play as important a role as the benefits gained from economic and scientific endeavors.

Much of the current discussions around AI, and its ability to completely circumvent human labour in its entirety is mostly noise, taking our attention away from matters of more significance and complexity. We can no longer hide behind classical economic theories around the production-consumption spectrum with myopic changes made to policies and corporate behavior or governmental policy constructs. The interplay between man and machine has reached a point of no return – with the stakes too high to remain transactional with our endeavors – corporate or governmental. We need to understand the "socio-cultural" and "humanistic" implications of AI on workforce and societies in general. It is not an "economic" argument - anyone doing so is barking up the wrong tree.

Would we be at the point where the world ends up pushing a "compliance economy" narrative, or would "self-governance" remain relevant any longer? We observe the dichotomy between private sector surveillance capitalism and the government's responsibility to ensure a level playing field. However, we may yet be missing the point that eventually, the consumer world seems not to really care about ethics and its interpretations, as much as institutions and some conscientious leaders seem to. After all, we are willingly and actively contributing to the world of surveillance capitalism and abhor any governance-centric interpretations to the proliferation of such technologies and the solutions being built on them.

I believe a time will soon come when we shall be left with little choices on whether to establish guardrails right now, or deal with an ambiguous, uncontrolled and non-human future where the species' superiority will no longer hold.

[18] Excerpt from the Global Risks Report 2024, by the World Economic Forum (page 51); **www.weforum.org**

CONTACT US

E: **bobby@matryzel.com**

W: **www.regenerative-futures.net**

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