

## **PREPARATION AND CHALLENGES OF INDUSTRY 5.0 FOR SMALL AND MEDIUM ENTERPRISES IN INDONESIA**

**Aries Kurniawan, Beni Dwi Komara, Heri Cahyo Bagus Setiawan**

### **Abstract**

The purpose of this study is to provide inputs for Small and Medium Enterprises (SMEs) in facing the era of Industry 5.0. Many perceive Industry 5.0 as a continuation of the fourth industrial revolution that utilizes ‘big data’ on the internet to run a business.

The approach used in this study was literature study, which was intended to examine the current events, especially in the production process. A number of documentary videos from several sources, including YouTube, National Geographic channel and other sources, were retrieved to examine the changes in the industrial trends in various parts of the world.

As a result, it can be concluded that the challenges faced by SMEs in establishing business in Industry 5.0 mainly relate to product excellence. Facing the new era, local SMEs have several advantages that have to be developed due to the involvement of human ‘touch’ in the business processes.

Some products are potentially irreplaceable despite the changes of industrial trend, namely products with special characteristics such as handicrafts and natural resources-based products.

For SMEs in Indonesia, there are other advantages in addition to the special characteristics in the processes and final products, which are the national and cultural values of Indonesia.

**Keywords:** Small and Medium Enterprises, Industry 4.0, Industry 5.0, Product Excellence

### **Introduction**

Small and medium enterprises (SMEs) are categorized into four groups: supporting industries, export-oriented industries, domestic market-oriented industries and home industries. Supporting industries are frequently linked to the machinery industry. The relationships are known to accelerate industrialization as well as to create job opportunities and economic diversification.

Today, SMEs have to face the ongoing changes in the industrial era. While the current Industry 4.0 requires the capacities of SMEs to utilize data, production equipment and management systems in decision making, the paradigm is actually moving towards the era of Industry 5.0, creating what is called a “smart factory”. In a modular structured smart factory, physical-cyber systems monitor physical processes, make virtual copies of the physical world and make decentralized decisions. Through the Internet of Things, physical-cyber

systems communicate and cooperate with each other and with humans in real time, and through the Internet of Services, internal and cross-organizational services are offered and used by value chain participants.

In the process of business activities, the Industry 4.0 has taken place on a massive scale, although it has not been comprehensively implemented in Indonesia. It is due to the required support of infrastructure, especially the Internet and human resources, which is an issue in Indonesia. As a consequence, the business activities of SMEs have not been optimized, implying the obstacle in facing the challenges of Industry 4.0.

Actually, not all parties encounter serious problems to cope with data and networks in business. The emergence of e-commerce sites, such as Tokopedia, Bukalapak, and Blibli, shows the passion and abilities in running business using database and the Internet. It is also applied

in service and transportation sector such as Go-Jek, Grab and similar platforms as well as online reservation service for flight tickets and hotels, e.g., Tiket.com.

The development of business in the era of Industry 4.0 finally has an impact on SMEs. For SME actors who have been prepared and have the ability to utilize the existing data, they will have an advantage in expanding business that was previously managed traditionally. Currently, SMEs can promote and sell their products anytime and anywhere.

Some SMEs have utilized the ‘big data’ technologies to market their products without any spatial and time limitation. In addition to the platforms mentioned previously, SMEs also marketing their products in Bukalapak, Tokopedia, Blibli or similar platforms. The benefits of Industry 4.0 have been discussed in the international conference held on May 15-17, 2019 in Piran-Slovenia with the title Industry 5.0 ‘The Expected Impact of Next Industrial Revolution.’ They are described in Table 1 below.

Table 1. The Benefits of Industry 4.0 for Business

Benefits	Description
Efficiency	Fewer people are involved in economic activities because they use more automation methods that encourage faster decision making processes and keep efficiency high. Automation also tends to maintain high quality and reduce production problems manually.
Agility	With a focus on high standardization and a small amount of production, Industry 4.0 produces high flexibility in the manufacturing process.
Innovation	The Industrial 4.0 production line is made to accommodate production with mixed materials and low volumes, this is suitable for new product introductions and experiments in design.

Benefits	Description
Customer Service	Responsive and available information on customer needs so that they can deliver products and services to customers on time.
Cost Reduction	After the initial investment for transformation, costs will fall. Fewer quality problems cause less material waste, lower personnel and operating costs.
The Advantage	Better quality, lower costs and the ability to serve customers well, Industry 4.0 puts manufacturers on the road to becoming the supplier of choice for today’s customers. This also opens up ways to serve a larger market for marketing, offering products and services with a customized margin for customers.

However, the dynamics of Industry 4.0 must be anticipated by SMEs hence they will be prepared to welcome Industry 5.0. In addition to the utilization of the available big data, Industry 5.0 also integrates it with robotic technology for the production process.

Previous study entitled “On the way from Industry 4.0 to Industry 5.0: From digital manufacturing to digital society,” Industry 4.0 is stated to be in its initial stage in which the development and major achievements are expected to occur by 2020 to 2025. Subsequently, it will enter a new era called Industry 5.0. This period involves the penetration of artificial intelligence in the life with humans, their “cooperation” aimed at increasing the capacity of human resources and returning humans to their place in the “Universe Center”. In this context, an appropriate term to refer Industry 5.0 is “Society 5.0” (Super Smart Society) as promoted by the business federation in Japan and the Science, Technology and Innovation Council, Cabinet Office, Japanese Government in 2016.

Unlike the concept of Industry 4.0, Society 5.0 is not limited to the manufacturing sector, but it attempts to solve social problems with the help of the integration of physical and virtual space. It is a society where sophisticated IT technology, IoT, robotics, artificial intelligence, and

augmented reality (AR) are actively used in daily lives, industry, health care and other sectors. The activities are not necessarily directed for progress, but rather the benefit and convenience of people.

This article describes the changes that potentially occur during the transition from Industry 4.0 to Industry 5.0 as the inputs for SMEs to make preparations and develop strategies to face the new era.

## Methods

Methodology is the study of how one can reach objective truth. In fact, the English word method comes from the Greek words *meta* (following) and *hodos* (street). So, the “method” implies that to achieve a goal, one must follow a certain way.

Design thinking is an iterative process that is driven by empathy, which develops solutions through prototyping and testing until the solution meets the needs of the stake-holders involved. Throughout the process, it entails the needs and experiences of people experiencing problems or services at its core, whether they are service users, providers, or system-level decision makers.

Design thinking encourages what people think by facilitating the development of unique and very useful solutions to problem solving. Meanwhile, this is also very practical because it requires practitioners to understand the situation from various perspectives and find solutions that will truly succeed in reality by examining the importance of the experience and needs of end users/services, while holding onto the reality of service providers and system constraints.

In the present study, the method of library study or library research was used. Literature research is research using libraries as the sources to obtain data.” Meanwhile, library research uses library as a source for collecting and analyzing data. Subsequently, researchers also draw and integrate their ideas to synthesize conclusions.

## Result and Discussion

Industry 4.0 is the integration of robots, interconnected devices and fast data networks in a factory environment, basically to make factories more productive and to carry out routine tasks that are best done by robots instead of humans. Since Industry 4.0 is very fond of automation and an unprecedented level of productivity, a number

of companies have currently adopted technologies such as IoT, AI, big data, cloud computing, and remote and sophisticated robotics. Nevertheless, the number of companies that have not adopted such technology is still higher. Meanwhile, companies at the forefront of technology have been in progress, moving on to the next era: Industry 5.0.

While Industry 4.0 is all about automation and digitization, the future of manufacturing is mainly in personalization. Manufacturing 5.0 or the 5th Industrial Revolution will focus on the collaboration between humans and robots. Although the focus is on automation and advanced manufacturing, human element is more important than ever before.

Essentially, Industry 5.0 is defined as the combination of an automatic and efficient concept and a traditional, personalized human involvement. Adopting a more conventional human-based arrangement might be perceived as a deterioration, while there is good reason for it. Nevertheless, it is not a setback or transformational change but rather is a merger or collaborative operation.

An analysis on Industry 5.0 indicates its uncertainty about what will be brought and how it will disrupt business in detail, but it will break down the barriers between the real world and the virtual (Scanlon, 2018). According to Østergaard (2018), the next step of the Industrial Revolution will be needed in accordance with high consumer demand for individualization in the products.

An article from Bloomberg claimed that a German car manufacturer has given more space to humans in the production factories by noting that customization is an important factor with modern consumers (Atwell, 2017). Therefore, Industry 5.0 will enhance collaboration between humans and smart systems such as robots, especially in factories. Consequently, machine takes over all monotonous and repetitive tasks while humans take on the creative side to take on more responsibilities and increase supervision of the system to improve the overall quality of production. However, this is not new a idea as it has been forecast by Accenture that surveyed 512 manufacturing executives from all over the globe. It reveals approximately 85% of respondents estimate a collaborative production line between humans and robots in their factories by 2020 (Atwell, 2017).

Furthermore, Østergaard (2018) stated that

products with special characteristics made by humans will have a higher price, for example items created by designer such as watches and handicrafts, as well as black salt from Iceland and local coal.

In the future, the demand for human touch within the production process will increase as consumers try to express their personalities by purchasing particular products. It outlines a new type of personalization, a feeling of luxury in which business people must pay attention to this aspect (Østergaard, 2018).

Similarly, the European Economic and Social Committee (EESC) describes Industry 5.0 as the combination of human's creativity and craftsmanship with the speed, productivity and consistency of robots" (EESC, 2018). By recognizing the trend of business development in Indonesia, it is expected that SMEs must play a position to face the Industry 5.0. Nevertheless, it does not only involving 'big data' that has been the basis of Industry 5.0. While previously system only combines computers and the Internet, Industry 5.0. requires them and also the presence of robots within the process.

Therefore, there are more requirements for facing Industry 5.0 compared to Industry 4.0. Without any preparation, it is projected that businesses, especially SMEs, will not be able to compete with those from other countries.

This threat can also be an opportunity. It can motivate Indonesian SMEs to improve the quality and uniqueness of their products even though their competitors use robotic technology in the production process.

SMEs in Indonesia actually have several advantages that are not possessed by their overseas competitors. Among the advantages are the abundant natural resources to be processed and marketed at international markets. Several potential and competitive sectors/commodities include: agricultural and plantation sector, mining sector, forestry sector, marine and fishery sector, handicrafts and local cultural sector, and culinary sector.

Furthermore, the Ministry of Industry and Trade releases the list of ten superior products as presented in Table 2.

These sectors/commodities, in fact, have indicated their high competitiveness level during the span of time from Industry 1.0 to Industry 5.0. This is inseparable from the nature and character

of Indonesian people who are able to compete with other communities in the world. In addition, Indonesian products have unique characteristics and can compete with products from other countries despite the development of the eras.

Commodity	2016	2017	Percentage (%) in 2018
Animal & Vegetable Fats and Oils	18.658,8	22.996,5	12,39
Mineral fuel	14.785,7	21.138,7	15,14
Electrical Machines & Equipment	8.161,0	8.504,9	5,35
Rubber and Rubber Products	5.664,2	7.740,7	4,05
Vehicles and Parts	5.867,8	6.863,5	4,47
Machinery / Mechanical Aircraft	5.890,9	5.869,4	3,54
Jewelry / Gems	6.3687,7	5.608,6	3,58

Indonesian people, especially SMEs, must be aware that their nobility, the national values, and culture provide an enormous variety of differences that can be further elaborated to enrich the human 'touch' in conducting business with the support of 'big data'.

Indonesia's flagship products, for example batik, are able to be recognized and accepted widely for generations due to its distinctive characteristics that cannot be replaced by any technological developments. It is also gained the recognition from UNESCO (United Nations Educational, Scientific, and Cultural Organization) in which on October 2, 2009, it was declared as Indonesia's cultural heritage. This international recognition will increase the value and competitiveness of batik in the international market.

In addition, according to the Director General of Small and Medium Enterprises, the Ministry of Industry, Euis Saedah, batik has a multidimensional dimensions, not only economic, but social, cultural, political and other dimensions. Basically, batik contains very broad meaning for Indonesian people. It implies particular messages. In fact, each motif has its own philosophy hence there is an objective in making certain motifs, including the purpose and the preference of certain colors. The process of making exclusive batik also requires natural colors.

## Conclusions

The development and transformation of the industrial era is a certainty, particularly in the economic sectors provided by SMEs. As a result, SMEs must successfully implement strategies to deal with the current developments.

Among the strategies adopted to improve the quality of production is the involvement of human 'touch' in facing the Industry 5.0. This era combines the sophistication of robotic technology, big data, and the values of humanism or humanity.

Indonesian people have the potential and ability to compete with foreign products. Basically, they have several strengths in terms of the nobility and national culture. While these values are elaborated into the production process, the products will have unique characteristics to be distinguished from those produced by robotic system in the Industry 5.0.

As an example of craft products and textile products is batik. This product has distinctive characteristics and advantages due to the direct human 'touch' in its production process. Such

aesthetic value cannot be replaced by robotic system. Moreover, aesthetic is a gift from Allah SWT hence human has a taste and initiative that is irreplaceable.

## References

- Almada-Labo, F. (2017). Six Benefits of Industry 4.0 for Businesses. Retrieved from <https://www.controleng.com/articles/six-benefits-of-industrie-4-0-for-businesses/>
- Atwell, C. (2017). Yes, Industry 5.0 is Already on the Horizon. Retrieved from <https://www.machinedesign.com/industrial-automation/yes-industry-50-already-horizon>
- Gartner. (2017). IT Glossary; Digitalization. Retrieved 24 April, 2018, from <https://www.gartner.com/itglossary/digitalization>.
- EESC. (2018). Industry 5.0 Retrieved from <https://www.eesc.europa.eu/en/agenda/ouevents/events/industry-5.0>
- Kospanos, V. (2017). Industry 5.0 – far from Science Fiction (pt. 2). Retrieved from <http://www.pnmsoft.com/industry-5-0-far-science-fiction-pt-2/>
- Lewis, A., (2016) Guide to Industry 4.0 & 5.0. Retrieved from <https://blog.gesrepair.com/category/manufacturing-blog/>
- Majalah Kina. (2013). Batik Nusantara. Jakarta.
- Marr, B. (2018). The 4th Industrial Revolution Is Here - Are You Ready?. Retrieved from <https://www.forbes.com/sites/bernardmarr/2018/08/13/the-4th-industrial-revolution-is-here-are-you-ready/#2b6b3e2628b2>
- Mohelska, H., & Sokolova, M. (2018). Management Approaches for Industry 4.0 – The Organizational Culture Perspective, Technological and Economic Development of Economy, VGTU Press.
- Moran, K. (2018). Benefits of Industry 4.0. Retrieved from <https://slcontrols.com/benefits-of-industry-4-0/>
- Newman, D. (2017). Four Digital Transformation Trends Driving Industry 4.0. Retrieved 3 January, 2019, from <https://www.forbes.com/sites/danielnewman/2018/06/12/four-digital-transformation-trends-drivingindustry-4-0/#1bf42316604a>
- Østergaard, E. H. (2018). Welcome to Industry 5.0, Retrieved from: [https://www.researchgate.net/profile/Mohamed\\_Mourad\\_Lafifi/post/Industry\\_40\\_vs\\_Industry\\_50-Does\\_industry\\_50\\_exist/](https://www.researchgate.net/profile/Mohamed_Mourad_Lafifi/post/Industry_40_vs_Industry_50-Does_industry_50_exist/)
- Paschek, D., Trusculescu, A., Mateescu, A., & Draqhici, A. (2017). Business Process as a Service – a Flexible Approach for It Service Management and Business Process Outsourcing, Management Challenges in a Network Economy. Proceedings of the Make Learn Conference.
- Pearce, R. (2017). How to be Part of the Fifth Industrial Revolution, Retrieved from <https://www.inmarsat.com/blog/how-to-be-part-of-the-fifth-industrial-revolution/>

- Rada, M. (2018). Industry 5.0 Definition. Retrieved from <https://medium.com/@michael.rada/industry-5-0-definition-6a2f9922dc48>
- Rundle, E. (2017). The 5th Industrial Revolution, When It Will Happen and How. Retrieved from <https://devops.com/5th-industrial-revolution-will-happen/>
- Sachsenmeier, P. (2016). Industry 5.0—The Relevance and Implications of Bionics and Synthetic Biology, Elsevier Engineering 2 Retrieved from <https://www.journals.elsevier.com/engineering>
- Scanlon, S. (2018). Now Prepare for the 5th Industrial Revolution. Retrieved from <https://gadget.co.za/now-prepare-for-the-5th-industrial-revolution/>
- Shelzer, R. (2017). What Is Industry 5.0 — and How Will It Affect Manufacturers?. Retrieved from <https://blog.gesrepair.com/industry-5-0-will-affect-manufacturers/>
- Urbach, N. (2018). Digitalization Cases, How Organizations Rethink Their Business for the Digital Age. Cham, Switzerland: Springer Nature.
- Ustundag, A., & Cevican, E. (2018). Industry 4.0: Managing The Digital Transformation. Cham, Switzerland: Springer Nature.
- Wang, K., Wang, Y., Strandhagen, J. O., & Yu, T. (2016). Advanced Manufacturing and Automation V. WIT PRESS