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To Patent or Not to Patent: Case of the Chinese Industry

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Abstract

Objectives: This study, on the subject of China's electrical and electronic industries which are making much investment in R&D, aims to grasp why they patent or don't patent the output of R&D. **Methods/Statistical Analysis**: This study drew "to patent" and "not to patent" factors through specialist Delphi with factors drawn from foregoing studies. With them it proceeded with direct or online survey on the subject of electrical and electronic industries in China. Finally, importance was calculated by finding means and standard deviations from collected factors. **Findings**: This study aims to look at the purposes of applying or not applying for patent presented by foregoing studies and conduct empirical analysis on Chinese enterprises. It was the order of performance index, preventing patent infringement suit, license profit, preventing imitation and blocking competitor's activity in the order. It was in the order of maintaining secrecy, patent maintenance cost, making corporate information public, patent application cost, easy invention and difficulty in proving a new invention. Difference between this study and foregoing studies lies in that this study made study on the subject of China's electric and electronic industry but foregoing studies made survey on Korean enterprises. A small number of samples for metrics seem to have caused such difference. **Improvements/Applications**: This study's suggestion is that it can be used by Chinese enterprises at the time of setting up strategic intellectual property rights from R&D stage; Practitioners could use this study for guideline in establishing each company's intellectual property right strategy.

Keywords: China Industry, IPR, Not to Patent, Patent, To Patent

1. Introduction

Technological convergence and fast progress are gradually increasing the importance of patents. Especially, unlike the past, as products have become complex and varied, it is the time when only one patent cannot produce finished products¹.

Generally, researchers want to have their research output protected. However, protection takes diverse efforts. One of them is patent right with secured 20 years of legal protection, a continued protection without making open as business secret².

Recently, however, as industrial spies are active, it is relatively hard to protect all research outputs because cases of copying another's idea ingeniously are gradually increasing. Of course, behavior of stealing another's idea has existed from the past³. For example, though light bulb is widely known as Edison's invention, there was a precursor. Joseph Wilson Swan, a British physicist, was the one who invented light bulb in 1860 and possessed the patent right in the UK. He also applied for another patent right in 1878 and in 1879 engaged in installing light bulbs visiting family homes around the country. However, Edison made amends for Swan's light bulb while copying and applied for and obtained patent in the US for his light bulb.

Besides, it is known fact that Bell invented telephone but actually it was Antonio Meucci who invented it in 1854, but being poor he had no choice but to obtain temporary patent. He ended by failing to register patent with his name and though filing a lawsuit against Bell, he lost and Bell officially registered patent for telephone.

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Apple copied GUI (Graphical User Interface) developed by Xerox and applied it to iOS, while after using Creative's "class user interface" technology without permission for iPod, Apple got a lawsuit and came to an agreement for \$100 million.

In 2011, Apple first proceeded with patent lawsuit against Samsung, which countered a lawsuit against Apple. Currently, as the US Supreme Court accepted Samsung proposal for final appeal, the lawsuit took a fresh twist. It is in about 120 years that US Supreme Court permitted final appeal on design patent. The hearing of final appeal is expected to open during the session of 2016-2017⁴.

Patent dispute take a long time and the result is unpredictable. Kodak and Polaroid engaged in patent lawsuits for 14 years. Though in the past, it was mostly technology-focused patent dispute, recently patent battles over design image are occurring in large numbers.

Carnegie, also called steel magnate, visited Henry Bessemer steel mill in the UK in 1872. Where he realized amazing potential of steel produced in a unique manner. Accordingly, he secured a monopoly on steel in the US, through which he realized the mass manufacture and circulation of steel. Carnegie established Edgar Thomson Steel, Inc, the first steelworks in the US, in 1875 and this daring investment soon led to a big success. Carnegie is a case where he made it big by securing monopoly on the right with an appreciative eye for the future although he never engaged in R&D⁵.

Once China was called the factory of the world but now industries are generally making fast growth. Still so far, it is on the level of copying advanced products. For case of Xiaomi, its notebook computer launched in July 2016 gives an impression of openly copying the product of Apple. It can be possible to sell in China but seems hard to aim at global market in the future with the current strategy.

Recently, Huawei is proceeding with a patent lawsuit against Samsung, which seems to be a strategy to secure a bridgehead for finding global market. The company recognized the importance of patent since earlier and has kept applying for patent; without patent, it secures patent through strategic M&A.

Like this, protecting the output of R&D is important for an enterprise. However, there are cases of applying for patent and not. So this study aims to look at the purposes of applying or not applying for patent presented by foregoing studies and conduct empirical analysis on Chinese enterprises.

Research on the purpose of applying for patent is partially going on⁶. In² divided the purpose of applying as importing license, preventing patent infringement lawsuit, preventing imitation, obstructing activity of competitors, performance index, use for negotiation, and increasing the company's name recognition². In⁸ made divisions into excluding competitor's launch into market, licensing, raising venture capital, honor and showing off the excellence of products⁸. In² made divisions into excluding Licensing Revenue, Prevent Suits, Prevent Copying, Blocking and Use in Negotiation.

In¹ surveyed on the subject of Korean industries and divided the purpose into preventing patent infringement lawsuits, interrupting competitor's activity, preventing imitation, importing license and performance index¹.

1.1 To Patent

Corporate purpose of applying for patent includes licensing revenue, prevent patent infringement suits, prevent copying or protect own technology from imitation, blocking or prevent competitors' patenting and application activities and measure performance.

Besides, there is patent application to use for negotiation, to increase the company's name recognition, to receive policy funds from the government or to participate in the government's public undertaking. Patent application also includes the purpose of seeking for improving technological image and then for enhancing the image of a leading enterprise in the market for consumers¹⁰.

Like this, there are many reasons why an enterprise applies for patent. As recently, convergence has allowed patent to perform the role as critical strategic weapon, its importance can hardly be overestimated.

1.2 Not to Patent

Corporate reason for not applying R&D output for patent is first because it is hard to prove the invention to be new (newness), second is an easy invention (progressivity). Third is the cost for applying for and maintaining patent. Fourth is the obligatory announcement of the company's content.

Besides the abovementioned, a company may get protection of their R&D output in secret without opening it to others. Coca Cola, which protects their output in business secret without obtaining patent, has dominated the global market up to now 1-3. This example shows that there

are diverse methods to secure profit without necessarily obtaining patent.

2. Research Model and Design

2.1 Research Model

This study sorted the purposes of yes and no patent application presented by the result of foregoing studies, which was made to finally draw question items by surveying patent-related specialists (professor, patent valuator, R&D practitioner, etc.).

2.2 Data Collection and Analysis Method

For data collection and analysis method, survey was conducted on the subject of China's enterprises with factors presented by forgoing studies.

Survey was conducted on a total of 50 persons including R&D person and patent practitioner from Oct 1 through 30 by visiting specialists in related fields. Specialists participating in the survey were composed of those possessed of theoretical and practical experiences. For questionnaire responses, 5-point Liker scale was used from five points meaning "Agree very much" to 1 point meaning "Don't agree at all." Besides, analysis was made using means to measure the importance of each factor.

2.3 Characteristics of Sample

The sample characteristics are: The subjects for survey are 17 electrical and electronic enterprises. Companies for survey included Two H Companies known globally not just in China shown in Table 1.

Corporate history included less than 10 years (29.4%), 10-30 years (47.1%) and over 30 years (23.5%). Career showed 1 to 5 years (58.8%), 5 to 10 years (35.3%) and over 10 years (5.9%). Besides, large companies accounted for 76.5% and smaller ones 23.5%. Sales mean for 2014 was around 50 billion Yuan and the mean of R&D portion against sales was 30.8%.

3. Result of this Study

3.1 To Patent

Ratings of selected factor is as follows: Performance index was found to be placed first, One of the reasons why an

enterprise registers R&D output for patent is because it is used inside and outside of an enterprise as performance index shown in Table 2.

Table 1. Characteristics of the sample

		Frequency	Percent (%)
Career	Career 1-5 years		58.8
	5-10 years	6	35.3
	Over 10 years	1	5.9
Firm Age	Firm Age 10 years		29.4
	10-30 years	8	47.1
	Over 30 years	4	23.5
business scale	large company	13	76.5
	small company	4	23.5

One reason why Chinese enterprises put much expense in R&D and register R&D output for patent is that it is used for performance index by their own and outside institutions.

Besides, foregoing studies maintained that activity on patent has positive effect on corporate performance while on the part of enterprise it is usual to use patent as performance index for R&D expenses put in. So it is likely a deduction of result of work.

The second place is preventing patent infringement suit. Patent suit recently represented by patent dispute between Samsung and Apple is drawing attention of the world. Unlike the past, enterprises find it hard to respond to product production and patent suit with only several patents like design patent, in addition to patent obtained with technology. In China, there are still considerably few patent suits due to the lack of perception about patent and original patent (Currently, there are considerably low winning cases for foreign enterprises because of China's cause for protecting domestic industries) but they have to go through patent suits for building into a global enterprise.

Profit from license took the 3rd place. License means the profit received by permitting specific user of my own patent to use it. For Qualcomm, 40% of the whole sales are license profit. Qualcomm is likely to earn a considerable profit as it signed a patent agreement with Huawei, ZTE, TCL and even Xiaomi.

The 4th place is preventing imitation. Even if launching products through R&D, if a competitor copies our company's product without permission and puts out similar products on the market, it results in much damage in

Table 2. To patent

	Licensing	Prevent Patent	Prevent	Blocking	Measure
	Revenue	Infringement Suits	Copying		Performance
A	2	3	2	1	5
В	4	4	4	4	4
С	4	4	4	4	4
D	5	3	5	4	4
Е	4	4	4	5	5
F	5	5	5	4	5
G	4	4	3	4	4
Н	1	3	3	2	3
I	2	3	2	1	5
J	5	5	4	4	5
K	2	3	2	1	5
L	43	3	4	4	4
M	5	5	5	5	5
N	5	4	4	5	4
О	4	4	5	4	3
P	4	5	3	4	4
Q	5	3	2	3	1
Average	3.82	3.82	3.59	3.47	4.12
VAR	1.65	0.65	1.26	1.89	1.11
STDEV	1.29	0.81	1.12	1.37	1.05
Ranks	3	2	4	5	1

profits as well as loss of the company image. In the past, 14 years of patent disputes with Polaroid, Kodak came to suffer great losses. On the part of Polaroid, it may well have been a choice to keep their just rights. So Chinese enterprises are making many efforts to block infringement on their company's patent originally through patent application. As latecomers have to copy the forerunner's products even in China, the latter seems to make such a choice.

The 5th place is blocking competitors' activity. Being similar to preventing imitation, this is to apply for patent in order to block competitors originally from advancing to the related industry we belong to ¹¹. Not apply for one patent, it is patent for related improvements, or to block advance into related industries by composing a patent pool. Good example is copier patent pool. Radial Chart is shown at to patent shown in Figure 1.

3.2 Not to Patent

The 1st place is to keep secret. It was found that protecting by keeping secret is a more important factor than applying and opening R&D output for patent shown in Table 3.

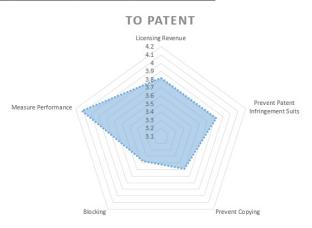


Figure 1. To Patent Radii.

Patent application is subject to legal protection but instead one must make one's technology public in principle. It is the strength of patent system for industrial development but on the part of enterprise, they cannot help being careful because a little detour of our patent and registration of a similar patent may cause a pure damage to us.

Table 3. Not to patent

	Demonstrating of	Disclosure	Application	Ease of Inventing	Patent	Trade
	Novelty an Invention		Cost	Around	Maintenance Cost	Secret
A	5	5	5	4	4	3
В	4	4	4	4	4	4
С	3	4	2	3	4	5
D	2	2	2	2	2	2
Е	2	3	2	4	3	5
F	1	1	1	2	2	5
G	4	3	3	3	3	4
Н	1	2	3	1	3	2
I	4	2	5	4	4	3
J	4	4	5	4	4	5
K	4	6	5	4	4	3
L	3	4	3	3	4	4
M	5	5	5	5	5	5
N	4	5	4	4	5	4
О	3	4	2	2	3	5
P	4	3	4	4	5	4
Q	2	2	3	4	3	2
Average	3.24	3.47	3.41	3.35	3.65	3.82
VAR	1.57	1.89	1.76	1.12	0.87	1.28
STDEV	1.25	1.37	1.33	1.06	0.93	1.13
Ranks	6	3	4	5	2	1

It is the same result as in that keeping secrecy appeared to rank first¹. Coca Cola mentioned by many studies has taken the monopoly of domination in the market even so far by protecting the recipe of cola as business secret rather than a patent.

The second place is the cost for maintaining patent (annual charge)

Generally, the cost of annual charge to maintain patent in China is not reasonable. For the initial patent registration, one must pay even the second year's annual charge and from the third year he must pay fixed amount of money yearly. In case of maintaining patent for 20 years, one must pay a total of 81,400 Yuan. It doesn't't matter if patent is one or two items, but having lots of patent will naturally be a burden for an enterprise.

Public announcement of corporate information appeared to be the third place. China has operated corporate information public announcement system since October 2014. It is the system of publishing corporate information to help the general public and investors make investment decision by grasping the enterprise accurately.

It was found that enterprises are possessed of R&D output rather than patent application because making their information public can have their technology or strategy exposed to competitors.

The fourth place is the fee for patent application. Cost for patent application in China is known as 27,000 to 30,000 Yuan. Besides, if one has the ticket of refusal at registration time, the expense must increase because of having to prepare the answer to it. Generally, for a smaller company rather than a large one, the expense taken for patent application can be a big trouble.

The 5th place is an easy invention. It refers to a patent no better than that possessed by the company so far, competitor or a leading enterprise in the market. Of the three requirements for acknowledging patent – newness, progressivity and industrial availability – easy invention can be confirmed in progressivity. It is because the relevant technology for patent application has no progressivity, it is hard to register for patent.

The 6th place turned out to be difficult in proving a new invention, which corresponds to newness of patent

requirements. Though enterprises consider foregoing technology, competitor's technology, etc. at the time for R&D, there can be development in a similar period of time, existence of foregoing technology or patent failed to check, or development of not considering the life cycle of technology. Such result must have appeared because if there is no newer part than the existing patent, it will not be registered for patent. Radial Chart is shown at not to patent shown in Figure 2.

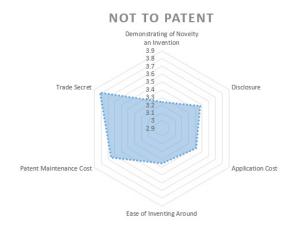


Figure 2. Not to patent radial chart.

3.3 Comparative Analysis of the Preceding Researches

First, according tostudy¹, the purpose of patent application (electronic industry) was preventing patent infringement suit, preventing imitation, blocking competitors' activity, license profit and performance index in the order. In this study however, it was the order of performance index, preventing patent infringement suit, license profit, preventing imitation and blocking competitor's activity in the order sown in Table 4.

Besides, according to 1 study, purpose not for patent application (electronic industry), keeping secret came first followed by difficulty in proving a new invention, easy invention, patent application cost, patent maintenance cost, and public announcement of corporate information in the order. However, in this study, it was in the order of maintaining secrecy, patent maintenance cost, making corporate information public, patent application cost, easy invention and difficulty in proving a new invention.

As to the purpose of no patent application, maintaining secrecy stood the first for both Korean and Chinese enterprises. This suggests preference for business secret to

Table 4. Comparative analysis of the preceding research

To patent	(1)(2015)	In this study	Not to patent	(1) ((2015)	In this study
LR	4	3	DNI	2	6
PPIS	1	2	Disclosure	5	3
PC	2	4	AC	4	4
Blocking	3	5	EIA	3	5
MP	5	1	PME	5	2
			Secrecy	1	1

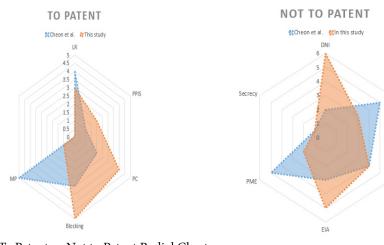


Figure 3. To Patent or Not to Patent Radial Chart.

Disclosure

patent for fear of exposing their technology or strategy to competitors so much, which agrees to the result of many foregoing studies.

Difference between this study and foregoing studies lies in that this study made study on the subject of China's electric and electronic industry but foregoing studies made survey on Korean enterprises. A small number of samples for metrics seem to have caused such difference.

Currently, China's enterprises are making much investment in R&D to advance into the global market and, realizing the importance of patent unlike the past, the government is making positive support for R&D and patent. This is considered to have caused a different result than that of foregoing ones. Radial Chart is shown at to patent and not to patent shown in Figure 3.

4. Conclusion

The rapid spread of ICT and globalization is bringing about so many invisible competitions that enterprises are forced to revolutionize to survive in such a fierce environment of competition. Innovation is an important motive for corporate growth and enhancing national competitiveness. Companies are making much investment in R&D to survive. For the output from tremendous input of costs in R&D, they are adopting dual method of applying or not applying for patent.

This study analyzed their either purposes with patent conducting direct survey on the subject of 17 electric and electronic companies in China.

This study's suggestion is that it can be used by Chinese enterprises at the time of setting up strategic intellectual property rights from R&D stage; Practitioners could use this study for guideline in establishing each company's intellectual property right strategy.

While most foregoing studies focused on patent, this study focused on the purposes of applying or not applying for patent on the subject of China's electric and electronic enterprises. It is the practical contribution of this study.

However, this study has limitations. With relatively few enterprises for survey focused on electric and electronic companies, it is not reasonable enough to generalize the results of this study. Future studies should be needed to expand the target enterprises and systematically analyze both purposes of yes or no patent application, which is missing from this study, by adding diverse methodologies.

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