The SWOT Analysis for Co-Operation Patent Classification and Its Development Strategy

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Abstract--**The patent classification plays an important role in the patent examination and the patent search. In this research, the most important task of this research is to analyze for the relationship between Co-operation Patent Classification (CPC) and International Patent Classification (IPC).**

I. INTRODUCTION

The patent classification system plays an important role in the patent examination and patent search. In the patent examination process, the patent classification is the indexing code which examiners mostly depend on. And for the patent search process, it will take less time to find more relative patents when patent classification symbols and keywords are used jointly.

As a world popular patent classification system, the International Patent Classification (IPC) has proved its value over the past years. Now more than 100 patent offices are using the system in their specifications. Nevertheless, just few years ago, the co-operation patent classification (CPC) is generated by United States Patent and Trademark Office (USPTO) and the European Patent Office (EPO).

Moreover, the IP5 (five IP offices) plan to construct the Common Hybrid Classification (CHC) that patent offices in the world can use. And the CPC will be the fundamental base of Common Hybrid Classification (CHC), which could be seen in OTA Yoshitaka's study [8].

The table 1 describes the patent documentations covered by CPC in 2014, and it shows that some major countries in the world are beginning to use CPC [11]. And the coverage area of patent documents in each country is presented in the column entitled "Systematically classified." In EPO, the priorities of documents in some countries were systematically classified into ECLA before the CPC was used. These documents with ECLA were directly converted into corresponding CPC. The other column like "CC" means the country code, and "Code" means the kinds of patent documents.

TABLE 1 CPC COVERAGE COUNTRIES

Country	CC	Code	Systematically classified**	Non-systematically classified**
ARIPO	AP		complete from 1 (3/7/1985)	
Austria	AT*	A,B	from 288 286 (15/1/1971)	from 100 022 (1925)
Australia	AU*	B,D	from 18/1/1973 (first filing: 1971)	from 1 019 332 (1933)
Belgium	BE		from 100 486 (1892)	years 1959-1962
Canada	CA*		from 848 159 (4/8/1970) for first filing resident from 939 101 (1/1/1974)	from 114 746 (1908)
Switzerland	CH	A, B D	from 208 320 (31/1/1939) from 1968	from 1 (1888)
Germany	DE	A,B,C U	from 1 (1877) from 6 609 798 (04/1/1973)	
EPO	EP	A	complete from 1 (20/12/19780	
France	FR	A,B E	from 292 (1844) From 92 701 (20/12/1968)	
United Kingdom	GB	A,B	from 1909 02 488 (27/1/1910)	from 1817 04 136 (1817)
Luxembourg	LU		from 555 (< 1920)	
The Netherlands	NL		from 28 (1913)	
OAPI	OA		complete from 1 (15/01/1966)	
The United States	US	A, B, E, I -defensive I -trial, project H	complete from 1 (13/07/1836) complete from 8 (23/4/1839) complete from 120 (04/10/1855) complete from 1 (03/12/198	
World(PCT)	WO		complete from 7800001 (19/10/1978)	

* for first filings only, i.e. without foreign priorities
** when the indication "complete" is not present, this means that some documents in the collection may not be classified in CPC
*** this means that some documents in the specified range of the collection are classified in CPC

TABLE 2 THE COUNTRIES TO BE CLASSIFIED IN CPC

Country	Number of documents available in DocDB	Number of documents classified in CPC (DocDB & CPCDB)	% of ducuments classified in CPC
China	8,579,224	1,627,479	18.8%
Korea	2,810,926	878,787	31.3%
Brazil	527,234	310,234	58.8%
Russian Fed.	2,070,407	244,158	11.8%

And in some countries, the conversion work is now under way. According to CPC Annual Report 2014, a substantial number of, e.g. Chinese, Korean, Japanese, Brazilian or Russian patent documents will be classified in CPC, which could be seen in Table 2 [11].

As we see, the CPC is developing in an uncanny way. However, we think it will be very difficult to generalize this classification, especially carry out the coordination work among countries in the world. Comparing to the IPC, the CPC has many advantages in patent documents and will replace IPC in the future. Then we are actively to study how to help the CPC to establish the status in the world.

In this study, there are three objectives: firstly, the study will describe the relationships between CPC and other important patent classifications in the world; and secondly, we will do a SWOT analysis that focuses on CPC, that is, the strengths, weaknesses, opportunities and threats of CPC which will be concluded in the analysis; at last, we will talk about the possible development strategies for the CPC, for how to become the world classification standard.

II. LITERATURE REVIEW AND METHODOLOGY

This part will introduce some important patent classification system in the world, such as Co-operation Patent Classification (CPC), International Patent Classification (IPC), European Patent Classification (ECLA), United State Patent Classification (USPC), File Index (FI) and File Forming Term (F-term). The available study argued that the IPC need to change, in the way of revolution or reform. Wolter [12] had compared these patent classifications but except the CPC in a view of retrieve result evaluation, and he pointed out that it was hard and inefficient to master so many patent classifications for patent examiners or patent searchers. Makarov [6] reviews the reasons for and progress of the IPC reform and describes procedures for its implementation and the structure of the reformed classification system. Rampelmann [9] suggested that the IPC union should make the IPC revision process more efficient and hence better able to keep pace with the accelerating rate of technological developments in patent information searching methods and systems.

List [5] argued that patent classification enters a new era with the CPC, in the view of searching patent documents. Kapoor et al. [4] had found that the retrieve results with CPC were more precise than with IPC. Montecchi et al. [7] had studied the drawbacks of keyword-based patent search, and they had found that search process with patent classification would overcome these drawbacks. Gange [2] described how the CPC improve the patent searching comparing with other classifications.

Some method will be used in this study like comparative study and case study. David et al. [1] provide us the SWOT method, and we think it could be applied to the analysis of CPC. There are a variety of patent classifications in the world, and they all have their special point. Especially, we use SWOT analysis in this research. Generally, the SWOT analysis could be conducted by two steps: (1) list the 4 key factors including internal strengths, internal weaknesses, external opportunities and external threats; (2) match 2 factors and conclude the resultant strategies, which includes strengths with opportunities strategies (SO), weaknesses with opportunities strategies (WO), strengths with threaten strategies (ST), weaknesses with threaten strategies (WT). And finally, we get the SWOT matrix as following Table 3 [10]:

TABLE 3 A GENERIC PRESENTATION OF THE SWOT MATRIX

		STRENGTH-S		**WEAKNESSES-W**	
		1. 2. . . n.	List of Strengths	1. 2. . . n.	List of Weaknesses
OPPORTUNITIES-O		**SO STRATEGIES**		**WO STRATEGIES**	
1. 2. . . n.	List of Opportunities	1. 2. . . n.	Use strengths to take advantage of opportunities	1. 2. . . n.	Overcome weaknesses by taking advantage of opportunities
THREATS-T		**ST STRATEGIES**		**WT STRATEGIES**	
1. 2. . . n.	List of Threats	1. 2. . . n.	Use strengths to avoid threats	1. 2. . . n.	Minimize weaknesses to avoid threats

III. THE SWOT ANALYSIS FOR CPC

This part will analyze the strengths and weakness of Co-operation Patent Classification (CPC), and its opportunities and risks in the future. The SWOT analysis will be used in this part.

Cooperative Patent Classification (CPC) has strong advantages in timeliness, flexibility and compatibility. In the study of Zhu et al. (2013), some characteristics were concluded comparing with the IPC [13]. Furthermore, we conclude the strengths of CPC by analyzing these characteristics as following:

1. Compare to IPC, the EPO and USPTO keep on updating the CPC system regularly, and refining the original IPC theme constantly so as to ensure that the classification number could correspond to the patent theme directly when the emerging technologies are patented with a classification; On the other hand, the CPC and IPC are similar in many aspects that CPC can be well compatible with IPC.

2. With respect to the USPC, the CPC system as a whole is easy to understand and use (despite it is still complex relative to the IPC). In addition to refer to the classification of the main table, the USPC also need to use the Patent Classification Definition, Index to Classification, and classification revisions. However, the CPC only comprises the main trunk, "2000 series" index and "Section Y", and the hierarchical structure of CPC is basically the same to the IPC, which is more easily to accept for the IPC using Patent Office.

3. Many patent classification systems have some important characteristics like accuracy in classification and refining with changes in technology development. However the most important limitation of these classifications such as ECLA, USPC and FI/F-Term are usually used only in a limited region. It is very inconvenient for the patent information to disseminate between the world countries, since the patent specifications need translation. For example, although the FI/F-Term has a very refining classification system, the countries except Japan need to understand the content when they use this classification. We could expect that extra expenses are needed to translate the Japanese. Therefore the generation of the CPC is in order to solve this problem.

In most of the literature, the weaknesses of the CPC are not mentioned, which is not good for the development of CPC. The EPO and the USPTO discussed the meaning to them at the conference in February 14th 2011 [3]. It also doesn't talk about the weaknesses at the same way. In this situation we summarize some deficiency according to our empirical observation. And now we analyze the CPC with SWOT method by using the materials of the conference and other literatures. There is the SWOT matrix.

Though CPC were born for several years, it still has many problems to solve for earning a place. At present the USPTO and EPO are actively trying to respectively convert their patent classification to the CPC. However, it needs to invest a lot of time and energy to carry out the transition, and as a proposition, the USPTO and EPO should make some corresponding development strategies in combination with the results of the SWOT analysis.

TABLE 4 THE SWOT MATRIX OF CPC

SWOT Analysis	**Strengths-S** 1.Improve file and document routing 2.Save resources on (re-)classification 3.Move to an IPC-based classification system 4.Understand the technology content easily just with English	**Weaknesses-W** 1.Harder to understand and more complex than IPC 2.The actual running time is too short 3. Excessively depend on IPC
Opportunities-O 1. Opportunity to clean up and better document classification 2. Lay a common foundation for future classification revisions 3. CPC promotes IP5 CHC project 4. Share control over CPC	**SO Strategies** Combining the strengths and opportunities, we think EPO and USPTO should make full use of the advantages of CPC, which is helpful to seize the opportunities.	**WO Strategies** In the face of opportunities, we suggest EPO and USPTO to improve the weakness of CPC for not letting the opportunities pass by.
Threats-T 1. Renumbering of ECLA will be needed (IT, examiner training, etc) 2. Resources needed for quality monitoring and training 3. Competition from IPC 4. Opposition of patent office using other classification	**ST Strategies** As listed in the threats, these problems should be resolved as soon as possible or it is adverse for the development. And the strengths maybe the best way to avoid threats.	**WT Strategies** The threats come from external of CPC but the weaknesses come from internal. And we think the weaknesses are part of reason of threats. So we suggest EPO and USPTO should consider the weaknesses of CPC when dealing with the threats.

IV. HOW TO MAKE A DEVELOPMENT STRATEGY FOR CPC

According to the SWOT analysis results, this section will analyze the possible development strategy for CPC. Now we have these strategies:

(1) **SO Strategies**. As mentioned in Table 3, we gave the suggestion for EPO and USTPO to make the SO Strategies. Furthermore, we give the following definite steps: 1. The classification of patent documents should be refined in the base of IPC classification, with more elaborate classification number and the detailed content which is more correlative to the emerging technology; 2. Mobilize more patent office of countries in the world to participate in CPC project; 3. Establish more universal and uniform classification standards than IPC.

(2) **WO Strategies**. Same to the SO Strategies, there are some concrete suggestions to use as reference: 1. Increase the publicity and promotion of CPC projects, and attract more patent offices or organizations to join; 2. Develop some special classification principle that the revision of CPC will not be limited to the revision of IPC; 3. Cooperate with developing countries and train the classification workers in the patent office, which is to extend the coverage of CPC.

(3) **ST Strategies**. Now these concrete measures are available: 1. Increase investment in the classification of patents, including policy, capital, manpower, technology and so on; 2. Develop the channels to raise the funds needed for patent classification, and attract more national patent offices to participate in the CPC project; 3. Strengthen the training of the patent office in developing countries, and help them skillfully use the CPC system

(4) **WT Strategies**. EPO and USPTO should regularly assess the CPC project, and take measures to improve existing problems. Actually, the measures are listed as following: 1. Cooperate with IPC Union, and persuade them to transit IPC into CPC, which could dissolve the competition with the IPC; 2. Decentralize the project risk by enrolling more patent offices, and this will help ease the burden of EPO and USPTO; 3. Establish information sharing mechanism and dispute resolution mechanism with the partners.

V. CONCLUSION

The CPC could be developed further for serving patent documentation management, or patent information service. One of the main obstacles we have met in using patent information is language and the CPC help us overcome it. We will never forget that we still need to improve our patent information utilization efficiency though the CPC have many advantages. In the future most of the patent classifications will be merged into one standard. That is what we are looking forward because the territoriality of patent information will be conquered in this situation. In this study we have finished our SWOT analysis of the CPC and we give some concrete suggestion to the EPO and USPTO. However, what we have concluded are almost all based on our empirical observation due to the limited literature and data that we collect. And we think that the CPC at a preliminary stage is one reason of this situation. As time goes by, we are sure that our conclusion will be further demonstrated and more work will be done.

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