Software Patents Tangle the Web

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ABSTRACT
A profusion of new software patents on Internet business methods puts our notions of intellectual property to the biggest test yet.

Introduction
Here’s a natural idea for an e-business: an “experts online” Web site. With a team of specialists willing to answer queries over the Web and a garden-variety search engine to pair these authorities with advice seekers, you could have an Internet business up and running in no time, fielding questions on everything from accounting to xerography. To make the site really slick, you could let users select the credentials they want in their experts and the fee they are willing to pay.

But before you tap your savings there is something you should know: This business has been patented. Sounds hard to believe, but last year the U.S. Patent and Trademark Office (PTO) granted exclusive rights to this “invention” to multibillionaire entrepreneur Jay Walker and his Stamford, Conn.-based intellectual property firm, Walker Digital. U.S. Patent No. 5,862,223 (“Method and apparatus for a cryptographically-assisted commercial network system designed to facilitate and support expert-based commerce”) contains more than 200 separate claims that spell out—in the broadest possible terms—the idea of dispensing expertise via the Internet.

To outsiders unfamiliar with the latest developments in the through-the-looking-glass world of intellectual property claims, Walker’s patent might seem absurdly broad. But broad patents on software-enabled businesses are fast becoming commonplace, especially in the burgeoning field of e-commerce. According to Q. Todd Dickinson, commissioner of the Patent Office, which is a division of the U.S. Department of Commerce, his agency is now receiving over 2,500 applications per year for so-called “business method software” patents.

To get a patent—whether for a new type of toothbrush or an energy-saving light bulb—an invention has to be “novel,” “useful” and “non-obvious” to an expert in the field. And as Dickinson explained recently to TR, the PTO views ownership claims on business methods like Walker’s as “actual, describable, discrete inventions” that meet these time-honored criteria.

Although Dickinson makes the new patents sound like business as usual, the fact is that the patent system has recently moved deep into unmapped terrain. A series of U.S. court decisions over the past several years, culminating in an influential 1998 ruling, has flung the doors wide open to patent claims on all manner of software-mediated business concepts, from online insurance policies to electronic voting.

Most of these new ownership claims have yet to be tested in the courts, but the number of high-profile disputes is mounting. In one closely watched case, a court injunction at the end of 1999 forced the online bookseller Barnes & Noble to remove from its Web site the feature that allows cybershoppers to buy books with one click of their mouse. The reason? Amazon.com’s exclusive patent on the so-called “1-Click” purchasing method.

With billions of dollars in Internet sales at stake, the proliferation of broad e-commerce patents is sowing confusion, uncertainty and a good deal of cynicism among many software developers and business leaders. Some legal experts, such as Robert Merges, a law professor at the University of California, Berkeley, believe the sheer number of patents now pending on business methods has “pushed the patent system into crisis.”

Others claim that a system designed to protect innovation is being turned into a weapon for crushing competitors. As law professor James Boyle of American University in Washington, D.C., puts it, “The Patent Office is issuing patents for blindingly obvious things just because they are being done with software or on the Internet.” Boyle says the patents are already causing “a chilling effect on electronic commerce.”

Edison 2.0
It will be years before the ultimate winners and losers emerge from this growing thicket of intellectual property claims.
But one thing is clear: e-commerce patents are pulling in capital as surely as an electromagnet attracts scrap metal. No one better embodies the current trends than Jay Walker himself, a man who was compared recently to Thomas Edison on the cover of Forbes magazine. With a nod to his illustrious forebear, Walker likes to call his firm, Walker Digital, an “idea factory.” But it operates far differently than Edison’s outfit ever did. Fully a third of Walker’s 60 employees staff its legal department: electronic scribes who spin out an average of two highly conceptual patent applications every week.

One of these patents—governing “buyer-driven sales” over the Internet—led to Priceline.com, a Web site begun as a means to allow consumers to bid for unused seats on airplanes and now scrambling to broaden its offerings to include everything from hotel rooms to groceries. The company, like so many Internet startups, has never turned a profit. But this hasn’t stopped investors from driving Priceline’s stock market value north of $10 billion, with Walker himself amassing a staggering paper fortune in the process. And much of this enormous windfall owes to the 20-year, government-sanctioned monopoly that Walker’s patent provides on Priceline.com’s core business method: using the Internet to let buyers name the price they’re ready to pay, and letting sellers decide whether or not to meet it.

If Priceline.com’s ability to attract investment is any measure, Walker Digital’s formula is working, and the firm has hundreds more patents in the works. Yet many of these are certain to raise eyebrows, like the one that describes the invention of ordering fast food from your Palm Pilot before arriving at the drive-up window. According to Boyle, even if you accept the notion of patenting business methods, some ideas are just “far too obvious” to merit a patent. By allowing Walker and others to own these ideas, he says, “the Patent Office is creating a ridiculous situation.” Not surprisingly, Dean Alderucci, head legal counsel for Walker Digital, concurs with PTO commissioner Dickinson that these kinds of ownership claims represent “a very logical extension of the patent system” we have always had. “If you have a new and useful business method,” Alderucci says, a patent can “force the money out of it and benefit the public.”

While Walker may excel at the game, his is not the only company with a strategy at the patent office (see Table 1). The firm CyberGold, for instance, has patented the idea of using incentives to reward consumers for paying attention to Internet ads. Open Market, a Massachusetts-based startup whose motto is “The Future of Business,” now owns three patents that are arguably indispensable to conducting e-commerce. One, U.S. Patent No. 5,724,424 lays claim to the very idea of making secure credit card payments over the Net. And Patent No. 5,715,314, covers the notion of electronic shopping carts, a system used by many e-commerce Web sites to let shoppers mark items for later purchase. The list goes on and on.

Broad and Broader

Companies such as Walker Digital have been emboldened to seek e-commerce patents—and to enforce them—thanks to a critical 1998 U.S. Appeals Court decision. In the case, California-based Signature Financial Group and Boston’s State Street Bank went to court over a method of calculating the value of a customer’s share of multiple mutual funds. Signature claimed its patent gave it exclusive rights to this classic computer accounting system, known as the “hub and spoke” method, which is used widely by banks around the world.

State Street’s lawyers argued that neither mathematical algorithms nor business methods were patentable. The law had long been murky on both these issues, and in the initial decision a judge ruled in State Street’s favor, agreeing that Signature’s computerized business method didn’t deserve the same patent protection given to other types of inventions. On appeal, however, the higher court firmly upheld Signature’s claims, giving an unequivocal green light to patenting software-enabled business practices. According to Alan Fisch, an intellectual property attorney with Howrey Simon Arnold & White in Washington, D.C., the “State Street” decision marks nothing less than “the endpoint of a nearly 30-year line of debate over what is patentable in this field.”

Less than a generation ago, in the early days of the computer age, the PTO simply refused to grant patents on software. The reasoning then was that software code is made up of strings of instructions, something like the recipes in a cookbook. And historically, the U.S. legal system has treated instruction sets as forms of expression protected by copyright law—not patents.

The distinction is far from trivial because copyright, by protecting a whole work and not its individual parts, allows practitioners far more latitude. Thus, a symphony may be copyrighted, but musical notes, phrasings, and motifs are kept in the public domain, so that they can be used in other pieces of music. Likewise, the PTO’s traditional thinking was that basic software algorithms should be freely available to all programmers. As co-creator of the Linux/GNU operating system and “open source” software advocate Richard Stallman notes, “A decade ago, the field of software functioned without patents. It produced innovations such as Windows, virtual reality, spreadsheets and networks. And because of the absence of patents, programmers could develop software using these innovations.”

Early on, the courts tended to agree with this view, as in a 1972 Supreme Court ruling that compared software’s logical steps to “mental processes” that not only couldn’t be patented, but had to be preserved in the public domain as the “basic tools of scientific and technological work.” Over time, though, this position began to erode. In the landmark 1981 case Diamond vs. Diehr, the Supreme Court upheld a patent on a rubber-making machine controlled by software. Here the logic was that software had altered the machine’s functioning so significantly that it had effectively created an entirely new, and eminently patentable, invention.

The precedent established by Diamond vs. Diehr left the door to software patents slightly ajar, and it wasn’t long before a flood of applications came rushing in. By the early 1990s, software had become one of the fastest growing sectors of the U.S. patent system. By one estimate, the PTO, which had once categorically rejected the idea of patenting
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industrial disaster that struck the Union Carbide plant in

Bhopal, India, in 1984.

Yet so far at least, the effects of software patents have not

been nearly so dire as predicted. Eugene R. Quinn, Jr., a law

professor at Barry University School of Law in Florida, has

tracked the number of patent lawsuits over the past decade.

While he has found a significant rise in the number of law-
suits filed, he also notes that the number of full-blown trials

has so far held steady. “A lot of cross-licensing is going on,
especially in the software field,” Quinn says, “because many

of the patents out there are invalid.” Some legal scholars liken

the situation to a commercial equivalent of MAD (mutu-

ally assured destruction) in which patents act as powerful
deterrents to attack but can't actually be used. Another re-

straint is the high cost of going to trial, which the American

Intellectual Property Law Association puts at over $1.2 mil-

lion even for simple patent disputes. Although the situation

clearly favors bigger firms, Quinn says, there is a good deal

deal of fear among all parties, and incentives to co-operate are

high.

Clouds Over Crystal City

Just because software hasn’t experienced a cyber-Bhopal
doesn’t mean it won’t ever happen. Indeed, the noxious

clouds of litigation now gathering around e-commerce are

renewing industry fears. What’s more, in what lawyers are
calling the “post-State Street environment,” all bets are off
for a software détente as companies are not just patenting
specific algorithms, but far more valuable Internet business
concepts. And to the great dismay of critics who fear a
wave of crippling lawsuits, the PTO may be granting many
of these software patents in error, simply because it can’t
keep current with advances in the field.

By law, no invention can be patented that has already been
patented by someone else or has been published prior to the
time the patent is filed; in the language of the legal system,
such patents and publications are known as “prior art.” A
key problem is that software programming—especially in its
early days—was famous for its lack of a published paper trail
and for the informal exchange of code and techniques among
programmers. These poor “non-patent” records, combined
with the PTO’s late arrival to the software game, mean the
agency examiners who scrutinize applications often have
tremendous difficulty establishing exactly when an invention
was first made.

“The prior art problem is one issue where software patent
proponents and opponents typically find common ground,”
says Alan Fisch, who in 1994 was one of the first computer
scientists hired by the PTO to work on software patents.
Although the PTO has hired hundreds of new software ex-
aminers since then, Fisch says that, despite the agency’s best
efforts, “the corpus of existing software patents does not de-
fine the totality of software innovation.” In other words,
the PTO’s collection of software art still resembles the tip of
the computer science knowledge iceberg. Although the
PTO boasts that examiners have access to some 900 online
databases, the reality is that, by almost all accounts, prior
art searches in the software field sorely test the PTO’s capa-

bilities.

The best-known example of the PTO’s mishandling of prior
art came in 1993 when the California-based firm Compton’s

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>U.S. PATENT NUMBER</th>
<th>SUBJECT</th>
<th>UPDATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon.com</td>
<td>5,960,411</td>
<td>one-click purchasing</td>
<td>Amazon.com has used its patent to force changes to Barnes &amp; Noble’s Web site.</td>
</tr>
<tr>
<td>CyberGold</td>
<td>5,794,210</td>
<td>attention brokerage</td>
<td>Patent covers rewarding Web surfers for paying attention to online advertisements.</td>
</tr>
<tr>
<td>E-Data</td>
<td>4,528,643</td>
<td>download-based sales</td>
<td>A judge blocked E-data’s attempts to enforce this pre-Internet era patent.</td>
</tr>
<tr>
<td>Netcentives</td>
<td>5,774,870</td>
<td>online incentives</td>
<td>One of several recently issued patents covering reward systems for Internet purchasing.</td>
</tr>
<tr>
<td>Open Market</td>
<td>5,715,314</td>
<td>electronic shopping carts</td>
<td>This patent may be infringed by many e-commerce sites on the Internet.</td>
</tr>
<tr>
<td>Priceline.com</td>
<td>5,794,207</td>
<td>buyer-driven sales</td>
<td>Priceline has sued Microsoft and its Expedia travel site for copying its patented business method.</td>
</tr>
<tr>
<td>Sightsound.com</td>
<td>5,191,573</td>
<td>music downloads</td>
<td>Sightsound is demanding a 1% royalty from all online music sellers, and has sued Time Warner’s CDNow.com music site for infringing its patent.</td>
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Table 1: A selection of broad e-commerce patents issued by the U.S. Patent and Trademark Office.
New Media, creator of an early multimedia CD-ROM titled Compton’s Interactive Encyclopedia, announced that it had received a patent on multimedia itself—specifically, the “process and concept” of retrieval technology in multimedia databases. With scores of multimedia CD-ROMs already on store shelves, the announcement was a bombshell.

The patent seemed ridiculous, not least because techniques for indexing and searching multimedia databases had been explored at Xerox’s Palo Alto Research Center almost two decades earlier. Under pressure from the software industry, Bruce Lehman, then-commissioner of the PTO (Dickinson’s immediate predecessor), took the highly unusual step of second-guessing his own examiners. He called on the Patent Office to re-examine the patent, this time taking into account “new evidence” that had come to light—namely, the prior art the agency had missed the first time around. The result: Every one of Compton’s 41 claims were rejected.

Over the past decade many have tried to redress the prior-art problem. One group of programmers, led by Bernard Galler, now professor emeritus of electrical engineering at the University of Michigan, founded a venture in 1992 called the Software Patent Institute. The idea was to have programmers voluntarily submit a pool of information about existing know-how that the U.S. Patent Office could use in its search for prior art. While the PTO’s ability to detect spurious patent claims has improved through such undertakings, Galler admits the effort has met with only limited success and that there is still far to go.

Just how far remains an open question. One of the Patent Office’s harshest critics, Greg Aharonian, publishes the Internet Patent News Service and makes his living investigating software patents issued can’t pass what he calls “the Crystal City test.” That is to say, if U.S. patent examiners ventured beyond the walls of their headquarters in Crystal City, Va., they would find that the techniques they are patenting are already widely known and used among programmers.

“The Patent Office is doing a horrendous job in the software area,” Aharonian contends bluntly, “and they have made zero progress since the Compton’s New Media patent in handling non-patent prior art.” In a 1999 survey, Aharonian found that half of all patent applications surveyed cited no prior art at all. The result, he believes, is a disaster in the making. “No matter how bogus they may seem, patents can be powerful weapons,” Aharonian says. “As people start making money on the Internet, you can fully expect these patents to start being asserted.”

Software Showdown

In one emerging battle to watch, Microsoft announced last fall that it would let consumers name their price for hotel rooms on its travel Web site Expedia. As expected, Priceline.com has now sued Microsoft and its Expedia subsidiary, claiming infringement of its patent on buyer-driven commerce. Industry observers say Priceline.com had little choice but to sue, since to have done otherwise would have welcomed more competitors and been an admission that its patent might not hold up in court.

Although neither side would comment on the specifics of the case, Priceline.com may have a considerably more difficult time proving its patent is “novel,” “useful” and “non-obvious” in court than it had at the Patent Office. For one, the patent could be invalidated if Microsoft successfully produces a single piece of evidence of prior art. Expressing confidence in his firm’s patents, Walker Digital’s Alderucci says the company takes great pains to research prior art with an eye to possible lawsuits. “Any patentee has to consider the chance of litigation,” Alderucci says. “We have anticipated it and are very well prepared for it.”

Even without a prior art knockout, the case could raise the $64 billion question of whether applying Internet technology to facilitate buyer-driven sales is an “obvious” use of the technology. And Priceline’s investors may not like the answer, especially since juries tend to take a more common-sense approach to the question of what is obvious than the PTO has. In 1997, for instance, the software firm Quantel sued San Jose, Calif.-based Adobe Systems for $138 million claiming that Adobe’s popular Photoshop software infringed five of Quantel’s patents covering painting with a stylus on a computer. The jury sided with Adobe, in an outcome widely seen as highlighting the difficulty of enforcing questionable patent claims on competitors.

Whatever their outcome, the Priceline.com dispute, as well as Amazon.com’s ongoing tussle with Barnes & Noble, are likely to set important precedents. If the e-commerce patents stand up, it will certainly precipitate even more patenting of business processes, more litigation and potentially a backlash led by large online firms increasingly hit by debilitating infringement suits. Losses by Priceline.com and Amazon.com could mean fewer companies enforcing e-commerce patents, although in no case is the patenting likely to stop, as the business claims will continue to prove useful for attracting investors and for cross-licensing.

Toasters or Tollbooths?

For his part, PTO commissioner Dickinson says he too is curious to see whether the business methods patents will hold up in court. For now, he is confident that Wall Street wouldn’t be making the investment if the patents weren’t strong. Nonetheless, Dickinson notes that the courts always function as a check on the job the Patent Office is doing. As he puts it, “We are going to do the best job we can, just as we have with every technology that has blown onto the scene. If the courts tell us we need to make an adjustment, we don’t mind that a bit.”

Taking a long historical view, much of the current patent conundrum stems from the advent of a new and uncharted technological realm. The Patent Office has almost always had problems with dramatic technology shifts, and software and the Internet are no exceptions. In the highly legalistic and precedent-driven view of the patent system, the lack of clearly defined “prior art” in emerging technological environments makes almost anything seem like fair game for an ownership claim.

PTO commissioner Dickinson likens the situation to the advent of electricity. “Man was making toast for thousands of years before electricity came along,” Dickinson says. “But
electricity opened the door for inventors to claim new methods for using a coiled wire of certain resistance to control the toasting of bread.”

The idea of patenting toasters seems reasonable enough, but unfortunately, Dickinson’s analogy falls short in the current climate. Put simply, the business method patents now being granted for e-commerce seem more akin to patents on the idea of toasting bread. The problem, critics say, is that the system is supposed to provide incentives to invent new toaster designs. But if someone owns the idea of making toast—or even the idea of making toast with electricity—the claim will clearly deter the emergence of new and varied toaster designs. Instead it will function like a needless tollbooth assessing royalty fees on everyone in an industry, or worse, like a roadblock that deters would-be competitors.

There’s ample historical evidence that overly broad patents have stifled innovation in emerging industries. A century ago, Henry Ford was held for ransom by George Selden’s “road engine” patent, granted to Selden even though he had never constructed an automobile. Ford prevailed in the courts, but only after a costly legal battle. In the early years of aviation in the United States, Orville and Wilbur Wright fought a largely successful nine-year campaign to enforce their broad patent on the airplane. While innovators helped aviation thrive in Europe, the Wright brothers’ patent crippled American industry until the outbreak of World War I, when the U.S. government forced the Wrights to license their technology so that planes could be built more expeditiously for the war effort.

To some, like Raymond Van Dyke, a patent attorney with the Dallas, Texas-based law firm Jenkens & Gilchrist, these and other examples are proof that the patent system is ultimately self-correcting. Historically, he says, “when there has been enough perceived inequity in the patent system, industry has revolted and other mechanisms have kicked in.” In the case of e-commerce patents, Van Dyke predicts “the courts will probably step in. Congress may have to step in. But you have to remember that all these forces, including broad societal forces, come together in a confluence that creates the law.”

In that view, it might behoove us all to park our electronic shopping carts for a moment and try to remember what the patent system is for—and what it’s not. The U.S. Supreme Court ruled wisely on the matter in a verdict issued more than 100 years ago. In the case, the court wrestled with the question of when a minor improvement—in this instance to a boat propeller—rose to the level of a bona fide new invention. The decision resonates with uncanny prescience throughout the current debate:

It was never the object of patent laws to grant a monopoly for every trifling device, every shadow of a shade of an idea, which would naturally and spontaneously occur to any skilled mechanic or operator in the ordinary progress of manufactures. Such an indiscriminate creation of exclusive privileges tends rather to obstruct than to stimulate invention. It creates a class of speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies, which enable them to lay a heavy tax on the industry of the country, without contributing anything to the real advancement of the arts. It embarrasses the honest pursuit of business with fears and apprehensions of unknown liability lawsuits and vexations accounting for profits made in good faith.

—U.S. Supreme Court, Atlantic Works vs. Brady, 1882