

A value chain approach to IP management

As a proactive business tool, a company can use its IP not only to increase profits in its traditional areas of product development, but also to foray into non-traditional markets and to build stronger relationships with buyers and suppliers. By Tom Hunt

In their recent book *Edison in the Boardroom*, co-authors Julie Davis and Suzanne Harrison discuss the hierarchy of expectations that companies may have regarding the value of intellectual property to their business. Davis and Harrison observe that a company's IP goals and level of IP sophistication can range from a purely defensive level, in which patents are specifically used to protect a product stream and to promote freedom of action, to the visionary level, in which IP becomes a strategic tool for identifying business trends, leveraging markets and enhancing profit margins. It is clear that, as a company's IP expectations move from defensive to visionary, the company must seek more sophisticated business models to use in viewing, strategising and tracking its IP portfolio.

The purpose of this article is to offer corporate strategists a way to view IP not just as a defensive/reactive tool, but as a more proactive, strategic tool that is an integral part of a firm's business plan. This can be accomplished through the novel application of IP strategies to a traditional value chain analysis. When properly applied, this approach can result in greater market leverage, greater revenue potential, and enhanced innovation.

Defining the value chain

A value chain is a strategic business map that follows the flow of a product, beginning with the raw materials used to create it and ending

with the introduction of the product to the consumer market. A company's position on the chain is determined by the business activities in which it engages, ie, what value the company adds in the overall product flow. A particular value chain stage also correlates to a certain level of profit margin/revenue that a company can expect when engaging in those business activities. An interested reader can find out more about the basis for, and more traditional uses of, value chain analysis by reading the book *Competitive Advantage* by Michael Porter.

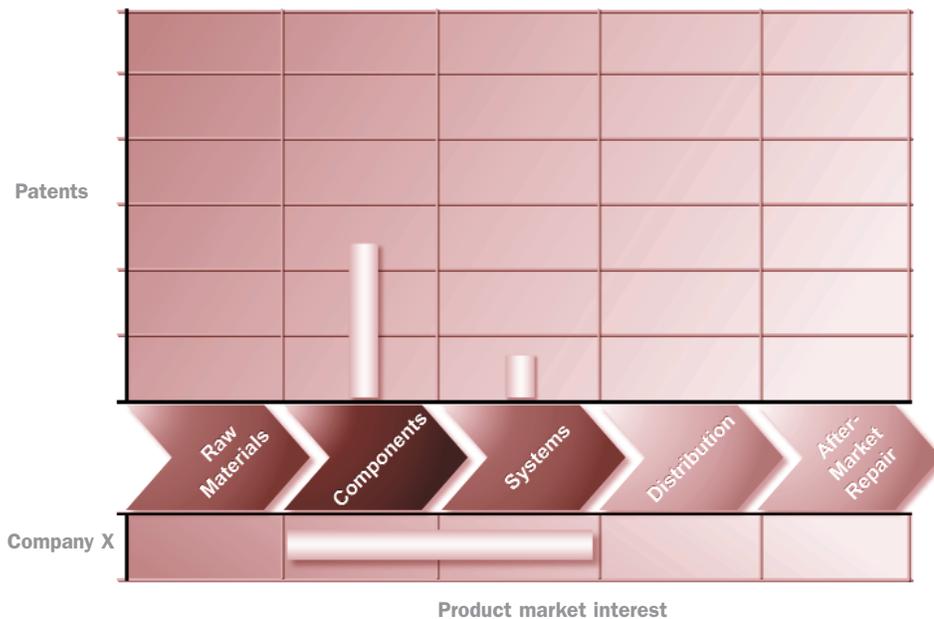
Figure 1 is an illustrative example of a value chain framework as might be developed for a company that manufactures and sells personal computers. The flow of product begins at the value chain stage labelled Raw Materials. In this example, companies that participate in the Raw Materials stage of the value chain may be involved in the production of integrated circuits, wire, sheet metal, etc. Companies operating within the Components stage would integrate these materials into circuit boards, power supplies, mechanical assemblies, and the like, while companies in the Systems stage would put together hardware modules, assemblies and subassemblies. Value, in this case, is being added to the product by introducing more complex physical assemblies through successive levels of integration. In contrast, companies at other value chain stages may add value to the product by providing a service that facilitates the delivery of the product to the end consumer, eg, the Distribution stage, or by assisting the end consumer in maintaining and servicing their computer system, eg, the After-Market Repair stage.

In practice, a unique value chain framework

Figure 1: a value-chain framework



Figure 2: distribution of patent portfolio



can be created for any industry, product market space, or individual company. Development of a value chain framework provides an extremely useful visualisation tool for understanding where value, and the market leverage it brings, exists in a company's business environment. Furthermore, the value chain is also a great structure for understanding how to develop and properly disposition IP which can be more strategically applied to the business.

IP and the value chain

An exemplary Company X is hereafter used to illustrate how effective IP strategies can be developed once a company locates and understands its particular position on the value chain.

Let us assume that Company X has traditionally produced products that fall into the Component and Systems stages of the value chain as illustrated in Figure 1. Company X would therefore want to focus its energy on becoming a more effective competitor in these market spaces. Because Company X has invested its R&D resources in developing new, innovative products, it has many inventions, some of which are patentable. Company X has dutifully expended resources to file patent applications on those inventions perceived to bring the greatest protection for its product set. Like so many other companies, Company X sees IP only for its defensive aspects, including freedom of action for itself, and/or to create a barrier-to-entry for its competitors.

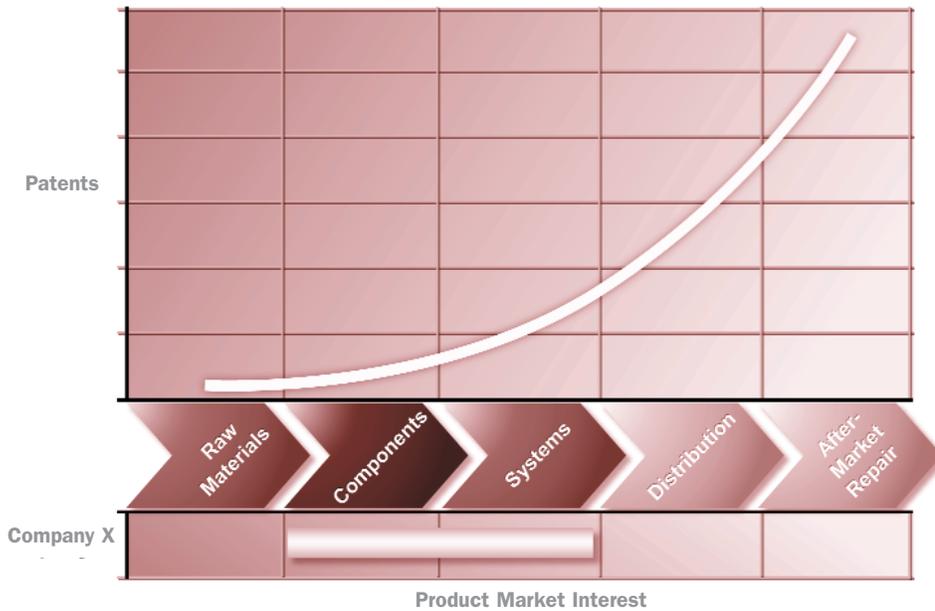
Company X's approach to IP portfolio development is a common one, and is evident in the distribution of its patent portfolio as shown in Figure 2. Company X has patents only in the Component and Systems stages of the value chain, with greater emphasis (ie, having more patents) on the more detailed inventions of the individual components, rather than on the broader inventions relating to the systems that it builds. However, what if Company X decided that it wanted to become more strategic in its use of IP? How could it use the value chain framework to accomplish this goal? Although there are many options, this article focuses on three of the most effective strategies.

Create leverage by developing IP in the high-profit stages of the value chain

In any value chain, certain stages of the chain are likely to be more profitable than others. This may be a result of the size of a market, the higher profit margins for that market, or a favourable combination of the two. Figure 3 illustrates the relative profitability of the stages of Company X's value chain. This exemplary profitability curve indicates that the level of profitability rises as the product moves toward the end-consumer. In this case, Company X produces products in the lower profit stages of the value chain. In addition, because of its traditionally defensive posture with regard to IP, its patents are also situated in low profit regions. While it is important for Company X to protect its products through the patenting of IP, it may also be uniquely able to develop IP in the higher profit stages of its value chain because of its industry experience and know-how. The value of a patent portfolio is, most often, directly related to the size of the commercial profits that can be gained through the sale of products that use the inventions. By applying some of its inventor resources to investigating novel methods of distributing and repairing its product, and then by patenting those inventions, Company X may be able to position itself to extract value from high-profit areas of its value chain that were previously unavailable to it. Value, in this case, could come in the form of licensing dollars gained in agreements made with companies that distribute and/or repair products like the ones made by Company X.

The value chain and the profit curve that have been proposed in this article for Company X and its product market are fictional. While it is understood that the profitability curves may differ between value chains for different market segments, the principle remains the same: companies that wish to participate in other high-profit segments of their marketplace can do so through strategic ownership and use of IP

Figure 3: relative profitability



by gaining an understanding of their value chain position and the distribution of profits across it.

Drive innovation in your product set by understanding downstream IP

The value chain has directionality, meaning that product flow is, in our example, from left to right. As shown in Figure 4, the direction associated with the flow of product is commonly referred to as downstream, while upstream refers to the direction that is counter to the flow of product. These terms are also useful in describing the relationship between companies participating in the same value chain. For example, the fictional Company X produces product in the Component and Systems value chain stages. Therefore, companies that participate in the Distribution and/or After-Market Repair stages can be said to be downstream of Company X.

Companies that are downstream of Company X are more likely to be customers of Company X. These companies are buying product from Company X, adding value either through the development of new applications for that product or through new methods of distributing

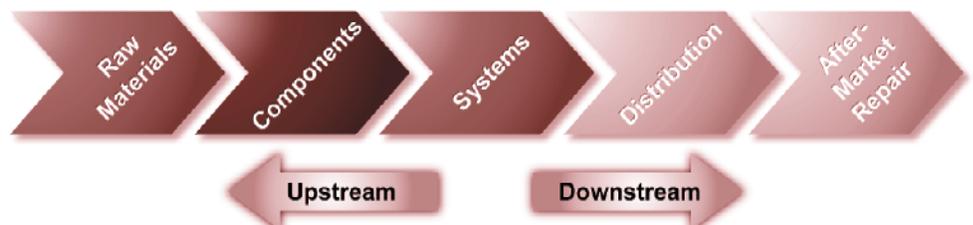
and selling those products to a market. By researching and thoroughly understanding the IP of downstream companies, Company X stands to gain insights into the most important issues facing its customers. After all, patents can be thought of as publicly available documentation of a company's key technical problems and its solutions to those problems. Collectively understanding its customers' key technical problems may lead a company to solve those problems more effectively by incorporating solutions into the products the company supplies to its customers, potentially saving them time, energy, and money. With this knowledge, it is also possible for a company to predict the new problems that will be facing its customers in the near future, and to work to solve them in its product set.

Aside from the positive impact on innovation within the company, attention to downstream IP can also help a company develop a stronger patent portfolio by ensuring that the patent portfolio covers not only the technical specifics of the product, but also the novel methods of use and business methods. In this way, the portfolio becomes broader and more difficult to invent around.

Extract value from supplier relationships by securing upstream IP

Conversely, companies that participate in the Raw Materials stage can be said to be upstream of Company X. These companies are typically materials vendors to Company X. Often, companies similar to Company X enter into joint development efforts with upstream companies during the course of product development. These joint development efforts take different forms, ranging from very informal conversations over coffee to formal programmes with contractual agreements in place. In any form, these efforts can be very productive and may generate potentially patentable subject matter. In fact, inventions that result in improved performance of the raw materials supplied to Company X may be the key market differentiators for the products it produces. Unfortunately, in most cases there is no formal mechanism for identifying, documenting, or properly determining

Figure 4: directionality of product flow



The Dow Chemical Company case study

The Dow Chemical Company is certainly not a newcomer to the intellectual asset management arena. Having first instituted their Inventions Management Program in 1947, and then making the move toward a more comprehensive IAM programme in the early 1990s, Dow is now recognised as being an industry leader in its use of IP to create value for the company. As testimony to this fact, licensing revenue from Dow's portfolio grew from a modest \$20 million in 1994 to a very respectable \$278 million in 2000.

Bruce Story is Intellectual Capital Director of the Polyolefins & Elastomers Business Divisions of Dow. Bruce, a veteran of Dow's R&D organisation, now spends his days developing and implementing new processes for managing intellectual assets at the company. Dow, a manufacturer of chemical, plastic and agricultural products, is about as far upstream in its value chain as one can get. The company supplies raw materials to a massive collection of downstream companies, including component and system manufacturers in a variety of application spaces.

We recently asked Bruce about Dow's IAM programme, the company's view of value chain analysis and its impact on strategic development and deployment of IP. In Bruce's view, Dow clearly understands the importance of the value chain from an intellectual asset (IA) strategy point of view.

"Yes, we are practising [value chain IP strategies] today," he says. "A prime example is our newly commercialised product, Dow XLA* elastic fibre. Although Dow is a basic materials supplier, we embarked upon a new business model in which we would capture more value downstream with this product. The most critical part in being successful with this strategy is in owning the intellectual assets of raw materials,

components and systems and having a strong trademark strategy. As a result, we are beginning to establish ourselves as facilitating innovative fashion fabric performance. We are finding a ready receptivity among leading fashion clothing designers as our material allows new freedoms in design and use."

When asked about the possibility of alienating Dow's customers by securing patents in their technology space, Bruce's response focuses on building stronger relationships with the customers. "There are various reasons why you would want to patent in [your customers'] space. A key reason for us is to protect our customers from their competitors. Our goal in developing new polymers is to be able to sell them to a wide variety of customers. If a particular customer were to broadly patent the use of that material in a particular application space, they would be able to keep the rest of their competitors from participating in the market. This would be bad for the industry and bad for Dow, as we would have a very small market, and it might not make good economic sense for us to make the product. So, we are trying to patent, or publish, in such a way as to create freedom of action in the broad end-use so as to protect all the customers."

In terms of IP, Dow determines which stages of the value chain it should participate in and which stages need to be protected and by what method. As the company takes a closer look into the different stages it does not actively participate in, Dow then determines what IP it should own in each of those stages.

Dow's development and implementation of new internal processes for IAM and clear understanding of its position in the market value chain has demonstrated proven value and delivered a positive impact on innovation within the company.

ownership of the IP resulting from joint development efforts with materials suppliers. As a result, the inventions become incorporated into the upstream companies' products, and are then sold to companies that may be in competition with Company X. What should Company X do about this?

- Have a contract in place for those suppliers with whom invention is possible/probable that clearly defines the terms for how IP will be handled. Key issues to resolve would be: who will be responsible for capturing and filing the IP; how ownership will be determined; and what will become of inventions that are developed and built on new innovations.
- Hold regular meetings to discuss and capture inventions generated by the joint development effort.
- Document inventions and consult IP counsel regularly.

By clearly defining IP ownership before and during the course of the relationship, a company prevents sensitive IP from being sold to competitors and avoids potential and ultimately costly conflicts that may arise over IP ownership.

Flexible strategies

The IP strategies discussed above are extremely flexible and able to be incorporated in any company's overall business strategy. Depending on its long-term goals and objectives, a company may want to employ one or a mix of the three IP strategies at different stages of its growth. In order to do so, it is necessary for a company to first understand its position in the market value chain and the IP implications of that position.

Over the past decade, IP has been increasingly considered a formidable asset in a company's strategic arsenal. It is important to understand that IP can be more than a defensive weapon, and that it can be actively incorporated in a company's business strategy. ■

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The author would like to acknowledge the contributions of Dave Crawford and Don Davis, Director and Managing Partner of ipCapital Group, to the creation of this article. Their early work in the area of value chain analysis and its use in IP strategy development added significantly to the article's content. He would also like to acknowledge the editorial assistance and commentary provided by Song Volk, an associate at ipCapital Group.
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