

Introduction

Creatively found elsewhere: strategies to succeed at open innovation

Introduction

At the beginning of the last century, companies began to create research and development (R&D) groups to advance the commercial application of science. This enabled them to have complete control over the new product development process, rather than having to wait for the scientific community or other companies to start producing the components required in their products. By doing everything themselves, companies had the advantage of owning the rights to inventions that they patented and had less need to acquire rights from others.

The technology market has now changed – and this requires organisations to change. It is now beyond the capability of any one company to manage everything itself. It is simply too expensive to develop ideas alone. As Henry Chesbrough of the Centre for Open Innovation at University of California at Berkeley said, “Corporations can no longer hire all the smart people.”

One way in which corporations are changing is through the adoption of the open innovation business paradigm. The term ‘open innovation’ was first coined by Chesbrough in his book *Open Innovation: The New Imperative For Creating and Profiting From Technology* (Boston: Harvard Business School Press (2003)). Therein he described how, in a world of widely distributed knowledge, companies cannot afford to rely entirely on their own research. They should instead buy or license processes or inventions (eg, patents) from other companies and, conversely, leverage internal inventions not being used in a firm’s business through licensing-out, joint ventures and/or spin-offs.

Thus, the concept of open innovation is actually a model for the corporate management of innovation, the licensing-in of needed technology and the exploitation of unused intellectual property for licensing-out.

This chapter discusses a new way of looking at open innovation: the ‘creatively found elsewhere’ (CFE) principle, which provides a new perspective and methodology on how to succeed at open innovation.

What is CFE?

The CFE principle means that if it does not come from here (your company), then it needs to come from elsewhere (outside your company) – and you should be creative in how you decide where your company’s next innovation comes from.

The CFE principle is an antidote to the ‘not invented here’ syndrome which can hinder an organisation’s ability to bring products to market more quickly. In this fast-paced, high-technology, knowledge-based era, innovation cycles are growing shorter. It is no longer possible for companies to rely solely on their own R&D and innovative teams to keep up with customer demands for new versions, upgrades and enhanced functionality. Companies must cast a wider net and have deeper resources – which means that they need to look elsewhere creatively to supplement their innovation initiatives and to find new applications for existing technology.

Benefits of CFE

At Thomson Reuters, a number of customers have told us that they are using open innovation as a means of enhancing their product pipelines, given the rapid product iteration cycles and demand for continuous upgrades and enhancements. Some of the benefits of open innovation that they have shared include:

- rapid iteration;
- quick ubiquity;
- increased revenue;
- a global talent pool; and
- finding a better way.

Helene Rutledge, director of open innovation at GlaxoSmithKline, recently stated that Glaxo was practising open innovation four years ago, but at that time less than 20% of its portfolio was open innovation related. Glaxo’s reason for embracing this methodology was to enhance its product development pipeline. Today, more than 50% of its portfolio is attributed to open

innovation and it incentivises people for their ‘proudly found elsewhere’ attitude (revealed at the World Research Group Conference: Corporate Counsel IP Summit, April 2010, New York).

Open innovation has proven that it can reduce product cycle times by incorporating the knowledge and insight of others in similar or tangential fields.

Forrester Research studied a partnership between InnoCentive, an organisation that harnesses collective brainpower around the world to solve problems, and SCA, a Swedish maker of personal hygiene products with over 50,000 employees and annual sales of €10 billion (\$14.6 billion). It found that R&D challenges posted externally by the firm generated an average return on investment of 74%, with a payback period of less than three months. Forrester also found cost savings, a faster research process and a more innovative culture (*The Economist*, “A Market for Ideas”, September 19 2009).

The bottom line is that open innovation can help companies to find new – and in many cases better – ways of doing things, more quickly and often more cost effectively than if they were done through their own organisations.

Strategies for applying CFE

The CFE principle involves the creative use of information resources to identify potential partnerships. One key way to do this is through the systematic examination of published patent data. Patents are used across the different stages of the innovation cycle to protect and exploit ideas arising from R&D through to protection and assertion of IP rights covering launched products and processes.

The stages of the IP lifecycle (as outlined by Thomson Reuters – IP Solutions Business in 2009) are shown in Figure 1:

- research and innovation;
- application and prosecution;
- maintenance and monitoring;
- licensing and commercialisation; and
- protection and assertion.

The CFE principle can be applied at all stages of this IP lifecycle. Here we examine how it can be used at two key stages: research and innovation, and licensing and commercialisation.

Research and innovation

Citations provide route to R&D paths and innovation

One strategy for the research and innovation stage is to use citation data to identify context shifts in development. Citations provide an enormous amount

of competitive intelligence and today’s technology allows us to follow citation trends across entire portfolios. We can follow the downstream activity from a founder patent and see where it has led.

According to a recent article in *Science Business*, it has been estimated that as many as 88% of the world’s patents are never used (“Recession is a Time for Innovation”, July 22 2010). Patents represent a rich source of unique ideas that can be leveraged in other industries. The question is how to find these treasures buried deep within the world’s patent data. One route to identifying new technology pathways is through patent citation maps. By tracing citations over time, you can see technology shifts. A high number of citations may be indicative of a patent that is valuable in the evolution of a field of technology.

Analyse the technology evolution

In the citation map in Figure 2, later published patents citing a core auto manufacturer’s technology patent are plotted clockwise by time to trace the evolution of the central technology.

The importance of a technology may not be as relevant during the early stages of its lifecycle. However, for this patent you can see the rate of citation increasing over time, which may indicate the increasing value of the technology and the identification of new uses of the invention or applications in adjacent markets.

This type of analysis can reveal potential partnerships, licensing opportunities and markets ripe for open innovation.

Figure 1

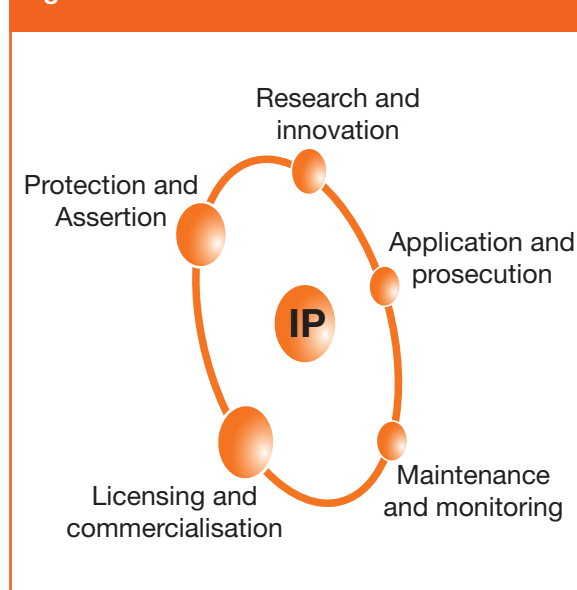
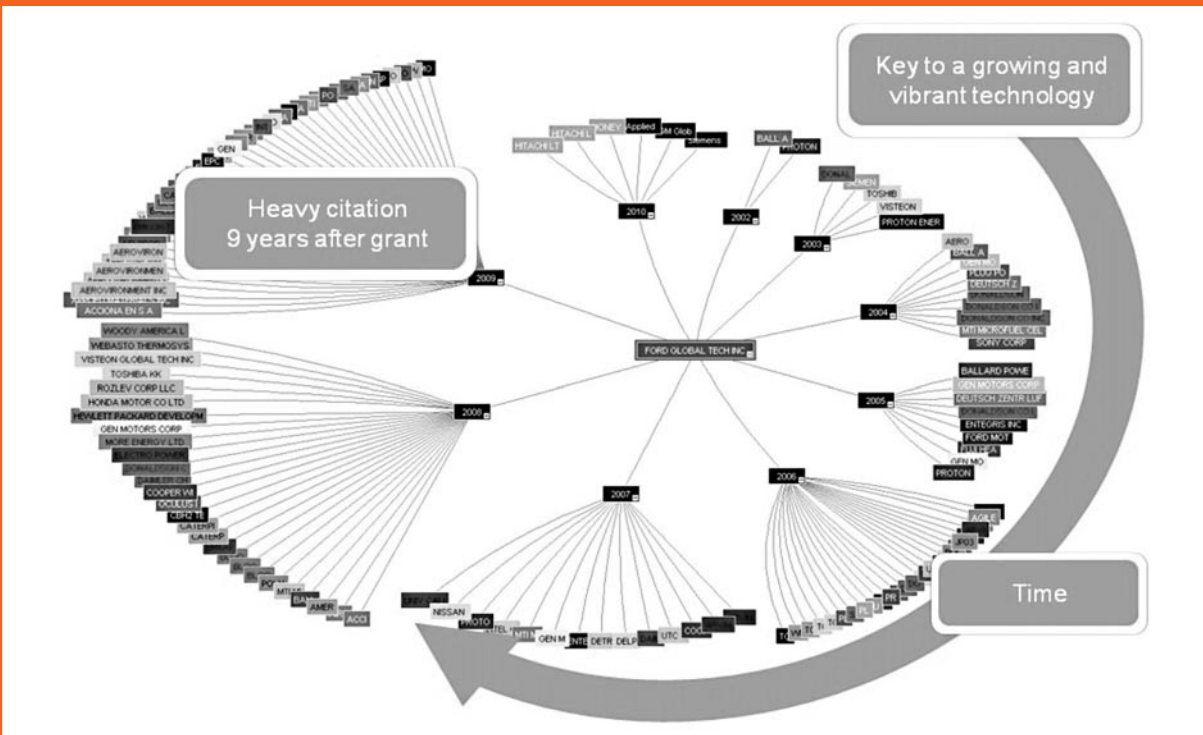


Figure 2: Citation map from Thomson Innovation, the research and analysis platform from Thomson Reuters, illustrating citation evolution grouped by time.



Citations highlight context shifts in development

Code drift is a feature of citation collections that can help to identify new directions in technology. This is a phenomenon that can sometimes be observed when examining multi-generational citation maps. The ‘code’ to which we refer is the International Patent Classification Code (IPCC), which categorises patents by technology. It can sometimes be seen when we look at citations of individual patents, but the reliability of the observations is much greater when we look at a mass of documents where any citation biases are diluted out, and where we can leverage the knowledge of hundreds or thousands of applicants and examiners.

By following the evolution from a founder patent in a particular technology space, you can see how it spawns generations of citations that eventually cluster in another technology area. Then, using text mining, you can map the entire collection of patent citations to see quickly the various applications in an evolving technology field.

In Figure 3 the founding document on the far left is IPCC Eo4Coo3, which refers to building materials used in construction (eg, joists, girders and trusses made from wood). Over time, a new application for this technology has developed, shown by IPCC A47, focused on furniture applications, including cabinets, racks and shelving units. In this case it is probably a natural progression of the

technology, but in some cases you discover a breakthrough idea. Either way, this analysis can spur an open innovation opportunity.

Highly significant founder documents can provide us with large collections to analyse for technology trends. In Figure 4 the founder document and citations by the founder inventor are in the same grey. But many citations have been made that are from other inventors or companies. Looking at just three citation generations from the founding document, there are over 1,400 citations. This citation collection can then be analysed via text clustering to understand all its applications.

By mapping the citation data into a three-dimensional model landscape visualisation, you can clearly see how the technology has evolved. In Figure 5 the original technology involved applications for datastream displays (bottom left). A future application of the technology has moved into another IPCC area involving waveguide arrays and other new uses, represented by the dark grey dots (top right).

Licensing and commercialisation

Antioxidant example: a by-product of paper pulp production

An example of using open innovation to break into a new market can be found by looking at tall oil, which

Figure 3: Citation map from Thomson Innovation showing forward citations grouped by IPCC.

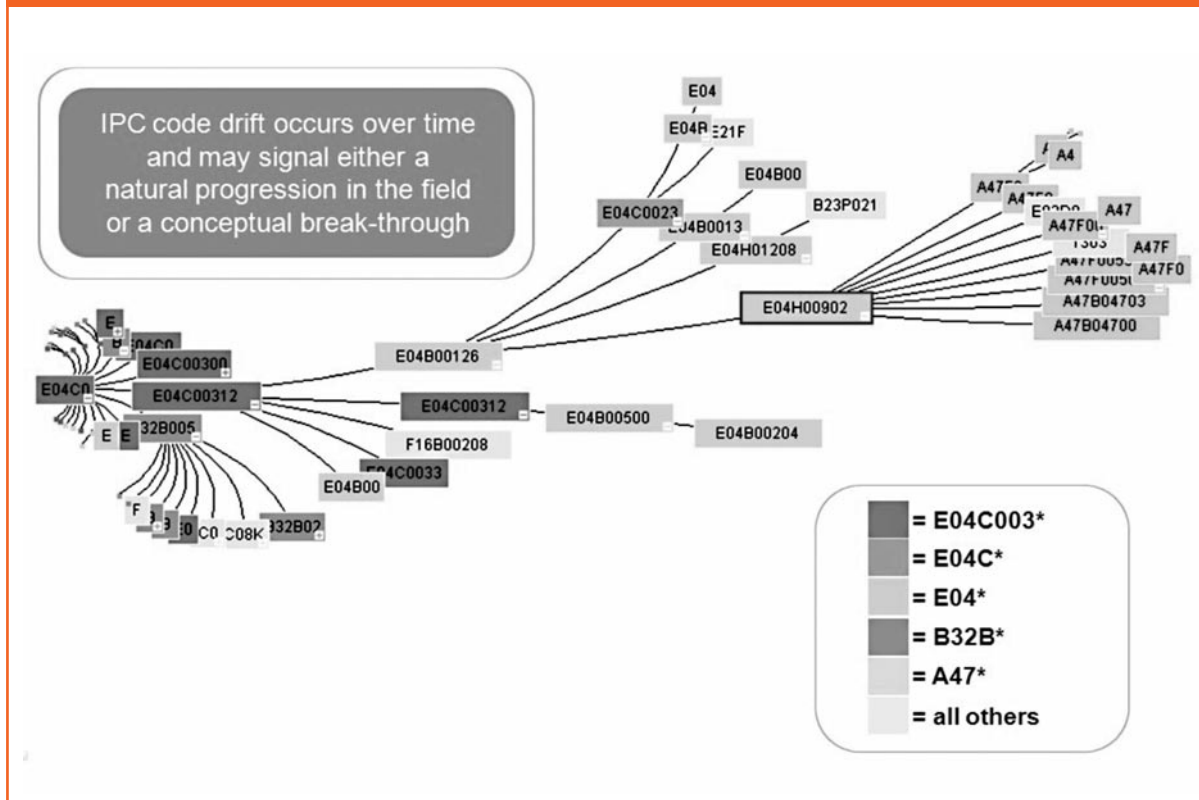


Figure 4: Citation map from Thomson Innovation showing three generations of forward citation activity, coloured by inventor/assignee.

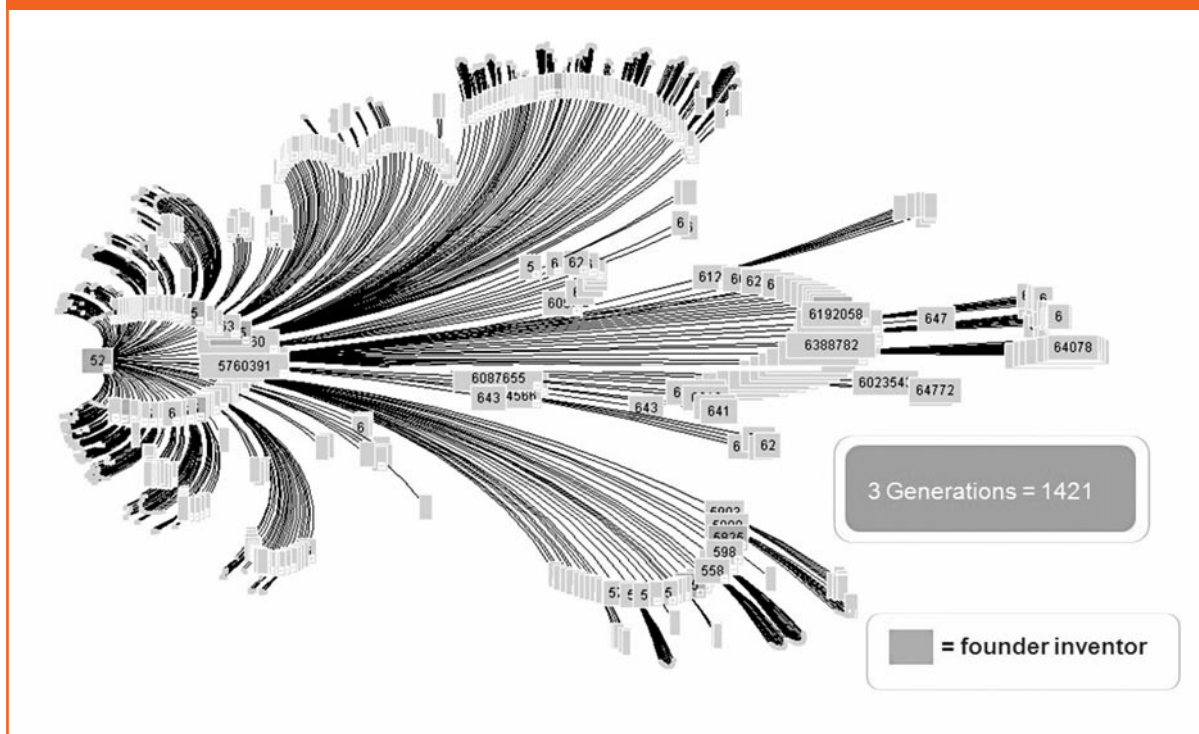


Figure 5: ThemeScape map from Thomson Innovation depicting technology applications via thematic conceiving and clustering.

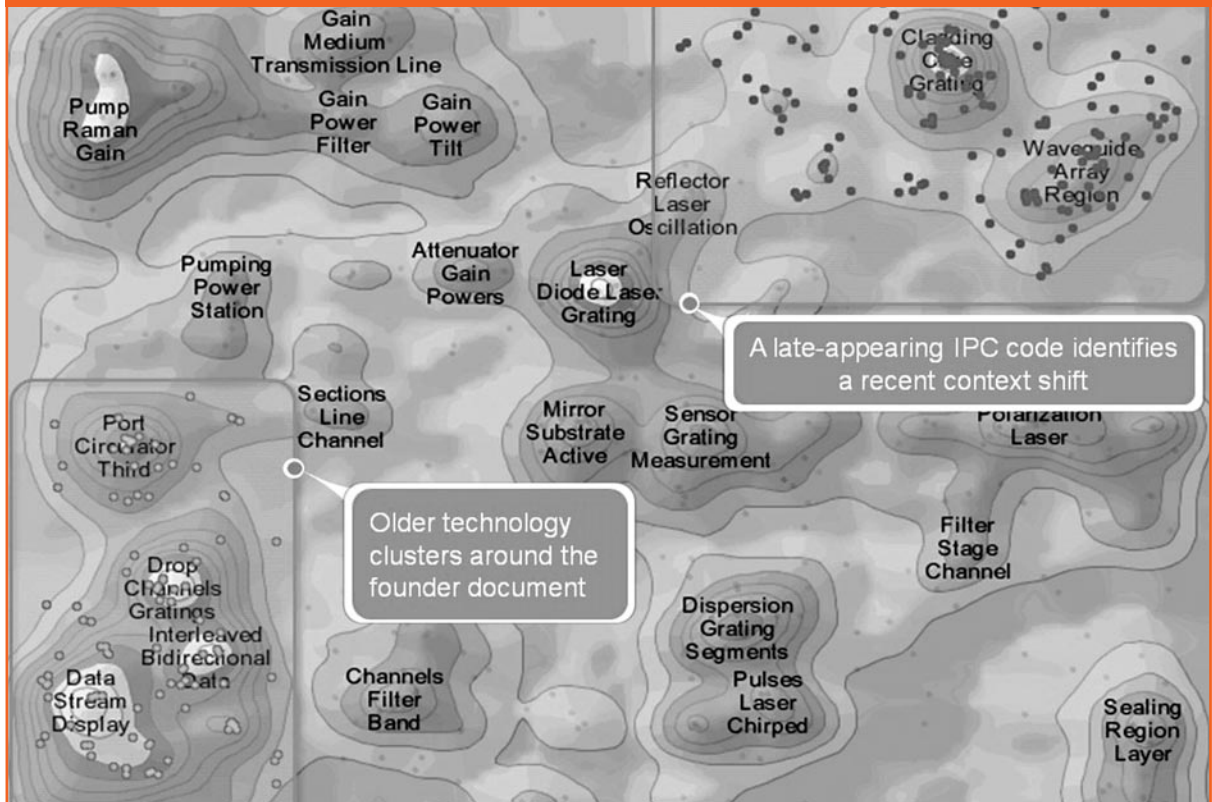


Figure 6: Citation map from Thomson Innovation showing the citation evolution by year.

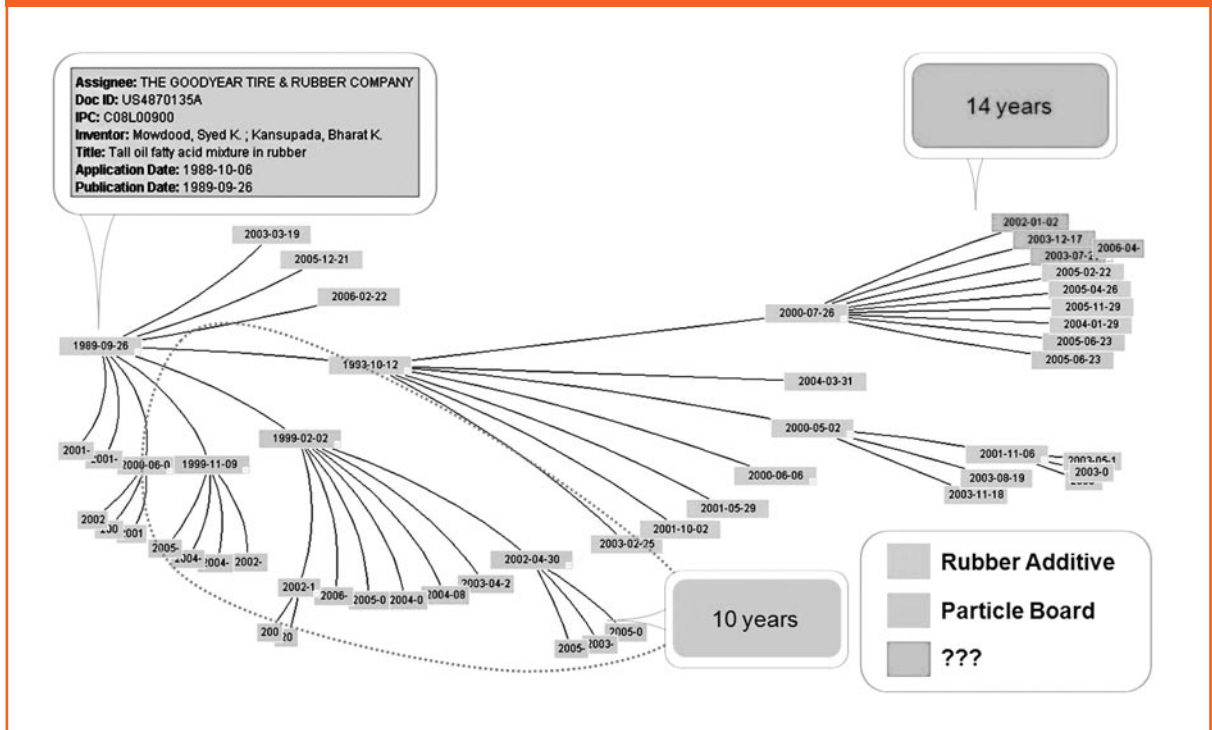
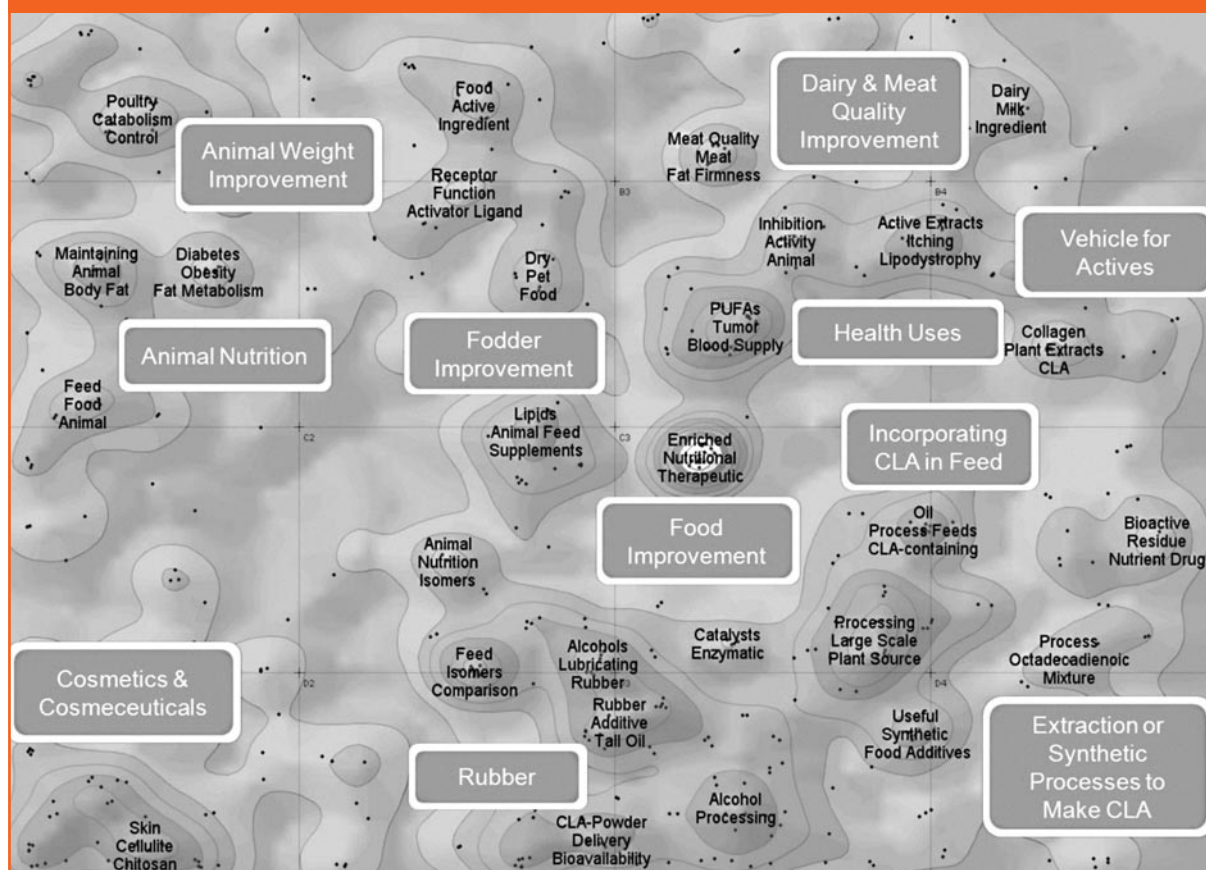


Figure 7: ThemeScape map from Thomson Innovation illustrating the various areas into and applications for which the original product evolved.



is a by-product of the processing of pinewood for paper and pulp. Over time it was discovered that tall oil also has many other applications (eg, in detergents, soaps, rubber, printing ink and asphalt additives).

In 1998 tall oil was used as a rubber additive for tyres, as is shown in Figure 6 in this analysis of IPCC around the founding patent. Applications for tall oil began to shift to particle board material, and then a surprising new application.

This evolution occurs over time. The first shift took about 10 years, and the new use took 14 years to be uncovered. In what might seem an unlikely development, a new use for tall oil in food was discovered. Certain of the patents are owned by Unilever and its spin-off, Loders Croklaan, and describe the use of conjugated linoleic acids (found in tall oil) as taste and health components in food products.

If we follow this development even further downstream through citations, the food use evolves into a healthy additive for foods and dietary supplements that have special applications for people with diabetes.

Laying out the complete collection of citations on a

landscape map, you can examine the entire field of conjugated linoleic acid use. All these applications are for what was once a waste product.

The map in Figure 7 represents the many licensing and commercialisation opportunities that have arisen from the single founder patent.

This type of citation analysis and landscape mapping exposes the potential for finding open innovation partnerships and perhaps in or out-licensing opportunities. This is a great example of how new ideas or extensions of existing inventions can be ‘creatively found elsewhere’.

Conclusion

Having described the benefits and techniques for identifying open innovation partners, how does one put the CFE principle into practice? A recommended process for identifying partners is as follows:

- Identify patents for which you want to find (or have found) alternative uses.
- Look at the citations – who is referencing these patents? Is the technology branching into new markets?

- Expand your view to look at the new technology space and see who else is operating in that area.
- Build a target list of players, identifying who they are and what intellectual property they have – where is the best quality and fit?
- Embrace the CFE principle – make the decision to engage in open innovation by creating visualisations

and maps as outlined here to help to convince senior management to explore the benefits of open innovation with the targets that you identify.

In describing some of the strategies behind the CFE principle, you are now armed with the information to succeed at open innovation.

**Susan E Cullen**

IP consulting practice director
sue.cullen@thomsonreuters.com

**Thomson Reuters – IP Solutions
Business**

United Kingdom

Susan E Cullen has 10 years of IP management experience, including directing a licensing office and participating in the redesign of IP practices at Monsanto/Pharmacia. Since 2000 she has worked as a consultant in IP analysis, helping people and companies to succeed through effective IP management. Dr Cullen develops methodology for extracting competitive and technical intelligence from intellectual property, gives advanced training to users of Thomson Reuters analytical tools and provides customised consulting for clients of Thomson Reuters.