Technology Forecasting In Competitive Intelligence : The Use of Patents Analysis

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The Problem

The global free trade market has affected the lives of all human kind. We all face the future with anticipation. The competition we face - individual and group - are going to be harsh and cruel. Global free trade market gives us the world without any boundaries, where the border of nations means nothing.
There's a pesimism among the third world countries about our abilities to survive. The third world countries are behind in terms of way of thinking and technologies.

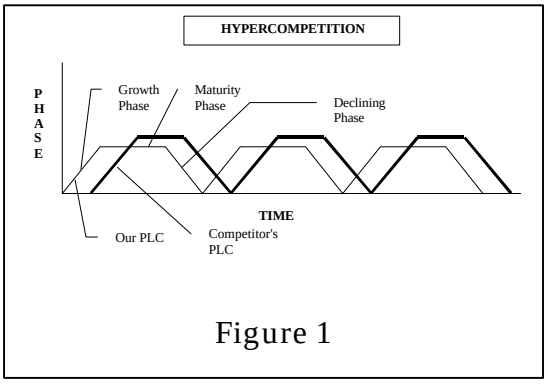

Figure 1

The rapid development of technologies, especially information technologies, is the main cause of the global free trade market. What happened in the United States can be known in Indonesia in seconds. People can react more quickly to the events in the world.
The rapid development of technologies also caused the short product life cycle. The manufacturers, especially the for the hi-tech merchandise, has no room to breath. Products, which are launched today, will have a better competition in months or even weeks. The people have freedom to choose. They will choose the product, which has the most value in term of price/performance. The world of competition becomes Hypercompetition[1].
In situation like this, the Research and Development (R&D) activity become very important. Those who can do better R&D will have the ability to launch their products faster. The R&D division is a very important part for the company. The funds invested in this field usually are very large.
It's ironic that the R&D activities have a high probability of failing. The Murphy's Law on R&D said that the larger the fund invested, the larger it's probability to fail.
The limitation in financial sector and competence made the third world countries losers in the competition. They don't have unlimited fund, so they can't do research in every sector like the big companies in the industrial countries. Research they do has to be focused in promising area. That leads to one question, how to focus the research activities to the promising areas? In short, how to forecast technologies?
These conditions propelled the development of Competitive Intelligence activities. Competitive Intelligence activities are mainly searching, collecting, and processing information to detect changes in company environment which has a future orientation.

Information Availability

[1] *D'Aveni*, Hypercompetition

The Global Free Trade Market era also brings us to the era of unlimited information. The rapid growth of information quantity supported by advanced means of communication. Companies now can use that endless stream of information.
HUNT classify the four class of information:
Textual information: is information in textual form. It can be processed by computer. Databases, integrated text etc. are in this class of information. This kind of information represents 40-60 % of total information.
Fuzzy information: is information that has to be actively seeked outside the company. Customer information, competitor's information, partnership are in this class of information. This kind of information represents 40-60% of total information.
Company expertise: is the databank of the company. The management of company "abilities" is very important. This kind of information represents 10-20% of total information.
Exhibitions: are what we can see about others. Brochure, company profile etc. are in this class of information. It can give us quite important information. It represents 10-20% of total information.
The Textual Information gives us a valid and tested information. It usually has been through a series of testing, so the informations are valid and can be verified. There are two kinds of sources for this kind of information, formal source and informal source. The formal sources are the source where the characters are stored in some kind of media (disc, microfilm, papers, etc.). The informal sources are all the source of information, which don't apply to the first category.
Patents are a principal source of information in Competitive Intelligence. Patents are technical information on an invention. Patents are the right tool to "follow" the competitor and their strategies. R.S. Campbel said "*patent indicators provide a very useful forecasting tool for decision makers in the public and private sectors. These tools are usable for R&D planning, for competition analyses and for analytical studies of how technologies emerge, mature and pass away".*
There are many databases available exclusively for patents. As examples, the patent databases commonly used by Competitive Intelligence Specialist are WPIL, EPAT, FPAT, USPTO etc. The database are either available online or on CD-ROM.
There are also many patent-search services available online such as the USPTO (www.uspto.gov), the STO Internet patent search system, (sunsite.unc.edu/patents/intropat.html], IBM patents server (patents. womplex.ibm.com) and many others not counting the offline patent search services.

Technology Forecasting

The technology forecasting process nowadays used an opinion polling methods. Methods such as Delphi method are used to gather expert's opinions. Those opinions are then used to determine the course of technology. To the company, the course determined determines the way the R&D process are headed.
The process largely depends on the experts' experience and qualifications. The experts usually do not have any structured information that helped them to make decisions. In short, they depend on their intuition. In this process the information processor take a passive role, only receiving what the experts gave them.

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-1-   (WPIL)
TI - Coupling structure of metal tube and
     resin pipe in gas piping system
     includes number of protrusion parts
     which protrude inside of metallic
     junction part to outer surface
TT  - COUPLE STRUCTURE METAL TUBE RESIN
     PIPE GAS PIPE SYSTEM NUMBER
     PROTRUDE PART PROTRUDE METALLIC
     JUNCTION PART OUTER SURFACE
PA  - (KYOT-) KYOTO SEKIUGASU KK
PN  - JP09089180-A   97.03.31 (9723)  8p
      F16L-047/02
PNA - J09089180
PR  - 95.07.19 95JP-182455
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Keyword

The Use of Patents

The information processor can take a more active role in the technology processing process. They can gather information that can help the experts make decisions. The information gathered has to be structured, giving the experts the critical information that is important to the forecasting process.

Figure 2

Technology

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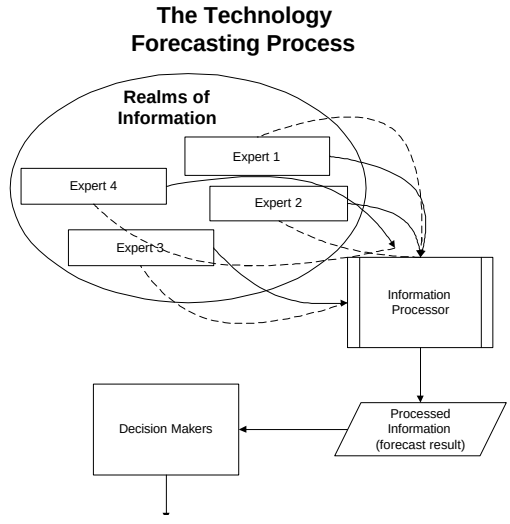

The patent anatomy makes it possible for us to obtain time information about when the patent was issued. Using this information, if we can select a group of patent to represent certain kind of technology, we thus can make an analysis for that kind of technology, its evolvement, etc. This analysis will provide a very useful tool for experts to aid them in determining the course of technology.

Patent titles current as of February 28, 1995.

Patent titles are truncated in length at 157 characters. This
is due to the C code used to do fast title text retrieval that
I wrote - it will be corrected.

5388011 X 1994
Peak detector with look ahead

5373404 X 1994
Helical scan type rotary head drum unit

5363364 X 1994
Audio data recording/reproducing apparatus

Before we can proceed further, the information processor need to identify the text structure of databases that are going to be used. It is important to remember that the information that is going to be extracted is only certain part of the patents, not the full text. The information processor has to devise means to extract the time information and then convert it into something "forecastable". The Software "P.E.P" (Patent Extractor and Processor, Industrial Engineering Department, ITB) is an example of software that extracts and converts the data into something comprehensible.
In this process, the selection of patents becomes a very important step. The selected patents must accurately represent the technology we want to forecast. The selection process varies among the patent-search services used. In ORBIT-Questel database, the selection of patent is performed using keywords. So, the selection process is selecting keywords that represent the technology. For US patent, patents are grouped in categories with each category representing a research area. A technology can either be represented by a category or several ones.
Selection of keywords and categories representing each technology has to be done by experts, as the information processor lack the expertise or insight to do this. The information processor can help the experts in choosing keywords or categories by supplying them with processed information about the database or search services (for example : tools to obtain wordlist from the database, tools to match categories etc.)

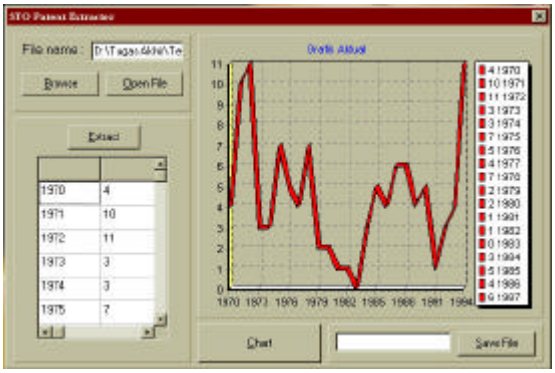

Figure 5

After the keywords or categories are obtained, the information processor can then proceed to collect the information from the selected databases. After the datas are collected, the

information processor process the information into something comprehensible for the experts to work on.
The experts then verify the information and by using the other external information they have and their experience, the experts give recommendation to the decision makers.

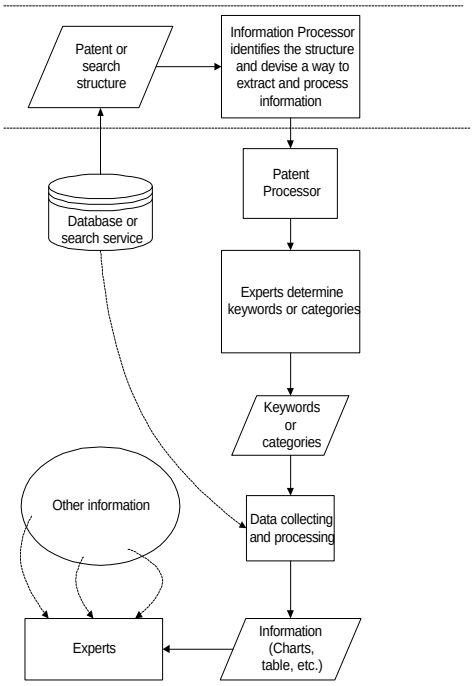

Figure 6

The Use of Patents in Technology Forecasting

Future Development

The use of patents in technology forecasting is made possible by advancement in computer technologies. Processing hundreds even thousand of records now can be done easily and fairly quickly.
Patents are structured documents . As the technology develop, especially in the area of artificial intelligence, the document processing can move toward the unstructured document processing.

Conclusion

The use of patents in technology forecasting cannot replace the role of experts in forecasting technology. It is a tool that help the experts make decisions. It gives the experts processed information that is easy to understand. It makes the decision process faster.