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The Strengths and Weaknesses of Japanese Innovation

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Abstract

Japanese enterprises have drawn public attention worldwide for their competitiveness. Such Japanese companies as Sony, Panasonic, and Toyota often became the benchmark for foreign companies. In recent years, however, the decline of Japanese enterprises is conspicuous. How can we explain this trend? The author has been researching the sources of Japanese competitiveness from the viewpoint of innovation for two decades and found the strengths and weaknesses of Japanese innovation. In short, the former can be observed in the innovation of product and process while the latter can be seen in that of management and society.

Keywords: *Japanese, enterprise, innovation, strength, weakness*

INTRODUCTION

First, let us think about what Japanese innovation is. The phrase "Japanese innovation" consists of two words: one is Japanese, and the other is innovation. The main concept is innovation and the sub-concept is Japanese. So, our discussion begins with the concept of innovation.

According to the author's research, innovation is the changing process that produces results leading an individual or organization to make things better.[1)] This definition brings us the following insights: (1) It is possible that both an individual and an organization make innovation happen. Since an organization is composed of individuals, basically they and their creativity are the source of innovation. But it is in an innovative organization that their creativity will be exerted well enough to make the effect of 1+1>2; (2) The purpose of the innovation is to improve on what exists. In other words, if a change occurs in the opposite direction, it is not innovation; (3) Innovation is not only the result of change, but also its process; and (4) It is possible to evaluate the result of change, but it is difficult to assess its changing process.

Once we understand innovation, it is not difficult to understand the nature of Japanese innovation. It is a type of innovation that entails the characteristics of Japanese culture and so is very "Japanese." To make this concept clearer, the author of this paper made a definition of Japanese innovation. That is, Japanese innovation is the process and results of all efforts made to pursue perfection in the details of product or service. In other words, Japanese innovation is the process and its result(s) of change based on the way of traditional Japanese manufacturing.

The whole world once paid much attention to Japanese innovation. Since 1990, however, the phenomenon has gradually faded during the "Lost 20 years". What are the reasons? This paper will examine them from the perspective of the strengths and weaknesses of Japanese innovation.

THE STRENGTHS OF JAPANESE INNOVATION

According to the definition mentioned above, the pursuit of perfection in details of product or service is the characteristic of Japanese innovation, which is based on the way of Japanese traditional manufacturing. Since Japanese products are popular among Chinese people, there are many fakes of them on the Chinese market. So, how do Chinese consumers judge whether or not a product printed "Made in Japan" is authentic? They check its details. If the details are neatly finished, they decide that the product is definitely made in Japan. Otherwise, it is a fake. Why? It is because the Chinese suppliers that make fake products want to gain maximum profits with a minimal cost. So the suppliers only mimic the appearance of Japanese goods in order to deceive consumers, never paying attention to the details.

Now, why do Japanese companies pursue the perfection of a product in detail? To answer this question, we need to view it from a historical viewpoint.

From the end of the World War II to the end of the 1950s, the image of Japanese products on the US market was "cheap and bad quality." At that time, Japanese companies would be experiencing failure and humiliation. However, under the guidance by quality control experts from the US, including Dr. William E. Deming (1900~1993), Japanese companies keenly realized the importance of quality, and started to learn the basics of manufacturing in earnest. Since then, the quality of Japanese products has improved rapidly. In the 1970s, it was sometimes as good as that of American products. Occasionally it was even better. So, why were Japanese companies able to achieve this?

There are three factors that contributed to their achievement. First, the Japanese were then eager to wipe from their mind humiliation inflicted on them by the war defeat. Defeat brought unprecedented humiliation to the Japanese. Getting rid of the complex as the defeated nation as soon as possible was the desire of the Japanese government and people. Therefore, Japanese managers who wanted to learn advanced techniques were more serious than American counterparts. You will understand it if you note the fact that the "Deming Prize," one of the most prestigious awards in business in Japan, was named after Dr. Deming, but little was known about it in the United States.[2)]

Secondly, the sense of crisis among Japanese people due to the lack of natural resources played a large role. Historically, they have been faced with the harsh reality of the lack of natural resources. As a result, they perceive the crisis of survival more seriously than other countries. This has led to Japanese tradition of taking care of things and not wasting them. Such a tradition emerges when the Japanese people create something.

Finally, Japan had to produce and export quality products for earning foreign currency. Owing to the lack of natural resources, Japan has to import almost all materials from abroad. It is necessary, however, for Japan to have foreign currency in order to import them. After all, for the purpose of obtaining foreign currency, the Japanese have had to create good products with high quality.

In this way, the pursuit of quality was not just a problem that belonged to a company or an industry; it was related to the matter of life and death of the whole Japanese society. So it is safe to say that the quick improvement in the quality of Japanese products resulted from the efforts by all Japanese people.

Now, why is Japanese innovation that is based on traditional Japanese manufacturing able to pursue and achieve perfection with regard to details? The key is the characteristics of Japanese employees working for companies. Their loyalty to their organizations is strong. They love their companies. They regard them as the place at which to work until they retire. Moreover, many employees would like to be mutually beneficial with their companies. Working hard, they are as it were unnamed heroes. They put their wisdom to work in order to improve the quality of products, getting pleasure and purpose for life in the working environment.

As there are many employees like this including workers in the field, middle, and top managers in Japanese companies, they succeed in developing a good environment for organizational knowledge creation. Japanese innovation is synonymous with the organizational knowledge creation.

Because of the homogeneous level of capability

among Japanese employees, the quality of the Japanese labor force is better than those of other countries. In business activities where companies succeeded in utilizing their employees' wisdom, they obtained excellent results. For example, quality control (QC), which was introduced from the United States, evolved to TQC and TQM after incorporating the employees' wisdom (e.g., suggestion system and small-group activities). Consequently, Japanese products with high quality expanded their share in the world.

These high-quality products have been used by consumers throughout the world for a long time. For example, there are consumer electronics products (color TVs, VTRs, etc.), vehicles (motorcycles, cars, etc.), machine tools (NC, etc.), construction machinery (shield tunneling machines, shovels, etc.), and so on. There are many more countless high-quality Japanese products. Product innovation is a strong suit of Japanese companies.

Studying the structure of innovation, the author classified innovation into four categories based on its social impact and difficulty of change. These are product innovation, process innovation, business innovation, and social innovation. The strengths of Japanese innovation lie in product innovation and process innovation, because it is based on manufacturing.

Product innovation occurs in terms of product or service. If a producer makes a change to improve its product, it is product innovation. Also, when a company providing a service introduces a change for the purpose of improving the quality of its service, it is product innovation. As for process innovation, it is mainly related to a change in manufacturing process and production methods. It is the change that happens anywhere in the process of making a product or providing service in an improved way.

The following examples illustrate the strengths of Japanese innovation.

(1) TV

Hayakawa Electric (the predecessor of Sharp) first sold a black-and-white television set in Japan in January 1953.[3] During the subsequent period of 60 years, Japanese consumer electronics manufacturers have carried out innovation continually. As a result, television sets have transformed many times. The method of broadcasting has changed from black-and-white to color and from analog to digital. In term of the hardware, the size of a TV screen was first only 14 inches; nowadays you can see a TV set with a 65-inch screen at a store. In terms of the technical side, TV evolved from a three electric gun cathode ray tube to Trinitron color, high-definition, LCD, plasma, and to 4K. While the TV's functions (recording, compilation, 3D, portable, etc.) and screen pixels are increasing, its volume, weight, and components are reducing with the price per inch falling. TV is moving more and more towards perfection.

(2) Car navigation system

Car navigation system was originally invented on the basis of the principles of GPS (Global Positioning System) in the United States. Due to its high cost, it was only used for military purposes. But a Japanese company purchased the system. It improved it again and again. Finally, it dramatically lowered the system's manufacturing cost and successfully commercialized it. Pioneer began to sell the GPS car navigation system as the first commercially available model in the world.[4] Currently, many car manufacturers and electrical equipment makers are producing the car navigation system. The ones sold on the market are very precise. The functions include not only search function, but also the displaying of distance and direction. The course guidance by synthetic voice was added, so a driver can go to the destination without getting lost on the road. Also, it has been developed into motorcycle navigation, personal navigation (PND), and a navigational function on a smart phone.

(3) Warm water washing toilet seat

What surprises foreigners who visited Japan for the first time, especially at an airport or in a hotel room, is the warm washing toilet seat. This device was invented by an American, but it is a Japanese company that has achieved the commercialization of the equipment. Since the company achieved the domestic production of it in 1967,[5] with the functions on the seat increasing and its price decreasing, the rate of the use of the warm water washing toilet seat has grown year by year. According to the consump-

tion survey conducted by the Cabinet Office, Government of Japan, in March 2013, 74% of Japanese household utilizes the warm washing toilet seat.[6] This product has good effects not only on hygiene, but also on disease prevention and promotion of health. It is likely, therefore, that the worldwide sales of the machine will take place in the future.

(4) Housing

Because of its small land, Japan people are unable to build a house on a wide site as do Europeans and Americans. All the more for it, they need to make effective use of their land and space, which has led to unique Japanese housing. A Japanese house may be small but is carefully designed to maximize the availability of the total floor area. Though the house is small, its residents would not feel pressured. Moreover, such a house is equipped with very useful devices and machines, which let the residents enjoy the full convenience of life. For instance, a kitchen system, floor heating, bathroom, and a warm water toilet seat are common. In addition, more and more houses are getting solar power and emergency power generation systems. Not only the wealthy people, but also the average salaried workers can own such a house. This fact speaks to the wonder of the Japanese society.

The cases mentioned above are all typical examples of Japanese manufacturing. What they have in common is that the manufacturers seek perfection in details.

Also, Japanese enterprises are strong in process innovation.

In 1973, Seven-Eleven Japan introduced the new business category of convenience store from the United States. Since then, for four decades, the company has continued improvement based on the concept of how to enhance the service for the residents in a community. For example, they introduced the POS system. Their stores also started agency payment service, installed more ticket stations, began to handle courier service, and placed ATMs and digital multifunction copy machines. The enterprise has grown enough to acquire its parent company in America in 2005.[7] The primary characteristic of a convenience store is its convenience. Rather than just selling goods, always taking convenience into account, Seven-Eleven has been transforming the process of providing service. It is a good example of Japanese process innovation in the field of service.

Cell Production System (CPS), which has been increasingly introduced in the consumer electronics industry and the precision equipment industry, is another example of process innovation. CPS is based on the Toyota Production System and was devised by Hitoshi Yamada. The system has the following good points: (1) the elimination of work in progress in the manufacturing process; (2) the quick response to the high-mix, low-volume production; (3) the improvement of efficiency by the development of multi-skilled workers; (4) the uplift of employees' motivation born of attachment to a product; and so on. Once "Toyota Production System" drew attention from the world and was appreciated as "Lean Manufacturing" by scholars in the United States. It is true, however, that "Toyota Production System" worked only in the automobile industry, not in other ones. On the other hand, developed on the deep understanding of "Toyota Production System," CPS is aimed at de-belt conveyor. This characteristic of CPS has helped it create a great track record in the electronics companies such as Sony, Canon, NEC and so on. In the future, CPS will be noted in the world as a good example of Japanese process innovation.

THE WEAKNESSES OF JAPANESE INNOVATION

Business innovation brings about a change in manufacturing or service itself. Simply put, it is the transformation of a business model. It is difficult to say that business innovation is the strength of Japanese enterprises. It is occasionally observed that a Japanese product born as a result of product innovation and process innovation ended up losing its competitive advantage due to the weakness of Japan's business innovation, even if the product was superior to ones made in other countries.

In the example of mobile phones, as a result of performing the product innovation, many Japanese manufacturers were offering mobile phones more quickly than any other foreign manufacturer. However, when the Japanese consumers were proud to have the world's number one product, foreign

consumers shunned Japanese mobile phones all together. Why? Because foreign consumers knew the fact that Japanese mobile phones did not work outside Japan, and they learned it earlier than Japanese consumers did.

On the other hand, although Apple, Samsung and Nokia started later than Japanese enterprises, they redesigned their business models from the beginning in a global perspective, and quickly conquered the mobile phone market in the world.

Among them, Apple stands out. Apple's manufacturing technology is not necessarily superior to those of Japanese enterprises. In fact, not only Apple but also the US manufacturing industry as a whole lost to Japan in the competition in the 1980s, except for minor industries such as in aerospace and advanced medical equipment. As Apple knows the fact well, it takes advantage of OEM (Original Equipment Manufacturing) or EMS (Electronics Manufacturing Services) in Taiwan or China for almost all of its production. Meanwhile, it immerses itself in the business model innovation. Consequently, Apple's novel products such as iPod, iPhone, and iPad came out one after another. Apple has protected its position as a winner for many years.

The same trend can be seen in the field of solar cells. Traditionally, Japanese manufacturers like Sharp, Kyosera, Sanyo Electric were leading the world, while now the new leaders are Chinese and German enterprises.[8)] In terms of personal consumption, only Toyota still holds on to the top share on the global automobile market.[9)] Compared to Japanese enterprises' prime during the 1980s, their competiveness weakened incredibly. Sony's Walkman is a good example.

Since the first version (cassette tape type) with a single function was sold in July 1979, many models came onto the market, such as the playing and recording Walkman, the radio Walkman, the CD Walkman, the MD Walkman, the Memory Stick Walkman, and so on. Sound quality improved again and again. Operating the device became easier. Its design became beautiful. The whole product became compact. As a good portable audio machine, the Walkman was used by its fans around the world, ushering Sony into its golden days. While Sony was continuing innovation of the Walkman, however, it was digging the grave of this product unconsciously. In those days, Apple started selling the iMode with a novel concept of downloading favorite songs at any time through the Internet. Compared to iMode, the Walkman was an outdated product and soon disappeared from the market. In this case, Sony's continuing innovation created what Clayton Christensen, professor of Harvard Business School, called the "Innovator's Dilemma."[10)] Sony developed a network Walkman and tried in vain to turn around a bad situation, but was unable to stop Apple's momentum. In October 2010, Sony announced that it would stop the production of the traditional type of Walkman, 220 million units of which it had sold worldwide.[11)]

The last is social innovation, which is a change that influences society and is the highest stage of innovation. Peter F. Drucker considered that Japan's social innovation was taking place from the period when Japan opened itself to foreign countries toward the end of the Edo era to the period when it ascended to one of the economic powers. He emphasized that, "For Japan, social innovation is more important than telegram and steam locomotive. In addition, the social innovation including the development of schools and universities, bureaucratic institutions, banks and social relationship between employees and employer was much difficult than the innovation of the telegraph and the steam locomotive."[12)]

Since the Meiji Restoration, however, social innovation did not have any noticeable effect in Japan. In particular, during the "Lost 20 years," Japanese politics changed in kaleidoscope (for example, the collapse of the 1955 system, the proliferation of new political parties, frequent resignations of ministers, the regime change, etc.). Social innovation did not take place easily, however. In Western countries, a new administration certainly tries to enact new policies, which are clearly different from its former regime and calls for its people to cooperate. As a result, some years later, the effect of the social innovation appears in the society. But in the case of Japan, politicians do what they want to do while saying, "This is for the people," but Japanese people themselves are well aware that nothing will change even after some years. So, more and more Japanese are becoming indifferent to politics.

ANALYSIS OF THE REASONS

Now the question is why Japanese enterprises are strong in product innovation and process innovation while they are weak in business innovation and social innovation? The author thinks that there are two reasons. The first is that Japanese enterprises tend to stick to the innovation of existing products and processes. The other is that the Japanese society lacks strong leadership.

As a result of continuous product and process innovation, the same product or service evolves in the same direction, that is, in the extension of the past success. Thus, the product becomes more multi-functional, compact and durable, and the service becomes more elaborate and sophisticated, but all of this leads to no breakthroughs and represents linear thinking.

The necessary condition for breakthrough is non-continuous innovation or dis- continuing innovation. In other words, breakthroughs need disruptive innovation, which involves self-denial. After some innovation has occurred, an individual or an organization has to change the way of thinking and go forward in another direction. It is not an exaggeration to say that the linear innovation may be committing suicide. Sony's Walkman is just a good sample. Needless to say, it is easier said than done. The implementation of the disruptive type of innovation requires a sharp foresight in management and great courage from a top manager.

The other reason is a lack of leadership. Not only business innovation, but also social innovation needs a leader who has strong abilities for thinking and acting. The human resource development in Japan, whether it happens at universities, enterprises or government agencies, has been about mass-producing people of homogeneity. It is not suitable for nurturing individuals with distinguished qualities. For large Japanese companies, where salaried managers tend to get behind the wheel, it is a big problem how to develop human resources with strong leadership abilities. In Japan, people are hoping for some distinguished business leader like Steve Jobs and a brilliant politician like Ronald W. Reagan.

PRACTICAL EXAMPLES OF THE USE OF THE STRENGTHS AND WEAKNESSES

Even for a major company, it is almost impossible to have the advantages of innovation in all fields because there is a limit to their management resources. In these days, among Japanese enterprises that are well conscious of their strengths and weaknesses, there are some that took advantage of their strengths and connected themselves with advantages of Chinese enterprises' innovation and as a result successfully expanded their business. Here are two good examples of such enterprises.

Case one: Daikin

The predecessor of Daikin was Osaka Metal Industry, which was established in 1924. Daikin is a nearly 90-year-old, long-established company of metal processing, fluorine chemistry and the refrigerator.

Daikin started their business in China in 1995. Compared to other Japanese air conditioning manufacturers, it was a latecomer. Moreover, rival leading manufacturers were more competitive not only in products, but also in the brand recognition. So, business in China was very tough for Daikin. Therefore, rather than selling room air-conditioning units whose market was large but whose prices were low, Daikin decided to sell the ceiling-embedded type of air-conditioning system as its main product and began joint production. Some people in the company were concerned that expensive air-conditioning systems for business like the one Daikin was about to sell in China might not appeal much, especially when the fierce price competition of room air-conditioning units was occurring. However, the company not only attained the top share on the Chinese commercial air-conditioning market, but also secured the highest profit margin in the overseas market.

Once rivals learned the profit margin from selling commercial air-conditioning systems was higher, they entered into the market. The competition soon became so harsh that Daikin made a next step, which was another joint production with a Chinese maker. This time the product that it was about to sell was the inverter air conditioner. The machine was the result of Daikin's product innova-

tion. The inverter is the technology that controls the compressor and the room temperature precisely. An air conditioner to which this technology was applied could save electricity by 30% compared to the non-inverter type.

GREE, a Chinese air conditioner maker, was founded in 1991 and became the number one maker in the field in China in only ten years. It was researching and developing an inverter system, but was not close to commercialization. Because it hit on the technological wall, it offered a joint venture to Daikin in 2008. Its technology did not bring any advantage for Daikin, but it had a strong sales network in China and the capability for low-cost mass production.

Daikin knew the difficulty of developing its share on the Chinese market alone (this was Daikin's weakness in marketing innovation), and so chose the path to combine their own advantage of product innovation and GREE's strengths in other fields. Although the voice against this idea was strong in Daikin due to the possible leakage of technology, the then president Noriyuki Inoue (the enterprise's current chairman) gave the go-ahead. Since the joint venture made use of the strengths of both companies, it grew steadily, and finally provided a successful example in the development of Daikin's global business. In 2011, Daikin became the number one air conditioner maker in the world by passing the US-based air-conditioning company Carrier.[13] Up to March 2013, Daikin expanded to 33 countries and regions overseas, with 112 sales companies, offices and factories worldwide. Its consolidated sales reached 1.2909 trillion yen in the same year.[14]

Meanwhile, GREE established nice factories overseas. They manufactured 60 million room air-conditioning units and 5.5 million units of business-type air-conditioner in 2012, becoming the number one air conditioner maker in the world with the sales revenue of 100.1 billion yuan (about 1.6516 trillion yen, translated at the rate of 1 yuan 16.5 yen).[15]

Case Two: Komatsu

Komatsu is a construction equipment manufacturer, which was established in 1921. On the Japanese market of hydraulic shovels it has remained number one for many years. Komatsu is good at product innovation too. In particular, their new products such as KOMTRAX (Komatsu Tracking System), hybrid of energy conservation, unmanned die-flops track were developed one after another. It is known for its technological capability in the world.

Komatsu's business in China can be divided into three stages. The first stage (1956-1978) was when it was mainly exporting its products into China. Its business took the form of mostly indirect export via trading companies. The second (1979-1994) stage was technical partnership, which means that Komatsu got technical guidance fees from Chinese enterprises by teaching them its technology. At the third stage Komatsu entered into the Chinese market by direct investment. It built two factories in China. Komatsu made good products, but its inventory would just pile up, since it did not have the sales channels. For foreign companies, whether or not to build an effective sales network in China is key to business success. At first, Komatsu tried to build a sales network by itself, but gave up shortly after, because the country was too large.

So, Komatsu changed its policy and decided to leave the sales to Chinese partners. That is, it left the sales to local companies and never touched it again. The one criterion used when it chose a person as partner was how motivated the person was. If someone was motivated enough, Komatsu would solve all other problems for them. For example, employees who worked for state-owned enterprises had high motivation and a good knowledge on the local conditions, but they lacked both sales experience and finances. So, Komatsu built dealer shops for them to run with its own resources, and taught them the know-how to sell. Based on the information that these people provided, Komatsu was able to understand the market needs and make quick production adjustments in China.

In addition, in order to collect the accounts receivable, Komatsu took advantage of ICT and sold products that were equipped with KOMTRAX. This apparatus not only had a GPS function, but also automatically sent the data gathered from engine and pump controllers of each product to the data center of Komatsu. Based on such data, Komatsu could replenish fuels and make a replacement of the parts just when needed. If the owner of

the shovel, who purchased it with loan, did not pay the accounts payable as contract, Komatsu could use the apparatus to lock the engine of the machine. Thus, Komatsu could collect the accounts receivable 100 percent.

In this way, Komatsu took advantage of its strengths of product innovation, compensated for its weakness of sales with Chinese partners' strengths, expanded steadily its share in the Chinese market, and kept the top share until 2011. Just as Masahiro Sakane, chairman of Komatsu, said, "Corporate management need not only build on the strengths, but also work on the weakness."[16] As of March 31, 2013, Komatsu's sales revenue was 119 billion yen and accounted for 7.15 percent of total sales.[17]

CONCLUSION

Innovation is the source of corporate competitiveness; at the same time, it is also a challenge for a company forever. Every company, regardless of its size, must have the strength of innovation in some areas. However, since today's competition in business is more fierce and uncertain than during the 20th century, it is not uncommon for even an excellent company to suddenly fall into financial crisis. In terms of the Japanese enterprises, Sharp is a typical example. The company is known as an innovator in the world and has sold a lot of original products both in Japan (the mechanical pencil, the black-and-white TV, the microwave, the solar cell, the word processor, etc.) and in the world (the electronic calculator with all transistor diode, the IC calculator, the new semiconductor GND, etc.). In particular, the research of liquid crystal, which started in the end of the 1960s, turned out to be a great success of LCD TV in the 1990s. Sharp once conquered a half of the world LCD TV market during the beginning of the 2010s.[18] People even associated the word "LCD TV" with the name "Sharp." However, Sharp, which has been highly praised in the media both in Japan and abroad, fell suddenly into the deficit of 376 billion yen in the fiscal year 2011.[19] How can it be explained? Sharp was too concerned with the strengths of innovation and neglected the weakness of innovation. In other words, Sharp was focusing too much on product innovation with little attention paid to business innovation. Fortunately, Sharp reversed its policy and decided in June 2013 to provide the IGZO which is a new LCD display technology for Nanjing Panda which is its joint venture partner in China.[20] This can be expected as a good example of overcoming the weakness of innovation with the strength of innovation.

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