

Training and Developing Employees in the Industrial Revolution of 4.0 Era

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Abstract: Industrial Revolution 4.0 known as smart factory, which can help industries to increase dominance and reliance on technology to produce far reaching efficiencies across a wide variety of sectors. Industry 4.0 can speed up innovation of a company, more flexible towards market changes and can speed up company growth. The objective of this study is to identify the nature of Industrial Revolution 4.0 and to the impacts of IR 4.0 towards employee training and development. In future this Industrial Revolution 4.0 will bring new categories of jobs, require new skill-sets and transform the way people work. This a review paper that employs secondary data analysis as the methodology. Related papers from years of 2015 and onwards are reviewed to identify the trend and practice used in training and developing employees for the Industrial revolution of 4.0 era. When an organization looking forward for their company growth, they need technology development at the same time workforce development to handle and understand the new technology which they plan to implement in their workplace. Companies are responsible to create intelligent workforce for their future.

Keywords: Industry 4.0, Revolution, Employee training

1. Introduction

1.1 Research Background

An endless process of gaining new skills, new expertise and meticulous learning for devote to developing one's profitableness is known as employee force. A person who have ability to find, stay and create successful transitions from one to other job or within the same job known as employee. Employee is a labour force, who has the aptitude to achieve, retain and swap employment over time to endure and triumph in life. Employee force used by different type of sectors to produce a product or contributing a service within an economy (Pologeorgis, 2019).

A constant learning and developing skill by an employee is one of the important factor to sustain in an organization. An employee attends constant training and evaluation in order to upgrade their dexterity and insight is need by an organization to develop and achieve their organization's objective. A strong pressure laid on employee by organization in order to be solve the competitive and financially situation, because they want to sustain in the dynamic market. Training mostly conduct by leaders or outsource services from well-established consultancies for their employee (Bashmakh, 2019).

Knowledge, skills and motivation of workforce are intangible characteristic of human capital or employee. An organization give more vital to human capital's intangible characteristic such as education, training, intelligence, skills, health and more in order to sustainable within the market. (Nda & Fard , 2013). Knowledgeable, skilled and experienced workforce bring a company to success. Organization need to continuously monitor employee's performance and effectiveness of training in order to maintain sustainability. Training and development for all employees at all levels is very important because skills erode and become obsolete over a period of time and need to be replenished. (Nda & Fard , 2013).

1.2 Problem Statements

Malaysia faced major transformation in economy from an agricultural to manufacturing and services sectors. This changes in economy structure, bring changes in the labour market (Nambiar). There are different types of industry running in Malaysia. Such as non-metallic mineral industry, aerospace, textiles industry, basic metals industry, electrical and electronic industry, food industry, machinery and equipment industry, medical devices industry, petroleum industry, pharmaceuticals, wood and furniture industry, green technology, education and industrial training service, health care sector, business services and supply chain innovation, oil and gas, research development and hospitality sector (Malaysian Investment Development Authority (MIDA) 2020). Each and every industry need well knowledgeable and trained employees to achieve the goal of the organization. In this 20th century, world is moving toward 4.0 revolution and same goes to the organizations.

1.3 Research Objectives

The objective of this study:

- (i) To identify the nature of Industry Revolution 4.0.
- (ii) To identify the impacts of Industry Revolution 4.0 towards employee training and development.

2.0 Employee Training and Development

This section explains about training, employee development, important of employee training, and industrial revolution 4.0. Training is a way of evolve the ability and dexterity of the employee to enable them for perform in their jobs productively (Bashmakh, 2019). Training is organized way to develop and improve quality of new and exist employees which conducted by organizations (Nda & Fard , 2013). An organization spend certain amount to conduct a training for their employees. Organization always ready to spend certain amount for training because they know the important training. There are few reasons of having training by organization for their employees. Training is help to motivate new joiners, increase marketing efficiency and also help to sustain high standards of customer service and production quality. Other than this, training is an essential way to introduce new technology, system or other advance changes for the employees. When employees get to know about the changes in work norm during the training session, they will support the company by adapting new technology.

An activity which acquire new knowledge or learn new skill for growing is known as development (Nda & Fard , 2013). In order to reinforce employee's capabilities, company furnish advance training

for them. An employee's development is process where employee undergoes different types of training programs to vamp skills and new knowledge with the bolster of employer. In other word, employee development is an important for employee and also to the organization to sustain in the current business environment. In order to maintain a competitive business environment, organizations need to invest in ongoing employee development to maintain both employees and organizational success (Nda & Fard , 2013).

A proper and strict method of employee selection not guarantee on choose perfect employee for organization, but perfect employee can form by effective training on what to do and how to do the job even high potential employees can perform the same. There is different type of training conducted by organization to train the employee. Such as, orientation, on-boarding training, technical skills development training, soft skills developing training, product and service training, mandatory training and more. Orientation is the basic and compulsory session which organize by the company for their employee. Orientation is a formal event which arrange by organization for new joiner to the company. New joiner will feel more comfortable organization norm after participate the orientation. This orientation will be held within the first week for new joiners. This orientation is suitable for all type of companies and all type of department in an organization (Elmokadem, 2019).

On boarding training is different from orientation, this is an on boarding training will take long time to complete, it will be conduct in a specific department or place. The goal of this on boarding training is enable the new employees to understand their role and work successfully in limited period. The next is technical skills training also referred as hard skills training, this training is more on guiding the employees on doing data analysis, content writing, coding, programming and more. Soft skills are also important for an employee to interact effectively with others in workplace, such as co-workers, management staffs and customer (Elmokadem, 2019).

Next is training of products and services, new employees will be attending on boarding training arrange by employer. Or new employee will be brief by employer about the products and services in the company. Mandatory training organizes by organization for their employee. In this training the employer will brief about the company statutory which need to follow by the employees. Care Quality Commission is the body where Health and Safety at Work Act and Local Authority requirements are specified (Mandatory Training, 2018). E- learning tuition reimbursement is one of the new and popular training method for employees which organize by organization. These programs offer employees to pursue advanced degrees, continued training sessions, conferences, and more. Organization also encourages employees to pursue their own personal development and in turn. And these personal developments will help them to generate new ideas for their organization. (Elmokadem, 2019).

A company can be differentiating from good company to great company by comparing the human capitals they have in their company. If training given for employees, the productivity of company also improves. This shows the value of training for an employee in an organization. Training not only help employees to enhance resourcefully, but also provides them with an opportunity to learn and perform their job more competently.

To achieve short and long term goal of an organization, training becomes major factor within the organization. Training and development not only improve individual knowledge but the company's growth and productivity (Nda & Fard , 2013). A company's nature changes by implement new technology, system and machines. Nature of company growth is depending on the development and changes they brings to a company. Adaption of the changes in work environment is important for employees, by adapting the changes, they will lead the company toward to growth.

3.0 Industry Revolution 4.0

This industry 4.0 can copy and decentralized the physical world for decision making (Bauer, Patel, & Veira, 2014). The fourth industrial revolution will increase dominance and reliance on technology to produce far reaching efficiencies across a wide variety of sectors. Sensors and computing, bio technology and simulation to Nano technology, cloud computing, smart technology and robotics are some example innovation from industrial revolution 4.0. Current technology helps us on monitor our health remotely, our online shopping can be tracked, even though we are in office we now able our home temperature and more development around us in this decades.

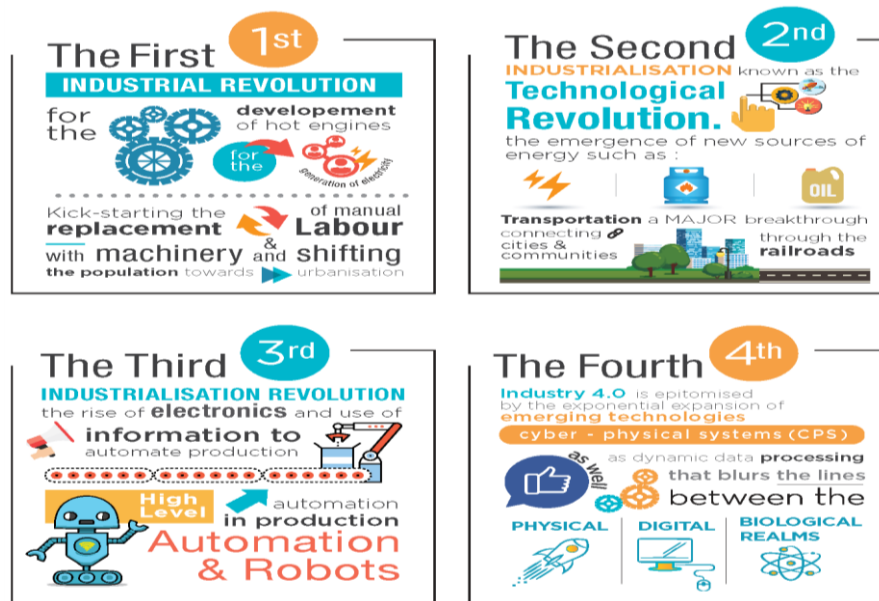


Figure 1: The 4 stages of revolution in industry (MPC, 2020)

Figure 1 shows the 4 different stages of revolution in industry (Malaysia Productivity Corporation (MPC) 2020). The first stage is Industrial Revolution 1.0, in this revolution introduced mechanical production facilities to the world. Water and steam-powered machines helped the workers in mass production of goods. A small business grew from a limited number of customers to large organization with owners, managers and a large number of employees, resulting in this transformation due to industrial revolution 1.0 create efficient production (Howard, 2020). The next stage is Industry Revolution 2.0; this revolution begins in 20th century. Machines was use electrical energy to run the works become the main contribution in this revolution.

Electric power was already used it as a primary source of energy. Automatic machines were more efficient to work and support. And automatic machines cost saving for a company. On the same revolution, first assembly line was constructed and mass production began. The goods were produce in large quantity and this assembly line became an ideal practice. (Howard, 2020). Industry revolution 3.0, brought the advances in electronic industry in the last few decades of the 20th century. In industry revolution 3.0, the electronic devices delivered variety of helpful outputs including transistor and integrated circuit. The machines were function by the transistors and integrated circuits and assistance on reduced effort, speed up the work, brought great precision. In some cases, these transistors and integrated circuits make the human agent a complete replacement. The fourth stage is industry revolution 4.0, and this chapter discuss bout Industry Revolution 4.0, employee training to move forward with industry 4.0 (Howard, The Evolution of the Industrial Ages: Industry 1.0 to 4.0, 2018).

In today's world our way of living and organizational behaviour are changing rapidly and the main reason for these changes is technological revolution. Industrial Revolution 4.0 called as smart factory 902

(Dutton , 2014). Industry 4.0 originated from Germany but is recognized by other leading industrial nation. In UK Industry 4.0 known as “Connected Enterprise” and the “Fourth Industrial Revolution” (Cordes & Stacey , 2017).

In the early 70s, radio-frequency identification was seen. In the early of 80s, 3D printing augmented in reality. Those are the key elements of Industry 4.0. Industry 4.0 is as much an organisational revolution as it is a technological one. Technology, engineering, manufacturing is developing quickly in today’s world. These growth is significant to create a manufacturing sector where products can be ordered, processed, manufactured and delivered without a pair of human hands being involved (Lewin , 2017).

Innovation highly connected in the Industry 4.0. Last decade, mobile, cloud, social media and big data was added as mix ingredients in the name of innovation. Those innovations could create a new concept for the process of current company and switch the old methods into the new competitive era (Geiger, 2009). Based on the World Economic Forum, artificial intelligence, robotics, the internet of things, biotechnology is driven from Industrial Revolution 4.0. The high growth in technology which is industry 4.0 creates new ways of consuming goods by mixing demand and supply.

4. Discussions on the Impact of IR 4.0 towards Employee Training and Development

4.1 The Substitution of Human Workforce with Automation

The fastest growth and developments in computer skills and abilities substitute human workforce with automation. Additionally, this development changes the nature and scope of work across industries and occupations. The way products are envisioned, manufactured, distributed, acquired and consumed will changed by Industrial Relation 4.0. In this 20th century, a lot of sectors or industries run by human workforce also called as employee. In the future, new technologies will reshape the future job. Such as manpower in repetitive jobs will be replace by the robots, productivity will increase and at last the country economy will help by new technology.

Based on the article released by The Star, 65% of Malaysia workers will loss current jobs by 2027 because of technological advancements and they will not have equipped for Industry 4.0. This rapid development brings applications artificial intelligence such as machine learning, 3D printers, driverless cars, and more. The future developments have ability to abolish more jobs currently done by humans, not just in manufacturing but also in service industries, ranging from low-skill tasks like home delivery to high-skill professional tasks like buying and selling stocks in the stock markets. Industry 4.0 will bring new categories of jobs, require new skill and transform people’s way of working, this statement has been stated by World Economic Forum through future job survey.

With this rapid development, more systems can be digitalized much more efficiently. This context explains that, more occupation will be automated away soon or later. At the same time new jobs and occupations will be introduced and emerged as well as hybrid configurations will be formed in the future through integrations of human-machine developed era. New business model will form if the digital transformation increase and become much more feasible. When business models changed by digital transformation, there will be changes in labour markets by creating new job descriptions and new job roles (Karaca, 2018).

There are few assumptions jobs for future which might formed by this Revolution Industry 4.0 such as Aerobat Coordinator, Digital Product Manager, Digital Business Developer, Data Protection Officer, Web Project Manager, Web Integrator, Digital Communications Planner, Crowd Innovation Facilitator, Digital Work Experience Expert, Design Learning Manager and more (The Future of Jobs Report 2018).

Although many researchers stated that, Industry Revolution 4.0 might bring job displacements and job losses will happen where automation can easily displace tasks and activities traditionally performed by humans. But, there are highly possible for offering new jobs and roles in various industries. Fast digitalization system will be experienced by workers who had occupations that previously involved routine tasks progressively performed more analytic and interactive. Industry Revolution 4.0 will bring many changes in all industry, mainly in employment landscape. The nature of workforce will be tremendously different when the Industrial Revolution 4.0 take over completely in industries (Karaca, 2018).

For this new era which is Industry Revolution 4.0 the Malaysian workforce need to be upgrade skill, and multi-skilled so the country can progress well prepared into this new industrial age (Jeyandran, 2017). An organization playing main role to help the employee to get know about the Industrial Revolution 4.0. When an organization looking forward for their company growth, they need technology development at the same time workforce development to handle and understand the new technology which they plan to implement in their workplace. Companies are responsible to create intelligent workforce for their future.

There are few preliminary steps which can use by organization for their employee to get know about the Industry Revolution 4.0. Firstly, organization or company can arrange workshop which related to Industrial Revolution 4.0. Awareness workshops aimed to elevate, grow and sustain the employee's careers into the future by instilling the current and future trends of the eco-system for the professionals to thrive in the Industrial Revolution 4.0 and beyond. By attending awareness workshops, employees will explore solutions needed to thrive in a digital transformation for their company (Online Industry 4.0 Training courses seminars classes, 2016).

4.2 Transformation to Online Training

Second is transformation journey online training; Senior Management Team need to be encourage by company to attend this kind of online training sessions. Today's business world is unpredictable, uncertain, complex and ambiguous. Those affected are businesses, the workforce, supply chain, competition, customers, regulations, technology and environment. Disruptive digital solutions emerging in the Industrial Revolution 4.0 era have given rise to a real sense of urgency to either transform for survival or face eventual extinction. When Senior Management Team attending this kind of transformation journey Industrial Revolution 4.0, they can easily find solution might they encounter in future or in current situation (Online Industry 4.0 Training courses seminars classes, 2016).

4.3 Seminars on Industrial Internet of Things

The employees those attend the Seminar which related with Industrial Internet of Things, can learn the basics of electronics, different types of development boards, interfacing with sensors, wireless networks, accessing the cloud platform, remote monitoring, triggering actions remotely based on logical conditions, and also basic data processing and visualization. The employees will have gained basic knowledge on different elements of the Internet of Things space and able to develop a basic Internet of Things device quickly and independently to apply in their company (Online Industry 4.0 Training courses seminars classes, 2016).

4.4 Readiness Assessment Workshop

Digital capabilities important to move forward with Industrial Revolution 4.0. Smart work pieces will control and monitor the production process and, in the final expansion phase, guide themselves autonomously through production, it will be not like as traditional production method. By attend the readiness assessment workshop, management and employees will have a clear view about industry

revolution 4.0, where smart factories are productive environment, they not rely on human intervention. The smart factory will run by the production system and logistic system.

The smart factory relies on Cyber-Physical Systems (CPS), which bind with the reality and virtually through reach out to outside world through an IT infrastructure, the Internet of Things. Smart gathering, storage and processing data are can be implicating by Industry 4.0 about the smart factory, employees will perceive the smart factory concept that requires the real-time. Other than that cross-company collaboration between manufacturing systems, information systems, and people. A huge amount of processed and analysed data will be integrated into the decision-making (Online Industry 4.0 Training courses seminars classes, 2016).

To move forward to adapt the Industry 4.0, ICT and other hard skills needed for future workforce. Technical knowledge of specific job and ICT skills needed by employee to reach the Industry Revolution 4.0. Capabilities of collaboration, communication and adaptability required in today's changing work environment. In other words, soft skill highly required by employers and employees in today's work environment. Organization need to be prepared financially to upskill the employees' knowledge and working skill to sustain in the market. While employees need to expand their technological capabilities and gain new skills to stay on the job market.

5. Conclusion

As a conclusion, current employees need to be upgrade their skills in technology and automation so they can understand the digital economy and requirements of digital economy. Today's young generation are forthcoming employees those need to expand and ready to full fill the requirements of future jobs requirements of future jobs. To welcome the Industry Revolution 4.0, organization need to create future workforce with full of new technology knowledge. Organizations are responsible to provide training for their employees to upgrade their skills. This training will reduce the error which will occur in the future on processing the products or providing services by the employees.

When an organization manage to adapt changes occur in business nature, accept and learn the new technology automatically they moving towards to new era which is Industrial Revolution 4.0. Current world is already tight with talented market, train and develop future workforce for upcoming changes in employment landscape is increasingly present in strategic planning priorities of companies. For strategic workforce planning, companies need to begin with understanding the changing scope and content of work requirements and workforce skill necessities.

According to Malaysia Productivity Corporation statement, from 2019 to 2021 the government will allocate RM 210 million to support the development and research for Industry 4.0. The Malaysia Productivity Corporation will conduct Readiness Research to assist up to 500 Small Medium Enterprises (SMEs) to learn about Industry 4.0 technologies (Malaysia Productivity Corporation (MPC) 2020). This shows that Government also support and encourage the development towards Industrial Revolution 4.0.

Each and every revolution which happen before this brings pros and cons. But revolution still happen to reach next level of business environment. Same goes to this Industrial Revolution 4.0, human capitals need to work together to create new era. Great understanding between employers and employee can lead the company to new era which in Industrial Revolution 4.0. Moreover, current students are future workforce, so students also need to know about Industrial Revolution 4.0. Students need to be aware with future work environment and job opportunity they will receive by this Industrial Revolution 4.0. Togetherness is a biggest strength to achieve successful society and economy in a country. When

all of us upskill our knowledge and working skills without comparing the employment level, we easily can adapt the new era without any doubts and hesitation.

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