

# A RESEARCH ON THE DEVELOPMENT MODE OF MAKER SPACE UNDER THE BACKGROUND OF BIG DATA

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## Abstract

With the development of the times, maker space has made great progress and its operation mode has also been constantly changing under the background of supply-side structural reform and new normal of economic development. With the development of Internet and the coming of big data era, the operation mode of maker space is very important to speed up the creation of small and medium-sized enterprises in China. Starting from the current situation of the development of maker space in our country, this paper analyses the existing operation mode of maker space and explores its new development mode, combining with the new situation of big data.

**Key words:** big data; maker space; development mode.

## 1. INTRODUCTION

In 2015, Premier Li Keqiang repeatedly stressed on the importance of mass entrepreneurship and innovation in the report on the work of the two sessions of the CPPCC and the CPPCC, and promoted it as one of the “twin engines” of China’s economic transformation and growth[1]. Following the trend of user innovation, mass innovation and open innovation in the era of innovation 2.0, and grasping the characteristics and needs of innovation and entrepreneurship under the Internet environment, a new low-cost, convenient, all-factor and open service platform for entrepreneurship — public creation space, has emerged through market-oriented mechanism, specialized services and capitalization.

## 2. RELATED CONCEPTS OF MAKER SPACE

From an academic point of view, it is generally believed that the maker space originates from foreign hackerspace. As a community-based creative practice base, it provides makers with open physical space and prototype processing equipment and other hardware facilities. At the same time, it organizes relevant gatherings and workshops to promote knowledge sharing and cross-border collaboration, which is limited to a technical concept[2].

After being introduced into China, maker space has evolved into an economic concept. It is more about realizing the transformation and docking of funds and knowledge, focusing on the realization of the commercial value of the project, having the dual functions of creating customer space and business incubation, driving or expanding employment, and

creating a new engine of economic development under the new normal conditions.

According to State Council’s *Guiding Opinions on Developing Maker Space and Promoting Public Innovation and Entrepreneurship*, maker space is the collective name of new service platforms for entrepreneurship; it is a low-cost, convenient, all-factor and open platform constructed by market-oriented mechanism, specialized services and capitalization to meet the characteristics and needs of innovation and entrepreneurship in the network era; it integrates the service functions of workspace, cyberspace, social space and resource sharing space to meet the needs of innovative entrepreneurs.

Maker space is not a simple physical concept. The Ministry of Science and Technology emphasizes that maker space is not a real estate construction, but an open entrepreneurial ecosystem based on various new incubators.

## 3. THE DEVELOPMENT CHARACTERISTICS OF MAKER SPACE IN CHINA

In 2010, China’s first hackerspace was born. At present, there are mainly six modes of professional maker space in China: first, maker space with activities focusing on regular project exchange; second, a training and tutoring maker space based on the training system of combining theory with innovation and entrepreneurship training and utilizing all kinds of innovation and entrepreneurship resources to serve college students’ innovation and entrepreneurship; third, a media aggregation maker space with the advantage of media and the leadership of media to provide enterprises with online and off-line integrated

entrepreneurship services; fourth, capital-led investment-oriented maker space that guides the gathering of other innovation and entrepreneurship elements and gathers angels, VC and PE investors to gather high-quality venture projects; fifth, open office leasing space developed and operated by real estate developers and real estate operating maker space similar to WeWork mode; next, industry chain service universities with the cooperation of upstream and downstream institutions of industry chain and joint investment of funds; last, a comprehensive entrepreneurship ecosystem maker space with comprehensive entrepreneurship ecosystem construction as its main task and comprehensive professional services for small and medium-sized enterprises, including legal, intellectual property, financial, consulting, inspection, certification, technology transfer and even accommodation services. With the development of China's economy and the opening of social thought, the maker space will gradually move towards a rational development in China[3].

Overall, after so many years of development, maker space presents the following characteristics:

(1) Obvious industry scale effect and gradual improvement of business incubation service chain

According to the data from the white paper, maker space in China is developing rapidly, ranking first in the world in quantity and still showing a rapid growth trend. The data shows that there were 5739 maker spaces included in torch statistics in China by the end of 2017, an increase of more than 33% compared with 2016.

The pattern features of maker space improves the chain of innovation incubation.

Thematic maker space, joint office maker space, maker space for gathering customers, and specialized maker space make it possible for entrepreneurs to dock innovative and entrepreneurial resources at low cost and effectively reduce the threshold of mass entrepreneurship.

(2) New development focus of "investment + incubation", attracting large capital participation

According to the white paper, the "investment + incubation" model has attracted the participation of many institutions. In 2017, the national maker space helped 18,000 teams and enterprises to obtain investment, totaling about 67 billion yuan. Among them, social capital investment accounted for 85%, which became the backbone of promoting the development of maker space.

High-quality maker space is favored by the capital market. According to the statistics of the white paper, by the end of 2017, there were 1091 maker spaces such

as Youhao Workshop, Innovation Workshop, Yinjiang Incubator, Suhe Hui, Causality Tree, etc. obtaining social capital investment, and 222 maker spaces themselves were listed enterprises, accounting for 3.9%.

At present, service income has gradually become the main source of income. In 2017, service income of maker space reached 6.45 billion yuan, accounting for 42% of the total revenue, becoming the main source of income.

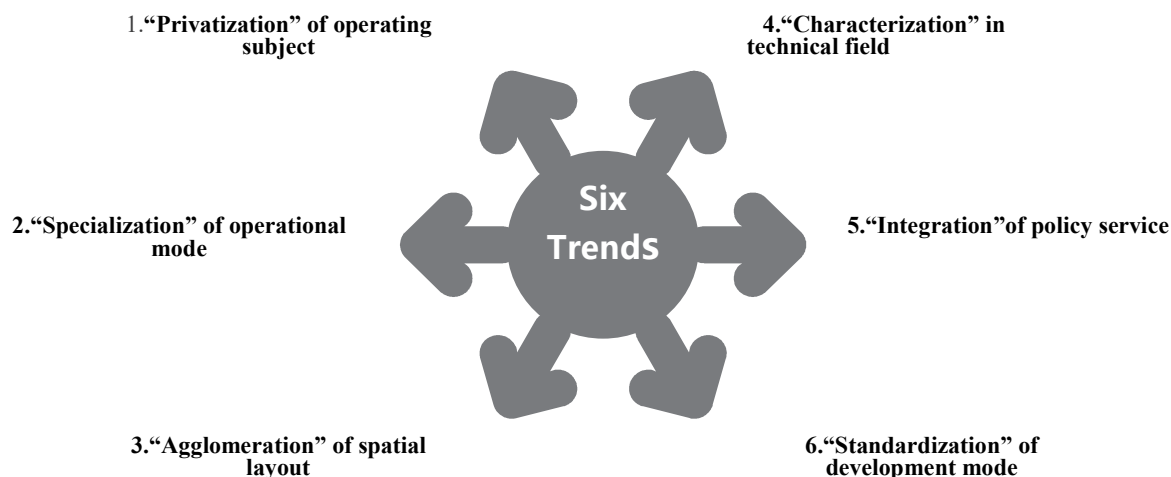
(3) The consensus of characteristic development and the obvious trend of topicalization and characterization. According to the white paper data, the combination of maker space and vertical industry is accelerating. Among them, enterprise services, Internet +, cultural and creative industry, artificial intelligence, intelligent hardware, sharing economy and other fields are more concerned, corresponding to the development level of new industries. It is worth noting that many maker spaces have gone deep into many vertical subdivisions, such as ocean, railway, aviation, automobile, music, wine, clothing, chip, catering, new materials, handicraft and so on.

From the point of view of the characteristics of the population, there are more and more maker spaces for the entrepreneurs with service characteristics, such as civil-military integration, women entrepreneurship, returning home entrepreneurship, ethnic minorities, college students, returning home from abroad, foreigners in China, academicians and research institutes, designers, etc. Makers benefit from the communal nature of maker spaces, engaging with diverse grouping of co-creators[4].

From the perspective of enterprise characteristics, including China Mobile, China Unicom, China Telecom and other large state-owned enterprises, as well as Alibaba, Tencent, Microsoft, Jingdong, Tou Tiao and other Internet eco-companies have also laid out business incubation and accommodation development has become an important trend. In addition, the services provided by space are becoming more and more professional, such as enterprise services, investment and financing services, entrepreneurship training, entrepreneurship mentors, policy consultation and so on.

#### 4. SIX TRENDS OF MAKER SPACE DEVELOPMENT

After the early exploration and development, the development of maker space has entered a new era, and some new trends and characteristics have emerged, which is shown in **Figure 1**.



**Fig. 1 Six trends of maker space development**

The first trend is "privatization" of operating subject. Most of the early maker spaces are dominated by the government or universities. The main reason is the long payback period of maker space revenue. However, after the initial "trial period" supported by the government, a large number of maker spaces established by social forces with multiple investors have gradually emerged. They provide various value-added services for customers through market-oriented operation.

The second trend is "specialization" of operational mode. In the early stage of the emergence and development of maker space, most of them were refitted from coffee shops and old workshops. Operating subjects generally provided venues and simple office conditions. After a period of development, the operation mode of maker space has become more and more specialized, and the service function of maker space has been extended vertically. A number of specialized maker space operators with certain scale and brand have appeared, such as Tencent, Pegasus Travel and Genesis Ark.

The third trend is "agglomeration" of spatial layout. The agglomeration development of maker space has become an important trend at present. Taking Beijing Zhongguancun Pioneer Street as an example, the total length of the street is 220 meters, with an area of 45,000 square meters. There are more than 30 entrepreneurship service institutions in Beijing, serving thousands of mobile entrepreneurship teams.

The fourth trend is "characterization" in technical field. From the perspective of the development process of maker space abroad, characterization of maker space is the future development trend. Private incubators are mostly professional incubators, which often combines local high-quality and characteristic industries in the industrial field to subdivide the industry, focusing on a subdividing area separately, and attracting a group of technology start-ups to settle in in a relatively short time through specialized incubation services.

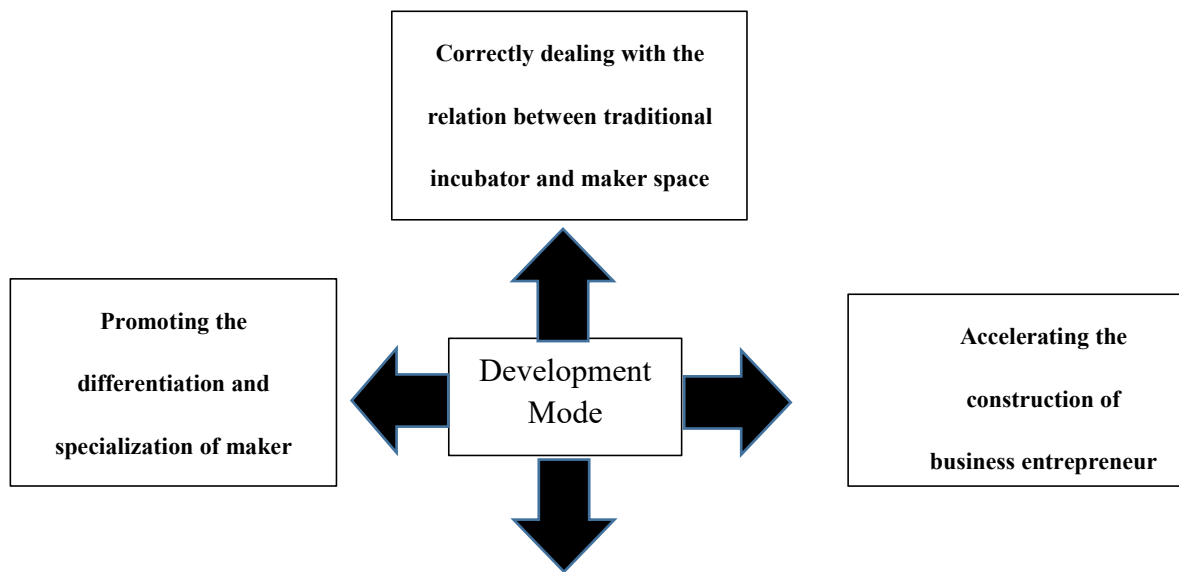
The fifth trend is "integration" of policy service. In the future, maker space will become an integrated platform for entrepreneurship and innovation policies, including

innovation and entrepreneurship policies of science and technology departments, financial science and technology plans and funds of finance departments, development policies of small and medium-sized enterprises in industry and telecommunications departments, entrepreneurship tax policies of tax departments, reform policies of business systems in industry and commerce departments, social security policy for entrepreneurs in human and social sector and industrial policy of development and reform sector. At the same time, global entrepreneurs, angel investments, cutting-edge information and feature services can flow freely and interconnect among the maker spaces.

The sixth trend is "standardization" of development mode. At present, the development of public space is uneven in China. Some construction of maker space pursues quantity too much. Some business modes and operation concepts of maker space are much the same. Therefore, the Ministry of Science and Technology has recently conducted in-depth research on the formulation of standards for maker space. It is expected that national, local and industrial standards will be issued soon.

#### **5. NEW DEVELOPMENT MODE OF MAKER SPACE UNDER THE BACKGROUND OF BIG DATA**

As China's economic development has entered a new normal, the economic development model needs to be upgraded and updated[5]. The Government Work Report of 2018 clearly states that an upgraded version of "double creation" should be created. As an important carrier and strong grasp of the strategy of "double-creation", the maker space should become the core component of the upgrading of double-creation. Especially in the network era and under the background of the big data, how to develop maker space is worth discussing. Based on the current situation of big data, a new development mode of maker space is initially constructed as shown in **Figure 2**.



**Fig. 2 New development mode of maker space under the background of big data**

(1) Correctly dealing with the relation between traditional incubator and maker space

As a new type of incubator, maker space will have a certain impact on traditional incubator. However, the mature operation mechanism and management mode of traditional incubators are incomparable for the time being. Therefore, in order to properly deal with the relationship between the two, imbalance should be avoided. Traditional incubator should be based on Internet thinking, optimize the innovation environment and service content, and create online and offline professional and vertical incubators. As for maker space, a unique operation mode and service system should be formed as soon as possible to enable the whole society to form a diversified carrier system of scientific and technological innovation with the functions of maker space, incubator and accelerator.

(2) Promoting the differentiation and specialization of maker space

According to the characteristics of industrial development, scientific and technological innovation ability, transportation and urban renewal and construction in different regions, it is necessary to properly guide the development direction of maker space in various districts and counties, and encourage the development of characterization and differentiation. As far as maker space is concerned, it is more necessary to create a gathering place with good entrepreneurial environment, sufficient sharing resources, convenient communication, rich cultural connotation and talent gathering, so as to give full play to the advantages of industry and platform, create a channels through creating space for all, to build Internet network for entrepreneurs, investors and service organizations, and to provide various innovative and entrepreneurial services for entrepreneurs quickly.

(4) Adhering to the principle of market-oriented

environment for mass entrepreneurship and to bless the surrounding areas, and jointly create a social atmosphere of scientific and technological innovation. It is necessary to combine with its own industrial characteristics and take industrial areas and university campuses as the core, and strive to construct a maker space in the field of specialization and subdivision, such as virtual reality, cultural creativity, advanced intelligence and online education, so as to cultivate the “four new economies” and promote new growth points of regional economy.

(3) Accelerating the construction of business entrepreneur service platforms for maker space

The future development of maker space lies in connection and sharing. The Amsterdam Start-up Platform in Netherlands draws a map of the technology city, which clearly shows the links between start-ups in the region. In addition, the “Guipan” area in the UK has also constructed relevant websites to facilitate timely communication and docking between relevant entrepreneurs and investors. Therefore, it is necessary to speed up the construction of a “platform for entrepreneurship services in public space” to achieve the coverage of all maker space based on Internet technology. On the one hand, real-time inquiries should be made about the presence, incubation and investment of enterprises in the public space, and real-time monitoring of the construction and management of the public space should be carried out to prevent excessive carriers and bad business model should be seen through in time. On the other hand, it is necessary to construct Internet platform and resource allocation of resources

A lot of maker spaces were mainly created by the government in the early stage, and some were even set up as model samples, which is very difficult to go far. The development of maker space and start-ups really needs government support, including providing certain

financial subsidies, tax and fee relief, but in general, it is necessary to adhere to the principle of government guidance and market-oriented growth. Maker space must also experience the washout of the market tide. Starting from the efficiency and effect, the government should support enterprises and institutions in the construction and expansion of entrepreneurship services, improve the technological service system, financing service system and management system of maker space, leave related matters to the market to decide, and give full play to the role of the market in the allocation of resources.

## 6.CONCLUSION

Maker space originates from the concept of foreign hackerspace, and its connotation and function have a new evolution in the process of localization. In China, maker space can be regarded as a new type of incubator, which is different from the traditional incubator of science and technology enterprises from the perspective of economic function. It is a new organization with wide audience, low threshold, resource concentration and open sharing. Faced with the problems of homogeneity, hollowness and excess of public space, tracing back to the root cause, only through the test of "Valley of Death" can we realize the sustainable development of maker space by market operation mode.

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