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SHORT COMMUNICATION

Industrial Revolution 4.0: An Overview of Readiness and Potential Economic Effects in Malaysia from Millennial's Perspective

Rafiq Idris

Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah, Malaysia

E-mail address: rafiq.idris@ums.edu.my

ABSTRACT

Industrial Revolution 4.0 (IR 4.0) and Internet of Things (IOT) have become subjects of much interest in recent years and are expected to gain momentum locally and internationally when they become part of the core initiative of various governments. With the advent of the 4th global industrial revolution, the government recognized the importance of integrating the IR 4.0 initiative into the national agenda as a mean to keep pace with the latest advancements. In this regard, is the Malaysian workforce ready for the change? How is this being perceived by the millennials? Are millennials familiar with internet of things, FINTECH, additive manufacturing, big data or smart manufacturing? This study attempts to investigate whether or not millennials studying at local public university are clear about IR 4.0. In addition, the study attempts to seek millennials on various issues pertaining IR4.0. A survey involving 400 students of public university in Malaysia are being undertaken. The finding of the study indicates that 90% of the respondents have heard about IR4.0. In addition, 70% expressed that they have some understanding on what is happening and expected to happen in the Fourth Industrial Revolution (IR 4.0) in general. There are also concern with regard to the potential impact of IR4.0 on unemployment and the economy.

Keywords: Industrial Revolution 4.0, millennials, public university, readiness, potential effects

1. INTRODUCTION

Industrial Revolution 4.0 and Internet of Things (IOT) have become subjects of much interest in recent years and are expected to gain momentum locally and internationally when they become part of the core initiative of various governments. With the advent of the 4th global industrial revolution (IR), the government recognized the importance of integrating the IR 4.0 initiative into the national agenda as a mean to keep pace with the latest advancements. The Malaysian government in its recent budget presentation announced that there will be some allocations to encourage transformation of companies into IR4.0.

IR 4.0 will make machine more intelligent where it gives manufacturers insights they never had before. Automation process is used in factory for the production in the manufacturing sector. The used of automation in factory are called smart factory. Having said all the above, is Malaysian workforce ready for the change? How is this being perceive by the millennials? Are millennials familiar with internet of things, FINTECH, additive manufacturing, big data or smart manufacturing? What are the potential impacts of IR4.0?

A recent study on IR 4.0 readiness involving 1500 corporate executives or CXOs across 19 countries revealed that only 14% of CXOs are highly confident their organizations are ready to fully harness industry 4.0's changes (Deloitte, 2018 [1]). In addition, only a quarter believe that they have the right workforce (Deloitte, 2018 [1]). Despite all these, 84% expresses that they strive to create a workforce suitable for IR 4.0 (Deloitte, 2018 [1]).

2. MATERIALS & METHOD

Limited studies are found with regard to IR4.0 in Malaysia. Several literatures on industrial revolution in general and specifically IR 4.0 have been reviewed such as by Crafts, N.F.R. (1985) [1], McCloskey, D.N. (1981) [2], H. Kagermann *et.al* (2013) [3], Chang-Tai Hsieh (2002) [4], Gregory Clark (2010) [5], Lucas, R.E. (2002) [6], Deloitte (2018) [7] P. Temin (1997) [8], Harlet and C. Knick (1982) [9], Deanne Phylis (1965) [10], Davis, Ralph (1979) [11], J. Rifkin. (2011) [12], McAfee, A. and Brynjolfsson, E. (2012) [13], Schwab, K. (2016) [14], Sandler, U. (2018) [15], Thames, L. and Schaefer, D. (2017) [16], Zikopoulos, et.al. (2011) [17], Michael C. Jensen (1993) [18] and Williamson, J.G. (1984) [19] and Jackson, R.V., (1992) [20]. A survey involving 400 respondents who are public university students in Malaysia are being undertaken by distributing questionnaires.

3. RESULTS & DISCUSSION

Table 1. General Questions and Response from Millennials

QUESTIONS	YES	NO
Have you heard about additive manufacturing?	70%	30%
Have you heard about additive internet of things?	90%	10%

Have you heard about big data?	80%	20%
Have you heard about smart factory?	85%	15%
Have you heard about FINTECH?	30%	70%

Table 2. Response from Millennials on Preparation, Effort to Educate Millennials and Embrace IR 4.0

STATEMENT / QUESTIONS ON IR 4.0	Not Important at all	Not important	Important	Extremely important
Education or awareness program on IR 4.0 for millennials is important	0%	5%	20%	75%
Funding by the government is important in transforming companies to IR4.0	5%	5%	30%	60%

Figures 1-7 indicates the findings of the study.

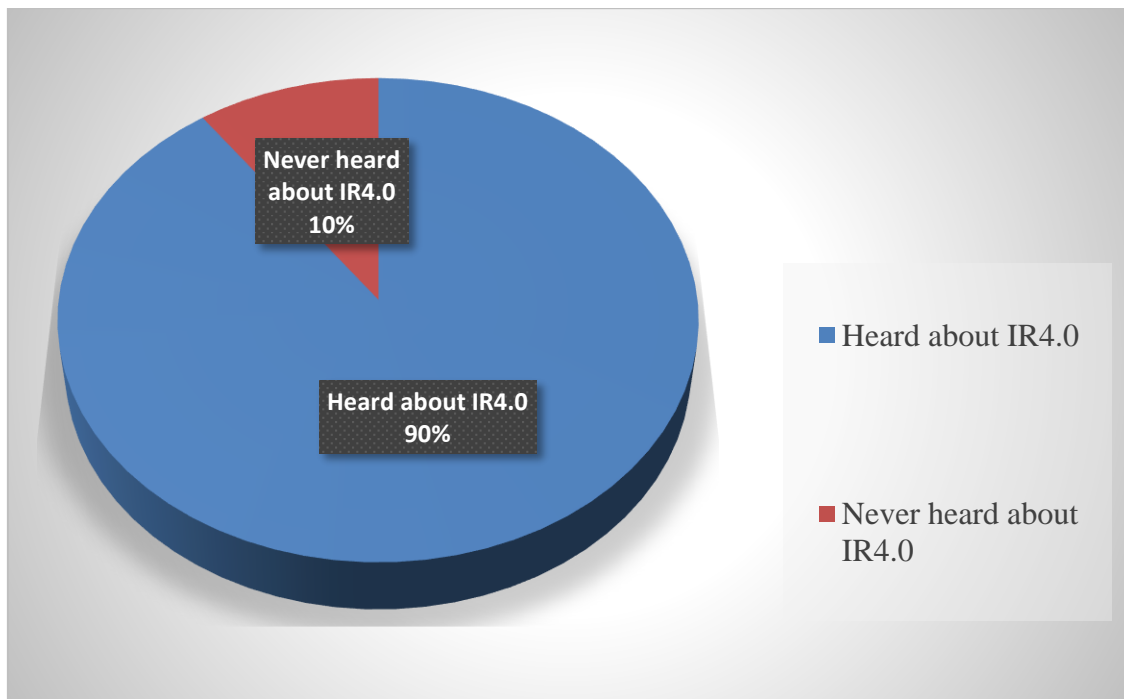


Figure 1. Millennials on IR 4.0 (% of respondents)

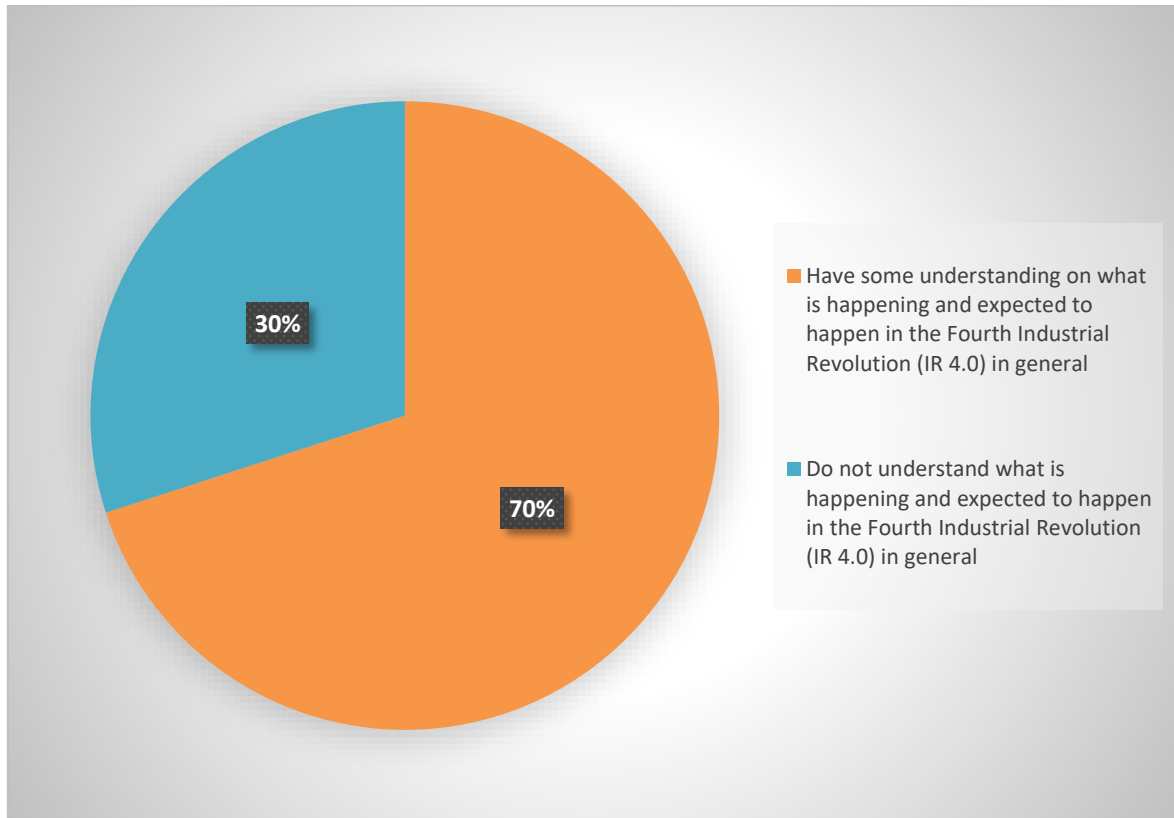


Figure 2. Millennials Understanding on IR 4.0 (% of respondents)

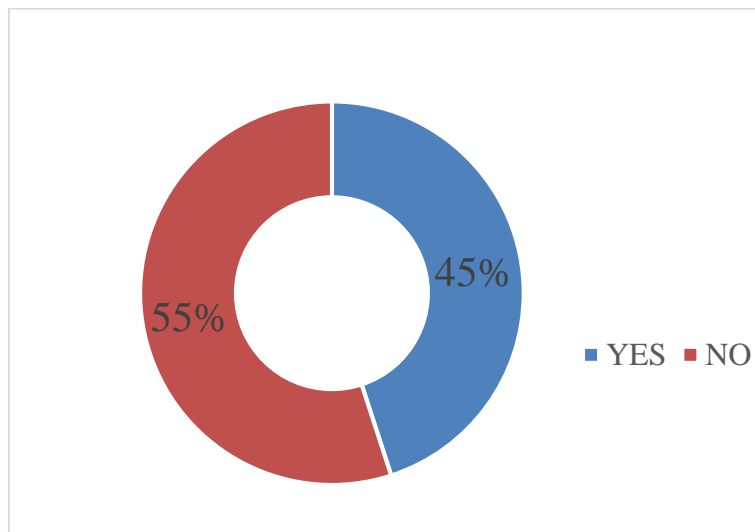


Figure 3. Do you think many other millennials know what IR 4.0 is? (% of respondents)

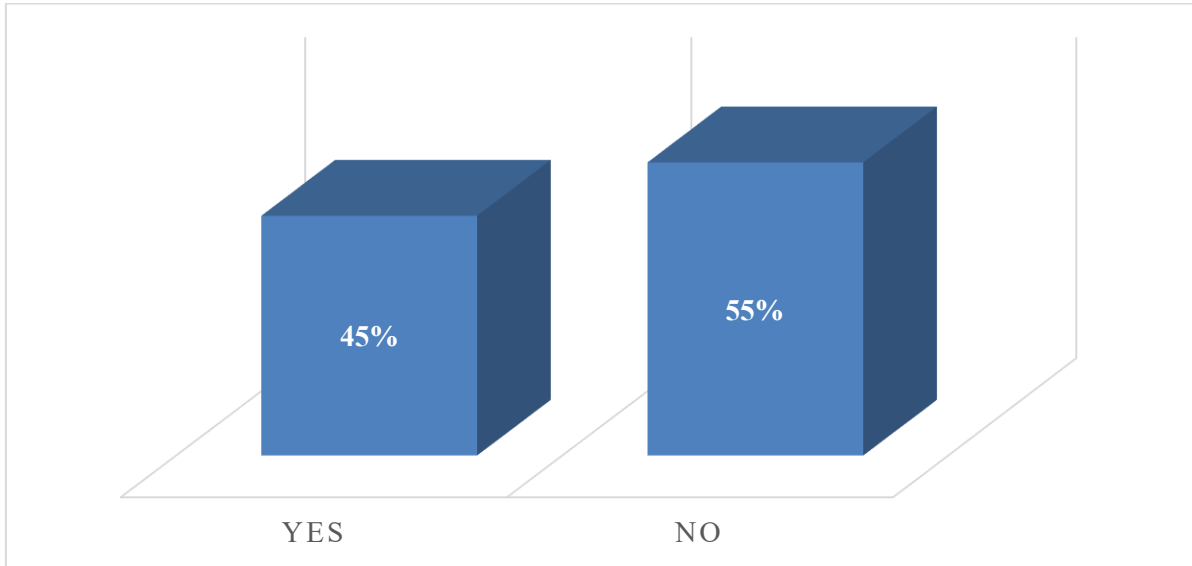


Figure 4. Do you think university has given enough effort in educating or creating awareness among millennials on IR 4.0? (% of respondents)

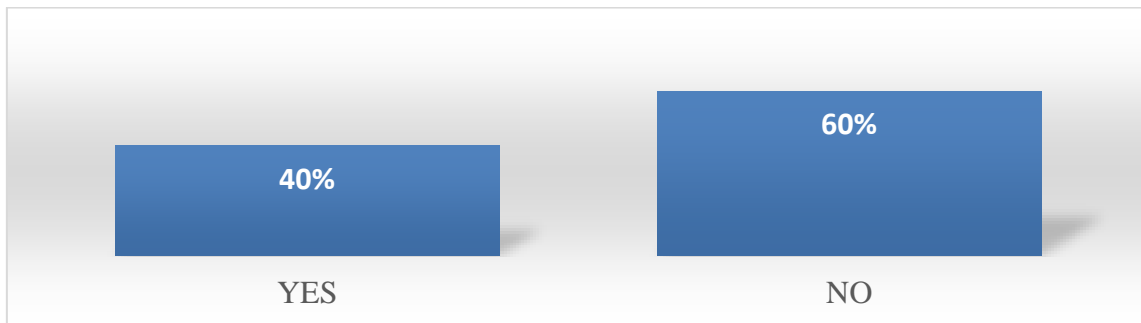


Figure 5. Do you think the infrastructure is ready in Malaysia to embrace IR 4.0? (% of respondents)

Figure 1-5 indicates that majority of the respondents have heard about IR 4.0, additive manufacturing, big data, smart factory and internet of things. On contrary, only 45% of the respondents think that many millennials know what IR 4.0. Moreover, about 30% have not heard about FINTECH.

With regard to preparation and effort to educate millennials and embrace IR 4.0, 75% of the respondents think that education or awareness program on IR 4.0 for millennials is extremely important and 20% thinks it is important. In addition, 30% and 60% of the millennials think that funding by the government is important or extremely important respectively in transforming companies to IR 4.0.

What are the potential macroeconomic implications of IR 4.0 on Malaysia? Figure 6 & 7 shows what millennials think with regard to potential effects. Efficiency gains confer cost benefits, which translates into more competitive pricing of Malaysian products (and exports).

More competitively priced exports have the potential to boost export volume, and stimulate the Malaysian economy. In other words, IR 4.0 may improve the competitiveness of Malaysian exports, thereby raising its Gross Domestic Product (GDP). A higher GDP translates into more income which may further boost the industrial sector and potentially employment.

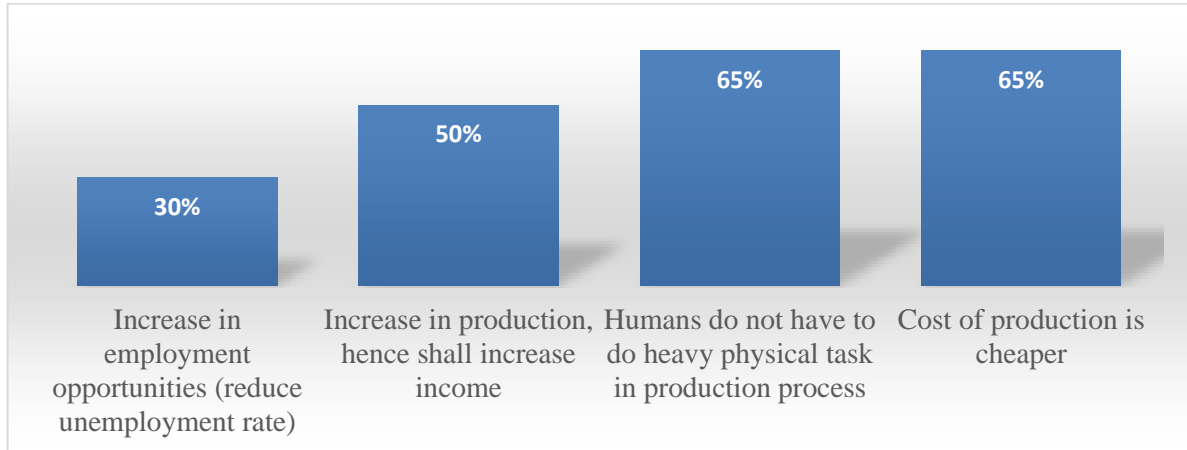


Figure 6. Potential Positive Effects (% of respondents)

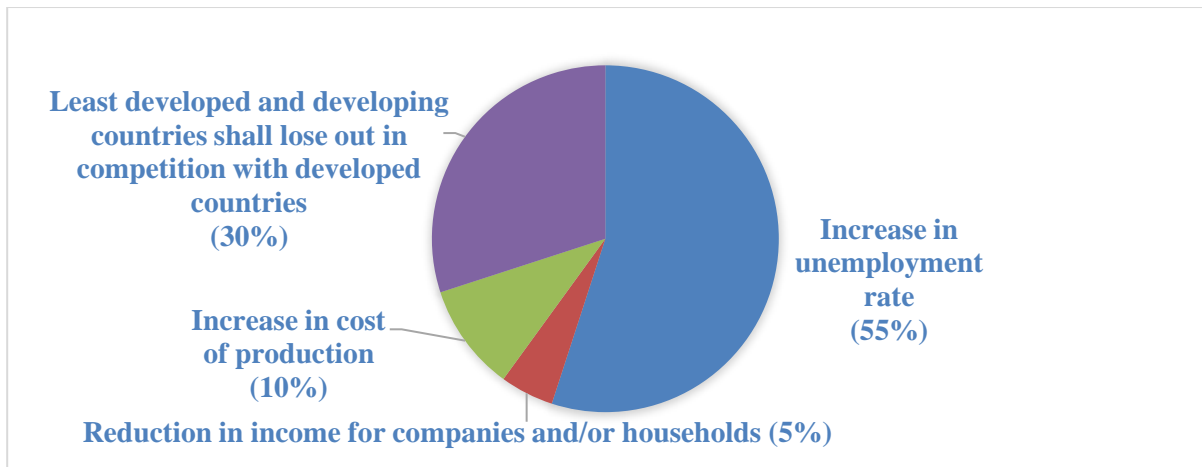


Figure 7. Potential Negative Effects (% of respondents)

When at least large corporations can lower cost of production as well as operation cost due to IR 4.0, price of goods and services to be sold might be lower and that as a result has the potential to make Malaysian products more competitive. This can happen if Malaysia adapt to changes fast, benefiting from early mover advantage. On the other hand, it may be argued that increased automation implies that employment opportunities may be reduced for highly manual jobs involving repetitive tasks. There is a potential that some will be out of job due to this wave as robots are taking human role for some activities. However, this is not expected to occur across all jobs, some large scale factories are already automated. The real benefit of IR 4.0 lies

in access to and learning from big data. These are likely to create new dimensions of employment, too.

4. CONCLUDING REMARKS & RECOMMENDATIONS

To sum up, majority of the respondents have heard about IR4.0. At the same time the respondents think that majority of the millennials never heard about IR4.0. The study also found that it is imperative that the necessary infrastructure is ready and available to meet the requirements for transition to IR 4.0. For example, internet services have to be further improved nationwide in terms of coverage and speed. This is necessary to fully capitalize on IOT and big data. Without the necessary infrastructure, the benefits of IR 4.0 will not manifest. In addition, the millennials aware that there are potential economic cost and benefits of IR 4.0.

What are the study recommendations to ensure that the Malaysian economy can benefit from IR 4.0?

Firstly, studies must be conducted in order to identify which sectors have the most potential to benefit from IR 4.0. These sectors must be given more priority, when shifting to IR 4.0. By this way, the transformative and deployment costs of IR 4.0 can be mitigated early on. This approach is also a good way of determining which activities are more suitable for automation, and the sectors that are not.

Secondly, creating awareness of IR 4.0 and stakeholders engagement is necessary. Many are still not fully aware of the importance and benefits of IR 4.0. There is a need to prepare Malaysian workforce in areas such as additive manufacturing, so that the transition to the new system is a smooth one, with minimal resistance.

Thirdly, there is a need to minimize the cost of transition to IR 4.0. Incentives should be provided to companies that are willing to transform. This not only has the benefit of reducing the cost of transformation, but also has the advantage of increasing the rate of transition to IR 4.0. There is also a need to minimize the social costs of shifting to 4.0. For example, to address possible unemployment issues arising from automation among others, the government or private sector must provide training programs or provide alternative forms of employment.

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