

# **Innovation Management of Patent Commercialization**

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## **Abstract**

Patent commercialization is an important issue to most country, for only 0.3 percent of patent have commercialized in the world. Researchers try hard to enhance the rate of patent commercialization. This paper focus on innovation of organization and management to enhance the rate of patent commercialization. Which is based on team work and plan to promote step by step, for most patent owner develop patent but do not equally put effort on patent commercialization, and that is waste precious time and resource. This research directly analysis government published patent secondary data and the other part is questionnaires survey to patentees, with which to find best way of patent commercialization.

**Keywords:** patent commercialization, patent management, strategy of commercialization

## **1. Introduction**

Corresponding to the number of patents increased rapidly in the whole world during recent years, this phenomenon imply that the world people are pay attention to the influence of intellectual property rights. Most country build a good national patent environment to provide creative and competitive resource, the less barriers of patent commercialization removed, and the higher rate of patent commercialization will be. Patent system protect inventor's interest from patent infringement, which means one who produce or sale patent product without authorization, he will be punished by pay loss of patentee's damage or more seriously treble fined for his behavior of patent right infringement. Another way of patent use is the patent owner can exercise his patent right in attack and defense in a compete war, he can use the patent right to beat competitors in the market, the value of patents value may up to

millions dollars, or much more than that, upper concepts highlight the reason and importance of patent commercialization.

Patent number keep on increase but the rate of patent commercialization still low, average rate of patent commercialization in the whole world are only near 0.3 percent. Innovation is a global trend for most inventor, patentees pass the patent examination by long time research and continuously improvement to inventions, but after a lot challenge and then gain the patent right. The process of patent application need about 3 more years, if the inventor is lucky enough, he may pass patent examination in first time, or he have to file roundtrip several times. Patentee have to pay an annual fee annually to maintain his patent right is another barrier of patent commercialization.

Why patentee shelved commercialization action after owned the patent? most inventors are top cleaver in their domain of industry, they can solve very complex technic problem, because patent should satisfy factors of useful, novelty and non-obvious, all these three factors have to testified by the patent examiner through precedent examination, there can't have any precedent be find in any other patent database of the whole world, or else the patent examiner will turn down the patent application.

Every cases of patent application are need a lot of resources from government and individuals, all front end process before patentee own his patent, regardless technic development or patent application are need to pay money, furthermore, patent maintenance fees pay annually increasing is money consuming. Since patent product's life cycle need continuously pay money from the beginning of patent invention to the patent right perished. An obscure question need to find the answer and why? The question is the patent pay compared with the outcome of value is extremely inequivalent, which imply that the patentee gain

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nothing in the end of patent life cycle, are they really want to pay price and without gain any benefit? we can trace back to the meaning of patent right to find the answer, here the answer should be very clear, the patent right originally mean the patentee have the right to exclusive others to infringe his patent right by the government authority, except that, the patentee have the right to sale the patent right, produce the product, if the patentee can do one of upper things, he will not be gain nothing from patent, this identify that most patentees are want gain benefit from patents but inability to do something have his patent commercialized.

Most patentee was numb about keep on pay fees annually after gain patent right, outcome of patents is zero year after year, in particular, they still have no active action of patent commercialization, which is not match the rule of investment, what are they work for is the question, how to solve the problem is the goal of this paper.

This paper focus on the secondary data of government intellectual property to analysis and find partial factors of patentee's inability of patent commercialization.

## **2. Literature Review and Hypotheses**

China is in response to the global trends, they establish a modern patent system in recently years, which is pave with international standards, with which to imply patent protection (Lulin Gao, 2008), it is difficult to have patents commercialized is a long term phenomenon in the world, may the reason of inadequate equipment or lack of incentive for commercialization (Avimanyu Datta, 2012), commercialization of university inventions (Yonghong Wu, 2013)

Basically patent inventors almost are excellent and clever, but in the link of patent commercialization are transfixed and silently endure no recovery and obtained repeatedly in long-term of non-use patent investment, this situation is not only a country's problem, there are almost the same in the world, which waste a large amount of national resources of examination and individual's monetary or time resources, this is really an practical and academic issue, for the benefit of all country and patentee, unravel the patent commercialization problem and do good to society and patentee in

the same time, this article as the results prevail for understanding patent commercialization of patentees. First, patent commercialization factors clarify, second, succeeded experience highlighting.

## **3. Research Frame and Hypothesis**

This paper have the operational definition on research facets as follow, which include patent number, patent of commercialization, organization, promotion action and investment of fund and time are computable from data or questionnaire. All patent data are collect from Intellectual Property Office, Ministry of Economic Affairs (MOEA), for some of the private information should collect from individuals, such as investment of fund or time, and both of upper two main factors are set to computable number in different facets. Patent commercialization was composed of several factors, which include human resource of promotion, action of promotion, investment of fund and time etc.

All factors are affect the patent commercialization rate, thus, hypothesis as follow, for patent commercialization was calculated on patent and commercialized patent, thus, the quantity of patent in equation's denominator will affect the result of patent commercialization rate. For patent commercialization is so difficult, thus it should be promoted by organized team, basically, the more employee member work together, the outcome of that team will be better.

- H1: The more quantity of patent number in patent data, the lower of patent commercialization rate.
- H2a: The more quantity of employee number in organization of patent commercialization, the higher of patent commercialization rate.
- H2b: The more quantity of action in patent commercialization, the higher of patent commercialization rate.
- H3a: The more quantity of fund in investment of patent commercialization, the higher of patent commercialization rate.
- H3b: The more quantity of time in investment of patent commercialization, the higher of patent commercialization rate.

## 4. Method

Due to research the individual patents commercialization, this research focus on the process and case of patent commercialization, because the rate of 0.3 percent patent commercialization is now exist the same in most country, thus, every successful experience will be very precious, we visit the patentee to find detail and factors of these patent commercialization(Nicole Ziegler, 2013).

This research focus on patent owner, up to now, all cases are from Taiwan patentee, and the patentee have the level of own about 100 patents, and the rate of patent commercialization over 5 percent, compare with the common patent commercialization rate with 0.3 rate, 5 percent could be a very successful and precious experience, for these case much better than common cases about ten times of commercialization rate. The method of analysis was adopt Statistical Package for the Social Sciences (SPSS) in analysis, secondary data and questionnaire was use in research reliability and validity, we exclude the invalid sample. Variable define and evaluation in this research was use patent number of patentee owned, individual patent commercialization rate was set and calculated from government published patent data number (PDN) divided by number of patentee commercialized patent (PCN), the same as total number of patent commercialization rate was averaged upper two factors to gain complex commercialization rate.

$$PCR=PN/PCN \quad (1)$$

The patent commercialization rate was affected by patent promotion (PP), and which was composed by two factors, first, promotion organization, second, promotion action, and promotion organization and management, promotion organization was define as the have tax pay for salary and number of patent promotion employee (PPE), action of promotion(AP) was define as have record of application of government subsidiary (AGS), records of patent t transaction (PT) in platform or produce of patent product(PPP), promotion time consuming(PTC), invest in capital(IC) etc. Patent strategy was adapt from questionnaire to the patentee, such as how much fund put to commercialization (FPC) his patent, and how many patent is plan to commercialization (PPC),

$$PPE=SA*NE \quad (2)$$

$$AP=AGS+PT+PPP+PTC \quad (3)$$

$$PCS=IC+IT \quad (4)$$

### 4.1. Secondary Data Analysis

All cases are selected by the level of the patentee have higher rate of patent commercialization, if a case can achieve this level, this kind of case have ten times of PCR than usually patentee have, and far exceed most country's PCR. Thus, for two reason of this research design, first, near 100 patents owner and 5 percent of PCR are strictly level for most patent owner, most patent owner in the world are in the situation of PCR lower than 0.3 percent, thus, the level of 5 percent PCR should be reliable for the test and study, first of all, in the first section, we choose the R&D team member less than 10 employee, for most patentee are individual inventor, we will limited our range for the study be exactly right to most patentee, thus, in the first section the participant will not be a firm level R&D operation.

### 4.2. Primary Questionnaire data analysis

Through phone call and e-mail to confirm the visit date and time, then have face to face questionnaire discussion with the patentee, furthermore, we visit the patent product factory and discuss with the manager and sales, questionnaire was design as Likert 5.0 scale, this process can be part of further internal empirical.

### 4.3. Cases Study

Case 1 have a research and development team, which is organized by about 5 people and led by a professor/Dr. who is a professor of National University, and serve in Department of brain neurology, through over 26 years of work and research from day to night, the professor/patentee own and partially involved 93 patents, most patents are medical equipment, he chaired his research team, focus on invention and patent design.

Case 2 have a research and development team, which is organized usually by about 2 to 5 people and led by a professor who is a professor of National University too, and serve in Department of material science, through about 11 year research, the patentee own and partially involved 172 patents.

Case 3 do not have a research and development team, who usually innovation by himself, through over 12 years of research, the patentee own and partially involved 72 patents,

all patent are through long term and continuous work and study, keep on try and error to win the patent, after this stage, patentee develop an partner owned product manufactory.

Table 1 Patent Case analysis

Patentee	A	B	C
Patent Domain	Medical	Material	Multiple
Patent Quantity	93	172	72
New Invented	85	172	24
New Design	8	0	25
New Type	0	0	1
Patentee Research duration	1999-2015	2004-2015	2004-2016
Patentee Research year	26	11	12
Commercial Quantity	5	7	32
Commercial rate	18.50%	24%	44%
Highest invention Quantity in a	15	45	22
Patent applied by University	76	150	0
Patent applied by Group	7	15	23
Patent applied by Individual	10	7	49
Average Year to Own patent	3.2year	4.5year	7.2month

### 5. Results and Discussion

Faith and determination be possible oobstacle to patentee in attempt to promote patent, plan and execute are main affect factors, patentee’s faith of patent commercialization, faith and commitment of a person’s attempt to complete plan (Ajzen1985). Possible future research design for this issue, the research design may focus on case study and questionnaire, include government officer, business manager, stock investors and experts, for all these people are important member patent commercialization.

After the research of data analysis, a successful patent commercialization are have a team to support the action of patent commercialization, which include research and development, promotion member of commercialization, financial support and marketing. If with a team operation continuously, especially on the promotion work, then, patent would be possible be commercialized, else, most patentee focus on research and development, there almost have no resource and promotion action have put in, thus, lack of promotion action in commercialization is the main reason exist

low rate of patent commercialization.

### 6. Conclusions

In this paper, three new way of the patent commercialization have been generated in this research. The feasibility of the new method is verified by. The result has shown that the new designs can produce a more wide range of non-uniform output motion than the existing design. Therefore, they are better alternatives for driving a variable speed input mechanism.

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