China’s 13th Five-Year Plan: Made in China 2025 and Industrie 4.0 Cooperative Opportunities

Following the Chinese government’s issuance of its Made in China 2025 strategy, which outlines plans to upgrade the mainland’s industries, its 13th Five-Year Plan, adopted in March 2016, sets out to deepen the implementation of this strategy in the next five-year period (2016-2020). While this has aroused interests as regards the development direction of Chinese industry, some industry observers have drawn parallels with Germany’s Industrie 4.0 strategy, which was designed to enhance the efficiency of German industry.

It is worth noting that some have raised concerns that the two strategies may lead to intensified competition between Chinese and German industries. Nevertheless, the two countries signed a memorandum of understanding to step up cooperation in the development of smart manufacturing technology in July 2015[1]. And further to an October meeting between Premier Li Keqiang and the visiting German Chancellor Angela Merkel in Beijing last year, both sides have also agreed to expand strategic cooperation in tapping newly-emerging opportunities in line with both Made in China 2025 and Industrie 4.0.

Indeed, the relative industrial development of the two countries, coupled with different strategic development priorities, reveal more opportunities for cooperation than competition, including in the area of industrial robots. Moreover, the different positions held by Chinese and German industries in the global supply chain also hint at further opportunities for relevant players stemming from Sino-foreign cooperation projects.

While Hong Kong is the first port of call for Chinese mainland companies seeking foreign
partners, the strength of the territory’s technology sector and its conducive environment – including sound protection of intellectual property rights – also make it an ideal place for German and other foreign companies to tap into the Chinese mainland market. Chinese government policy therefore clearly points to new opportunities for relevant players here.

"Smart Factories" Pursued by Industrie 4.0

Essentially, Germany’s Industrie 4.0 advocates the adoption of state-of-the-art information and communication technology in production methods as a means to further enhance industrial efficiency. This strategy is developed on the basis that Germany’s strong machinery and plant manufacturing industry, its IT competences and expertise in embedded systems [2] and automation engineering make it well placed to consolidate its position as a global leader in the manufacturing engineering industry.

In the final report of the Industrie 4.0 Working Group[3], it is stated that Germany is uniquely positioned to tap into the potential of a new type of industrialisation. Hence, Industrie 4.0 is described as a fourth industrial revolution since the first one in the late 18th century. Cyber-Physical Systems (CPS), under which smart facilities are in place to facilitate improvements to industrial processes across manufacturing, engineering, material usage, supply chain, and so on, will be deployed in industrial systems in order to bring about the age of “Smart Factory”.

*Industrie 4.0 advocates the adoption of state-of-the-art technology in production methods. Industrie 4.0 strives to bring about the age of the “Smart Factory”.*
Industrie 4.0 considers that businesses will establish global networks that incorporate their machinery, warehousing systems and production facilities. With Cyber-Physical Systems, the embedded manufacturing systems are vertically networked with business processes within factories and enterprises, resulting in Smart Factories which allow decision-making to be optimised and individual customer requirements to be met profitably. Challenges relating to resource and energy efficiency will be addressed during optimisation processes. The high level of automation made possible by the Internet of Things and Services and big data recorded by smart devices and sensors will help release workers from performance of routine tasks, enabling them to focus on creative, value-added activities.

Smart Factories as Part of the Internet of Things and Services

Interaction of Made in China 2025 and Industrie 4.0
Industrie 4.0 aims for intelligent production by connecting the current embedded IT system production technologies with smart processes in order to transform and upgrade industry value chains and business models. This will require Germany to enhance its research and development efforts in areas such as further integrating manufacturing systems. New industry and technical standards will be required to enable connections between the systems of different companies and devices, while data security systems will need to be upgraded to protect information and data contained in the system against misuse and unauthorised access. All of these developments are expected to enhance the efficiency and innovative capacity of German industry, while saving resources and costs.

As regards Made in China 2025, the focus is on innovation and quality, as well as guiding Chinese industries to move away from low value-added activities to medium- and high-end manufacturing operations, rather than pursuing expansion of production capacity. The strategy is also aimed at eliminating inefficient and outdated production capacity, and helping enterprises to conduct more own-design and own-brand business. These objectives are to be facilitated by actions including the establishment of manufacturing innovation centres, strengthening intellectual property rights protection, building up new industrial standards, and facilitating the development of priority and strategic sectors.

(For more details of Made in China 2025, please refer to the document Made in China 2025, and the HKTDC research article China’s 13th Five-Year Plan: The Challenges and Opportunities of Made in China 2025)

German and Chinese industries may look to be on course to increasingly compete with each other as both countries aspire to upgrade. However, Industrie 4.0 is geared towards using the Smart Factory to enhance the efficiency of German industry, which is already at the forefront of the world in terms of its sophisticated technology infrastructure. In contrast, China’s immediate priority is to tackle the problem of inefficient production. Made in China 2025 accordingly envisages that China will achieve moderate status among the world’s manufacturing powerhouses by the year of 2035.

As the two countries’ industries are at different stage of development, it is therefore obvious that in the short to medium-term China will not compete with German engineering products, especially higher end ones. Paradoxically, Chinese enterprises will continue to rely on advanced equipment and technology supplied by their foreign
counterparts in order to modernise and automatise production. For one thing, Germany is currently one of the major suppliers of advanced production technology and machine tools and equipment to China. There is likely to be huge business opportunities for the industries of both sides, therefore, if China can benefit from the standards and experience of Germany in the course of upgrading its industrial processes.

China could ride on the standards and experience of Germany in the course of upgrading its industries.

China is in the course to tackle the problem of inefficient production.

Smart Solution Required to Upgrade Chinese Robots

China’s 13th Five-Year Plan outlines that the country will launch a number of key scientific and technological projects in the course of upgrading its industries. This intention is echoed by the Made in China 2025 strategy, which the Chinese government issued last year. In particular, smart manufacturing and robotics are identified as key development areas in both documents. However, apart from certain high-tech and high-precision facilities, China has not developed robots “smart” enough to raise its production efficiency. It can therefore be expected that Chinese companies will look outside for standards and solutions developed by their foreign counterparts, including advanced countries like the US and certain European countries. All of this points to opportunities for relevant technology players and smart solution suppliers.

Implications for Industry Players

Made in China 2025 is primarily aimed at enhancing the competitiveness of Chinese industry. However, there is still a long way to go before Chinese enterprises can reduce their reliance on imports of key parts and components. Moreover, China still lacks the standard solutions to move towards smart manufacturing. Hence, both Made in China 2025 and the 13th Five-Year Plan encourage Chinese enterprises to go out to seek external support from and cooperation with foreign partners. These circumstances bode well for technology players and suppliers able to render relevant key parts and components, as well as smart manufacturing solutions.

Nonetheless, there are still other challenges faced by Chinese enterprises. For instance,
foreign initiatives such as *Industrie 4.0* primarily focus on the enhancement of their own countries’ competitiveness. In order to benefit from such countries’ technological development and experience, Chinese enterprises therefore have to clearly identify the appropriate technology and solutions for their own needs, and avoid acquiring inappropriate technology.

Moreover, foreign companies often have concerns about the problem of intellectual property rights infringement in China. In the case of smart manufacturing, where a large amount of information and data is likely to be processed to achieve optimisation, security issues around protecting data and proprietary information are likely to be high among foreign companies’ priorities. In addition, some foreign players are likely to be concerned that transferring cutting-edge technology to Chinese enterprises will affect their own competitiveness in the long term.

Against this background, Hong Kong can serve as a connector to bridge mainland and foreign technology companies. Notably, Hong Kong is identified by Chinese mainland companies as a first port of call for going out and seeking foreign partners. This is partly thanks to a wide range of professional services rendered in the territory. For example, Hong Kong’s service professionals are well positioned to conduct due diligence investigations, undertake risk management, and assess the applicability of technologies and facilities on behalf of mainland companies.

Hong Kong also already accommodates a technology cluster composed of companies of many different origins. It is therefore well poised to allow its technology partners access to the Chinese mainland market. Indeed, some foreign enterprises have set up subsidiary companies in Hong Kong for the purpose of owning specific intellectual property, managing related operations, and entering into contracts with mainland clients while enjoying the better protection afforded by the territory’s legal system.

Indeed, Hong Kong is well known internationally for its sound legal system and its adherence to international industry practices. It is part of the city’s business tradition and ethical framework to respect business and commercial secrets, including design and technology information. Hong Kong’s edge in areas such as application and commercialisation, along with the availability of various financial facilities, are also key considerations when technology companies opt to locate their business in the territory.
Therefore, in the course of China’s upgrading of industries, Hong Kong is well positioned to work with foreign players to tap into the mainland market.


[2]  The embedded systems are referred to as IT systems with dedicated functions within a larger mechanical or electrical system.


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