Development Direction and Countermeasures to Internet of Things Industry Planning in China

Quan YUAN
Bohai University, Jinzhou, Liaoning Province, China

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Abstract. This paper summarizes the development status and characteristics of China's Internet of Things industry. And it points out the shortcomings in the current layout of the Internet of Things industry. In addition, based on the specific situation of our country, this paper puts forward the countermeasures to improve the concentration of the Internet of Things industry, and to accelerate the implementation of the development of the Internet of Things industry. These measures will be able to promote the realization of scientific and reasonable layout of China's Internet of Things industry. Furthermore, the article points out that the government should play a leading role in the layout of the Internet of Things industry, to promote the rapid development of the Internet of Things industry in China.

1. Introduction

The Internet of Things is a fusion application of intelligent perception, recognition technology, pervasive computing and ubiquitous network. It is a new technology integration that connects people with things and things with things. It is called the third wave of information industry development in the world after computer and Internet. It has become a new driving force for the development of the world economy, science and technology. Therefore, countries all over the world have invested in the development of the Internet of Things industry. The Internet of Things is a key development area of strategic emerging industries. The development of the Internet of Things industry can improve the core competitiveness of the information industry, upgrade the traditional industry and enhance the level of social information. In addition, it has also become an important breakthrough for all regions to accelerate the transformation of development mode and promote independent innovation. At present, the application of Internet of Things in security, energy, transportation and logistics industry has a good prospect. China's Internet of Things industry is an important part of the global Internet of Things industry, and is facing great historical development opportunities. In recent years, with the rapid development of Internet of Things in the Chinese market, the demand for sensor products has further increased.

2. Issues

At present, China's Internet of things industry has maintained a high-speed development trend. However, the development of China's Internet of things market is restricted by many factors. The core problems faced by the Internet of things industry are mainly reflected in the following aspects: (1) the lack of effective industrial coordination and the lack of joint efforts; (2) the unclear business model and the lack of industry leaders; (3) the inconsistency of standards, resulting in difficulties in the integration of the Internet of things industry.

3. Development Direction of Internet of Things Industry

3.1 Introduction to the Leading Industry of Internet of Things

Leading industry refers to the industrial sector that can realize the rapid growth of national or regional economy, with strong technological innovation ability and broad market prospect. The selection and development degree of leading industries are related to the economic development...
level and competitive advantage to the whole country or region. Therefore, the first premise of implementing the development plan of Internet of things industry in China is to determine the regional leading industry. After each region has determined its own advantageous industries and leading industries, it will develop auxiliary industries around the leading industries. This can realize the optimal allocation of production factors and resources, and promote the growth of characteristic industrial clusters of the Internet of things. Therefore, all these measures should be guided by the Industrial Cluster Theory. The leading industry has the following four basic characteristics: high comparative advantage coefficient, high industrial relevance, high demand income elasticity and high productivity rise rate. The selection of leading industries is great significance in the development planning of Internet of things in China. In addition to the above economic indicators, it should also refer to a large number of non-economic factors, including policy, knowledge, environmental protection and other factors. It is quite difficult to quantify these factors with indicators. Therefore, to determine the leading industry in the development planning of the Internet of things industry in each region of China, it needs to comprehensively consider the economic indicators of the development of the Internet of things industry in each region, as well as other non-economic factors such as historical evolution and industrial foundation. Due to the implementation of the Internet of things industrial development plan in China, a lot of information is lacking, and some data are not quantifiable, so this paper will select the leading industry of the Internet of things in each region from a qualitative perspective. China's Internet of things industrial chain has a huge structure, including many links. According to the current development situation, it can be divided into seven links: Chip manufacturing industry, sensor equipment industry, label product industry, reader and writer manufacturing industry, system integration industry, network supply and operation service industry, application demonstration industry. At the same time, according to their respective industrial characteristics, seven links can be integrated into four sub industries: Internet of things material R & D and chip manufacturing industry, Internet of things equipment manufacturing industry (label finished product manufacturing, sensor equipment manufacturing and reader writer manufacturing), Internet of things system integration industry and Internet of things application demonstration industry. The relative reasonable planning of the leading industries in the major development areas of the Internet of things in China should follow the following preconditions: The development level of the Internet of things industry in each region, the dominant industry and the basic characteristics of the leading industry. We can select major regions as the center to focus on the development of regional internet of things leading industries. At the same time, it is necessary to drive the overall development of the Internet of things industry in the surrounding areas. These measures can eliminate regional development differences and build a modern Internet of things industry development system.

### 3.2 Conception of Implementing the Industrial Planning to the Internet of Things

In recent years, China's Internet of things industry has formed a number of Internet of things industry development clusters centered on regional developed cities. These industrial clusters have different scales and leading industries. The Yangtze River Delta, Pearl River Delta, Bohai rim and other major Internet of things industrial concentration areas have initially formed. The reason for this phenomenon is the role of market law. It conforms to the development trend of traditional high-tech industry in the world. Therefore, under the background of fully developing the Internet of things industry in China, it is feasible to form a number of Internet of things industrial bases centered on regional developed cities. It can divide the Internet of things industry into four types of bases. Such planning is based on the significance of influencing factors, such as the development level of Internet of Things industry in different regions, the development planning of regional Internet of Things industry leading industry, and the layout of Internet of Things industry.

#### 3.2.1 Application Demonstration Industrial Base

As the end of the Internet of Things industrial chain, the extensive application of Internet of Things technology is the ultimate goal of the development of Internet of Things. The area of developing application demonstration industrial base should have large-scale relevant industrial
foundation, perfect network provision, operation service facilities, and good technological innovation environment. In addition, the local government's support for the development of the Internet of Things industry is particularly important. Beijing, Shanghai and Xi'an have developed the Internet of Things economy earlier, with deep foundation and perfect industrial chain. They have built several application demonstration industrial bases of the Internet of Things. Therefore, the application demonstration industry cluster should be formed based on the above cities.

3.2.2 Research and Development and Chip Manufacturing Base

As the upstream of the industry chain, the research and development and chip manufacturing industry are the foundation and indispensable part of the Internet of things industry. There are three basic characteristics for the development of material R & D and chip manufacturing industry: taking electronic information industry as the leading industry, having the advantages of transportation location to facilitate product transportation, and abundant human resources for manufacturing industry. Cities with development potential include Suzhou, Shenzhen and Chengdu. The above three industries have a solid foundation and good conditions for the development of Internet of things chip manufacturing base. They should give full play to their own advantages and interactive development, so as to promote the industrial upgrading of their region and lay a solid foundation for China's Internet of things industry.

3.2.3 Equipment Manufacturing Base

The equipment manufacturing industry is the midstream of the entire Internet of things industrial chain, which plays a connecting role. It includes label products, sensor and reader manufacturing. The prosperity of equipment manufacturing industry is related to the development of the whole industry, and the prosperity of the manufacturing industry needs a reasonable industrial layout as support. According to the characteristics of IOT equipment manufacturing industry, the cities that may form IOT equipment manufacturing industry cluster include Guangzhou, Wuhan and Fuzhou. The Internet of things equipment manufacturing industry in the above cities has taken shape. The local government strongly supports the development of the Internet of things industry. At the same time, the regional advantages of the above areas also facilitate the exchange and interaction between the upstream and downstream industries.

3.2.4 System Integration Industrial Base

The system integration industry includes the integration of hardware system and the development of application software, which is closely related to the application of Internet of things technology. Therefore, the site selection of system integration industrial base needs to consider whether the communication with application demonstration industrial base is convenient. The convenient communication can save a lot of costs, increase technological innovation and provide reliable guarantee. According to the above requirements and the analysis of leading industries in different regions, the cities that may form the industry cluster of system integration include Nanjing, Tianjin, Hangzhou and Chongqing. The above-mentioned four cities have a good economic foundation and rich scientific and educational resources. Their development potential is huge, the development trend of system related hardware and software industry is good, and their location advantages are obvious.

3.3 The Formation of Regional Industrial Clusters

Taking the core cities of the four bases as the development points, it can initially form the development trend of regional industrial clusters. When the industrial base of Internet of things in the above areas is mature, the following industrial clusters can be formed: River area Industrial clusters, southeast coastal area Industrial cluster in and Bohai Rim Industrial Cluster.

4. The Countermeasures of Internet of Things Industrial Planning

In theory, the paper puts forward the idea of implementing the industrial planning of Internet of
things in China; On the other hand, the realization and layout of reasonable industrial planning in specific practice requires a high degree of industrial concentration. According to the standard of high-tech industry development, the concentration of Internet of things industry in most areas of China is still at a low level. It will have a negative impact on the smooth implementation of the layout of the Internet of things industry which if cannot be effectively improved. Therefore, it needs to improve the concentration of domestic Internet of things industry from the following four aspects.

4.1 Stronger Policy Support

The formation of Internet of Things industrial cluster has its specific market mechanism, which is the same as other high-tech industries. The market allocates and combines various resources. However, it is impossible to form a complete Internet of Things industrial cluster in a short period of time which completely depending on the role of the market. At the same time, it is easy to lead to the imbalance of industrial development in various regions. Therefore, the government should strengthen the planning of Internet of Things industrial cluster and the support of relevant industrial policies. Relevant government agencies should adjust and control according to the its development level in each region, its location advantages, its industrial organization rules and its own economic characteristics. In addition, the government should also implement supporting industrial development policies, improve relevant infrastructure, reduce production costs of enterprises, eliminate administrative barriers to entry of industries, so as to create a good environment for industrial development and innovation, and promote the formation of Internet of Things industrial cluster network. At the same time, the government should reduce unnecessary administrative intervention on the premise of providing a benign market environment and competitive order. At the enterprise level, the government should use various economic means to cultivate large enterprises in the Internet of Things industry. It should guide the combination of industry, University and research to improve the innovation ability of enterprises, and provide policy and financial support for small and medium-sized Internet of Things enterprises. Finally, governments at all levels should introduce foreign advanced innovative enterprises and develop strategic cooperation. These measures can form a perfect Internet of Things industrial chain, so as to build an Internet of Things industrial cluster with international competitive advantage

4.2 Integrate Existing Enterprises and Establish Industrial Alliance

To improve the concentration of the Internet of things industry, the role of market mechanism is essential. In addition, it is also necessary to effectively integrate the existing Internet of things enterprises, expand the scale of enterprises, and set up Internet of things enterprise groups. It should encourage the upstream and downstream enterprises in the industrial chain, enterprises and scientific research institutions to form industrial alliance. Alliance can be achieved through merger, alliance, listing and so on. This is beneficial to the complementary advantages of each subject, thus forming a group of large enterprise groups and industrial coalitions with independent intellectual property rights, strong innovation ability and international competitive advantage. In addition, this can also improve the industrial concentration of the Internet of things in China and realize the advantages of scale economy.

4.3 Construction of Public Service Platform

The Internet of things industry has the characteristics of high investment and long cycle. Therefore, the development of industrial clusters should be based on the characteristics of the Internet of things industry itself. It should integrate R & D, technology application, loan guarantee, product testing and other public service platforms. This can form a public service system that provides technology, information and financial support to Internet of things enterprises to promote cooperation in production, learning and research, and to accelerate the industrialization of research results. On the other hand, the Internet of things enterprises themselves should also make full use of external resources. This requires the establishment of public networks in the region to facilitate the flow of technology and experience between enterprises. It also needs to optimize the structure of the
Internet industry to reduce unnecessary repeat investment and construction. The above measures can help to enhance the technological innovation ability of the Internet of things industry and promote the agglomeration of the Internet of things industry.

5. Summary and Prospect

Through the implementation of the above planning and countermeasures, the concentration of the Internet of things industry in China can be effectively improved, and a more perfect industrial chain of the Internet of things can be formed. The above measures can also form an Internet-of-Things industry system with perfect structure and reasonable layout, so as to realize the optimization and configuration of the cluster and the resources of the enterprises in the industry.

References

[1] Ye T, Chen D, Wang H. New Development of Internet of things industrialization [J]. 2017.
[2] Zheng Z. The Research on the Present Situation and Countermeasures of the Development of Internet of things Industry in China. Inner Mongolia Science and Technology and Economy [J]. 2018.
[3] Wang S, Xia L, Chen C. The Development Situation and Strategy of Internet-of-Things Industry Base in the Digital Economy Era. Communication management and technology [J]. 2018.
[4] Li Z, Zhang M. The Present Situation and Countermeasures of China Internet of Things Industry. Chinese high-tech enterprises [J]. 2018.
[5] Han C. Problems and Countermeasures in the Development of Internet of things in China. Contemporary economy [J]. 2018.