

China Road for 4th Industrial Revolution

The Chinese approach for global prosperity is based on peace, mutual respect and trust. Some of the dominant factors of Chinese philosophy are already discussed in the earlier part of the book, yet this chapter further explains some of the innovative and creative ideas of China for making a peaceful and sustainable world. The China's history of recovery from an Opium addicted people and poverty stricken country to upper middle class country in last 3-4 decades is not less than a miracle. The China's future outlook is based on creating Win-Win situations for all countries, smaller or larger, North or South, Near or Far. This chapter illustrates the dynamics of 4th Industrial revolution and Chinese approach to handle the associated challenges of I 4.0.

The first industrial revolution happened in United Kingdom with the inventions of Steam Engine. The inventions of steam machineries forced the industrial development in Europe. This increase in productivity led to urbanization, the growth of regional and global market economies, the relevance of democratic governments, and a rising middle class in the western hemisphere¹.

The second industrial revolution is manifested in the 1860s to 1914 and is reflected in the development standardization, technical complexity, and precision in manufacturing, as well as large-scale technological infrastructure such as electricity grids

1 Thomas Philbeck and Nicholas Davis (2019), THE FOURTH INDUSTRIAL REVOLUTION: Journal of International Affairs , Vol. 72, No. 1

and new forms of public transportation based on the internal combustion engine.

The third industrial revolution took place after the second World War and bloomed along the double helix of space race and development of nuclear power. The post WWII, world was modernized with new technologies and use of computers for complex calculations.

The fourth industrial revolution (I 4.0), involves use of modern information and communication technologies in the design, development and manufacturing processes. These new technologies include Artificial Intelligence (AI), Block Chain, Cloud Computing, Internet of Things, Quantum computing, Virtual and augmented reality, 3D printing and industrial optimization.

The digital China is the combination of two mega events, China economic rise and digitalization of the global economy. At the start of 21st century, massive digital platforms were developed for transactions and businesses in China and companies like Alibaba and Tencent started use of online digital platform for e-commerce. Due to high population and user of internet as well as smart phones, China offered large market for the digital economy to grow faster than the rest of Asian countries. The number of broadcast internet users on China grew from 298 Million in 2008 to 828 Million in 2018. The China ICT industry is contributing 4.8% of its GDP and 2.6% of employment. Mobile payment services such as Alipay and WeChat Pay has become very popular in China. The digital China has implications for social implementation and private IT companies leading this.

In a keynote speech made in the Belt and Road Forum for International Cooperation held in May 2017 in Beijing, President Xi highlighted the country's intentions to "adhere to innovation-driven development; support cooperation in frontier areas such as the digital economy, AI, nanotechnology, and quantum computers; promote big data, cloud computing, and the construction of smart cities; and connect the digital silk road of the 21th century. The digitalization will create a new marketplace for

China and other South and South Asian countries. This will lead to *Newly Digitalized Economies* or *Digital Emerging Economies*².

The China' has succeeded in moving out of the isolation and becoming one of the most powerful countries, now on way to become the mightiest economic power of the world. The foreign policy of China is closely linked with self-perception. After opening up in the 1970s during Deng Xiaoping period, China is trying to build partnerships and alliances with countries from all parts of the world, with more focus on countries from developing world. China desires to share its experience of economic growth and reforms with the third world countries for their prosperity and affluence. China has already achieved the status of regional power, it is assuming the status of Quasi-Superpower second the new world order³.

China foreign policy is based on five principles of Peaceful Coexistence: 1) mutual respect for each other's territorial integrity and sovereignty, 2) mutual non-aggression, 3) mutual non-interference in each other's internal affairs, 4) equality and mutual benefit, and 5) peaceful co-existence. Internally, the ultimate goal of Chinese policies is to strengthen One Party Socialist Government, which required political stability in the country and region. The economic crisis and recession of 2008 less harmed China as compared to US and Europe and as a result, the Chinese foreign policy became more assertive. China mover from low profile approach to striving for achievements approach, which has been more advocated and pursued by the current Chinese leadership of President Xi Jinping.

The new foreign policy of China is focused on achieving modernization, creating a benevolent and peaceful external environment, and taking steps that allow it to develop its domestic economy⁴. The domestic challenges for China include

2 Asei Ito (2019) Digital China: A Fourth Industrial Revolution with Chinese Characteristics? Asia-Pacific Review, 26:2, 50-75

3 Breslin, Shaun. 2009. "Understanding China's Regional Rise: Interpretations, Identities and Implications. International Affairs.85(4): 817-835.

4 Zhao, Kejin. 2013. Guiding Principles of China's New Foreign Policy. Carnegie-Tsinghua Center for Global Policy.

maintaining steady growth rate and economic development as well reducing the socioeconomic inequalities. The future foreign policy of China is expected to be more driven by the domestic dynamics as well. With China, grabbing more economic powers, the antagonism by United States is natural as it feels losing ground in the global politics and economy. The recent withdrawal of American troops from Afghanistan and fall of Kabul to Taliban is one of the examples. Nevertheless, for sustainable peace at regional and global levels, cooperation between the two economic powers is inevitable. The Chinese foreign policy under President Xi is thus based on mutual understanding and strategic trust, respecting each other's core interests, mutually beneficial cooperation, and enhancing cooperation and coordination in international affairs and on global issues⁵. With the objectives to strengthen its influence in the developing countries, China has been pursuing its relations actively with the countries in Latin America, Central Asia and Africa. For such countries, the China development model is good lesson to learn and practice. The China foreign policy will continue to be more dynamic and evolving to cater with the regional and global challenges to shape the new World Order.

China joining World Trade Organization was accompanied with skepticism both inside and outside, yet China continued with their commitment to the principles of liberalization and free trade. For advancing their products in the global market, China introduced *Made in China 2025 (MIC25)*. China launched the ambitious plan to become technological leadership by year 2049. China will focus on the core emerging technologies and industries such as robotics, power equipment, AI, alternative energy vehicles, facial recognition and next-generation IT. This progressively will lead the world to 4th Generation Industrial Revolution (I 4.0). For this purpose, China wants to achieve major breakthroughs and create globally competitive companies. More than 530 smart

5 Xi, Jinping, 2012. Speech at the National Committee on U.S.-China Relations and U.S.-China Business Council Luncheon, Washington, D.C., February 15, 2012

manufacturing industrial parks have been constructed in China to this end. Some of the emerging technologies like Big data, new materials, Industrial Internet and cloud computing have been focused in these parks. The R&D investment of China is one of the highest in the world and currently it stands at 2.1% of the GDP.

To achieve the MIC25 goals, the China Ministry of Industry and Information Technology has devised the following focal points:

- Establishing local specializations and “MIC25 National Demonstration Zones”
- Industrial Internet, emerging industries, establishing world-class industry clusters
- Innovations in basic general technologies
- Establishing manufacturing innovation centers Fiscal support mechanisms

The manufacturing and industrial sectors of China are still mainly grabbed by the State

Owned Enterprises (SoEs) at 83%. These SoEs are more dominant by the CPC leadership, with high level of interference and influence at the executive level. For more innovative and creative technologies to achieve MIC25, would need to involve private sector from country and abroad.

The concept of MIC25, has already created its impacts on the European Economy. The emerging technologies in the global tech market, will change the competitive advantage of many European countries. This fierce competition to grab the market between China and Europe and US, may erode the profitability of many western countries in the Hi-tech sector. This has also convinced the European countries like Germany to forge partnership with China in R&D in the areas of innovative technologies⁶. Some of the collaborations include Fraunhofer Society, Max Planck Society and the Helmholtz Association of German Research Centers are

⁶ Maz J. Zenglein and Anna Holzmann (2019), EVOLVING MADE IN CHINA 2025 China's industrial policy in the quest for global tech Leadership-Mercator Institute of China Studies (Merics).

key actors in research collaboration with China. This cooperation will further increase for developing innovative and emerging technologies in time to come.



Ten Core industries set the basis for Made in China 2025 (MIC25)

China has been pursuing the 10 core industries for MIC25 with different intensities, with high focus on manufacturing, Artificial Intelligence (AI), new material and renewal energy etc. In the next generation AI industry, China is working on smart products such as smart connected cars, smart service robots, video image identification system and smart home products. The major bottleneck to this ambitious plan of China is their high reliance on imported hi-tech products. Thus puts China to negative balance of trade in the areas of the high-end spectrum of biotechnology, life science and technology, opto-electronics, electronics, computer-integrated machinery, and aerospace. Hence China has still to do a

lot for becoming experts in the new technologies enabling them to develop MIC25.

China has developed top level policy design, and released of final document in Feb 2017, MIC25, has progressed from policy to implementation. There is internal criticism for the MIC25 and former minister Lou Jiwei, declared the plan as wastage of taxpayers' money⁷. This may become a major internal debate in China and President Xi has to work hard to achieve internal support and confidence than external. Apart from technological and industry specific priorities, China through Ministry of Information Technology has developed the following focus areas in 2018:

- Optimizing capital allocation by developing new financing mechanisms for industrial policy purposes
- Support of local specializations and the establishment of MIC25 National Demonstration Zones
- Industrial Internet, emerging industries and the establishment of world-class industry clusters
- Innovations in basic general technologies applicable within and across industries
- Establishment of manufacturing innovation centres and quality brands
- Fiscal support mechanisms
- More opportunities for foreign investment

The pilot demonstration of the MIC25, have been launched since 2015 in the areas of Green Manufacturing, Smart Manufacturing, Manufacturing and Tech innovation, Manufacturing and internet integration and industrial Champions. Under green manufacturing, green factories, green industrial parks, green supply chain management and green products design has been pushed and by end of 2018, about 1646 industries have been established under this. For Smart manufacturing,

⁷ Lo, Kinling (2019). "‘Made in China 2025’ all talk, no action and a waste of taxpayers’ money, says former finance minister Lou Jiwei." South China Morning Post. March 7,2019.

Comprehensive standardization, New business application, Sino-German smart manufacturing cooperation have been initiated, with total number of 854 established. In the areas of tech innovations 599 projects on Tech innovation (demonstration enterprises), Manufacturing “mass entrepreneurship & innovation” platforms, Hackerspaces are included. In the area of Manufacturing and internet integration, 388 projects on Integration management, system Cyber-physical systems (CPSs), Cloud solutions for key products & equipment, E-commerce platforms, Industrial Internet Big Data (industry development & services. Finally, in the area of creating industrial champions, 390 projects have been undertaken by end of 2018.

China can learn from East Asian nation about their journey for transformation including Japan, Taiwan and Korea. This will require focus on the following important aspects⁷⁷:

- Raising awareness among businesses and academia
- Strict investment regulations for acquisition of high-tech companies
- Review process or regulation of high-tech investments in China
- Revision of legislation and prosecution of acts of passing on trade secrets
- Guidelines and industry cooperation on preventing intentional and unintentional knowledge transfer
- Countermeasures preventing knowledge transfer via recruitment (head hunting)
- Technical cooperation in joint research for high-tech not encouraged by government
- Development of incentives to reduce companies’ dependence on Chinese market

China has to bring more innovations by engaging private sector and attracting FDI from abroad, to realize, their dream for MIC25. This will require further reforms and transformation in the industrial and finance sectors.