

Employee Engagement in 4.0 Industrial Revolution

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Abstract: This literature research aims to determine the relevance between the development of information technology and the existence of human resources as a key in a company. The research was carried out by observing several scientific articles that developed until 2018. The scientific articles were divided into two topics, namely industrial revolution 4.0 and employee engagement. Search results on several articles indicate that employee engagements refer to individual attitudes and behaviors that are significantly influenced by several factors. Furthermore, employee engagement also affects productivity, performance, and profitability. In other words, employee engagements determine the success of the company. On the other hand, the 4.0 industrial revolution that combines physical devices with information technology through the internet of things and the internet of people has the potential to reduce employee interaction with the company's internal environment, such as the interaction between employees, employee interaction with leaders. The use of mobile technology connected to the internet allows employees to work from outside the company so as to reduce face-to-face communication. Based on the factors that influence employee engagement associated with internet technology, the potential to influence employee engagement is inversely proportional.

1 INTRODUCTION

The development of information technology, especially the internet has led the industry to an increasingly competitive situation. Efficiency in the use of resources and effectiveness in achieving company goals are two things that are increasingly preferred. The use of machines (physical devices) as part of the previous industrial revolution, faced challenges from the development of internet technology. Cisco Systems predicts that in 2014 there are 21.1 billion internet-connected devices, and will reach 50 billion by 2020. Cisco systems also estimate that there are 1.5 trillion devices in physical form, the future 99% of these physical objects will be part of a network (Greengard, 2015, p. 14). While Gartner predicts in 2020, IoT (Internet of Things) will reach 26 billion (I. Lee & Lee, 2015). Other reports show the use of robots in 1000 workers in the USA, Europe, China, and Asia. The USA and Europe show a lot of robot usage compared to China and Asia. In Europe, German countries are the countries that use the most robots. China and Asia show the use of robots which is relatively slower,

until 2015. And the industry that uses robots most is automotive (Chiacchio, Petropoulos, & Pichler, 2018).

The use of physical equipment as developed at this time is artificial intelligence is part of the production process, giving consequences for the existence of human resources (employees). As a company resource, employee behavior is something more complex than machines or other assets (King, 2017). So that the existence of employees makes it an important resource, and in the current global era, companies will compete to get employees who have the skills, knowledge, and abilities that will become the company's assets in the long run. Information technology currently allows employees to be able to freely move anywhere and at any time by staying connected to the company (Gilchrist, 2016, p. 236). Thus employees cannot always come to the office during working hours.

The industrial revolution era 4.0 will significantly affect work relationships such as purchasing, production, automation and overall processes of the company (Prifti, Knigge, Kienegger, & Krcmar, 2017). Industry 4.0 directs

interaction not only between humans, or humans and machines, but also in machine interactions with machines (Roblek, Meško, & Krapež, 2016). This shows the emergence of technology in the form of artificial intelligence that can replace humans in creating value, through information and communication technology. IoT, IoP, IoS, make the industry become dependent on its ability to use internet technology. The trend of ICT development directs the industry to the potential for efficiency and effectiveness more effectively with its ability to manage large amounts of data today. Artificial intelligence will ultimately reduce employee involvement in the production process.

Thus the industrial revolution indicates that human involvement is increasingly reduced in the production process (Wyrwicka & Mrugalska, 2018) and affects the labor market (Sandrine Kergroach, 2017). The development of ICT in the I4.0 era changed the dominating industrial environment in I3.0, namely automation and computerization. I4.0 forms a new environment such as the need for workers with ICT mastery qualifications, legal instruments, data security, and infrastructure to support ICT. Upward integration, downward integration and horizontal integration in internet usage makes the industrial environment more competitive and promises more definite sustainability, and makes it a smart company. However, expertise, knowledge, and abilities are not enough to support the company's performance in the long run. Need other factors of human resources, which are greater which can contribute to the company in the long term, namely the engagement of employees. A big challenge for managers of human resources to get, and maintenance workers who have the ability to use ICT in the midst of the lack of employee interaction with employees, the lack of interaction between employees and leaders.

2 THEORETICAL FRAMEWORK

There is certainly no agreement on the definition of the industrial revolution. One definition of an industrial revolution is a period of time in which work that was initially started and completed at the factory, can then be started and completed at home (Liao, Loures, Deschamps, Brezinski, & Vennencio, 2018). This definition shows a process that allows industry can carry out the operational efficiency of the company. This shift requires the existence of a media or technology that allows employees to remain connected to the office or by machine.

Another definition is that the industrial revolution is the stage of the transition of economic development from domestic to the manufacturing model (Unyimadu, 1989). In the next development, with the emergence of the term industrial revolution 4.0, the definition of the industrial revolution shifted towards the use of information technology and the interconnection of various things. Thus the definition of the industrial revolution will continue to evolve following the development of technology in the future. There is at least a characteristic of an industrial revolution, namely a big change that has a significant impact on many things.

The development of internet technology continues to experience development, which in the 21st century is followed by the development of artificial intelligence, the need, and availability of large data and connectivity of technology users (Roblek et al., 2016). The industrial revolution since its inception, became an intense debate and controversy among academics and practitioners (Bertola & Teunissen, 2018; M. Lee et al., 2018). Industrial revolution 4.0 begins with the industrial revolution of 3.0, 2.0 and 1.0. The Industrial Revolution 1.0 was marked by significant changes in manufacturing, agriculture, transportation and technology that changed the socio-economic and cultural conditions. The steam engine began the industrial revolution 1.0 in the 18th century (Wyrwicka & Mrugalska, 2018) so that the manufacturing sector was able to carry out mass production. The second stage of the industrial revolution (Industry 2.0) shows the development of technology for industry, especially steel technology, electricity which triggers the emergence of telephone, cars, aircraft followed by a demand for labor that has expertise in steam engines (Chin, Juhn, & Thompson, 2004). Industry 3.0 can be said to be a digital era that changes the way people communicate, business people and other practitioners who utilize the results of digital technology, that is contemporary (Zeng, 2016). The use of this technology has greatly changed the industry where there is a shift in the use of labor towards the use of machinery. Information technology in the industrial era 3.0 allows humans to find data, share data with others to improve their lives (Fitzsimmons, 1994).

The first 4.0 industrial revolution in 2011 by the German government with a view to creating efficiency, flexible production, individual production through the complete decentralization of production supervision and digital supervision (Prifti et al., 2017). I4.0 is also called an intelligent factory,

where physical form and decentralization of decision making can be developed (Morrar & Arman, 2017).

One of the characteristics of the industrial revolution 4.0 (I4.0) is connectivity and digitalization which forms a wide network with large data usage. Transformations in information and communication technology (ICT) in industrial systems are key in the fourth industrial revolution (Karabegović, 2017). Other characteristics of I4.0 are full automation and the process of digitizing the manufacturing and service sectors through the use of information and electronic technology (Roblek et al., 2016). I4.0 can also be called the name of the digital revolution where the line between physical objects and the digital field becomes vague, as a result of the physical transformation to digital (Soares & Kauffman, 2018). The digital transformation allows humans to connect with machines, machines with machines (M2M) and current human connections, known as the Internet of things (IoT) and the internet of people (IoP). However, the concept of I4.0 is not fully known and widely understood by business people. Based on Fernandez's (2017) research, I4.0 is only understood by the middle management level and upper management level.

The benefits of the development of information technology and communication through the internet of things include the support and stabilization of a simpler production environment, where employee involvement becomes less. With the availability of large data, the computational model with statistics can help in designing the next framework (Wagner, Herrmann, & Thiede, 2017).

Every company expects and will continue to look for employees who are able to contribute maximally to the company, especially when the employee has high competence and competitiveness. This high competency and competitiveness is an asset for the company. Thus obtaining and maintaining these employees is important for the company because one of the competitiveness of the company is determined by the competence and competitiveness of its employees. There are four main elements of the human resource management strategy model, namely: competitive strategy, employee behavioral needs that are linked to company strategy, employee behavior that is connected with competitive strategies, and human resource management practices (Schuler & E. Jackson, 2014). Among the employees' behavior that the company needs are the employee engagement. the term employee engagement appears as a big challenge like management in the workplace (Osborne & Hammoud, 2017).

Employee engagement in Holbeche (2012, p. 7) is a feeling of the characteristics of commitment, desire, and energy that can bring employees to the highest level. Meanwhile, Thomas (2009, p. 11) defines employee engagement more simply, that employee engagement is a degree that shows a person's activity in his work. These two definitions show that the employee's engagement is in someone with whom the employee becomes more potent and does what he or she desires. There are three things related to employee engagement, namely that the employee's engagement involves commitment, dedication, and loyalty to the organization, to coworkers and to their supervisors (Marciano, 2010, p. 40). The difference between Marciano's definition and the other is the object of the employee engagement.

Other authors say that employee engagements have three sides, namely first intellectual engagement, shown by thinking hard about their work and thinking how to do their work better. Both affective engagements, positive feelings in doing their work, and third social engagements, actively engage in discussions with others in the workplace (Armstrong & Taylor, 2014, p. 194). Kahn's statement means that the employee engagement to the use of members of the organization for their own work roles is manifested in the form of physical, cognitive and emotional involvement in their work. Referring to Crawford, Armstrong said that to be able to bring up the employee engagement, first need to understand several things, namely: job challenges, autonomy, using different skills, feedback, suitability, opportunities to develop, appreciation and recognition (Armstrong & Taylor, 2014, p. 230).

The definition means that employee engagement is a degree of involvement of an employee in his work and is strongly committed to his work and company (Noe, Hollenbeck, Gerhart, & Wright, 2011, p. 277). From Noe's definition of employee engagement at least two things, namely over-involvement and high commitment. Albrecht (2010, p. 4) says that employee engagement as an individual feeling aims and focuses on energy in the form of personal initiative, adaptability, and perseverance in achieving organizational goals. Albrecht's employee engagement is a reflection of motivation in the form of a high willingness to focus on investing in an effort to achieve organizational goals and success. This is similar to what Schaufeli et al stated in Albrecht (2010, p. 75). Schaufeli's statement can mean that engagement is a psychology statement that has cognitive components and affective components. A positive state of mind

characterized by enthusiasm, dedication, and integration. From these two definitions, it can be concluded that the engagement of the employee involves the positive impulse that arises from the individual, with that, the individual is able to do his work voluntarily.

Other authors divide employee engagements into two parts: physical energy and behavioral energy. As physical energy shows the desire to go further into the company/organization, struggle, merge with the organization, focus and feel want to be involved. As behavioral energy, employee engagements can be observed from their behavior within the organization, that employees who have an engagement to the organization can think and work actively, and continue to look for opportunities to achieve organizational goals; Employees who are bound by their organization, not only rely on the job description of their work but focus on achieving goals for organizational success; Employees who are tied to the organization are looking for methods to develop their expertise, to enhance their role in the organization and to achieve the company's mission; Employee engagement is also evident from employee behavior towards change. Employees who have high engagements can easily adapt to organizational changes (Macey, 2009, p. 9). Meanwhile, the employee's engagement is an energy spirit of employees to provide the best to the organization to serve customers. This concerns the willingness and ability of employees to provide business on the basis of their own ideas to help the success of the organization. The employee's engagement focuses on the relationship between employee engagement and service to customers. Where the degree of engagement of employees can affect the quality of service of the employee concerned to the customer (Cook, 2008, p. 3).

Employee engagement shows the level of commitment and employee involvement in the company which is related to a variety of positive activities produced by the company such as customer loyalty, productivity, profitability and labor turnover (Agarwal, 2017). Every company, every industry, and every country has different determinants of employee engagement. There are at least three determinants of employee engagement, namely leadership, job value, and opportunities for growth (Agarwal, 2017). Differences in these determinants lead to differences in perspectives on employee engagements so that the definition of employee engagement varies (Ahlowalia, 2014; Kamau & Sma, 2016). However, some academics attribute employee engagement as an individual

reflection of employees to what they feel while working. Explanation of employee engagements according to Khan that employee engagement refers to three aspects namely cognitive engagement, emotional engagement and physical engagement (Guest, 2014). Cognitive engagements include aspects of trust and perspective on the organization, and its leaders and organizational environment. Emotional engagement shows employees' feelings about the organization, leaders and the environment that can lead to positive behavior or negative behavior. Physical engagement shows the energy that encourages employees to complete their work (Ahlowalia, 2014).

Based on research (Jena, Pradhan, & Panigrahy, 2018; Kamau & Sma, 2016; Kavya & Padmavathy, 2017) shows that employee engagements are factors that influence the direct and indirect employee engagement, including talent management. Employees with a high level of engagement will show hopeful behavior, maintain interpersonal relationships and show high performance.

3 RESEARCH METHOD

This article is a review of the theme of employee engagement, where the explanation is carried out descriptively. Some articles and theoretical concepts are used to be able to find the relationship between industrial revolution 4.0 and the employees engagement which is then analyzed the influence of the industrial revolution on employee engagement.

4 ANALYSIS

Based on research conducted by the Gallup Management Journal, shows that only 29% of employees are actively involved with their work, 54% are not tied to their work and 17% are actively not tied to their work. Likewise, the Hewit Associates study showed that companies with high levels of employee engagement showed a 19% share gain above the average in 2009. While companies with a low level of engagement gave a share benefit of 44% below the average. Gallup's 2008 study, when the financial crisis occurred in the United States, also showed that companies that were highly engagement were better able to survive. Wharton Business School, shows that employees with high levels of satisfaction encourage profitability for a long time (Zenoff, 2012, pp. 5–6).

In Stephanie and Gustomo's research delivered in 2014 at the 6th International Conference on Innovation, Entrepreneurs and Small Businesses, concluded that the average employee engagement score was a score of 3.36 out of 5. Three factors that influence employee engagement are welfare, career and social support and work motivation. Employees who have a high level of engagement to their organization or company provide their potential for the success of their organization or company (Stephanie & Gustomo, 2015). Maniam said that employee engagements have potentially related to the company's continuity and profitability (Kaliannan & Adjovu, 2015). From what Maniam said, it can be said that either directly or indirectly, employee engagement encourages employees to behave effectively and efficiently which will encourage an increase in company profits and the continuity of the company. Kazimoto's (2016) research results show evidence that employee engagement has a correlation with organizational performance. Thus the employee engagement becomes very important in improving the performance and continuity of the organization or company through effective and efficient behavior in generating profit (profit). Likewise, Georgiades (2015, p. 9) that in terms of organizational change, employee engagement is a very important thing in achieving organizational change success.

Several other studies show that there are significant effects of several variables on employee engagements. including job satisfaction (Abraham, 2012; Bin, 2015; Taghipour & Dezfuli, 2013), organizational culture (Jaghargh, Ghorbanpanah, Nabavi, Saboordavoodian, & Farvardin, 2012; Jiony, Tanakinjal, Gom, & Sigantul, 2015; Kalia & Verma, 2017), work environment (Aliyah, 2017; Chaudhry, Jariko, Mushtaque, Mahesar, & Ghani, 2017; Mohd, Mohd Shah, & Zailan, 2016). Likewise, there are several determinants of the degree of engagement of other employees which are the results of research in the aviation industry (Ganguly, 2015).

Employees as a corporate entity have a degree of employee engagement to different companies/organizations. Employee engagement is a concept inherent in an individual (Dajani, 2015). How do employees have a commitment to their company, employee loyalty, how are employees responsible in carrying out their duties, how are employees involved in the company, how are employees engaged in company activities outside working hours, how employee loyalty is a part of indicators that can describe employees' engagements to their companies. The difference in doing

'engagement' and being 'engaged' indicates that employee engagement is a theme that needs to be implemented, needs to be carried out in common perceptions, and needs to be developed as a construct/concept (Truss et al., 2011). Based on the research (Mulyanti, Sule, & Kusman, 2017; Osborne & Hammoud, 2017) shows that employee engagements are part of a series of sequences of implementation of work centralization policies, leadership, work-life balance, power awards, incentives, appreciation, culture, and autonomy. The next sequence is the achievement of high corporate performance, loyalty, and commitment through a high degree of employee engagement. The high degree of employee engagement also impacts the comfort of employees in interacting with customers, thereby increasing customer loyalty (Mehta, Chandani, Moksha, & Parul, 2016). In addition to being influenced by determinants of employee engagement, it also determines other factors of individual morale, task performance, and performance of extra roles and organizational performance (Bailey, Madden, Alfes, & Fletcher, 2017). Other research shows that employee engagements to elements of reward and talent management strategies, friend and teamwork relationships, work environment, can improve individual and organizational performance (Anitha, 2014; Ongel, 2014). The relationship between employee engagements and management performance is also shown in a model (Gruman & Saks, 2011).

5 RESULTS

From various studies regarding an employee, engagements will continue to grow along with the fluctuations in the level of employee engagement as a result of changes in the world of work (Bakker & Albrecht, 2018). Changes in the use of technology have the potential to cause changes in the work environment. Based on Sumer's opinion (2018), widespread use of technology can have an effect on the labor market, expertise, and employment. Some fields of work that will be affected are technicians, clerks, service, sales, and factory operators. Thus I4.0 will change job opportunities with the ability to master information technology. The use of ICT in the industry can change the internal environment of the company to become more competitive on the one hand, and on the other hand, make it a company with less use of labor. Human life can be negatively affected by the development of ICT with reduced

sharing time among employees (Riminucci, 2018). Another potential that can be affected is the operational activities of human resource management. The purpose of human resource management operational activities is to create employees who are able to work efficiently. Technology in I4.0 allows employees to be able to do activities on two or more jobs at different companies. This is possible because developing ICT technology shows high employee mobility. Thus, the employee engagement to the company becomes weak. Employees can at any time leave the company where they work, and of course, this is a loss for the company.

IoT and IoP technology allows employees to communicate with the tools they carry. This has the potential to be an emotional relationship as a sequence in building emotional engagement can be reduced. The need as a human being to socialize with his environment has the potential to be greatly reduced so that employees can feel unattached with others (Kavya & Padmavathy, 2017). Technology in I4.0 also allows customers not to communicate face to face with their producers through employees, this is contradictory to what Mehta (2016) delivered. So that the implementation of I4.0 has the potential to reduce employee engagements both emotional engagements, physical engagements, and cognitive engagements. Therefore, it is necessary to conduct human resource management activities that can develop the skills and abilities of employees in the use of ICT in IoT and IoP frameworks. The use of organizational structures that are more flexible and still provide space for employees to improve the balance between life and work.

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