

Impact of Global Managerial Strategies on 4.0 Industrial Revolutions

RABIUL ISLAM, MUHAMMAD FUAD OTHMAN, AMINURRAASYID YATIBAN, BAKRI MAT
School of International Studies, University Utara Malaysia, Sintok, Kedah, MALAYSIA

Abstract: The aim of this paper was to address the impact of global managerial strategies on 4.0 industrial revolutions. The engagement of technology and factory in industrial revolution 4.0 become a crucial part of new ways doing business globally. Data for this study were obtained from existing literatures on industrial revolutions. The methodology heavily relied on existing previous literatures on the subject being dealt with. The findings indicate that managers must be wise and brilliant enough to choose what the best way is. Since the revolution in rapidly evolve, it is very important to have a good leadership traits and being dynamic accordingly with the situation. Global managerial strategies would respond to 4.0 industrial revolutions and at the same time looking forward to have a sustainable development. Therefore, it must always be aware and ready to change so that the country does not miss out on the era of the industrial revolution 4.0.

Keywords: Managerial strategy, industrial revolution, internet, globalization, efficiency

1. Introduction

The introduction of steam power in the market and the implementation of mechanization culminated in the shift from man power to machine control, thereby the cost of manufacturing and exporting uniform and skilled goods to a larger public as an eventual consequence of mechanization throughout the 18th century. Just before the millennium year starts, at the end of the 19th millennium, the second technological revolution centred on the separation of labour started to develop with the help of the usage of electrical resources and with the invention of telegraph and telecommunications, networking technology continued to evolve. Unlike the first case, the value of scientific research had arisen in the second industrial revolution. Consequently, the application of energy and digital technologies to development was labelled Industry 2.0 and 3.0. Eventually, with the introduction of the internet of things and cyber-physical networks, technology 4.0 is starting to have an influence on all part of society across the world today.

The first Industrial Revolution achieved prosperity by hydropower usage, steam use and the manufacturing of machine

tools; the second Industrial Revolution incorporated industrial development of energy and assembly lines, and the third Industrial Revolution turned up automation through circuitry and computing technology.

Industrial Revolution 4.0 has already moved through our daily life whether in our workplace, home, and also for many other reason. It integrates the technologies to the advance level and will continue expanding day by day. This fourth industrial revolution can be said as a rapid transformation in many aspects such as in design, operation, production, manufacturing and also the services to the people. The goals of this revolution are to improve interaction between smart machinery and robots with human being. In order to get most of the technologies offers, organizations must be willing and ready to invest in building the capabilities of the transformation process.

The integration of men and machine in this modern world are taking place. Things being done digitally through cyber-physical system (CPS) where organization manages to personalised production to meet customer needs and demands. It is called the concept of smart factory; digital tools are used to increase the integration between vertical and horizontal value chains. Production and services can be delivered at the most competent output and

flexibility, cut down all the drawback of conventional work completed by men alone. Industrial revolution 4.0 do contribute in boosting economic, more factory were build as demand in production increase not only for existing product but upgraded, and new creation of tools that would help human daily life easier. However, instead of making utmost profit from highest production level, issues of environmental arise as more factories means modern era of greenhouse gas pollution and climate change, exploitative labor conditions, human right deniable and unhealthy working environment.

Global managerial strategies would respond to 4.0 industrial revolutions and at the same time looking forward to have a sustainable development. Most likely focusing is on Malaysian government planning on how to put economic, social and environmental elements encompassed to be at level of balance in all. Beside of actively inviting foreign investment and encouraging multinational company or known as MNC to growth in opportunity of industrial revolution, government outlined some policy and rules that abide MNCs to keep what we have today, remain be enjoyed by the future generation. By that, ethics and social responsibility make sense in these issues as they, MNCs need to give back to society and the host country's mother earth. As a feedback from the growing awareness of and concern by company stakeholder in social and environmental issues, most of MNCs are proactively publishing their report on the corporate social responsibility (CSR) related principles and activities (Kellian & Hennigs, 2014). Multinational companies are firms that engages in foreign direct investment (FDI) and owns or control value adding activities in more than one country engaging with manufacturing, sales or service subsidiaries, also known as multinational enterprise (MNE) or transnational corporation (TNC) (Youssef, 2004).

The engagement of technology and factory in industrial revolution 4.0 become a crucial part of new ways doing business globally. In meeting with highest production, customer expectation, minimal cost of work,

flexibility in adjusting needs and production, less human energy consumption or cutting cost of labor will ensure company making profit rather than loss. Investing in industrial revolution research and development will not bother some of the capitalist to aim for maximisation of profit. On the other part, while global company are doing this, there are issues to be solved in term of environment and social sustainability development. The objective of this study is to figure out how local government would arrange their strategies in adapting with the issues of sustainability development through Industrial revolutions 4.0.

The use of water and steam has made significant changes to the industrial development in the 18th century. With this use, the industry revolution 1.0 was formed. Machinery such as railways and vehicles were mobilized using steam engines in this era. Subsequently, the discovery of electricity by scientists before the First World War introduced the industrial revolution 2.0. This acquisition has influenced the creation of phones, aircraft and vehicles based on the Internal Combustion Engine. With the power of electricity, the product can be mass produced and indirectly create a large production plant. The industrial revolution 3.0 era began in the late 1960s. The revolution has created many electronic and digital tools such as cameras, televisions, radios and so on. The digital revolution has also impacted the continued development of the internet until the industrial revolution of 4.0. Revolution 3.0 has been at the core of revolution 4.0 where the development of the internet has led to improved human relations with digital technology. In this era, the use of the Internet can connect the human mind with digital technology. For example, by using the internet, one can control smart robots according to their instructions for doing a job.

In a way to cope with the rapid changes, it requires continuous innovation that relevant with the era. With the ongoing process of digitization and automation, it indirectly will create many business opportunities but not to forget the challenges

that will occur. In any sectors, challenges that companies facing will lead to the changes of their business model and strategies that need to be taken that can give an impact to the organization. Thus, it is very important to the leaders to have such an extraordinary traits to face any challenges from many other factors that than can drive the organization to the right track to compete with others in this challenging world. So, the purpose of this paper is to identify the challenges and also the strategies that need to be taken by the leaders in this fourth industrial revolution.

The objective of this study is to figure out how local government would arrange their strategies in adapting with the issues of sustainability development through Industry 4.0. First, government agenda portrayed in National Policy Industry 4.0 will support Sustainability Development Goals outlined by United Nations. Second, government action in tightening rules and regulation in preserving is sustainable environment for future generations. This will expedite the industry's path into a higher stage and change industries and enable a new age of innovation and prosperity. That will bring the businesses to a new era in growth and profitability and to a growing demand.

2. Literature Review

2.1 Industrial revolution

According to Kagermann (2013), Industrial Revolution 4.0 continues after three previous industrial revolutions. It starts with the first one around 1760 in Europe and United States, where the use of steam and water power as well as the development of mechanisation system. It than continues with technological revolution in manufacturing such as the producer of steel and also the use of electricity. The third one is the process of digitalization by using computers and microprocessors. This fourth industrial revolution consist of automation, network interconnected smart devices and also the exchange of data in order to create smart working environment that conclude everything

that technologies related (Marik et al., 2014). In order to going towards that, there are a necessary element should be focus on, such as high technology of infrastructure, good information systems as well as highly skilled people (Shamim et al., 2016). Initiative from German government that promotes the automation in manufacturing industry to develop smart factories is challenging the ways of how manufactures nowadays think about knowledge intensive industrial process. It makes the industry become smarter, flexible, and effective. High quality of product might be rapidly created and directly influenced the production and create more competitive market; if manpower, machines and technologies are arranged strategically (Bauernhansl et al., 2014; Henke, 2014).

Sokolava & Mohelska (2018) described that this revolution is characterized by a blended information technologies, production process and smart autonomous machines which is based on the booming of digitization, robotics and automation. Besides that, it also based on Internet of Things (IoT) which has brings a change to manufacturing and maintenance in the industry; where it has been transform from the reduction of production cycle to the automation machinery maintenance. It is be said as more complex interconnection of the entire process starting from the planning, development, production, distribution but not to forget is after sales services. Autonomous robots can control and regulate all the process through various communication medium such as network connections and other technological devices.

This revolution depends on the initiatives that are initiates by any sectors whether from government or privates based on innovative technological development such as in information and communication technologies (ICT), which are function to digitize information and then integrate the systems at all level. In order to monitor and control the process of development, organizations plays a vital roles as well as by the support from human workers by using smart machinery such as robots, intelligent

tools and also augmented reality (Davis, 2015; Fraunhofer, 2013).

2.2 Managerial strategies

According to Gomez and Sanchez (2005), they said that managers play strategic and important roles in order to balance local and global forces by building social capital including other resource such as human resource, monetary etc. Besides that, they also believed that managers are important and critical in facing any possible challenges that will occur including the transformation process towards the fourth industrial revolution. Other than that, they also have to make sure that organizations can execute practices that are critical for global strategy.

Business competition becomes tougher day by day and it forces the organizations to increase their productivity to ensure their survival. Due to the enhancement of globalization, a strategic managerial strategy is used as one of the reasons that can increase the effectiveness of the organization. Gale and Buchhozz (1987) described managerial strategies is a set of strategic action that are planned and implemented to maximize the economic return. It will enhance the organizations potential to improve their performance in order to compete in the latest industrial revolution era. For this purpose, a good managerial strategy is needed to running organization smoothly and achieved their desired goals.

As the world is changing rapidly, strategy in management were also influenced by and with dynamic management capabilities, it is focus on the variation in organization abilities in order to adapt quickly with the rapid changing environment (Teecee et al, 1997). Managerial strategies in this dynamic environment were described as a dynamic process that gives impacts for the purpose of generating future value.

2.3 Internet to thing

According to Muhammad Nizam (2018), in the era of industry 4.0, the economy of a

country will be dominated by technological developments. At the same time, this will help the industrial sector to maximize production of their products. Era 4.0 is a transformation that will be guided by nine components namely Autonomous Robot, Internet of Thing, Big Data, Simulation, Additive Manufacture, Cloud Computing, Augmented Reality (AR), Cyber security and Integration. The use of machines or robots as a whole without human help is an element of automation robot technology. According to Chu, Jung, Lim, & Hong (2013), robot capabilities are capable of doing any complex job while at the same time improving product quality and work productivity. This ability is achieved because the robot is controlled by sensors that allow it to understand and act on the tasks it provides. Chu, Jung, Lim, & Hong (2013) also state that in this era the use of robots has been widely used in various industry sectors. Some of the sectors that have been affected by the use of robots are the manufacturing and agricultural sectors. In general, United State is the first country to create robots to help the medical sector. In this modern age, the Internet is a common feature used by all walks of life. The Internet is interconnected, a network that creates network intelligence that is able to control, program and detect automatically forgetting the definition of Internet of Thing (IoT) (Chase, 2013).

According to Coffman & Odlyzko (2001), so far the development of the internet has been divided into three waves. Kevin Ashton was the first British Technology pioneer to introduce the term IoT in 1999. Weber & Studer (2016), states that the IoT is a system that enables the connection between the physical world and the internet with the help of sensors. According to Alaba, Othman, Abaker, Hashem, & Alotaibi (2017), in the era of IoT, even without human help, communication between sensors and objects is possible. An increase in the amount of data has occurred on a daily basis as a result of technological advances. Basically, big data means big data. Smart phones, sensors, and computers are among the sources contributing to the presence of data (Portela, Lima, &

Santos, 2016). Therefore, good data management is crucial as the increasing volume of data can lead to the era of industry revolution 4.0. In general, to collect big data requires the use of large data systems. The big data component, therefore, refers to Variety, the data that comes from and is available from a variety of sources and sources. For example, text, sensors, audio, video, graphs and so on. Next, Volume means the amount of data created and stored from various sources. Finally, Velocity is the speed of data created. Simulation is something different from augmented reality. The real-time visualization of the process in virtual form in three-dimensional (3D) animation is a form of simulation. This shows that simulation is not a real-time image. For example, it is the virtual reality (VR) technology (Dilberoglu, Gharehpapagh, Yemen, & Dolen, 2017; Lim et al. 2012; Sage, 2012), to store large amounts of data through internet connection is to use cloud computing. Business agility and IT efficiency are two trends in information technology associated with cloud computing (Yu, Xiao, & Zhang, 2016). Microsoft Azure (2017) states that prior to the advent of cloud computing, a data centre or farm server was used as a place for data storage. Oracle Cloud was the first to introduce this application to the public. Basically, a company can use this application to store data over the internet without using a private server. Therefore, using this application can save on their expenses.

2.4 Globalization on industrial revolution 4.0

Fourth industrial revolution is the real digitization of industry, which presently covers another, genuinely expansive origination and incorporates new advancements and ideas identifying with the association of the worth chain. Industrial revolution makes a separately organized savvy industrial facility, which means the Cyber Physical System (CPS) screens physical procedures. The last known Revolution is worldwide influencing the total of the world,

enlightening the personal satisfaction of the individuals around the globe. Innovation has opened another universe of conceivable outcomes, including underdeveloped, developed and creating countries of the global. Moderateness and access would be the issue with the world nations. Accessible progression is in miscellaneous things of the various groupings of modern transformation.

The business worry of imbalance speaks to the best cultural and worldwide test related with the Fourth Industrial Revolution. Countries by development besides innovativeness on mechanical headway will at present remain providers of academic and physical venture, the pioneers, speculators, and economic related authorities separating the expanding opening of wealth among those nations that are riches made a beeline for those that are work driven. Development is right now among the essential explanations why wages have worsened, or even diminished, for a common of the populace in more-salary nation the interest of exceptionally talented specialists has expanded although the interest for laborers with fewer training and minor aptitudes takes diminished. However, according to (Markus & Andreas, 2013), they stated that, Globalization has uncovered the number of inhabitants in nations into are revolution enhanced economy where done portion of the people (particularly the youth) Utilizes stages of online networking to associate, learn and trade information. For a perfect world, these collaborations will give a chance to comprehension and association with various societies.

3. Fourth Industrial Revolution on Economy

The advances of the three major forces of manufacturing in the Forth Industrial Revolution offer a wider context for potential economic growth. Since 1995, the IT industry has accounted for 20 per cent of US GDP growth; the value added of IT services in OECD countries increased by 115 per cent

from 1996 to 2008 (OECD, 2011); the global IT industry accounted for 7.1 per cent of GDP in 2010 (Shapiro and Mathur, 2011). It can be deduced that the breakthroughs in the Fourth Industrial Revolution will have significant impacts on the global economy. Therefore, the Fourth Industrial Revolution will reinforce relations between suppliers and customers, control economic volatility, reduce seasonal fluctuations, and thereby promote the growth of the global economy in a more stable manner.

3.1 Acceleration of economic restructuring

About any sector will be influenced by the Fourth Industrial Revolution. The rewards become evident as the modern industrial sectors utilize up-to-date technology to drive new industry with creative ideas. At the same moment, we can therefore see the reduction in the ability of companies or sectors to develop. As a consequence, a transformation of the global economy is required. In China, the growth of new businesses backed by network, big data and e-commerce technology is very rapid. According to the Central Bureau of Statistics of the People's Republic of China, the volume of online retail trade exceeded $1,25 \times 10^{12}$ Yuan (RMB) in 2012, accounting for 6.1 per cent of the total trading value. In 2015, these two variables reached 3.88×10^{12} and 11%. Online retailing has become an irreplaceable driving force for current economic growth in China. Overall, the development of the Fourth Industrial Revolution can have benefits on the transformation of economic growth further into a new era, in other words, the tendency of knowledge operation growth, innovation-driven growth, resource regenerative growth and connotation development growth.

3.2 Increase in production efficiency

Technology, unlike traditional sources of development, such as land or manpower, has non-exclusive and instant-diffusive functionality. The IoT network overcomes the disadvantage of traditional carriers, saves quest costs and reduces information

asymmetry. In fact, ample data suggests that the contribution of knowledge and expertise will conserve a significant amount of natural resources: the more advanced digital technology is involved, the fewer resources are consumed. At the end of the day, intelligent development will save an enormous amount of human energy and environmentally required working hours, that usage by performing the important job. Thus, the Fourth Industrial Revolution will save money, increase manufacturing output and eventually gain economic prosperity from income.

3.3 Shifting of global value chains

The Fourth Industrial Revolution would also intensify the transfer of industrial workers from emerging countries back to industrialized countries as a diplomatic reaction to the 2008 financial crisis (Daper, 2013). Trends in procurement and distribution have controlled the world trading environment for a long time. The emergence of transnational companies has been related to the growth of an interconnected international manufacturing network through foreign direct investment in other countries (Sako, 2005). FDI flows foster global economic globalization and development, as well as create fast growth prospects for many underdeveloped countries. The role of global supply chains is clear: trade in intermediate products now accounts for more than half of goods imported by OECD economies and near to three-fourths of imports from major developed economies, such as China and Brazil (Ali and Dadush, 2011). Today, these global value chains, originally generated through foreign direct investment, manufacturing and manufacturing, are experiencing a 'switch back to the past' change in geography. Developed countries, particularly the US, consider the return of the manufacturing sector a new boost to economic development. The US president, Donald Trump, keeps emphasizing that he will take measures to bring overseas manufacturing jobs back to the US. This approach should be driven not only by the growing labor cost difference between the industrialized and the

developing world, but also by the Fourth Industrial Revolution.

The Fourth Industrial Revolution, by significantly growing efficiency, replacing labor with capital, and contributing to innovation-driven production, gives more economic importance to countries fitted with strong industrial technologies in manufacturing. This will lead to a shift of global value chains. After all, the direction of this shift is determined by the forces both from all countries that participate in the chains, which may differ from industries to industries.

3.4 Industrial internet of things (IIoT)

The IIoT links the real universe of sensors, computers, and devices to the Internet and transforms vast data into valuable new knowledge and insights through introducing deep analytics through applications. The IIoT applies to the addition and usage of IoT in the manufacturing and telecommunications industries. With a heavy emphasis on machine-to-machine (M2M) connectivity, big data, and deep learning, the IIoT helps companies and enterprises to achieve greater flexibility and productivity in their activities.

3.4.1 Industrial internet

The concept of an Industrial was first articulated by General Electric (GE) (Leber, 2012), and described as the definition of the Industrial Internet includes two key components: The connection of the industrial machine sensors and actuators to local processing to the internet; the onward connection to other important industrial networks that can independently generate value. The main difference between the consumer/social internets and the industrial internet is in how and much value is created. For consumer/social internets, the majority of value is created from advertisements (Floyer, 2013).

The definition explicitly distinguishes the Web from the Industrial Network, but the purpose of the Web in all situations is to provide the broad field of networking. The Industrial Internet was more recently described as a source of both operational

efficiency and innovation that is the outcome of a compelling recipe of technology developments. The resulting sum of those parts gives you the industrial Internet – the tight integration of the physical and digital world. The industrial internet enables companies to use sensors, software, machine-to-machine learning and other technologies to gather and analyse data from physical objects or other large data streams – and then use those analyses to manage operations and in some cases to offer new, value-added services (Digital, 2015). With this concept, a key component of the Industrial Internet becomes obvious to researchers as the capacity to analyze results, as confirmed by a statement that is then established in their analysis. Big Data analytics is the foundation of the Industrial Internet. The ability to collect and analyze data is a attribute essential to Industry 4.0.

3.4.2 Industrial internet of things (IIoT)

There are various IoT concepts, some applicable to industrial implementations make clear the categories of smart components installed in ordinary artifacts so that they can act as IoT tools and shape components of cyber-physical systems (CPS). Three concepts that are defined as a definition for the IoT would be a “group of infrastructures, interconnecting connected objects and allowing their management, data mining and the access to data they generate” where connected objects are “sensor(s) and/or actuator(s) carrying out a specific function that are able to communicate with other equipment (Dorsemaine, 2016). The terms ‘Internet of Things’ and “IoT” refer broadly to the extension of network connectivity and computing capability to objects, devices, sensors, and items not ordinarily considered to be computers. These “smart objects” require minimal human intervention to generate, exchange, and consume data; they often feature connectivity to remote data collection, analysis, and management capabilities (Rose, Eldridge, & Chapin, 2015).

However, such a clear formulation is not enough for our intent in this article. To

advise our proposed IIoT system, we need something concrete and a specific conception. The basic idea renders a design private for a specification IIoT, as it tries to describe IIoT correctly by referring to two important features: (a) forms of technology used in IIoT design and (b) The distinguishing goals and aims of certain systems. We need a description that has the framework but also allows us a bigger extension of (a) and (b).

The benefit of simplistic architecture is that because it makes it transparent that the related innovations are used for industry-specific uses, it satisfies the fundamental requirement of helping one to differentiate between IoT devices and IIoT devices. Of instance, products such as smart kettles and smart bike locks are not useful from a business perspective per se, the basic architecture correctly categorizes such things as non-IIoT products. Given the benefit, the description still remains uninformative. Another pitfall to avoid when attempting to achieve an IIoT definition is the understanding of IIoT with regard to another term, which simply does not separate itself from IIoT and would uninformative circular the explanation. This kind of question is illustrated, for example, in industry-led literature: The IIoT vision of the world is one where smart connected asset (the things) operate as part of a larger system or systems of systems that make up the smart manufacturing enterprise (Conway, 2015).

A system that include the usage, in real-time, digital and autonomous access, activities, study collection, and communications, computers, or the sharing of knowledge within the industrial context, in order to maximization of overall performance value, of the cyber-physical resources and networked digital elements relevant to generic information technology. The profit can include: increased products or services demand, enhanced productivity, lowered labour costs, reduced energy consumption and increased building-to-order times.

3.5 Industry sector

The strategic industries are important to the magnitude and scope of the risks to an

enterprise and the IIoT tools utilized in the operating systems of the company (Beecham, 2014). All sectors allow varying degrees of use of Institute of Licensed Company Secretaries (IACS), and us of IIoT is likely to be increased based on market patterns identified by industry analysis firms. With retail exception, industrialized economies typically accept the sub-categories mentioned above as essential infrastructure. Retail was included to represent the vital distribution of important products to customers and illustrate the increasing technological sophistication of certain retail outlets, such as the building control, maintenance and protection systems installed at their properties. The overview of the industrial industry is adapted from the UK Government funded study on modern production (Maier, 2017).

3.6 Technology Category

3.6.1 Automation

Automation basically refers to the stage of the operation. Industry 4.0's basic concept lies in "increasing productivity by sensible automation"(Heng, 2015). Phrases apply to process control, or more precisely automated facilities, if stated (Lasi, Fetteke, Temper, Feld, & Hoffmann, 2014; Schlechtendahl, Keinert, Kretschmer, Lechler, & Verl, 2015), data exchange (Lu, 2017), communication (Shrouf, Ordieres, & Miragliotta, 2014), vehicles (Li, 2018), feedback to suppliers (Sanders, 2016) or employees (Schuh, 2015) or even "truly automated value chains" (Rubmann, 2015). Some sources view CPS (Li, 2018) and IoT (Li, 2018) as the engines of enhanced automation.

The environmental consequences of increased automation are not stated in any of the examined publications. On the other side, it discusses societal consequences. Schuh proposes the likelihood of "immediate automated input for production employees" and "online pre-processing of captured

production data" which "can be sorted, compiled, aggregated and abstracted to promote cognitive learning and usage by the employee" (Schuh, 2015). Li sees opportunity to support human operators by way of automation (Li, 2018), While Hofmann and Rusch consider automation as a way of allowing logistics "without human involvement" in industry 4.0 (Hofmann & Rusch, 2017)

Five media find Big Data a vital technology with an industry 4.0 base, relating almost entirely to the method and business framework stages, its primary aim is to help convert the immense volume of data (Almada-Lobo, 2016)(Monostori, 2014) into useful information (Lee & Kao, 2014) in real-time (Vogel-Heuser & Hess, 2016) and thereby technically support automation (Jazdi, 2014). Nevertheless, the overwhelming majority of text fragments referring to Big Data often identify their position by mixing it with, or even simply removing, the word with other technology such as cloud (eleven publications) or CPS (six publications) – a trend not found with any other core function to that degree. Yet more comprehensive explanation of Big Data's practical role in business 4.0 could be contained in each of the text fragments. Just one textual segment concerned with big data in the wider context applies to sustainability, by beginning it will lead "to achieving high performance"(Wang, 2016).

3.7 Employees

Employees of the main attribute are found in various ways that can be loosely outlined in two sub-categories. Such include, firstly, the consequences of Industry 4.0 for workers with respect to software (Heng, 2015; Stock & Seliger, 2016) and organizational aspects (Stock & Seliger, 2016; Xu, Xu, & Li, 2018) of potential jobs and, concurrently, training, job requirements and expertise for industry 4.0 workers (Erol, 2016; Stock & Seliger, 2016). More broadly, parts of the text discuss the human position in business environment 4.0. It is generally assumed that there is a diminution in the form of physical labour in comparison to intellectual function, for example. Hard

muscle labor ad is often performed by robots as part of the mental job" (Gabriel & Pessl, 2016). Certain relevant considerations require *decentralization* of decision-making and greater management flexibility (Schumacher & Erol, 2015)(Stock & Seliger, 2016).It is believed that career pathways and the job itself should become more versatile about "place, time, and material" (Bauer, 2015).

Analyzing comments pertaining to training and potential job conditions, ICT abilities, transparency, collaboration and teamwork are considered explicitness as essential skills (Gabriel & Pessl, 2016; Sanders, 2016; Xu, Xu, & Li, 2018). Working in Industry 4.0 would often allow workers to constantly learn new skills and expertise (Bauer, 2015) to be interested with the technical activities (Stock & Seliger, 2016) and build inventions and enhancements (Erol, 2016). Document fragments associated with workers of business 4.0 discussed the mechanism or stage of the company in the first instance. The bulk of the pieces of the same document deals with the potential repercussions for future research. They also contain optimistic factors, such as improved opportunities for aging workers (Gabriel & Pessl, 2016; Heng, 2015). Publications often report possible adverse effects in terms of employment reductions for under-qualified employees (Heng, 2015; Stock & Seliger, 2016) and "greater psychological stress (emotional and mental)" (Gabriel & Pessl, 2016). All of the above-mentioned consequences for workers are critical for understanding the social aspect of sustainable change in potential working conditions.

4. Global Managerial Strategies Effect on Industrial Revolution 4.0

4.1 Effect of industrial revolution 4.0

The development of the Industrial Revolution 4.0 and its impact on the socio-economic status of a country cannot be underestimated. There are positive effects of the use of this industry of 4.0 revolutions such as economic growth and the smoothness of daily life. At the

same time, negative effects such as job loss are also important factors.

4.1.1 Positive effect of industrial revolution

There are a number of positive things Industry 4.0 has to offer, such as the possibility of new jobs being created, such as social media account manager for an organization or company that runs facebook, whatsapp, instagram and twitter for marketing purposes. The use of robots and machines will also make a job or job process faster and more efficient. At the same time, it will help the country's economic growth as each product and product will be delivered in quality and systematically within a set time. In addition, the presence of Industry 4.0 can also influence the country's economy, which will modernize all sectors of Malaysia that are geared towards digitization according to current needs. According to Internet users statistics released in January 2018 reached 25.08 million (79%). In Malaysia Internet business activities are gaining popularity and are gaining popularity in line with the country's economic development and development. For example, the technology used in the internet business is e-commerce in which transactions and banking are carried out between traders and consumers over the internet. Successful entrepreneur Vivy Yusof has been the first to bring the concept of e-commerce to Malaysia. Fashion Valet is the first online fashion store in Malaysia run by her and her husband. Co-founders Vivy Yusof and Fadzarudin Shah have proven that they are difficult partners to overcome. Their business started in 2010 now offering 500 brands to customers worldwide.

In addition, Industry 4.0 also has an impact on the tourism sector where some hotels and travel centers will sell their products by promoting them over the internet so that the market will expand beyond the country. This situation will attract more tourists to come and holiday in our country and at the same time will result in foreign currency flows. In addition, through the

industry revolution 4.0, the upstream and downstream sectors of the sector have been able to increase productivity. The Automatic Rubber Tapping System (ARTS) is one example of the benefits of this revolution. The ARTS trial process has shown a timeline for tapping and collecting latex. At the same time, the use of stimulants can also be used to improve outcomes. In order to identify the appropriate action, data collection and analysis for each gram, torque and principal (GTT) can be done. In addition, by utilizing automation as a whole, foreign labor can be reduced and this will reduce the cost of the company.

4.1.2 Negative effect of industrial revolution 4.0

As the industrial revolution 4.0 marks the beginning of a new era with the emergence of various advanced technologies such as supercomputer and smart robots, the emergence of such advanced technologies demonstrates technological capabilities without directly involving humans in any field or task. The development and use of technology that is gaining traction in today's work organization has certainly led to the growth and productivity of an organization. However, these developments have led to a reduction in the workforce of both the public and private sector in an organization. Technological advancements with the advent of sophisticated machines and automation robots are capable of completing a wide variety of jobs in a short period of time without the help or control of many workers. These smart machines and robots dominate the field of work that is supposed to be done by humans, but due to rapid technological advances, many workers are faced with the removal and reduction of manpower at every department and organization. Some of the biggest job losses are with women as they are more involved in the office and administration.

The emergence of technology in industrial revolution 4.0 has had a profound impact on society today, making it the leading

field of Malaysian national development. But on closer scrutiny, the use of infectious technology is a rare negative effect because it arises unknowingly that the working space has been compromised because workers have to work outside of office hours. This can lead to employee dissatisfaction with the employer and can lead to greater conflict. In addition, the advent of advanced information and communications technology (ICT) in which workers receive messages and instructions through social media networks such as email and social media applications such as whatsapp accessible via mobile further conflicts work and family (Derks et al., 2016). Occasionally, some employers send messages using social media applications asking about work, while employees are on vacation or spending time with family. This will result in role conflicts, time conflicts and pressure conflicts. Even at home, the role of the worker is still being demanded and the employee must complete the tasks assigned either immediately or indirectly. Indirectly the time allotted to the family has diminished and the attention to the family has been neglected. This situation affects the emotions of the workers and creates tension in the family. Workers are unable to focus on their role in the family, which is likely to put pressure on not only the employee but also their family members. Technology is constantly evolving over time, which is why technology requires continuous improvement and this will cost a lot of money. Any changes that may occur should be communicated to the employee through courses, workshops or training. So this will take a long time. During this process the productivity of the company decreases as workers need time to adapt to the newly introduced system (Belcher, 2010). In addition, companies have to bear the cost of software, technical services and the implementation of burdensome courses. Every shift in technology will also cause workers' motivation to decline as they have to deal with the difficulties of learning new applications and meeting new standards. Once the system upgrade is completed the maintenance fees will have to be borne by the company. The

irony is that Industry 4.0 certainly exists and the impact will be felt all over the world including Malaysia. Through Industry 4.0, it will surely benefit the country especially in terms of economy. In the face of this industry 4.0, the government needs to work with all parties so that the community is ready to meet the challenges of transition to ensure that our people are well informed and highly skilled in comparison with other developed countries.

4.2 Challenges of industrial revolution 4.0

In accordance with digitalization that leads to a transformation of doing business whether in manufacturing, production, communication as well as in human resources, innovative strategies is needed to create a norms that can go globally. Organizations must always be ready to handle new challenges. Design thinking is one of the strategies that linking creative, innovative and analytical methods. It will determine and strategically develop new ideas and concepts that can increase the organizations competitiveness. Organizations need to develop strong digital culture that can drives to the successfulness of organizations (Oberer & Erkollar, 2018). Integration of technologies and the enhancement of globalization make the work structure become more technologically complicated, which will increase the demand for high skill workers with related qualification. It will be quite hard to retain these qualities; whereas at the same time, a little bit low quality workers that not really fit the position will lose their jobs. Besides that, new competencies are expected not only from employees in doing jobs, but also from managers to make coordination. With continuous changes, it becomes more critically important for managers to design new cooperation between the industries. The roles of managers and leaders will grow relatively with the development.

Nowadays, market becomes more volatile and diverse. Many companies feel the pressure to sustain their business and also

must consider their stakeholders need by maintaining the competitiveness. The complexity of process is growing with the value chain become more correlated between others. In respond with this, organizations really need employees who is equipped with intercultural skills, have a good entrepreneur thinking, and also the abilities in creating networking with other organizations internationally (Hecklau et al., 2016). Other than that, this revolution has emerged by social aspects trends where it directly affects business such as aging population in workplace. Many countries such as Japan, China and German are also facing these challenges. Furthermore, it can be observed within younger generation. This new generation has a change in their social values and beliefs, the difference in workplace where nowadays becoming more virtual and also the process of work which seemly become more complex. According to Holtgrewe (2014), it will bring considerable and unpredictability to employees, which will increase the demand of coordination and negotiation. As be mentioned, these trends will need the employees who have the extraordinary traits and ability to adapt to a changing working environment without putting aside sufficient technical skills and accepting uncertainty of situations.

One of the most crucial challenges is in technological aspects. It includes the growth of information technology such as a huge amount of data usage, growing platform and collaboration, and also the need in security such as protection against cyber-attacks. These challenges stress out the importance of technical and analytical skills of human resources in order to ensure the success of fourth industrial revolution. At this particular point, it is a fundamental change in organization to the roles of employees and managers. Employees are predicting to deal with more complex task and the need of an effective problem solving and decision making. Managers must be prepared to present a significant leadership skill and the abilities to manage changes in line with development.

Besides that, environmental aspects cannot be left behind. As far as this issue is concerned and focused, it is noticed that climate change, resource shortage, energy efficiency, demographic change and many others led to produce demands for people with a sustainable of mindset, motivation to protect the environment and also creative and innovative way to develop new sustainable solutions (Hecklau et al., 2016; Kagermann et al., 2013). With the challenging issues that we are facing, managers must have a strong will power to establish any possible actions that can make environmental aspect not being neglected just because focusing on technology and productions of goods only.

4.3 Strategies of industrial revolution 4.0

In facing a rapid development of technology and the uncertainty of demand, managers must have qualities as global leaders to make things done strategically. Fourth industrial revolution requires new skills and managers need to train the right talent for the right post. In worlds' today's, human capital is critical in achieving success for organizations. It is predicted that there will be a different shape of scenario where the changes is anticipated. There are the elements of human capital as a key success factors that organizations needs such as education, knowledge and also the experience. According to human capital theory, it mentioned that knowledge give more cognitive skills to individuals that can influence work productivity and efficiency. But, with this new era, the recruitment may differ from what have been done before. Instead of recruiting based on candidates qualifications, companies should focus on the capabilities in the need organizations. Any existing programs may need to re-evaluate again with considering the new technologies that related for.

Moving towards, changing of leaderships styles in this digital era is a must. Leader must be competence enough with critical perspective and dimension together with fast changing environment, team oriented, more cooperative approach and also robust focus innovation. Both leaders and

employees should work actively and independently with creative and innovative mind in align with revolution (Oberer & Erkollar, 2018).

Personal competencies are very important and can be considered as one of the most important strategies. It include the ability of a person to act in a reflective and autonomous manner such as the ability to learn and it can indirectly develop cognitive abilities, without forgetting the development of personal attitude and ethic value. In addition, managers must make sure that employees that they are hired for must being able to face the task that are not as routine as usual line what they have done before. It is because, the future is very uncertain and uneven. Their task will keep on changing rapidly and because of that they need to ready every single of time. Organizations should also focus on the personal development of employees as a lifelong learning not only for individual but also for the organizations. However, it is believed that the moral value aspect in creating a good attitude towards technological development also important in building organizations that perform well in every aspects.

Besides that, in this fourth industrial revolution, managers must know how to manage the change process strategically. Organizational change process must consist related components to make things done perfectly. In includes a phased transition, emergence of change through network, current work culture and also must look back onto any redundancy that has happened before. Organization's decisions makers must give their full attention toward that and make things go right in fastest way.

In managing organizations that rapidly moving toward Industrial Revolution 4.0, managers must make sure human resources being able in contributing to the companies parallel with organizations vision and mission to achieve their desired goals. In order to achieve it, human resources managers with suitable traits are really important. Hence, managers who can understand and interpret data and know about some technical things

about technology and at the same time up to date with the latest development will have some advantage. Managers also must prepare themselves to have a good command control in handling organizations and go beyond the expectation.

The vision for this industrial revolution is to propagate so that workers can control, regulate and then configure smart manufacturing steps. Since the basic routine tasks are taken over by smart machines, so that employees can focus more on creative, innovative way that can give value added to the organizations. Organizations can plan well and make a strategic roadmap on going towards that. With this, it enables organizations to communicate clearly about their goals strategically with all the stakeholders.

Along with that, any organizations must consistently initiate the process of innovation with a systematic approach to plan strategies, visualize goals, and plan future projects for organizations. This approach requires full commitment from management to ensure shared understanding of organizations focus and any possible impact from global environment. The organizations strategic roadmap need to have transformation of business models and analytical assessment of the impact of technology. Besides that, roadmap also must consist the development vision, and strategies regarding the transformation and revolution for organization.

5. Conclusion

The journey towards fourth industrial revolution can be said as evolutionary and ongoing process. Technologies have to be adapted to the emerging demand and requirement of manufacturing and innovation management. Everything must be done quickly in order to adapt with rapid changes. New business model and strategies have to be developing for new demand from stakeholders as well as new forms of cooperation and collaboration.

Managers in organization plays a very important role to make it run smoothly and can

compete globally. With so many challenges that we are facing, a good managerial strategies that fit best organizations requirement can increase the productivity and efficiency. In managing, there is no leadership style that fits all situations. Hence, managers must be wise and brilliant enough to choose what the best way is. Since the revolution in rapidly evolve, it is very important to have a good leadership traits and being dynamic accordingly with the situation.

With this online business, purchases can be made from home and this will save you costs and expenses. Various online applications can be used for this purpose. Rapid technological advances have turned the manual into automatic. The whole world including Malaysia is working to adapt to the changing times and developments of this technology. Regional countries such as Vietnam, Indonesia and Thailand are also preparing for this new era. Therefore, we must always be aware and ready to change so that the country does not miss out on the era of the industrial revolution 4.0.

References

- [1] Al-Rodhan, N. (2015). The Moral Code: How to Teach Robots Right and Wrong. Retrieved from <https://www.foreignaffairs.com>.
- [2] Alwahaibi A, Zeka A. (2016). Respiratory and allergic health effects in a young population in proximity of a major industrial park in Oman. *J Epidemiol Community Health*, 70(2):174–180.
- [3] Belvedere, V., Grando, A., & Bielli, P. (2013). A quantitative investigation of the role of information and communication technologies in the implementation of a product-service system. *International Journal of Production Research*, 51(2): 410-426. <http://dx.doi.org/10.1080/00207543.2011.648278>.
- [4] Canepari, B. (2017). Environmental Performance Management in Multinational Corporations. Department of Business and Management. Chair of International Business.
- [5] Gaille, B. (2014). Industrial Waste Statistics and Trends. BrandonGaille Small Business & Marketing Advice. Retrieved from <https://brandongaille.com/10-industrial-waste-statistics-and-trends/>
- [6] Gaille, B. (2017). Gripping Industrial Pollution Statistics. BrandonGaille Small Business & Marketing Advice. Retrieved from <https://brandongaille.com/8-industrial-pollution-statistics/Malaysia> Productivity Corporation (MPC) (2010). Sustainable Development Initiatives in Malaysia. <http://www/mpc.gov.my>
- [7] Baharin, I., Daud, M. and Sentosa, I. (2012). Sustainable Development and Multinational Business. *Journal of Business and Management*. 1:3.
- [8] Jules, T. D. (2017). Public Policy and Governance. The Global Educational Policy Environment in the Fourth Industrial Revolution: Gate, Regulated and Governed. United Kingdom: Emerald Group Publishing Limited.
- [9] Liao, Y., Deschamps, F., Loures, E. F. R., & Ramos, L. F. P. (2017). Past, present and future of industry 4.0: a systematic literature review and research agenda proposal. *International Journal of Production Research*, 55(12): 3609-3629. <http://dx.doi.org/10.1080/00207543.2017.1308576>.
- [10] Markus, L. and Andreas, T. (2013). "The Internet of Things and the future of manufacturing | McKinsey & Company". *Mckinsey.com*. Retrieved 2016-11-30.
- [11] Marshall, R. S. (2009). MNCs and Environmental Management. Northwest International Business Educators' Network (NIBEN), Centre for International Business Education and Research (CIBER). University of Washington, Seattle, Washington.
- [12] Ministry of International Trade & Industry (2018). National Policy on Industry 4.0.
- [13] Ministry of International Trade & Industry (2019). Malaysia's Trade and Economic Information Booklet 2019: 4th Quarter.

- [14] Mamun, M. A., Junaid, M. S. and Easmin, R. (2017). Corporate Social Responsibility Disclosure in Malaysian Business. *Academy of Strategic Management Journal*. 16:2.
- [15] Mudu, P., Terracini, B. & Martuzzi, M. (2014). *Human Health in Areas with Industrial Contamination*. Copenhagen: WHO Regional Office for Europe.
- [16] Müller, J. M., Daniel, K., and Kai-Ingo, V. (2018). What Drives the Implementation of Industry 4.0? The Role of Opportunities and Challenges in the Context of Sustainability. *Sustainability* 10: 247. Pereira, A., & Romero, F. (2017). A review of the meanings and the implications of the Industry 4.0 concept. *Procedia Manuf.* 2017, 13, 1206–1214.
- [17] Petrillo, A., Felice, F. D., Cioffi, R. & Zomparelli, F. (2018). Fourth Industrial Revolution: Current Practices, Challenges and Opportunities. *Digital Transformation in Smart Manufacturing*. INTECH.
- [18] Prisecaru, P. (2016). Challenges of the Fourth Industrial Revolution. *Knowledge Horizons. Economics*, 8(1): 57-62.
- [19] Rajer M, Zwitter M, Rajer B. (2014). Pollution in the working place and social status: co-factors in lung cancer carcinogenesis. *Lung Cancer*, 85(3): 346-350.
- [20] Raman, R. (2008). *Impact of Multinational Corporation in Malaysia*. Institute of Economics. State University of Campinas, Brazil.
- [21] Robert Paehlke, Globalization, Interdependence and Sustainability; Paper retrieved on <https://www.eolss.net/outlinecomponents/Introduction-Sustainable-Development.aspx>
- [22] Sang-Yong Eom, Jonghyuk Choi, Sanghyuk Bae, Ji-Ae Lim, Guen-Bae Kim, Seung-Do Yu, Yangho Kim, Hyun-Sul Lim, Bu-Soon Son, Domyung Paek, Yong-Dae Kim, Heon Kim, Mina Ha, and Ho-Jang Kwon (2018). Health effects of environmental pollution in population living near industrial complex areas in Korea. *Environ Health Toxicol.*
- [23] Schwab, K. (2017). *The Fourth Industrial Revolution*. New York, Crown Publishing Group. Schwab, K. (2015). *The Fourth Industrial Revolution: What It Means and How to Respond*. Retrieved from <https://www.foreignaffairs.com/articles/fourth-industrial-revolution>.
- [24] The World Counts, (2020). Retrieved from theworldcounts.com
- [25] Trade and Industry Related Emerging Issues Division, (2017). *Malaysia and The United Nations Framework Convention on Climate Change (UNFCCC)*. Ministry of international Trade and Industry (MITI).
- [26] United Nations, (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*. A/RES/70/1. sustainabledevelopment.un.org
- [27] United Nations Conference On Trade and Development, (2019). *World Investment Report 2019: Special Economic Zones*. United Nations Publication, Geneva. Retrieved from un.org/publications
- [28] Varghese, A., & Tandur, D. (2014). Wireless requirements and challenges in Industry 4.0. *International Conference on Contemporary Computing and Informatics*; 634-638.
- [29] World Commission on Environment and Development Report, (WCED, 1987).
- [30] Zhou, K., Liu, T., Zhou, L. (2015). Industry 4.0: Towards future industrial opportunities and challenges. *12th International Conference on Fuzzy Systems and Knowledge Discovery*; 2147-2152.