The Challenge of Industry 4.0 in Information System of Management

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Abstract

This research is aims to conduct a study on the challenges of information systems of management in the industrial era 4.0 which causes changes in all aspects of life, such as economic, social, politic, culture, defense and security. The changes occurs also in the aspects of individual and community data protection. The research method is the troubling method which examines the causal relationship of the information system of management and the development of industry 4.0 in depth, to do listens to input from various parties and finds ideas for appropriate solutions through the study of narratives that are expressed qualitatively. The study found that the implementation of a weak artificial intelligence of management information system still dominates in various sectors of life. This development will become a strong basis for the progress of a strong artificial intelligence in information system of management for the human.

Keywords: challenges, industry 4.0, information, system, management, life

INTRODUCTION

The changes that occur in the world today are changing faster and will continue to change. Changes are happening faster than any previous era in human history. If we use the model that it used to visualize the above statement, it is just as a metaphor, then there may be several explanations that can show this change of the world. According to Telesko (Telesko, 2018) in the human mind of the change regarding the initial changes experienced, this world is believed to be flat and is assumed to be a kind of flat object or plate with two dimensions, where everyone can get fall when they stand on the edge of the earth. This belief of the world is held until about 500 BC, then, until the belief of people change that the earth as not in a flat, known as Eratosthenes with the same diameter, then about two centuries later, in a very abstract way, they believe that the world is identified with three-dimensional shapes. without edges. An after two centuries later, people belief that the earth was spherical as a globe formed by doing an experimental of journey to prove that the earth was globe shaped after circling the earth in the early 16th century. Once again, in the globalization of the world, Again, people back to think that "The earth is a flat sharped, by bringing back the idea that the world is only two dimensions which they are interconnected flatly. This is become to reinforced by today's prediction that the changes occur in the world do to the way of exponentially, ensuring that our world follows a one-dimension exponential

curve model, in which it is rise an issues of economic and social change that are identified in their essential essence of which then develop at an exponential pace and growth.

The pattern of the 2D (two-dimensional) flat of the world geographically through a 3D (three-dimensional) globe in its development due to economic and social problems around the globe that are interconnected in 2D and end up in a curve of exponential 1D. This led the futurist Ray Kurzweil become to predict that the dimensions of the singularity have brought closer all the points in the same time where machines are smarter than humans as an implication of technological development. According to him, this prediction will be to achieved soon, but if that happens, will the world go to zero dimension? Zero dimension is all gone.

THE CHANGES IN TECHNOLOGY

The broad discussions that took place in the industrial revolution that almost everyone is talking about today, have started in the last decade and it will soon change the world. In German, the expression "Industry 4.0" (abbreviated I4.0) first appeared, as part of the fourth industrial revolution, following the initiative of the German government. Asprion et.al (Asprion, Schneider , & Frank G, 2018) states, the developed countries with high state income in particular, they will make more use of technological innovations to win the competition and keep management information systems more advance. The countries, to keep the goals of go ahead of the market demand and supply, the cyber information system are use to function to combine digital information with the real world. This information system, as it is known, it is become the driving force behind the development of the internet of things (IoT) activities, big data or augmented reality in German in the era of fourth industrial revolutions.

The definition era of fourth industrial revolution according Sharma and Jain (Sharma & Jain, Development of Industry 4.0, 2020) mention that the industry 4.0 is an era defined by the power of data that collects complete data with its elements and branches as well as the importance of using large amounts of data summarized and processed by systematic sequence into information such as information presented at a website address. The industrial revolution 4.0 is related to the process of collecting complete data with its elements, branches and interests in large numbers as mentioned above and developed through the expansion of connections that they are connected to one another in an information system. Information systems that they are connected to one another in large numbers based on relationships to perform independently as according to their own demands in providing information between these data or they called self-adaptive, the process by a smart and timely system that it is very reliable. This is the main determining factor in achieving the goal of providing information in the Industrial 4.0 era. The provision of information that they do as mention above in the industrial era 4.0 is the main pillar of supports technological developments that they are always changing, developing dynamically and revolutionizing on their achievements. Furthermore, a revolutionary process like this is bound to happen in all the time which in turn will be the driving force for the emergence of new business opportunities. The development of information in Industry 4.0 is constantly moving to change the development of information systems in every transformation in industrial dynamics. The emergence of a large number of data summaries and new business models that it is work with specificity automatically of ultimately poses a challenge to prepare a talented and skilled workforce to meet the needs of workers in the new business model mentioned above. This development, especially in fulfilling the talent and skill needs of workers, is very important to achieve the goals of the business model in industry 4.0. Therefore, improving the capabilities and skills of workers with strong talents in information systems as mentioned above in industry 4.0 is very necessary. The development of quality and skills new talents and then shaping an appropriate talent model and designing the talent as according to the fashion of talent needed in developments of industrial era is certainly a necessity for itself.

In Indonesia, several institutions such as the National Police of Indonesia have prepared and implemented the human resources capabilities of the police personnel through a capacity building program in collaboration with Australia in developing cyber information technology. According to Burhansyah (Burhansyah, 2016), the capabilities of these personnel human resources are aimed at addressing the actions that it needed to tackle cybercrimes which they have several characteristics that distinguish from conventional crimes, namely on (1) The acts in committed illegally; (2) The act uses any device that it connected to the internet; (3) The act results in material or immaterial of losses; (4) The perpetrator of a person who has the ability to operate technology and internet skills; (5) The acts that it often carried out transnationally or across national borders.

Many publications related to the I4.0 at this time begin their discussion by evaluating the technological advances that they have been achieved and then proceed with the concept of developing future technologies of I4.0 to bring about the new changes in the business of the world. For example, the focus of change on IoT which it is changes on the previous manual business model into a new digital business model. Intelligent digital information systems and connected technology systems, which they are used in an integrated manner to each other, that they are difficult and challenging for many industries, to dominate them especially in the context of growing their company's products.

An integrated technology system that is supported by the increasing number of available of data, it is undeniable that the new technologies that emerge through the digitization of management information systems have a major impact on changes in the company's business of the world. In addition, digitalization that occurs between workers in the world and in between different countries in the labor market are also brings new ideas and hopes. This change needs to be understand in management information system as a development of tecnologies by learning and working in different places and times. Companies that realize the need for this digital information system change, it will certainly attract the generation of workers as customers and employees. After considering of its suitability for future changes, the unit of IT preparation must be carried out by considering the changes that occur in an integrative way.

Various approaches have been taken in integrating the preparation of information technology into production and distribution activities, one of which it is a metamodeling. In the metamodeling approach, especially an ontology-based, according to Kanellopoulos (Kanellopoulos, 2010) it is explained that ontology is used to define modeling languages in doctrinal models formally, which it can be interpreted by machines and humans according to the doctrine of ontology orders.

The complexity of the ontology model as referred to the machines and humans in the network of complexity of information is carried out on individual network elements. According to Kanellopoulos (Kanellopoulos, 2010, p. 10) this complexity arises in individual networks due to the communication that it needs to networks and services as well as the heterogeneity of individuallythat it connected equipment. Likewise, in the size and complexity of growing commercial network requirements are forcing new techniques to manage the production and operations of commercial communications. This process is time-consuming and error-prone, and requires increased equipment and personnel capabilities to handle highly complex network processes. This makes IT systems expensive. Companies generally spend 33-50% of the cost to prepare IT systems that can withstand failure through trial and error. The computational autonomy given to the model that it will reduce the complexity of the information network and automate all the tasks of the information management system as expected above. In a high degree of information autonomy of network applications in characterizes autonomous systems, human intervention is limited to the definition of business goals only. These autonomous can be appllied by the usefull of alogirithms.

In the context of using algorithms as an artificial intelligence on smartphones, according to Telesko (Telesko, 2018, hal. 66) the function of martphones become the way to get more entertainment of lives of most people today. So, based on this facts, a web application was developed to increase the usefulness of the presence of a smartphone as a first step in working life to meet a certain needs. One example of an application that is made to get over the problem of stress on the algorithm in a smart phone experienced by users is a social media application. These applications are like those developed by the company Companion (applications on the smartphone platform), which are implemented as a web applications that it can be run on smartphones, tablets, or desktop computers. One of the most important issues of negative effect of social media when people using the applications, leaving traces, which they are used to meet business and network of the needs of which they are worked on them then developed and presented and finally reach the public as a public consumption..

In order to use of the application, it is necessary to setup the application menus. In this arrangement, according to Telesko (Telesko, 2018) the Companion application as an example of an artificial intelligence algorithm is separated into three phases, specifically the planning, the pilot project, and the dispersion and socialization phase.

In the implementation of application projects in Indonesia, especially in the field of education, it is currently recognized but it is still in the early stages of the implementation of Information Technology (Universitas Daerah Medan, 2019), which it is compiled through the application of 1. The admission System for new student, 2. The payment system via online, 3. The QR-Code for the digitalizatioin data, 4. E-learning programme, 5. Application of internal campus program, 6. The system of campuss academic, through the application of Siakad which helps universities in reporting their academic data to the government (PDDIKTI), and also as big data for decision making on campus development, 7. Job oppurtunyties and the systems of carrier, 8. The dashboard of campuss program development, 9. The facitlites of e-certificates for student activities, and 10.

THE SYSTEMS OF FINANCIAL THROUGH ONLINE AS A RESULT OF THE DEVELOPING OF MANAGEMENT INFORMATION SYSTEMS IN THIS 4.0 INDUSTRIAL ERA.

The arrangement of application depend on the availability of data. The data should be analysis in various version according to big data requirement. According to Ghavami (Ghavami, 2020) the analysis of Big Data to support in complying the requirement for data in a customer classification is not only finished usually based on the classification of customer demographic data, namely age, gender, and lifestyle, but also various data with their own characteristics that they are relevant to customer data in an accumulation of data collection in Big Data related to the customer, both obtained from data sources rooted from primary and secondary data, including data from an announced information. The definition of customer data sourced from primary, secondary and data sourced from the announced data, in the context of Big Data analysis is intended for a description prospective to illustrate customers. When a customer, under this Big Data framework, makes an electronic purchase via a mobile device with an electronic transaction, then the customer has stored the data directly to big data. The proceeds data is a primary data. Meanwhile, the secondary data for the same customers can be shown in the set up of the location of purchases made by them. The announced customer data is basically data in the design of side effects from the purchase transactions made at the time. Such as the length of time of the transaction is used until the completion of the customer's electronic transaction. The analysis carried out in Big Data provides various options for carrying out strategies to increase the usefulness or value of the information possessed by the ability to run it differently depending on the objectives to be achieved through different multi-factor analysis. This analysis can be done in the practice of key indicators,

predictions and marker points used to produce the desired outcomes. These analyzes provide an opportunity to look at various indicators enabling us to "see" the indicators including the indicators that determine success used in previous activities and the ways in which these indicators are used to make decisions that determine success.

In the supply chain system of management, according to Hanne and Domberger (Hanne & Domberger, 2018) it is recognized that apart from the transportation aspect, technical advances in information and communication technology in supporting logistics activities between suppliers and consumers (and of course, business activities in general) are very influential to each other. Some of the most influential aspects of IT such as the digitization of supply chain management that they have increased computer performance and decreased individual costs over the past decade. Another impact of development is the influence respons of the emergence of the E- bussines and various internet applications. Various examples can be seen how logistics are directly affected by E-business trends. E-business encourages goods to be shipped directly to customers than distributed through retailers. The change of distribution of supply chain management provides greater cost savings for higher-profit shipping.

E-BUSINESS APPLICATION

Currently, e-business applications have been used by the government at every level. According to Domberger, Inglese, Korkut and Zhong (Dornberger, Inglese, Korkut, & Zhong, 2018) from the highest level to the lowest level of government that it is directly related to the community in identifying IT potential use of the aplication, especially to provide all kinds of services in civil society engagement platforms, such as election platforms, electronic tax system platforms, and other types of civil service platforms. This is known as E-Government. To adapt all the developments of Information Technology, it need the governance discipline and compliance to run the electronic service process in services, both in government and private services. These services has an implications for legal and information aspects, which they are referred to as the concept of ethical standards of good and wise behavior.

The implementation of e-government services that they have implications for ethical standards of behavior according to Leimstoll, U., Dannecker, A., Knechtli, H., et. al (Leimstoll, et al., 2018) digitizing services and transformation are major issues in the development of economic and social. This indicates that the digital era and the new economic era proclaimed by developed countries a few years or twenty years ago are actually happening now.

In responding to the question of how the digitalization of connectivity with current technological changes, according to Susanto, Leu, Chen, & Muhiddin (Susanto,, Leu, Chen, & Muhiddin, 2020) telecommunication systems with information exchange which it was originally introduced in the United States, go back to the digital revolution in 1970s by Jack Nilles, it came up with the idea of communicating with local employees as a solution instead of having to move to another state to prevent unnecessary wastage of transportation costs. Thanks to the invention of digitizing information, nowadays, technological advances have facilitated the widespread use of information exchange in the telecommunications sector. On the other hand, during the 1980s, which it was also the beginning of the advent of the invention of the internet, personal computers, and cell phones, which it was expensive at the time however, it cause of as infrastructure and equipment emerged then further due to competition and the emergence of new applications, infrastructure costs fell, which it ultimately led to significant economic growth mainly as lower prices created in more demand worldwide throughout the year by causing lower prices for telecommunications devices such as smartphones to become affordable. Therefore, the advances in information technology (IT) facilities and affordable prices for obtaining them have enabled more workers to work remotely. According to the US Census Bureau (in 2012), the

number of workers working from home increased by about 3.9 million people between 1999 and 2010. Today, people holding sophisticated devices are often seen mainly on smartphone users for the purpose of communicating not only with co-workers, but also with friends and family members from far away. Due to the development of these communication technologies, they have become a complementary tool to the human need for information exchange which it stimulates the transformation of the way of working from traditional settings to the possibility of doing work from anywhere in the world.

In another answer to the question of how digitalization is connected with information systems in the current era of digitalization in all industries, according to Grivas et.al (Grivas, Peter, & Giovano, 2018), on the one hand, the existing business model in the digital transformation of communication is increasingly needed. It was dominated by the corporate management agenda. Interconnected information technology requires supporting solutions such as cloud, business analytics and mobile technology to drive further of the digital transformation. Companies that use cloud support in the file storage solutions come up with more skilled offerings to stand out in the face of competition and thus create new business advantages for companies. Companies are able to change more efficiently and more successfully in require condition of the companies to actually manage the changes that they have to do themselves and rethink their existing business processes and models. In accordance with these developments in the implementation of information technology, affecting the organization and IT departement of the company, which gradually changed orientation to become the main focus of the company's activities. These developments, which occurred in a short period of time, put enterprise IT in a new, more challenging opportunities. It must be faster and even more agile and efficient. In the context of this change, the company's IT unit must support the digital transformation of the business and reduce the costs significantly. IT management includes areas such as changing at the manual storage of IT services from manual to digital, IT governance and IT strategy which will be very important in supporting the company's operations. Meeting the demands of new technology needs to be carried out effectively and efficiently, specially optimizing the digital transformation process and the most important is the goal of making the customer become the center of attention. This brings changes to the new role of IT companies as a business partners and put the transformation of IT with a focus on production costs to customers. IT transformations in a very high-complexity enterprises need to make various adjustments, which it is include not only changing in one aspect, but moving from being cost-centred to being centered on business providers, then to be an enterprise architecture including the cloud, redesigning applications or choosing from stored applications such as file storage, or transferred from IT delivery to IT service center through a brokering process.

In IT transformation with very high complexity, in accordance with the concept of E-Business application that it has been applied by Gojek (Gojek.com, 2021) includes such as: Transportation & Logistics, Payments, Food order and shopping, An entertainment, business activties on manage restaurants from daily operations to ad placement. The Gojek Indonesia has made a change to become an information digitization company from previously a transportation provider in a certain business features.

In guiding companies to address the gap in digital transformationl, the management of company's can do to adopt a digital transformation approach called "digital leadership" and to do ending with a "sociotechnical framework" approach, to do outlining and strengthening the transformation of organizational forms in carrying out digital transformation in which may be required.

THE NEW CONSTRUCTIONS OF LEADERSHIP AND RISK DISTRIBUTION

Conducting a deeper study, before the Industrial Revolution occurred, according to Schwaferts and Baldi (Schwaferts & Baldi, 2018) the average manufacturing company consisted of only four employees or even less. The products are made to met the order in small batches or made in house. This constructions of manufacturing product is mostly done in-house using very simple hand tools products or machines productions.

Today, the decreasing of relevance of the management principles that they applied in the first industry revolution towards a trend of change that is carried out through the way of iterative and measurable explanation of every human activity with machines, digitalizations, AI and physical collaboration of network systems. For everything that it can be digitized or automated then they will do it. Focussing these trends and the pace of change that it is happening in a very fast, it is very clear that there are changes in the concept of Industry 4.0. On the other hand, this change shows the increasing importance of other success factors apart from the role of management that it carried out by humans.

Regarding the increasing of high automation factor, as it can be shown in Airbnb's business processes, it shows that the business ideas developed by Schwaferts and Baldi (Schwaferts & Baldi, 2018, p. 154) stated that although the ideas to automation of information systems were created by two students, initially only motivated for personal necessitate, it was able to grow very rapidly. At a conference in San Francisco in 2007, what the automation that emerged from these students' networked automation ideas was simply begin to rent out three beds on their living room and prepare their own meals, then in their bed, continue to set up running room service and to sleep for guests from various places around the world.

Along with developments in the field of modern human resource management and supported by rapid digital technology innovation, it poses significant challenges in several sectors including health. Digital technology is changing stakeholder relationships between the established industry players, including medical device industries. To maintain the leading of the competition and profitability, the factories of high-tech medical devices such as Medtech are required to focus to customers and then they need to shift investment in the services that it offered, as an alternative service that affects production costs and increase the patient satisfaction.

It is undeniable that, nowadays, the digitalization is ubiquitous, and it seems inevitable. According to Kutzschenbach et. al (Kutzschenbach, Schmid, & Schoenenberger, 2018), the digitalization on the industries of transportation had major changes triggered by a such digitalization of transportations and hotels industries process. The taxi and hotel industries are examples of the disruptive digitalization effects that they are often discussed in a business digital technology. However, not all industries are currently experiencing this level of disruption tecnology [non- reflective use of digitization, and adoption of new digital technologies, as they have unintended effects on a company's final product]. Digital technology developers can harm or damage the business success of companies since they have been the center of attention. Thus, in contrast to the technological optimism and futuristic expectations, the effects of digitization across industries have also led to the problems arise as disruptions that they are simplified, often misunderstood, or even misused. However, this challenges of transformation of the digital technology need to corresponding in organizational change. These digital technologies transformation put processes and transform organizations. The approach to the change of digital transformation in organization, for example, they makes implementation in the production process as a massive change through a new technology documentation, which it can help manage the messy

document processes that arise from the development of complex efforts such as revising business logic in a different industry moving.

The changes that occurred as a resulted in bound to respond the feedback on the disruption of technology. According to Yunaz (Yunaz, 2021) the feedback system in learning of digital tecnology during the Covid 19 pandemic at the Institute of Business and Informatics of Kosgoro 1957 (IBIK57) described the interaction of lecturers and students in digital tecnology on the way of scientific in the digitalization transformation. This learning process is in the form of online learnng that the lectures give response and delivery of tutorials, through online learing way and do practicum and seminars as well as community service and research with group discussions, simulations, case studies, collaborative, cooperative, project based, problem based and others.

It is undeniable that in overcoming the failure of digital technology disruption, feedback systems an example case occurred in Institute of Business and Informatics of Kosgoro 1957 (IBIK57) in revising its strategic position. Consisting of more than one product revision. Applying feedback through a systems approach, it is done by developing hypotheses about what is desirable and what is not desired from the impact of applying innovative digital technology to new service thofferings in the healthcare industry.

For this reason, the development of digital technology that it is increasingly innovative along with the development of artificial intelligence (AI) is currently a separate alternative. Artificial Intelligence discusses the history of changing the manual documents into artificial intelligence transcripts. How did the experts of 100 years ago think about today's AI.

The development of AI, according to Chivers, (Chivers, 2019) that the thought of artificial intelligence 100 years ago was called the world of 'transhumanism. The term 'transhumanism' in some of the ideas that emerged in the first half of the 20th century are synonymous. In 1923 J.B.S. Haldane predicts a world in which humans use genetics to make themselves smarter, healthier and taller. The term AI working on itself in acoined by Julian Huxley, in 1927: 'which he explained that the human species, under their will, transcended itself - not only sporadically, individually in one way, one individual and another another way - but overall, as an AI human resources activity, it's an option. Back then, they needed a name for a new belief in AI called transhumanism.

The term of transhumanism is currently widely known as Artificial Intelligence. According to Hanne and Dornberger (Hanne & Dornberger, 2017) the trends change of the technological developments is Information Technology (IT) systems which they are smarter in solving problems than ever before, it is about too complex to solve, or because of computational power limitations that prevent completion in normal time. This change brings the trend of increasing use of AI, related to modeling of simulations in mathematic and optimazing for practical application purposes, reviewing a particular information technique known as Computational Intelligence (CI),.

The development of AI has change the trend of mathematic in practical application. According to Echeberria (Echeberria, 2020) the changing trend in Artificial Intelligence has given rise to heated debates about how AI research incorporates areas that they are at the center of the defining developments fundamentally in AI through research with the methods combined on their application areas. These areas include, firstly, the Extensive Machine Learning Scale, which focuses on machine learning algorithms that it is not only limit the scale of predefined algorithms but also broadly incorporate large amounts of data into machine learning. Machine learning is to perform in depth, carried out through the procedure for classifying learning classes, execute to support object recognition

facilities which they are displayed in an image, videos containing the types and constructs by labeled recognition, drawing a series of activities that they need to be undertake, and changing objects into objects that they are in accordance to the perception to be achieved through materializes such as audio sound, delivery in the constitute of narration and processing of interpretation into natural language. In processing to strengthen the learning purpose, this is becomes the framework underlies the changes in learning made by machines from various materials that they are further understood as a learning experiences in delivering decision-making choices. The learning experienes promises an opportunities in future for AI applications to become a choice in occupy a decision making to comply real-world demands. It is undeniable, although most of the learning machine experience was based on academic activities in the past few decades purely, and now, the machine learning has shown that it has been achieved in machine learning activities that it can be realized in the real world. Second, Robotics, Robotics is a robot machine that can be trained to interact to the real world to perform a complet work that it has been previously predicted. It is related to how to provide facilities to manipulate an object that it can comply interactions with the surrounding environment or in interacting to fill human needs. The most advanced developments in robotics today are assuring the reliable capabilities in the fulfillment of reliability and general ability to carry out computer vision and other vision in establishing the understanding robotic machines that it should be understood. Third, Computer Vision, the computer vision is interpreted as a formulation of understanding or machine perception of the fashions of the most influence of the running of computer equipment. These tools are the sub- sections of AI that are most prominent in transforming immersive machine as a generated learning. The learning outcomes generated these devices, for the first time to demonstrate machine intelligence in carrying out pre-defined tasks, a better than humans. Recent studies have shown that automation systems in the images and videos captured in all the time are the center of attention. Fourth, Natural Language Processing, it is a device that performs language processing that it can be understood naturally when it is transformed into an application. In this process, it is often combined with automatic speech recognition. Applications that they are generated with the ability to recognize voice automatically, they are becoming increasing of utilization on the management of a wide range of compiled data.

Fifth, the Research is current being carried out in capacities and capabilities of the system that it was developed particularly to interact with the humans through two-way dialogue that it is not only limited for responding the various styles of requests from someone, from different countries in the world directly in between people to joint discussion scope. Sixth, Collaborative Research System in Studying a Model and Algorithm which it is intended to formulate a system that runs independently by collaboratively integrating among various other different systems in relation to human. Seventh, Research involving Many People in Computing system given to Humans, which it is research that investigativing in nature the methods of using computer systems to improve the ability to solve problems in accordance with human expertise that it has not been able to be solved by computers properly it self. Eighth, Algorithmic Game Theory and Social Choice Computing that draws attention to the economic and social dimensions of computing in AI, it such as how systems deal with incentives that they are potentially inconsistent with the choices made by humans in dealing with the same problem, including dealing with incentives given to humans or the way to handle the companies that they are carried out by humans and various automations on computer machines built based on AI as a human representatives in the same handling. Ninth, IoT research with specificity in all directions, elements and branches of a device, including various equipment used to connected to the utilize of vehicles, building, the use of monitoring cameras in an application, which shows that all these equipment are interconnected in the purpose of gathering and sharing an extensive information through sensor signification for the intention of using knowledge intelligence. Tenth, Neuromorphic Computing which it is a set of science and technology that equates a biological neural network system in the human body that it is able to increase efficiently the use of hardware and perform computing systems with

strong endurance and capabilities, by replacing the previous utilization through modules separately, in processing and diverging the instructions that it given to the input/output.

Related to the supporting of technology in the Internet, the defined IoT according to Azizi (Azizi, 2019), the definition of the Internet of Things (IoT) in the advancement of science and technology explains the reciprocal relationships that occur in carrying out operating activities on input/output generated from one machine to another through a system of smart equipment, with radio frequency technology associated to a centralized communication system that it is able to monitor the information on the movement of all input/output objects, through images as an important data and communicate the movement of these inputs/outputs through the available internet network in a software application.

Receiveing an important information at the moments that is directly used according to the time of occupy, it has substantial value in various of manufacturing industries, such as an information distribution system that it is adapted to the manufacturing process in a production process with a certain flexibility, affecting the management of the amount of inventory needed and running the process for distribution in chain to the customer of the company's supplier. At this period, an advances in technology and modernization in the system of assembly industry, starting from production activities to transportation activities, they have provided an increase in crossing the demand to convey the developments of passed information stages and identify events that occur in materials handling, materials process, products and other things directly to the substance of interest. One of the current technological developments that they have a decisive propose in the application of IoT that it can identify and provide movement of information on the parts that they are passed by an object in the manufacturing industry is Radio Frequency Identification (RIFD).

It is undeniable that the development of the internet of things today has affected all aspects of life. In term of the development of the IoT, Azrour et.al (Azrour, Farhaoui, & Azidine , 2020) state currently the world of the internet with the development of the various device application, continues to grow. The development of the internet has not only become a spot to obtain information in order to comply the require information but also provided various services that they are mutually integrated in each other in order to able to create a new way of communicating and interacting systems between people through electronic mail, information exchange, short messages, video conferences at different distances, or telephone calls through the internet service provider's network. For the communication process, to ensure the required communication runs as accordingly, various protocols are used for communication signals. For this purpose, in particularly, various protocols which they have capable signals of transmitting frequencies have been developed, such as SIP models, H323, MGCP, SKYPE and so on. The protocol model currently that it most prominent used is SIP (Session Initiation Protocol) developed by the IETE company in a various functions that they are capable of providing signals for multimedia services including display changes or the stoppage facility in viewing of multimedia sessions. In the context of the purpose of the protocol, it still requires improvements to various service on leans of provided protocol and it is an optimal serve in running the same program when compared to the H323 protocol from the ITU company.

In running the same program related to the development, it need face the challenge in research. According to Mukherjee and Loganathan (Mukherjee & Loganathan, 2020) the challenge faced in conducting research on technological developments involving an advanced information systems is the availability of literature preparation that they explains the functions of human body today which they are translated into machine functions in the development of science. The next challenge is to prepare technology that it is able to reach future technological developments based on the current knowledge that it makes the current technological advanced is the past of future technology. These challenges, of

course, are very difficult to do, considering that the predictions of future technological developments often occur when information system failures which it is cause disruptions of them then change the development to the new technology market direction that it is become more in line with the necessary to the new direction of technological progress. more complete and real. However, there are many indicators that they have been achieved to date today, which it is scientifically show the achievements of these technologies are demanded in the future as they should be, such as the need of meeting for big data sharing technology, the shape of the cloud, which it is in the cloud world that always needs more developments. The new technology through cloud computing which it is constantly evolving in novelette technologies and services that it is provided to meet the market demands of the business model of technology in the next few years.

The management of data expose on databases for the employ in adapting to new technological advances is currently continuing to develop and evolve from managing the most complex forms of data from computer software to management systems that it is showing management of exposed on database or in simple terms called system of database. It is the most prominent part in the use of computers. The system of databased management provides the ability to store the amount and availability of large data that it is independent, not tied to any particular interest, which it is free to use in the process of decision-making. The management of this database, which it is used not only to support the effective adoption of data but also supported by multifunctional data storage, which it can be seen in the introduction of interface program expose on the database. This program provides flexibility to the users in accessing and managing their data to fulfill the communication mechanism that it needed more satisfactorily, especially in converging the objectives that it need to be achieved. In contrast to the ordinary data storage system, this new database system, allows the use of large data with different management process in more complete manner with a wider use of purpose as well. Furthermore, the supervision of the company's transaction management in the use of databased system allows management of database provides support for the company's ability to take the desired bid position in accordance with data accessible. The sustainable support of access data that it can be achieved through different practices is referred to the data transaction process. The ability to manage the use of this data is an important part to prevent failure or avoid unnecessary mistakes when the company makes decisions with different choices in its transactions.

The development of technology today according to Fong, Li and Muhammad (Fong , Li, & Mohammed, 2021) begin with the rapid development in technology due to creativity and the outcomes of development of the different functions of smart devices such as contact sensors that they embedded in various devices and on the smartphone itself, it has shown a very fast technological development in this era. The use of application data thru streaming for the purpose of monitoring between devices that they do interact with each other. The multiple streams thru data streams, passed mastering from the rapid improvements in the use of IoT by various applications, that they have a high level of analytical testing with a very substantial system of sensor of data streamed in live streams. The applications on IoT through embedded devices in these applications are constantly expanding the benefits and functions of data, sending and analyzing the data and delivering benefits according to consumer needs in very fast. Just a quick overview, the data system embedded in the application can be depicted on a cylinder gas with a practice that immediately provides information to the user such as an example when the tube is full of gas then it must be stopped filling immediately. New computational models are always be necessary to converge the requires of data processing in IoT, especially in related to the completion of filling of the certain object volumes, converging the needs of variations on the requires of certain objects as well as various new fashion that they are different from the first beginning. This data processing also needs to minimize the latent impact that it is appears on the application, which it is turn to slow down the streaming of the data stream then put it on mistake from the predetermined target. For example, some augmented reality devices with applications that it replace functions of human tissues respond on

delays up to tenths of a second. However, it is very difficult to avoid the inherent latent effects of a large and varied number of applications. A number of tenths of a second is required to close an application in manufacturing company with line production functions in an electronic system process that it is happen suddenly or the disturbance occurs which causes the electronic system in line production functions to be forced to start it over to their original functions. This happens because the computations process in the cloud parts are closer to storage to the bottom while the cloud storage computing as a whole has not moved as the same with the required time that it is has been reached. This problem occurs specifically due tdifficulties that occur in a set of public devices. Contrary to any conditions, decision making at a sensitive time still has to be taken even though at the same time, the data that it is collected and presented continues to be produced. Of course, at this moment, the cloud computing systems that they are carried out on traditional way are not in accordance with the development of current condition of IoT.

Accoring to Guo, Mei and Li (Guo, Mei, & Li, 2021) the utilization of cloud data storage continues to grow today in information management system by increasing the speed in process of complexity and in the capacity of data sources. Various process are very dynamic developments in environmental conditions that support the utility of cloud data storage that they have very significant influence on the equilibrium of the network and the expansion of data sources in their utilization. Even with very favorable conditions that it is mention above, it is possible to sharp an equilibirium model that performs scheduled maintenance on the cloud which it is allows further research on the utility of shared networks among multiple users of data sources and the used of the cyber utilization in more efficient way. It is potentially to do research among multiple user as part of future developments in the management of networks sharing in order to share resources of information and to increase more utilization of usefulness.

The application of AI in Indonesia is carried out off-line learning. They still in the stage of weak AI implementation. According to Halim and Prasetyo, (Halim & Prasetyo, 2018) starting with the C programming language courseware, for example, the designed forms as a reflection of artificial intelligence. Furthermore, the courseware program is designed as the first part to perform the filter. Each error in the algorithm language is categorized in a classification as C which it is used to describe or present the algorithm as a bubble. The teacher's explanation is included in this study. The example of a combination of an artificial intelligence and the assistance based on retrieval data and instructions. The principle of the application is as follows:by starting with the focus of each section according to the ability of students, and the difficult part is the courseware choices that it is reflect the choices of students in the class, the choices set by X_i, Y_j, X_k, with X_i ($i = 1,2, ... n$) for the instruction accuracy value, Y_j ($j = 1,2, ... n$). All data for correct scores are arranged according to the level of learning difficulty, Z_k ($k = 1,2, ... n$) to weights to reflect student choices. At the same time, the function of f is set as according to the parameter weights. The next step is to calculate the value of $PI = f(X_i.Y_i.Z_k)$ ($I = 1, 2. ... n$), and assume that the different parts of realization multimedia files are compiled into selectable file names on each of file1.exe and file, file2.exe ... ..., fileN.exe (assuming that the part of the N is document), according to the following selection rules:

if (PI = 1) then
do l.exe file
if (PI = 2) then
do another file2.exe

By following the above steps that it can further achieve the function of an intelligent machines, as an alternative options to provide flexible teaching progress according to student reflections in the classroom which it will be later used to achieve a better teaching outcomes.

In the computational intelligence system carried out at Gajah Mada University in formulating GeNose accuracy according to UGM researchers (Gajah Mada University, 2021) based on the GeNose C19 prediction process which it is prioritized on: 1) The quality of the pre-processing signal is normal, low and invalid/inconclusive for better feature extraction of GeNose engine sensor, 2) Improved AI performance by adding analysis windows which can improve the accuracy of feature response reading pattern extraction classification based on normal signal reading and low signal from algorithm, 3) Due to variation and invalid signal quality that is not good, then invalid signals are excluded from the algorithm.

LANGUAGE CHALLENGES IN HUMAN COMPUTER INTERACTION

The challenge of human computer interacton faced today is how machines understand human language, so it takes many layers, such as morphology, syntax, semantics and pragmatics. According to Jungling, et.al (Jüngling, Lutz, Korkut, & Jäger, 2018) morphology and syntax are needed to define the basic units of words known as morphemes, and how they formulate a correct words and sentences between humans and machines. Semantics deals with the creation of logic and real-world references in words, sentences and text into machines. Pragmatics deals with the problem of how sentences are used in different situations and how to interpret them (adapted from Natural Language Processing, NLP) which it is consists of processing the artifact layer input data that contains the logic words to apply to the input and output machine artifacts that it used. This makes the processed data outcomes can be interpreted by humans. One of these machine artifacts is likely to draw with some sort of knowledge from the previously mentioned ones in the future.

CONCLUSION

The challenge of management information systems in the industrial era 4.0 is an impossibility to replace human intelligence with machines, but in reality, in the industrial era 4.0 in all aspects of human intelligence can be replaced by robots. Management information systems in the application of strong artificial intelligence (AI) put the information technology in place of robotic intelligence equal to human intelligence or even more. Management information systems are currently still dominated by weak AI, but will continue to develop along with the development of artificial intelligence as a result of technological advances in the future.

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