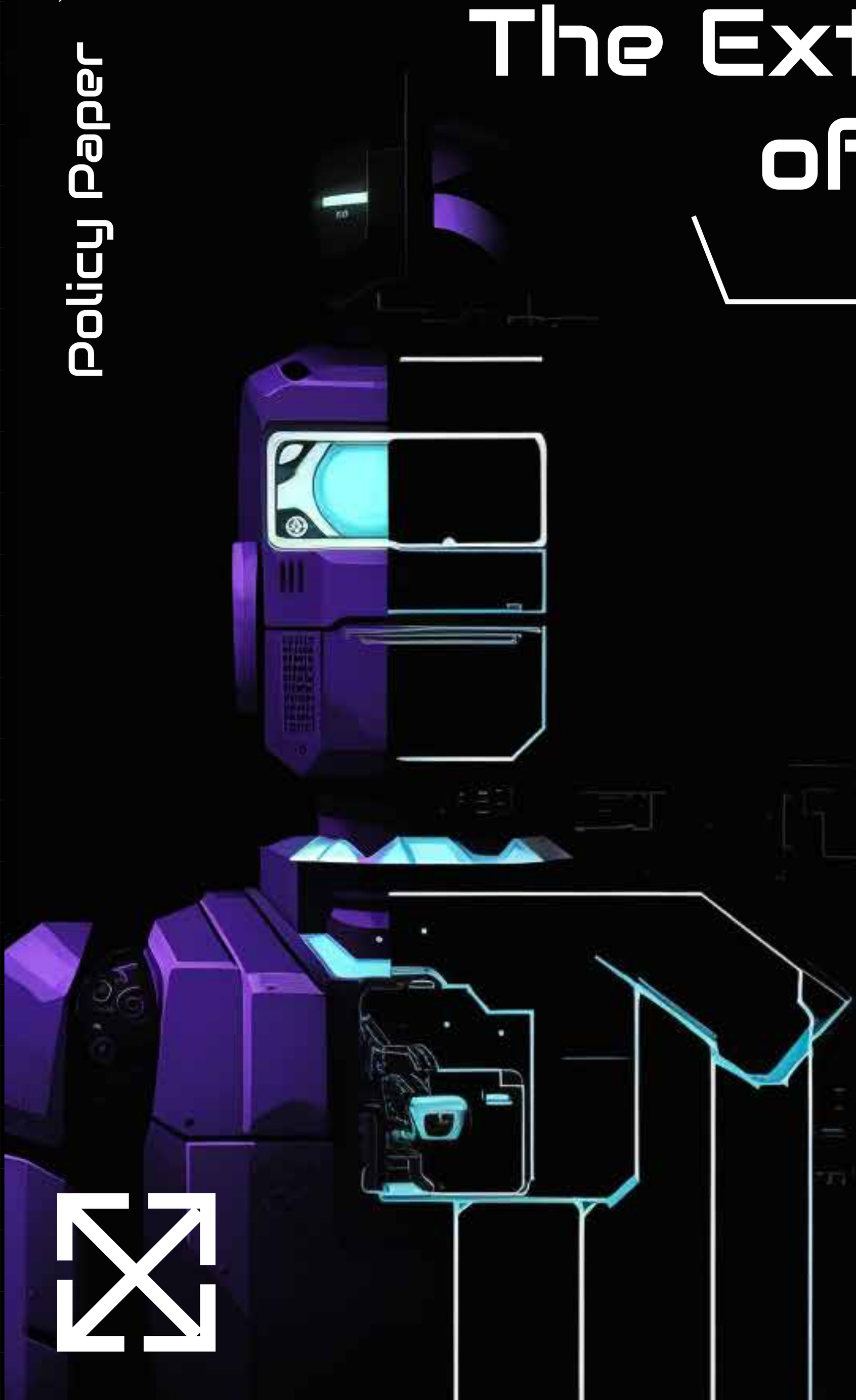
Technological Unemployment & The Extinction of Work?

Policy Paper



by Chew Zhun Yee

Malaysian Philosophy Society

The debut of ChatGPT and other Large Language Models (LLMs) signalled a seismic shift in our daily lives and the world of employment.[1] Just yesterday, we were still manually conducting research on the web, creating art pieces from scratch, and building software by assembling teams. Today, we can accomplish all of these tasks with just a few clicks and from the comfort of our own homes (Open AI, 2024; Ruby, 2024).[2] While the technological strides forward undeniably enhance our lives, they also send ripples of fear of technologies replacing human labour globally. This deep-seated fear has historically accompanied major technological breakthroughs and disruptions.[3] Nonetheless, things feel different this time, due to the democratisation of AI, which allows virtually anyone to acquire, access, and develop AI technologies with minimal expertise and cost.

In 2013, Carl 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.[4] 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 (World Employment and Social Outlook, 2016). In Malaysia, the outlook is similar, if not worse. 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. This is highly alarming because 70 percent of semi-skilled jobs are identified as being at high risk, and 90 percent of all semi-skilled jobs are occupied by Malaysian nationals who will bear the brunt rather than foreign workers (Ng, 2017).

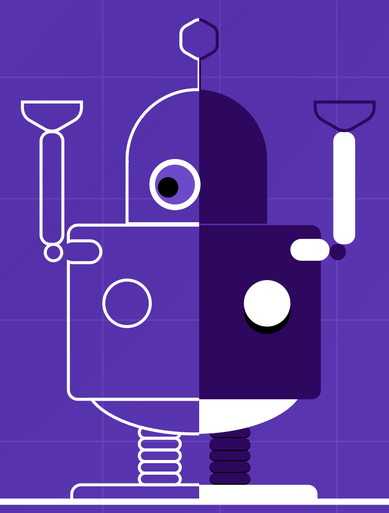
This paper delves into the issue of technological unemployment through three main sections. The first section provides a critical analysis of the theoretical arguments surrounding technological unemployment, addressing the key question: Is technological unemployment really occurring? The second section offers an evaluation of the existing solutions and proposals from local governments and sectors dealing with technological unemployment. Finally, in the final section, it invites the audience to reconsider their view on the centrality of work in their lives, considering the proposal of a potential future of a world without work.

[1] Large Language Models (LLMs) are Artificial Intelligence (AI) that use deep learning algorithms to perform Natural Language Processing (NLP) tasks. In simple terms, 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, Bing AI and many other AI applications. See What is a large language model? (2024) for more details.

[2] Some of the incredible things that GPT-4 can do include coding within seconds, completing exams, creating creative work such as poems and images. See Open AI (2024) and Ruby (2024).

[3] Refer to Pessimists Archive (Anslow & McKenzie, n.d.) for a collection of technophobia that accompany various new technology breakthroughs across history.

[4] 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).



1 Work & Technological Unemployment

1.1 What is Work?

The paper addresses the threat of technological unemployment and the loss of human work to technology. Let us begin with defining these terms. As ironic as it sounds, the seemingly straightforward and widely understood term “work” is notoriously difficult to define. As Bertrand Russell remarked, “work is of two kinds: first, altering the position of matter at or near the earth’s surface relative to other such matter; second, telling other people to do so.” (Russell, 2004) However, this definition of work is over-inclusive for the purpose of our discussion. It involves all kinds of activities that involve causal relation between the workers and the world. For the purpose of this paper, we are not interested in work that solely contributes to subjective experiences or personal fulfillment, such as leisure pursuits or hobbies, which may not be significantly impacted by technological unemployment. Another problem with Russell’s definition is that work is characterised as dominating in nature, akin to a master-slave relationship. However, work needs not be mediated this way. Someone who is a proprietor or entrepreneur can participate in work and the production of values and goods to society through self-employment. Contemporary capitalist work also includes activities that are done with economic compensation or with the hope of ultimately receiving some such reward. John Danaher redefined work as “the performance of some act or skill (cognitive, emotional, physical etc.) in return for economic reward, or in the ultimate hope of receiving some such reward.” (Danaher, 2017). While this definition rightly encompasses the forms of work we are interested in this paper, I believe it needs to be broadened slightly to include work that is “necessary” for individuals and for societal reproduction, whether paid or unpaid. This expansion is crucial because our concern extends beyond work that is merely "financially and economically detrimental" when displaced, but also includes work that is "socially detrimental" when displaced. Technological advancement is impartial and indiscriminate in its selection of which types of work to replace. This encompasses pro-bono work, care work, domestic tasks, cultural and community projects, citizen science initiatives, open-source software development, and more. These activities are vital for the reproduction of society and their replacement by robots and automation would not be desirable (Deranty, 2021). Thus, the refined definition of work is as follows: Work entails the performance of actions or skills (cognitive, emotional, physical, etc.) that are necessary for social reproduction, typically with the expectations of economic compensation.

> Work is the performance of actions or skills (cognitive, emotional, physical, etc.) that are necessary for social reproduction, typically with the expectations of economic compensation.

1.2 What is Technological Unemployment?

Now that we have defined what work is, we can better understand the concern of technological unemployment. Technological unemployment can be understood as the substitution of human labour, engaging in work as defined above, by technological alternatives such as machines, computer programs, and robots (Danaher, 2017).

There are two versions of the argument. The first version of the argument concerns partial technological unemployment and the non-recovery of certain human labour in the near future, and can be laid out as follows:

(P1) If technology is replacing more and more forms of human labour, 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 labour, 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.

Let us analyse each premise in turn. The first premise is relatively uncontroversial. We can also find much existing evidence of technologies replacing human labour to support the second premise. Examples range from robot waiters and hotel AI, to customer service chatbots and radio DJs.[5] (Biron, 2019; Brynjolfsson & McAfee, 2014; Burhan, 2022; Ford, 2015; Kaplan,

Additional support of this premise can be found in historical trends. Since the recessions in the 1990s, economic recoveries have failed to substantially boost overall employment levels. Consequently, productivity gains have not translated into corresponding increases in employment (Brynjolfsson & McAfee 2014).

The problem lies with premise (2). It is criticised that this premise commits the Luddite Fallacy (Brynjolfsson & McAfee, 2014; Danaher, 2017). This is the fallacy that believes that technological displacement necessarily reduces the scope of available job opportunities.

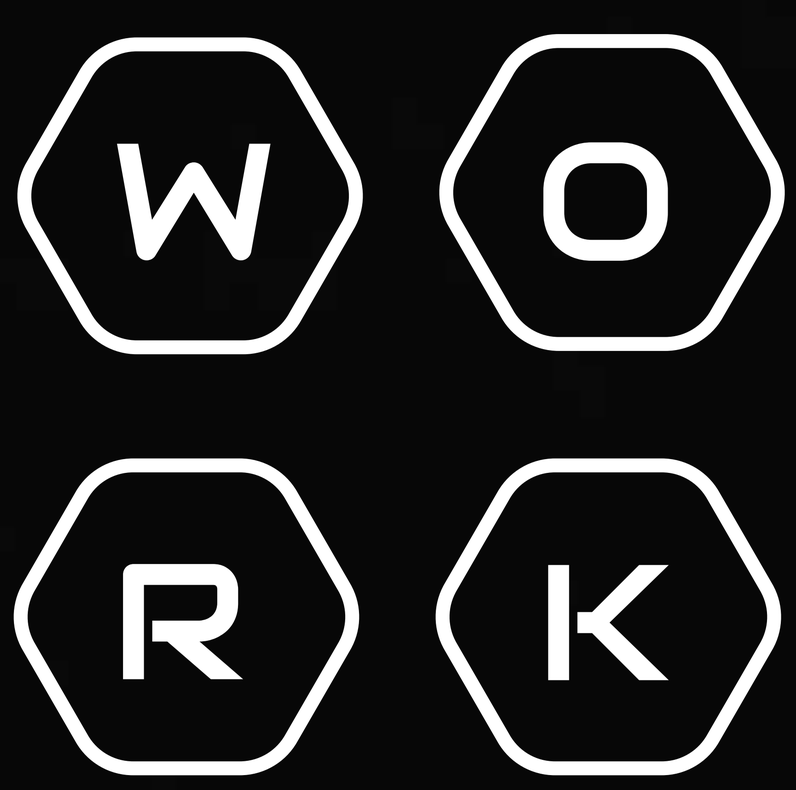
Critics believe that technological advancement will have no long-term negative impact on employment levels, and will eventually increase job opportunities (Autor, 2015). The validity of this view will be evaluated in the coming section.

For the remainder of the paper, I will refer to individuals who advocate the view of the Luddite Fallacy as technological optimists, and those who defend technological unemployment as technological pessimists.

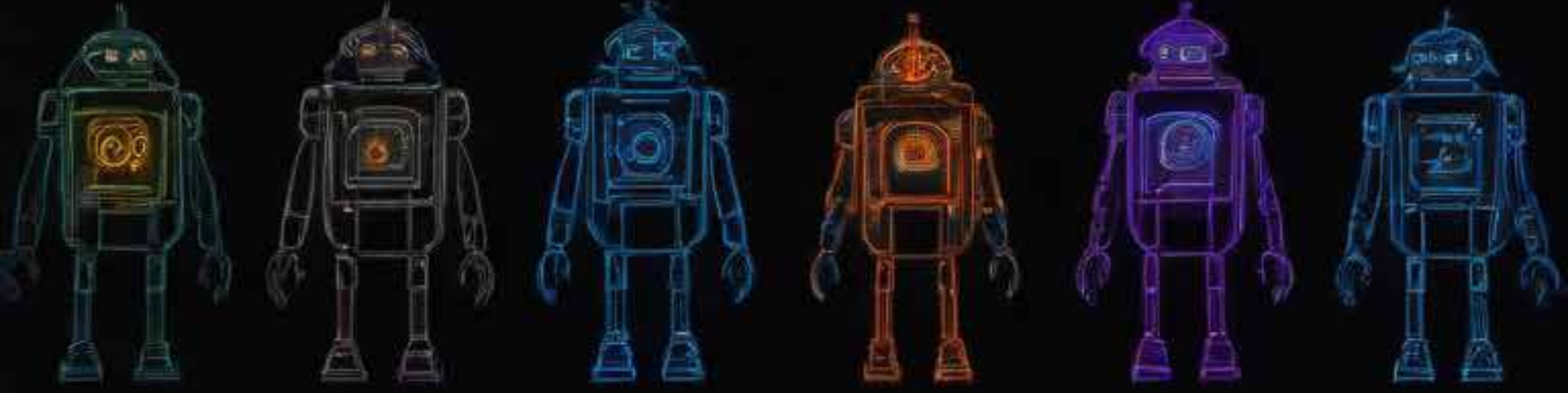
[5] *A list of companies that have undergone mass layoffs and are planning to do so in 2024 can be found here at O'Sullivan (2024). More evidence of AI replacing human labour can be found at Semuels (2020).*

The second version of the argument concerns complete technological unemployment, and can be laid out as follows:

(P1) If technology replaces all forms of human labour, and there are no alternative forms of work for humans available, then there will be complete technological unemployment.
(P2) There is no alternative form of human labour available.
(C) Therefore, there will be complete



This argument is valid, and while complete technological unemployment remains a theoretical possibility, its soundness could be questioned. This is because a world of complete technological unemployment is not guaranteed because of the complex interplay of factors such as technological development, economic structures, government policies, and societal attitudes towards work and technology. It is beyond the scope of this paper to discuss the possibility of complete technological unemployment. Our concern is on the more immediate implications and challenges associated with the ongoing integration of technology into the workforce. In order to facilitate conversations and actions in this regard, it is first integral to establish if partial technological unemployment is already happening, and whether technological pessimists can address the Luddite Fallacy.



1.3 Is It True that Technological Unemployment Is Really Happening?

1.3.1 The Luddite Fallacy

The Luddite Fallacy rests on theoretical and empirical claims. Theoretically, it is argued that improved technology and automation enable mass production of goods, boosting productivity while requiring fewer workers. This leads to reduced prices, resulting in increased disposable income for purchasing additional goods. Moreover, profitable businesses are prompted to invest in job creation, thereby fostering employment opportunities (Autor, 2015, pp. 6-8). Empirically, it is argued that past automation waves did not make human labour go obsolete but instead created more jobs. For instance, during the "information age" in the 1950s and early 1960s, we see the introduction of the first industrial robots, and the ensuing concerns about automation and joblessness were later dismissed as not a threat of employment. Famously, the growth of ATMs in the 1990s has resulted in an increased demand for tellers and a new field called "relationship banking", transforming the role of bank tellers from checkout clerks to salespersons and customer relationship managers (Autor, 2015). The same scenario is predicted to unfold in the current Artificial Intelligence (AI) revolution era, which is also referred to by some economists as "the second machine age", despite the rapid acceleration of the development that is unprecedented, and the widespread adoption and democratisation of AI, as well as the disruption AI causes across various industries (Autor, 2015, p. 4; Brynjolfsson and McAfee, 2014, p. 11).[6]

However, there is an increasing shift in opinion in the recent automation wave caused by AI. More is beginning to adopt the belief that the Luddite Fallacy is itself a fallacy, assuming that automation associated with job losses is necessarily matched by job creation (Wolff, 2015, p. 2). I will examine the rebuttals to the Luddite Fallacy argument.

While technology may displace certain jobs, it also creates *new* ones, leading to overall economic growth and increased employment.

[6] Technological optimists do not reject the notion that technological advancement can lead to job displacement; rather, they argue that this effect is only short-term and will ultimately be balanced by job opportunities in the same, different, or novel fields. It is believed that even if technology displaces jobs in one field, people can always spend their surplus income elsewhere, boosting demand in other fields, even if they are unrelated to technology. See Autor (2015), p. 7.

(i) Rebuttals to the Luddite Fallacy

Inelastic Demand & Market Saturation Problem

Firstly, technological optimists presuppose elastic demand for outputs, suggesting that price reductions or income increase would stimulate demand. However, this assumption may not hold true universally. It could be inaccurate for specific products or services, as well as entire industries. Historical data appears to support this contention (Autor, 2015, p. 6-8). 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). Technological optimists assert that the demand elasticity for human labour in the broader economy tends to hover around one in the long run. [7]

[7] *If a particular good or service has a demand elasticity of one, then for every 1% reduction in price, there will be a corresponding 1% increase in demand for that good or service.*

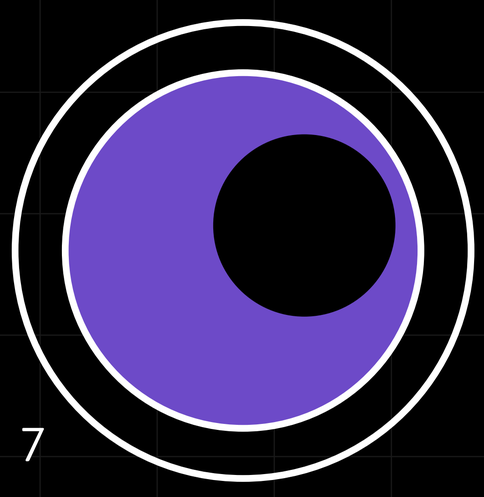
However, some products and services, such as automobile tires or household lighting, have exhibited relatively inelastic demand. For instance, halving the price of artificial lighting did not result in a doubling of consumer and business demand, leading to a decline in total revenues for the lighting industry despite increased efficiency (Brynjolfsson and McAfee, 2014, p. 350-359; Danaher, 2017, p. 6).

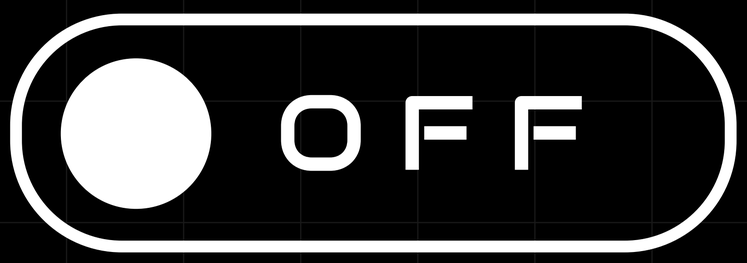
We can also argue that demand inelasticity does not only apply to specific industries, but rather there is a limit to how much demand of human labour can increase across all industries, even with rising incomes. This is the inelastic demand problem, which says that the demand changes are minimal in response 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.

An explanation can be found in economist John Maynard 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).

Furthermore, we could also argue that continuously declining prices wouldn't necessarily result in increased consumption of non-essential goods and services. To explain this, we need to look at the "Law of Diminishing Marginal Utility". The principle suggests that as people earn more money and spend it on discretionary items, the additional satisfaction they derive from each extra dollar spent diminishes over time (What is 'Law of diminishing utility'. N.d.). In this view, individuals would reach a point of satisfaction or satiation where they opt to consume less despite lower prices. Consequently, the demand for additional goods and services, and thus the demand for labour to produce them, may not grow proportionally to increases in income beyond a certain threshold as a result of "diminishing marginal utility".





Technological optimists may respond by saying that some goods or services may have inherent qualities that defy the "Law of Diminishing Marginal Utility", such as luxury goods. This is because part of the utility derived from luxury goods comes from their exclusivity or status, which can increase with increased consumption. However, we could say that even for luxury goods, there is likely also a point of diminishing marginal utility, where the additional boost in status may become commonplace with repeated consumption.

A further rebuttal from technological optimists is that human innovation always has the ability to discover fresh markets and new avenues for human labour. However, it could be argued that the progression of history is a complex matter that involves not just technological advancement and brute economic forces, but numerous other factors including the decisions made by human agents.[8] As such, while it could be the case that new markets are indefinitely being created, it is also completely logical that if technological advancements make it cost-effective to replace human labour with automation or other forms of technology, most if not all employers would adopt these technologies to reduce expenses, leading to job displacement and technological unemployment in the long-run. The issue of contingency of historical progression and the role of human agents in shaping the future of work will be addressed in more detail in the following sections. To sum up, the assumption made by technological optimists regarding elasticity of demand is put into question. Inelastic demand and market saturation may lead to slower growth in the economy, resulting in fewer job opportunities being created, and when combined with technological automations, can exacerbate technological unemployment.

[8] "Human agents" here refer to individuals or groups of people who play an active role in shaping the future directions of employment, and "economic forces" refer to supply and demand as well as market dynamics.

(ii) Outpacing Problem, History Doesn't Predict Future

Next, technological optimists 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 argument to the point prior, historical trends may 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) History is Not Deterministic and the Influence of Human Agents

Finally, the future of work is not merely a matter of economic forces and technological advancement. They alone cannot determine the outcome of the future of work. Further nuances are added to the discussion when we consider the human agents behind history, as their decisions, biases, and actions interact with societal structures and economic forces to shape the future landscape of work and employment. In this section, I will explore the roles of capitalist employers, government, policy makers, think tanks and consultancies in shaping the narrative of history.

Market monopoly and monopsony by capitalists.

Firstly, let us consider the role of capitalist employers. With an increasing number of goods and services being digitised, replication can be done at near zero marginal cost, reducing the cost of production significantly (Rifkin, 2014). In theory, it is natural to assume that the saved cost will be reinvested in human labour and talent, resulting in wage rise and affordable goods.

However, in reality, many large corporations operate as monopolies (control over the “sell side” of the market on labour or goods). To boost profits, monopolists would hike prices, resulting in reduced production as fewer consumers are willing to pay the inflated prices, consequently leading to workforce reduction. Monopolists also deliberately suppress wage growth for employees. 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).[9]

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).

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).[10] 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 (Brynjolfsson and McAfee, 2014; Keen, 2015).

[9] 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).

[10] 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.

Optimistic Projections in Reports by Consultancies.

Next, expanding on the point that history cannot predict the future, arguably, there is no single "right" measure or algorithm to predict the future landscape of employment with existing data, nor can one determine with certainty what the actual object of the research is. As a result, 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 & Osborne, 2017; Morgan, 2019, p. 17).

Furthermore, because of the elusiveness of algorithms or research objects available, 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.

[11] *See Bughin et al (2018), Deloitte (2015), Hawksworth et al (2018), Manyika et al (2017a), Manyika et al (2017b), Schwab (2016) and WEP (2016).*

[12] *See DBEIS (2017), Deloitte (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.*

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.[11] 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).[12] As a result, they tend to provide optimistic projections on business and employment prospects (Morgan, 2019, pp. 11-2).[13]

These reports have also been instrumental in shaping governmental strategies in Malaysia. For example, a report by TalentCorp, an agency under the Ministry of Human Resources (MOHR), focused on talent building and mobility, referenced findings from the World Economic Forum and Deloitte. 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).[14] 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.

This shows that the evidence used to support certain claims about the future of work advanced by technological optimists may be subjected to scrutiny. Furthermore, human biases at play can influence conversations and actions of stakeholders in specific directions, as well as promote anxiety or complacency regarding the future of work.

1.4 Further Caveats & Considerations: Contingency of the Future

In the preceding paragraphs, the assumptions underpinning the Luddite Fallacy were put to question, bringing attention to issues such as inelasticity of demand, the problem of induction and outpacing, market monopoly and monopsony, human biases in reports about the future of work, as well as non-determinism of history. I also highlighted how historical progression is not a matter of linear determinism, and how human agents play crucial roles in shaping the trajectory of the future of work.

I would like to highlight that this objection raised against the Luddite Fallacy and technological optimists regarding contingency of the future does not solely apply to the technological optimists. Just as technological optimists may err in assuming that the past predicts the future and may be biased in favouring a future safeguarded from technological unemployment, it would be equally erroneous to assert with certainty that technological unemployment is inevitable by referring solely to evidence that supports this view.

Just because technologies can replace human labour, it does not mean that they will or should replace them. The first is a descriptive claim, and the second is a normative claim. I will explain why in the following paragraphs.

[13] 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.

[14] 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 Deloitte (2015), over the next 20 years, more than 100,000 jobs in the legal sector are at a high risk of automation.

1.5 "Bullshit" Jobs

David Graeber, the author of "Bullshit Jobs", argued that widespread unemployment is already happening, it has just been masked by "new", pointless, unfulfilling "bullshit" jobs that are created for the sake of political pressures from various factions, apprehensions among the capitalists and elite about potential societal disruptions if mass unemployment is to happen (Graber, 2018, p. 28-58). Consider the invention of automated elevators, which was supposed to relieve the role of elevator operators in early elevator systems which would require manual operating levers and switches. In modern society, some buildings still continue to employ elevator operators often as a gesture of tradition or perceived prestige. There are so many more examples like these in contemporary workplaces.[15]

It is said that upon removing these "bullshit" jobs, it becomes apparent that the catastrophic levels of joblessness forecasted in the 1930s have materialized, with upwards of 50 to 60 percent of the population effectively unemployed (Graeber, 2018, p. 265). But throughout history, there hasn't been a clear trend that demonstrates a consistent correlation between technological productivity and a reduction in work hours. Instead, there has been an ongoing struggle between social and political movements advocating for workers' rights and fair conditions, and the inherent drive of companies to dominate markets and maximize profits, sometimes at the expense of exploiting workers (Morgan, 2019; Pitt, 2017).[16]

Along the same line of thoughts, it is argued by accelerationists like Nick Srnicek and Alex Williams that under capitalism, technological progress is frequently leveraged primarily for profit-driven objectives, limiting its potential for broader societal or environmental advantages and the adoption of alternative societal and economic frameworks that may conflict with prevailing capitalist ideology (William and Srnicek, 2013; Morgan, 2019, p. 9). This suggests that those in power may constrain the capacity of emerging technologies to foster alternatives to modernity and continue to create pointless jobs to serve their interests.[17] Thus, the current reality of technological adoption may not fully reflect the scale of what technologies are capable of achieving. Even if technologies can replace human labour, technological unemployment may still not ensue because the reality is influenced by various factors including human agents and power dynamics, beyond mere possibility.

Irrespective of the perspective one adopts, whether it is technological optimism or technological pessimism, the consensus emerging from the discussion so far underscores the importance of exercising caution against oversimplifying the intricate interplay of factors shaping historical progression. Indeed, the trajectory of the future of work is influenced by a myriad of variables, extending beyond mere economic dynamics and track records of technological advancements. Decisions made by human agents, societal values, principles and laws also play significant roles in this intricate process (Morgan, 2019, p. 5).

[15] 5 types of bullshit jobs were identified by David Graeber. The list is non-exhaustive: (i) flunkies (feudal-style retainer jobs like doormen, sycophants), (ii) goons (jobs that are manipulative and coercive like lobbyists, telemarketers, PR specialists), (iii) duct tapers (jobs that involve solving problems that ought not to exist like copy pasting, transferring information), (iv) box tickers (jobs that involve reporting and paperwork that serve no ostensible purpose), and (v) taskmasters (jobs that involve assigning work to others like supervisors and middle managers). See Graeber (2018), p. 28-58.

[16] For instance, Uber's zero-hour contracts to avoid offering employment rights and benefits is one of the latest versions of this ongoing conflict. See Jeyaraj (2021).

[17] The adoption of technologies and automations has the potential to disrupt existing power structures and economic paradigms, which may be perceived as a threat by capitalists, and hence the reluctance to fully embrace technological advancements that could challenge the status quo or undermine established hierarchies.

2 Existing Approaches to Technological Unemployment

Despite this, however, it is important for us to be prepared for any possible outcome in the future of work. Existing solutions towards technological unemployment rest on the assumption of technological optimists that job displacement due to technology is short-term, and that the economy will recover and continue to grow in new, unforeseen sectors, creating replacement job opportunities for those displaced by technology. We will evaluate them in turn.

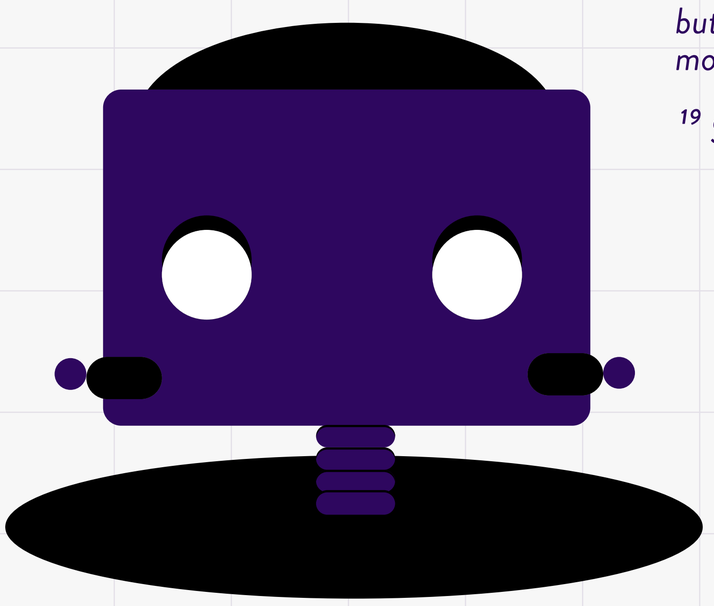
2.1 Education, Upskilling & Retraining Programmes

One of the most common responses to job displacement due to technology is through enhancing technological readiness via education or retraining of displaced workers. Several initiatives have been implemented in recent years in response to the acceleration of technology and automation. First is 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 in the country, equipping 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 government has also launched Malaysia Digital Economy Blueprint (MyDIGITAL) not long ago, 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. Furthermore, the effectiveness of these initiatives can sometimes be put to question. 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, and even basic technological skills (Bassah, 2022).[18] 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, & Murnane, 2003; Autor, 2015). 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).

Following this, it is not necessarily true that high-skilled work or tasks involving advanced reasoning are immune to technological automation. This is because certain industry and technical skills, as well as high-level reasoning and formal logic skills can be 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).[19] 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 & McAfee, 2014; Moravec, 1988). 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).



[18] 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.

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

2.1.1 From A "Banking" to A "Chiseling" Model

Recommendation

Beyond programs specifically tailored to upskill and train the talent and workers in Malaysia, the pedagogies used in the broader Malaysian education system to train the future generation of leaders and workers can also be put into question. Elsewhere in my paper "Practical Philosophy and a Perspective on Oppression and Liberation in Malaysia", I highlighted how the Malaysian education system is built upon a "Banking Model" elucidated by Paulo Freire (Chew, 2024). In this educational model, students are viewed as passive recipients, likened to containers or receptacles waiting to be filled by the teacher or authoritative figures. According to Freire, education becomes a process of depositing knowledge into individuals, who are then expected to mechanically absorb, memorize, and regurgitate it (Freire, 2005, p. 71).

This "banking" model of education does well in imparting skills like memorization, regurgitation, and theoretical knowledge, but it falls short in preparing the next generation for the demands of the modern world, and certainly it is highly questionable that it can safeguard students and graduates from long-term technological unemployment. I argue for an alternative model of education called the "chiselling" model, whereby instead of absorbing and building up fixed knowledge from teachers that is quickly phased out, under the "chiselling" model, students learn to deconstruct and unlearn the information they receive through active inquiry, challenging assumptions, exploration, reflection, actively "chisel" away the knowledge they gain and synthesise them to create something new. This way, students are empowered to continuously adapt and refine their knowledge based on new challenges and situations.

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.[20] Practically, this can be done by incorporating Socratic Dialogues, collaborative projects, problem-based learning, reflective practices, hands-on workshops, and student-led initiatives in the local education and TVET classrooms.[21] These modern classroom teaching methods not only facilitate the acquisition of tacit and critical thinking skills but also cultivate adaptability and versatility necessary in the rapidly changing world of technology, with the hopeful outcome of safeguarding students and graduates against longer-term job displacement due to technology.

In summary, the Malaysian education system necessitates an overhaul, transitioning from an environment that prioritizes memorization and retention of information to one that promotes the learning and application of tacit and soft skills. Technical skills can quickly become obsolete in the sense that humans find the tasks requiring certain technical skills being displaced by technology, whereas the capacity for creativity, flexibility, and adaptability stands a better chance of survival in this world, allowing us to unlearn and learn new ways of thinking and solutions to problems.

[20] Constructivist learning approaches include methods like inquiry-based learning and project-based learning, with an emphasis of encouraging students to construct their own understanding through inquiry, hands-on exploration and collaboration.
[21] Read Heckmann (2022) for a more detailed explanation of what Socratic Dialogue is.

2.1.2 Further Challenges: Polanyi's Paradox Has Been Overcome?

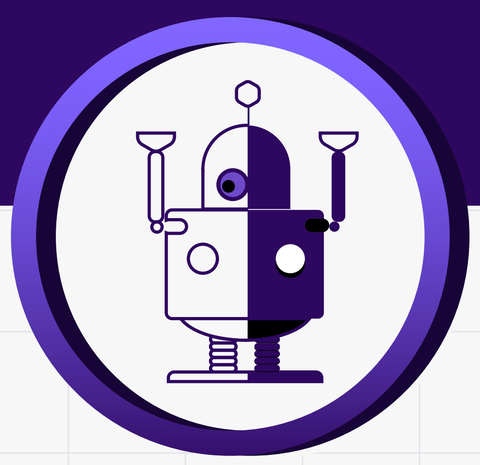
However, some technological pessimists pointed out that the Polanyi's Paradox has been overcome with recent development in Machine and Deep Learning (Susskind, 2017, pp. 1–14.; Kaplan, 2015, pp. 41–3, 145).[22] For instance, DeepMind's AlphaGo, an AI program developed by Google, exemplifies how AI advancements enable machines to excel in tasks such as chess, traditionally thought to require tacit skills, as demonstrated by its victory over top Go player Lee Se-dol in the 2016 tournament (McAfee & Brynjolfsson, 2016).[23]

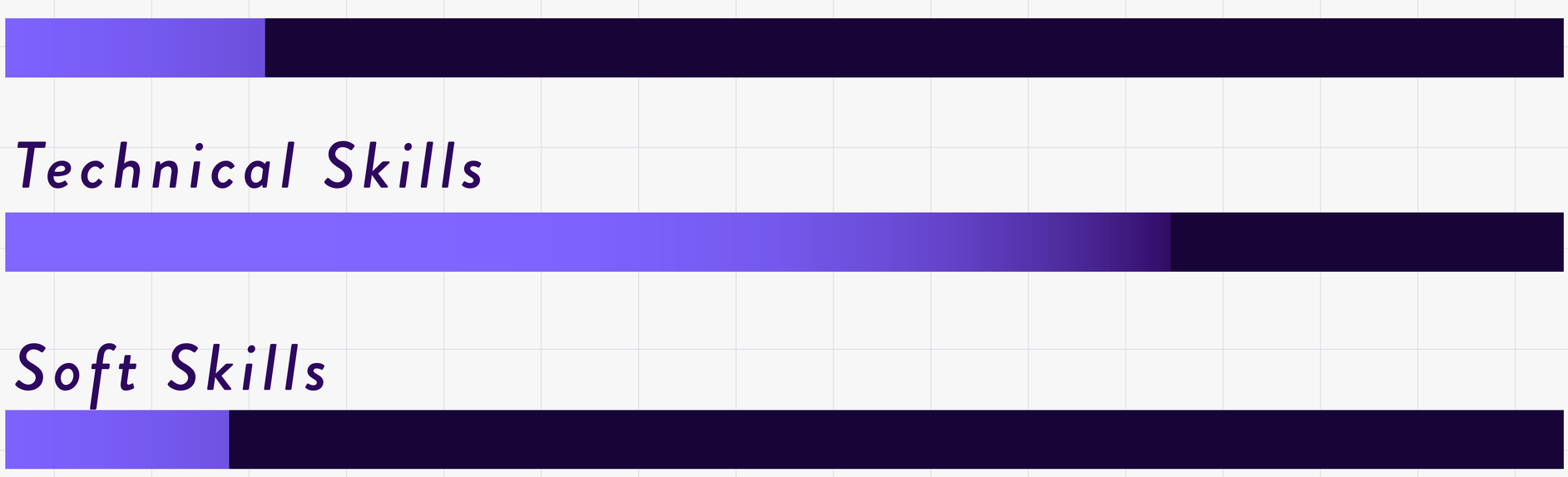
However, even if Polanyi's Paradox has successfully been overcome and assuming that current technologies can solve human problems that traditionally only tacit skills can, it does not necessarily entail that all human tasks can be automated by technologies. Even if they can be automated, it does not follow that they would be or should be automated.

As such, there is still value in transforming the model of education to better prepare students and graduates for imminent job displacement due to technology. This is a clarion call for educators, parents, and policymakers to prioritize investment in reform and policies that promote curriculums built on a "chiselling" model, rather than specific skills or knowledge that may be outpaced.

[22] These views claim that it is a mistake to assume that machines have to learn tacit knowledge or follow the same rules humans learn. Rather, machines can produce similar outcomes through their own means of data processing, reasoning and inference.

[23] It is said that chess-playing requires tacit skills because the players themselves cannot fully explain the knowledge and procedures required to win a game. See McAfee & Brynjolfsson (2016).





2.2 Just Transition to the Future of Work

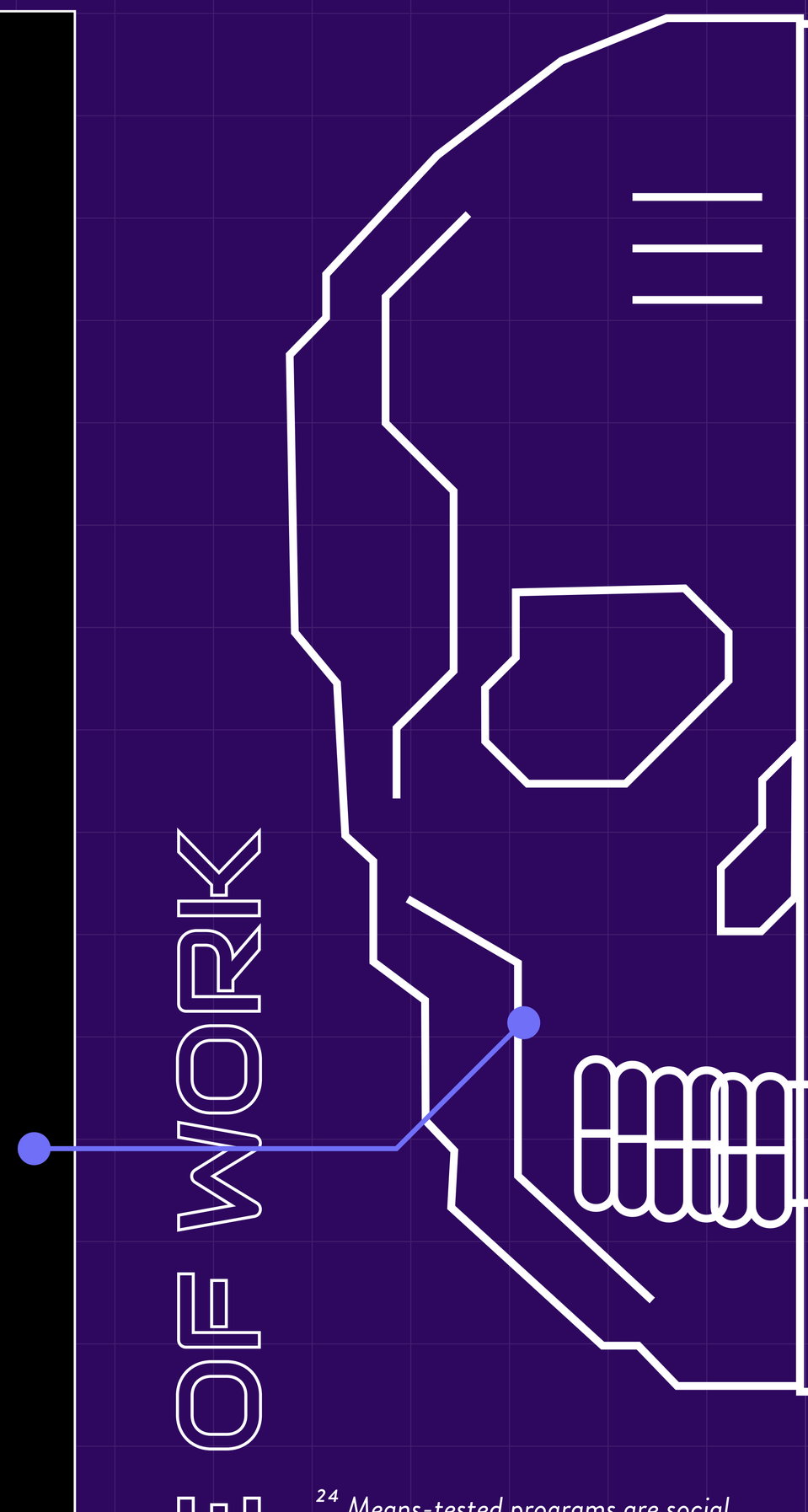
Imagine if the most extreme forecasts regarding technological unemployment were true: automation technologies assume control over most if not all types of human labour. How can we prepare for it? In this case, the solution to educate, upskill and retrain students and graduates may no longer be relevant. In the case of full technological unemployment, the question is now one that is social and ethical in nature: How will the people obtain essential and nonessential goods and services, which presently rely on income earned through work?

LOADING...

Technological unemployment suggests that a larger portion of income will be allocated to capital rather than human labour, which will result in widening income and social inequalities (Atkinson, 2015; Autor, 2015; Piketty, 2014). This can only be mitigated through significant wealth redistribution from capital owners to displaced workers or through other substantial economic re-organization. In the case of large-scale technological un-employment, existing solutions surrounding enhancing social safety nets such as unemployment benefits and income support programs can no longer be sufficient to provide a financial cushion for workers affected. 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) 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; Potential Employment and Retrenchment, 2020). However, this initiative primarily aims to mitigate short-term effects of unemployment. There is at the current stage no plans or initiatives in place to tackle the potential long-term structural unemployment that could be brought about by tech-nology and automation.

Another proposal that has gained popularity in recent years is the implementation of an Unconditional Basic Income (UBI) to everyone, which is the proposal to provide everyone, regardless of your social status, a guaranteed minimum income without the need for traditional employment, to ensure just distribution in the face of technological unemployment.

However, this proposal is not without objections. To actualize UBI for all, a substantial source of funding is imperative (Bastani, 2019, p. 226; Greenstein, 2019; Standing, 2017, p. 130). Consider providing RM3,000 per month, or RM36,000 per year, per Malaysian aged 18 or older. Given the rough estimates of adult Malaysians will come out to be about 23 million, that works out to RM828 billion per year. That is about ¼ of the current Malaysia GDP (GDP – Malaysia, 2022). How can this significant increase in government spending for UBI be funded? One way is through significantly elevated tax rates which could be problematic on multiple grounds (Sammeroff, 2019, p. 54; Wright & Przegalińska, 2022, pp. 72-3). Firstly, philosopher Nicholas Smith argued that without a strong working incentive, there wouldn't be sufficient funds for redistribution, assuming that the funds required for a UBI are derived taxes on income generated through work (Smith, 2018a). Higher taxes may also cloud growth prospects by discouraging productivity investments in research and development of new technologies, or engage in tax avoidance strategies that may ultimately undermine the effectiveness of the proposed taxes in funding UBI (Torry 2019, p. 101). Furthermore, Higher income taxes may similarly defeat the purpose of UBI itself. Alternative means of funding UBI such as decreasing or eliminating other government expenditures such as means-tested or welfare programs were also proposed (Standing, 2017, p. 131; Torry, 2019, p. 158).[24] However, this would mean the exacerbation of social inequalities by being less targeted in wealth distribution, and redistributing some of the portion upward (Greenstein, 2019).

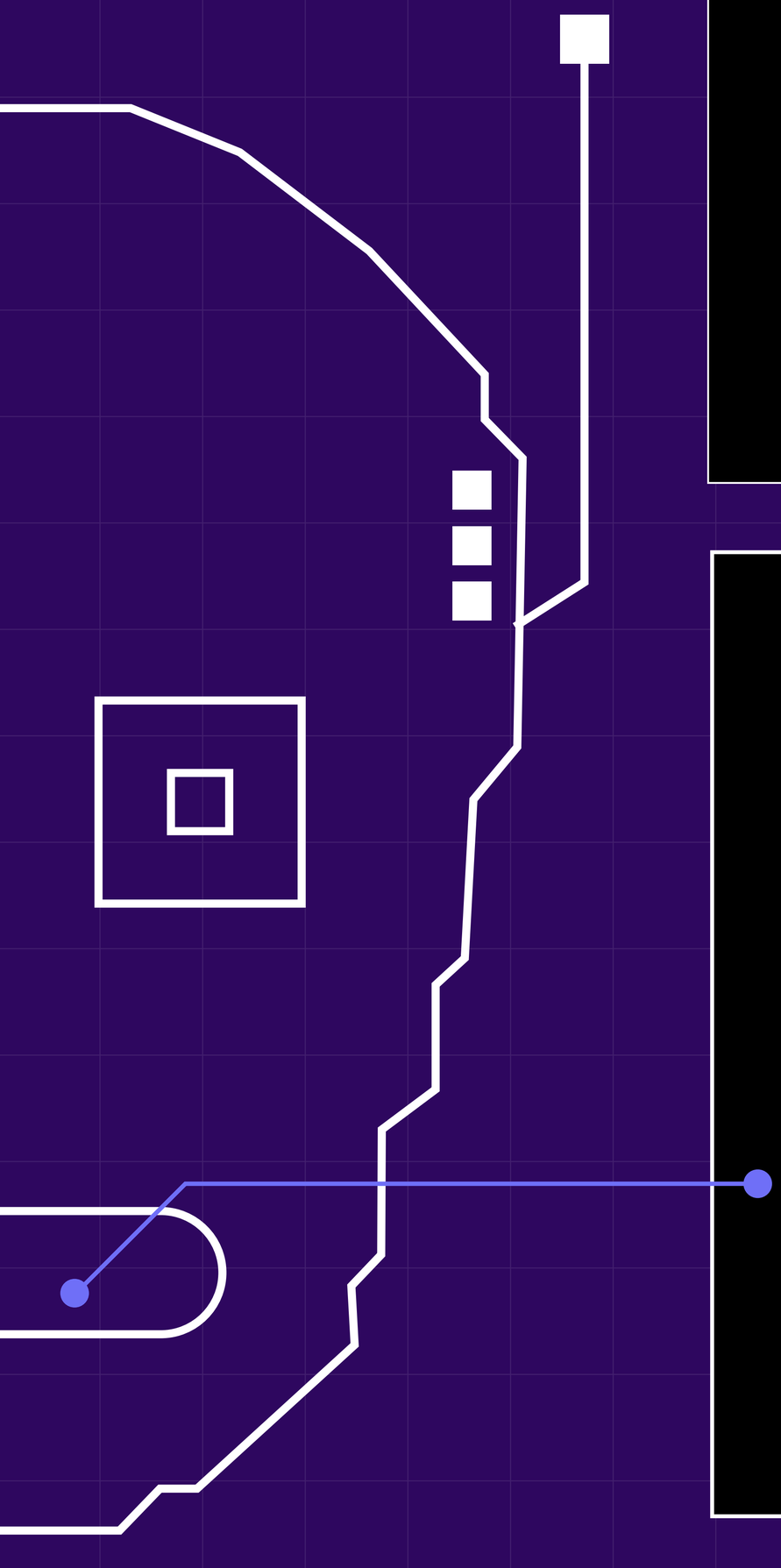


[24] *Means-tested programs are social welfare programs that provide assistance to individuals based on their financial needs or means. Examples of means-tested programs are Rahmah Cash Aid (STR) and Malaysian Family Aid (BKM).*

[25] *The term "Least Bad Tax" originated from Georgian (Henry George)'s land value tax (LVT), based on the proposal that the government should be funded by a tax on land rent rather than taxes on labour to improve wealth equality. LVT can be also seen as a source of funding for UBI. See Torry (2019), p. 452–54.*

[26] *Yet, defining what qualifies as "unfair practices" and managing the imposition of such a tax could prove difficult and open to varying interpretations, potentially resulting in political conflicts and legal intricacies.*

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



Variations of the UBI models were also proposed, such as adjusting UBI to Universal Job Guarantee. This is the idea that the government serves as an "employer of last resort", providing work to anyone who needs it (Wright & Przegalińska, 2022, p. 107). Still, it could be argued that this merely shifts the problem to another domain as a universal job guarantee program would still require huge funding (Torry, 2019, pp. 222–5). A potentially workable source of funding could be achieved through a form of taxation known as the Least Bad Tax (LBT), through a one-time 100% tax on profits obtained through unfair practices such as cosy government contracts, cartels, preferential agreements, tariffs, bribery, theft and fraud (Torry, 2019; Wright & Przegalińska, 2022, p. 107).[25] This form of taxation kills two birds with one stone – providing support for the people and at the same time deter economic activities that are not beneficial in society.[26]

Apart from cost and funding, there are other problems associated with UBI, ranging from social concern about inequity, political concern about whether the government is willing to replace existing social welfare programs with UBI, to philosophical concern about whether money is considered a birthright, and more (The pros and cons of universal basic income, 2021). Furthermore, UBI is an idea that is still at its early stages of development, and has yet to be implemented in any sizable political jurisdiction for an extended period of time (Standing, 2017, pp. 276-8; Wright & Przegalińska, 2022, p. 106).[27] It is beyond the scope of this paper to discuss all the problems related to UBI in detail. The primary question of interest here is whether UBI is the only solution to the challenges in our labour market posed by technological unemployment.

Undoubtedly, our current social welfare and security system falls short in safeguarding workers from technological unemployment, due to factors such as unpredictability, insufficient longevity, and under-coverage (Hamid et al, 2021). As more and more jobs are being displaced by technology, it is essential to acknowledge that UBI presents itself as a potentially transformative approach to addressing socioeconomic challenges. However, implementing it may be practically challenging given the aforementioned obstacles. Yet, they do not automatically render the UBI model flawed and unusable (Standing, 2017). A full-scale UBI may not be necessary but structural changes in the social security and welfare system that align with the goals of UBI is a good step to just prepare the nation for longer-term structural unemployment without incurring the hefty costs entailed by UBI, but also promote greater justice and reduce social inequalities.

Recommendation 1: Expansion of Welfare from B40 to B70

Recommendation 2: Welfare to Cover Non-Standard and Precarious Work

Recommendation 3: Longer Term Job Displacement Subsidies

Recommendation 1

Below are a few recommendations that are middle ground suggestions between UBI and the current social welfare and security systems. Firstly, there is a need for the government to expand welfare subsidies and benefits to a larger income and employees group, making social benefits relatively more "universal". 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).

Recommendation 2

Moreover, 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). As of 2020, approximately 30% of the workforce operates within the informal sector, equating to around 6.5 million individuals (Sim & 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. As such, the government can consider expanding the social security program to include fund allocation to non-standard workers, and offer flexible schemes such as income supplements during lean periods.

Recommendation 3

On top of that, implementing longer term job displacement subsidies, not just during pandemic or times of emergency can provide the needed cushion, something like a partial UBI to help employees transition between jobs or other self-employed work opportunities. Furthermore, reducing identity-based welfare in Malaysia and focusing more on the "universal" character of funding through opening up an entrepreneurship fund for everyone could contribute to greater fairness as well as social unity (Torry, 2019, p. 75).[28] Emphasizing greater universal access to resources also fosters a sense of shared responsibility and solidarity among the people, promoting social unity and collective efforts to address common challenges like technological unemployment.

To sum up this section, even though a full-scale UBI which may not necessarily be economically, politically and socially feasible, the above measures and proposals are reasonable middle grounds to prepare the nation for a potential future of technological unemployment. Even if technological unemployment fails to materialize, these adjustments represent a positive step forward. They foster a fairer system of social protection against the impact of job displacement resulting from technology.

[28] *For instance, the government recently allocated RM1bil for the new Bumiputera entrepreneurship fund in 2024. See Tan (2024). Expanding the eligibility of the entrepreneurship fund would allow Malaysians to have a more equal access to financial support and resources for starting or growing their businesses.*

3 Alternative: Embracing A Potential Post-Work World?

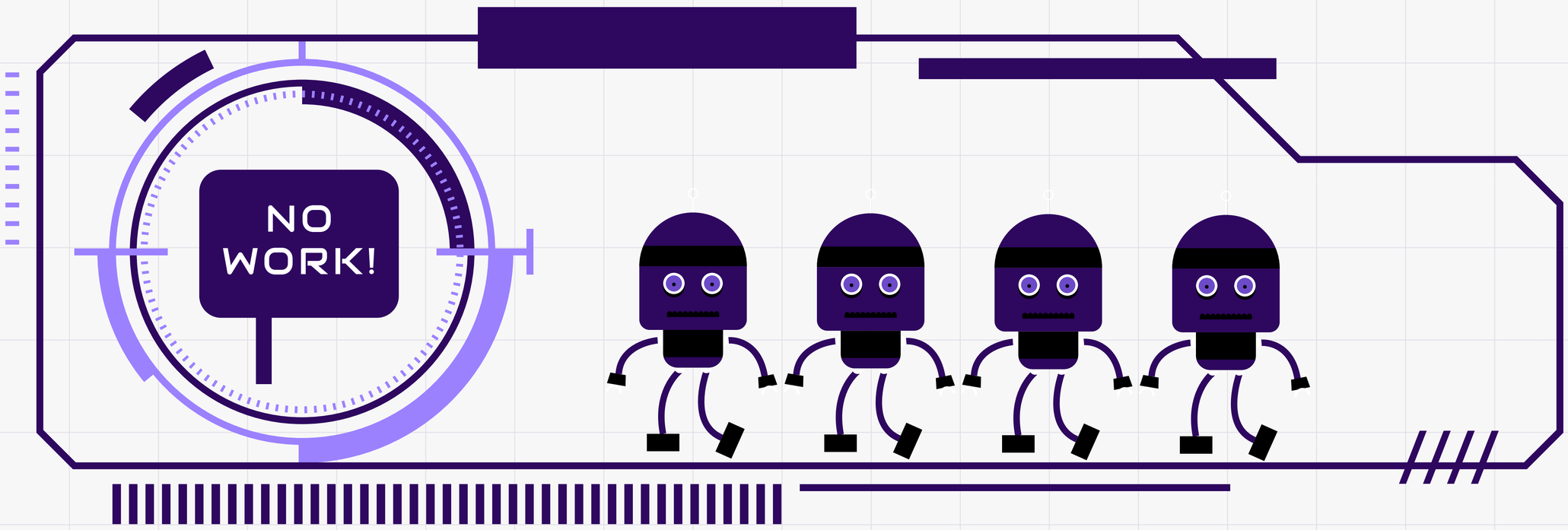
3.1 Work is Bad

Various experimentative UBI models worldwide were proven to provide people the opportunity to escape the structural badness of work, leading to improved mental health, happiness, motivation to work or start entrepreneurship (Samuel, 2020). While UBI is still a contentious model with limited testing, the inherent flaws of the system of work have prompted some to embrace technological unemployment and a post-work perspective.

Various theorists have advocated for a paradigm shift towards a post-work society that prioritizes human needs and freedom by eliminating work from the equation entirely. One prominent advocate for the abolition of work is philosopher Bob Black, who famously declared: “Work is the source of nearly all the misery in the world. Almost any evil you’d care to name comes from working or from living in a world designed for work. In order to stop suffering, we have to stop working.” (Black, 1986). Bertrand Russell and Keynes similarly challenged the notion that "work is virtuous" and proposed a greater emphasis on idleness in our lives (Keynes, 1930; Russell, 2004). John Danaher has even envisioned a potential post-work society resembling a game, where individuals are free to pursue their passions and develop their crafts without the constraints of traditional employment.

These philosophers all agreed that work is structurally bad because various reasons, ranging from unrealised goods as a result of poor compensation, income inequalities and distributional injustices, lack of recognition, lack of autonomy and freedom due to practices of domination, monopolisation of time, precarious nature of employment, meaningless nature of work, burnout, and alienation (Black, 1986; Cholbi, 2018, Frayne, 2015; Han, 2015; Marx, 1932; Russell, 2004; Weeks, 2011; Weil, 2014).

These theorists share the general hope that by embracing technological advancement with open arms and acknowledging the inevitability of unemployment, we can usher in a new era where individuals are liberated from the shackles of meaningless labour. Instead, we can cultivate a society that values leisure, creativity, and personal fulfillment, fostering a more harmonious relationship between humans and technology.



3.2 Centrality of Work and Middle Ground

Undeniably, this vision of a post-work society does offer a compelling alternative to the current paradigm, presenting an opportunity for humanity to redefine its relationship with work and reclaim control over its destiny. However, post-work advocates could be said to be too defeatist and pessimistic to believe that work is a pure abomination and the only alternative is to stop working entirely. While it is true that there are many bad-making properties of work, we cannot ignore the fact that work plays a central role in our lives. Work is central not just to our livelihood, but also in developing individual's well-being, fulfilment and self-realisation, as well as providing a sense of recognition and social esteem to our accomplishments (Dejours & Deranty, 2010, pp. 169-72; Dejours, 2012; Smith, 2018b).

Yet, proponents of post-work societies can argue from the perspective of an "opportunity cost" argument that while work might be seen as central due to its psychological and social properties, the bad-making properties of work still overpower these properties, so non-work is better (Danaher, 2017, p. 14). Despite this, however, proponents of centrality of work could argue that it is Utopian and naïve to believe that work can just wither away. Work also plays a central and irreplaceable role in social reproduction.

PROCESSING...

In other words, even if robots and automated systems eliminate numerous existing human labour, human society will still require activities essential for the material, emotional, and symbolic reproduction of our communal existence, many of which are uniquely suited to humans. These include activities done by historians, social workers, caregivers, educators, counsellors, and more (Deranty, 2021).

In fact, the view that work is central could be seen as the dominant view of the current society, with a majority subscribing to the belief that work possesses intrinsic value and serves as a pathway to freedom, success and happiness.[29] However, this belief often faces disillusionment in the current age of neoliberal capitalism—an era characterised by free-market ideologies, decentralisation and deregulation and privatization. In this landscape, workers often experience alienation, misrecognition and burnout as a result of erosion of workers' rights and the emergence of new forms of managerialism focusing on entrepreneurialism and excess productivity (Han, 2015; Honneth, 2000, pp. 179-84; Honneth, 2007, pp. 343-6).[30]

Therefore, while it is true that work consists of numerous bad-making properties that sometimes we feel it is better off for the society to be structured around leisure activities, given the centrality of work in people's lives, work is not something that most of us can imagine giving up on. But this does not mean that we cannot strive for a world where the system of work undergo substantial improvement, and in this world, humans can continue to enjoy the benefits or goods of work.

[29] Even in UBI trials, it is found that there is no significant reduction in work and people still continue to work despite being given a universal income. See Torry (2019), p. 59.

[30] Neoliberal capitalism surfaced in the latter portion of the 20th century in reaction to perceived shortcomings of Keynesian economics and state interventionism.

3.3 What's Next for Malaysians?

The future of work is not solely the product of strict determinism, but one that is heavily influenced by the ideas, attitudes and actions of human agents. We have explored several reasons why technological unemployment may still be likely, including the inelastic demand problem, capitalist monopoly and monopsony and optimism bias in research on the future of employment. However, the contrary may also be true in the case of the maintenance of "bullshit" by capitalists, actively "resisting" technological unemployment for various reasons such as maintaining power dynamics. Regardless of the outcome, technological unemployment need not be viewed as our adversary; instead, it presents an opportunity for us to shape a more promising future of work.

As policymakers, there is room for enhancing existing measures aimed at preparing the workforce for job displacement resulting from technology, particularly those that are predominantly short-term in nature. This includes refining pedagogical approaches and methodologies utilized in local education and human resource upskilling programs, alongside implementing measures to establish a more equitable social security and welfare system.

There is also an urgent need for transformation of the structure system of work. Changes might involve reducing working hours, introducing job sharing, promoting cooperative management, implementing public ownership of key industries, bolstering workers' bargaining power, recognizing unpaid work and expanding the social security and welfare policies mentioned above. These measures aim to address the drawbacks of traditional employment structures, while still allowing the option for individuals to partake in meaningful work activities within the society (Deranty et al., 2018, pp. 164-73; Hanon, 2023, p. 256-257).

As citizens of the future of work, we cannot precisely forecast the trajectory of technological unemployment, but we can actively contribute to shaping ongoing conversations about the future of work. We can advocate for proactive measures and policies that cultivate a digitally literate, critical, and adaptable generation. We can strive for a more just and meaningful system of work for all, ensuring that technological advancements and automations benefit all members of society and lead to more liberating work experiences rather than exacerbating inequality and marginalization.

The future of work is still a mystery. In one possible scenario, technologies and robots assume all aspects of human labor, ushering in a post-work, game-like society supported by UBI. In another scenario, work retains its centrality, but the culture and system of work is transformed for the better. Another possibility could involve humans collaborating closely with AI and robots, perhaps even integrating with them as cyborgs. Yet in all possible futures, there is one thing we can be certain about - our commitment to adopting a proactive stance. This involves transcending beyond theoretical debates surrounding technological unemployment or UBI, and actively engaging in conversations to shape a future where work may not be abundant, but is unquestionably fair, meaningful, and fulfilling for all.

References

Agar, N. (2015) The Sceptical Optimist. Oxford: OUP.

Anslow, L., & McKenzie, A. N.d. Pessimists Archive. https://pessimistsarchive.org

Arntz, M. Gregory, T. & Zierahn, U. (2016). The risk of automation for jobs in OECD countries: A comparative analysis. OECD Social, Employment and Migration Working Papers 189. Paris: OECD Publishing.

Atkinson, A. (2015). *Inequality: What can be done?* Harvard University Press

Automation and Adaptability: How Malaysia Can Navigate the Future of Work. (2020). McKinsey and Company.

Autor, D. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3): 3-30.

Azmi, T., & Salleh, D. (2021). A Review on TVET Curriculum Practices in Malaysia. *International Journal of Education, Psychology and Counselling*, 6(40): 35-48. DOI 10.35631/IJEPC.640003.

Bassah, N. (2022). The issues and challenges of TVET in Malaysia: from the perspective of industry experts. TVET@asia. https://tvet-online.asia/18/the-issues-and-challenges-of-tvet-in-malaysia-perspective-of-industry-experts/

Bastani, Aaron. (2019). *Fully Automated Luxury Communism*. New York: Verso.

Biron, B. (2019). Chinese e-commerce giant Alibaba has a hotel run almost entirely by robots that can serve food and fetch toiletries — take a look inside. Business Insider. https://www.businessinsider.com/alibaba-hotel-of-the-future-robots-ai-2019-10

Black, B. (1986). The Abolition of Work and Other Essays. Port Townsend: Loompanics Unlimited.

Brynjolfsson, E. and McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. WW Norton and Co.

Budget 2024 Highlights. (2023). Ministry of Finance Malaysia. https://www.mof.gov.my/portal/en/news/press-citations/budget-2024-highlights

Bughin, J., Seong, J., Manyika, J., Chui, M., & Joshi, R. (2018). Notes from the Frontier: Modelling the impact of AI on the world economy. San Francisco: McKinsey Global Institute.

Burhan, T. (2022). The new revolution of robot waiters. FMT. https://www.freemalaysiatoday.com/category/leisure/2022/11/21/the-new-revolution-of-robot-waiters/

Chew, Z. Y. (2024). Practical Philosophy and a Perspective on Oppression and Liberation in Malaysia. https://www.myphilsoc.com/oppression-and-liberation-in-malaysia/

Cholbi, M. (2018). The Duty to Work. *Ethical Theory and Moral Practice*, 21 (5):1119-1133.

DALL·E 3 is now available in ChatGPT Plus and Enterprise. OpenAI. https://openai.com/blog/dall-e-3-is-now-available-in-chatgpt-plus-and-enterprise

Danaher, J. (2017) Will Life Be Worth Living in a World Without Work? Technological Unemployment and the Meaning of Life. *Science and Engineering Ethics*, 23(1): 41-64.

DBEIS, Department for Business, Energy and Industrial Strategy. (2017). Industrial strategy: Building a Britain fit for the future. White Paper, November. HM Government, United Kingdom.

Dejours, C., & Deranty, J-P. (2010). The Centrality of Work. *Critical Horizons*, 11(2):167-180. DOI: 10.1558/crit.v11i2.167

References

Dejours, C. (2012). From psychopathology to the psychodynamics of work. In N. H. Smith & J.-P. Deranty (Eds.), *New philosophies of labour: Work and the social bond* (pp. 209–250). Brill.

Deloitte. (2015). From brawn to brains The impact of technology on jobs in the UK. Deloitte LLP: London.

Deranty, J.-P., et al. (2018). *The Return of Work in Critical Theory: Self, Society, Politics.* Columbia University Press.

Deranty, J-P. (2021). Post-work society as an oxymoron: Why we cannot, and should not, wish work away. *European Journal of Social Theory*, 25(3): DOI: 10.1177/1368431011012169.

Dijmarescu, I. (2021). The Future of Work in a Jobless Society: Globalization, Smart Digitalization, and Cognitive Automation. SHS Web of Conferences, 92(5):07016. DOI: 10.1051/shsconf/20219207016.

Ford, M. (2015) *The Rise of the Robots: Technology and the Threat of a Jobless Future.* New York: Basic Books.

Frayne, D. (2015). The Refusal of Work: The Theory and Practice of Resistance to Work. London: Zed Books.

Freire, P. (2005). *Pedagogy of the Oppressed*. Continuum.

Frey, C. B & Osborne, M. A (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting & Social Change*, 114, 254-280.

GDP - Malaysia. (2022).The World Bank. https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=MY

Graeber, D. (2018). *Bullshit Jobs*. UK: Penguin Random House.

Greenstein, R. (2019). Commentary: Universal Basic Income May Sound Attractive But, If It Occurred, Would Likelier Increase Poverty Than Reduce It. Centre on Budget and Policy Priorities. https://www.cbpp.org/research/poverty-and-opportunity/commentary-universal-basic-income-may-sound-attractive-but-if-it#:~:text=Consider%20what%20that%20would%20mean,inequality%20rather%20than%20reduce%20them

Hall, M. (2023). Elasticity vs. Inelasticity of Demand: What's the Difference? Investopedia. https://www.investopedia.com/ask/answers/012915/what-difference-between-inelasticity-and-elasticity-demand.asp

Hamid, H. A., et al. (2021). Building Resilience Towards Inclusive Social Protection in Malaysia. Khazanah Research Institute. https://www.krinstitute.org/assets/contentMS/img/template/editor/Booklet%20-%20Building%20Resilience.pdf

Han, B.-C. (2015) *The Burnout Society*. Stanford: Stanford University Press.

Hanapi, Z., Safarin, M., & Che, R. (2015). Unemployment Problem among Graduates of Technical Field: Competencies of the Graduates and Quality of the Education. Sains Humanika, 2, 53-57. https://doi.org/10.11113/sh.v2n2.414

Hanon, I. (2023). Technology and postcapitalism: a critical appraisal of antiwork, full automation reveries. *Studies in Political Economy*, 103(3): 241-261. https://doi.org/10.1080/07078552.2022.2161229

Hawksworth, J., Berriman, R., & Goel, S. (2018). *Will robots really steal our jobs? An international analysis of the potential long term impact of automation*. London: PricewaterhouseCoopers LLP.

Heckmann, C. (2022). What is Socratic Dialogue — Definition, Examples & Uses. Studiobinder. https://www.studiobinder.com/blog/what-is-socratic-dialogue-definition/

References

Heimann, R. (2023). ChatGPT: It can tell but does not know. https://bdtechtalks.com/2023/03/02/chatgpt-polyani-paradox/

Honneth, A. (2000) Das Andered er Gerechtigkeit.Au fsatzez ur praktischen Philosophie. Frankfurta m Main: Suhrkamp Verlag.

Honneth, A. (2007). *Recognition as ideology*. In B. van den Brink & D. Owen (Eds.), Recognition and power: Axel Honneth and the tradition of critical social theory, Cambridge: Cambridge University Press.

HR Ministry wants 60pc of SPM leavers to enter vocational training, Malay Mail, December 3, 2019, https://www.malaymail.com/news/ malaysia/2019/12/03/hr-ministry-wants-60pc-of-spm-leavers-to-enter-vocational-training/1815618

Jeyaraj, P. (2021). Supreme Court Ruling on Uber Drivers Highlights Lack of Legal Certainty in Employment Law. Zero Hours Justice. https://www.zerohoursjustice.org/blog/supreme-court-ruling-on-uber-drivers-highlights-lack-of-legal-certainty-in-employment-law

Jun, S. W. (2023). Padu, a tool to ensure govt's efficiency in delivering targeted subsidies, to be launched today. Malay Mail. https://www.malaymail.com/news/malaysia/2024/01/02/padu-a-tool-to-ensure-govts-efficiency-in-delivering-targeted-subsidies-to-be-launched-today/110085

Kaplan, J. (2015). *Humans Need Not Apply: a Guide to Wealth and Work in the Age of Artificial Intelligence*. New Haven: Yale University Press.

Keen, A. (2015). The Internet is Not the Answer. Atlantic Monthly Press.

Keynes, J. (2009). Economic possibilities for our grandchildren. Accessed from http://www.econ.yale.edu/smith/econ116a/keynes1.pdf

Kurzweil, R. (2006). *The Singularity is Near: When Humans Transcend Biology*. London: Penguin.

Levy, F, & Richard J. M. (2004). The New Division of Labor: How Computers Are Creating the Next Job Market. Princeton University Press.

Maier, J. (2017). Chair, Made Smarter Review 2017 Department for Business, Energy and Industrial Strategy. London: HM Government. Accessed through https://assets.publishing.service.gov.uk/media/5a74fceced915d502d6cc9dd/20171027_MadeSmarter_FINAL_DIGITAL.pdf.

Malaysia Digital Economy Blueprint. (2021). Economic Planning Unit, Prime Minister's Department. https://www.ekonomi.gov.my/sites/default/files/2021-02/malaysia-digital-economy-blueprint.pdf

Manyika, J., Chui, M., Miremadi, M., Bughin, J., George, K., Willmott, P., & Dewhurst, M. (2017a, January). *A future that works: Automation, employment and productivity*. San Francisco: McKinsey Global Institute.

Manyika, J., Chui, M., Madgavkar, A., & Lund, S. (2017b, January). *Technology, jobs and the future of work*. San Francisco: McKinsey Global Institute.

Marx, K. (1847). *Wages*. In Works of Karl Marx. MECW. (Original work published 1924 in Russian in the journal Sotsialisticheskoye khozyaistvo and 1925 in German in the journal Unter dem Banner des Marxismus).

Marx, K. (1932). *Economic and Philosophic Manuscripts of 1844.* (M. Milligan, Trans.). Moscow: Progress Publishers. (Original work published 1844).

References

McAfee, A., & Brynjolfsson, E. (2016). Where Computers Defeat Humans, and Where They Can't. The New York Times. https://www.nytimes.com/2016/03/16/opinion/where-computers-defeat-humans-and-where-they-cant.html

Moravec, Hans. 1988. *Mind Children: The Future of Robot and Human Intelligence.* Harvard University Press.

Morgan, J. (2019). Will we work in twenty-first century capitalism? A critique of the fourth industrial revolution literature. Economic and Society, 48(3): 371-398. DOI: 10.1080/03085147.2019.16200

Naidu, S et al. (2018). More and more companies have monopoly power over workers' wages. That's killing the economy. Vox. https://www.vox.com/the-big-idea/2018/4/6/17204808/wages-employers-workers-monopsony-growth-stagnation-inequality

Ng, A. (2017). The Times They Are A-Changin': Technology, Employment, and the Malaysian Economy. Khazanah Research Institute. https://www.krinstitute.org/Discussion_Papers-@-The_Times_They_Are_A-Changin'-;_Technology,_Employment,_and_the_Malaysian_Economy.aspx#:~:text=It%20is%20estimated%20that%20more,jobs%20are%20held%20by%20Malaysians

Noran, N. (2023). Media Prima Audio to Ride the Opportunities in AI. BFM. https://www.bfm.my/podcast/morning-run/pressing-matters/media-prima-audio-radio-kj-dj-ai-advertise

O'Sullivan, I. (2024). Companies That Have Already Replaced Workers with AI. Tech.co. https://tech.co/news/companies-replace-workers-with-ai

Over Four Million M'sians Likely to Lose Jobs by 2030 if They Lack Skills. (2023). The Star. https://www.thestar.com.my/news/nation/2023/06/26/over-four-million-msians-likely-to-lose-jobs-by-2030-if-they-lack-skills

Polanyi, Michael. 1966. *The Tacit Dimension*. New York: Doubleday.

Poo, C. (2021). The State of the Nation: New approaches needed to tackle unemployment in 2021. The Edge Malaysia. https://theedgemalaysia.com/article/state-nation-new-approaches-needed-tackle-unemployment-2021

Rifkin, J. (2014). The Zero-Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism. St Martin's Griffin.

Ruby, D. (2024). 11 Incredible Things Only GPT-4 Can Do. DemandSage. https://www.demandsage.com/things-only-gpt-4-can-do/

Russell, B. (2004). *In Praise of Idleness and other essays*. London and New York: Routledge.

Schwab, K. (2016). The Global Competitiveness Report. World Economic Forum (WEF). https://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf

Semuels, A. (2020). Millions of Americans Have Lost Jobs in the Pandemic—And Robots and AI Are Replacing Them Faster Than Ever. TIME. https://time.com/5876604/machines-jobs-coronavirus/

Shareen, S. (2017). Visioning Malaysia's Future of Work: A Framework For Action. Talent Corp. Accessed https://www.talentcorp.com.my/clients/TalentCorp_2016_7A6571AE-D9D0-4175-B35D-99EC514F2D24/contentms/img/publication/TalentCorp_Visioning%20Malaysias%20Future%20of%20Work_2017.pdf

References

Sim, O. F., & T. A. Hamid. (2010). Social Protection in Malaysia – Current State and Challenges Towards Practical and Sustainable Social Protection. In Asher, M. G., S. O., & F. P (Eds.), Social Protection in East Asia – Current State and Challenges (pp. 182-219). ERIA Research Project Report 2009-9, Jakarta: ERIA.

Smith, N. (2018a). Post-Work Won't Work. Iai News. https://iai.tv/articles/post-work-wont-work-auid-1081

Smith, N. (2018b). When work stops working [Interview with David Rutledge]. The Philosopher's Zone. ABC National Radio. Retrieved from http://www.abc.net.au/radionational/programs/philosopherszone/when-work-stopsworking/10013266

Standing, Guy. (2017). *Basic Income: And How We Can Make It Happen*. London: Penguin.

Susskind, D. (2017). Re-Thinking the Capabilities of Machines in Economics. University of Oxford Department of Economics Discussion Paper Series. Oxford.

Tan, R. (2024). RM1bil for new Bumiputera entrepreneurship fund, says Anwar. FMT. https://www.freemalaysiatoday.com/category/nation/2024/03/02/rm1bil-for-new-bumiputera-entrepreneurship-fund-says-anwar/

The pros and cons of universal basic income. (2021). Penguin Random House. https://www.penguin.co.uk/articles/2021/02/universal-basic-income-pros-cons

Torry, Malcolm, ed. (2019). *The Palgrave International Handbook of Basic Income.* Cham, Switzerland: Palgrave Macmillan.

Wadhwa. (2015). Sorry, but the jobless future isn't a luddite fallacy. The Economic Times. https://economictimes.indiatimes.com/news/economy/policy/sorry-but-the-jobless-future-isnt-a-luddite-fallacy/articleshow/47983556.cms?from=mdr

Weeks, K. (2011). *The Problem with Work: Feminism, Marxism, Antiwork Politics, and Postwork Imaginaries*. Durham: Duke University Press.

What is a large language model (LLM)? (2024). Elastic.co. https://www.elastic.co/what-is/large-language-models#examples-of-popular-large-language-models

What is 'Law of diminishing utility'. The Economic Times. n.d. https://economictimes.indiatimes.com/definition/law-of-diminishing-utility

Williams, A. & Srnicek, N. (2013, May 14). #ACCELERATE MANIFESTO for an Accelerationist Politics. Critical Legal Thinking. Retrieved from http://criticallegalthinking.com/2013/05/14/accelerate-manifesto-for-anaccelerationist-

Wolff, J. C. (2015). Technological Unemployment and a Theoretical Solution to its Imposing Threats. *Journal of Socialomics*, 4(2). DOI: 10.4172/2167-0358.1000120.

World Employment and Social Outlook: Trends 2016. (2016). International Labour Organization. https://www.ilo.org/global/research/global-reports/weso/2016/WCMS_443480/lang--en/index.htm

World Economic Forum. (2016). The future of jobs: Employment, skills and workforce strategy for the fourth industrial revolution. Geneva: World Economic Forum.

Wright, R. E., & Przegalińska. A. (2022). *Debating Universal Basic Income: Pros, Cons, and Alternatives.* Palgrave Macmillan.