
Methods for Advancement of Major Products into China's Domestic Market: Focusing on Future Growth Engines

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Wearable devices

The wearable device industry in 2015 showed rapid growth year on year and is drawing attention as a new growth engine industry in the future. In particular, as Chinese companies including Xiaomi have been growing exponentially, there are ongoing arguments that Korean companies should respond to the situation in an urgent manner.

As of now, the wearable device market, similar to the other IT industries, is composed of the high-price and high-end markets led by global large enterprises and the low-cost distribution markets where Chinese companies are strong. However, when it comes to the wearable device industry, unlike the global industrial development patterns of the existing IT industry, Chinese companies are growing rapidly in the low price distribution market starting from the initial stage of the industry, and now it is needed for Korean

companies to make changes in their success strategies. In terms of China's wearable device industry, centered on the clusters densely located in the Hunan region, the companies manage the entire process of raw material, design, processing and manufacturing, and in Shenzhen more than 1,000 companies are manufacturing wearable devices.

When it comes to Korean companies, they maintained their market share through swift responses centered on large corporations in the introduction period of the wearable device industry, but starting from 2015 the competitiveness of Korean companies has weakened as they lagged behind Apple and Chinese companies. Accordingly, in order to be competitive in the wearable device industry, which is anticipated to grow rapidly in the future, it is needed to consider the following factors. First of all, it is required to come up with strategies to increase the global market share by preoccupying the Chinese market. Along with this, it is necessary to build up Korea's own production system different from the existing one while enabling Korean companies to be more competitive under the changing global competition environment. Third it is urgently needed to prepare for a basis for growth to create an ecosystem in the wearable device industry. Fourth, it is needed to make plans to facilitate the convergence among industries as well as large businesses and small and medium sized enterprises. Lastly it is required to provide policy supports enabling a mutual coexistence, while escaping from the existing structure of the industry centered on large corporations.

Smart cars

Smart cars gaining attention as one of new items for the future that have been continuously selected as a promising technology by major future outlook reports at home and abroad. As it is anticipated that smart car technologies would bring about innovations not only for products and services but also for structural changes in the automobile industry, experts are expecting that the smart cars would be on the market by 2020. In the days ahead, the ripple effects of smart cars, which are expected to have many positive effects such as reducing costs caused by traffic accidents, will increase convenience for drivers and improving efficiency of cars, not only on the automobile industry but also on many other industries and the market is expected to grow remarkably.

Meanwhile, Chinese IT and automobile companies consider smart cars as key items for the future, thus pushing forward with the developments of relevant products and services through cooperation with companies home and abroad. The Chinese government is providing policy supports for the development of key technology for smart cars and preparing related laws and regulations. When it comes to smart car related technologies, it turned out that Korea is three years ahead of China, and it was surveyed that the speed of technology development in Korea is faster than China.

Although Korea is ahead of China in terms of smart car technologies, it is highly likely that China with many global IT service companies takes the smart car market, so it is needed to prepare for this. Firstly, it is necessary to build up an integrated framework of government's policy support and secondly it is essential to have

segmented strategies by each sector in order to advance into the smart car related market in China. Thirdly, in terms of establishing technology standards, laws and regulations, it is needed to come up with plans for Korean companies to advance into the Chinese market under close cooperation with the Chinese authorities.

Unmanned vehicles

As mechatronics and artificial intelligence technologies have advanced to the level that can be used in the real life, products and services related to unmanned aircrafts (drones), unmanned automobiles, unmanned ships and other unmanned vehicles are actively under development. In particular, the market has grown exponentially as drones which have been utilized for military purposes are now a public hobby. With such growth, the private sectors are sparing no efforts to invest in the development of related products and services and the government is grappling with the establishment of laws and regulations.

Meanwhile, when it comes to drones, Chinese companies have occupied the most of market share in the global market, and as seen in the China's move to conduct a test operation in the field of unmanned automobiles, there has been remarkable growth in the area of unmanned vehicles. In fact, as of 2014, China is about 0.9 year ahead of Korea in terms of the technologies, so Korea should improve the technologies in an urgent manner. In particular, comparing with the application technologies, Korea is five years behind of China when it comes to the basic technologies, so it is urgently needed to support the R&D related to the basic key technologies.

In addition, as Korean companies are importing major key parts and components of unmanned vehicles, there are possibilities of which companies in China and other advanced countries would make inroads in the unmanned vehicle related market in Korea. Thereby, in order to activate the domestic market and improve capacity, it is necessary to consider the development of key and original technologies for components rather than those for application areas. In addition, it is needed to prepare for accidents caused by the introduction of unmanned vehicles through easing the drone related aviation law in Korea and newly create unmanned vehicle related rules, as well as creating an environment in which the existing related companies can advance into the new industry.

□ 5G mobile communication

With the recent increase in mobile data traffic and the facilitation of IoT, demands for new mobile communication technologies are on the rise, and amid this circumstance people are paying more interest on the 5G mobile communication technology. Up to now the technology has selected eight key factors including the large-scale traffic and low latency as standard technology requirements, and there are ongoing discussions on the standard technology methods. In the days ahead when the stand technology methods are confirmed, experts anticipate that the technology will be commercialized in the year 2020.

While it is expected that growth will be made in not only the telecommunication service market but also in the peripheral markets, it seems that in the future, China's mobile communication

market with enormous growth potential would grow as the biggest mobile telecommunication market in the world. It turned out that mobile communication service providers in China are already discussing the 5G technology development and the standardization with IT companies in Korea and other countries with an aim to preoccupy the market. In addition, the Chinese government had adhered to its own communication system in the past but now the government is working to lead the global market, as it actively participates in the process of establishing the global standard for 5G mobile communication.

In order to enhance the competitiveness of mobile communication service industry in Korea, targeting the markets in China with a tremendous potential is a must and it is necessary to understand the industrial environment in China prepare for technological changes. In specific, first, it is important to create an ecosystem centered on services and contents and platform which consider the scenarios for the 5G mobile communications such as IoT and the massive content. Second, it is expected that the demands for Small Cell and other devices to support small communications networks, and therefore it is essential to improve the competitiveness of the communications device industry. Third, it is needed to secure 5G frequency bands in advance and preoccupy the 5G service business model after considering China's industrial environment through development of devices and services considering the technology standards.

Tailor-made wellness care

The tailor-made wellness care selected by the government as one of new industry areas to enhance the quality of people's lives is a health care service converging IT and BT, which changes the health paradigm in a society by preventing diseases of an individual and managing health through consistent management and monitoring efforts. Already due to the increase of chronic diseases which have contributed to the aging society and increasing income level, well-aging has attracted interests not only from Korea but also from the world, becoming a global mega trend. At the initial stage, the demands concentrated on fitness and health management and are now expanded to chronic patients and the senior citizens base on technological advancements such as increased accuracy in assessing vital signs. Various studies have proven the effects of saving the government budget and improving the national health as the result of introducing new technologies thus supporting the ground for the introduction of the new health care system.

Accordingly, the EU, Japan and the US are strengthening the basis for the development of the new health care service industry by introducing the technologies through streamlining infrastructure and policies in advance. China has conducted a drastic reform on regulations and systems starting from the late 2000 to solve the deep seated issues in the medical community.

Although Korea has continuously implemented policies such as U-healthcare or smart care service, there have no tangible achievements, but recently the Korean government expressed its enthusiasm by announcing plans to make the specific basis for the

commercialization. However as still there are many laws and regulations including the medical law, the Acts on bioethics and safety, industrial developments were not facilitated, and above all there are obstacles remain such as the opposition from the Establishment and the lack of demands.

Meanwhile, in China, social needs for the new health care system are high and the medical workers are accepting the new system well; therefore, it seems that the new industry would settle down soon. In 2011 the medical costs in China took 5.15% (24.3 billion Yuan) of the GDP, so individuals are bearing many burdens of medical costs of about from 35% to 50%, and the healthcare infrastructure is underdeveloped so that it cannot meet the rapidly increasing demands of patients. Therefore the Chinese government urgently needs to introduce the new and effective health care system different from the existing one. The Chinese government is making every effort to accept the new health care service such as telemedicine by implementing the government-led policies.

However still the medical devices produced by the most of Chinese companies are mainly the middle/low end products. According to the survey conducted by the Korea Health Industry Development Institute in 2011, when it comes to the level of technologies in Korea and China related to the tailor made wellness, it turned out that mostly Korea is far head of China. But the technology gap has been gradually narrowed down.

With its domestic markets excluding telemedicine, Korea does not have sufficient demands to facilitate the growth of the new industry, and it is hard to anticipate the growth of new industries. Therefore Korea should increase exchanges with China, an excel-

lent trade partner and the country that Korea recently signed the Free Trade Agreement with. To this end, what needs to be done first is establishing a strategic alliance with Chinese medical device related SMEs by using IT convergence technologies and making attempts to ensure the safe advancement into the market by using the licensing policy regarding local production and the distribution network.

Secondly, Korean medical institutions need to advance into the market under a package deal when exporting a hospital system concerning recuperation and senior care. As the Chinese government has provide various incentives for the advancement by overseas medical institutions in the silver industry amid high demands among high income earning seniors in China, it seems that such package advancement using various policy advantages would be relatively easy. In addition, above all, for Korean companies' successful advancement into the Chinese market, the Korean government should engage in promotional activities for Korean companies and there should be indirect supports such as selecting proven Chinese partner companies and coordinating the licensing process with local governments in China.

Titanium metal material

Titanium and the titanium based materials can be applied to various application sectors and these materials are safe in high-temperature situation and corrosive environment and are have lower density compared with the existing materials. Therefore, the materials are gaining attention not only as highly efficient materials

but also as energy-saving and environmentally friendly materials. However, processing costs of the materials are relatively higher as the materials are hard to refine and other manufacturing processes are more difficult in terms of technology, so it is true that the materials have been used in some high value added industries such as the defense, aerospace and biomaterial industries.

However, as target performance required by many products in various industries gets more complicated continuously and demands for high fuel efficiency and energy efficiency are growing mainly in terms of transportation machineries, the demand for titanium materials is rapidly on the rise recently. In particular, production and consumption of titanium in China is growing exponentially due to the growth of not only the existing defense industry but also the industries related to the civil aviation, and China has secured its position as a biggest producer and exporter in the world in terms of the primary processed products including sponge titanium and bar.

With recent industrial development, Korea has grown into the 5th biggest importing country of titanium materials but the country's competitiveness in the relevant industries remains at the top 15. Accordingly, it is urgently needed for the entire country to nurture the industry, and therefore the Korean government is pushing forward with the policies to nurture the related industries by designating titanium materials as one of future growth engines for the country. However, among the neighboring countries of Korea, while China has preoccupied the industry in terms of scale, and Japan has taken the lead in terms of technologies, Korea needs to build up value chains in consideration of cooperation with the

neighboring countries and find out its role based on the established value chains. Along with this, as titanium has a characteristic concerning demands and supply different from the existing material industry, it is required to draw a business platform optimized for such demands and explore business strategies based on the platform.

Intelligent semiconductor

Intelligent semiconductor is defined as ‘an intelligent electronic component converging SoC and SW, which conducts intelligent services of an IT convergence product’ and it is expected to grow in the future into a key component of various industries. The Ministry of Science, ICT and Future Planning selected intelligent semiconductor as one of 13 future growth engines and announced the comprehensive action plan in Mar 2015. This article compared the current states of Korea and China related to intelligent semiconductor, and suggested policy implications to respond to the situations.

The global market scale of the semiconductor industry is about 305.6 billion dollar as of 2013, and intelligent semiconductor takes up about 144.6 billion dollars (about 75% of system semiconductor). Korea represents roughly 5% of the global market, but most of it is Application Processors of Samsung Electronics, and the growth of Intellectual Property of semiconductor and fabless semiconductor companies which are the key of competitiveness of intelligent semiconductor is still slow.

Korea is evaluated as about 10% ahead of China in terms of the technologies, but the gap of the export market share for system

semiconductor was expanded significantly to 13.9% in 2013. In particular, while the Chinese fabless companies have grown fast representing 9% of the world market, the Korean companies takes up about 1% of market share.

China has the largest semiconductor market in the world and has aggressively worked for the localization. The Chinese government has dealt with the intelligent semiconductor sector by implementing policies to nurture the semiconductor and SW industries together, and recently raised a fund of 21 trillion won to improve the competitiveness of the country's semiconductor companies and create an ecosystem. Such supports from the Chinese government have led to the rapid growth of fabless companies and the efforts of major foundry companies to build up an ecosystem for semiconductor related cooperation within the country.

In order to nurture the intelligent semiconductor industry in Korea, this article suggests the following policy measures. The measures include 1) securing a dominant position concerning technology by developing a platform technology that would converge semiconductor and SW, 2) coming up with specific measures to build up a cooperation ecosystem for intelligent semiconductor, 3) expanding the business scale and securing the global competitiveness by facilitating M&As, 4) having a preemptive response to the convergence standard of intelligent semiconductor, and 5) securing a competitive advantage based on semiconductor intelligent property.

Internet of Things (IoT)

Internet of Things (IoT) is expected to become the key industry

of the next generation for the coming 10 to 20 years. Therefore it is anticipated to have a significant impact on the improvement of national competitiveness and productivity and to be an important game changer that can reverse the economy rankings among countries. The consulting firm Accenture a, views that IoT would generate opportunities worth trillions of won as it would be applied to various industries, and also expects that countries who hope to have a rapid growth in the digital era would have a basis for another leap forward thanks to the emergence of IoT.

The US is the country that leads the IoT related technology and industry, but China is catching up with the US rapidly. China has different characteristics in terms of the development of the IoT industry comparing with other countries. First, China has an advantage of 'the economy of scale' on the basis of its vast domestic market. Specifically, the country is a large consumption market of IoT and sees rapidly increasing investment on IoT to build up new infrastructure and production facilities along with its urbanization and industrialization. Second, China is aggressively supporting the IoT industry through policies. The Chinese government is not only supporting the industry to grow IoT as a growth engine for the next generation but also investing a lot into the industry as it views IoT as one of solutions for social issues caused by lack of infrastructure and the urbanization. Third, there are Chinese companies growing with advancement of technologies and the domestic market. The IoT market in China has growth more than 30% year on year, the growth is possible with the existence of large scale enterprises having world-class technologies and newly created startups adjusting swiftly base on their creativity which comprise the ICT

ecosystem in China.

In short, China is emerging fast as a global leader in the IoT industry based on the biggest demand base (e.g. Internet users and mobile subscribers), policy supports from the government, and manufacturers equipped with technologies. China is equal to Korea in technology and has surpassed Korea in some of the areas in the IoT industry. Thereby for Korea, the fierce competition with China is inevitable. In this situation, Korea needs to overcome the weakness of the narrow domestic market by using the select and concentration strategy, which focuses on specialized areas by nurturing its strength and then aggressively advancing into the Chinese market. In addition, it is urgently needed for the Korean government to provide policy supports by setting up a model complex for IoT and conducting bold regulatory reform, so that the Korean companies can commercialize their creative ideas while being closely followed by China.