Challenges of Public Administration Reform in the Industrial Age 4.0

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Abstract
The history of the industrial revolution starts from industry 1.0 to 4.0, increasing digitalization of manufacturing supporting factors such as increased data, computing power and connectivity, analytics, business capabilities and intelligence, changing human-machine interactions, and improving digital changes to the physical world, such as robotics and 3D printing. This paper describes how the basic principle of industry 4.0 is the amalgamation of machines, workflows and systems by implementing an intelligent network along the production chain and process to control each other independently. The research findings show that transparency of information is the ability of information systems to create cyber knowledge by enriching digital models with data sensors including data analysis and information provision. There is an aid system to support humans by combining and taking information consciously to make informed decisions and solve proximity problems in a short time.

Keywords:
Government, Public Administration Reform, Digital Services

1. Introduction
Industry 4.0 is marked by an increase in manufacturing digitization driven by four factors: 1) Increased data volume, computing power and connectivity; 2) The emergence of business analysis, skills and intelligence; 3) The occurrence of new forms of interaction between humans and machines; and 4) Improved digital transfer instructions to the physical world, such as robotics and 3D printing. That also the basic principle of industry 4.0 is the combination of machines, workflows and systems by implementing an intelligent network along the chain and production processes to control each other independently (Lifter and Tschiener, 2013). Hermann, et al, (2016) added, there are four industrial 4.0 design principles. First, interconnection (connection), namely the ability of machines, devices, sensors and people to connect and communicate with each other through the Internet of Things (IoT) or the Internet of People (IoP). This principle requires collaboration, security and standards. Second, information transparency is the ability of information systems to create virtual copies of the physical world by enriching digital models with sensor data including data analysis and information provision. Third, technical assistance which includes: (a) The ability of the

assistance system to support humans by combining and evaluating information consciously to make informed decisions and solve urgent problems in a short time; (b) The system's ability to support humans by performing various tasks that are unpleasant, too tiring or unsafe; (c) Includes visual and physical aids. Fourth, decentralized decisions which are the ability of virtual physical systems to make their own decisions and carry out tasks as effectively as possible.

The background of this research is also how evaluation activities are basically similar to supervision, control, supervision, control and monitoring, only the objectives are different. Furthermore, when policies arrive at programs and projects that are followed by physical actions, they certainly have a consequence, namely in the form of results, effects or consequences dividing the consequences of the policy into two categories, namely output and impact. Output is goods, services or other facilities received by a certain group of people. Meanwhile, impacts are changes in physical and social conditions as a result of policy output. So an impact study aims to examine the consequences of a policy, or in other words, to find answers to what happened as a result of implementing a certain policy and to discuss the methods used and the results achieved. impact gives greater attention to the output and impact of policies than to the process of implementing them. So impact evaluation is a policy framework that can be used to evaluate policies after the program is implemented. In relation to impacts, as mentioned earlier, there are expected impacts and unexpected impacts. The expected impact implies that when the policy is made, the government has determined or mapped the impacts that will occur. Among the impacts that were expected to occur, there were those that were expected and some that were not expected, even more so after being implemented there were also unexpected impacts.

2. Literature Review

Industry 4.0 has introduced flexible mass production technology (Rakicka-Pustułka et al., 2020). Further, machines will operate independently or in coordination with humans. Industry 4.0 is an approach to control the production process by synchronizing time by unifying and adjusting production. According to Lionardo et al. (2020); Neumann et al. (2021) that industry 4.0 is used in three interrelated factors, namely: 1) Digitalization and economic interaction with simple techniques towards economic networks with complex techniques; 2) Digitalization of products and services; and 3) New market models.

The digital revolution and the era of technological disruption are other terms for industry 4.0. It is called the digital revolution because of the proliferation of computers and automation of records in all fields. Industry 4.0 is said to be the era of technological disruption because automation and connectivity in a field will make the industrial world and job competition non-linear. One of the unique characteristics of industry 4.0 is the application of artificial intelligence (Tjandrawinata, 2016). One form of application is the use of robots to replace human labor so that it is cheaper, more effective and efficient.

Public administration challenges focus on the implementation of government tasks, development and fostering of local communities. That is why the demands of the community to carry out regional development in addition to the above conditions are to obtain, facilitate and get closer to the central government as a public service. Public service is an issue that is very crucial and interesting to always be discussed. Where in practice the public is always in an unequal bargaining position with the government. The government as the main actor of the bureaucracy tends to make convoluted and complicated regulations. There are 4 (four) categories of public services, namely: Administrative services, such as granting various permits and identity of the population, infrastructure services, such as roads, irrigation networks, transportation and others, basic needs services, such as clothing, food, drinking water, health, education, employment, sense of security and a clean environment., Regional revenue services, such as local revenue.

In relation to this research, the intended public service belongs to the category of administrative services in which the bureaucrats who carry out and operate their responsibilities do not function ideally, and even grow in large government machines. In fact, in Max Weber's concept, the presence of bureaucracy is intended to limit the excessive authority of the authorities and increase the quality of service to the community. In relation to this research, the intended public service belongs to the category of administrative services in which the bureaucrats who carry out and operate their responsibilities do not function ideally, and even grow in large government machines. In fact, in Max Weber's concept, the presence of bureaucracy is intended to limit the excessive authority of the authorities and increase the quality of service to the community.

Some of the views of observers and social scientists and practitioners about bureaucracy in relation to public services reveal the desires written by Osborne and Gaebler, in their book Reinventing Government, namely ten alternative

models for bureaucracy in order to provide good public services. First; as a policy maker, the government should be able to act as a guide, rather than insist on being an implementer. Second; the government as belonging to the community should empower the community. Third; The government as an institution that lives in an era of competition should inject a competitive spirit into the minds of government officials and service organizations. Fourth; government units as institutions tasked with realizing the mission should be freer to be creative, not shackled with rigid rules and implementation guidelines. Fifth; as a results-oriented "factory", the government should be more concerned with the results to be achieved rather than too focused on input. Sixth; as a public servant, ideally, the government is more concerned with meeting the satisfaction of society than its own interests. Seventh; as a government business entity, it must be smart in finding opportunities to earn foreign exchange. Eighth; as an institution that has the government's anticipatory power, it must be able to prevent problems from arising. Ninth; as the holder of government decentralization authority, it should shift the hierarchical working pattern that has been adhered to towards a participatory work model and cooperation. Tenth; as a market-oriented party, the government should try to boost change through its control over market mechanisms.

In general, they state that public services absolutely belong to the public, meaning that they are entitled to get it because it is the duty of bureaucrats to serve the public. However, the problem is how good public service is and satisfies the public and what is the measure or performance indicator of public services by public organizations. This problem arises when each party feels that they have not received satisfactory service and the bureaucrat feels that he has done and provided good service to the public. There are two different points, assessing the need for performance indicators to assess the quality of public services and public organizations must have organizational goals and missions. Performance indicators, goals and organizational mission are needed in order to improve service quality for the public. This indicator is productivity, generally understood as the ratio between input and output by a public or private organization. Quality of service (quality of service); Service quality forms a public image of public organizations. If the community is satisfied with the services provided, a positive image will be created, on the other hand, if the dissatisfaction is received, a negative image is inherent in public organizations. Responsiveness (responsivenees); namely, the organization's ability to recognize community needs, formulate service agendas and priorities and develop public service programs according to community needs and aspirations. Responsibility; assessment of public organizations, namely matching the implementation of activities and programs with administrative procedures and provisions that exist in the organization. Accountability (accountability); assessments conducted by various components of society (people's representatives, political officials, community leaders) where the results are used as a tool to assess the accountability of public organizations.

First, the bureaucracy exists and works in a hierarchical, bureaucratic, monopolistic environment and is bound by political authority, as a result it is rigid or rigid, follows the instruction, and does not have initiative and creativity. Second, the bureaucracy is full of tasks and functions that are not focused on public services, but also serve as a motor of development and empowerment activities so that they are not mobile. Meanwhile, by referring to the opinion of several experts and ministerial regulations, it identifies the performance indicators of public organizations, especially local governments, from two perspectives, namely results orientation and process orientation.

Regarding all of the above opinions, in relation to this research, namely providing public services, especially administrative services, the desired desire with the occurrence of regional development is that the community is getting closer to the center of government and getting "reasonable" services from bureaucrats with indicators on time, cost. light, transparent and accountability and empathy for the public. So public service is a form of service that is obtained by the public from the government, where they get it in accordance with the provisions governing the existence of these services.

Advances in technology allow automation in almost all fields. New technologies and approaches that combine the physical, digital and biological worlds will fundamentally change patterns of life and human interaction (Jipp et al., 2008; Lionardo and Nasirin, 2020b). Industry 4.0 as a phase of the technological revolution changes the way human activities are in scale, scope, complexity and transformation from previous life experiences. Humans will even live in global uncertainty. Therefore humans must have the ability to predict a very fast changing future. Each country must respond to these changes in an integrated and comprehensive manner. This response involves involving all global political stakeholders, from the public, private, academic to civil society sectors so that the challenges of Industry 4.0 can be managed into opportunities. Wolter identifies the following industry 4.0 challenges: 1) Information technology security issues; 2) Reliability and stability of the production machine; 3) Lack of adequate skills; 4) Reluctance to change by stakeholders; 5) The loss of a lot of work due to turning into automation (Sung, 2017).

Basically, public policy is inseparable from public and government problems, one of whose functions is to formulate policies to meet the demands of a person or group because of the conditions at hand. This happens because there is a condition that does not satisfy some people so that it encourages them to satisfy part of the community in order to overcome them through the system they have. This is where the foresight of public officials is required to understand the needs of society for the public problems faced. And furthermore, not only understanding, but taking appropriate policy steps that can satisfy the people they lead. There are so many public policies that are interpreted by several experts from their respective points of view, including Parker limiting that public policy is: "A certain goal, or a series of actions taken by the government at a certain period in relation to a subject or a response to a crisis ". A proposed direction of action or policy put forward by a person, group or government in order to overcome obstacles or take advantage of opportunities in a certain environment in order to achieve a goal or realize a goal ".

3. Methodology

The research aims to determine the challenges and opportunities that will be faced in Industry 4.0. and what are the readiness of the Regions in facing Industry 4.0. A qualitative approach is an activity that aims to obtain the truth of scientific knowledge, through predetermined procedures. Therefore, this study is carried out carefully and thoroughly, so that the results obtained are accurate in the research activities carried out carefully in determining the type of data, data sources, how to collect data, research objectives and data analysis techniques. A qualitative descriptive approach, which is intended for careful measurement of certain social phenomena in developing concepts and gathering facts, but does not test hypotheses.

4. Results and Discussion

Mapping of industry 4.0 challenges and opportunities to prevent various impacts on people's lives. One of them is the problem of unemployment. The 2017 Work employment and Social Trend Outlook predicts the number of unemployed people globally in 2018 is estimated to reach 204 million with an additional 2.7 million increase. Almost the same as the conditions experienced by western countries. Indonesia is also predicted to experience the same thing. Unemployment is still a challenge and even tends to be a threat. Indonesia's open unemployment rate in February 2017 was 5.33% or 7.01 million people from a total of 131.55 million people in the workforce (Source: BPS 2017).

Industry 4.0 challenges and opportunities encourage innovation and creation of a region. The government needs to review the relevance of the ability of regions to respond to changes, challenges and opportunities in the industrial era 4.0 while still paying attention to human aspects (humanities) (Lodgaard and Dransfeld, 2020; Nasirin and Lionardo, 2020). Responding to the challenges of industry 4.0, Bukit (2014) explained that it is necessary for the Regional Government to prepare the State Civil Apparatus which has the following characteristics: 1) Oriented to individual performance in the world of work; 2) Special justification on real needs in the field; 3) Focus on psychomotor, affective and cognitive aspects; 4) The benchmarks of success are not limited to schools; 5) Sensitivity to the development of the world of work; 6) Requires adequate facilities and infrastructure; and 7) There is community support.

The results of the study explain that competence greatly influences the development of an employee's identity related to work and the fulfillment of competence is a place to forge one's maturity and skills so that it cannot only be borne by a group but becomes a collective responsibility. The purpose of increasing competence is the development of knowledge, abilities, skills and the formation of one's competence. These challenges must be answered quickly and precisely so as not to contribute to increasing unemployment. The Regional Government seeks to respond to industry 4.0 challenges, the threat of unemployment and demographic bonuses with a focus on improving the quality of human resources through vocational education in 2018. The government through cross-ministerial and institutional policies issued various policies. One of the government policies is revitalization. Support from the government must include: 1) Learning systems, 2) Education units, 3) Students, and 4) Educators and education personnel are also needed. Some of the skills structures needed today are as follows; 1) Complex problem solving; 2) Cooperating with other people; 3) Management of people; 4) Think critically; 5) Negotiation; 6) Quality control; 7) Service orientation; 8) Assessment and decision making; 9) Active listening; and 10); Creativity. In 2020 the work structure changed to: 1) Solve complex problems; 2) Think critically; 3) Creativity; 4) Management of people; 5) Cooperation with other people 6) Emotional intelligence; 7) Assessment and decision making; 8) Service orientation; 9) Negotiation; and 10) Cognitive flexibility (Secondary Data, 2020).

Table 1. Job Skills Challenges

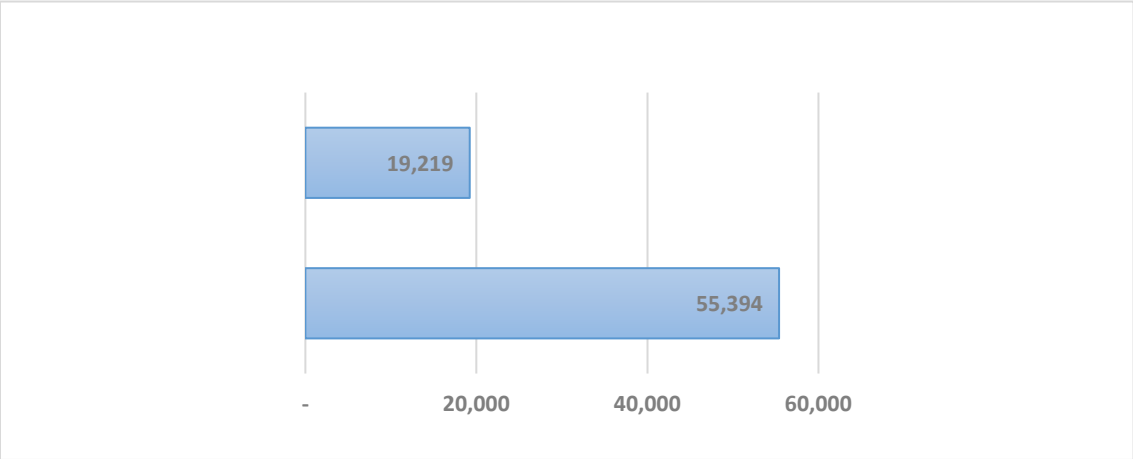
No	Soft Skill	Jobs	Labor	Employment Opportunity
1.	Problem Solver	427	835.504	183.351
2.	Critical thinking	411	718.894	117.301
3.	Creativity	398	626.393	231.055
4.	Management people	340	615.725	485.792
5.	Emotional Intelligence	311	630.400	567.902

Source: Secondary Data, 2020

In dealing with industry 4.0, local governments really need community support. Bartkowiak and Koszel (2017) explained that local government needs support and recognition and cannot be separated from the interests of the community. This will increase people's confidence to feel safe as skilled workers because of the support and recognition from the community and good leadership in the organization (Lionardo and Nasirin, 2020a). Basically vocational education can be provided or facilitated by the community and government to prepare and change individuals quickly to meet the demands of the world of work and the changing times including the industrial phase 4.0 (Latunreng and Nasirin, 2019).

Competency development must involve all stakeholders involved in the system to answer industry 4.0 challenges. Belle et al. (2017) offers a model called A Bioecological Model of Human Development. The model explains that systems, individuals, micro systems, meso systems, ecosystems such as industry, mass media, local social and political services, and macro systems must be able to collaborate to form a complete system, namely the chronosystem. That element must be involved in the learning health system of the educational unit, students and educators and education personnel in accordance with their respective roles (Asch et al., 2020; Nasirin et al., 2020). Civil servants, which are referred to as State Civil Servants (ASN), as mandated by Law No. 5 of 2014 states that the duties and functions of civil servants are as makers and implementers of public policies. In connection with the Industrial Revolution 4.0, as a public service, of course, civil servants are required to work optimally. Civil servants no longer think routinely, but think out of the box. If necessary, think outside of the box to have a mental service, insight and knowledge must also be global, not in a narrow mind and not open and allergic to other people's opinions. Civil servants are also static and dynamic and have digital competence.

Table 2. Customer Area Of Public Services



Source: Secondary Data, 2020

Based on that data, we know that industry 4.0 brings many changes the environmental impact of human, animal life to gain the quality of life (Adeel et al., 2017; Nasirin, 2020) . Industry 4.0 has fundamentally changed the way people do activities and have had a major impact on the world of work. The positive influence of industry 4.0 is in the form of effectiveness and efficiency of resources and production costs even though it has an impact on reducing

employment. Industry 4.0 requires a workforce who has skills in digital literacy, technological literacy and human literacy. Regions must be able to meet digital competencies.

5. Conclusion

The Regional Government currently has to prepare the competencies possessed by the State Civil Apparatus (ASN) from their competencies such as special skills, education levels, leadership skills, innovation, digital competence and high creativity. Leadership in local government must have a transformative leadership spirit, where the leader of a region is able to translate and change the current conditions to the current conditions Industrial era 4.0. The readiness of a region in supporting the Industrial 4.0 revolution includes organizational business readiness, technology infrastructure readiness and human resource readiness. Local government strategies in preparing for the Industrial revolution include encouraging workforce in Indonesia to continue to learn and improve skills to understand the use of IoT technology or integrate internet capabilities with industrial production lines, use of digital technology to spur productivity and competitiveness in small and medium industries.

References

Adeel, Muhammad, Xiaoming Song, Yuanyuan Wang, Dennis Francis and Yuesuo Yang 2017. Environmental impact of estrogens on human, animal and plant life: a critical review. Environment international 99: 107-119.

Asch, David A, Steven Joffe, Barbara E Bierer, Sarah M Greene, Tracy A Lieu, Jodyn E Platt, Danielle Whicher, Mahnoor Ahmed and Richard Platt 2020. Rethinking ethical oversight in the era of the learning health system. In Rethinking ethical oversight in the era of the learning health system, Healthcare, 100462: Elsevier.

Bartkowiak, Piotr and Maciej Koszel 2017. Forms of relationships among local government units in Polish metropolitan areas. Procedia Engineering 182: 76-82.

Belle, Morgane, David Godefroy, Gérard Couly, Samuel A Malone, Francis Collier, Paolo Giacobini and Alain Chédotal 2017. Tridimensional visualization and analysis of early human development. Cell 169: 161-173. e112.

Jipp, Meike, Achim Wagner and Essameddin Badreddin 2008. Individual ability-based system design of dependable human-technology interaction. IFAC Proceedings Volumes 41: 14779-14784.

Latunreng, Wahyuddin and Chairun Nasirin 2019. Competitive advantage: Exploring the role of partnership with suppliers, customer relationship and information sharing as antecedents. Journal of Supply Chain Management 8: 404-411.

Lionardo, Andries and Chairun Nasirin 2020a. Leadership Management and Youth Competencies in the Administration of Public Policy in Indonesia. International Journal of Economics & Business Administration (IJEBA) 8: 335-343.

Lionardo, Andries and Chairun Nasirin 2020b. The Quality Effect of Digital-Based Signature Services on the Performance of the District Government. Webology 17.

Lionardo, Andries, Chairun Nasirin, Rudy Kurniawan and M Chairul Basrun Umanailo 2020. Accountability of Local Government Policy in Improving Health Services to Respond Industrial Revolution Era 4.0. Vol. 29: pp.4121-4127.

Lodgaard, Eirin and Sebastian Dransfeld 2020. Organizational aspects for successful integration of human-machine interaction in the industry 4.0 era. Procedia CIRP 88: 218-222.

Nasirin, Chairun 2020. Determinant of the Ouality of Life with Schizophrenic Disorder Living in the Community: Health Policy to lmprove Nurse.

Nasirin, Chairun and Andries Lionardo 2020. Administration Healthcare System: Advancing the Knowledge and Skills of Nurses' Professional Working with Family Caregiver of Mental Illness. International Journal of Pharmaceutical Research 12.

Nasirin, Chairun, Andries Lionardo and Rudy Kurniawan 2020. Knowledge and Attitudes of Nursing Students in the College of Health in The Face of Global Pandemic Covid-19: Community Empowerment in Preventing Epidemic Disease.

Neumann, W Patrick, Sven Winkelhaus, Eric H Grosse and Christoph H Glock 2021. Industry 4.0 and the human factor–A systems framework and analysis methodology for successful development. International Journal of Production Economics 233: 107992.

Rakicka-Pustułka, Magdalena, Aleksandra M Mirończuk, Ewelina Celińska, Wojciech Białas and Waldemar Rymowicz 2020. Scale-up of the erythritol production technology–Process simulation and techno-economic analysis. Journal of Cleaner Production 257: 120533.

Sung. TK (2017). *Industri 4.0: A Korea Perspective. Technological Forecasting and Social Change.* Journal, 1-6.

Tjandrawina, RR (2016). *Industri 4.0 : Revolusi Industri Abad Ini dan Pengaruhnya pada Bidang Kesehatan dan Bioteknologi.* Jurnal Medicinus, Vol 29, Nomor 1, Edisi April.

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