Discovering New Value in Intellectual Property

More companies are learning to exploit patents as potent competitive weapons and as a source of unexpected revenues. Think clustering, bracketing, and mapping.

Richard Thomas is not your typical chief executive officer. Most Fortune 500 CEOs, when asked how they intend to increase shareholder value, will talk about increasing sales, creating new leading-edge product lines, or pursuing mergers and acquisitions. But Thomas, who was appointed CEO of the $30 billion Xerox Corporation last summer, isn't content with such conventional strategies. He believes one of the strategic keys to Xerox's future is something so intangible, so invisible to traditional bottom-line thinking and corporate practice, that it doesn't even show up on the balance sheet.

"My focus is intellectual property," he declares. "I'm convinced that the management of intellectual property is how value added is going to be created at Xerox. And not just here, either. Increasingly, companies that are good at managing IP will win. The ones that aren't will lose."

by Kevin G. Rivette and David Kline

HARVARD BUSINESS REVIEW January-February 2000

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Intellectual property? Five years ago, that phrase wasn't even in the vocabularies of many CEOs, let alone a part of their business strategies. Indeed, many chief executives still regard patents, trademarks, copyrights, and other forms of intellectual property as legal matters best left to the corporate attorneys to fuss over while the CEOs concentrate on the truly strategic stuff of competitive warfare.

Not Thoman. Where others see mere legal instruments, he sees business tools. And where others see obscure pieces of paper gathering dust in the corporate legal office, he sees "Rembrandts in the attic" waiting to be exploited for profit and competitive advantage.

To understand why Thoman thinks that way, you have to go back to his days as chief financial officer at IBM. There, he saw firsthand how an aggressive intellectual-property effort boosted annual patent-licensing royalties a
phenomenal 3,100%—from $30 million in 1997 to nearly $1 billion today. This $1 billion per year, it should be noted, is largely free cash flow—a source of capital that represents one-ninth of IBM’s annual pretax profits. That money goes straight to the bottom line. To match that sort of net revenue stream, IBM would have to sell roughly $30 billion worth of additional products each year, or an amount equal to one-fourth its worldwide sales.

Thoman is taking a similar approach to IP management at Xerox. He plans to boost the copier and document-management company’s patent royalties from just under $10 million to more than $100 million annually within two years. And that’s not all. Just as IBM now leverages its patents for strategic and economic gain—Big Blue used them as the currency for $30 billion worth of new component sales in 1999—Thoman also believes that Xerox’s rich portfolio of patents could become passports to lucrative new market opportunities. He believes patents could help the company regain its leadership role in the global technology industry.

The concentration on intellectual property marks him as one of a new breed of chief executive. Those IP-savvy business leaders believe that, in a world where battles are increasingly being waged not for control of markets or raw materials but for the rights to new ideas and innovations, the management of intellectual property must become a core competence of the successful enterprise. Though still a minority among their peers, they nonetheless lead some of America’s most successful companies, including Microsoft, Lucent, IBM, Dell, Dow Chemical, and Gillette. These leaders all recognize that the knowledge economy has given rise to a new ecology of competition in which intellectual assets rather than physical assets are the principal wellsprings of shareholder wealth and competitive advantage. Therefore lies one of the next great corporate challenges: figuring out how to unlock the hidden power of patents.

In this article, we will demonstrate how companies can manage and deploy their patents not just as legal instruments but also as powerful financial assets and competitive weapons that can enhance their commercial success and increase shareholder wealth. We use the terms profit and intellectual property interchangeably in this article, but patents are actually only one type of intellectual property (or legally protected intellectual assets); others include trade secrets, trademarks, and copyrights. We focus on patents for two reasons. First, patents are the most tangible form of intellectual property, they enjoy the strongest legal protection, and (except in the media and entertainment fields) they have the greatest effect on the commercial success and market value of companies today. And second, patent databases are a virtual Alexandria of information. When combined with new automated data-mining and visualization software, these databases can be powerful sources of rich competitive intelligence.

We recognize, of course, that patent strategy is not some Holy Grail for business success, and it is certainly no substitute for quality products, excellent operations, or effective marketing. But the strategic management and use of patents can significantly enhance a company’s success in three broad ways: by establishing a proprietary market advantage, by improving financial performance, and by enhancing overall competitiveness.

Kevin G. Rivette is cofounder and chairman of Ausrigion Systems in Mountain View, California. Ausrigion develops software for intellectual property management. David Rible is an author and a business consultant specializing in patent strategy and electronic commerce-related business opportunities. This article is adapted from their book Rembrandts in the Attic: Unlocking the Hidden Value of Patents (Harvard Business School Press, 2000).

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Establish a Proprietary Market Advantage

Patents enable companies to stake out and control a private and competitive advantage. That is their most powerful benefit. Properly deployed, patents can translate into category-leading products, enhanced market share, and high margins. In some cases, they can even serve as the foundation for a new industry. (Chester Carlson’s original xerography patent comes to mind.) This is true even in the emerging e-commerce industries, where it was once thought the advantage simply belonged to those who got to market first. The collapse of competitive barriers and blurring of industry boundaries on the Internet suggest that patents may become one of the most effective—and sometimes even the sole—means of creating a proprietary, defendable market advantage.

Barnes & Noble, for example, discovered to its dismay that because it lacked any proprietary advantage or patent defense against on-line rivals, its market share could be easily “Amazoned” by the upstart bookseller of the same name. Amazon’slibrary of information. When combined with new automated data-mining and visualization software, these databases can be powerful sources of rich competitive intelligence.

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copier market for nearly 20 years; double-digit margins and earnings growth were the result. But when Xerox was forced to license those copier patents under the terms of a federal consent decree in 1977, the company lost its market share, margins, and industry dominance quickly erode. (Court rulings later overturned the presumptive view at that time that patents were inherently anticompetitive.)

But what if the true source of a company’s competitive advantage lies not in its products or services but in its innovative way of doing business? For example, Dell Computer owes its success in the PC business not to the technological superiority of its products—though of good quality, they are made mostly with off-the-shelf components—but rather to its innovative “build to order” direct-sales business model. In other words, Dell’s advantage lies not in its computers but in its system for selling, distributing, and providing after-sales support for those computers. In similar fashion, Wal-Mart owes its $138 billion-a-year retailing success not to its products but to the sophisticated purchasing, copying its system too closely, the company says its plans in this area are confidential. But Dell has already leveraged those patents to bolster its market advantage: in 1999, the company used its patents as the collateral for a $5.6 billion cross-licensing deal with IBM that provides it with lower-cost components. Dell is freed from having to pay IBM tens of millions of dollars in royalties, which makes Dell more price competitive. Wal-Mart, meanwhile, hasn’t patented its business systems; it is relying instead on the notoriously ineffective protections of trade-secret law. As a result, the retailing giant couldn’t even prevent key employees from walking out the door and taking their knowledge of Wal-Mart’s proprietary systems to potential on-line rivals such as Amazon.com.

The critical point here is that companies must ensure that they protect and leverage whatever it is that adds the most value to their business and whatever represents the most vital sources of their competitive advantage.

Boost R&D and branding effectiveness. Patents can help companies build category-leading products as well as enhance the branding efforts devoted to those products. Hitachi, for example, tries to develop only those products for which patents can help it establish market-dominant share. These aren’t necessarily the most technically complex products, either. Hitachi’s automotive airflow sensor would be easy for rivals to copy, for example, but the company has built such an effective patent wall around it that rivals

Building a wall of patents around category-leading products can help companies defend against copiers and can secure and protect market share.
were forced to look for more complex and expensive—and therefore less competitive—design approaches in their own airflow sensors.

Smart biotechnology and pharmaceutical companies also think about the potential strength of patents when setting their research and development priorities. The biotech firm Genetics Institute decides which version of a drug to develop partly based on which iteration shows the best results in clinical trials but also according to which version can command the strongest patent protection. Genetics Institute's patent counsel says the strength of the potential patent position is a "leading factor" in deciding what research to pursue.

But few companies (and certainly no consumer product company) can top Gillette's use of patents to secure and sustain a market choke hold, as the development of its Sensor shaver a decade ago demonstrates.

According to John Bush, Gillette's former vice president of corporate R&D, the first challenge in developing the Sensor was to map out the patent landscape surrounding the shaver's key performance attribute: its ability to deliver a closer and...
ported that 67% of U.S. companies own technology assets that they fail to exploit. The study noted that these companies on average let more than 35% of their patented technologies go to waste simply because the technologies have no immediate use in products. RTG put the value of those wasted technology assets at more than $115 billion. But that es-
timate is surely too conservative; it assumes that $1 invested in R&D yields a return of only $1. Economic data indicate the return is more like ten to one, thereby suggesting that corporate America is wasting a staggering $1 trillion in underutilized patent assets.

Given the pressures on companies these days to maximize shareholder return, this underutilization of tech-
nology assets represents either a stingi
g indictment of corporate myopia regarding intellectual prop-
erty or the greatest opportunity to be
to the chief financial officers in a
generation. Indeed, the current run-
up in intellectual asset values—demon-
strated not least by the growing
gap between the book and market
values of public companies—sug-
gests that patent rewards may be as
great as the rewards the leveraged
buyout kings obtained 30 years ago
when they capitalized on the under-
valued real estate and pension hold-
ings of corporate America. Let's look
at ways to realize the hidden finan-
cial value of patents.

Top patents for new revenues.
Revenues from the licensing of
patent rights have skyrocketed in
the last ten years, increasing from
$15 billion in 1990 to more than
$110 billion today. Companies are
slowly realizing that intellectual
property can be among their most
valuable and flexible assets. And
the licensing market is still in its
infancy. Experts say revenues could top a half-
trillion dollars annually in ten years.

Yet most companies remain com-
pletely unaware of the earnings po-
tential of their patent holdings.
Those few that do begin licensing ef-
forts tend to do so only when pressed
to the wall financially or when strug-
gling to turn around their competi-
tive fortunes. That was certainly the case for IBM when, in the midst of

its early-1990s restructuring and re-
visualization efforts, it began to sys-
tematically mine its patent portfolio
for revenues. (As we noted earlier, it
now nets nearly $2 billion a year
from the effort.)

Texas Instruments is another
company that began portfolio min-
ing out of desperation; it launched
its patent-licensing efforts in the mid-
1980s, when it faced bankruptcy.

The proper management of patent assets can yield
significant savings in the form of reduced portfolio maintenance costs and taxes.

Since then, TI has earned a phenom-
enaal $4 billion in patent royalties,
and its current licensing revenues
are thought to be in the neighbor-
hood of $500 million a year. Last
May, TI signed yet another licensing
 pact for its semiconductor patents—
this time with Hyundai. That deal
added 12 cents to TI's second-quarter
1999 earnings and is expected to net
a total of $1 billion in additional roy-
alties over the next ten years.

Some companies take a more en-
lighted approach and treat portfo-
lio mining for revenue as a business
in its own right. Under Rick Tho-
man's leadership, for example, Xerox
has established a new business unit
to create profit and competitive ad-
vantag efrom the company's patent
assets. "If you only use your patents
to protect your products, which is
the old paradigm, you're missing all
manner of revenue-generating and
other opportunities," explains Jan
Jafarian, vice president of intellec-
tual property at Xerox.

Lucent, too, recently centralized
its patent assets in a 256-person
business unit and reportedly already
cuts several hundred million dol-
ars a year from it. But with 22% of
its $30 billion in annual revenues
now invested in R&D, Lucent is re-
portedly stepping up licensing efforts
in pursuit of even better returns on
that investment.

In some cases, patent-savvy com-
panies have taken advantage of other
companies' underutilized patent po-
tential. For example, in the mid-
1980s, semiconductor vendor SGS-
Thomson (now STMicroelectronics)

sank cost as a source of R&D fund-
ing or bottom-line revenue, or one
can simply ignore it. We believe
patents just like any other asset,
should be required to generate

Reduce costs. The proper manage-
ment of patent assets can also yield
significant savings in the form of re-
duced portfolio maintenance costs and taxes. Perhaps the best-known
example of reducing costs through
patent management involves Dow
Chemical. In 1994, as part of a corpo-
rate cost-cutting effort, Dow initi-
ated a year-long audit of its IP assets—
an audit that became somewhat leg-
dary in intellectual property cir-
cles. [New automated technology
tools can now do this in days.] Each
of the company's patents, 20,000 at
that time, was valued and assigned
to one of 15 major business units.
The units thereafter assumed finan-
cial responsibility for the patents' use. "Intellectual-asset managers"
from each business unit met regularly
to review patent activity company-
wide and to identify licensing, com-
mercialization, and joint venture op-
opportunities among individual patents or groups of patents.

As a result of its audit, Dow
achieved immediate savings of
$50 million in taxes and mainte-
nance fees on unneeded patents that
were pruned from the portfolio and
in some cases, leased to universities.

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Auditing Your Patent Portfolio

Auditing your company's patent assets involves two distinct tasks: assessing the financial value of the patents in your portfolio and assessing the patents' business and commercial value.

Assessing the Financial Value

Determining the financial worth of your patents, unfortunately, is no easy task. For one thing, valuation methods for intangible assets are at best rudimentary, and the subject of more than a little debate. For another, markets for the trading of patent assets are still in their infancy and thus of little help in providing reliable valuation benchmarks.

Such markets include the proposed Yeta.com, an on-line shopping mall for intellectual property, and the Patent & License Exchange (PLEX), a trading exchange that was slated to launch late in 1999. Nonetheless, it is possible to obtain a rough valuation of your IP assets. The valuation begins with an audit that separates your patents into core and noncore groups.

Core patents are technologies that are or will be used in current or future products. There are few market-based guidelines for valuation of these patents since the patents aren't usually the subject of licensing efforts. They're evaluated, instead, based on how much they contribute to the commercial value of a product or business. Dow Chemical uses the Tech Factor Method, a tool invented by Arthur D. Little consultants. The method quantifies the monetary contribution of each patent as a percentage of the business's total net present value. Alternatively, a Rand Corporation study sets the value of a patent as equivalent to an R&D cash subsidy rate of up to 75%.

Noncore patents cover technologies that aren't being used in either current or planned products. These patents are sometimes easier to value because they can be the focus of IP licensing efforts. Licensing rates vary from industry to industry, but are usually between 1% and 5% of the gross sales of products or services that employ a patented technology. Another approach, the "25% rule," sets royalties as a percentage of net profits. Many companies choose to outsource their licensing programs to independent firms at a cost of around one-third of royalties earned.

Rather than attempt to divine the value of each patent, however, many companies simply assign some portion of their total market capitalization as a proxy for the value of their intellectual property. The easiest of these proxy methods is to subtract the company's book value from its market value. What remains is then considered the value of its knowledge assets. There are several limitations to this approach, however. It assumes that book assets have no value above their reported cost. And since this measure is subject to the daily vicissitudes of the stock market, the values assigned will fluctuate in a manner not related to the real underlying value of the assets themselves.

An alternative approach—the Knowledge Capital Scorecard—is offered by Baruch Lev, finance professor at New York University's Stern School of Business. Subtract from the company's annual normalized earnings the earnings from tangible and financial assets (which you get by multiplying the recorded assets by their respective after-tax expected returns—for example, 7% for tangible assets and 4.5% for financial assets). The remainder is the earnings generated by knowledge assets. Divide this by the knowledge capital discount rate—that is, the expected rate of return for knowledge assets (which for the software, biotech, and pharmaceutical industries, at least, is 10%). The result is the value of your IP assets. With at least a rough approximation of the value of your intellectual assets in hand, you are ready to consider various means of taping their value for financing or investment purposes.

Enhance Competitiveness

The value of patents as competitive weapons and intelligence tools becomes most evident in the day-to-day transaction of business. Indeed, whether a company is trying to block a competitor's product development plan, gain entry into a hotly contested new market, find the most attractive acquisition opportunity, or reduce the risks involved in a high-stakes merger, patents can be potent weapons—and quite possibly the greatest source of competitive intelligence on earth. Let's look at some ways that companies are bolstering their competitiveness by using patent strategies.

Outflank competitors. In early 1999, S3 was a small chip-design firm with a big problem. The company knew that Intel's patent wall would eventually stall its high-performance graphic chip business. So S3 hatched a plan to fix the problem. Acting anonymously, S3 co-opted Intel to acquire the patents of bankrupt chip maker Exponential Technologies for $10 million. In doing so, S3 obtained a patent that predated Intel's Merced chip patents and, according to analysts, could potentially hold Intel's next-generation processor hostage. S3's bold IP gambit paid off when it revealed itself as the buyer and forced Intel to cross-license its patents to S3 in exchange for the rights to that "hostage" patent.

Over in the tool sector of the chip business, meanwhile, Quickturn
Assessing the Business and Commercial Value

To assess the best commercial use of individual patents, assign each patent to a business unit that either already employs the patented technology in its products, intends to use the patents, or could do so.

Next, create a grid map in which the business units are grouped along the vertical axis according to their growth rate (compared with a standard metric). Finally, along the horizontal axis, group the patents according to whether they are being used in the unit’s current operating plan, in a future strategic plan, or in no plan at all. Patents that are essential to a higher-growth business unit are far more valuable than patents used merely in middling-growth units, for obvious reasons: they are key to a venture that brings in more profit. Now you have a basic map that broadly outlines which patents have the greatest and most direct commercial value, which might be more suitable for licensing to generate revenues, and which should simply be abandoned to reduce maintenance costs.

In Dow Chemical’s audit, 75% of its patents fell into the most valuable upper-left quadrant of the chart; these had direct application in the commercial activities of its high-growth business units. Another 35% of the patents fell into the upper-right quadrant of the map; these had no direct use in current or planned products but might be valuable to other firms engaged in related high-growth businesses. It was on these neglected but potentially valuable patents that Dow’s Intellectual Asset Management team concentrated its revenue-generating licensing efforts. The final 13% of Dow’s patents fell into the lower-right quadrant of the audit map, representing technologies that were unlikely to be used in the firm’s business units or to be valuable to other companies. These patents were abandoned.

We use the GDP of the country in which the business operates as the standard metric because it normalizes the growth rates of units operating in different countries. Business units are grouped according to whether they are growing at, say, four times the GDP of the country of operation, two to four times the GDP, or the same rate as the GDP.

Design Systems also had a problem. The company had sued rival Mentor Graphics for patent infringement and had gotten an injunction that blocked U.S. sales of Mentor’s key product, Quickturn. Then Mentor faced a hostile bid by Mentor to acquire the company and thereby scuttle Quickturn’s injunction. Quickturn resisted, of course, and the two companies battled through the summer and fall of 1998. Quickturn knew it could not fend off Mentor’s advances forever, so it dropped its intellectual property bankie (as it were) in front of white-knight Cadence Design Systems, which responded with a $152 million buyout offer that the much-relieved Quickturn happily accepted. Its banks no longer exposed to hostile M&A action from Mentor, Quickturn continued to press its infringement case until Mentor agreed last June to withdraw its SimExpress product from the market.

Explicit new market opportunities. Patents can also give companies

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thought of having to divide $1.3 billion by four instead of three, Johnson & Johnson filed a patent infringement suit. Guidant responded three days later with a surprise maneuver: rather than file a patent countersuit, Guidant bought EndoVascular Technologies. The deal surprised analysts because EndoVascular doesn't even make stents. But reporter Herb Greenberg, then writing for the San Francisco Chronicle, revealed Guidant's logic in his October 8, 1997, column: "What nobody talks about is patents. [Guidant] will also be getting its hands on a potentially lucrative patent that could give [it] control over the superheated U.S. coronary stent market."

It seems the Guidant deal was really aimed at acquiring an unused EndoVascular stent patent that may prove to be a legal bombshell. The patent in question was issued two years before Johnson & Johnson's patent was issued. Does Guidant now hold a winning weapon in the stent wars? It remains to be seen.

But doubtless Guidant already feels that the $170 million it paid for EndoVascular and its key stent patent was money well spent: in its first six months in the stent business, the company sold $30 million worth of the devices.

IBM has shown a slightly different and very enlightened approach to seizing an opportunity in the telecommunication components industry. Because of users' voracious need for routers and networking equipment, this market is exploding. But rather than spend buckets of cash to enter the market or cut component prices to rock bottom in the hopes that users would buy its products, IBM used its patents to structure a win-win deal with Cisco, the market leader. The $2 billion pact guarantees the sale of IBM's components to Cisco for two years and gives IBM a substantial foothold in a new market for its products.

Reduce risk. As a vital source of competitive intelligence, the information contained in patents can also help companies steer their R&D and M&A programs around infringement and due diligence potholes.

The most famous example where a company failed to use patent information to reduce its risk involves the great patent war between Polaroid and Eastman Kodak over the instant photography business. Kodak ignored the "patent thicket" that its much smaller rival Polaroid had created around its fast-growing instant-camera business. In 1975, Kodak launched a line of instant cameras and films that many people—including key Polaroid executives—felt bore too close a resemblance to Polaroid technology. The patent case that resulted finally concluded in 1990 with a judgment that Kodak had indeed infringed on Polaroid's patents.

The total cost to Kodak of its misguided patent strategy? The company was ordered to pay Polaroid a staggering $35 million in damages. Kodak was also forced to shut down its $1.3 billion manufacturing plant.

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lay off 700 workers, and spend nearly $500 million to buy back the 16 million instant cameras it had sold to consumers between 1976 and 1983. Legal fees during the 14-year-long court battle cost Kodak an additional $100 million, and a decades-long R&D effort had to be written off as a total loss.

Kodak's $5 billion market disaster may be the most expensive example of IP mismanagement in the history of corporate R&D, but it is hardly unique. In 1991, Minolta was ordered to pay Honeywell $127.5 million – a patent that Minolta may have thought it safe to infringe upon because Honeywell was not using the technology in any products. More recently, tiny Fonar Corporation hauled General Electric into court for infringing on Fonar's patented MRI technology, which is used to detect cancers and other diseases in the human body. To its great shock, GE was forced to pay Fonar $128.7 million – an amount equal to ten times the little company's annual revenues at the time – which Fonar distributed to its shareholders in the form of "patent infringement dividends."

Many executives consider it unnecessary to spend the time and money to map out the patent landscape and avoid infringement dangers. After all, they say, in today's fast-paced economy, the life span of a new product may be shorter than the time required to obtain a patent for it. But that kind of thinking is extremely risky. Who has the time (or the millions of dollars) it takes to defend against a patent suit? And who can afford to devote a year or more to the research and development of a product, only to have to abandon it later because of an infringement problem that could easily have been spotted and designed around early in the process?

Another consideration is the emerging threat of board liability and shareholder lawsuits regarding patents. Failing to make best efforts to steer R&D away from potential infringement problems could be seen as the intellectual property equivalent of negligently building

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your factory atop a seismic fault. Indeed, the prospect of shareholder lawsuits over "IF wasting" is very real, according to Steven Bochner, an attorney at Sonnenschein, Goodrich & Rosati, the California-based law firm that represents more Silicon Valley boards of directors than any other.

Besides protecting research efforts, patent mapping can also reduce the risks inherent in mergers and acquisitions. And here, unfortunately, many managers would be surprised to discover just how absurd most due diligence efforts regarding intellectual property actually are. "I'd say—and I'm speaking very generally now—that patent analysis is usually just a pro forma component of the due diligence process in most M&As," admits a senior executive at one of Wall Street's leading investment banks. "Most M&A companies, including ours, simply don't look closely at the patent portfolios involved, either for valuation issues or for exploitation possibilities."

Most investment banks have teams of accountants, tax advisers, management consultants, and regulatory affairs experts to structure deals to a company's greatest advantage. But one would be hard-pressed to find a major investment bank that employs even one individual with experience in evaluating patent portfolios. Doubtless this will change as corporate America and Wall Street become more attuned to the financial and strategic value of intellectual property, but as matters stand now, "due diligence" regarding patent assets is usually more myth than reality.

That is sometimes true even in the drug industry, where companies live or die on the strength of their patent holdings. According to Cynthia O'Donohue, principal information specialist at global drug company Allergan, businesses don't always look closely enough at the patent issues involved in a merger or acquisition. "A company may see that the firm it wants to buy has all these wonderful patents," she explains, "but sometimes they don't ask when those patents expire. And especially if they're acquiring a smaller firm, executives have to ask if the company has maintained its patents. If the maintenance fees are not paid, then those patents have elapsed. What's more, can those patents be invalidated? Are there loopholes or improper claims or prior art errors in them? If you can invalidate them, so can someone else. And what about the engineers and key executives? Are they going to remain once the company is acquired? It's not just the patents, but the human expertise behind them that you want."

Those are only a few of the due diligence issues that need to be addressed in M&As that involve the transfer of intellectual assets. Are the acquisition candidate's patents being cited less often by other companies, suggesting that its technology is not as innovative as it once was? Are its own citations of other companies' patents older and less frequent, indicating that its innovative pace has slowed? That is just a small sample of the intelligence that can be gleaned from patent data.

In the examples in this article, we have tried to spotlight some of the benefits to be gained by treating patents not just as legal tools but as business assets of enormous financial and competitive value. The power of patents to influence and even determine competitive outcomes will only grow—especially in the booming e-commerce industries. History shows that after the initial race to innovate and grab market share in an emerging industry, there is a period of shakeouts and consolidation—precisely the period we are entering in the Internet's life cycle—and patents then often become decisive. As one observer of the history of U.S. patenting has noted, "The ultimate winner in the race to capture the lead position in a new industry is often determined by the outcome of a patent shoot-out."

Indeed, the first shots in what will likely become one of the Internet's most important battles were fired in October 1999. Priceline.com filed a patent infringement suit to prevent Microsoft's Expedia group from deploying a "name your own price" auction system similar to Priceline's.

Two weeks later Amazon filed its own suit against its chief rival in online book retailing, Barnes & Noble. Whatever the results in these particular lawsuits, the wars over e-commerce patents are sure to become increasingly common—and increasingly bloody—in the knowledge economy.
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