



**A STUDY ON READINESS OF UNIVERSITY STUDENT TOWARDS  
INDUSTRIAL REVOLUTION 4.0**



Bachelor of Technology Management with Honours (Technology Innovation)  
UNIVERSITI TEKNIKAL MALAYSIA MELAKA  
Final Year Project

Faculty of Technology Management and Technopreneurship

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

JANUARY 2023

## SUPERVISOR'S APPROVAL

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## DECLARATION

I hereby declare that the work has been done by myself supported by variety of references and no portion of the work in this research project proposal has been submitted in support of any application for any other degree or qualification of this or any other university or institute of learning.

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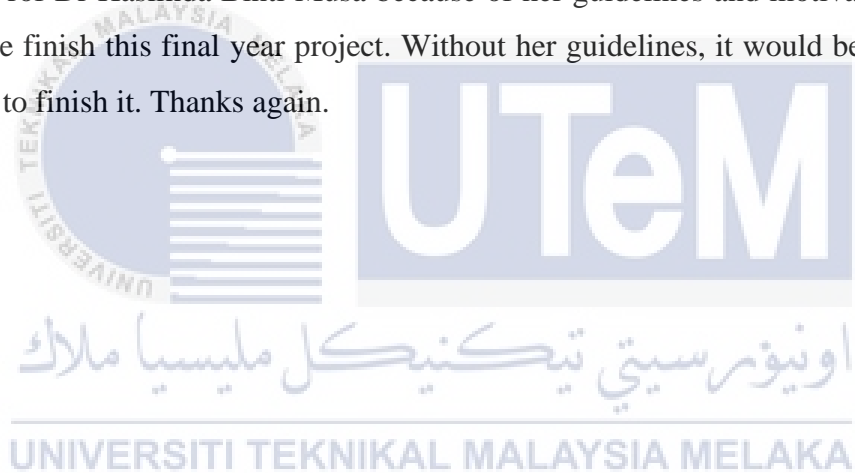
## DEDICATION

I would like to dedicate the great appreciation to my beloved family who have been my endless supported and my friends who always give encouragement and helped me to complete this final year project. Besides that, I would like to thank my supervisor, Assc. Prof Dr. Haslinda Binti Musa and panel, Dr. Sitinor Wardatulaina Binti Mohd Yusof who have guided and motivated me all the way to finish this thesis.



## ACKNOWLEDGEMENT

I am grateful to Allah SWT because of His permission for me to complete my thesis successfully. Besides that, I also want to thank to my family and my lovely friends because they have supported me as well and always give advice and inspiring me to be hardworking and try hard best to complete this thesis. Great thanks also to my supervisor, Assc. Prof Dr Haslinda Binti Musa because of her guidelines and motivations for me to struggle finish this final year project. Without her guidelines, it would be much tougher for me to finish it. Thanks again.



## ABSTRACT

Industrial Revolution 4.0 which are most often associated with industrial development is considered as combination of advanced technology like Robotics, Internet of Things, Artificial Intelligence, Cloud Computing, Big Data, 3D printing, Biotechnology and so on. It is very helpful to the industrial field but in the same it also provides the challenges especially for the young generation or university students that have no preparation or much knowledge about this forth industrial revolution. The aim of this research is to study the readiness of university students towards industrial revolution 4.0 and to determine the relationship between independent variables (knowledge, attitude, skills, habits) and dependent variables which is readiness of university students towards industrial revolution 4.0. Therefore, the expected number of respondents that will be collected as data by the researcher is 384 of respondents based on the Table of Krejcie & Morgan (1970) in sampling design. Therefore, the data analysis will be conduct using SPSS Statistics in order interpret and transform the collective data into statistic to more understand and clear to translate the data. The data analysis involving including pilot test, descriptive analysis, reliability analysis, Pearson correlation analysis, multiple regression analysis and hypothesis testing. Then, all of analysis data will be conclude into the best summary.

*Keywords: Industrial Revolution 4.0, Student's Readiness*

## ABSTRAK

Revolusi Industri 4.0 sering dikaitkan dengan perkembangan industri, suatu kombinasi teknologi seperti seperti Robotik, Internet Pelbagai, Kecerdasan Buatan, Pengkomputeran Awan, Data Besar, Percetakan 3D, Bioteknologi dan banyak lagi. Ia sangat membantu dalam bidang industri namun pada masa yang sama ia merupakan cabaran kepada generasi muda atau pelajar universiti yang kurang bersedia atau tidak berpengetahuan tentang revolusi industri 4.0 ini. Matlamat utama kajian ini ialah untuk mengetahui tentang kesediaan pelajar universiti mengenai Revolusi Industri 4.0 dan mengenalpasti hubungan antara pemboleh ubah tak bersandar (pengetahuan, sikap, kemahiran, perlakuan) dan pemboleh ubah bersandar iaitu kesediaan pelajar universiti terhadap revolusi industri 4.0. Jumlah responden yang dijangka direkodkan sebagai data oleh pengkaji ialah seramai 384 orang responden berdasarkan Jadual Krejcie dan Morgan (1970) dalam persampelan data. Oleh itu, data yang akan dianalisis menggunakan Statistik SPSS untuk memastikan data tersebut diterjemah dan diubah kepada data yang lebih mudah difahami dan jelas. Ujian yang digunakan untuk menganalisis data adalah ujian perintis, analisis deskriptif, analisis kebolehpercayaan, analisis korelasi Pearson, analisis regresi berganda dan ujian hipotesis. Kesimpulan yang terbaik akan dihasilkan daripada kajian ini.

*Kata kunci: Revolusi industry 4.0, Kesediaan pelajar*

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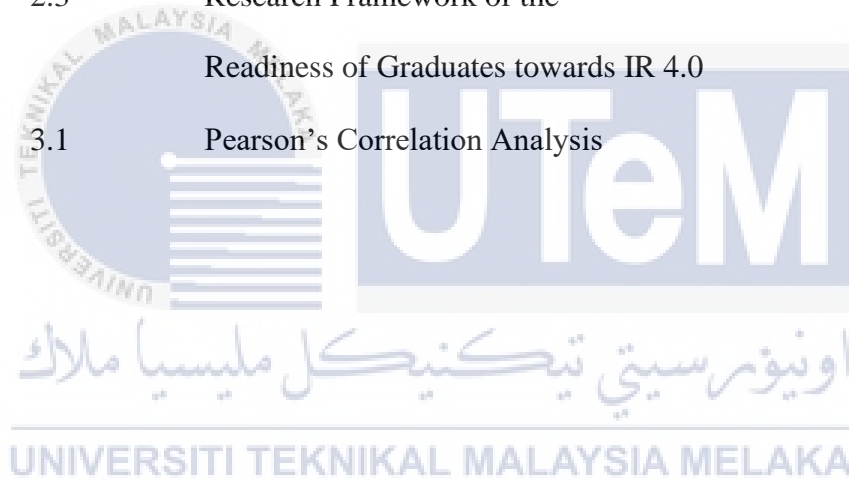
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## LIST OF ABBREVIATION

NO	ABBREVIATION	DESCRIPTION
1	IR	Industrial Revolution
2	SPSS	Statistical Package for Social Science
3	MRA	Multiple Regression Analysis



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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

This chapter will discuss and elaborate about the readiness of university students towards Industrial Revolution 4.0. It also explains about the research background, problem statement, research questions, research objectives, scope, and limitation of study, significant of study and summary.

### 1.2 Research Background

There have been three distinct kinds of industrial revolutions in the history of the globe, and all of these revolutions was brought about by revolutionary breakthroughs. The first industrial revolution turned our agricultural economy into an industrial one. Products were made for the first time, and processes were automated. During this era, the finding of coal and its mass mining, as well as the invention of the steam generator and iron forge, transformed the production and interchange of products. The first industrial revolution was fueled by coal, whereas the second is powered by the invention of electricity, gas, and oil. These power sources accompanied the development of the internal combustion motor. Nuclear energy and electronics arrive in century. Nuclear power originated in Europe, flourished in Britain and the U.S., and then developed in Asia. As the 4th industrial



revolution continues, the Internet of Things, cloud technology, and AI will evolve, and the virtualized worlds will combine.

Day by day, more and more graduates have graduated, while job opportunities are limited. Then came the increase in unemployment among graduates. According to the Minister of Higher Education, YB Dato 'Seri Idris Jusoh (2017), a total of 54,103 graduates of institutions of higher learning (IPT) in the country are still unemployed within six months after graduating based on the Graduate Tracking Survey system in 2006. Lasakova, Bajzikova, and Dedze (2017) further recommended that in effort to cope with advancement in IR 4.0, the government may consider updating the curricular model by emphasizing the development of the necessary competencies in students based on IR 4.0 requirements.

In line with the Industrial Revolution 4.0, it is expected to have a huge impact on the world of work. According to YB Dato 'Seri Idris Jusoh (2017), the emergence of the cyber-physical system that is plaguing the world will cause 60 percent of the current jobs to disappear by 2050. Therefore, students must have the same mindset in resisting the currents of the Revolution The Fourth Industrial or Industrial Revolution 4.0. Students are also affected by the Industrial Revolution 4.0 where many employment sectors use robotic automation.

### **1.3 Problem Statement**

The degree of students understanding of Industrial Revolution 4.0 and preparation for Industrial Revolution 4.0 challenges is disturbing. The significance of this research is in assessing students understanding of the Industrial Revolution 4.0 and their preparedness to face it. According to Sandrine Kergroach (2017), future technologies will certainly bring massive automated and irreparable work structure adjustments, posing huge issues for labour markets and authorities responsible for encouraging skills and employment.

More individuals losing their employment due to economic issues and new technology is worrying. Banks, insurers, builders, and manufacturers may be impacted.

Malaysia's workforce figures climbed by one percent to 14.7 million individuals last year, up from 14.5 million the year before. According to Dr. Mohd Uzir Mahidin (2017), an increase in the working population of 96,000 persons to 14.2 million people led to the increase. The labor force participation rate (LFPR) in Malaysia was 67.7% in 2016, down 0.2 percentage points from 2015. This is because they are not seeking a job since they are still studying, have a family to support, will complete their education, are disabled, and have no desire.

The country is predicted to gain 1.5 million employment as a result of the Fourth Wave of the Industrial Revolution (industry 4.0). In addition, the government is aiming for around 35% of the total labor necessary. If students are adept at grabbing the chances available, the Industrial Revolution 4.0 will not limit the amount of employment accessible to people, but will instead generate diverse fields of industry that demand more high-skilled occupations (Dato 'Sri Richard Riot Jaem, 2017). Industry 4.0 poses new difficulties for all sectors in Malaysia, which must adapt to digital transformation to remain competitive and guarantee that Malaysia is on pace to reach developed nation status.

Besides that, the advancement of Industrial Revolution 4.0 and disruptive technology which are accompanied by the formation of new value creation networks and redistribution of production facilities that make the processes of technological development and new value chains' formation are turbulent. This will create new technology gaps between developing and developed countries and give a critical impact on national economic growth like productivity, job creation, employment, and population income (Vishnevsky et al., 2019). Based on an article Civil Engineering Graduates Towards Industry Revolution 4.0, the reaction from IR introduction in Malaysia on 18 September 2018 gives impact to the graduating student whom seeking for employment

where specific skills were required by the industry. This creates a gap of skills between them. The finding reveals that the most skill required by the industry are Computational thinking follow by Social Intelligent and Design Mindset based on an analysis (Rashidah et al).

Fourth industrial revolution is causing tremendous uncertainty as the development transform the way of live and work. It is including change the job profiles and therefore requires employees with a wide range of competencies especially to the digital skills that lastly result in the graduate employment rate in Malaysia was more than three times higher than national unemployment (Khan et al., 2021). It is a big challenge especially for graduate students that lack of required skills and knowledge about Industrial Revolution 4.0. The IR 4.0 which introducing multiple tools is great that further streamline workflows and give humans even more freedom to accomplish greater improvement but at the same time, the preparation is very important such as have technical skills sets, problem-solving abilities and strategic capabilities to make sure their digital transition is successful and adaptable to IR 4.0.

In general, the use of technology in the field of education has grown rapidly in the world including Malaysia, and affects people from day to day until it is impossible to imagine today's world without the application of technology in daily life. Therefore, this study is important in identifying students' readiness to understand technology to ensure students' readiness for Industrial Revolution 4.0 in using technology, understanding pedagogy, and integrating technical knowledge into their learning process. In the Industrial Revolution 4.0, the essential tasks of humans will be replaced by robotic energy and millions of people will lose their jobs, especially in the manufacturing sector. Smith and Anderson's report (2014) found that 48% of experts imagine that in 2025, robots and digital agents will cause human unemployment, although another 52% think that technology will not replace jobs but instead believe that human intelligence will provide

new jobs, create industries and new ways of life. If not faced with sufficient knowledge and skills, we will be left behind and unable to compete.

#### 1.4 Research Questions

In this study, to achieve the objectives in line with the title several research questions have been identified:

- i. To what extent do students understand the Industrial Revolution 4.0?
- ii. Are students given exposure to the Industrial Revolution 4.0?
- iii. What is the readiness of students to face the challenges of the Industrial Revolution 4.0?

#### 1.5 Research Objectives

This study was conducted to achieve the following specific objectives:

- i. To identify the **understanding** of the Industrial Revolution 4.0 among university students.
- ii. To identify the **level of exposure** of Industrial Revolution 4.0 to students.
- iii. To identify the **level of readiness** of students to face the challenges of the Industrial Revolution 4.0.

## **1.6 Scope of the Research**

This research paper is focusing the study on the readiness of university students towards Industrial Revolution 4.0. This study was conducted to examine the extent of university students' knowledge of Industrial Revolution 4.0 such as understanding, exposure and readiness based on knowledge, skills, attitude and habits. The researcher will conduct this study in the category of university students in order to small the scope of findings. The researcher will target on university students as main respondents of this study. The targeted respondents will be random from various courses such as management, engineering and soon. Then, the researcher conducted through distributing questionnaires in Google form survey to random respondents of various universities such as UTeM, UiTM, KUIS and others.



## **1.7 Significance of the research.**

This research study can provide information on the importance and perceptions of Industrial Revolution 4.0. This study also aims to understand the challenges of Industrial Revolution 4.0 and the university students' level of readiness in facing the Fourth Industrial Revolution. This study will be beneficial to the community especially for the students to measure how far their readiness to Industrial Revolution 4.0. From this also, the researcher can test respondents' comprehensions to industry revolution. This study will attempt to explore and elaborate this topic as well.

## 1.8 Summary

In a nutshell, this chapter discussed about the background of Industrial Revolution 4.0. It also discussed about problem statement, research questions, research objectives, scope and limitation of study and significant of study. In the coming chapter, we will discuss on the literature review of this research. The information that is provided will be wider and more understanding.



## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

In the literature of this study, the researcher discusses the theory of writing related to the study conducted by the researcher. The literature of this study is important to obtain accurate information with the title of the study, in addition to ensuring the objectives to be achieved on the study of the knowledge of the Industrial Revolution 4.0 among university students. The term 'Industry 4.0' has been a hotly debated global topic since it was introduced by Germans in 2011. There are too many definitions about it and it can be difficult for the average person to understand its true meaning. Furthermore, by reading the relevant literature, dependent variables and independent variables were defined. The literature review is significant to develop the research method such as qualitative and quantitative method. In this chapter also the proposal research framework is the best described the theory and developing the hypothesis.

The Industrial Revolution 4.0 also had a major impact on the higher education system. According to the World Bank's Chief Higher Education Expert (Francisco Marmolejo, 2017), higher education systems nationwide will also change as a result of the Industrial Revolution 4.0. In the early stages, the Fourth Industrial Revolution or Industry 4.0, digital technology had already entered the physical system as it is today. This includes the placement of computer sensing and communication systems in energy grid management, transportation, manufacturing, and water, as well as the household

appliances we use daily, entertainment systems as well as air conditioning (known as IoT or Internet of Things).

## **2.2 Industrial Revolution**

There are four types or classifications of industrial revolution which are first, second, third and industrial revolution 4.0.

### **2.2.1 Classification of Industrial Revolution**

In this millennium era, we are exposed to industrial revolution that developed phase by phase. It shows the development and improvement of technology itself. The faster the development science and technology, the shorter the age of an industrial revolution. Sutanto (2018) mentioned that the development of industrial revolution began when the steam engine was discovered. Moreover, the industrial revolution continues today to revolution 4.0. It started with first industrial revolution that was marked by the discovery of steam engines and weaving machines in 1784 while for 2.0 industrial revolution was marked by the discovery of electricity in 1870. After that it continued to third industrial revolution began when it was discovered by PLC and last industrial revolution is 4.0 that was marked using smart automation system in 2015. Figure 2.1 showed the transformation of technology in industrial revolution 1.0 until IR 4.0.