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The Art and Science of Patent Mapping

By Joseph Hadzima and Craig Carlson

It's Monday morning and the Senior Management Team of Technology, Inc. has started its weekly executive meeting. The CEO turns to Mary (VP of R&D) and Bill (VP of Strategy/Business Development) and says "I have been thinking we should launch a new product initiative into the electronic widgets market. Mary's team has been tinkering with widgets and I have a feeling that this could be a big opportunity for us. I want you two to check it out and get back to us next Monday."

In the past, Mary would get her R&D staff looking at technical papers and assembling information about technical solutions to widgets. She would be particularly interested in the intellectual property landscape for widgets- is there even room to maneuver here? Mary brings in her patent counsel, who does some searches and presents Mary with a stack of 50 patents to review.

Meanwhile, Bill would have his staff looking at trade press and publications to determine who is in the widget space: the competitors, the partners and new players. There is a huge amount of information to sift through - detailed patents, technical papers and so forth; and then the business and technical people have to communicate and understand what is going on. It is a very daunting project.

Help has arrived. Patents represent significant investment decisions in technology and in the perfecting of intellectual property rights to protect that technology. According to a GAO study, the cost for a small company to obtain and maintain a patent in 10 industrial countries is in excess of $350,000.

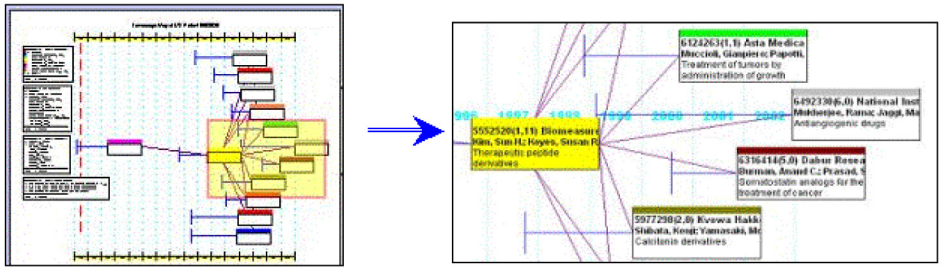
Patents contain critical information about corporate strategies in markets, products and technologies. New techniques and advances in text processing, parsing and analysis technologies have made it possible to data-mine the golden information contained in patents. One of the most exciting new approaches is relationship mapping and in particular patent citation mapping.

To obtain a patent, the inventor must show that the invention is novel and must cite known prior inventions/art

which are relevant to this determination. Each patent has at least three people looking at what is relevant prior art: the inventor, his or her lawyer and the patent office examiner.

These "multiple eyes" provide insights into the technologies relevant to a single patent. But if you can integrate these insights over *groups* of patents then the information revealed goes well beyond the legal or technical areas and provides critical actionable information to support business strategies and processes. The problem is how to pull all of this highly detailed information together in a way that is understandable to technical and non-technical people alike.

Patent citation mapping using visualization technology provides a solution. One version of mapping technology developed in the course of commercializing MIT technologies provides a high-level view of the landscape while preserving the detail. Patents are displayed in a time dimension (earlier patents to the left, later patents to the right) and the patents are connected by their prior art citations, showing key patents and relationships. Right-clicking on any patent box provides the legal and technical team with access to underlying documents at the US Patent Office, such as the full text of the patent, the drawings and image file, the assignment and prosecution history and the worldwide patent family from the European Patent Office.



(Patent Map courtesy of IPVision, Inc., Cambridge, MA)

Experience has shown that when the patent universe can be visualized in these ways, communication is facilitated and new innovation can be ignited. Visualization of this information enables communication among technical, legal, marketing and strategic functions thus facilitating the development of intellectual property strategies, R&D planning and new product initiatives.

For example, an oil field service company found that its patents were being cited by inventors of minimally invasive, endoscopic surgery devices. The reason? Both applications involve locating, positioning and manipulating

devices (drill bits and endoscopes). The oil industry engineers are now studying how smart medical device engineers are approaching similar problems, thus providing potential innovative ways of thinking to the oil industry.

The managerial challenge is to take this vast array of information and formulate a view that includes an IP dimension as well as market and competitive parameters. Analyzing these landscapes is an ongoing exercise utilizing technical and legal experts. It also must involve the senior management of the organization to be fully successful.

Experience has demonstrated that understanding the art and science of patent mapping greatly improves the selection of in-licensing and out-licensing targets, helps find potential infringers, assists with making the best deals and maximizes returns in the creation of value.

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