

## The Drone Industry in China and the Actions taken by Japanese Companies to Enter the Market

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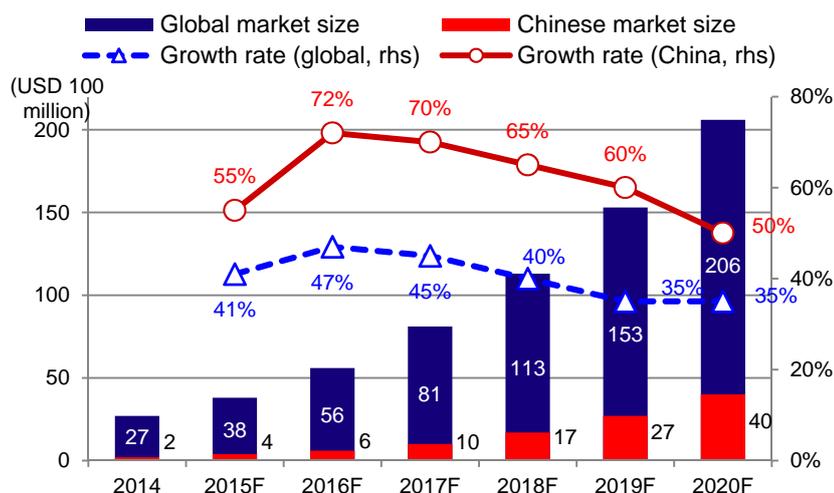
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The drone industry has recently been attracting substantial attention as an “aerial industrial revolution” and has been broadly used in business purposes throughout the world. In particular, the drone industry in China has been rapidly growing and developing, bearing a major drone manufacturer that accounts for more than 70% share of the world market for drones for private use. It is said that 2015 marked the first year for the drone industry in China. The rapid growth of the industry was supported not only by the research and development of the technology but also by promotion via governmental measures, as well as strategic alliances among different enterprises. This article will discuss the environment that supported the growth of the private-use drone industry in China, in order to suggest how Japanese companies may be able to enter the market.

### Growth of the drone market

The use of drones in China began for military purposes, and it was not until the 1990s that research started to give serious consideration to their use for private purposes. As a result, low-end drones appeared. In 2007, private-owned companies started to enter the private-use drone market, and more and more companies have tapped in to the business ever since. In recent years, active measures have been taken by both governmental and private organizations to secure safety and industrial use of drones, in order to create economic opportunities for the future.

**Fig. 1: Market size and growth rate of private-use drone industry**

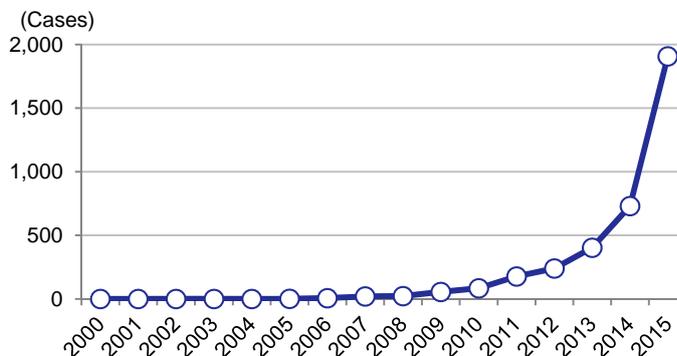


Source: China Industry Net

Fig. 1 shows the market size for private-use drones in China. As of 2015, the market size has been CNY 2.33 billion (equivalent to USD 373 million). The average annual growth rate from 2014 to 2020 is estimated to be 61.5%, exceeding the growth of the global market. By 2020, the Chinese market is expected to account for approximately 20% of the global market at CNY 26.1 billion (equivalent to USD 4.04 billion). Drones are mainly expected to be used in industries of aerial photography, agriculture and forestry, security, and electricity, while their potential in logistics, healthcare, and infrastructure management is also being considered.<sup>1</sup>

The increasing research and development related to the drone industry in China can be seen from the intellectual property rights obtained in the field. The number of patents achieved increased sharply in the late 2000s, growing rapidly in five years from 84 in 2010 to 1,908 in 2015 (Fig. 2). In terms of the patent category, the majority involve invention patents and new utility model patents. This suggests that research and development activities are being carried out strategically with business use in mind.<sup>2</sup>

**Fig. 2: Number of drone-related patents in China**



Source: China Intellectual Property Right Net

<sup>1</sup> iResearch 『2016年中国无人机行业研究报告简版』

<sup>2</sup> Asei Ito, Brief Observation Report: Shenzhen International Unmanned Aerial Vehicle Expo 2016

### Standardization of the drone industry in China

The rapid growth of the drone industry in China has only been made possible through the support of the Chinese government. They have emphasized this point by identifying the aerospace and aviation equipment industry as a strategically important area together with next-generation information technology, high-end equipment, new materials and biopharmaceuticals in *Made in China 2025* (Report No. 28, 2015, issued by the State Council) issued in May 2015<sup>3</sup> and particularly clarifying its plan to promote the drone industry in the same report. Furthermore, *2016 National Standardization Work Priorities* (Report No. 7, 2016, issued by the Standardization Administration of China)<sup>4</sup> also defines the strategic promotion of standardization in the aerospace and aviation equipment industry as one of the practical means as part of the “strategic action for standardization.” In reaction to such measures taken by the Chinese government, industrial standardization and the development of management sectors and legal matters are being carried out in an accelerated manner.

For example, the Civil Aviation Administration of China issued regulations related to drone operation licenses by 2013, and these were further revised in 2016.<sup>5</sup> It was made obligatory to obtain a license to operate drones that weigh 7 kg or above. Drone licenses are categorized into three types: unmanned multicopters, unmanned helicopters, and unmanned fixed-wing aircraft. There are three types of exams for becoming a pilot, a pilot in command, or a trainer, for each category.

Secondly, rules for small unmanned aircraft (for trial implementation) were issued at the end of last year, in order to secure safety flight of drones.<sup>6</sup> Compared to those of other countries, these rules are characteristic in that it permits a relatively broad flight area, making it possible for drones to fly out of visible areas or in dense residential areas (Fig.3), subject to obligatory reports through cloud data and operation licenses. However, these rules don't oblige an airworthiness certificate<sup>7</sup> or flight insurance. Therefore, the next challenge would be how to secure safety.

**Fig. 3: Restrictions in the use of drones in various countries**

	China	Japan	U.S.	France
<b>Supervising body</b>	Civil Aviation Administration of China	Ministry of Land, Infrastructure, Transport and Tourism	Federal Aviation Administration	Ministry of Ecology, Sustainable Development and Energy
<b>Year in which rules were issued</b>	December 29, 2015 and after	Revised on December 10, 2015	(From 2016)	In 2012

<sup>3</sup> 国务院 『中国制造 2025』 (国发[2015]28 号)

<sup>4</sup> 国家标准委员会 『2016 年全国标准化工作要点』 ([2016] 7 号)

<sup>5</sup> 中国民用航空局飞行标准司 『民用无人机驾驶员管理暂行规定』

<sup>6</sup> 中国民用航空局飞行标准司 『轻小无人机运行规定 (试行)』

<sup>7</sup> A certificate to prove that the aircraft achieves the safety standard (as issued by a supervising body) in terms of its structure, strength, and flight functions

<b>Weight</b>	Aircraft weight of 116 kg or below and take-off weight of 150 kg or below	2 kg or above	25 kg or below	2 kg or below / 2–25 kg / 25–150 kg / 150 kg or above
<b>Pilot license</b>	Necessary	Not necessary	Necessary (over 17 years old)	Necessary
<b>Airworthiness certificate</b>	Not necessary	Not necessary	Not necessary	Not necessary for aircrafts of 25 kg or below
<b>Operation permit</b>	Not necessary	Not necessary	Necessary	Necessary
<b>Highest altitude</b>	150 m	150 m	150 m	150 m
<b>Prohibited areas</b>	Airspace above political, military, economic zones, and air-related areas	Airspace that may affect the safety of the flight of aircrafts, such as areas near airports	Areas around airports and around Washington D.C.	Areas around airports and specially protected areas
<b>Flight in dense residential areas or places of high population</b>	Flight is permitted only if the aircraft has a cloud-based reporting system and is possible to transmit data at least for 30 seconds each time	Not permitted	Not permitted, in general	Flight is permitted if the weight of the aircraft is 4 kg or below and if safety equipment such as a parachute is used
<b>Flight out of visible areas</b>	Permitted (In principle, manned aircraft are prioritized)	Not permitted, in general (Apply when necessary)	Not permitted, in general	Flight is permitted if it is an unmanned area, within 1 km into the horizontal direction and within 50 m into the vertical direction from the pilot
<b>Flight within visible areas</b>	Flight permitted only during the daytime	Flight permitted only during the daytime	Flight permitted only during the daytime	Flight permitted only during the daytime

Source: Compiled by Mizuho Bank based on materials released by the supervisory body of each country

### Three key trends related to the drone industry

Three key trends can be seen for the rapid-growing Chinese drone companies: the Pearl River Delta, strategic partnership, and the introduction of foreign capital.

#### The Pearl River Delta

In the most recent several years, there is a remarkable trend that Chinese drone companies have been gathering in the Pearl River Delta, especially in Shenzhen, Guangdong. As of the end of 2015, there were more than 300 drone companies based in Shenzhen, accounting for approximately 75% of the total number of drone companies nationwide.<sup>8</sup> Given the importance of

<sup>8</sup> 新华网发展论坛 专家呼吁建立民用无人机操作安全标准

Chinese companies in the global drone market, it can be said that Shenzhen is not only the capital of Chinese drone market but also the capital of the global drone market. Shenzhen has become an attractive area for drone companies because there were already companies located there with base technologies. In other words, it was possible to make use of existing resources. In the drone market, it is possible to apply technologies that have been developed mainly for smartphones, such as arithmetic processing and image data processing. From this point of view, Shenzhen has expertise in the manufacturing of electronic parts from the time during which the city was called the “factory of the world.” It is possible to procure a large amount of chips, acceleration sensors, small high-performance sensors (such as the GPS), motors and batteries essential for drones, all for reasonable prices. Furthermore, the area is attractive because it is home to many small and medium-size enterprises with highly advanced technology for control software development or metal cutting. Today, many of the companies related to the smartphone industry have also started manufacturing drone parts, in order to maintain strength in the market. A famous example is a major smartphone company, Xiaomi, which released the Mi Drone. Even though the drone is not manufactured by the company itself, as is the case with other products by Xiaomi, it exemplifies the company’s attitude toward making use of existing procurement networks and development resources.

#### Strategic partnership

Another catalyst for technical innovation is the strategic partnership among various companies beyond national or industrial barriers. For example, DJI, a drone manufacturer in Shenzhen that accounts for over 70% of the global drone market, has been actively establishing business alliances with other companies.<sup>9</sup> Its partner companies can be found in many countries, including Germany, Japan, the U.S., and Europe, with diverse business purposes ranging from system development, the use of service platforms, relay broadcasting to sales and promotion. Similar alliances can be found among companies in other countries and regions. However, as was discussed above, this is a good example in which Chinese companies skillfully used their networks with companies all over the world developed from the years of processing trade, paired with their technical expertise built through experience and their supply chains, which can keep up with rapid technical innovation, all in order to support technical alliances among drone-related companies.

#### Introduction of foreign capital

Apart from technical alliance, capital alliance with foreign companies has also become active in each field of the drone industry. Yuneec Ltd. , based in Shanghai, received investment of USD 60 million from the U.S. Intel.<sup>10</sup> Yuneec seems to be planning to gain high-added value for its products through technical collaboration with Intel. The aforementioned DJI has also

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<sup>9</sup> [Da-Jiang Innovations Science and Technology Co., Ltd. \(DJI\)'s Website](#)

<sup>10</sup> [Intel Invests \\$60 Million in Chinese Drone Maker Yuneec](#)

received investment of USD 75 million from a U.S. venture capital Accel Partners and plans joint product development. Zerotech, a company with expertise in aerial photography using drones, received investment of a total of CNY 150 million from investors led by Qualcomm Ventures, which is the investment section of Qualcomm, a major U.S. communications technology and semiconductor development company. Zerotech and Qualcomm have been cooperating with a Communist Party of China related online news website the People's Daily Online, to promote media broadcasting using drone. With the capital alliance, the companies plan to explore further the potential of using drones in the media industry.<sup>11</sup>

### **Opportunities for Japanese companies**

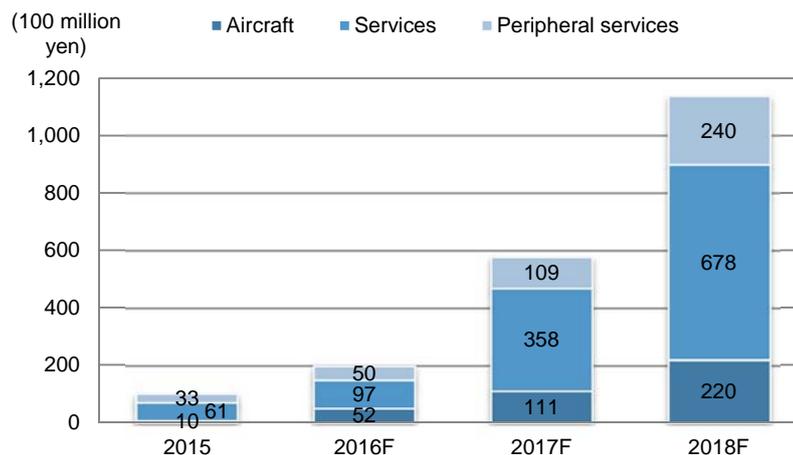
Under such conditions, this section discusses the opportunities for Japanese companies in entering the market.

In Guangdong Province, which is home to many drone companies, many Japanese companies already have manufacturing bases. It is a geographically advantageous location to explore new business ideas. According to statistical data gathered by DRONE II.COM, a media company dedicated to the drone media industry, among the top 20 commercial-use drone companies identified globally in the third quarter of 2016, six were Chinese companies, and all of them focus on the manufacturing of platforms.<sup>12</sup> Therefore, it goes without saying that there is high demand for other parts, such as highly advanced technical products, to be installed in drones. For the Japanese companies that have manufacturing bases in Guangdong Province, an important key toward developing new business would be conceiving ideas that can apply existing business to the rapidly growing drone industry.

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<sup>11</sup> [零度智控完成1.5亿人民币的B轮融资](#)

<sup>12</sup> [TOP20 Drone Company Ranking Q3 2016](#)

**Fig. 4: Expected size of the Japanese drone business market**

Source: Business Survey Report 2016, issued by Impress Research Institute

Furthermore, Chinese companies are mainly focusing on the development and innovation of aircrafts themselves, while two thirds of the Japanese drone market is taken up by drone operating services (Fig. 4).<sup>13</sup> Major examples include services for spraying pesticides or transportation services using drones. It is expected that in 2018, drone services and related areas will account for nearly 80% of the overall drone market. If Chinese hardware can be combined with Japanese software and services, the market will be able to expand further. It is therefore possible for Japanese companies to provide their own expertise and services using various channels such as business or capital alliances in the areas where further growth is expected in China, such as the agricultural or logistics industries. Thus, Japanese companies will be able to establish a win-win relationship that leads to strategic partnerships with Chinese companies.

### **Conclusion**

The support that the Chinese government has given to the drone industry is substantial and strategic, leading to larger business opportunities in the industry. In order to seize on this, local Chinese companies are rapidly considering forming partnerships with overseas companies, while also rapidly internalizing technologies and expertise through M&As. In the drone industry, which is rapidly growing every day, it would be essential for Japanese companies to enter the market in a more strategic and accelerated manner than before.

<sup>13</sup> *Drone Business Survey Report 2016*, issued by Impress Research Institute; the size of the aircraft market refers to the domestic sales of the completed aircraft for business use (fixed wing and rotating wing). This does not include aircraft for military use. The size of the service market refers to the sales of the companies that provide business using drones. However, if drones are used only for part of the service, the sales of the part using drones are estimated. The size of the peripheral service market refers to the total of the sales of consumable goods, such as batteries, maintenance fees, and human resources training, as well as optional insurance.

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