Patent Map Applied to Decode Patent Information

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Abstract— Patent information is a derivative product from the legal patent system. This information, which includes patent applications, patent descriptions, patent gazettes, patent abstracts, and patent data, is prepared in exact compliance with the regulations and specifications of the patent acts. Patent information, different from other published circulating information, is legally well protected. For convenience, this study classifies patent information into bibliographic and numeric data to create a patent map.

Keywords— **Patent information; Patent map; Bibliographic data ; Numerical data**

1. INTRODUCTION

It is now an epoch of knowledge economy in which the innovation and development are essential touchstones. The human industrial economic development, as defined by the world famous World Economic Forum (WEF) is classified into three stages; the agricultural economy stage before 20th century, the industrial economy in the 20th century and the knowledge economy in the 21st century.

Also the world-known Institute for Management Development (IMD), IMD emphasizes in its World Competitiveness Yearbook Report that the patent performance is a major evaluation index on a nation's competitiveness evaluation list in the knowledge economy. Besides, the World Intellectual Property Organization, WIPO report points out the fact that mostly almost 90-95% of world R&D outcomes are covered in the patent publications and the least 5-10%, discovered in the technical literatures (essays and publications). If the patent information which is utilized to the best advantage would likely shorten 60% R&D time and save 40% R&D cost(Cantwell et al

1999). The patent technology provides novel and industrial usability which in the throat-cut competitive market will strongly enhance the product's high competitive edge and produce substantial efficiency and benefits.

The patent case derived from the patent information, after carefully search, retrieval, consolidation and analysis, will be presented in a patent map (Asakana, 2001) for a variety of industry for further processing analysis and development, tendency forecast and patent strategy and finally to plot out the most dominant effective value for each patent technology.

This study is dedicated to discuss these key problems and intended to bring up the feasible recommendations. The patent information is classified into the bibliographic data and the numerical data as shown in Fig. 1 .
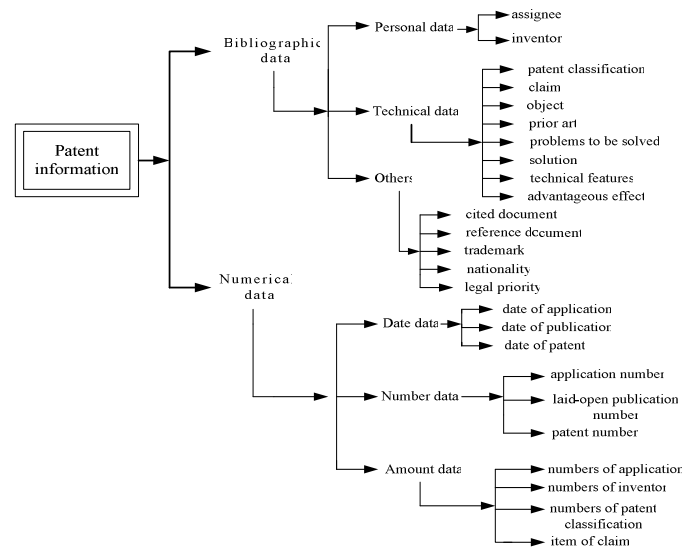

Fig. 1 Diagram of bibliographic and numerical data for patent information

2. BIBLIOGRAPHIC DATA AND NUMERICAL DATA

The bibliographic data cover personal data, technical data and others. And the numerical data cover date data, number data, and amount data.

The bibliographic data and numerical data collected and consolidated in this study are processed by means of various analyses as shown in Fig. 2 in an attempt to identify and obtain the purpose of development and creation in a specific technical field(Archibugi, 1992).

■ Quantitative analysis: including patent number statistics, changes, sequence, market share and cluster.

■ Qualitative analysis: including technical development contents, key technology, trend and forecast.

■ Relationship analysis: studying the mutual relationship among differing data terms and data relation change derived from other factors.
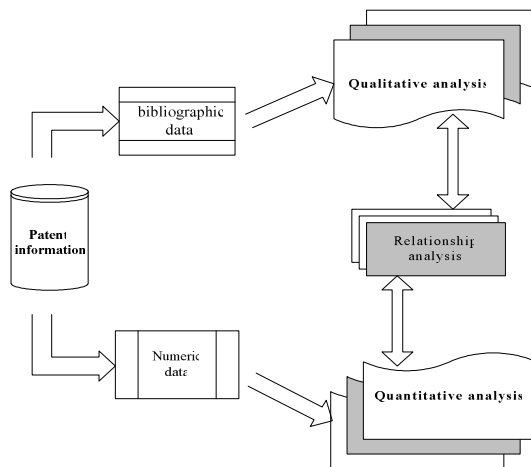

Fig. 2 Diagram of process and analysis of patent information

Patent information embraces numerous potential energies. Analysis of patent information will secure a clear picture of the development trend of a specific technology, catch up what is the technical development or the technical strategies the competitors are carrying out. It is vital for you yourself to plan the R&D work on a specific technology.

By means of quantitative analysis, qualitative analysis and relationship analysis on patent information, this study is intended to dig out the following potential energies:

■ Technical capability index

Detail analysis of patent documents will discover the total number of patent, and the competitors have obtained along with their technical development direction based on which you will know, where your technology will lead and which direction you have to go (Fagerberg, 1994).

■ Technical development and resource distribution

Based on the full discovery and understanding of the technical development phenomena and industrial competition the competitors are doing, you are in the better position to work out your own R&D direction and resource distribution (Meyer-Kramer, et al 1998).

■ Implied economic value

The patent citation is a reliable to know all patents in a specific technical filed. More number the patent has been cited, higher the economic value it implies(David, et al 1992).

■ Precious reference for strategy planning and technical development

Detail analysis and statistics of patent information gives you a clear picture the status quo of a specific technology, based on this understanding, you are in the most advantageous position to plan your R&D direction to shun away the patent cluster problem (Holger, 2001).

■ Creative technology

The prior art is outstanding foundation for improvement and creation of another new technical patent(Narin, 1985).

3. PATENT MAP

The patent map is a diagram showing all related patent information (Grupp, et al 1999).

The patent map presented in this study is vision-effective patent map in which all derived patent information related to a specific patent are collected and thoroughly processed with quantitative analysis, qualitative analysis and relationship analysis.

3.1. Target

The major purpose of this patent map is to analyse the following targets as indicated in Fig. 3.
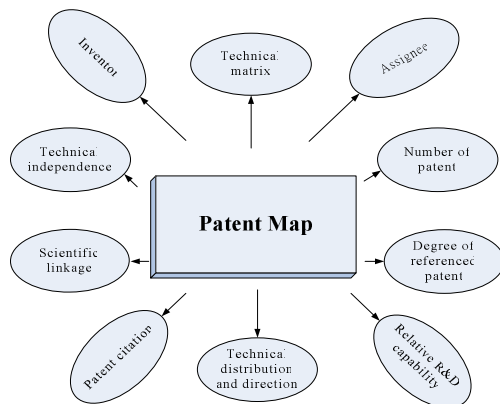
Fig. 3 Target of patent map

■ Technical matrix

This study uses the FI & F-term classification system as a foundation and applies the multiple technical viewpoints to prepare this technical matrix. The technical matrix reveals where the technical cluster is and where the technical blank exists. In an effort to achieve the patent design around and to create new technology (Meyer, 1998).

■ Assignee

In case the patent owner is a company entity, the statistics will tell the R&D capability and direct the company is heading who should be considered as the major competitor in this specific technical field (Trajtenberg, 2002).

■ Number of patent

From the total number of patents accumulated years after years, it is easy to understand the status of the technical development. More patent applications indicate that the specific technical field has come to mature. If it is intended to enter such a technical field, you will encounter the patent infringement, or face a powerful competition. Patent forecast will tell the life cycle of a specific technology(Carpenter, et al 1980).

■ Degree of referenced patent

This study counts the total number of other company's patent cited for use to calculate the degree of referenced patent, the larger the number of the cited patent, the more abundant of patent knowledge this R&D team possesses and the more powerful the technical creative capability is (Hicks, et al 2001).

■ Relative R&D capability

The relative R&D capability is collectively appraised by number of patent, number of patent cited, number of patent self-cited together with the varying weight system(Klevorick, et al 1995).

■ Technical distribution and direction

Counting the number of patent classification exposes the technical distribution and direction for a specific technical field which is used as valuable reference for our R&D work(Narin, et al 1997).

■ Patent citation

The patent citation reveals what is the technical mainstream in a specific technical field and the way for technical evolution(Robert, 2001).

■ Scientific linkage

This study utilizes the number of scientific literatures in the patent description that has referred to. The more the literatures are referred, the stronger the scientific linkage the patent document is bending with the basic science. It also connotes that the R&D team of this company uses the basic science to greatest extent (Faulkner, et al 1994).

■ Technical independence

This study assumes that the technical independence equalling to the total patent of self citation being divided by the total number of cited patent. However the value of the technical independence shall never be larger than " 1 ", it implies that the larger the value, the more powerful is the R&D strength in this specific technology of this company with ease continuity and well organized strategy for this patent layout(Meyer-Kramer, et al 1998).

■ Inventor

The inventor is the producer of the patent. Controlling the inventor enables to strengthen the technical development capability(Zhu, et al 1999) [15].

4. FLOWCHART AND PREPARATION OF PATENT MAP

Fig. 4 shows the preparation for flowchart of patent map and the right hand displays various patent maps. From the figure, the following steps for the preparation of patent map can be included:
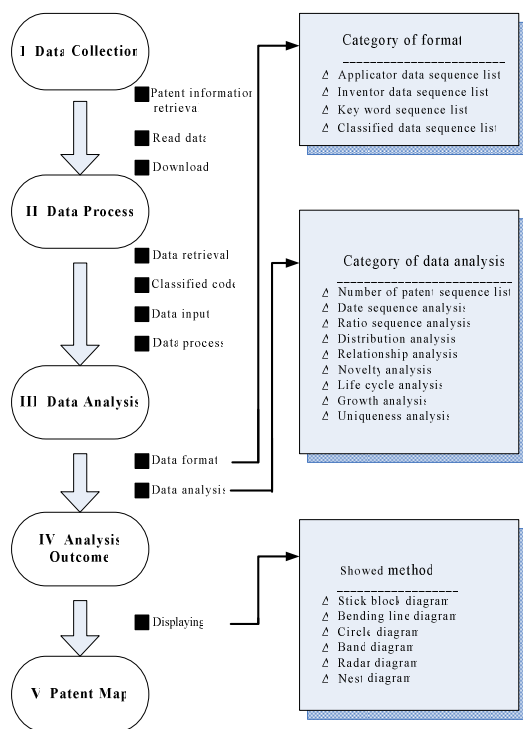
Fig. 4   Flowchart for patent map

Data Collection step; the data to be analyzed are collected from IPC classification, FI & F-term classification, USPC classification, or the combination of key word, processed after logic operation.

Data Process step; the data is sorted and segregated according to the similar nature to form the data group of technical target for further analysis in the next step.

Data Analysis step; the data after symmetrically analyzed and the outcome becomes a statistic data.

Analysis Outcome step; the outcome is displayed in the form of figures to achieve a particular purpose.

Patent Map step; a step complete vision-effective patent map.

5. CONCLUSION

Patent map is a symmetric integration of patent information. Nowadays, the patent information is tremendously huge, this study provides an easy and concise way to integrate the patent information by dividing the patent information into bibliographic data and numerical data, after throughout quantitative analysis, qualitative analysis and relationship analysis and finally present the outcome in varying figures. This method offers an effective control over patent information, and the patent map so prepared will open an avenue to develop and create newest technology in most economical way.

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