Technological Unemployment and the Future of and Work in Malaysia

Policy Paper

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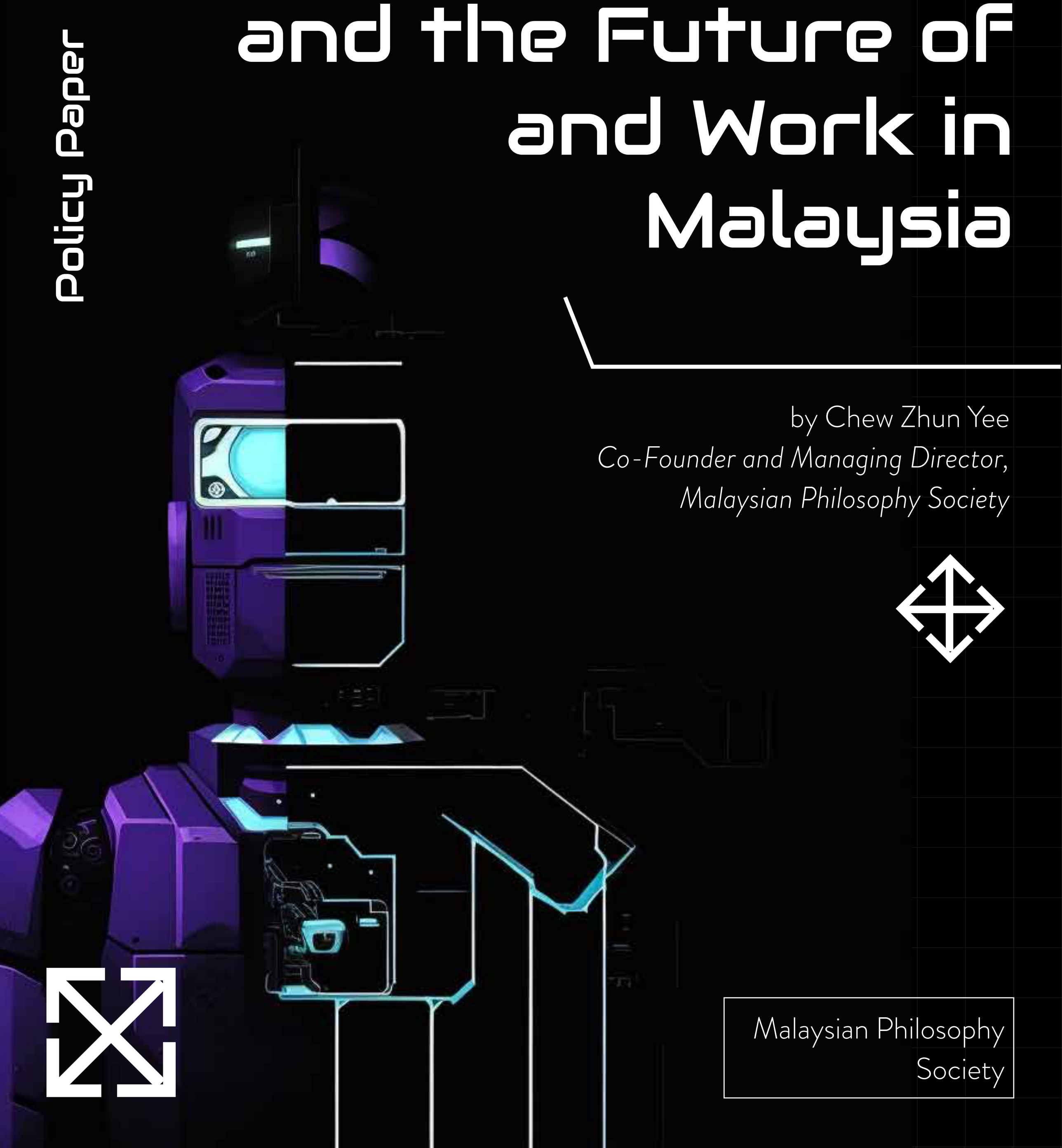


Malaysian Philosophy Society

Introduction

In 2013, Carl Benedikt Frey and Michael Osborne authored a highly influential paper examining the likelihood of jobs being replaced by advancing technology (Frey and Osborne, 2017). Their analysis suggested that 47 percent of jobs faced a high risk of displacement within the subsequent two decades. More recently, the International Labour Organization (ILO) conducted a similar study in 2016 focusing on five ASEAN countries—Cambodia, Indonesia, the Philippines, Thailand, and Vietnam—and found that 56 percent of jobs in these nations were at risk of displacement (International Labor Organization, 2016). In Malaysia, the outlook is similar. Khazanah Research Institute (KRI)'s analysis projected that 54 percent of all jobs in Malaysia could face significant displacement due to technology within the next two decades.[1] Furthermore, 70 percent of semi-skilled jobs are identified as being at high risk, and this is alarming because 90 percent of all semi-skilled jobs are occupied by Malaysian nationals who will bear the brunt (Ng, 2017).

With the prevalence of Big Data, and the rising popularization and democratization of AI and Large Language Models (LLMs),[2] the deep-seated fear of technology replacing human labor, which has historically accompanied major technological breakthroughs, has resurfaced.[3] Mirroring historical trends, sentiments are divided, from headlines ranging from high pessimism, such as, "AI could replace equivalent of 300 million jobs" (Vallance, 2023) and "AI could lead to "permanent technological unemployment" (Blair, 2023), to high optimism, such as "Technological unemployment is a myth" (AI Could Lead to 'Permanent Technological Unemployment', 2023) and "We've been here before" (Rotman, 2024).

Similarly, scholarly debates surrounding technological unemployment have been divided into two primary camps: what Nick Dyer-Witheford called the "AI Apocalypse Now" camp and the "Business-as-Usual" camp (Dyer-Witheford et al., 2019, p. 69). The "AI Apocalypse Now" camp believes in the imminent job crisis caused by technologies (e.g., Brynjolfsson and McAfee, 2014; Ford, 2015; Frey and Osborne, 2017; Hardt and Negri, 2001; Mason, 2016; Srnicek and Williams, 2016), whereas the "Business-as-Usual" camp believes that technological advancements will ultimately create new opportunities and industries (e.g., Autor, 2015; Mokyr, 2015).

This paper is divided into three parts. In the first part, it analyses both the arguments from the "AI Apocalypse Now" camp and the "Business-as-Usual" camp. In the second part of the paper, it reviews the measures currently implemented by the Malaysian government to address potential technological unemployment. In the final part, the paper proposes alternative solutions and policy recommendations aimed at fostering a more just, equitable, and autonomous future of work and technology in the country.

[1] It is said that half of the work time in Malaysia is dedicated to repetitive tasks that are highly susceptible to automation, elevating the concern of technological unemployment. See Automation and Adaptability (2020).

[2] Big data is data defined in large volume, received and acted on in high velocity and exist in great variety, made available by digital technologies, Internet and AI. It is used to track and analyze patterns, trends and human behaviors (Big Data Defined n.d.). LLMs are AIs that use deep learning algorithms to perform Natural Language Processing (NLP) tasks. They are trained using massively large data sets to process and understand human language and respond using human modes of communication such as speech or text. A famous example of LLM is Generative Pre-Trained Transformers (GPT) models used in developing ChatGPT, Google Bard and Bing AI (Elastic, 2024).

[3] See Anslow (n.d.)'s Pessimists Archive for a collection of technophobia that accompany various new technology breakthroughs across history.

The Definition of Contemporary Work

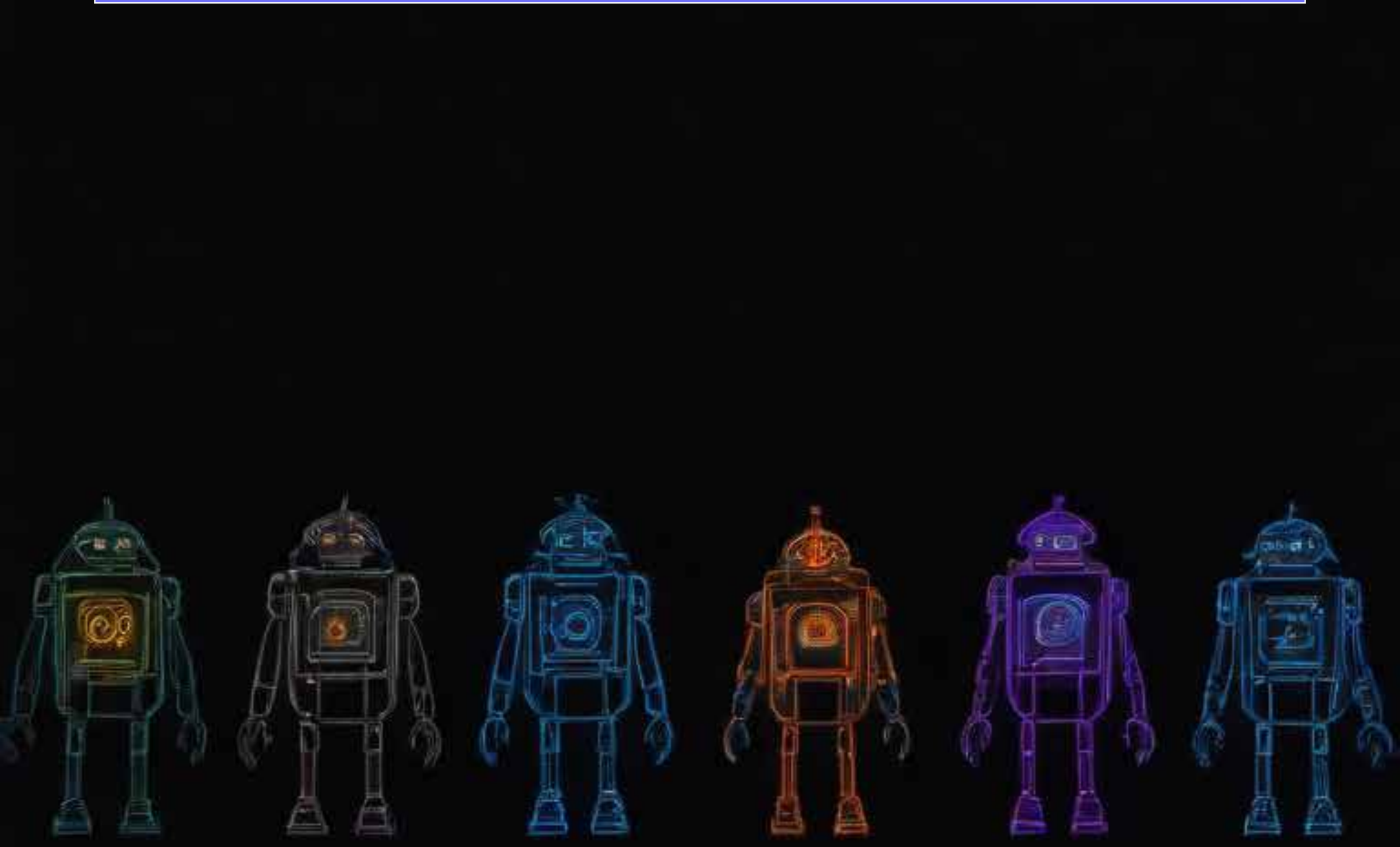
This paper addresses the threat of job displacement due to technology. Let us first begin by defining what work and technology are. Firstly, work involves performance of action or skills that produces what Raymond Geuss (2021, p. 5) refers to as "objective" value—value found in "external" products that can be "measured and valued independently of anything one might know about the process through which that product came to be or the people who made it." Work is not limited to the production of physical goods. It also includes services like banking, digital marketing, consulting, intellectual labour like researching, teaching, creative endeavors like art, music, writing, emotional labour, and the creation of data and information others consume on the Internet. In addition, work typically involves the performance of some act or skill in return of economic or material compensation, or at least an expectation of compensation, as Danaher (2017) pointed out. However, it is worth noting that not all work activities involve material compensation. For example, voluntary work, internships and domestic work are considered unpaid work. Moreover, in the current era of digital technologies, work is no longer confined to traditional employment and full-time waged positions.

"Gig economy," characterized by "contractor," "freelance," and "task-based" work (Friedman, 2014; Kessler, 2018), and cognitive labor, characterized by knowledge and information sharing and creativity (Moulier-Boutang, 2011; Walton and Nayak, 2021; Zuboff, 2015), have increasingly become mainstream since the late 20th century. Some of these work activities are done without necessarily expecting material compensation, but they still receive compensation in the form of non-material recognition and acknowledgment, such as through engagement from user-generated content creation on social media. As such, on top of material compensation, work can also be said to also involve an expectation of receiving recognition and acknowledgment of one's contribution (Dejours, 2012; Fraser and Honneth, 2003, pp. 156, 256). With these considerations in mind, the following definition of work is sufficient for the purpose of our current discus-

> Work: The execution of tasks or the application of skills that produce an outcome or use (physical or immaterial) that can be measured and valued independently by others, typically with the expectation of some form of compensation or recognition.

The Definition of Technology

The scope of “technology” employed in this paper is more focused than the broader definitions provided by Jacques Ellul and Langdon Winner. According to Ellul, technology, or “technique” as he terms it, is the “totality of methods rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity.” Technique is not just machines; it is the totality of methods, communications and organizations used by society to adapt and organize itself, focusing on maximum efficiency (Ellul, 1964, p. xxv). Similarly, Langdon Winner defines technology broadly as an amalgamation of ‘apparatus’ or “physical devices of technical performance,” “whole body of technical activities–skills, methods, procedures, routines–that people engage in to accomplish tasks,” and “varieties of social organization-factories, workshops, bureaucracies, armies, research and development teams, and the like” (Winner, 1977, pp. 8-12). “Technology” in this paper covers a more narrow scope; it concerns apparatuses (gadgets, tools, machines, robots, software, systems, platforms, algorithms and automations included) that are used in enhancing different human tasks, with a focus on AI and work technologies. These technologies can be considered as labor-reducing or labor-augmenting.



1.Argument from Technological Unemployment and Luddite Fallacy

Now with work and technology defined, we can better understand the notion of technological unemployment. Technological unemployment can be understood as the permanent substitution of human work by technology as defined above. This view is usually supported by the "AI Apocalypse Now" camp. We will first explore the question of whether technological unemployment can happen, before reviewing the solutions that have been proposed to mitigate its effects. The case for technological unemployment can be laid out as follows:

(P1) If technology is replacing more and more forms of human labor, and if there are fewer and fewer alternative forms of work for humans to go to, then there will be technological unemployment.
(P2) Technology is replacing more and more forms of human labor, and is doing so in a way that results in fewer and fewer forms of alternative work for humans.
(C) Therefore, there will be technological unemployment (Danaher, 2017).

While this argument is valid, its soundness may be contested. Proponents of Luddite Fallacy argue that those who believe that technological displacement necessarily reduces the scope of available job opportunities are committing a fallacy. The premise under scrutiny is P2. The first component of P2 is relatively uncontroversial. Examples range from delivery robots and surgical robots, to warehouse bots and self-driving cars (Brynjolfsson and McAfee, 2014; Ford, 2015; Kaplan, 2015). However, the second component of P2 is said to commit the Luddite Fallacy.

Proponents of Luddite Fallacy believe that technological advancement will have no long-term negative impact on employment levels, and will eventually increase job opportunities as the market will adjust accordingly, like what happened in previous waves of technological breakthroughs (Autor, 2015; Mokyr, 2015). This market adaptability is referred to by various terms, such as "productivity effect" (Acemoglu and Restrepo, 2017) or "multiplier effect" (Deranty, 2022, p. 13; Deranty, 2024, pp. 12-13), generally suggesting that technological advancement in one industry can lead to increased productivity and "multiplication" of other economies connected to them.

Empirically, this argument is supported by data showing that past technological breakthroughs have not resulted in long-term job displacement. While technological advancements have undoubtedly led to temporary job losses in specific tasks and industries (for instance, manufacturing job losses account for 11% in the U.S., 16% in Japan and 20% in Brazil in the 1990s) (Ford, 2009), the employment rate has generally seen an upward trend. For instance, between 2014 and 2023, the Malaysian economy saw a net increase of 1.96 million jobs (Total Employment in Malaysia, 2023). Moreover, the U.S.' labor force participation rate is currently at 70.4% (Malaysia Labor Force Participation Rate, 2024), an increase of 6.6% since 2010, whereas its unemployment rate was only 3.2% in August 2024 (Malaysia Unemployment Rate, 2024). The following sections will explore if either of these arguments is right about their projections.

1.1 Problems with Argument from Technological Unemployment

In this section, I will explore three other issues associated with the argument from technological unemployment, exploring why the sentiment surrounding technological unemployment needs to be addressed with greater nuance and care. These issues include (1) the assumption of neutrality of technology and how it leads to the confident projection that technological advancement will lead to widespread job displacement, (2) the underestimation of work ethic and centrality of work in people's lives, and (3) methodological doubts surrounding research and views warning against technological unemployment.

(i) Politics of Technology

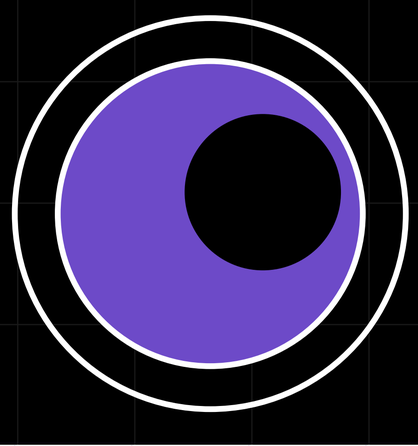
Technological development does not exist in a political vacuum. Within the capitalist context, technology is not neutral; it is capitalist-owned and controlled, and its development, implementation and use are biased toward the interests and objectives of the capitalist class, which include the maximization of profitability and surplus value production (Deranty, 2024, p. 16; Nieswandt, 2021, pp. 14-17; Spencer, 2016, pp. 4-5; Spencer, 2018, p. 5), often at the expense of human workers (Hughes, 2019, p. 61; Marx, 1976, p. 492; Spencer, 2016, p. 4; Spencer, 2018, p. 10). While there is an inherent tendency for capital to adopt labor-saving technologies to reduce costs and increase relative surplus value (Kosar, 2024), this tendency does not necessarily result in technological unemployment, as the pursuit of capitalist goals can restrict this outcome.

To further the argument, Nieswandt (2021) contends that in a competitive market, capitalist owners have no egoistic incentive to churn jobs or reduce production and the workforce; rather, the efficiency and productivity made possible by labor-saving technologies are often turned into the expansion and intensification of production and devaluation of labor. This is facilitated by labor-augmenting technologies such as surveillance technologies, productivity and performance tracking technologies and gig economy technologies. Because of technological advancement, previously unimaginable surveillance and performance tracking technologies, from location tracking (Head, 2014), to keystroke tracking (Goh, 2023), wristband tracking (Bales and Stone, 2020, pp. 17-18; Yegingsu, 2018) and sociometric badges (Moore et al., 2018) are deployed alongside the threat of termination for failing to meet expectations (Head, 2014; Walton, 2023).

As a consequence, intensive surveillance has led to greater pressure and longer working hours (Goh, 2023), as well as greater productivity expectations and more inhumane working conditions (Sainato, 2021). This is further confirmed by the evidence that technological advancements and the emergence of labor-saving technologies have boosted workers' productivity across different sectors without corresponding increases in their leisure time (Nieswandt, 2021, pp. 11-12; Sprague, 2014). Globally, work hours have generally increased (e.g., Kenya, Singapore, Switzerland, Thailand) or stagnated (e.g., Malaysia, Austria, China, Canada, Finland, New Zealand, Philippines, United States), with only a few countries experiencing decreases (e.g., Japan, Korea, Portugal), and the majority having maintained a statutory work hours limit of 35 to 39 hours per week since the 1970s (Lee et al., 2017, pp. 13-16). Many countries also raised the retirement age, increasing the absolute number of work-hours (Nulimaimaiti, 2024). While increased exploitation and alienation of work can result in class conflict and resistance, technologies have been used to suppress resistance and uprising efforts. For example, Whole Foods and Amazon are seen utilizing "heat mapping" software to monitor employee unrest and identify stores "at risk of unionisation" (Peters, 2020).

Meanwhile, Google has developed a Chrome browser extension that alerts managers to internal meetings with over one hundred employees, aimed at preventing employee organizing (Statt, 2019).

Gig economy technologies that boomed at the late 20th century, fast-tracked by the weakening of collective bargaining power in neoliberal capitalist society marked by a high level of policies favoring deregulation and decentralization, privatization, and the championing of free-market ideologies (Bal, 2018; Crowley and Hodson, 2014, pp. 91-93; Friedman, 2014, pp. 173-76), have also resulted in the rise of precarious working conditions and workers exploitation (Friedman, 2014, p. 172; Mokyr, 2015, p. 46; Standing, 2018; Stewart and Stanford, 2017; Wajcman, 2017, pp. 124-125). Notable examples include Mechanical Turk, TaskRabbit, Uber, Deliveroo, Grab, Upwork and Clickwork, among others. Within these technology platforms, decisions are often obscured in a black box. For example, the way pay algorithms on these platforms work are not made clear to the workers; their arbitrary fluctuations are seen as strategies for companies to drive wages down (Kerr, 2022).

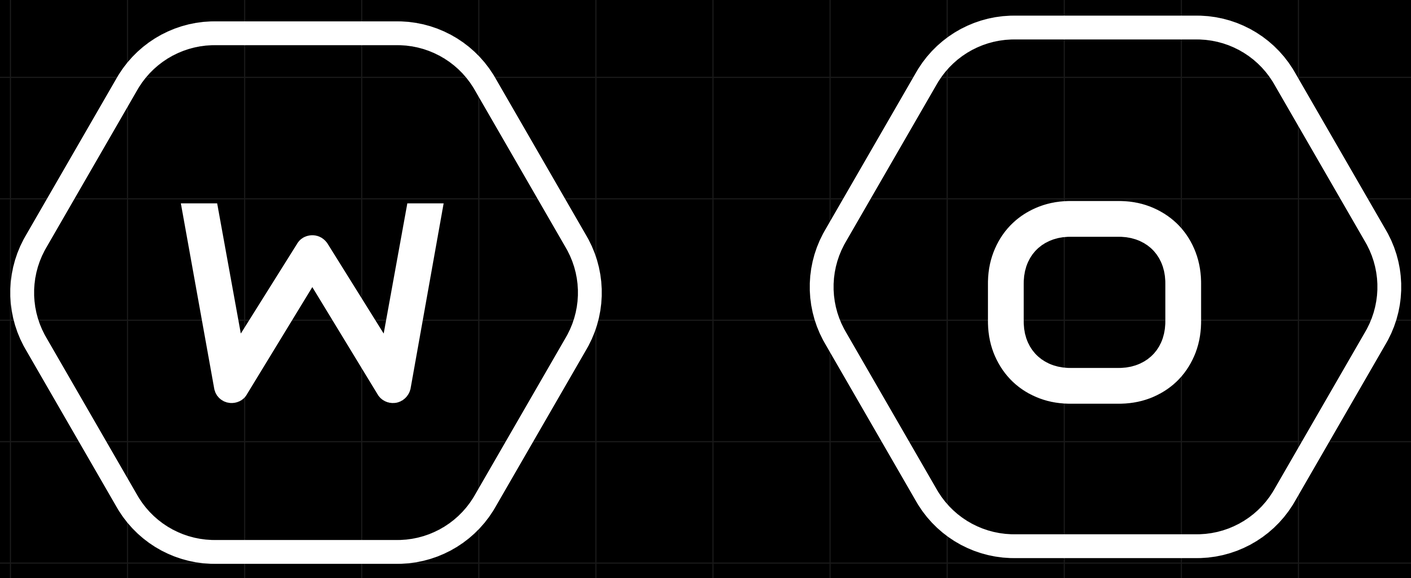


Consequently, given the current climate of weakened bargaining power and the proliferation of low-wage and precarious work (Linder, 2024), it is questionable that capitalist employers would have strong incentive to invest and deploy labor-saving technologies when surplus-value can be extracted from cheap human labor (Deranty, 2024, pp. 16-17; Dinerstein, 2021). As Mueller (2021) argues, labor-saving technologies are often employed to circumvent well-organized labor forces that effectively resist capitalist demands. As the labor market becomes increasingly fragmented, the impetus to transfer work to capital to bypass human labor correspondingly decreases, challenging the outcome of technological unemployment in a technology-driven economy. This has come to show that while technology can replace human jobs, it can also augment work and lead to greater exploitation, precarity and longer working hours, through intensified surveillance, undifferentiated gig work, and a reduced labor share of income.

Furthermore, the conclusion of a "fully automated capitalism" is incompatible with Marx's labor theory of value, which asserts that only human labor produces surplus value (Marx, 2000), without which surplus value cannot be created, undermining the capitalist system (Kosar, 2024, p. 92).

As such, while capitalists are compelled to adopt technological innovations to remain competitive, they risk causing stagnation and decline by over-investing in fixed capital at the expense of variable capital. So to counteract this tendency, capital may resort to exploitative measures, such as surveillance, to extract "more for less." (Upchurch, 2016). Capitalists have in the past also tended to increase unnecessary or superfluous work to keep the system going (Marx, 1979, p. 653). This is evident in the creation and sustenance of "bullshit jobs," jobs that are often perceived as pointless or unfulfilling yet continue to proliferate in modern technology economies (Graeber, 2018, pp. 51-58).

However, the consideration of the ownership of technology, power dynamics within technology, as well as capitalist agendas are sometimes undertheorized in literature surrounding technological unemployment. For example, In Brynjolfsson and McAfee's book The Second Machine Age, technologies are largely considered as neutral and apolitical products, with little consideration of how they can be developed and deployed in ways that obstruct the outcome of technological unemployment. As Spencer (2016, 4) pointed out, "there is more in their book on the power of computers than on the power of capital." John Maynard Keynes, in his famous 1930 essay Economic Possibilities for Our Grandchildren, envisioned a future where technological progression replaces most human labor, reduces working hours, and solves mankind's "economic problem" of scarcity and poverty (Spencer, 2018, 3). Like Brynjolfsson and McAfee, Keynes did not sufficiently consider how capital can—and often does—appropriate the benefits of technological efficiency for itself, rather than using these gains to reduce human labor and shorten working hours.



(ii) Work Ethic and Centrality of Work

A subdivision of the “AI Apocalypse Now” camp, known as post-capitalists, holds a starkly different view on technological unemployment compared to economists like Brynjolfsson and McAfee. Post-capitalists see technology not merely as an opportunity for a post-work future, but also a future where private ownership is abolished, paving the material foundation for abundance of resources and collective ownership. Proponents of this view include Paul Mason, Aaron Bastani, and Srnicek and Williams. These theorists adopt an optimistic outlook on technological unemployment, believing that technological advancements are paving the way for an alternative future beyond capitalism and work. They also assert that the economic conditions necessary for a post-capitalist, post-work future are already being met. Paul Mason argues that capitalism is in a phase of self-destruction in the age of information technology due to the “exhaustion of capitalism’s 250-year-old tendency to create new markets where old ones are worn out” (Mason, 2016, p. 160) and the erosion of the “price mechanism of digital goods” (Mason, 2016, pp. 110, 131). Similarly, Bastani believes we are heading toward a future where “information, labor, energy, and resources become permanently cheaper” (Bastani, 2019, pp. 55-56). As the marginal cost of goods approaches zero due to the rise of digital goods and automation—and with fewer new markets to commercialize—these theorists argue that these economic shifts signal the arrival of a more collaborative, sharing-based, and post-scarcity economy. Bastani describes this as “a society with greater collective wealth, where all essential needs and creative desires are satisfied” (Bastani, 2019, pp. 55-56). Technological advancement is hence seen as a key driver that facilitates the dismantling of traditional capitalist structures, leading to the decline of scarcity-based economies and the rise of a post-scarcity society where work is no longer necessary and leisure becomes the prime value defining the society.

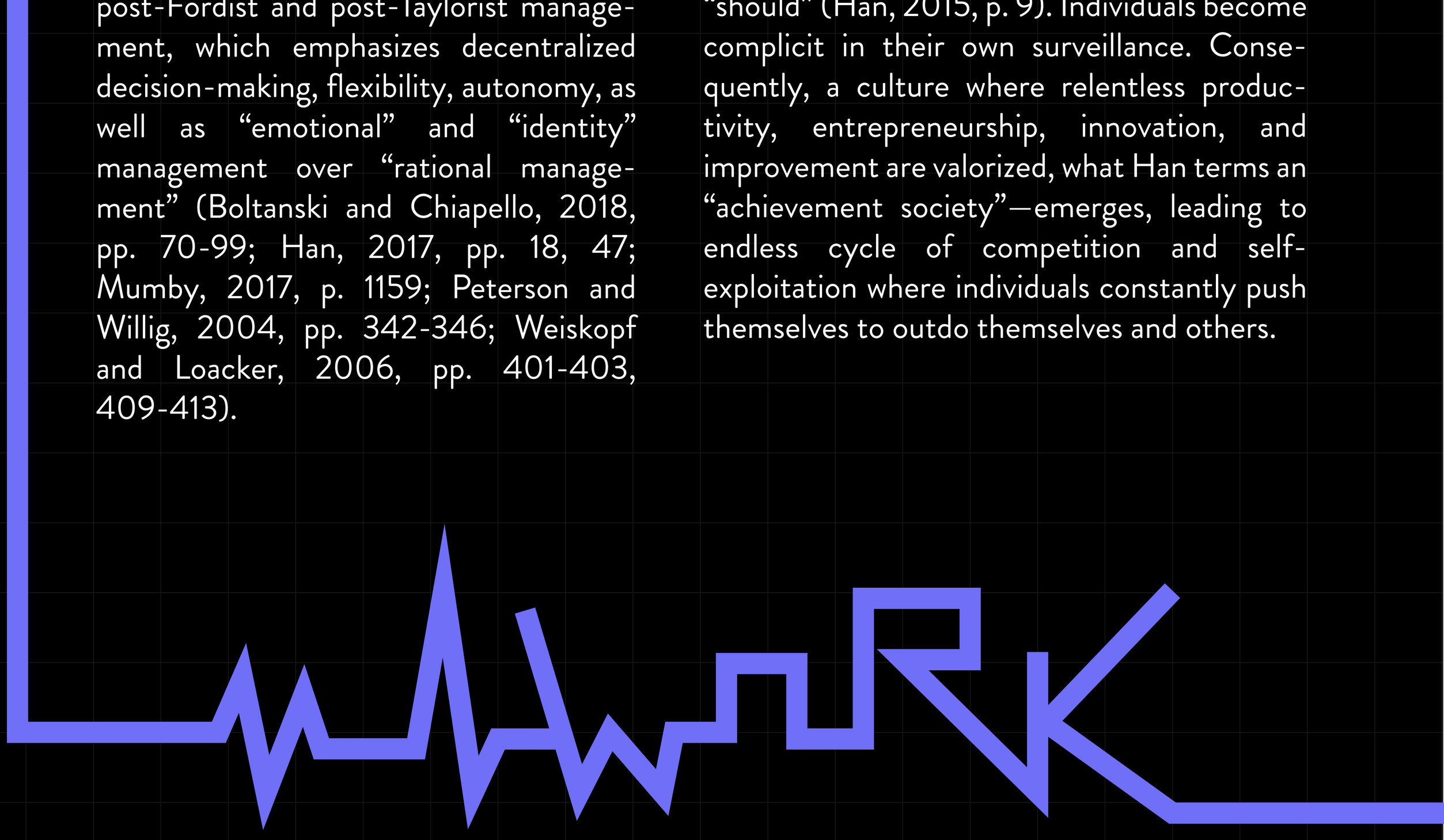
However, it is worth noting that even if technological advancement and economy no longer require everyone to work, a dominant work ethic may persist – something which post-capitalists tend to overlook. Capitalist work ethic finds its roots in Protestantism, notably Calvinism, with Protestant work ethic prescribing an approach to labour akin to a divine calling, thus laying the groundwork for the ethos of capitalism (Weeks, 2011, pp. 39, 42-43; Weber, 1958, p. 83). The Calvinist teachings emphasized the doctrine of predestination, and the importance of disciplined and industrious life as signs on the “elect” being chosen by God for salvation.

According to Protestant doctrine, a virtuous life entails dedication to arduous work and steadfast diligence. Over time, the religious underpinning of work ethic has evolved to encompass a secular dimension, with work gradually being viewed as a path to individual self-expression and self-development, closely linked to one’s identity and purpose (Weeks, 2011, pp. 39, 42-43; Weber, 1958, p. 83). In modern capitalism, work ethic is now seen as a biopolitical and disciplinary force, to borrow Michel Foucault’s terms—which functions to generate consent for capitalist exploitation by shaping the workers through “voluntary submission,” internalization and identification with productivist norms (Weber, 1958, p. 152).

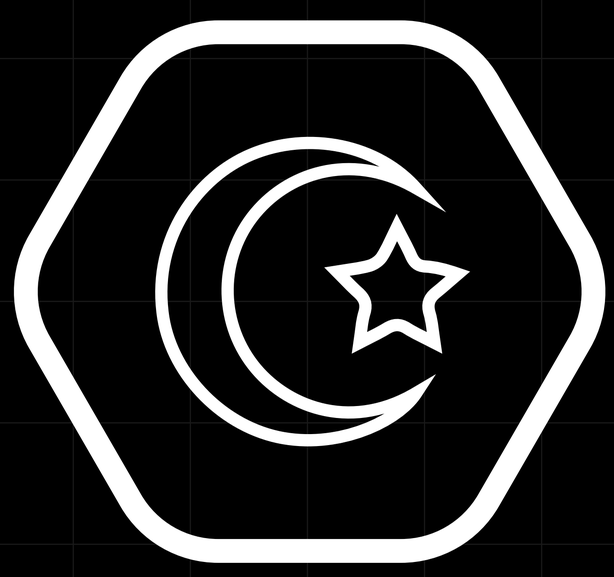
In Foucault's terms, biopower and disciplinary power are understood as "the administration of bodies and the calculated management of life" (Foucault 1978, 140), the "training" of "docile bodies" (Foucault, 1977, pp. 138, 170), as well as influence the beliefs and values of individuals. Work ethic, alongside surveillance technologies and management practices can be seen as forces that keep the workforce productive, compliant and governable (Foucault, 1977, p. 175), through "the cultivation of habits, the internalization of routines, the incitement of desires, and the adjustment of hopes, all to guarantee a subject's adequacy to the lifetime demands of work." (Weeks, 2011, pp. 53-54).

After the mid-twentieth century, a new variation "postindustrial work ethic" came to the forefront, facilitated by the rise of post-Fordist and post-Taylorist management, which emphasizes decentralized decision-making, flexibility, autonomy, as well as "emotional" and "identity" management over "rational management" (Boltanski and Chiapello, 2018, pp. 70-99; Han, 2017, pp. 18, 47; Mumby, 2017, p. 1159; Peterson and Willig, 2004, pp. 342-346; Weiskopf and Loacker, 2006, pp. 401-403, 409-413).

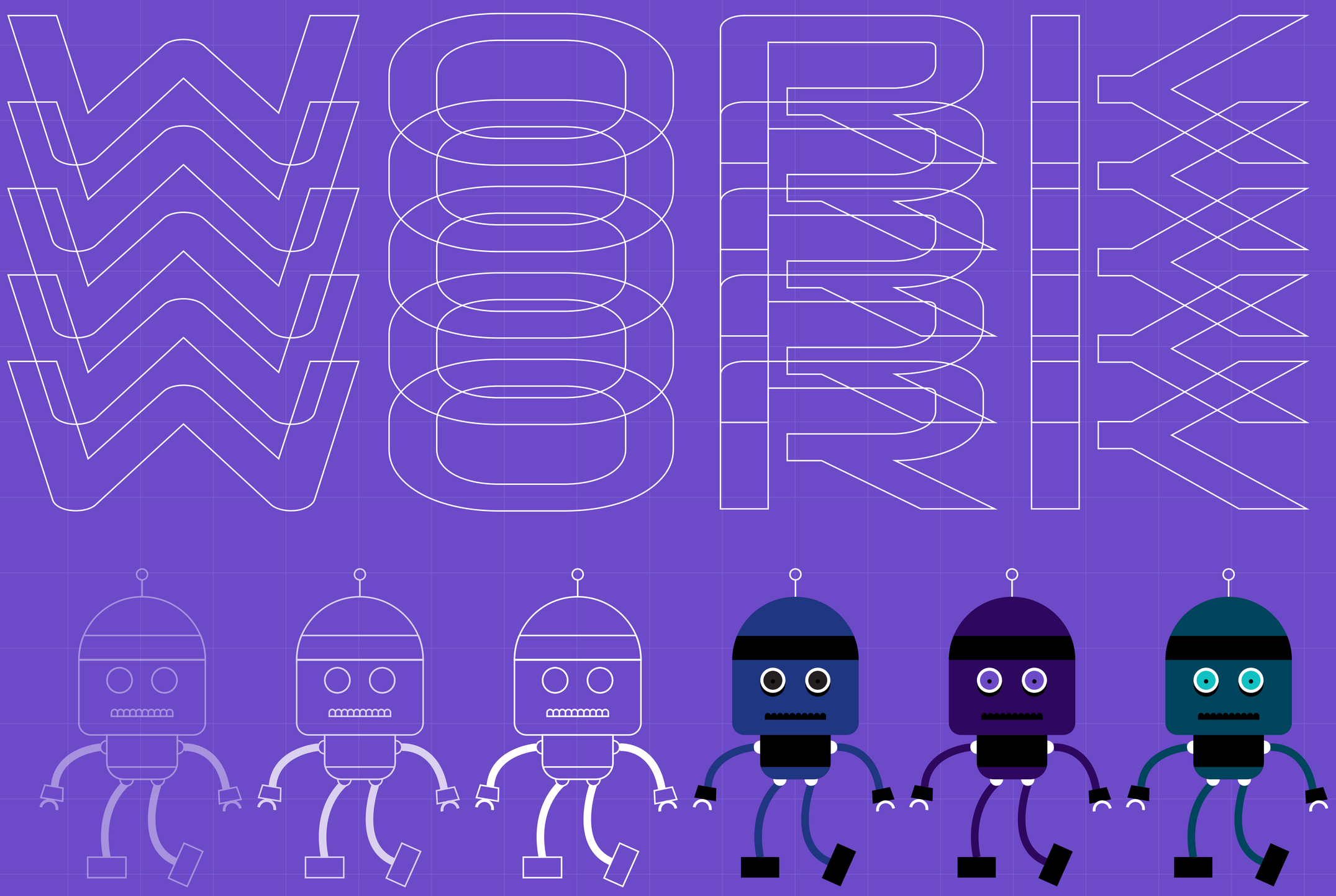
Work is to be approached as a form of individual self-expression, self-development and creativity (Bunting, 2004, p. 168; Rose, 1985, pp. 77-92; Weeks 2011, 46; Zuboff, 1983, p. 166), and workers are often encouraged to go beyond their regular job scope and think of themselves as "sidepreneurs" (Friedman 2014, 173), "entrepreneur of the self" (Visser, 2020, pp. 5-6), "creative," "innovative", "flexible" (Weiskopf and Loacker, 2006, pp. 401, 407), and "empowered" to shape their own destinies (Honneth, 2007, pp. 343-345).This is accompanied by the emergence of a new form of power that is deceptively friendly and seducing rather than coercive and limiting (Han, 2017, pp. 13-15, 19-28, 61; Zuboff, 2015, pp. 83-84). Termed by Byung-Chul Han as "psycho-power", this new form of power exerts its influence through encouraging self-optimization, self-initiatives, self-exploitation and endless productivity, and through the imperatives of "can" instead of "should" (Han, 2015, p. 9). Individuals become complicit in their own surveillance. Consequently, a culture where relentless productivity, entrepreneurship, innovation, and improvement are valorized, what Han terms an "achievement society"—emerges, leading to endless cycle of competition and self-exploitation where individuals constantly push themselves to outdo themselves and others.



As a result, the various forms of ingrained work ethic acquired from capitalist environments can continue to create a pressure to engage in work, even in an economy of reduced work or where a UBI is implemented, because of the association of work with subjectivity and moral worth, and fear of stigmatization. Furthermore, in Islamic societies such as Malaysia, it could be said that further cultural obstacles persist towards a future of less work or technological unemployment. In Islam, work is seen as both an ibadah (religious duty) and jihad (service to Allah). Work serves not only to protect fundamental human needs, maintain a thriving and healthy society, but is also seen as a virtue and divine calling (Kamaluddin and Manan, 2010, pp. 61-62; Rizk, 2008). As stated in the Quran: “Whoever work righteousness, man or woman and has faith verily to him will We give a new life, a life that is good and pure and We will bestow on such their reward according to the best of his action” (Al Qur’an, Al Nahl, p. 97), and in Hadith: “Truly Allah likes to see his servants striving to earn an honest income” (Dailami). Islamic ethic also highlights istiqamah (excellence) as a virtue in work. As The Prophet Muhammad advised, “Allah loves that when anyone does a job, he does it perfectly” (Baihaqi). As Allah has decreed: “Verily, Allah commands that you establish justice and be efficient and proficient” (Al Qur’an, Al Nahl, p. 90). Up to the current stage, Islamic ethic shares many similarities with Protestant work ethic. One key feature that sets Islamic ethic apart from Protestant ethic is the emphasis on niyyat (intention). Work is not only about the external results but also about the internal sincere intention and devotion to work to please Allah. In Protestant ethics, the focus is more on actions and outcomes (Kamaluddin and Manan, 2010, p. 60). Consequently, a devout Muslim not only feels a strong obligation to invest extra effort and time at work, but unquestionable enthusiasm to deliver more than what is simply required. This cultural framework could present significant obstacles to the adoption of ideas like universal basic income (UBI) or reduced work weeks, even if automation makes such changes feasible in the face of shifting economic and technological realities.



Furthermore, it could also be argued that work plays a central and irreducible role in our psychological, social and political lives. In other words, work is necessary and indispensable in subjective health, social recognition, social relations and political life, solidarity, gender relations, construction of subjectivity, and society reproduction (Deranty and Dejours, 2010; Deranty, 2015). Philosophers such as Jean-Philippe Deranty argue that work offers unique heteronomous determinations or constraints that can lead to self-development, including external judgments regarding success, normative expectations, social responsibilities, command and control, engagement with the real world, as well as expectation that duties will be fulfilled as part of a cooperative scheme – goods that non-work activities cannot provide (Deranty, 2021, pp. 8-10). Furthermore, Deranty also argues that the need for social reproduction—ensuring that society continues to function—remains tied to labor, regardless of how that labor is structured. As he remarked, social reproduction involves "activities human beings purposely engage in to sustain their own and their peers' lives, within the frame of collective organisation" (Deranty, 2021, p. 6). Consequently, given the central and irreplaceable psychological and social roles work play in our lives, it is highly unlikely that a future characterized by widespread technological unemployment would be embraced without significant resistance. As testament of this view, in multiple Universal Basic Income (UBI) trials worldwide, it is found that there is no significant reduction in work despite being given a universal income (Torry 2019, 59), suggesting that work still plays a central role in human lives and societies, and that technological advancement and social safety nets do not necessarily eliminate work ethic and the belief in centrality of work in our lives.



(iii) Methodological Doubts

Finally, it is worth mentioning the caveats associated with research and data surrounding technological unemployment, and evaluate the reliability of these various projections about the future of technology and work. Firstly, because of the lack of a single "right" measure or algorithm to predict the future landscape of employment with existing data, as well as the slipperiness of the object of research, considerable variability is observed across various influential reports about employment effects depending on the methodologies used. For instance, while the report by Frey and Osborne projected a significant number of occupations facing displacement in the near future, studies by Arntz et al., for instance, yielded more optimistic findings by employing a "relaxed" categorization of occupations, focusing instead on the displacement of bundles of tasks rather than entire occupations (Arntz et al., 2016; Frey and Osborne, 2017; Morgan, 2019, p. 17). This could also be due to what Deranty (2024, p. 8) referred to as "slipperiness" of the concepts such as "skillfulness," which leave room for a variety of possible interpretations depending on the viewpoint adopted.

Moreover, there are gaps between mathematical models predicting the trajectory of technology and work on a macro-level, and the plural economic realities on a micro-level, of the specific jobs that are replaced and created in specific contexts (Deranty, 2024, p. 14; Ebben, 2020; ILO, 2018). This is because AI and technology impact work differently in different contexts and economies (Spencer and Slater, 2020), as a result of a multitude of external factors, including culture, public policy, geopolitics, climate, resources, among others (Clifton, Glasmeier and Gray, 2020; Deranty 2024, 14). Malaysia's heavy reliance on migrant and foreign workers working on low-skill roles could potentially face more economic and labor market disruptions compared to countries that have a more highly skilled workforce or a stronger focus on technological innovation (Ng 2017). Furthermore, factors such as government-led initiatives and policies aimed at upskilling the workforce, taxes, funding, as well as government's attitudes towards technologies and how they should be utilised could influence the extent and nature of technological disruption in Malaysia's labor market.

Malaysia's specific cultural, political, and economic context will shape how technology impacts its labor market, making it difficult to apply broad, macro-level predictions without accounting for these unique factors. As such, evidence used to support certain claims about the future of technology and work should be viewed more critically. We should not take these data as the ultimatum, as they often reflect broader assumptions and methodologies that may not account for the complexities of real-world labor markets.

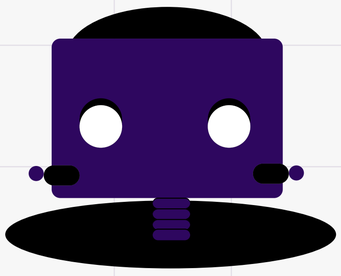
1.2 Problems with Argument from Luddite Fallacy

This section will be dedicated towards the exploration of objections and rebuttals to the argument from Luddite Fallacy advocated by the “Business as Usual” camp.

(i) Inelastic Demand and Market Saturation Problem

Demand elasticity quantifies the responsiveness of demand to income or price changes. When an industry is demand-elastic, it shows high sensitivity to price and income fluctuations. When demand is inelastic, it shows relatively little sensitivity to price fluctuations, meaning consumers’ demand remains relatively stable over time (Hall, 2023). Some products and services, such as agriculture, manufacturing, automobile tires or household lighting, have exhibited relatively inelastic demand. For instance, halving the price of artificial lighting did not result in a doubling of consumer and business demand, leading to a decline in total demand for labor and revenues for the lighting industry despite increased efficiency (Brynjolfsson and McAfee, 2014, p. 350-359; Danaher, 2017, p. 6). We can also argue that demand inelasticity does not only apply to specific industries, but rather there is a limit to how much demand of human labour can increase across all industries, even with rising incomes. This is the inelastic demand problem, which says that the demand changes are minimal in response to price changes, income levels, and substitution. This is because people’s consumption activities have kept up with their incomes (Danaher, 2017, p. 6). Even in the case of rising incomes, consumption may reach a saturation point where additional income does not significantly increase demand and this could have a negative impact on the job market. An explanation can be found in Keynes’ essay “Economic possibilities for our grandchildren,” in which he argues that human needs fall into “two classes”, “those needs which are absolute in the sense that we feel them whatever the situation of our fellow human beings may be, and those which are relative in the sense that we feel them only if their satisfaction lifts us above, makes us feel superior to, our fellows.” According to Keynes, while relative needs may seem insatiable, there’s a point, possibly sooner than we realize, where our basic and absolute needs are met and we choose to focus our efforts on pursuits beyond purely economic ones by embracing technological unemployment (Keynes, 2009).

The advocates from “business as usual” camp or proponents of Luddite Fallacy may argue that human innovation always has the ability to discover fresh markets and new avenues for spending and human labor. However, Mason argues that as technology replaces more human labor, while new market has always been created in history, “at a certain level, human life and interaction resist commercialization”. He imagines a future capitalist society where people perform “micro-services” for each other, turning “what we currently do for free, socially, into paid work” because of the lack of paid work going around to be unsustainable. Such a society, according to Mason, would hit what philosopher André Gorz called the “limits of economic rationality”, characterized by high inefficiency and low value (Gorz, 1989, p. 127; Mason 2016, 160).



(ii) Outpacing Problem, History Does Not Predict Future

Next, advocates from “business as usual” camp or proponents of Luddite Fallacy posit that individuals will continuously adapt and acquire new skills at a pace that surpasses the advancements in technology. However, this assertion is highly dubious. A growing chorus of voices contends that technological progress is experiencing exponential growth. It is argued that the time required to retrain a worker or provide education from scratch may no longer suffice to keep pace with the rapid advancements in technology (Agar, 2015; Danaher, 2017; Kurzweil, 2006). Unlike the Industrial Revolution, which unfolded gradually over centuries, today's technological revolutions transpire at an accelerated pace, often occurring within mere years (Wadhwa, 2015).

Along a similar line of reasoning, historical trends do not necessarily dictate future outcomes. The absence of long-term structural unemployment in previous waves of automation does not guarantee immunity from technological unemployment in the future. There is no inherent logical contradiction if technological unemployment is to happen despite previous waves of automation did not lead to widespread unemployment. As Wolff noted, "The Luddite fallacy is a historical observation, not a law" (Wolff, 2015). This perspective cautions against underestimating the potential impact of AI. AI technologies are remarkably versatile, making it exceedingly difficult to accurately predict their applications even a decade into the future.

(iii) Market Monopoly & Monopsony

As we progress towards a more globalized economy where goods and services are distributed globally seamlessly through improved communication and Internet, “winner takes all” markets and monopolies arise (Brynjolfsson and McAfee, 2014; Danaher, 2017, p. 7; Keen, 2015). For example, we see the Internet currently being dominated by mega corporations such as Meta, YouTube, Google and Amazon due to globalized networks. And this has long-term implications towards employment. As Danaher (2017, 7) describes, if less labor is required to dominate an entire market—even a newly emerging one—then the creation of new markets would not necessarily lead to higher employment levels.

Furthermore, monopolists are also known to deliberately suppress wage growth for employees, resulting in further income inequality and a decrease in workers’ purchasing power. For instance, large companies were reported to engage in no-poaching agreements and non-compete clauses, effectively restricting employees from seeking better opportunities with competitors. This concentration of power among capitalists and employers severely limits workers’ ability to negotiate for fair wages or improved conditions, causing some to leave (Naidu, 2018). Monopsony (control over the “buy side” of the market on labour or goods) functions analogously to monopoly, albeit in the realm of the “buy side” of the market. To maximize profits, monopsonists would drive down selling prices or wages, prompting workers to resign due to insufficient compensation (Naidu, 2018).[4]

As consequences of monopoly and monopsony, these practices create a surplus of unemployed and underemployed individuals within capitalist economies, serving as a mechanism to control wages—a concept famously articulated by Marx as the "reserve army of the unemployed" (Marx, 1847).[5] Groups of capitalist employers wielding significant market power can lead to diminished employment opportunities. Consequently, workers who lose their jobs due to automation might not find equivalent, well-paying jobs to replace them and, as more jobs are replaced by technologies, the pool of available jobs for displaced workers continues to shrink, exacerbating the challenges of unemployment and underemployment. This is how monopoly and monopsony can work in tandem with technological advancements to exacerbate the reality of technological unemployment.

[4] High-tech companies like Apple were discovered engaging in collusive "no poach" agreements to prevent engineers from switching between companies. And the voices of workers are further dwindled with the conservative backlash against technocratic liberalism, championed by figures like Ronald Reagan and Margaret Thatcher, weakening support for labour rights and employment laws. See Naidu (2018).

[5] Marx's idea of the "reserve army of the unemployed" describes a group of individuals who are not currently working but are ready and available for employment. He argued that capitalism naturally generates and sustains this segment of unemployed or underemployed individuals to ensure that wages remain advantageous for capitalist employers. See Marx (1847), Vol. 6, p. 415.

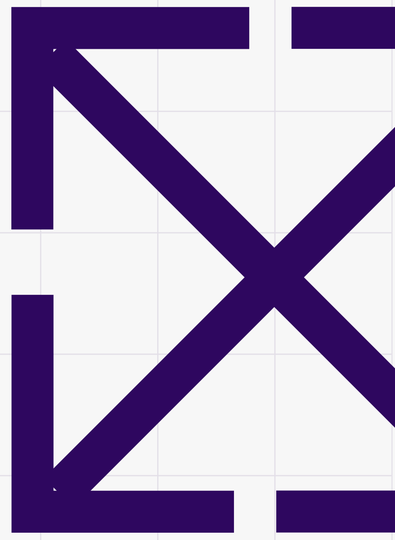
(iv) Biased Interpretation of Data

Earlier we have shown the elusiveness of algorithms and slipperiness of concepts surrounding research on technological unemployment. Because of this, they can be manipulated to fit the interest or agenda of the stakeholders. To elaborate on this point, the bodies behind these research informing discussions on technological revolution are primarily consultancies and think tanks, whose clientele often include governmental bodies. Consequently, the reports produced by these entities may exhibit biases towards the interests or agendas of their clients. For instance, the literature surrounding the future of employment primarily comes from consultancies, think tanks, and economists, such as the World Economic Forum, Deloitte and McKinsey.[6] Some of these reports are incorporated by the UK government in the UK Industrial Strategy Green Paper and the Made Smarter Review, aiming to position the UK as a leader in Fourth Industrial Revolution (4IR) technologies by 2030 (Danaher, 2017).[7] As a result, they tend to use algorithms and objects of research that provide more optimistic projections on business and employment prospects, and focusing on maintaining the status quo (Morgan, 2019, pp. 11-12).[8] Alternatively, research funded by tech companies might emphasize the benefits of automation, while studies by labor organizations could focus on the risks of job displacement.

[6] See Bughin et al (2018), From Brawn to Brains (2015), Hawksworth et al (2018), Manyika et al (2017a), Manyika et al (2017b), Schwab (2016) and WEP (2016).

[7] See DBEIS (2017), From Brawn to Brains (2015), Maier (2017), Schwab (2016) and WEP (2016). 4IR encompasses the most recent development in Artificial Intelligence, Machine Learning, robotics, sensors, connectivity, cloud computing, nano-technology, 3-D printing, natural language programming, and the Internet of Things (IoT). See Danaher (2017), p. 3.

8 The publication of the Made Smarter Review in October 2017 by the Department for Business, Energy and Industrial Strategy proposed measures to position the United Kingdom as a global leader in leveraging these advancements, projecting potential benefits including £7.5 billion in new revenue, £10 billion in cost savings, a 4.5% reduction in CO2 emissions, and a net increase in employment of 175,000 by 2025-2030. This review refers to Deloitte's "From Brawns to Brains" report. The report acknowledges the negative impact of technology in causing job displacement, but also highlighted technology's role in creating nearly 3.5 million new highly skilled roles. See Danaher (2017), p. 11-12.



These reports have also been instrumental in shaping governmental strategies in Malaysia. For example, a report by Talent Corp, an agency under the Ministry of Human Resources (MOHR), focused on talent building and mobility, referenced findings from the World Economic Forum (2016) and From Brawn to Brains (2015). The report pointed to optimistic directions of cultivating a "high-skill, future-ready Malaysian workforce" and transforming Malaysia into a "global and dynamic, market-oriented talent hub" despite the pessimistic outlook with high potential of job displacement (Shareen, 2017).[9] Likewise, just as how research directions can be adjusted to fit a certain interest or agenda, research data can be interpreted in ways that align with the agenda of specific groups. Here we see research data being interpreted in ways that align with the agenda of nation building, and may not necessarily reflect the realities on the ground. In Malaysia's case, while reports by Talent Corp and others project an optimistic future of a tech-savvy workforce, they may understate the challenges faced and the complexities of transitioning the population into high-skill jobs, especially in industries more vulnerable to technological displacement and with limited retraining opportunities. Furthermore, research on technological unemployment guided by consultancies tend to also frame technological advancement as a universally beneficial force and downplay the issue of ownership and control o technology. The focus tends to be on the benefits of technological innovation for economic growth and competitiveness, rather than scrutinizing the implications of concentrated ownership in the hands of a few corporations or individuals. The lack of attention to ownership may perpetuate existing inequalities and hinder the shaping of the future of technology and work towards one that is grounded in justice, equality and fairness.

As such, it is important to treat the existing data and projection about the future of technology and work with caution and critical scrutiny, before making any definitive conclusions or policy decisions. This is not to say that we should not trust any of the existing research or data, but rather that we should approach them with a healthy degree of skepticism and recognize their limitations. For example, when reviewing literature and research papers surrounding technological unemployment, take note of the sources of information, consider who is funding the research and what interests might be influencing the outcomes, identify any potential biases, explore the objects of research and methodologies used and compare them with other existing research, and critically assess the broader socio-political realities. It is also crucial to engage a diverse range of perspectives when discussing the implications of technological advancements on employment, including insights from labor organizations and grassroot movements.

[9] According to WEP (2016), 65% of children beginning primary school today are expected to pursue careers in job types that have not yet been invented. And according to From Brawn to Brains (2015), over the next 20 years, more than 100,000 jobs in the legal sector are at a high risk of automation.

2. Current Measures and Challenges Addressing Technological Unemployment

The above section has shown that both the arguments from the "AI Apocalypse Now" camp and the "Business as Usual" camp have their own limitations. In reality, the trajectory of technological development is not linear – it is rather shaped and influenced by a wide range of factors from computing power, market's ability to recover and adapt to technological advancement, how fast workers can upskill and reskill themselves to meet new workforce demands, cultural attitude towards work and technology, unforeseen global events like pandemics and natural disasters, and more. Despite these uncertainties, a few things are clear:

(1) Mass displacement of jobs due to technological advancement may be a possibility, but a future where there is complete end of work is highly implausible due to work ethic and centrality of work in human lives.
(2) Humans do not play a passive role in shaping the future of technology and work. Capitalist employers, think tanks, researchers, consultancies, government agencies, and workers all influence the trajectory of technological development, steering it toward either greater justice and equality or increased alienation and exploitation.
(3) Technology in a capitalist framework and economy, with a prioritization of profit over the people, cannot genuinely promote equity, autonomy and social justice without addressing the inherent power dynamics and profit motives that shape its development and deployment.

Incorporating these insights into strategies to prepare the nation towards a more just, equitable and autonomous future of work and technology, it is important for policy suggestions to promote sufficient social safety nets, as well as ethical considerations that prioritize social responsibility, transparency, equity, justice and autonomy in the creation and deployment of new technologies. Let us first review at the existing measures employed by the Malaysian government, to see If they hold up to the necessary standards for fostering an inclusive and humane future of technology and work.

CHALLENGES FUTURE FUTURE FUTURE FUTURE OF WORK

CURRENT CURRENT CURRENT MEASURES

In recent years, the Malaysian government has implemented several initiatives to prepare the workforce for technological disruptions, such as the “National Policy on Industry 4.0” (Industry4WRD) in 2018 (Industry4WRD, 2018), which aims to accelerate Malaysia’s transition into an advanced and intelligent manufacturing ecosystem, and the “National Fourth Industrial Revolution (4IR)” Policy in 2021 (Economic Planning Unit, 2021), which outlines strategies for embracing advanced technologies like AI, robotics, and automation. Industry4WRD involves a list of strategies and initiatives including introducing tax breaks to encourage investment in and the adoption of Industry 4.0 technologies and processes by Small Medium Enterprises (SMEs), intensification of Research, Innovation, Commercialisation, and Entrepreneurship (RICE) initiatives, public-private partnerships (PPPs), as well as reskilling and upskilling efforts of lesser-skilled workers to equip them with the skills necessary to keep up with technological advancement (Industry4WRD, 2018). On the other hand, the “National 4IR Policy,” on top of achieving the goals set forth in Industry4WRD Policy, promotes growth through technological advancement with a more human-centric focus on emphasizing the development of technologies that promote humanistic and societal values, such as a better work-life balance, convenience, safety and security, equal access to technologies, social well-being, environmental sustainability and cultural heritage. Some of the strategies and initiatives include upskilling and reskilling programmes, encouraging innovation and exposure to 4IR technologies by implementing Pembelajaran Abad Ke-21 (Learning in the 21st Century) in all schools and making all schools in Malaysia “My Digital Maker Champion Schools”, enhancing 4IR-related courses in higher education institutions (HEIs) and technical and vocational education and training (TVET) institutions, providing social protection for gig workers, promoting Research & Development & Commercialization & Innovation (R&D&C&I) funding for technology innovations that enhance the preservation of ecological integrity, as well as providing incentives to minimize the risk of job displacements (Economic Planning Unit, 2021). In the most recent Budget 2025, the government also plans to introduce a carbon tax to encourage the use of low-carbon technologies, and redirect the revenue from this tax to fund research and green technology programmes. The government will also provide investment tax allowance to logistics companies to encourage the adoption of IR4.0 technology, and RM 3 billion will be allocated to three million training opportunities (Highlights of Budget 2025, 2025).

Let us first discuss the commendable aspects of these policies. The initiatives under both policies reflect a proactive approach in preparing Malaysia for the future of work and technology. Moreover, the inclusion of human-centric goals in the "National 4IR Policy" is a progressive step towards building a society where technology serves not only economic growth but also broader societal values. The emphasis on work-life balance, safety, security, equity, and environmental sustainability reflects a critical approach to ensure the benefits of digital transformation are felt across all sectors of society. Now onto the areas that require further attention and improvement. The policies and initiatives suggested are still mostly focused on maintaining the status quo within the current political-economic framework. The focus remains on economy and technology-driven growth rather than addressing the deeper social issues caused by technological disruption, such as income inequality, increased exploitation and intensification of work, and the erosion of job security. There is no critical examination of the rise of precarious and unjust working conditions, and the policies suggested are mostly framed within the framework that accepts work as the primary organizing principle of life, as well as geared towards capitalist goals of boosting workforce productivity. However, while these policies may support economic growth, they may overlook deeper systemic issues and the potential for genuine transformative solutions to the current power structures. Without addressing the root causes of inequality, exploitation, and alienation within the workplace—regardless of their intentions—such policies risk becoming mere band-aid solutions that fail to enact meaningful change. For example, practices promoting work-life balance have in the past been frequently co-opted – many organizations implement these practices as a way to extract more labor from workers. For instance, flexible working arrangements or remote work options may appear beneficial, but they can sometimes lead to expectations of constant availability and increased pressure to perform.

The next issue concerns both the adequacy and the equity or access to social welfare programs. First, with respect to the adequacy of these programs, there are significant concerns that the current support structures may not sufficiently meet the needs of the populations they are intended to serve. Our current social welfare and security system is said to fall short in safeguarding workers from technological unemployment, due to factors such as unpredictability, insufficient longevity, and under-coverage (Hamid et al., 2021). We have seen examples of subsidies offered by the Malaysian government to combat structural unemployment during the COVID-19 pandemic. The Wage Subsidy Programme (WSP 3.0), for instance, offered eligible employers a month's wage subsidy of RM600 for each employee earning less than RM4,000, for a total of three months (Poo, 2021; Human Resources Development Fund, 2020). However, this initiative primarily aims to mitigate short-term effects of unemployment. There is at the current stage no plans for a more "universal" social welfare program to combat potential higher level of job displacement that could be brought about by technology and automation. Second, with respect to issue of equity and access, the current social welfare system that prioritizes the B40 group (bottom 40% of income earners) may fail to address the needs of other vulnerable populations, such as the women, elderly, persons with disabilities, and rural residents within and beyond the B40 group, who may not receive adequate support under current policies. A critical review of the current social welfare programs is needed to ensure a more just and equitable future for all.

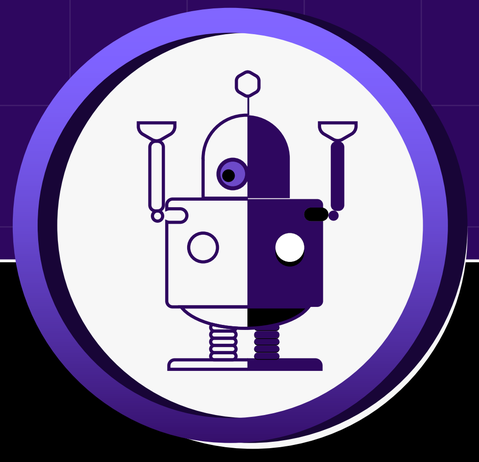
As for the sustainable goal of harnessing technological development that align with environmental sustainability, the suggestion to create more technologies that enhance the preservation of environment may not be sufficient because, in reality, many of the capitalist technologies are socially and ecologically unsustainable. Many of the existing labor-saving technologies are designed for large-scale and export-oriented production, and entail "standardization, homogenization and the simplification of ecosystems, therefore leading to the "loss of biodiversity, soil erosion and compaction, salinization, groundwater contamination, and deforestation" (Hanon 2023, 251-252).

Another problem lies in the effectiveness of the retraining and reskilling programmes implemented to prepare the workforce against the challenges posed by automation. Several initiatives have been implemented in recent years in response to the acceleration of technology. On top of the initiatives proposed in the "National 4IR Policy," such as the "My Digital Maker Champion Schools" initiative which goal is to transform specific schools across Malaysia into digital hubs (#MyDigitalMaker Champion School Playbook, 2020), as well as the "PAK-21" initiative which goals is to equip students with 21st century learning skills, the government has also introduced "Skills Malaysia 2.0," an educational outreach program that aims to boost participation in Technical and Vocational Education and Training (TVET) (Automation and Adaptability, 2020; HR Ministry Wants 60pc of SPM Leavers, 2019). Next is the "Industry Driven Talent Acceleration Programme (ID-TAP) 2023" that has been recently announced, with the aim to retrain 900 workers with the latest industry skills and knowledge such as mechatronics, electrical and electronic engineering, data analysis and information technology (Over Four Million M'sians, 2023), and the "Malaysia Digital Economy Blueprint (MyDIGITAL)", outlining aims to target the development of 20,000 cybersecurity knowledge workers and 30,000 data professionals by 2025 (Malaysia Digital Economy Blueprint, 2021).

While these initiatives are ambitious, a question arises if they can survive the outpacing problem mentioned above, which is the issue that growth of technology way surpasses the speed we can train and retrain talent. A closer look at the existing TVET system in Malaysia reveals worrying problems surrounding the competence of the students and skill sets they acquire. A study demonstrated that TVET students are well equipped with hard technical skills, but lack soft skills like communication skills, teamwork and leadership skills. Furthermore, there is a concerning deficiency in basic technological skills like proficiency in the Microsoft Office suite (Bassah, 2022).[10] This is partially attributable to the lack of efficient teaching staff in TVET institutions in imparting practical skills (Hanapi et al., 2015). It could also be argued that skills that are currently being prioritized in TVET programs may not adequately prepare students for the fast-changing demands of the technological landscape. Studies indicate that jobs most susceptible to displacement are those involving middle-skilled, routine tasks, such as bookkeeping, clerical work, and administrative tasks (Autor, Levy, and Murnane, 2003; Autor, 2015).[11] Consequently, workers in industries like banking, insurance, accounting, and auditing services face a heightened risk of automation in the near future (Dijmarescu. 2021). On the flipside, work that is proven to be most vexing to automate to automation are those that require flexibility, judgment, and common sense—skills that are understood tacitly. This is explained by the Polanyi's Paradox, which posits that "we know more than we can tell" (Autor, 2015; Polanyi, 1966).

A review of the curriculum practices of TVET programmes and upskilling plans in Malaysia reveals that tacit skills are not emphasized enough in local TVET programs and other initiatives aimed at upskilling and retraining employees (Azmi & Salleh, 2021; Malaysia Digital Economy Blueprint, 2021).

Next, these programs often reveal discrepancies between policy intentions and their actual implementation. For example, while the promotion of 21st-century learning skills through the PAK-21 initiative aims to address gaps in the current education system by emphasizing skills that are more adaptable to the rapidly evolving economy and technology—such as critical thinking, creativity, communication, and collaboration—the execution of this initiative still faces significant challenges. Studies showed that there is a substantial gap between the theoretical frameworks or policies and the practical application of 21st-century skills in teaching, largely due to poor curriculum design (Aini Safri and Jamaludin 2022, 101; Vivekanandan 2019), insufficient resources and training (Keane et al., 2016; Liyew et al., 2017; Rusdin & Ali, 2019; Silva & Lazaro, 2020; Yahaya et al., 2019), and a lack of support and active involvement of stakeholders, particularly the Ministry of Education, in implementing PAK-21 skills in the teaching curriculum (Aini Safri and Jamaludin 2022, 108; Mishra and Mehta 2017). These factors have resulted in a lack of confidence and misunderstandings about the expectations placed on teachers and students (Azizan 2022).



To sum up this section, while the policies and recommendations employed by the Malaysian government rightly highlight some key goals and strategies towards addressing technological unemployment and disruptions, there is still a formidable gap between the theoretical frameworks and policies proposed and the future of a more just, equitable, sustainable, inclusive and humane future of technology and work. The section will explore specific recommendations to bridge this gap, focusing on enhancing policy implementation, fostering critical engagement and collaboration among stakeholders, and ensuring that social safety nets and ethical considerations are integral to the development and deployment of new technologies. These suggestions are proposed with the hope that Malaysia can move closer to realizing its aspirations of building a future-ready country that prioritizes humane goals and equitable opportunities for all.

[10] Here are some of the feedback gathered from the survey conducted with industry experts with years of experience in working industries and experience supervising interns and fresh graduates: "These TVET students... I see that they are only taught hard skills. Their ability to interact and communicate is very weak...their body language is inappropriate." (Mr. Hazwan) "Most fresh graduates do not yet have these leadership skills." (Mr. Faiz) "We have to admit that many TVET graduates are very weak in the use of computers. They are not even capable of using basic Office Windows." (Mrs Suria) "Most TVET instructors have no problem imparting knowledge theoretically, but I see them having trouble in delivering practical modules." (Mr Saiful) See Bassah (2022) for more survey feedback.

[11] See Levy & Murnane (2004) for many more examples.

3. Long-Term Policy Suggestions - Towards A Just, Equitable, Autonomous, Humane and Inclusive Future

(i) Expand Social Welfare from B40 to B70

1

With the rise in job displacement due to technological unemployment, the current welfare policies' focus on the B40 group may not be a sufficient safety net to protect employees from unemployment due to technology. A KRI study revealed that the lowest 20% of households in Malaysia struggle to fulfil their basic needs, while only the top 30% exhibit characteristics of "middle-class" consumption. Meanwhile, households in the middle 50% income bracket often encounter financial constraints. This underscores the necessity to re-evaluate and broaden welfare coverage. Recommendations were made to extend welfare coverage from the bottom 40% (B40) to at least the bottom 70% (B70) (Hamid et al., 2021). We concur with these recommendations.

In addition, it is also crucial for the government to consider more "universal" social welfare programs to ensure a larger portion of the population is protected in the face of economic disruptions caused by technological advancements.

This is not to say that we should adopt a Unconditional Basic Income (UBI) – the proposal to provide everyone, regardless of your social status, a guaranteed minimum income without the need for traditional employment. UBI is still a Utopian idea that comes with a lot of skepticism because of the substantial source of funding required, concerns about UBI intensifying social divides and inequalities, as well as issues about whether UBI would result in a more centralized and authoritarian government. As a result, it has yet to be implemented in any sizable political jurisdiction for an extended period of time (Standing, 2017, pp. 276-78; Wright and Przegalińska, 2022, p. 106). [12] However, while a full-scale UBI may not be necessary, it is worth considering more progressive and "universal" social welfare system that benefits Malaysians during lean periods. For instance, conditional cash transfers or a form of guaranteed minimum income specifically designed for workers displaced by technological advancements could also be explored, regardless of one's previous income group status.

(ii) Promote a More Targeted Welfare Support System

2

A more "universal" social welfare program should also be complemented by targeted measures. Individuals from traditionally marginalized or economically disadvantaged communities should receive special consideration to ensure they are not left behind in the face of technological disruption. Technological unemployment is identity-blind – automation and AI threaten jobs across industries and demographics; they do not discriminate based on race, gender, age, or socioeconomic background. However, while technology itself may be impartial, the impacts of technological unemployment are far from evenly distributed. Those from marginalized communities such as women, LGBTQI, gig economy workers, lower education levels or disabilities for instance tend to bear the brunt of job displacement.

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[11] Read Samuel (2020) for a list of the UBI experiments conducted across the world in various scales and their outcomes.

(iii) Provide Social Safety Nets for Gig & Non-Standard Workers

3

As of 2020, approximately 30% of the workforce operates within the informal sector, equating to around 6.5 million individuals (Sim and Hamid, 2010, p. 208). This group of workers is usually the ones that are most vulnerable because of the precarious and insecure nature of their work. They also represent workers who have been displaced. Workers who are displaced often find re-employment in other industries, but many end up in lower-paid and more precarious or gig work (Meckstroth, 2013; Nursilah, 2021). While the 4IR policy aims to provide social protection for gig workers, the implementation of these protections remains vague. Many gig workers, such as ride-hailing drivers or food delivery workers, operate without adequate legal protection, health-care benefits, or retirement plans. The current social security scheme only covers benefits for standard workers or full-time employers, overlooking the rapidly rising non-standard work employees performing gig work, freelancing work, part-time work, or employment via agency (Hamid et al., 2021). While the government currently considers providing social security benefits for gig workers through its social security scheme for the self-employed (SKSPS), we suggest for a more radical proposal of providing some form of social safety nets or "basic income" for gig workers (Rahman, 2024). For instance, government can consider providing fixed income subsidies to gig workers who earn below a certain annual income target. Providing gig workers with income subsidies can offer them greater freedom and autonomy to pursue more stable employment opportunities or engage in non-work activities, rather than being driven solely by economic necessity.

A more targeted social welfare program could ensure that resources are distributed based on actual need rather than solely based on socio-economic markers, which would contribute to a more equitable and inclusive system. For instance, a policy designed to support B40 communities may not differentiate between the unique challenges faced by rural women, urban women, or people with disabilities within this group. Each of these sub-groups experiences different barriers to social mobility and economic opportunities, and a "universal" social welfare programme focusing on income status can fail to capture these nuanced distinctions. In particular, rural women might need more access to childcare and local employment opportunities, while urban women may benefit more from digital skills training and entrepreneurial support, and people with disabilities may require accessible infrastructure, assistive technologies, or specialized training programs that address their specific needs. A more targeted support of these traditionally marginalized subgroups, such as women, people with disabilities, and ethnic minorities can allow support to be delivered to those genuinely in need, as well as providing the right support the people need.

(iv) Provide Care Income to Unpaid Care Labor

4

In the event of large-scale technological displacement, traditionally marginalized pockets of the society performing unpaid care and domestic work, such as women and foreign workers, will be most affected. Cultural gendered division of labor still persist in our society, with the perception that women as the primary caregivers and men as the primary "breadwinners" at home. And in case of technological unemployment, as more wage jobs are being displaced, unpaid household or domestic labor can persist, and fall unequally on women and marginalized communities, who have historically been expected to take on domestic work even if it is without pay or recognition. As Weeks observed, "Even if an employed woman's time on the job decreases, her work in the household - housework, consumption work, child care, and elder care could easily expand to fill the extra time." (Weeks 2011, 162) These unpaid domestic work are said to be among the work that is more resistant to be replaced by robots and automation because of affective and emotional labors that are involve—qualities that machines struggle more to replicate. Additionally, even if machines can replicate these tasks, proponents argue that human touch remains indispensable in caregiving and domestic work and cultural resistance to fully automating these roles is likely to persist (Deranty 2021). As such, to promote a more equitable future, government should consider introducing some form of "Care Income," where individuals receive a regular payment for engaging in caregiving, domestic or volunteer work, reflecting the societal value of non-market labor and promoting greater social cohesion and equality. At the same time, "Care Income" should be accompanied by policies that ensure a more equitable distribution of unpaid domestic work, such as promoting shared responsibilities within households, encouraging flexible work arrangements, and education to help soften cultural resistance towards technologies for domestic work.

(v) Transform the Education System with a Focus on Tacit Skills and Strong Collaboration between Stakeholders

5

Given the polarization of jobs, the workforce is increasingly divided into high-skilled, high-paying positions and low-skilled, low-paying jobs, with fewer opportunities for middle-skill employment. The focus on technical skills and technological skills in the local upskilling, reskilling and retraining programmes can quickly become obsolete as industries evolve and new technologies emerge. Certain industry and technical skills, as well as high-level reasoning and formal logic skills are more easily computerized through language rules and verbalizable procedures, as compared to tacit skills such as sensorimotor abilities, common sense, judgment, intuition, creativity, emotional intelligence, and spoken language (Autor, 2015, p. 11-12). As Moravec noted, "It is comparatively easy to make computers exhibit adult level performance on intelligence tests or playing checkers, and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility" (Brynjolfsson and McAfee, 2014; Moravec, 1988).

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As such, upskilling, reskilling and retraining programmes should focus on the development on tacit skills such as sensorimotor abilities, common sense, judgment, intuition, creativity, emotional intelligence, and spoken language (Autor, 2015, p. 11-12), as well as adaptability thinking and problem-solving. This can be achieved through a greater emphasis placed on constructivist learning, inquiry-based learning, collaborative learning, as well as experiential or hands-on learning. Practically, this can be done by incorporating collaborative projects, problem-based learning, reflective practices, hands-on workshops, and student-led initiatives in the local education, TVET classrooms and employee reskilling programmes. Retraining of academic staff is also crucial to effectively teach and equip students with the skills they need for future employment. Professional development programs should be established to provide academic staff with opportunities to learn about emerging technologies, pedagogical strategies, and industry-specific knowledge. The introduction of upskilling and reskilling initiatives by the government should go beyond merely providing a guideline or playbook and expecting teachers to implement these changes without adequate support. For these programs to be effective, there needs to be a robust system that includes comprehensive training, continuous professional development, and access to necessary resources. Furthermore, a top-down approach without consulting educators on the ground often leads to misalignment between policy expectations and real-world challenges. Close collaboration and communication between stakeholders including teachers and students should be incorporated in the design and execution of upskilling and reskilling programmes to help bridge the gap between theories, policies and realities.

(vi) Reduce Working Hours

6

This may be a controversial claim, but given the increasing negative aspects of work and technological advancement, reducing working hours could significantly improve the quality of life for many workers, especially in a world where technologies are rapidly advancing and reshaping the labor landscape. As philosopher John Danaher (2017, p. 10) points out, contemporary work is often associated with degrading and humiliating conditions, elevated rates of mental health issues, depression, and suicide, exposure to unacceptable physical hazards, bullying, intimidation, and sexual harassment, as well as exhaustion and demoralization.

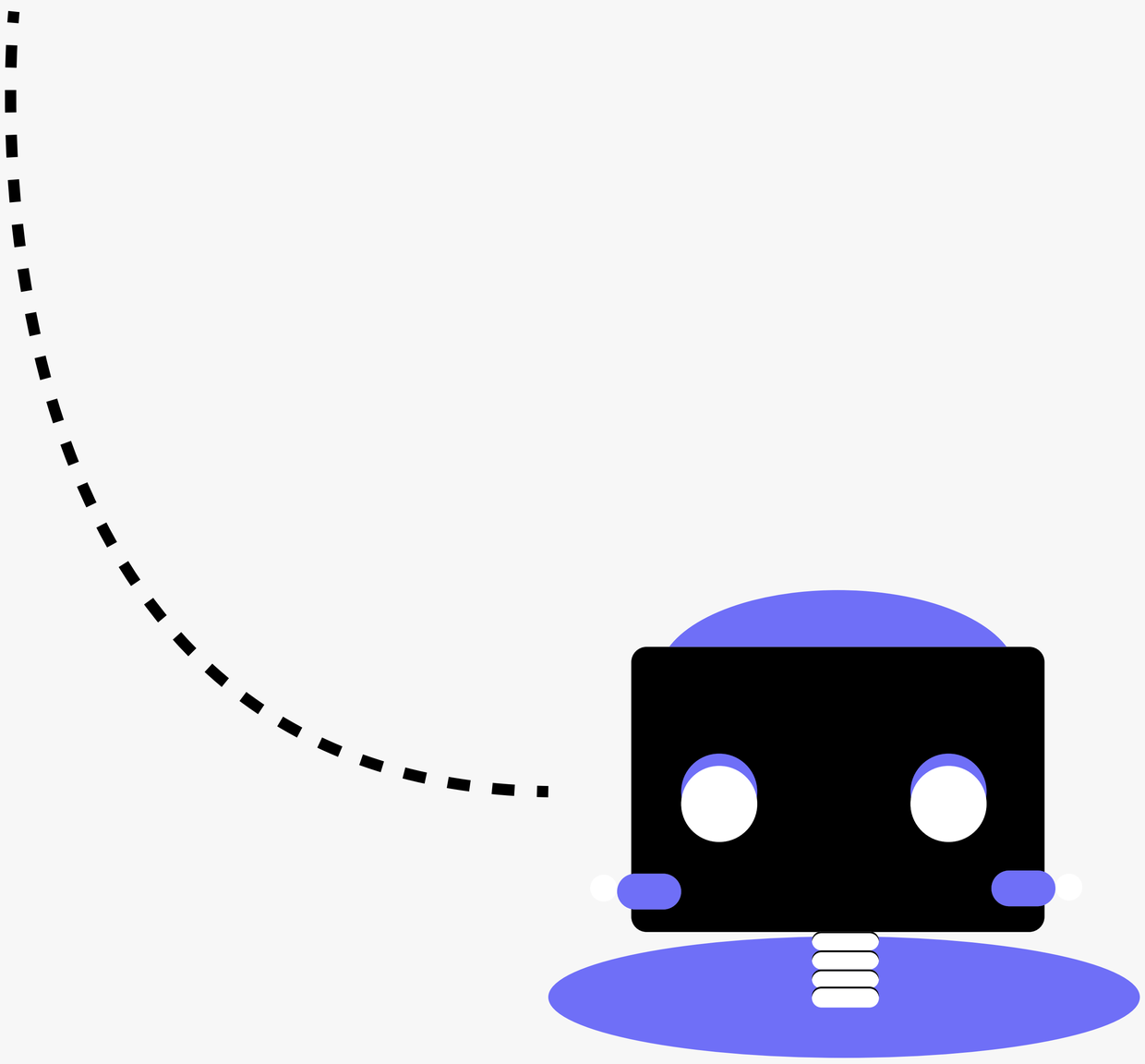
Furthermore, the rise in an “achievement society,” of hyper-productivity, according to Han, has accompanied the growth of a burnout population that is “too alive to die, and too dead to live.” (Han, 2015, p. 51) With these considerations in mind, a shift towards an economy that prioritizes human well-being over endless production and consumption, and one that encourages leisure, creativity, and personal development as central to human flourishing should be pursued, rather than relying on band-aid solutions like work-life balance or remote work initiatives.

(vii) Implement Taxes and Funds towards Equitable Use of Technologies

7

Countries such as Iceland, Sweden, and New Zealand have implemented a reduced work week with positive outcomes, including improved well-being, happiness, lower stress levels and higher job satisfaction among employees. With Kuala Lumpur rated as the third most overworked city in the world, following Dubai and Hong Kong (Zulkifli, 2022), and the rise of "quiet quitting" trends globally, it is evident that the relentless work culture is taking a toll on the well-being of its residents (Harter, 2022). However, some dissenting voices argue that a reduced workweek is not feasible in Malaysia at this time due to low productivity (Aziz et al., 2022). Nonetheless, a shift in how we define productivity and work ethic could lead to better work-life balance without sacrificing economic output. For example, fostering a culture that encourages job sharing and collaboration can promote more effective problem-solving, greater innovation, as well as higher-quality outputs, as individuals contribute their unique strengths to collective efforts. A strategic utilisation of labor-saving technologies, alongside education building awareness about the benefits goods beyond work, can also facilitate a cultural transition towards a reduced workweek in Malaysia.

A more critical approach to what technologies should be created, and how they should be developed and utilized is also crucial, considering how technology has always been controlled by those who own it to advance capitalist agendas at the expense of workers. The government plays a role in shaping the development and deployment of technology, ensuring that it serves the interests of the broader population rather than just the privileged few, through regulations and policies that prioritize specific outcomes aligned with societal values and public good. For example, the introduction of carbon tax to encourage the use of low-carbon technologies in Budget 2025 is a great starting point. More can be done to ensure that technologies are deployed for the common good rather than for the private accumulation of wealth. For example, the government can consider implementing a "Tech Monopoly Tax" to disincentivize monopolistic practices or dominant market positions, ensuring they contribute fairly to the economy. A "Patent Tax" for patent holders who sit on technology without making it accessible or furthering its development can also be implemented to encourage the sharing of innovations and ensure that breakthroughs benefit society at large. A "Robot Tax" could also be considered to curb the rapid automation of jobs by corporations. Finally, fundings for the development of common-based, open-source technologies that prioritize accessibility can promote a more equitable and inclusive future of technology.



(viii) Implement Taxes and Bans on Environmentally Degrading Tech

8

Along similar lines, a genuine transformation of technological development to align with the social needs of the broader population, including environmental sustainability, requires a paradigm shift. This involves not just supporting R&D of technological designs that enhance ecological integrity, but also implementing policies and introducing taxes that place a more stringent limit to on harmful capitalist-driven practices or technologies, or even replacing them entirely. Otherwise, we risk perpetuating existing inequalities and exacerbating environmental degradation.

Additionally, the government can consider investing more in localized technological solutions tailored to specific ecological contexts, such as promoting sustainable agriculture practices that are adapted to local ecosystems. Such approaches can help restore biodiversity and promote sustainable practices that align with the needs of local communities. Furthermore, shifting towards circular economy models that prioritize resource efficiency, waste reduction, and the regeneration of natural systems can help mitigate the ecological harm caused by linear production processes.

(ix) Promote Decentralized and Democratized Economy and Workplaces

9

To build a genuinely equitable, just and sustainable future of work and technology, there needs to be a transition from capitalist economy grounded in privately-owned corporations to worker-owned or community-owned cooperatives where users collectively own, manage, and benefit from technologies and the value they generate. However, this is a future that is contingent upon several key factors, including the people's willingness to embrace cooperative ownership models, systemic changes in governance, education, and regulatory frameworks that promote the democratization of ownership and decision-making processes, as well as collaborative efforts from all stakeholders, including governments, communities, and individuals.

To discuss the possibility and feasibility towards a post-capitalist society is beyond the scope of this paper, but we should recognize that there are tremendous benefits for the government to promote a more democratized economy and workplace.

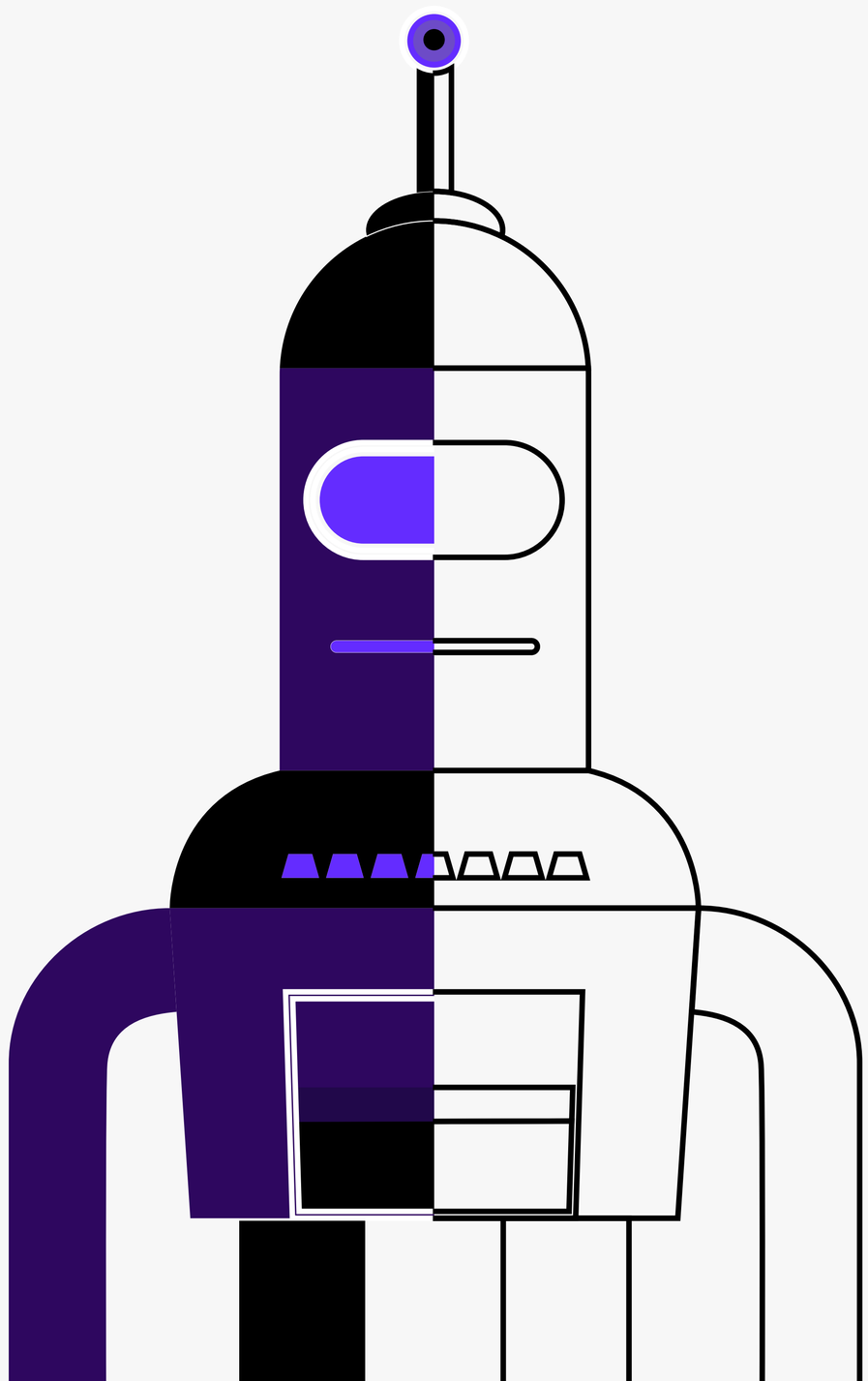
This includes greater economic resilience against the effects of technological unemployment from greater equality, collaboration and community ties, improved worker satisfaction and wellbeing, and community participation in technological decisions. What the country leaders can do is to help level the playing field by promoting policies and initiatives such as incentives and tax breaks for cooperatives or corporations that implement Employee Stock Ownership Plans (ESOPs) and profit-sharing schemes that distribute wealth more equitably among workers. Additionally, leaders could facilitate education, training programs and grassroot movements that promote cooperative governance, shared ownership structures, and management skills, ensuring that workers are equipped to take on active roles in the decision-making and operations of their organizations.

(x) Implement Critical Pedagogies in Local Education System

10

Critical pedagogies focusing on promoting social justice, critical thinking, and active participation in democratic processes such as through collaborative, problem-posing dialogues (Freire, 2005) are important to encourage bottom-up approaches that empower communities to engage meaningfully in discussions about technology and work, question existing power structures, as well as promote collective action towards a more autonomous future of work and equitable distributions of wealth generated by technology. Discussions surrounding the meaning and value of work, the ethical considerations related to gig and precarious employment, power dynamics within the labor market and technology, and how work should be structured in the current society should be integrated into education.

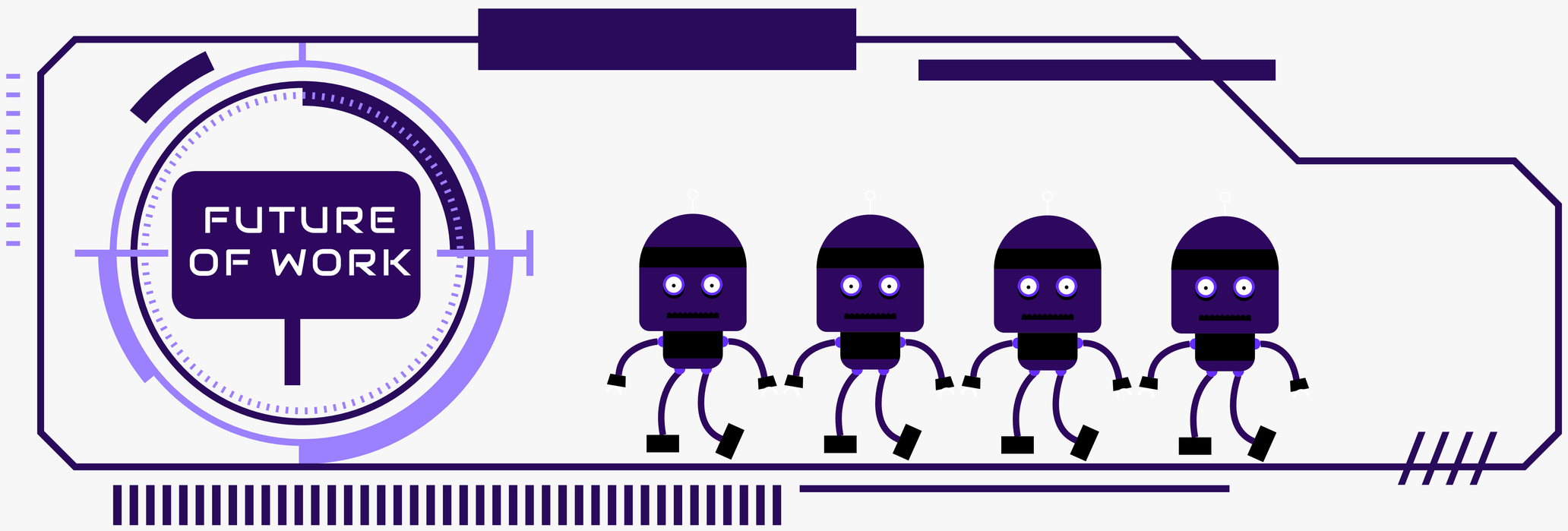
This can empower students to think critically about the future of technology ownership and the types of work environments and societies they wish to create or be a part of. Education should not be about maintain the status quo, if alternative models of work and technology can lead to more equitable, just and sustainable futures. The issues inherent in current work and economic systems are no longer speculative; they are well-documented realities that include injustices, lack of recognition through low wages and precarious working conditions, diminished autonomy, and increased alienation and exploitation through surveillance and hyper-productive workplace practices. By fostering these collaborative dialogue through critical pedagogies and education that emphasise critical reflection and collective action, we can cultivate a generation of thinkers and leaders equipped to genuinely reshape the future of technology and work for the better, rather than merely adapting to existing structures that perpetuate inequality and exploitation.



4. What's Next for Malaysians? Concluding Remarks

The future of work and technology remains an uncertain landscape, marked by rapid advancements and unpredictable shifts in technology and labor markets. Both the "AI Apocalypse Now" camp and the "Business as Usual" camp have their fair share of advocates. Both arguments, however, have their flaws and may not fully account for the complexities of the modern labor market. The "AI Apocalypse Now" camp may have overestimated the capacity for technology to replace all forms of human labor by overlooking the politics and ownership of technology, as well as the cultural and ethical realities surrounding the ideology of work. On the other hand, the "Business as Usual" camp may have been overconfident in their beliefs about market adaptability, downplaying issues such as inelastic demand, outpacing problem, monopoly and monopsony. Research on technological unemployment can sometimes demonstrate conflicting conclusions as a result of elusiveness of research methodologies and objects, as well as biases, and should be treated with critical scrutiny.

In an alternate possible future, technologies and robots could assume most aspects of human labor, ushering in a society where work is significantly reduced, supported by UBI. In another alternate possible world, work retains its centrality in human lives. In yet another alternate possible future, humans could be collaborating closely with AI and robots, perhaps even integrating with them as cyborgs. The truth is, no one can truly predict the future of technology and work, not even the most ideal simulation or mathematical model. This is because there are just too many contingencies and external factors that can influence the trajectory of technological development, be it culture, geopolitics, politics, economy, or even unforeseen global events like pandemics and natural disasters. Additionally, human behavior—often irrational and unpredictable—plays a significant role in shaping how technologies are adopted, resisted, or modified.



However, this does not mean that we should be sitting ducks, passively awaiting the consequences of these changes. Instead, proactive measures must be taken to navigate this uncertain landscape. The existing measures of the Malaysian government, while they represent a step forward in preparing the nation towards challenges of automation, they often focus primarily on boosting productivity and economic growth without fully addressing the social implications of these advancements. We have proposed a list of policy suggestions that can drive the future of work and technology in Malaysia toward a focus on justice, fairness, equity, and autonomy. However, we acknowledge that, given the complexities and unpredictability of the future of technology and work, there is a need for flexible, adaptive strategies that can respond to shifting landscapes rather than banking on rigid predictions or prescriptive policies.

As such, as citizens of Malaysia and the future of work, it is essential to foster an inclusive dialogue that engages various stakeholders, including government officials, industry leaders, educators, and community members. This collaborative approach can help identify emerging challenges and opportunities, ensuring that policy responses are not only timely but also reflective of the diverse needs and aspirations of the population. We should not be afraid to get our feet muddy by actively contributing to the ongoing conversations and participating in critical discussions about the direction of technology and work, thinking outside the box, and advocating for policies and changes that prioritize values that align with social justice, equity, inclusivity, autonomy and sustainability, even if they mean a radical departure from the current status quo. At the same time, we should remain open to continuous learning, adaptation, and imaginative thinking that encourages us not only to adjust to the evolving demands of technology but also to consistently question and rethink our current approaches to work and technology, envisioning alternative futures that better reflect our shared commitment to justice and human flourishing.

Ultimately, embracing this proactive stance means recognizing that the future of work and technology is not predetermined; it is something we can collectively influence. By committing to a vision that champions the well-being of all Malaysians, we can work toward a future that is not only technologically advanced but also just and equitable, ensuring that no one is left behind in the pursuit of technological and economic progress.

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