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Maker, Maker Space and Maker Culture Construction

Qunzhen QU*

School of Economics and Management, Shanghai Maritime University, Shanghai 201306, China

Abstract Shanghai is planning to launch a strategic research of new round of development in 2050, carry out future urban planning research in 2040, and started start the implementation of thirteenth five-year development planning research. This paper firstly analyzed the relationship between Big Cloud Movement and Maker, and introduced current development situation of makers in Baoshan District of Shanghai. Then, according to current development situation, it came up with recommendations for the maker culture construction: strengthening the awareness for protection of intellectual property right in the district, building "Internet + X" development model for Baoshan District, establishing maker parks in Baoshan District, actively creating the innovation atmosphere, opening the Big Cloud Movement platform the society and promoting generation of grassroots makers, enhancing the cooperation with adjacent district to realize trans-regional cooperation of innovation talents, and introducing social capitals to help innovation teams to make transformation of innovation results.

Key words Maker, Maker space, Maker culture, Big Cloud Movement, Baoshan District of Shanghai

1 Introduction

Shanghai is planning to launch a strategic research of new round of development in 2050, carry out future urban planning research in 2040, and started start the implementation of thirteenth five-year development planning research. In the end of March 2015, Shanghai Municipal Science and Technology Commission issued the "Entrepreneurship Pujiang Action Plan" to build the best city in the world, and plan to gather 200000 people to start up businesses, with more than 3000 entrepreneurship enterprises, to form 100 startup unions. "Entrepreneurship Pujiang" implemented 8 major actions, in which the most innovative one is the "city of maker" action, to build the global best practice city of maker^[1].

As the north gateway of foreign exchange of Shanghai, Baoshan District is strategically located in the northeast gateway. In recent years, Baoshan District has established the industrial pattern with Baoshan Iron & Steel Co., Ltd. as the pillar, ocean-going cruise tourism as characteristic and coordinated development of three industries. In order to realize a good start for Baoshan District in the 3th Five-Year Plan period, the district leaders and government departments at all levels, taking No. 1 program of Shanghai Municipal Committee as the core, strived to create a technological innovation environment for Baoshan District, which will put the mass entrepreneurship and innovation in a prominent position. In this process, it is required to fully consider the impact of a new round of scientific and technological revolution and industrial reform, include the construction of global innovation center into the layout of the future development of Baoshan District, formulate

global scientific and technological innovation center development strategy, and further make clear the leading and support function of scientific and technological innovation to economic and social development of Baoshan District. Baoshan District should closely connect relevant requirements of the state and Shanghai, uphold the open concept, actively integrate into the Internet plus era. In the process of promoting the construction of industrial Internet innovation practice area, it should accelerate the development of maker space and other carrier platforms, and make effort to create an excellent innovation and entrepreneurial ecological environment^[2].

2 The relationship between "Big Cloud Movement" and "Maker"

2.1 The development of maker space The appearance of "Maker" is the representative of innovation generation 2.0, based on the social technology development path from personal communication to personal computing, and then to personal making, to build a user-centered, application-oriented under innovation environment integrating the creative, design and making. The advent of the era of innovation promotes innovation to come down from the altar and become mass innovation and social innovation from individual innovation. It reflects a positive attitude towards life, and there is the meaning of making effort to find solutions through action and practice. Makers are a group of sharing people. Naturally, there will a place for gathering of makers, and such place is maker place. The first domestic Maker Space is "New Workshop" set up by Li Dawei, Wu Sili, and Xie Minlin couple in Shanghai in 2010. Later, more Maker Spaces appeared in Beijing, Shenzhen, Chengdu, Nanjing and other places, of which the prominent ones include Beijing Maker Space and Shenzhen Chaihuo Maker Space, and as well as Shanghai New Workshop. In Shanghai, in order to realize the scale innovation, nearly 40 startup service organizations have jointly set up the Shanghai Maker Space Alli-

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* Corresponding author. E-mail: qzqu@163.com

ance. As the first regional public creation space alliance in China, it will become a platform for resource sharing and exchange and cooperation of new incubator resources in Shanghai.

2.2 The relationship between Big Cloud Movement and maker space Zhu Xiaoming, director of Shanghai Research Center for Digital and Internet Finance and president of China Europe International Business School, said in his speech on "Sweat and Gold of Mobile Internet O2O", if in the era of product economy, its infrastructure was railway, road and bridge taxes, and water, electricity, and gas; in the present digital service times, it still needs soft things, namely, "big, cloud, movement", in other words, "big data", "cloud computing", "platform economy" and "mobile Internet"^[3].

When the whole society takes the constantly progressing technology as a standard, if the Maker concept wants to go farther and to have richer connotation, we should create the maker development environment from both hardware and software. At present, except Guangzhou, all the four first-tier cities have maker spaces, the other second and third tier cities are constantly exploring a new mode of development, such as the introduction of maker space into the library, coffee bar and other places, these are constantly improving the hardware environment for the development of maker space. However, the present situation is soft environment always lags behind the hardware facilities, makers also need to solve this urgent problem. The interests of makers focus on engineering-oriented topics, such as electronics, machinery, robots, 3D printing, etc., and also include skillful use of related tools, such as CNC, laser cutting machine, as well as the traditional metal processing, carpentry and artistic making, such as casting, handicrafts and so on. To put these practical operations into practice, it is necessary to establish a "Big Cloud Movement" resource platform. "Big Data" provides key information of customer demands and product performance for makers, while "cloud computing" helps makers change from theory to physical construction; "platform economy" is the inevitable path from innovation to business startup and then to economic transformation, while "Mobile Internet" is the method for disseminating maker products. Therefore, the development of maker space must be based on the improvement of soft environment.

3 Current development situation of maker in Baoshan District

3.1 Holding maker marathon to help the development of maker enterprises At the beginning of introduction of the maker concept to China, Baoshan District has attached great importance to the cultivation and support of maker groups. For example, in September 2013, Baoshan District Economic Committee, with cooperation of Boji Shanghai Zhihui Park, Leiphone Network, Scientific American, and Scientific American (Chinese Edition), launched the global maker marathon, which attracted about 150 makers including well-known business instructors in mobile Internet industry, venture capital institutions, and enterprise represent-

atives from all areas of China, and witnessed intelligence and wisdom of innovative and creative maker teams, made effort for promoting innovation of mobile Internet science and technology. For the award-winning team in the event, the District Economic Commission offered 10000 yuan cash award and 500000 yuan investment funds^[5]. It is obvious that Baoshan District Government has paid great attention to the development of maker group and vigorously supported the establishment and development of maker enterprises, and has positioned them as the key driving force for the adjustment of industrial pattern and the development of science and technology.

3.2 The strong momentum of the mobile Internet industry in the district is helpful for promoting the development of maker culture

In recent years, the development of mobile Internet industry in Baoshan District is in the ascendant. It has established a mobile Internet industry base with total construction area of 1.73 million square meters, more than 20 parks including Fudan Software Park and Shanghai Mobile Internet Industry Innovation Park, and Baoshan becomes the district with rapid development mobile Internet industry in Shanghai. On November 27, 2012, Baoshan District successfully became the first mobile Internet industry base in Shanghai. Since the awarding of the base, eight key parks have been established in the district: Boji Shanghai Zhihui Park, Baoshan Science and Technology Park, Fudan Software Park, Shanghai Intellect Industry Park, Shanghai Mobile Business Industry Park, Shanghai Mobile Game Industry Park, Shanghai Mobile Internet Innovation Park, and Haibao Demonstration Park. It has gathered 415 mobile Internet related enterprises, such as Renren Game (mobile games), Tianya Online (mobile community), Guyu Network Technology (mobile gaming company invested by People's Daily Online), Weimob (mobile e-commerce), Bestlinks (mobile multimedia), CheerZ (mobile education), Instony (mobile insurance), Etrump Information Technology (mobile Internet fonts), and Roadoor (mobile finance) and other mobile Internet-related enterprises. In these enterprises, 79 were introduced this year, Baoshan District has formed mobile Internet with mobile games, mobile commerce, mobile new media, mobile medical, mobile application platform and software development as industry characteristics^[6]. The rise of the Internet industry is a key step to explore the industrial transformation in Baoshan District. As an essential field of scientific and technological innovation, the development of industrial cluster will undoubtedly promote the development of maker spirit in Baoshan District.

3.3 Industrial structure gets constantly optimized, and the development of new industries sets forth requirements for the digital environment

In 2014, the proportion of tertiary industry of Baoshan District further rose, which constantly promoted development of innovation and transformation and upgrade of economy. By the end of February 2015, 64559 enterprises in Baoshan District belonged to the tertiary industry, accounting for more than 8% of the total enterprises in the district, increased by 2 percentage points compared with the same period of the last year. The

proportion of "science and technology" and "modern service" enterprises further increased. The core industries such as "service-oriented science and technology enterprises" and "business service enterprises" increased by more than 40% compared with the same period of last year; the proportion of "manufacturing", "transportation, warehouse and postal industries", and "real estate industry" further declined, reflecting the strong desire of enterprises to invest in new and hi-tech industries, and the transformation and development momentum was good^[7]. The optimization of industrial structure sets forth new requirements for the social innovation atmosphere. It is imperative to accelerate the improvement of the social innovation environment and speed up the establishment of the social mechanism of "mass entrepreneurship and innovation".

4 Recommendations for the maker culture construction in Baoshan District

4.1 Strengthening the awareness for protection of intellectual property right in the district To further deepening the concept of Big Cloud Movement, it is required to strengthen the protection of innovation intellectual property right. On the one hand, behind the big data, it is the privacy of the group information, cloud computing concerns network security, the most important criterion for the implementation of the platform economic model is the high degree of customer information security. Mobile Internet also has high security requirements for the network carrier, part of which needs establishing a supporting intellectual property system, so that the security of its operating environment can be guaranteed. On the other hand, as maker groups, their innovative and creative inspiration has original characteristics. However, at the current domestic market, plagiarism is very serious, which poses a great challenge for the protection of intellectual property rights. Therefore, when constructing the maker culture in Shanghai, it is required to first make innovation of the original system. In other words, the system innovation should be implemented first. Specifically, Baoshan District should vigorously promote the innovation of intellectual property rights system, so that makers will not worry about their innovative products and are willing to put their inspiration into practice.

4.2 Building "Internet + X" development model for Baoshan District In the era of "Big Cloud Movement", the key is to seize the new economic development model of the Internet and build new "Internet + X" development model combined with the actual development of regional industries. As a key enterprise in Baoshan District, in the process of innovation and transformation, Baoshan Iron & Steel Co., Ltd. established Ouyeel Cloud Commerce Platform with "Internet + iron and steel" as major part, including Shanghai Steel Exchange Center, Shanghai Fourth Party Iron and Steel Logistics Service Platform, Steel Internet Financial Service Platform, and Steel Material Technology Service Platform, and created an internationally leading steel spot exchange online CBD. Other industrial economies in the district can also try to establish the "Internet + X" model, which can use the big data,

cloud computing, platform economy and mobile Internet, to provide the production service industry with external soft environment for industrial development. The "Internet + X" development model is an innovation method for traditional enterprises. Through this model, it can realize Internet based traditional enterprise, promote enterprise restructuring, and also can explore an innovative development road for industries in Baoshan District, so as to realize sprouting and development of maker culture in the process of industrial transformation.

4.3 Establishing maker parks in Baoshan District and actively creating the innovation atmosphere Maker Culture is implantation, sprouting, growth, and spread of innovation awareness, and such awareness must be based on strengthening of materials. Therefore, to vigorously develop the maker culture in Baoshan District and integrate the maker culture into culture construction of the district, first it needs building maker parks from external material environment. For example, it is feasible to make secondary utilization of waste factories or use universities as bases with reference to New Workshop in Beijing and Warehouse No. 15 in Dalian, to build a maker park. This is also manifestation of innovation awareness. In addition to actively creating a new maker park, it is also recommended to give full play to the existing model of creative parks. At present, Baoshan District has set up a series of maker parks, including Maker Space Demonstration Base and Maker Space Construction Base, Zhangjiang Baoshan Park Service Center, and Shanghai Zhangjiang National Independent Innovation Demonstration Zone Baoshan Park, as well as innovation bases established jointly with the group companies, including Sci-Tech Town established jointly with Shanghai Lin'gang Economic Development (Group) Co., Ltd., China Internet Industry Innovation Practice Zone built in cooperation with Baoshan Iron and Steel Group, and Big Data Industry Base built jointly with Fudan University. These can be considered as cultural spirit of makers developed by the district government. Through the establishment of a sound system of innovative personnel, it is recommended to realize sustainable supply of innovation talents from the perspective of human resources, thus creating an atmosphere of innovation in the district.

4.4 Opening the Big Cloud Movement platform to the society and promoting generation of grassroots makers To really introduce the concept of "Maker" to China, when the existing domestic infrastructure is not well established, it is required to make every effort to build a "Big Cloud Movement" platform and provide support facilities. On the one hand, for the maker group, it is difficult to obtain a lot of data and resources, which needs the government to play the role of resource allocation. For example, to open the database to the general public, there should be an effective measure for guaranteeing the information security. It is understood that Shanghai New Workshop Maker Space is located in Jing'an District, the new workshop proved that Jing'an has such soil or environment for us to regard Maker Space as an entertainment place. Baoshan District also can explore grassroots maker ac-

tivities, to make the maker spirit penetrate into people's mind. The masses have a great life of wisdom, thus they can transmit the close attention of Baoshan District to makers to the outside. Then, it is expected to form a kind of maker cultural spirit in the common people fundamentally. Besides, Baoshan District can invite grassroots makers to reside in Boji Shanghai Zhihui Park, Baoshan Science and Technology Park, Fudan Software Park, Shanghai Intellect Industry Park, Shanghai Mobile Business Industry Park, Shanghai Mobile Game Industry Park, Shanghai Mobile Internet Innovation Park, and Haibao Demonstration Park. Baoshan District can provide office, startup guidance, industrial and commercial administration services, which is favorable for transformation of maker ideas and truly bringing into play their functions of promoting social progress and economic development.

4.5 Enhancing the cooperation with adjacent district to realize trans-regional cooperation of innovation talents The introduction of mass entrepreneurship and innovation is to stimulate the creativity of hundreds of millions of the masses. As a group with strong sense of innovation, college students are also maker groups available for use in recent years. Every year, more than 7 million college students are graduated and can be used for undertaking maker activities. Due to the location of the district, there are few colleges and universities in Baoshan District and even fewer colleges and universities with the ability of cultivating innovative and entrepreneurial talents. In comparison, adjacent districts have obvious talent advantages. Yangpu District has Shanghai University of Finance and Economics, Fudan University, and University of Shanghai for Science and Technology, and Putuo District has Huxi Campus of Tongji University and East China Normal University. Therefore, Baoshan District government should actively cooperate with other districts such as Yangpu District, to attract graduates of adjacent districts to enter Baoshan District, and carry out trans-regional cooperation through innovative talents for new high technology industries and Internet science and technology, to realize the healthy development of innovative talent environment.

4.6 Introducing social capital and helping innovative groups to transform the scientific findings The Maker phenomenon is the exploration of scientific and technological innovation in new economy. The generation of maker group, to a certain extent, marks the innovation culture (Maker Culture) with people-oriented, creative, innovative, and entrepreneurial culture as the symbol, which has excellent demonstration significance for guiding scientific and technological talents to start their own businesses, and promoting scientific research achievements and social employment. Besides, the maker group is still a small group in China, it

still needs more care and support in environment creation and public service supply. Baoshan District government should formulate comprehensive policies to support maker talents, such as providing guidance in start-up fund-raising, providing free offices and reducing taxes for individuals who conduct autonomous undertaking and innovative enterprises. At present, Baoshan District has worked out Maker Line No. 1, Maker Line No. 3, and Maker Line No. 7 development plans. By the end of 2014, near 100 enterprises in Baoshan District attracted attention of venture capital companies, and 23 enterprises along Maker Line No. 3 have obtained investment of venture capitals. In order to obtain more social funds, Baoshan District government should actively perform road shows and vigorously disseminate innovative enterprises of the district, to attract social funds and promote innovation and development of enterprises. Besides, Baoshan District government can assist these innovative groups in finding an enterprise that can realize product industrialization, realizing the docking of them. Enterprises invest funds, while maker groups provide technology, to realize the win-win objective in the form of technology investment, to complement each other and promote the transformation of scientific findings.

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