

# 포스트 코로나: AI 스마트 제조 플랫폼과 디지털 기업

정일영, 박수철  
(주)디엘정보기술

[iychong54@gmail.com](mailto:iychong54@gmail.com), [scpark@dlit.co.kr](mailto:scpark@dlit.co.kr)

## Post COVID-19: AI based Smart Manufacturing Platform & Digital Enterprise

Ilyoung Chong, Soo Chul Park  
Digital Literati Information Technology (DLIT)

### 요 약

The major focal point of this paper highlights mainly on the manufacturing innovation including AI capability, and further, the Digital Enterprise model will be reached to support more flexible business and manufacturing collaboration among companies. The reshoring tide of developed countries, and occurrence of COVID-19 pandemic make its acceleration toward Digital Enterprise. This paper analyses and shows its rationale of reshoring and the direction toward Digital Enterprise due to big situations.

### I. Introduction

Early in the first quarter of 2020, companies in the smart manufacturing and Industry 4.0 sectors around the world were anticipating another strong year with an accelerating global economy after more than a decade of rapid growth. In January 2020, market research from Markets and Markets forecasted year-over-year accelerating growth for the smart manufacturing market with a total market value of \$214.7 billion in 2020 and continued strong growth through 2025, reaching a projected total market value of \$384.8 billion and a 12.4 percent CAGR from 2020 to 2025. See Figure 1 below.

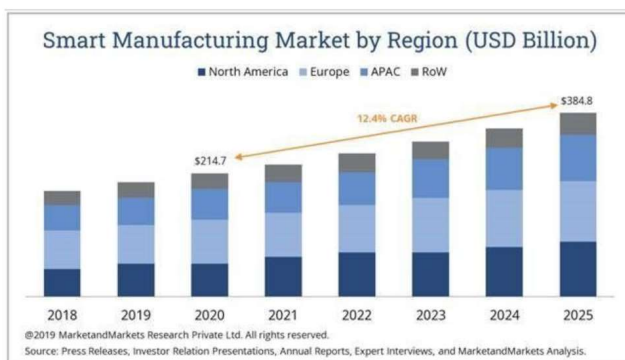


Figure 1 Smart Manufacturing Market by Region (Jan., 2020)

And the COVID-19 pandemic forced companies around the world to adjust their strategies to survive in the so-called “new normal.” Customers have tweaked their priorities, too. Many prefer to shop online or have found that the stores they frequented in person not so long ago now only offer deliveries. Businesses experienced surges in demand for some products, while entire industries virtually ceased operations due to coronavirus shutdowns.

The emerging news in recent years is that manufacturing companies in OECD economies are increasingly bringing manufacturing activities back home. Headline cases of a number of large multinational companies (e.g. Apple, General Electric, NCR, Ford Company) have given increased visibility to the phenomenon of reshoring, and accordingly, reshoring has recently gained increasing attention in the (economic) press, academic research and policy discussions.

In the mixed effect of COVID-19 pandemic and reshoring trend it will very interesting to consider how to cope with this kind of big change and situation. For example, collaborative robots will be used in manufacturing activities where they coexist with humans and other machines to enhance and optimize manufacturing operations. Apart from the automobile industry, collaborative robots can also be used in other sectors, which has led to their increased demand even during the pandemic. However, their market growth is expected to be below the growth estimated during pre-COVID-19. During this pandemic, increased usage of collaborative robots is expected to boost the manufacturing of various products and devices such as ventilators, respirators, valves, masks, and other life-essential goods. Despite its positive growth in 2020, it would be difficult for collaborative robot sales to reach the estimates pre-COVID-19.

If we consider the supply chain management, the episode of AI to impact podcast, how the pandemic has affected the Supply Chain ecosystems throwing their sourcing network, lead times and data pipelines off balance. In the post-COVID era, they can be empowered with a high standard of data and analytics sophistication to cope and thrive. By allowing that, they could have a steady demand forecast based on sensing algorithms and react faster to such events.

### II. Reshoring and Smart Manufacturing in Industry 4.0

If we consider the characteristics of reshoring, the reasonable results are shown as follows. (1) Reshoring is more frequent among large companies (above 150 employees) and the propensity for reshoring increases with firm size; (2) The number of reshoring cases is lowest in low technology manufacturing sectors, and more frequent in high technology sectors; (3) Comparing the propensity for reshoring and offshoring at the industry level, the results do not lend support to a strong tendency for re-industrialization; (4) Motivations for reshoring are to a large extent related to problems with the quality of goods produced abroad and the loss of flexibility (to respond quickly to demand changes and unexpected events). Innovation related factors like the loss of know-how and qualified personnel seem to be less important in the reshoring activities by EU companies; labor costs are also found to play only a minor role (Figure 2).

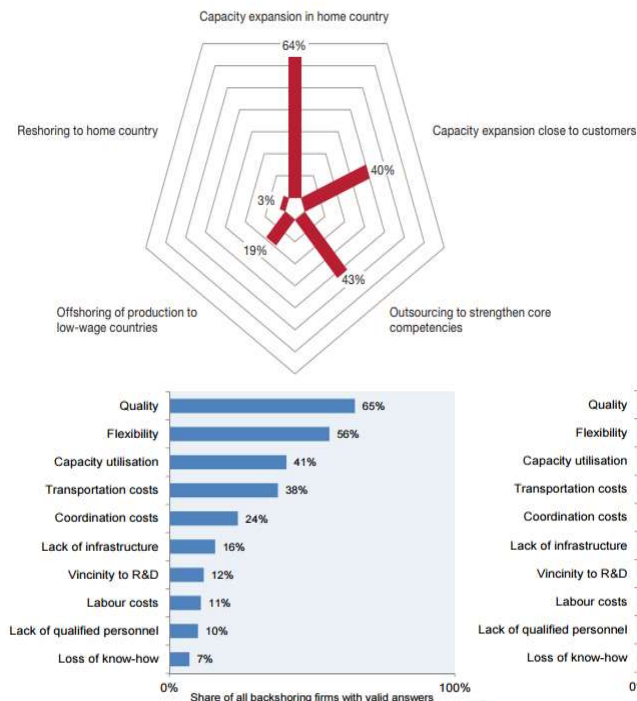


Figure 2. Reasons for Reshoring production,

### III. Framework toward Digital Enterprise

At a factory level, that means getting on board with the software and automation that will transform efficiency and eradicate the dependency on manual labor, and as a result on low pay regions. At an ecosystem level, it will mean embracing data analysis, the digital twin and ensuring a fully connected manufacturing landscape where data is aggregated, AI is used to manage complexity and where meaningful decisions are made in real-time to create better outcomes.

It may be a perfect storm of disruption that has led us to the realization that digital transformation is essential, but there is also a perfect storm of technical building blocks that have come together to make the ideals of the smart factory real and attainable. Figure 3 shows an example of collaborative business through distributed smart manufacturing (B2B use case), and each domain of factories contains AI functions, and federated function of AI is performed in factory domain C.

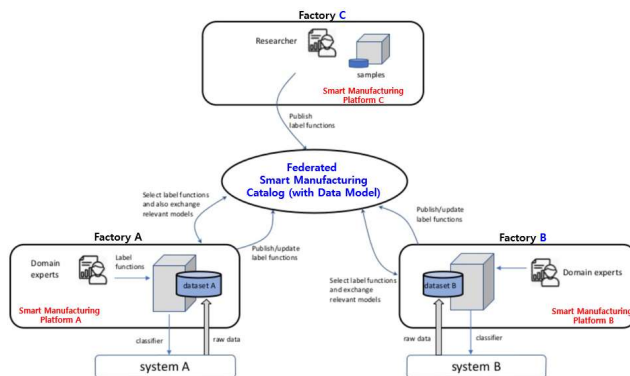


Figure 3. Example: Distributed manufacturing Model with Federated AI capabilities.

### IV. Conclusion

This paper describes the future landscape of digital enterprise in response of reshoring, and furthermore COVID-19 pandemic situation has accelerated its speed toward to **Digital Enterprise** in manufacturing domain. It should be important to prepare the transition strategy and steps toward **Digital Enterprise**. This paper

will indicate its requirements and approaches in the presentation.

### ACKNOWLEDGMENT

This research was financially supported by the Ministry of Trade, Industry and Energy (MOTIE) and Korea Institute for Advancement of Technology (KIAT) through the International Cooperative R&D program (Project ID:P0011880).

### REFERENCES

- [1] De Backer, K. et al. (2016), "Reshoring: Myth or Reality?", OECD Science, Technology and Industry Policy Papers, No. 27, OECD Publishing, Paris.
- [2] Reihard Geissbauer (April 2016), "Digital Factories 2020 : Shaping the future of manufacturing", Price Waterhouse Coopers(PwC)