

Technology: Killer or Saviour?

Kiva robots. That's the name of Amazon's "holiday workers" in a warehouse located in Tracy, California. Kiva robots are like orange suitcases on wheels that makes the shelves in warehouses come to you. More than 3000 of these robots cruise Amazon's warehouse floors in California, helping employees complete millions of orders. Before Kiva robots, Amazon workers had to comb through warehouse aisles just to find certain products to complete shipments. Now, workers just stay on platforms while the robots bring the shelves with the items directly to them. These 320-pound robots can lift up to more than 2 times their weight, has motion sensors to detect objects in their way and can travel at 3-4 miles per hour. The robot's small footprint allows it to fit up to 50% more inventory in the warehouses while simultaneously increasing efficiency up to 20%, filling orders in 15 instead of 90 minutes. Many worry about the jobs taken away from them by these robots, however this was not Amazon's intention. But still, can we deny the number of workers these robots have replaced?

Applied technology can be evidently traced back to as early as the pre-16th century. In ancient Greece and Rome, many free workers became jobless due to simple ancient Greek technology in that period such as gears, screws, rotaries and mills. To overcome this, leaders in that era launched many public works such as infrastructure projects and recreational projects financed by the government to create jobs for the people. Some rulers go to the extent of refusing or banning new inventions and innovations to save labour costs. Emperor Vespasian, a Roman emperor rejected a new method of cost-effective transportation of heavy merchandise saying: "You must allow my poor hauliers to earn their bread." In the medieval and renaissance period, European authorities often sided with "guilds" or the majority of the working population and proceeded to refuse or ban new technologies. The constant dilemma of whether to adopt new technology can be seen in the 16th-18th century in Great Britain. The effect of innovation on employment became a concern which can be evidently seen when Queen Elizabeth I declined to issue a patent for a knitting machine invented by an English clergyman called William Lee on the account that it might cause the layoff of textile workers.

In the 19th century, many controversies and debates over technological unemployment arose. David Ricardo, a British political economist voiced his opinion on the implementation of technology and believing that it is often very injurious and harmful for workers when people substitute machine for human jobs. While many other economists supported his stand, a French economist named Jean Baptiste Say was the first to respond to Ricardo's argument saying that machinery does not compete with labour, and society would be better off because of the increased productivity. Say mentioned that a new machine supersedes a portion of labour of a human worker, but does not reduce the amount of product, saying that it would be absurd to adopt it if it did. At that time, water carriers were relieved of duty due to the introduction of the hydraulic engine. Say could not deny the problem and recognised that the water carriers were still unemployed. Therefore, he believed that 3 factors would considerably alleviate the detrimental effects of unemployment:

1. New machines are gradually created and still more gradually brought into use, giving those who are affected time to adjust.

2. Machines cannot be created without the input of considerable human labour, which can create jobs for some workers even as machinery may put others out of work.

3. The circumstances of consumers, including workers affected by the replacement with machinery, is improved by the lower prices of consumer products. [Adapted and paraphrased from Bruce Bartlett (1984) Cato Journal, vol. 4(2), pages 625-650]

How would replacing 50% of the current jobs with technology look like for Malaysia, a developing country? Firstly, the controversial problem still remains - workers in Malaysia would be susceptible to technological unemployment or tech layoff. Figure 1 below depicts Malaysian jobs at risk of automation. With AI (Artificial intelligence) on the rise, and automation replacing jobs, semi-skilled and low skilled workers are at a high risk of losing their jobs. 90% of semi- skilled jobs such as support workers and salespeople consist of Malaysians and 4 out of 5 jobs at high risk of displacement are semi-skilled jobs as compared to low-skilled jobs. Although Malaysia heavily depends on low-skill foreign labour especially in manufacturing and industrial sectors and there is a possibility of the replacement with technology reducing our reliance on it, the probability of Malaysians being put out of their jobs is higher, leaving a large figure of Malaysian workers unemployed. This is because most blue-collared jobs are highly susceptible to automation and ironically, a large portion of those positions are held by Malaysians. This might cause Malaysians to switch to lower pay jobs or not being employed at all. The sosio-economy of Malaysians would be under immense pressure. Unemployed Malaysian workers would have to suffer a lower standard of life. Occupations that are routine based and have many manual tasks are more susceptible to replacement by technology as compared to jobs that are non-routined and require high cognitive skills. At the end of the day, although our economy may be growing due to rise in productivity and lower price in the long term, the wellness of our own Malaysian citizens may be neglected in the short term.

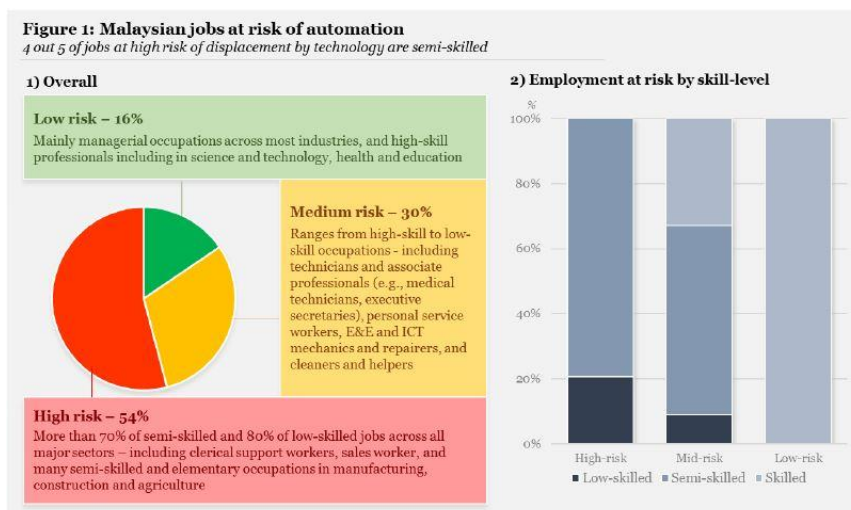


Figure 1: Malaysian jobs at risk of automation

Source: Methodology adapted from Frey and Osborne (2013) and ILO (2016) data from ILOSTAT and DOSM, author's calculation [Adapted from *The Times They Are A-Changin': Technology, Employment, and the Malaysian Economy* by Allen Ng, Khazanah Research Institute]

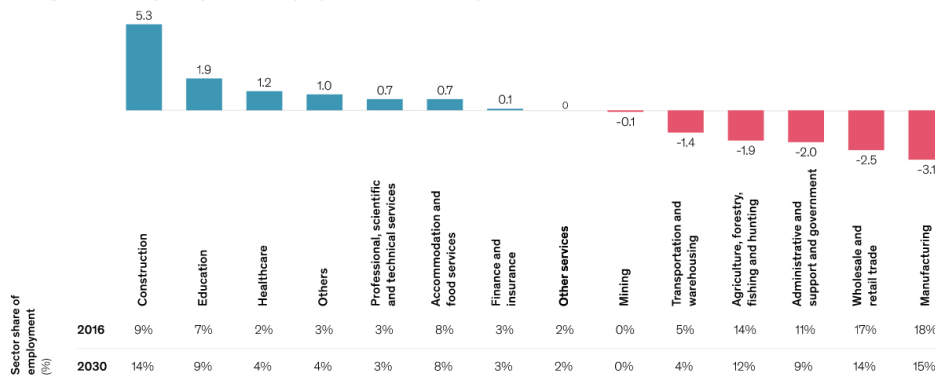
Not only are the welfare of Malaysians put at risk, but also the scale of the economic equality in Malaysia will be tipped. With the replacement of workers with technology, companies that adopt labour-saving technologies will monopoly the industries. Some firms have exclusive rights to methods of manufacturing products causing smaller firms to lose out in competitiveness because of higher cost-per-unit. This will cause a great difference in terms of income among high skilled workers and technology owners versus semi-skilled and low skilled workers. A greater inequality of wages within occupations will arise as only certain workers have the skills needed for certain jobs. Skills that are hard to acquire in the technological field also can cause wages to be unequal. On top of that, income inequality may result in a higher rate of health problems and social problems.

On another note, replacement of human labour with technology will cause Malaysia to face a massive restructuring in different sectors in the economy. As higher productivity with new technology lowers prices of goods and opens new sectors to be explored, new labour demand will be created in certain sectors. The demand for jobs will switch from manufacturing sectors to services in the future, just like how the demand for jobs switched from agricultural sectors to manufacturing sectors in the late 90s in Malaysia. The chart below depicts the change in share of jobs by sector, recording the construction with the highest share and the manufacturing sector a negative figure. An increasing proportion of jobs require at least a college level certificate if not advanced degrees. This proves the need for Malaysians to upgrade their skill levels to be qualified and to keep up with the times.

The job mix across sectors is expected to shift towards services.

Net impact of automation and 7 catalyst drivers on job share by sector, 2016-30

Change in share of jobs by sector (step-up labor demand, midpoint automation)¹



1. Midpoint of earliest and latest automation adoption in the "step-up" scenario (i.e., high job growth)
 Note: Doesn't include new occupations created
 Source: ONET, BLS, EIU, IHS, Oxford Economics, McKinsey Global Institute analysis

Figure 2: Change in share of jobs by sector

Source: ONET, BLS, EIU, HIS, Oxford Economics, McKinsey Global Institute analysis [Adapted from Automation and adaptability: How Malaysia can navigate the future of work (2020)]

In conjunction with creating new demand in the labour force across different sectors in Malaysia, the substitution of jobs with technology can possibly add more value to occupations with the human element, making jobs that require human interaction more valuable. For example, when Automated Teller Machines were first created to automate simple tasks such as simple transactions and deposits, the remaining tasks that cannot be automated became more valuable. Bank tellers became people who form personal relationships with the customers and can sell them financial services at a high margin.

On the flip side, wealth distribution becomes an uprising problem as not everyone is given a fair share even with increased productivity and lower cost. Advancement in various sectors may result in a digital divide between different regions and demographics. Urban areas may continue to advance whereas rural areas which are neglected continue to deteriorate in terms of technological advancements because of the failure of implementation of technology as a whole. Areas that have limited access lack the resources to advance in technology. This may possibly create a wider gap between regions and races socially and in terms of progress and cause an increase in poverty among different races in Malaysia.

However, we cannot deny the possibility of Malaysia flourishing with the implementation of technology. In the 1990s the Malaysian government has always put a priority in making Malaysia an industrialized country with the 7th prime minister, Tun Dr Mahathir Mohamad launching Wawasan 2020. Since then, many efforts have been made in increasing Malaysia's use of technology in different sectors. Though the replacement of jobs with technology might upset the labour force and possibly obsolete the field of manual labour in certain sectors in the short term, the demand for labour force in other trades will significantly increase in the long term. Increased production would increase supply, lowering the general cost of items, increasing the national dividend thus increasing our competitiveness in the global market. With time, a new demand of labour will be created placing new, skilled workers in those fields. Economic growth as a whole can be accelerated.

Technology replacing 50% of jobs also create high income jobs or increases the wages of existing workers that are involved in the field of technology but also widen existing income inequality at the same time. According to a study by Justin Lim, Kevin Wong, Rosaida Mohd Rasep and Sonia Kumari Selvarajan (2018), wages per worker in the ICT industry has risen proportionately from RM38,274 per annum to RM53097 per annum in 2015 whereas wages of workers in the non-ICT industry only rose by RM6150 in the course of 5 years. Because workers in the ICT industry comprise of a small share of the total labour force and small employment growth, the wage disparity between non-ICT workers and ICT workers has been widening and would likely continue to widen even more over time.

Table 1: Wage per worker of ICT vs non-ICT Industry

	2010	2015	CAGR
	RM per annum		%
ICT	38,274	53,097	6.8
non-ICT	20,478	26,628	5.4
<i>ICT wages as a multiple for non-ICT wages</i>	<i>1.87</i>	<i>1.99</i>	-

Source: DOSM ICT Satellite Account, GDP by Income Approach, authors calculations

Figure 3: Wage per worker of ICT vs non-ICT Industry

Source: DOSM ICT Satellite Account, GDP by Income Approach, authors calculations [Adapted from Wage premiums in the digital economy: Evidence from Malaysia (2018)]

With new technology being constructed, Malaysia can explore the possibility of taxing new technology or “robot taxes”. According to The Telegraph, Bill Gates even voiced out the opinion that robots that take away jobs from humans should be taxed, which can make up for income taxes from workers that lost jobs. This could slow down the speed of automation and its negative effects on the labour force. In August 2017, South Korea became the first to introduce the world’s first tax on robots by cutting tax incentives for investments to boost productivity. If 50% of jobs were to be replaced, taxes on technology could increase the country’s income and improve the citizen’s standard of life by giving back to the people, increasing economic development through new infrastructure digitally and physically.

In general, technology replacing 50% of jobs in Malaysia benefits most of the stakeholders in the long run and has the potential to generate economic wealth for Malaysia. New innovations and technology are churned out on a daily basis due to globalization. To be able to compete in the global market, Malaysia has to keep up with the times and take bold steps in adopting new technology in various sectors. Though there is a possibility of technology replacing human jobs, nothing beats the value of a human’s touch. To dampen the adverse side effects of replacing human workers with technology, policy makers need to create new alternatives in helping displaced workers readjust to new sectors and work environments. As for Malaysian citizens, we must not stand by the side lines idly, but instead hop on the wagon of change. Being active players in the labour force, we must not take the importance of education (especially in the field of technology) lightly and sharpen our sword of education thus increasing our skills. Only with technological intelligence can we as Malaysians stand out in the global market as drivers of change, standing out amongst nations that are technologically advanced.

(1997 words)

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