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The Patentability of Electronic Commerce Business Systems in the Aftermath of *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*

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THE PATENTABILITY OF ELECTRONIC COMMERCE BUSINESS SYSTEMS IN THE AFTERMATH OF *STATE STREET BANK & TRUST CO. v. SIGNATURE FINANCIAL GROUP, INC.*[*]

Sari Gabay[**]

Today we are witnessing the early, turbulent days of a revolution as significant as any other in human history. A new medium of human communication is emerging, one which may prove to surpass all previous revolutions—the printing press, telephone, television, computer—in its impact on our economic and social life.[1]

INTRODUCTION

The Internet is the most exciting innovation to impact the United States. At its current rate of growth the Internet will reach fifty million households in the United States within five years, while it took radio thirty-eight years, and television thirteen years to reach the same number.[2] The Internet provides a new channel for retailing. It is estimated that by the year 2000, 150 million Web users will be "just a mouse-click away from consummating transactions twenty-four hours a day, seven days a week."[3]

Electronic commerce, or "e-commerce,"[4] refers to the

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[*] 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999).

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[1] DON TAPSCOTT, THE DIGITAL ECONOMY: PROMISE AND PERIL IN THE AGE OF NETWORKED INTELLIGENCE 8 (1995).

[2] PAUL EDWARDS ET. AL., MAKING MONEY IN CYBERSPACE 129 (1998).

[3] *Id.* (citations omitted).

[4] The prefix "E-" is used as "[t]he all-purpose Internet and Web prefix." Giles Felton, *How to Talk Dot-Com Like a Webmaster*, N.Y. TIMES, Sept. 22, 1999, at G3. The "E," which refers to "electronic," is familiar from "E-mail." *Id.*

commercial sale of products or transaction of services in an electronic format and has become the common term for the practice of doing business over the Internet.[5] E-commerce is predicted to generate between $34 billion and $37 billion in Internet sales by 2002.[6]

With the exponential expansion of e-commerce,[7] there is, necessarily, a process of adjustment to adapt existing legal frameworks to businesses that operate in the electronic world.[8] One particular area of concern is the increasingly frequent granting of e-commerce patent protection[9] to methods of doing business on

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In this Note, "electronic commerce" and "e-commerce" are used interchangeably.

[5] "The Internet is a compendium of millions of interconnected computers" or "a large number of worldwide interconnected networks." Frank J. Cavaliere, *Legal Research on the Web (With Resource List)*, 42 PRAC. LAW. 63, 63 (1996). The Internet was created in 1969 by the Department of Defense as a packet-switching system for the Advanced Research Projects Agency ("ARPA") so that ARPA research sites could share information and give access to computers elsewhere. TAPSCOTT, *supra* note 1, at 27-31. *See also* BILL GATES, THE ROAD AHEAD 97 (1995) (explaining that even when the Internet became a commercial service, it was mostly used by scientists at universities and companies in the computer industry for exchanging e-mail).

[6] Tina Kelley, *Internet Shopping: A Mixed Bag*, N.Y. TIMES, July 30, 1998, at G1.

[7] *See, e.g.*, Don Thompson et al., *Business By Bytes*, BUS. Q., July 1, 1998, at 32 (noting that electronic commerce is still in its youth and predicting a boom as the digital economy becomes more developed and advanced).

[8] *See generally* Patrick F. McGowan, *The Internet and Intellectual Property Issues*, 455 PLI/PAT 303, 307 (1996) (discussing legal issues prompted by the sudden growth of the Internet); William A. Tanenbaum, *The Challenge of Cyberspace Intellectual Property*, 15 COMPUTER LAW 14 (1998) (discussing emerging Internet technology trends).

[9] A patent confers the right to exclude others from making, using or selling the claimed invention in the United States for a term of 20 years. *See* DONALD S. CHISUM & MICHAEL A. JACOBS, UNDERSTANDING INTELLECTUAL PROPERTY LAW § 2A (1992) (describing the patent system). The Patent Act requires that a utility patent fall under one of the following categories of subject matter: a process, machine, manufacture, composition of matter, or new and useful improvement thereof. 35 U.S.C. § 101 (1994). Other requirements are that the invention is novel, useful, and nonobvious, in light of prior art. 35 U.S.C. §§ 102-03 (1994 & Supp. II 1996). *See also infra* Part I.B, providing a background to patent law.

the Internet.[10] Many of these patents have issued following the recent decision in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*,[11] where the United States Court of Appeals for the Federal Circuit[12] recognized that a method of doing business is as eligible for patent protection as any other process or method.[13] This astounding decision, in upholding a patent issued for a computerized accounting system used to manage investment funds, circumscribed the traditional exceptions to patentability, making headlines nationwide.[14]

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[10] Methods of doing business were historically considered outside the scope of patentable subject matter. *See, e.g.*, Hotel Security Checking Co. v. Lorraine Co., 160 F. 467, 469 (2d Cir. 1908) (finding that "a system of transacting business, such as a method for cash registering and account checking, apart from the means for carrying out the system, is nonstatutory subject matter"). The business method exception was never clearly defined and the exception was criticized as early as 1934. *See, e.g.*, George Tew, *Method of Doing Business*, 16 J. PAT. OFF. SOC'Y 607, 608 (1934) (calling for a "clearer definition of unpatentable process than . . . found in the mere expression that 'methods of doing business are unpatentable'"); Rinaldo Del Gallo, III, *Are "Methods of Doing Business" Finally Out of Business as a Statutory Rejection*, 38 IDEA 403, 411 (1998) (pointing out that many commentators have described the business method exception as "ghostlike in nature, its apparition having been only in dicta in perhaps every case it was ever supposedly invoked"). *See also infra* Part I.B, describing the history and development of the business method exception.

[11] 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999).

[12] The United States Court of Appeals for the Federal Circuit is the appellate court that has exclusive jurisdiction of an appeal from a judgment where jurisdiction was based on the patent provisions of 28 U.S.C. § 1338 (1994). ROBERT L. HARMON, PATENTS AND THE FEDERAL CIRCUIT ix (4th ed. 1998). Congress created the Federal Circuit on October 1, 1982, to have exclusive appellate jurisdiction in patent cases and to increase doctrinal stability in the field of patent law. *Id.* at § 16.1(b).

[13] *State Street*, 149 F.3d at 1377 (stating that "[w]hether the claims are directed to subject matter within [section] 101 should not turn on whether the claimed subject matter does 'business' instead of something else").

[14] *See* James B. Altman & James P. Tuite, *"Business Methods" Can Be Patented*, LEGAL TIMES, Oct. 1998, at 64 (explaining that the *State Street* decision has nationwide authority given the Federal Circuit's exclusive jurisdiction over patent appeals); William T. Ellis & Aaron C. Chatterjee, *"State Street" Sets Seismic Precedent*, NAT'L L.J., Sept. 21, 1998, at B13 (labeling the Federal Circuit's ruling in *State Street* "one of the most important decisions relating to the patentability of software"); Seth H. Ostrow, *Federal Circuit*

In the short time since *State Street*, the United States Patent and Trademark Office ("PTO")[15] has granted a proliferation of patents to e-commerce business methods.[16] This trend signifies the PTO's and the Federal Circuit's growing recognition of technological advances and the need to extend, rather than limit, the scope of what constitutes patentable subject matter.[17] In 1998, U.S. patent

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Disposes of "Business Methods" Exception, 15 COMPUTER L. STRATEGIST 1 (1998) (stating that "[t]he U.S. Court of Appeals for the Federal Circuit, in a landmark ruling, has laid to rest the controversial doctrine that business methods are unpatentable"); Barry D. Rein, *A New World For Money Managers: Circuit Upholds Financial Patent*, N.Y.L.J., Sept. 21, 1998, at S1 (explaining that the *State Street* decision "swept away most of the cobwebs that have hobbled rulings on software patentability . . . and drove a stake through the heart of the century-old 'business methods' exception to patentable subject matter"); Robert C. Scheinfeld & Parker H. Bagley, *"State Street": "Virtually Anything Is Patent-able,"* N.Y.L.J., Sept. 23, 1998, at 3 (stating that the Federal Circuit "made clear that a patent will no longer be denied on the grounds that it merely uses numbers or claims a method of doing business"); Raymond Van Dyke, *Software Patents Offer Opportunities and Obstacles "State Street" Sparked a Boom in PTO and Court Filings, and the Dust Has Not Quite Settled*, NAT'L L.J., May 24, 1999, at C19 (stating that "[i]n the wake of *State Street*, almost all companies, particularly Internet and e-commerce firms, have begun to evaluate their technology in light of the benefits of seeking patent protection for their innovative endeavors").

[15] The United States Patent Office ("PTO") is a part of the Department of Commerce headed by the Commissioner of Patents, who is appointed by the President. HARRY KURSH, INSIDE THE U.S. PATENT OFFICE 3-4 (1959). The Commissioner is responsible for receiving patent applications and for granting or rejecting patents in accordance with the patent laws. *Id.* at 4.

[16] *See* Tim Clark, *Who's Got the Patent?* (visited Oct. 14, 1999) <http://www.news.com> (explaining the different systems of e-commerce that the patents were awarded to protect). *See also infra* Part IV.A, discussing current e-commerce patents.

[17] *See, e.g.*, AT&T Corp. v. Excel Communications Inc., 172 F.3d 1352, 1355 (Fed. Cir. 1999) (following *State Street* and holding that claims that cover technological processes whose steps rely on mathematical algorithms, are patentable subject matter if the application of the algorithm produces a "useful, concrete, and tangible result"). *See* Mark J. Abate, *Patent Law: Protecting Software*, NAT'L L.J., July 19, 1999, at B4 (stating that the Federal Circuit in *AT&T* extended *State Street* and reinforced the holding that specific, practical applications of algorithm-based software are patentable). For a review of the Federal Circuit's discussion of mathematical algorithms prior to *State Street* and

examiners were faced with a quarter-million patent applications and issued a record 154,579 patents in fiscal 1998, processing an estimated 203,000 applications, including about 48,000 that were rejected or abandoned.[18] This influx of patent applications has been attributed to the Federal Circuit's ruling in *State Street*, the rise in the importance of the Internet, and an increase in patent awareness among companies.[19] However, whether Internet technology can be patented has been challenged, largely because patents traditionally have been awarded for physical inventions, while Internet innovations often involve intangibles, such as software.

Intellectual property law has assumed a prominent place in the public interest.[20] Denying patent protection to new areas of

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AT&T, see *In re* Alappat, 33 F.3d 1526 (Fed. Cir. 1994) (holding as patentable a system for improving and controlling the illumination of screen displays for digital oscilloscopes); *In re* Schrader, 22 F.3d 290, 295 (Fed. Cir. 1994) (finding that in order for an invention that contains a mathematical algorithm to be considered a patentable process under 35 U.S.C. § 101, there must be a transformation or reduction of subject matter data); *In re* Warmerdam, 33 F.3d 1354, 1358 (Fed. Cir. 1994) (pointing out that there is no clear definition as to what is a mathematical algorithm); Arrhythmia Research Tech. Inc. v. Corazonix Corp., 958 F.2d 1053, 1058 (Fed. Cir. 1992) (suggesting that as long as a computer program produces external output, rather than just performing endless internal calculations without practical output, the test for patentability is satisfied); *In re* Grams, 888 F.2d 835, 840 (Fed. Cir. 1989) (declining to answer whether section 101 precludes patentability in every case where the physical step of obtaining data for the algorithm is the only other significant element in mathematical algorithm-containing claims).

[18] Brenda Sandburg, *Patent Applications Flow Freely: Internet Craze, Court Decisions Spark Onslaught*, LEGAL TIMES, Feb. 22, 1999, at 12. "[I]n the past year, the number of applications with claims similar to those in . . . *State Street* increased more than 40 percent." *Id.*

[19] David Hayes, *What the General Intellectual Property Practitioner Should Know About Patenting Business Methods*, 16 COMPUTER LAW. 3 (1999).

[20] Michael J. Chakansky, *Intellectual Property At Center Stage*, N.Y.L.J., Jan. 27, 1999, at S9. Intellectual property was the subject of the New York State Bar Association's annual meeting on January 17, 1999, entitled, *"E-Commerce: Intellectual Property Concerns of Doing Business Over the Internet" Id. See also* Gregory J. Maier, *High-Tech Economy is Propelled By IP*, NAT'L L.J., Aug. 9, 1999, at B10 (discussing Internet business and intellectual property issues). U.S. patent law reform is on the agenda of the 106th Congress. American Inventors

technology that were unforeseen by Congress at the time the Patent Act was drafted would be contrary to the principles underlying the United States patent system.[21] Parallel to technological advances in genetic technology that posed challenges to the patentability of natural species and genetics-related products,[22] e-commerce is the next area to test the waters of patentability.

    This Note will focus on an analysis of the business method and mathematical algorithm exceptions to patentability, the recent ruling of *State Street*, and the necessity of awarding patents to protect electronic commerce business systems. Part I of this Note provides

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Protection Act of 1999, H.R. 1907, 106th Cong. (proposed May 24, 1999). *See* John M. Richardson, *Global Movement for Harmonization: Back to the Future*, N.Y.L.J., July 26, 1999, at S5 (discussing the legislation). At issue is the reexamination of patents in the United States. *Id.* Opposition, revocation, or reexamination proceedings are a form of checks and balances so that the patent office can have an opportunity to evaluate new information and perhaps fix mistakes. *Id.* This system, which was implemented almost 20 years ago, receives about 400 annual requests, but it has proved to be unsuccessful. *Id.* "One of the most significant changes would limit the 'first to invent' defense in patent infringement disputes to inventions involving methods of doing business, [whereas] the previous bill would have allowed the defense to be raised for manufacturing processes used in an invention as well as for business methods." Brenda Sandburg, *House Passes Patent Law Reform*, NAT'L L.J., Aug. 16, 1999, at B4.

    [21] *See* Graham v. John Deere Co., 383 U.S. 1, 5-10 (1966) (providing a review of policies behind the patent system).

    [22] Biotechnology is the technology of manipulating deoxyribonucleic acid ("DNA") and proteins to produce commercially useful products, often for the medical and agricultural industries. *See* Lawrence S. Graham, Note, *Equitable Equivalents: Biotechnology and the Doctrine of Equivalents After Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 6 J.L. & POL'Y. 741, 743 n.12 (explaining that although section 103(a) of the Patent Act requires an invention to be non-obvious in light of prior art, at one time it was not clear whether a known process for producing a particular molecule of DNA made the molecule itself obvious). Today, section 103 specifically prohibits rejection of a patent because of the method by which a DNA molecule was produced. 35 U.S.C. § 103(c) (1994 & Supp. II 1996). *See also* Lawrence M. Sung & Don J. Pelto, *Bioinformatics May Get Boost From "State Street" Software That Can Manipulate Vast Libraries of Genetic Data May Receive Protection*, NAT'L L.J., Oct. 19, 1998, at C28 (stating that bioinformatics ignited a fiery debate concerning the potential stifling of basic research and development that depends on access to certain genetic information).

an introduction to electronic commerce and a background to patent law. Part II discusses the rise of the business method exception and then explores the mathematical algorithm exception with a focus on a trilogy of Supreme Court opinions that grappled with this judicial construct in assessing the patentability of computer software. Part III introduces the factual and procedural background of *State Street* and provides an analysis of the district court's decision and the Federal Circuit's reversal. Part IV explores the emergence of e-commerce patents in response to the Federal Circuit's and the PTO's recognition that a business method is within the penumbra of patentable subject matter. This Note concludes that the Federal Circuit has effectively refined the mathematical algorithm exception and eliminated the fiction of the business method exception to patentability. The patents that have been issued to businesses and entrepreneurs have spurred the growth of this industry and are necessary to encourage continued innovative efforts as the United States moves into a digital economy.[23]

I. INTRODUCTION TO ELECTRONIC COMMERCE AND PATENT LAW

A. *Electronic Commerce—An Overview*

E-commerce enables people to shop on-line without ever physically entering a traditional store. A significant advantage of the Internet for consumers is that shopping becomes easier, and in a few moments on the Internet, a consumer can find a particular

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[23] In a digital economy, information in all its forms becomes digital. *See* TAPSCOTT, *supra* note 1, at 5-9 (emphasizing the speed at which modern businesses can operate as information becomes digital). In a digital economy, information is:

> [R]educed to bits stored in computers and racing at the speed of light across networks. As a result, vast amounts of information can be compressed and transmitted at the speed of light. Information can be stored and retrieved instantly from around the world, eventually providing instant access to much of the information recorded by human civilization.

TAPSCOTT, *supra* note 1, at 8.

item that might otherwise take several days to locate.[24] Through the use of a computer, a modem,[25] an Internet Service Provider[26] and a Web browser,[27] a consumer can find anything on the Internet, ranging from fine art to antique washing machines.[28] In searching for a product or a good deal, a customer can visit a Web-site, browse through the products and services offered by the Web-site[29] and compare products and prices by browsing through other

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[24] EDWARDS, *supra* note 2, at 50. *See also* Erica Goode, *The On-line Consumer? Tough, Impatient and Gone in a Blink*, N.Y. TIMES, Sept. 22, 1999, at G22 (describing Internet shoppers as "[t]ough, mouthy, impatient, in control, [as] they wiz through Web sites like the White Tornado through a dirty kitchen and vote their displeasure with the click of a mouse").

[25] A "modem," short for "modulator/demodulator," is the device that translates or modulates digital data coming into the computer into an analog signal that can be transmitted, and then demodulates incoming analog data into digital format. EDWARDS, *supra* note 2, at 246. The term modem has been expanded to include "any device that performs the necessary translation of transmitted data on its way into or out of a computer." EDWARDS, *supra* note 2, at 246.

[26] The function of an Internet Service Provider ("ISP") is to provide individuals with access to the Internet, which is accomplished by maintaining computers with permanent connections to the Internet. EDWARDS, *supra* note 2, at 239. These interconnnected computers are constantly in communication, and some ISPs exclusively provide connections to other ISPs, while other ISPs deal with businesses and commercial customers. EDWARDS, *supra* note 2, at 239.

[27] Browsers are programs that read, search, and retrieve documents and allow users to view Web pages from the Internet. EDWARDS, *supra* note 2, at 66. Some of the most common browsers include Netscape, Mosaic, America On-Line, Prodigy, and Compuserve. EDWARDS, *supra* note 2, at 66. *See* PEGGY MILES, INTERNET WORLD: GUIDE TO WEBCASTING 408 (1998) (defining the Web as "a collection of data and associated resources that is assembled on pages accessible through a browser on the Internet"). Web pages use Hyper Text Mark-Up Language ("HTML") to display text, graphics, animations, audio, and video on a computer. *Id.* Web pages are connected to a Web-site or domain that is found by an address, or a Universal Resource Locator ("URL"). *Id.*

[28] Edwards, *supra* note 2, at 50.

[29] *See* MILES, *supra* note 27, at 404 (explaining that a "site" refers to a location on the Internet specified by a domain name and Internet Protocol address). "Web browsing" involves connecting to a server and when a screen of information with a number of hyperlinks appears, a user can use a mouse to click on the hyperlink and be taken to another page. GATES, *supra* note 5, at 94. That other page, which may be stored on the same server or another server on the

Web-sites. Ultimately, a purchase can be executed by paying with a credit card or another form of on-line payment, and the products are then shipped to the consumer.[30] With approximately seventy-five percent of the 100 million people who use the Internet in North America having made purchases on-line,[31] shopping on the Internet is becoming a popular method of purchasing goods and services.[32]

The Internet is also becoming a coveted area in which to start a business. There are four common types of Internet-related businesses that are best categorized by the method in which they generate revenue. These include companies that offer sales of goods and services, Web-site content development, advertiser-supported sites, and existing businesses that have entered the Internet.[33] Sales of goods and services can include hard-to-find

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Internet, may contain additional information and other hyperlinks. GATES, *supra* note 5, at 94.

[30] TAPSCOTT, *supra* note 1, at 15. Currency is one of the central issues to be resolved with respect to the specificity of e-commerce transactions. TAPSCOTT, *supra* note 1, at 15. *See* Beth Cox, *An E-Commerce Idea You Can Take to the Bank*, ELECTRONIC COMMERCE WKLY., May 5, 1997, at 28 (describing various methods of payment when purchasing goods on-line). Although credit cards are currently the most common method of payment for on-line purchases, "e-checks" are becoming extremely popular. *Id.* E-checks are secure checks sent via e-mail that enable a consumer to "sign" digitally before writing and transmitting the e-check. *Id.* Using e-checks reduces processing costs from one to three dollars per paper check to as little as 10 cents per e-check. *Id.* The Financial Services Technology Consortium is running a trial on e-checks in the United States and expects widespread deployment by 2001. *Id. See also* Jason Krause, *Cash, Check or Charge? Sure Your Site Takes Credit Cards But Does It Take Checks?*, INDUSTRY STANDARD, Sept. 7, 1998, at 48 (explaining that although credit cards are most commonly used for payment online, the new check-processing services that are coming online are causing many e-commerce sites to consider changing their "no checks" policies).

[31] Goode, *supra* note 24, at G22.

[32] *See* Peter H. Lewis, *Silicon Stocking Stuffers for Technophiles*, ARIZONA REPUBLIC, Dec. 21, 1998, at E1 (pointing out that "truly last-minute shoppers can buy electronic gift certificates on-line and have them delivered to the recipient by e-mail on Christmas day").

[33] EDWARDS, *supra* note 2, at 42. *See* Emily Esterson, *Degrees for a Digital Economy*, INC., Sept. 15, 1998, at 42 (stating that "[s]tarting a business without understanding electronic commerce is like starting a race with your shoelaces tied

goods that may not constitute a large enough market to be
profitable to a general retailer, groceries, or items particular to the
Internet such as Web browsers or electronic greeting cards.[34] An
advertiser-supported Web-site is one that profits by selling space
on the site to others who desire to promote their goods and
services, while the Web-site offers its services at no charge to
visitors.[35] Businesses that provide content development may write
for publications on the Internet, design Web-sites, or sell services
to others who develop content for the Internet.[36] Finally, compa-
nies that pre-dated the Internet have now moved on-line. These
businesses can generate profits and avoid costs by going on-line,
such as the overhead of rent, merchandise display, salesclerks,
inventory, security and losses due to theft or damage.[37]

There are many other advantages to conducting business on the
Internet. Virtually any business can be started on the Internet,
relatively inexpensively.[38] A Web-site is not only inexpensive to

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together and 30 pounds of pennies in your pockets").

   [34] EDWARDS, *supra* note 2, at 50.

   [35] EDWARDS, *supra* note 2, at 78. The most common types of advertising on
Web-pages include banner ads, in-line ads and pop-up ads. EDWARDS, *supra* note
2, at 81. *See* EDWARDS, *supra* note 2, at 81 (discussing the different types of
Web-page ads).

   [36] EDWARDS, *supra* note 2, at 97.

   [37] EDWARDS, *supra* note 2, at 130.

   [38] Because an Internet business can be started for $100 or even less, the
inexpensive cost of selling in the electronic world is the significant strength of
conducting e-business. EDWARDS, *supra* note 2, at 46. *See* Marty Katz, *For a
Perky Do-It Yourself Web Site, the Price Was Right*, N.Y. TIMES, Sept. 22, 1999,
at G29 (explaining that maintaining an electronic commerce Web-site need not
be difficult or expensive). The author discusses an off-line coffee shop, "The
Fine Grind," whose owner uses the Internet as a means to communicate with
customers and sell coffee-related items. *Id.* For an alphabetical listing of over
125 Internet businesses, see EDWARDS, *supra* note 2, at 262-70. The range of
businesses include: grocery shopping and delivery; real estate sales; manufac-
turing and sales of custom wood blinds; and sales of rare, specialty, and used
books. EDWARDS, *supra* note 2, at 262–70. Although it is inexpensive to set up
a Web-site, put up items for sale, and to change those items in hours, the most
time consuming task becomes knowing what to sell and how to get consumers
to buy. EDWARDS, *supra* note 2, at 46. There are also "z-shops" which are
designed to assist merchants in setting up shop quickly and inexpensively, though
small businesses still face the problem of time, money, and technical experience

establish, but it is also a less expensive way to provide consumers with the information they might want in deciding whether or not to execute a purchase.[39] For example, consumers' questions can be answered on-line, thus saving a company the cost of paying for toll-free calls to answer questions, and with a Web-site, a company saves the cost of sending out catalogs to inform consumers about the available products or services.[40]

Additionally, certain information is accessible to Internet businesses, which they may not have or may find too costly to obtain in the non-e-commerce world. For instance, merchants can collect data about consumers' buying habits and can use that data to tailor their products and prices accordingly. Furthermore, absent the physical constraints of a traditional store, inventories can be expanded enormously.[41]

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in getting a Web-site up. Troy Wolverton, *Net Giants Make Room For the Little Guy* (visited Oct. 11, 1999) <http://news.cnet.com>.

[39] EDWARDS, *supra* note 2, at 46.

[40] EDWARDS, *supra* note 2, at 46.

[41] *See* Robert D. Hof, *The Net is Open For Business—Big Time*, BUS. WK., Aug. 24, 1998, at 108-09 (discussing the amenities afforded to an Internet based company as contrasted with a physical store). For example, the online bookseller, Amazon.com is able to offer three million titles, while Barnes & Nobles' physical store only offers 175,000 titles. *Id.* Further, Amazon.com receives payments instantly because buyers purchase with their credit cards, yet Amazon.com does not pay publishers for their books until 46 days later. *Id.* Meanwhile, Barnes & Noble has more immediate expenses. *Id.* On-line auctions are also a way to earn profits and offer a variety of items. *See* Amy E. Cortese, *Good-bye to Fixed Pricing? How Electronic Commerce Could Create the Most Efficient Market of Them All*, BUS. WK., May 4, 1998, at 70 (explaining that online auctions allow consumers to bid on everything from collectibles to treadmills though certain auctions are geared toward specific merchandise). The Web-site "Onsale.com," which began operating in 1995, runs seven live auctions each week where people outbid one another on anything ranging from computer gear and electronic equipment to steaks. *Id.* In 1997 alone, Onsale.com sold $115 million worth of goods. *Id.* The founder of Onsale.com stated that "suddenly, consumers are active participants in price-setting. . . . It's infinite economic democracy." *Id.* In addition to the variety of items available at auctions, merchants are able to expand their inventories.

The advent of e-commerce has brought not only a new industry but new legal issues as well.[42] Legal principles developed over centuries tailored to face-to-face business transactions need to be adapted to the digital age.[43] E-commerce has already posed challenges to other areas of intellectual property, and traditional principles are being refined as new rules are emerging to function in the digital age.[44] With innovation as the underlying principle

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[42] *See generally* Vincent I. Polley, *A Model Electronic Communications Policy For the Workplace*, 44 PRAC. LAW. 25, 25 (1998) (stating that "[a] communications revolution is taking place, and it is driven by e-mail and Internet-based technologies. . . . [t]here has been a lag in the orderly evolution of applicable laws"); Kelly M. Slavitt, Note, *Gabby In Wonderland–Through the Internet Looking Glass*, 80 J. PAT. & TRADEMARK OFF. SOC'Y 611, 613 (1998) (explaining that the Internet is already stretching the law in addressing issues such as jurisdiction and domain names).

[43] *See Tanenbaum, supra* note 8, at 14-15 (listing emerging Internet technology and business trends and proposing that two trends in intellectual property need to be accelerated, including the emergence of the development of copyright law for electronic works and computer software and the use by the courts of patent law concepts to resolve electronic copyright disputes). *See also McGowan, supra* note 8, at 307 (recognizing that intellectual property issues on the Internet, including copyright, trademark, patent and trade secret issues, are the most important legal issues involving information being transmitted over the Internet).

    There are many other legal issues posed by the Internet involving areas of law not related to intellectual property. *See, e.g.*, Pamela Samuelson, *Intellectual Property and Contract Law for the Information Age: Forward to a Symposium*, 87 CALIF. L. REV. 1 (1999) (discussing Article 2B of the Uniform Commercial Code ("U.C.C.") and the governing of transactions of information in Cyberspace). Article 2B anticipates marketplaces in which electronic agents representing prospective licensors and licensees of information will meet in cyberspace and form enforceable contracts by exchanging messages on acceptable terms and conditions. *Id.* at 4 n.14 (citing U.C.C. § 2B-204 (Draft, Aug. 1, 1998)).

[44] For an example of challenges the Internet poses to copyright law, see Laurie A. Santelli, Note, *New Battles Between Freelance Authors and Publishers in the Aftermath of Tasini v. New York Times*, 7 J.L. & POL'Y 253 (1998) (discussing who owns electronic rights in freelance articles); Robert P. Merges, *The End of Friction? Property Rights And Contract in the "Newtonian" World of On-Line Commerce*, 12 BERKLEY TECH. L.J. 115, 117 (1997) (discussing the role of property rights and copyright law on the Internet). *See also* Marguerite S. Dougherty, Note, *The Lanham Act: Keeping Pace With Technology*, 7 J.L. & POL'Y 455 (1998) (discussing legal issues the Internet poses in trademark law).

of a digital economy,[45] principles of patent law must be adapted accordingly to extend protection to innovators in this new medium.

B. Development of Patent Law

The United States Constitution gives Congress the power to "promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their respective . . . Discoveries."[46] Congress exercised this power by establishing a national patent system to promote progress by offering inventors exclusive rights for a limited period of time as an incentive to promote inventiveness and research efforts.[47] Congress intended that "[t]he productive effort thereby fostered [would] have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for our citizens."[48]

Congress enacted the first Patent Act in 1790, authorizing patents for "any useful art, manufacture, engine, machine, or

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[45] TAPSCOTT, *supra* note 1, at 70. "[R]ather than traditional drivers of success such as access to raw materials, productivity, scale, and cost of labor, human imagination becomes the main source of value." TAPSCOTT, *supra* note 1, at 70-71.

[46] U.S. CONST. art. I., § 8, cl. 8. The Constitutional Convention unanimously adopted this provision following suggestions by James Madison of Virginia and Charles Pickney of South Carolina for federal jurisdiction over both patents and copyrights. *See* S. REP. NO. 82-1979, at 2 (1952) (explaining that the first and subsequent patent laws were entitled, "Acts to promote the progress of useful arts"). The clause was "written against the backdrop of the practices—eventually curtailed by the Statute of Monopolies—of the Crown in granting monopolies to court favorites in goods or businesses that had long before been enjoyed by the public." Graham v. John Deere, 383 U.S. 1, 5 (1966). *See* Michael L. Fuelling, *Manufacturing, Selling, and Accounting: Patenting Business Methods*, 76 J. PAT. & TRADEMARK OFF. SOC'Y 471, 476 (1994) (providing a review of Article 1 of the Constitution, the Patent Act, case law, and previous patents to illustrate that there is no basis for denying patents to business methods).

[47] S. REP. NO. 82-1979, at 2.

[48] Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 480 (1974).

device, or any improvement therein not before known or used."[49]
Three years later, Congress replaced the 1790 Act with the 1793
Act.[50] The 1793 Act extended patent protection to "any new and
useful art, machine, manufacture, composition of matter, or any
new and useful improvement [thereof], not now known or used
before the application."[51] The 1790 and 1793 Patent Acts, and the
court decisions interpreting them, introduced concepts that are
fundamental to the current patent system.[52]

Systems to determine patentability have evolved through these
early concepts. Originally, patents were granted to every applicant
on the condition that the applicant satisfied the formal require-
ments, filed the necessary papers, and paid certain fees.[53] This
system continued until 1836 when the dissatisfaction with patent
awards, without any examination of novelty or other matters, led
the Senate to appoint a select committee and introduce a bill that
became the Patent Act of 1836.[54] The 1836 Act is similar to

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[49] CHISUM & JACOBS, *supra* note 9, at § 2B (1992) (citing Act of Apr. 10,
1790, ch.7, 1 Stat. 109). Jurisdiction was vested in a board consisting of the
Secretary of State, the Attorney General, and the Secretary of War. S. REP. NO.
82-1979, at 3. Anyone on the board could issue a patent for a period not
exceeding 14 years to any applicant who "'hath invented or discovered any
useful, art, manufacture, or device, or any improvement therein not before known
or used' if the board found that 'the invention or discovery [was] sufficiently
useful and important.'" Graham v. John Deere, 383 U.S. 1, 7 (1966) (quoting 1
Stat. 110). Thomas Jefferson, who was Secretary of State at the time, had a deep
personal interest in the subject matter of patent law and was the author of the
1793 Act. *Id.* Although the board favored granting patents, their other duties
made it difficult to devote the necessary time to this work and as a result, the
law was changed in 1793 to make the granting of patents a clerical function. S.
REP. NO. 82-1979, at 3.

[50] CHISUM & JACOBS, *supra* note 9, at § 2B.

[51] S. REP. NO. 82-1979, at 3 (citing Patent Act of 1793, ch. 11, 1 Stat.
318–323 (Feb. 21, 1793)). When the First Congress met, the consideration of
patents and copyrights was one of its first items of business. S. REP. NO. 82-
1979, at 3. The first patent bill was H.R.10 of the first Congress in 1790. *Id.*

[52] *See* CHISUM & JACOBS, *supra* note 9, at § 2B (providing several
examples, including the 1793 Act's "four category approach" to the definition of
patentable subject matter, which is still in force).

[53] S. REP. NO. 82-1979, at 3 (referring to the Patent Act of 1793, ch. 11
Stat. 318-323 (Feb. 21, 1793)).

[54] CHISUM & JACOBS, *supra* note 9, at § 2B.

present patent law, having created a Patent Office with the Commissioner of Patents at the helm, and examiners underneath assigned the function of examining applications for patents and given the power to refuse patents.[55] This authority was not present in the previous law.[56] The 1836 Act, and subsequent Acts of 1870, and 1874, embodied the same broad language of statutory subject matter as the 1793 Act, and remained in Congress' recodification of the patent laws in 1954 into the current Patent Act of Title 35 of the United States Code.[57]

C. *Statutory Subject Matter*

The current Patent Act defines the areas of innovation available for patent protection. "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."[58]

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[55] S. REP. NO. 82-1979, at 3. *See* 35 U.S.C. § 131 (1994) (providing that the "Commissioner shall cause an examination to be made of the application and the alleged new invention; and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent therefor").

[56] S. REP. NO. 82-1979, at 3.

[57] *Id.* (referring to the Patent Act of July 4, 1836, ch. 357 § 6, 5 Stat. 117; Act of July 8, 1870; c.230, 10 Stat. 198; Rev. Stat. 54886 (1874)); Patent Act of 1874). Congress only changed the word "art" to the word "process." S. REP. NO. 82-1979, at 4. The present patent laws contain approximately 60 sections of the revised statutes of 1874, in addition to a number of acts passed by Congress since that date. *Id.* at 1. The 1870 statute has since been divided into three parts: the first relating to the patent office generally; the second relating to the conditions and procedures under which a patent may be obtained; and the third relating to the patents themselves, including protection of rights. *Id.* at 3-4.

[58] 35 U.S.C. § 101 (1994). The Supreme Court has defined the term "process" as "a mode of treatment of certain materials to produce a given result, . . . an act or series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing." Cochrane v. Deener, 94 U.S. 780, 788 (1876). The term "process" was not added to the statutory specifications of patentable subject matter until the patent laws were recodified in 1952. Congress defined process as, "process, art or method, [including] a new use of a known process, machine, manufacture, composition of matter, or material." 35 U.S.C.

The Supreme Court has acknowledged this prerequisite to patentability by stating that "[n]o patent is available for a discovery, however useful, novel and nonobvious, unless it falls within one of the express categories of patentable subject matter of 35 U.S.C. § 101."[59] On the other hand, the Supreme Court has also recognized that "[a] rule that unanticipated inventions are without protection would conflict with the core concept of the patent law[,] that anticipation undermines patentability."[60]

Historically, Congress and the courts have interpreted the scope of patentable subject matter to include "anything under the sun that

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§ 101. A "machine" is a device that has relatively moveable parts and that performs a useful operation. *Id.* The Federal Circuit has recently held that a computerized accounting system used to manage mutual funds is a machine. State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999). The Supreme Court has defined the term "manufacture" as "the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand labor or by machinery." Diamond v. Chakrabarty, 447 U.S. 303, 308 (1980) (citing American Fruit Growers, Inc. v. Brogdex Co., 283 U.S. 1, 11 (1931)). The term "composition of matter" includes "all compositions of two or more substances and . . . all composite articles, whether they be the results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids." *Chakrabarty*, 447 U.S. at 308 (citing Shell Development Co. v. Watson, 149 F. Supp. 279, 280 (D.C. Cir. 1957)).

[59] Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 483 (1974). The Court of Customs and Patent Appeals has stated that:

> [T]he first door which must be opened on the difficult path to patentability is section 101. . . . The person approaching that door is an inventor, whether his invention is patentable or not. . . . Being an inventor or having an invention, however, is no guarantee of opening even the first door. What kind of an invention or discovery is it? In dealing with the question of kind, as distinguished from the qualitative conditions which make the invention patentable, section 101 is broad and general; its language is: 'any process, machine, manufacture, or composition thereof.'

In re Bergy, 596 F.2d 952, 960 (C.C.P.A. 1979).

[60] *Chakrabarty*, 447 U.S. at 304. The Court recognized that the fact that genetic technology was unforeseen when Congress enacted section 101 does not compel the conclusion that microorganisms cannot qualify as patentable subject matter until Congress expressly authorizes such protection. *Id.*

is made by man,"[61] reflecting Thomas Jefferson's philosophy that "ingenuity should receive a liberal encouragement."[62] Perhaps in attempting to strike a balance between the requirements for patentability set forth in the Patent Act and the liberal philosophy underlying the patent system, the Court has limited this seemingly broad scope of patentable subject matter by denying patent protection to laws of nature,[63] mathematical algorithms[64] and

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[61] S. REP. NO. 82-1979, at 5.

[62] *Chakrabarty*, 447 U.S. at 308-09 (citing 5 WRITINGS OF THOMAS JEFFERSON 75-76 (Wash. ed. 1871)). Jefferson appreciated the social and economic rationale behind the patent system and viewed the patent right as "a reward, an inducement, to bring forth a new knowledge. . . . [o]nly inventions and discoveries which furthered human knowledge, and are new and useful, justified the special inducement of a limited private monopoly." Graham v. John Deere Co., 383 U.S. 1, 9 (1966).

[63] *See* Diamond v. Diehr, 450 U.S. 175, 186 (1981) (stating that an "algorithm, or mathematical formula, is like a law of nature, which cannot be the subject of a patent"); *In re* Miller, 418 F.2d 1392, 1396 (1975) (stating that "printed matter by itself is not patentable subject matter"); Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130 (1948) (holding that the discovery that certain strains of bacteria could be mixed without harmful effect to their properties was merely the handiwork of nature and was therefore unpatentable).

[64] The Court has stated that a "mathematical formula," also referred to as a "mathematical algorithm," is unpatentable subject matter when viewed alone in the abstract. *See Diehr*, 450 U.S. at 186 (characterizing an algorithm or mathematical formula as a law of nature, and therefore outside the scope of protection). The Court stated that "[t]he term 'algorithm' is subject to a variety of definitions. . . . [Petitioner's] definition is significantly broader that the definition this Court employed in *Benson* and *Flook*." *Id.* at 186 n.9. The Federal Circuit has recognized that the Supreme Court's interchangeable use of "algorithm," "formula," and "equation" illustrated the Court's struggle in articulating a rule for mathematical subject matter. *In re* Alappat, 33 F.3d 1526, 1543 n.20 (1994). *Accord In re* Schrader, 22 F.3d 290, 293 n.5 (Fed. Cir. 1994) (recognizing that the term "algorithm" is not universally agreed upon and proposing a working definition to be, "[a]n algorithm is an unambiguous specification of a conditional sequence of steps or operations for solving a class of problems") (citing Allen Newell, *Response: The Models Are Broken*, 47 U. PITT. L. REV. 1023, 1024 (1986)). *But see* State Street Bank & Trust Co., v. Signature Fin. Group, Inc., 149 F.3d 1368, 1374-75 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999) (refining the mathematical algorithm exception to patentability and pointing out that under a broad definition of the term "algorithm," any step-by-step process, whether it be mechanical, electronic, or

abstract ideas.[65] These judicially created exceptions were founded on the notion that such discoveries were basic tools that should be available to everyone.[66] As a result, patents tended to be limited to tangible objects. More recently, the scope of patentable subject matter has been fashioned to extend to technological advances.

D. Obtaining and Owning a Patent

Patent protection does not confer automatically. Rather, an inventor must file an application with the PTO and pay a fee.[67] The patent examiner assigned to the application then must deter-

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chemical, involves an algorithm); AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1357 (Fed. Cir. 1999) (following the reasoning in *State Street* and assessing whether the mathematical algorithm at issue is applied in a practical matter to produce a useful result).

[65] Thus, a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. *Diehr*, 450 U.S. at 175. *See* Hotel Security Checking Co. v. Lorraine Co., 160 F. 467, 469 (2d Cir. 1908) (recognizing that a system of transacting business, such as a method for cash registering and account checking, apart from the means for carrying out the system, is not statutory subject matter). The parameters of the business method exception were left undefined. *See generally* Fuelling, *supra* note 46, at 476 (determining that there is no basis for denying patents to business methods); Del Gallo, *supra* note 10, at 435 (reviewing the application of the business methods exception).

[66] According to the Supreme Court, discoveries involving laws of nature, mathematical algorithms and abstract ideas are "manifestations of . . . nature, free for all men and reserved exclusively to none." Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130 (1948). *See also* Gottschalk v. Benson, 409 U.S. 63, 71-72 (1972) (recognizing that allowing an invention that involved the use of a mathematical formula "would wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself"); Parker v. Flook, 437 U.S. 584, 593 (1978) (explaining that the discovery of a law of nature is not the type of discovery that the patent system was designed to protect). By 1986, the Supreme Court recognized the conditions under which such "discoveries" may indeed be patentable: "phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work . . . . If there is to be an invention from such a discovery, it must come from the application of the law of nature to a new and useful end." *Diehr*, 450 U.S. at 67.

[67] STEPHEN ELIAS, PATENT, COPYRIGHT AND TRADEMARK: A DESK REFERENCE TO INTELLECTUAL PROPERTY LAW 188-90 (1st ed. 1996).

mine whether the claimed invention qualifies for a patent.[68] Typically, the process of applying for a patent involves correspondence between the applicant and the examiner in which the applicant may amend certain claims to show that the invention is novel and non-obvious in light of prior art.[69] If the invention is approved for a patent, generally between one and three years after filing, the PTO may issue a patent, and with it, define the patent's scope.[70]

The patent owner can bring an infringement suit against anyone who uses the invention without permission,[71] and the court can decide to uphold the patent, order an injunction preventing the infringer from any further use or sale of the infringing device,

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[68] *Id.*

[69] Claims are statements included in a patent application that describe or recite in exact terms, the structure of an invention. *Id.* at 203. They may be broad or narrow in terms of the scope of the invention they address, though the broader the scope, the wider the reach of the patent. *Id.* at 204. Claims allow the PTO to determine whether an invention is patentable and the court to determine whether an invention has been infringed. *Id.* at 203. In response to most patent applications, the PTO sends the applicant an office action rejecting some aspect of the application. *Id.* at 195. The applicant has three months to respond with amendment(s) to the application or the rejected claim(s) and if the response is not timely, the application is considered abandoned. *Id.*

[70] *Id. See* 35 U.S.C. § 131 (1994) (providing that the PTO shall issue a patent if the application and invention meet the requirements set by law). A written notice of allowance of the application shall be sent to the applicant if the application is approved by the examiner, and the necessary fees to be paid by the applicant should be specified. *Id.* at § 151 (1994 & Supp. II 1996).

[71] ELIAS, *supra* note 67, at 191. *See* 35 U.S.C. § 271 (1994 & Supp. II 1996) (defining the class of people who may be considered patent infringers and the kinds of activities that may be considered infringements). *See also* Jonathan Bick, *Patents Are Important For Internet Business Methods*, N.J.L.J., Dec. 14, 1998, at 28 (explaining that injunctive relief is available when the business process is crucial to operation of an infringing party). For example, "Coolsavings.com" received a patent for a method of distributing coupons over the Internet and later sued a competitor who was advertising a similar service over the Internet. *Id.* Coolsavings sought damages as compensation for a reasonable royalty and injunctive relief. *Id.*

award damages to the patent owner, or, arrange a royalty agreement between the two parties.[72]

II. THE BUSINESS METHOD AND MATHEMATICAL ALGORITHM EXCEPTIONS

Since the early 1900s, the patent system has operated under the assumption that "business methods," or systems used for conducting business, are per se unpatentable.[73] This judicially created "business method exception"[74] can be traced to the 1908 Second

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[72] *See* 35 U.S.C. § 283 (1994 & Supp. II 1996) (empowering courts to order a party to do something or cease from doing something if such an order is necessary to enforce a patent owner's rights); *id.* § 284 (1994) (providing the monetary damages that a patent owner may recover in court for patent infringement).

[73] Del Gallo, *supra* note 10, at 404.

[74] The business method exception was never clearly defined and the exception was criticized as early as 1934. *See, e.g.,* Tew, *supra* note 10, at 608 (calling for "a clearer definition of unpatentable process than . . . found in the mere expression that 'methods of doing business are unpatentable'."). *See also* Fuelling, *supra* note 46, at 472 (pointing out that 25 years after Tew's article, there is still confusion in this area and although courts still engage in dicta regarding the topic, no case has clearly held that "methods of doing business" are unpatentable). Subsequent to *Hotel Security*, the First Circuit attempted to provide examples of "methods of doing business." *See* Lowe's Drive-In Theatres, Inc. v. Park-In Theatres, Inc., 174 F.2d 547 (1st Cir. 1949) (distinguishing the concept of a drive-in theatre from the means necessary for carrying it out). The court stated:

> A system for the transaction of business, such, for example, as the cafeteria system for transacting the restaurant business, or similarly the open air-drive-in system for conducting the motion picture theatre business, however novel, useful, or commercially successful is not patentable apart from the means for making the system practically useful, or carrying it out.

Id. at 552. *But see In re* Schrader, 22 F.3d 290, 297 (Fed. Cir. 1994) (Newman J., dissenting) (criticizing the business method exception). According to Judge Newman:

> [T]he Board [of Patent Appeals and Inferences] remarked that the "method of doing business" is a fuzzy concept, observed the inconclusiveness of precedent, and sought guidance from this court. Indeed it is fuzzy. . . . The decisions that have spoken of "methods of doing

Circuit decision in *Hotel Security Checking Co. v. Lorraine Co.*[75] Although the business method exception was employed to deny or invalidate patents for many business methods including an accounting system,[76] printed forms,[77] and the concept of a drive-in movie,[78] courts explicitly stated that under the right circumstances, "some methods of doing business might present patentable novelty."[79] In fact, neither the Federal Circuit nor its predecessor court, the Court of Customs and Patent Appeals, ever relied on this theory to deem an invention unpatentable.[80]

Today, many business methods, particularly e-commerce methods, are implemented and managed through software systems. Because software generally contains mathematical algorithms, a review of the judicially created "mathematical algorithm exception"

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business" have, or could have, resolved the issue in each case simply by relying on the statutory requirements of patentability such as novelty and unobviousness.

Id. at 298.

[75] 160 F. 467, 472 (2d Cir. 1908).

[76] *See Ex parte* Murray, 9 U.S.P.Q.2d 1819, 1821 (1988) (finding an accounting method not proper subject matter for patent protection because it constitutes a method of doing business, and further, it preempts an algorithm).

[77] *See In re* Sterling, 70 F.2d 910, 912 (C.C.P.A. 1934) (holding that printing on check forms alone, without a physical structure, fails to satisfy patentable novelty).

[78] *See Lowe's Drive-In Theatres, Inc.*, 174 F.2d at 547 (holding a drive-in theatre concept as unpatentable in abstract, separate from means of implementation).

[79] *In re* Wait, 73 F.2d 982, 983 (C.C.P.A. 1934) (holding that financial services are not patentable when presented as business methods). The claims involved a process for selling commodities at remote locations which involved three functions: transmitting offers to buy or sell to distant locations where interested parties could see the offers posted; transmitting acceptances; and recording each transaction. *Id.* at 982. Although these claims were rejected because the method presented no novelty, consisting of nothing more than the "essential steps in all dealings of this nature," the court reinforced the legal fiction that methods of doing business are not patentable subject matter. *Id.* at 983.

[80] *See id.* at 982 (holding a claimed invention unpatentable for lack of novelty but making broad statements regarding the unpatentability of methods of doing business).

is necessary to understand the patentability of modern business methods.

A. *The Origin of the Business Method Exception*

Since the enactment of the Patent Act, courts tended to focus on the specific categories of invention in assessing a patent's validity. Thus, in 1908, when the Second Circuit was faced with a claim for a cash registering and account checking system in *Hotel Security*, and that system fell outside of the categories of invention, the court instructed that a "business method" was not patentable subject matter.[81]

The invention at issue in *Hotel Security*, designed to protect hotel or restaurant proprietors from losses due to employee dishonesty, provided a system for distinguishing each waiter's order slips from other waiters in the same establishment.[82] When the court applied the Patent Act and found that the claimed invention was not a machine, manufacture, or composition of matter, the court considered whether the system could be categorized as a "new and useful art."[83] The invention, however, was deemed "as old as the art of bookkeeping, i.e., charging the goods of the employer to the agent who takes them,"[84] and the court then looked for the presence of any physical means of implementing the system that could be considered new and useful.[85] In finding none, the court held the claim invalid for lack of novelty.[86] The

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[81] *Id.* at 469. The court stated that "[a] system of transacting business disconnected from the means for carrying out the system is not, within the most liberal interpretation of the term, an art." *Id.*

[82] *Id.* at 468-69.

[83] *Id.* at 469.

[84] *Id.*

[85] *Id.* The court found that the physical means (the sheet and the slips) apart from their manner and use, did not present any new and useful feature. *Id.* The court stated "[a] blank sheet of paper ruled vertically and numbered at the top cannot be the subject of a patent, and, if used in carrying out a method, it can impart no more novelty thereto, than the pen and ink which are also used." *Id.*

[86] *Id. See infra* Part III.C, discussing *State Street* and the Federal Circuit's acknowledgement that the Second Circuit in *Hotel Security* held the invention invalid for lack of novelty.

precedent setting dicta, that a "system for transacting business" was not an "art" under the then existing Patent Act, marked the genesis of the business method exception to patentability.[87]

Following the lead of *Hotel Security*, the PTO adopted the notion that business methods are not patentable subject matter of the Patent Act by incorporating the exception into the *Manual of Patent Examining Procedures* ("MPEP").[88] Although examiners are not bound by the MPEP, under its guidelines, they can reject a method of doing business in finding that the method was not within the scope of the four statutory categories.[89]

The judicially created business method exception to patentable subject matter remained a long-standing obstacle seemingly barring patent protection for computer-implemented inventions.[90] A second obstacle was the mathematical algorithm exception, which

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[87] *But see infra* Part III.A, categorizing the business method exception as "an unwarranted encumbrance to the definition of statutory subject matter that [should] be regarded as error prone, redundant, and obsolete."

[88] PATENT AND TRADEMARK OFFICE, U.S. DEP'T. OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 706.03(a) (1994).

[89] The MPEP is an operating manual used by the PTO but courts are not bound by its terms. HARMON, *supra* note 12, at § 15.1. The Board of Patent Appeals and Interferences, which hears appeals when claims are rejected twice by the examiner or made the subject of final rejection under 35 U.S.C. § 134 (1994); 37 C.F.R. 1.191 (1999), upheld the business method exception as the basis for rejection on at least one occasion. *See Ex parte* Murray, 9 U.S.P.Q.2d 1819, 1820 (1988) (finding a claimed accounting method to be "a vivid example of the type of 'method of doing business' contemplated by our review court as outside the protection of the patent statutes"). Nonetheless, the court noted that in some situations it may be problematic to determine what falls within the judicially prescribed business method exception. *Id.* Today, the accounting system in *Murray* would not be excluded from patent protection on the grounds that it is an unpatentable business method. Rather, the test is whether the system has practical utility and produces a useful, tangible, and concrete result. State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999).

[90] *See, e.g.*, Lance L. Vietzke, *Patent Protection for Computerized Business Methods*, 12 COMPUTER L. 6 (1995) (calling for an elimination of the business method exception). The author points out that the Federal Circuit had the opportunity to address the business method exception in *In re Schrader*, but declined to do so. *See In re* Schrader, 22 F.3d 290 (Fed. Cir. 1994).

arose primarily out of the Supreme Court's trilogy,[91] and was refined by the Federal Circuit's 1994 decision, *In re Alappat*.[92]

B. *The Mathematical Algorithm Exception*

The historical exclusion of mathematical algorithms appeared to preclude patent protection for computer programs entirely.[93] The Supreme Court ruled on the patentability of computer software in three significant cases between 1972 and 1981.[94] The cases of *Gottschalk v. Benson*,[95] *Parker v. Flook*,[96] and *Diamond v.*

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[91] The Supreme Court grappled over the patentability of computer software in three significant cases. Diamond v. Diehr, 450 U.S. 175 (1981); Parker v. Flook, 437 U.S. 584 (1978); Gottschalk v. Benson, 409 U.S. 63 (1972). *See infra* Part II.B, discussing the Supreme Court's trilogy.

[92] 33 F.3d 1526 (Fed. Cir. 1994). In *In re* Alappat, the Federal Circuit upheld as patentable an application based on computer software and pointed out that "[t]he Supreme Court has never held that a programmed computer may never be entitled to patent protection." *Id.* at 1545.

[93] *See In re* Warmerdan, 33 F.3d 1354, 1360 (Fed. Cir. 1994) (denying an application which was directed to an algorithm that created a particular data structure in a computer memory and holding that a mathematical algorithm was not patentable); *Alappat*, 33 F.3d at 1532 (upholding as patentable an application based on computer software and pointing out that "[t]he Supreme Court has never held that a programmed computer may never be entitled to patent protection"). *But see* Marc E. Brown, *Recent Court Decisions Offer Encourage-ment, But Should Not Be Interpreted As Resolving the Thorny Issue of Patentability of Software*, NAT'L L.J., Dec. 12, 1994, at B8 (stating that although the Federal Circuit has gradually been moving towards declaring software to be patentable, as of 1994, the patentability of computer software remained uncertain).

[94] *See Diehr*, 450 U.S. at 183-84 (upholding as patentable a process for curing synthetic rubber that employs a well-known mathematical equation); Parker v. Flook, 437 U.S. 584, 590 (1978) (holding particular software not patentable but emphasizing that a claim is not rendered unpatentable merely because it contains an algorithm); Gottschalk v. Benson, 409 U.S. 63, 71 (1972) (holding that a method for converting signals from a binary-coded decimal form into pure binary form was not patentable and noting that all computer programs are not unpatentable).

[95] 409 U.S. at 63.

[96] 437 U.S. at 584.

Diehr[97] reflect the Court's uncertainty concerning the patentability of inventions that recited mathematical algorithms.

The 1972 decision in *Gottschalk v. Benson* contains the first discussion of algorithms as the focus of analyzing a computer program-related invention.[98] The Court introduced the term "mathematical algorithm," defining it as "a procedure for solving a given type of mathematical problem."[99] The Court denied a patent for a computer algorithm for converting binary coded decimal numbers into binary numbers.[100] Finding that the underlying mathematical formula, although novel and useful, had "no substantial practical application except in connection with the digital computer," the Court held the patent invalid.[101] The Court concluded that the recited process was too abstract, and identified "transformations" of material to a different state as the "clue to patentability" for a process that does not include a particular machine.[102]

Six years later, in *Parker v. Flook*, the Court held that a computer program for calculating "alarm limits," or numbers, in a petroleum refining process for the catalytic conversion of hydrocarbons was not patentable.[103] According to the Court, the only

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[97] 450 U.S. at 175.

[98] Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025, 1032 (1990) (discussing the significance of the invention in *Benson* to the computer industry).

[99] *Benson*, 409 U.S. at 65.

[100] *Id.* at 67.

[101] *Id.* at 71. The Court suggested that the patent laws should be extended to cover computer programs, but considered that issue a policy matter, which the Court declined to address. *Id.* at 71-72.

[102] *Id.* at 70.

[103] Parker v. Flook, 437 U.S. 584, 585 (1978). "During catalytic conversion processes, operating conditions such as temperature, pressure, and flow rates are constantly monitored." *Id.* The invention claimed the following three step method for updating alarm limits. The first step measured the present value of the process variable (e.g., the temperature), the second step used an algorithm to calculate an updated alarm-limit value and the third step adjusted the actual alarm limit to the updated value. *Id.* at 585-86. The Court noted that an argument could have been made that the Supreme Court has "only recognized a process as within the statutory definition when it was either tied to a particular apparatus

difference between the invention and conventional methods was a
new mathematical formula connected to a specific post-solution
activity to implement the method.[104] The Court held that the
claims should be reviewed without the mathematical algorithm or
formula to determine whether patentable subject matter re-
mains.[105] While denying a patent to a computer program in this
case, *Flook* essentially cleared the way for software patents by
affirming the potential patentability of an industrial process that
included as one of its steps the use of a mathematical formula and
a programmed digital computer to do the calculations.

In 1981, the Court opened the door to computer software
patents and held as patentable an invention that claimed a process
for curing rubber in a mold through the use of a formula solved by
a computer program.[106] The computer program in *Diamond v.
Diehr* was necessary to continuously recalculate a certain chemistry
formula in order to determine the precise time to open the mold in
which the rubber was cured.[107] The Court recognized that an
industrial process[108] that was controlled by certain computer
algorithms could be patented, and held this particular process
patentable because it involved the transformation of an article of
raw, uncured synthetic rubber into a different state or thing.[109]
The Court explained that "a claim drawn to subject matter
otherwise statutory does not become nonstatutory simply because

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or operated to change materials to a 'different state or thing.'" *Id.* at 589.

[104] *Id.* at 595.

[105] *Id.*

[106] Diamond v. Diehr, 450 U.S. 175, 177 (1981).

[107] *Id.* at 192-93. The Court recognized that an application of a law of nature
or mathematical formula to a known structure or process may deserve patent
protection. *Id.* In this case, if the synthetic rubber was cured for the right length
of time at the right temperature, it became a usable product. *Id.* at 193.

[108] *Id.* at 192-93. The process involved a well-known mathematical formula
coupled with constant measurement of temperature inside a mold. *Id.* at 193. A
computer calculated ongoing changes in temperature inside the mold and
automatically terminated the curing process at the proper point with a degree of
precision that was unknown in the art. *Id.* at 178-79.

[109] *Id.* at 184.

it uses a mathematical formula, computer program or digital computer."[110]

While *Benson* and *Flook* instructed that algorithms in the abstract are not statutory subject matter, *Diehr* posited that an otherwise statutory process that uses a computer program was not, for that reason alone, ineligible to be patentable.[111] A synthesis of the Supreme Court's trilogy indicates that a patentable process must involve more than calculating abstract numerical values.

From *Benson*, *Parker*, and *Diehr*, the Court of Customs and Patent Appeals ("CCPA") extracted the principle that computerized methods must be applied in some manner to physical elements.[112] Following the Supreme Court's rulings, the CCPA formulated the two-prong *Freeman-Walter-Abele* test as a means to facilitate the assessment of the validity of claims containing mathematical algorithms. In applying this analysis, a court first was to consider whether a mathematical algorithm was directly or indirectly recited, and if a court found a mathematical algorithm to be present, the second step directed a court to determine if the algorithm was otherwise statutory, or applied in any manner to physical elements or steps.[113] Thus, under the second step, if the mathematical algorithm was applied to one or more elements of an otherwise

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[110] *Id.* at 187.

[111] In *Benson*, the Court noted that the decision did not preclude a patent for any program servicing a computer. Gottschalk v. Benson, 409 U.S. 63, 71 (1972). Here, the claimed invention involved a mathematical formula that had no practical application except in connection with a digital computer and upholding a patent would have pre-empted others from using the mathematical formula. Similarly, in *Flook*, the Court stated that "a process is not unpatentable simply because it contains a law of nature or mathematical algorithm." 437 U.S. 584, 590 (1978). The Court stated that "it is commonplace that an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* Thus, this element of physical transformation was hinted at in *Benson* and *Flook*, but was made explicit in *Diehr*. 450 U.S. at 184.

[112] *See* State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1374 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999) (explaining the *Freeman-Walter-Abele* analysis) (citing *In re* Freeman, 573 F.2d 1237 (1978) (as modified by *In re* Walter, 618 F.2d 758 (1980))).

[113] *State Street*, 149 F.3d at 1374.

statutory process claim, the requirements of section 101 were satisfied.[114]

In 1994, the Federal Circuit in *In re Alappat*, removed the physicality requirement from the focus of analysis in assessing the patentability of an invention that recited a mathematical algorithm.[115] The invention in *Alappat* involved a system for improving and controlling the illumination of screen displays for digital oscilloscopes.[116] Even though the invention used a computer program to solve a specific set of mathematical equations, the court upheld the patent.[117] The court looked to the plain meaning of section 101 and interpreted Congress' use of the expansive term "any," as an intent "not to place restrictions on the subject matter for which a patent can be obtained beyond those specifically recited in [section] 101."[118] The court also noted that, although the Supreme Court has held that certain mathematical subject matter, standing alone, cannot be patented, the Supreme Court did not intend to "create an overly broad, fourth category of subject matter excluded from [section] 101."[119] According to the Federal Circuit in *Alappat*, the Supreme Court's trilogy implies that types of mathematical subject matter that represent nothing more than

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[114] *See In re* Schrader, 22 F.3d 290, 292 (Fed. Cir. 1994) (explaining that to be patentable under the *Freeman-Walter-Abele* test, the mathematical algorithm must "be applied to one or more elements of an otherwise statutory process claim").

[115] *State Street*, 33 F.3d at 1545.

[116] *Id.* at 1537. The screen of an oscilloscope is the front of a cathode-ray tube ("CRT"), which is something similar to a television picture tube. *Id.* When this screen is in operation, an array of pixels are presented. *Id.* A CRT screen contains a finite number of pixels, and as these pixels rapidly rise and fall, portions of a waveform may appear jagged. *Id.* This, along with other effects, is known as "aliasing." *Id.* The invention in *Alappat* involved an anti-aliasing system. *Id.* Essentially, it was "an improvement in an oscilloscope comparable to a TV having a clearer picture." *Id.*

[117] *Id.* at 1544. The court explained that the invention at issue was not a "disembodied mathematical concept which may be characterized as an 'abstract idea,' but rather a specific machine to produce a useful, concrete, and tangible result." *Id.*

[118] *Id.* at 1542.

[119] *Id.* at 1543 (citing Diamond v. Diehr, 450 U.S. 175 (1981); Parker v. Flook, 437 U.S. 584 (1978); Gottschalk v. Benson, 409 U.S. 63 (1972)).

abstract ideas when standing alone, until reduced to a practical application, are unpatentable.[120]

The Federal Circuit concluded that computer software could constitute patentable subject matter, provided that all of the requirements to patentability as set forth in title 35 were satisfied.[121] In *Alappat*, the mathematical transformation of data by a machine to produce a smooth waveform on a screen display was found to be a patentable application of an abstract idea because the waveform produced was considered a "useful, concrete and tangible result."[122] This decision lessened the level of judicial scrutiny for patenting computer software.[123]

In 1996, the PTO responded to the emphasis on the patentability of software and computer related inventions and extended to any business idea that is performed on a computer, or one that simply results in a tangible outcome, the eligibility for patent protection.[124] In recognizing that "office personnel have had difficulty

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[120] *In re* Alappat, 33 F.3d 1526, 1543 (Fed. Cir. 1994).

[121] *Id.* at 1545.

[122] *Id. See also* Arrhythmia Research Tech. Inc. v. Corazonix Corp., 958 F.2d 1053 (Fed. Cir. 1992) (holding that the mathematical transformation of electrocardiograph signals from a patient's heartbeat in order to determine the condition of the patient's heart constituted patentable subject matter). *Arrhythmia* suggests that as long as the computer program produces external output, rather than just performing endless internal calculations without practical output, then the test for patentability is satisfied. *Id.* The concurring opinion, in finding *Diehr* to be the most recent and controlling opinion, stated that "courts should not read into the patent laws limitations and conditions which the legislature has not expressed." *Id.* at 1064 (Rader J., concurring).

[123] Note that the *Freeman-Walter-Abele* test still retained some validity. *See, e.g., In re* Schrader, 22 F.3d at 293-94 (involving claims to a competitive bidding system for which computers were useful but were not necessary). *But see* State Street Bank & Trust Co. v. Signature Fin. Group, 149 F.3d 1368 (Fed. Cir. 1998) *cert. denied*, 119 S.Ct. 951 (1999) (finding that the *Freeman-Walter-Abele* test is outdated and should be discarded).

[124] In the 1996 MPEP, the following passage in section 706.03(a) was not included: "[t]hough seemingly within the category of process or method, a method of doing business can be rejected as not being within the statutory classes." *See* State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1376 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999) (citing MPEP § 706.03(a) (1994)). *See also* Hotel Security Checking Co. v. Lorraine Co., 160 F. 467 (2d Cir. 1908) (suggesting that business methods are not proper

in properly treating claims directed to methods of doing business," the PTO changed the *1996 Guidelines for Computer Related Inventions* [Guidelines], instructing that such claims "should be treated like any other process claims."[125] Although the Guidelines do not have the force of law, the Guidelines are "based on the Office's current understanding of the law and are believed to be fully consistent with binding precedent of the Supreme Court, the Federal Circuit and the Federal Circuit's predecessor courts."[126]

The Federal Circuit's analysis in *Alappat*, together with the PTO's amended guidelines, set the stage for *State Street* to shift the focus from whether the claimed invention falls under an enumerated category of invention within the Patent Act to whether the product constitutes a "useful, tangible and concrete result."[127]

III. *STATE STREET BANK & TRUST CO. V. SIGNATURE FINANCIAL GROUP, INC.*[128]

In 1993, the PTO granted a patent to Signature Financial Group, Inc. ("Signature"), protecting a data processing system.[129] The patented system was designed to administer a "Hub and Spoke" configuration, a type of investment structure whereby mutual funds ("Spokes") pool their assets in an investment portfolio ("Hub") organized as a partnership.[130] The system calculates and stores data representing the percentage share that each Spoke fund holds in the Hub portfolio and any daily activity

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subjects for patent protection); *In re* Wait, 22 C.C.P.A. 822, 823-24 (1934) (affirming the notion that business methods are outside the scope of patentable subject matter).

[125] Examination Guidelines, 61 Fed. Reg. 7478, 7479 (1996). *See also infra* Part III.B, discussing *State Street* and the Federal Circuit's recognition of these new guidelines.

[126] 61 Fed. Reg. at 7479. *See* HARMON, *supra* note 12, at § 15.1 (discussing the force of the MPEP Guidelines).

[127] State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999). *See also* 35 U.S.C. § 101 (1994) (listing the categories of invention).

[128] 149 F.3d 1368.

[129] *Id.* at 1369.

[130] *Id.* at 1371.

affecting the portfolio's assets, allocations of gains, losses and expenses to each of the Spoke member funds.[131] The system can also track and update data, and that data is used to determine aggregate year-end income, gains, losses and expenses for accounting and tax purposes.[132] Essentially, the system functions to input, process, store and retrieve data from the storage medium.

When negotiations for a license broke down between State Street Bank & Trust Co. ("State Street") and Signature, State Street brought a declaratory judgment action asserting invalidity, unenforceability, and noninfrignement of Signature's patent.[133]

A. The District Court's Analysis

The district court found the system to be both an unpatentable mathematical algorithm and an unpatentable method of doing business and thus, invalidated Signature's patent.[134] In reaching this conclusion, the court found that the patentability of computer software is best analyzed under the two-prong *Freeman-Walter-Abele* analysis.[135] According to this analysis, if the software constituted a mathematical algorithm, and the algorithm did not cause some transformation of an article or even data into a different state or thing, then the software was not patentable.

The court found that the first step of the analysis showed that Signature's patent was directed to a mathematical algorithm because the claimed data processing system was "an apparatus specifically designed to solve a mathematical problem"[136] and further, the claims actually recited "calculating data as a function of the machine."[137] The second step of the analysis showed that

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[131] *Id.*

[132] *Id.*

[133] *Id.* at 1370.

[134] *See* State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 927 F. Supp. 502, 517 (D. Mass. 1996) (granting motion for summary judgment to State Street and finding the patent invalid as outside the scope of statutory subject matter).

[135] *Id.* at 511. *See supra* notes 112-114 and accompanying text (explaining the two-prong analysis of the *Freeman-Walter-Abele* test).

[136] *State Street*, 927 F. Supp. at 513.

[137] *Id.*

Signature's invention lacked the requisite physical transformation for patentability, because the invention did not physically convert data into "a new and totally different form."[138] According to the court, "[a] change of one set of numbers into another, without more, is insufficient to confer patent protection."[139] The court distinguished the Federal Circuit's reasoning in *Alappat*,[140] where the claimed invention physically converted data into a different form, and stated that the invention involved "no further physical transformation or reduction than inputting numbers, calculating numbers, outputting numbers, and storing numbers. . . . [These] functions could be performed, albeit less efficiently, by an accountant armed with pencil, paper, calculator, and a filing system."[141] In focusing on the absence of a physical transformation, the district court considered Signature's system to be a software program that failed to meet the physicality requirement under the *Freeman-Walter-Abele* analysis.[142]

In an alternative argument, the district court also found the claims to be invalid under the business method exception, and reasoned that "patenting an accounting system necessary to carry on a certain type of business is tantamount to a patent on the business itself."[143] In conclusion, the court granted summary judgement to State Street on the grounds of patent invalidity for Signature's failure to claim statutory subject matter.[144]

B.   The Federal Circuit's Reversal

The Federal Circuit reversed the district court on both the mathematical algorithm exception and the business method

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[138] *Id.* at 513-14.

[139] *Id.* at 514.

[140] *Id.* at 510.

[141] *Id.* at 515.

[142] *Id.* at 514.

[143] *Id.* at 516. *See supra* Part I.B, discussing the business method exception.

[144] *State Street*, 927 F. Supp. at 517. *See* Steven B. Pokotilow & Andrew G. Isztwan, *Court Casts Shadow on Patenting Financial Software*, 2 NO. 9 INTELL. PROP. STRATEGIST 7 (1996) (discussing the district court's decision in *State Street*).

exception as to unpatentable subject matter. First, the court addressed the mathematical algorithm exception, finding that the district court erred in applying the inconsistent *Freeman-Walter-Abele* analysis, explaining that "[a]fter *Diehr* and *Chakrabarty*, the *Freeman-Walter-Abele* test has little, if any, applicability to determining the presence of statutory subject matter."[145] Rather, the court asserted that "whether a claim encompasses statutory subject matter should not focus on which of the four categories of subject matter a claim is directed to . . . but rather, on the essential characteristics of the subject matter, in particular, its practical utility."[146]

Further, the court expressly restricted the mathematical algorithm exception to those situations in which the mathematical calculation merely articulates an abstract idea consisting of disembodied concepts that are not applied to a produce a useful result.[147] The court did not identify a mathematical algorithm as an additional, separate category of unpatentable subject matter. Rather, under this refined approach for analyzing mathematical algorithms, the court explained, "[u]npatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts that are not 'useful.' . . . This means that to be patentable, an algorithm must be applied in a 'useful way.'"[148] The court invoked *Alappat* as an example of a practical application of an abstract idea, because the waveform that the mathematical algorithm produced constituted a "useful, tangible, and concrete" result.[149]

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[145] State Street Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 1373-74 (Fed. Cir. 1998), *cert. denied*, 119 S.Ct. 851 (1999). *See supra* notes 112-114 and accompanying text (explaining the two-prong analysis of the *Freeman-Walter-Abele* test).

[146] *State Street*, 149 F.3d at 1375.

[147] The Federal Circuit stated that the lower court erred in applying the *Freeman-Walter-Able* test, and ameliorated the means for attacking financial software patents. *Id.* at 1373-74.

[148] *Id.* at 1373.

[149] The court emphasized that the inquiry should not focus on the specific statutory category; instead, the focus should be on the essential characteristics of the claimed invention, specifically, its practical utility. *Id.* at 1373.

Significantly, the Federal Circuit in *State Street* held that the transformation of data could constitute a practical application of an algorithm to qualify for a patent, and explained, "[t]oday, we hold that the transformation of data, representing discreet dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces 'a useful, concrete and tangible result'."[150] Signature's "Hub and Spoke" software satisfied the test under section 101 because it produced a final share price, momentarily fixed for recording and reporting purposes, and that final share price was considered a "useful, concrete, and tangible result."[151] Despite the presence of a mathematical algorithm, the usefulness of the software rendered it patentable under the Patent Act, even though the useful result was "expressed in numbers, such as price, profit, percentage, cost, or loss."[152] Accordingly, in order for an invention employing an algorithm to be patentable, it is not necessary that the transformation be limited to physical matter.

Overruling the district court's holding as to the business method exception, the Federal Circuit embraced "the opportunity to lay this ill-conceived exception to rest."[153] The court asserted that "since the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as

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[150] *Id.*

[151] *Id.* at 1375.

[152] *Id.*

[153] *Id.* at 1375-76. The court adopted Judge Newman's comment on the business methods exception:

[The business method exception] is . . . an unwarranted encumbrance to the definition of statutory subject matter in section 101, that [should] be discarded as error-prone, redundant, and obsolete. It merits retirement from the glossary of section 101. . . . All of the "doing business" cases could have been decided using the clearer concepts of Title 35. Patentability does not turn on whether the claimed method does "business" instead of something else, but on whether the method, viewed as a whole, meets the requirements of patentability as set forth in Sections 102, 103, and 112 of the Patent Act.

Id. at 1375 n.10 (citing *In re* Schrader, 22 F.3d 290, 298 (Fed. Cir. 1994)) (Newman, J., dissenting).

applied to any other process or method."[154] Moreover, neither the Federal Circuit, nor its predecessor court, the CCPA, ever invoked the business method exception to deem an invention unpatentable.[155] When this exception has been applied, it has been after a "ruling based on some clearer concept of Title 35 or . . . on finding a mathematical algorithm."[156] For emphasis, the court pointed out that the Second Circuit in *Hotel Security Checking v. Lorraine Co.*[157] did not rely on the business method exception to invalidate the patent at issue in that case, but invalidated the patent because the invention lacked the requisite "novelty."[158]

In conclusion, the Federal Circuit quoted the PTO's position on the business method exception. It contrasted the *1994 Examination Guidelines*, which instructed, "[t]hough seemingly within the category of process or method, a method of doing business can be rejected as not being within the statutory classes," with the 1996 Guidelines which omitted this exclusionary language.[159] The court found the PTO's position further buttressed by the PTO's *1996 Examination Guidelines for Computer Related Inventions*, which state that methods of doing business should be treated like any other process claims.[160] In aligning its reasoning with the PTO, the Federal Circuit agreed that the focus should not turn on whether the claimed subject matter is a method of doing business.[161] Thus, a business method, similar to any other method, constitutes statutory subject matter if it has a 'practical utility' in producing a "useful, concrete, and tangible result."[162]

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[154] *State Street*, 149 F.3d at 1375.

[155] Del Gallo, *supra* note 10, at 435.

[156] Del Gallo, *supra* note 10, at 435.

[157] 160 F. 467 (2d Cir. 1908).

[158] *State Street*, 149 F.3d at 1376. *See supra* Part II.A, discussing *Hotel Security* and the origin of the business method exception.

[159] *State Street*, 149 F.3d at 1376 (citing *Hotel Security*, 160 F. 467; *In re Wait*, 73 F.2d 982 (1934); MPEP § 706.03(a) (1994)).

[160] *State Street*, 149 F.3d at 1377 (citing Examination Guidelines, 61 Fed. Reg. 7478, 7479 (1996)).

[161] *Id.*

[162] *Id.* at 1375. The court noted that the expansive language of section 101 is demonstrative of Congress' intent not to place any restrictions on the subject matter for which a patent may be obtained beyond the four categories recited in

C. Effect and Reasoning of State Street

Given the holding in *State Street*, to determine whether a claim is too broad to be patentable, the PTO and the courts should no longer focus on the specific categories expressed in section 101, but rather, on the practical utility of the matter claimed. As the Federal Circuit has abandoned the limiting principles that "mathematical algorithms" and "business methods" are not patentable subject matter, it has ended the confusion as to whether computer programs and business methods are indeed eligible for patent protection.[163]

Strengthening its reasoning in *State Street*, the Federal Circuit, recently, in *AT&T Corp. v. Excel Communications Inc.*,[164] overturned a district court's ruling that a patent was directed to an unpatentable mathematical algorithm. In employing its reasoning in *State Street*, the court held that claims that cover technological processes whose steps rely on mathematical algorithms, are patentable subject matter if the application of the algorithm produces a "useful, concrete, and tangible result."[165] While *State Street* concerned a machine-type claim, the court in *AT&T* applied

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the statute. *Id.* at 1373.

[163] *See* Seth H. Ostrow, *Federal Circuit Disposes of 'Business Method' Exception*, 15 COMPUTER L. STRATEGIST 1 (1998) (stating that the important legal developments of *State Street* "should ease the way for innovators in the financial, insurance, accounting and related industries to obtain and enforce patents covering new business processes implemented on computer systems"). It is important to note that although *State Street* broadens the statutory subject matter of a patent, the other requirements of patentability set forth in the Patent Act, specifically, that the invention must be novel and nonobvious in light of prior art, are not effected by this decision. *See* Thomas S. Hahn, *No 'State Street' Revolution Coming*, NAT'L L.J., Dec. 7, 1998, at A21 (pointing out that *State Street* "in no way repeals, modifies, or mitigates this law. . . . The decision attempts to nail the coffin shut on knee-jerk unpatentability holdings against patent claims covering business methods").

[164] 172 F.3d 1352, 1355 (Fed. Cir. 1999).

[165] Robert C. Scheinfeld & Parker H. Bagley, *Broadened Scope of Protection*, N.Y.L.J., May 26, 1999, at 3. *See* Mark J. Abate, *Patent Law: Protecting Software*, NAT'L L.J., July 19, 1999, at B4 (discussing the Federal Circuit's analysis in *AT&T*).

the *State Street* analysis to process claims and reinforced the holding that specific, practical applications of algorithm-based software are patentable.

The Federal Circuit "has struggled to make our understanding of the scope of section 101 responsive to the needs of the modern world."[166] Ensuring that algorithm-based software produces a "useful, concrete, and tangible result" facilitates the patentability requirements for Internet-related inventions, while at the same time, allows other inventors to use the same mathematical formulas and algorithms to develop new and useful inventions.

State Street also appears to have finally put an end to patent refusal based on the nearly century-old doctrine born out of dicta in *Hotel Security*.[167] This was a logical conclusion, especially since the PTO and various courts had been issuing patents on business methods for many years.[168] Prior to *State Street*, whether in fact business methods could be patented was a murky subject area in want of clarification. The widespread attention that was attributed to the Federal Circuit's decision greatly increased the public's awareness of the possibility of patenting methods of doing business.[169] Because modern business models are implemented

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[166] AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 1356 (Fed. Cir. 1999).

[167] 160 F. 467, 472 (2d Cir. 1908). *See supra* Part II.A, discussing *Hotel Security* and the origin of the business method exception.

[168] As early as 1982, the PTO granted a patent to Merrill Lynch for a securities brokerage-cash management system. *See* Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith Inc., 564 F. Supp. 1358, 1369 (D. Del. 1983) (ruling on a summary judgment motion, that patent claims to a financial vehicle were not invalid as drawn to a business method). *Id.* at 1359. The data processing computer program was similar to a form of bookkeeping and the patent was challenged on the grounds that it claimed a method of doing business. *See* Lynne B. Allen, *The Patentability of Computer Programs: Merrill Lynch's Patent For A Financial Services System*, 59 IND. L.J. 633 (1983) (suggesting the difficulty in categorizing the Merrill Lynch patent into one of the four enumerated categories of section 101). *See also* David L. Hayes, *What the General Intellectual Property Practitioners Should Know About Patenting Business Methods*, 16 COMPUTER LAW. No. 10 Oct. 1999, at 9 (discussing sample business method patents that have issued pre- and post-*State Street*).

[169] Hayes, *supra* note 168, at 3. *But see* Robert M. Kunstadt, *Sneak Attack on U.S. Inventiveness*, NAT'L L.J., Nov. 9, 1998, at A21 (arguing against the

and managed through software systems, there has been a recent increase in the number of "software patents" filed.[170]

IV. THE RISE AND BENEFITS OF E-COMMERCE PATENTS FOLLOWING *STATE STREET*

State Street's instruction that algorithm based computer software is patentable[171] had an immediate impact on businesses in the electronic commerce realm. Although many believed such subject matter should not be patentable,[172] the PTO responded to the Federal Circuit's holding by issuing a stream of patents

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Federal Circuit's abolition of the business method exception and suggesting that Congress consider legislation in this area).

[170] Hayes, *supra* note 168, at 3. According to the Acting Commissioner of the PTO, the number of applications containing claims similar to those in *State Street* increased by over 40% in the past year. Hayes, *supra* note 168, at 3.

[171] *See* Ernest D. Buff, *Protection and Exploitation of Financial Services Software*, METRO. CORP. COUNSEL, Sept. 1998, at 17 (explaining that the scope of the exceptions to patentability has long been debated and noting that the unpatentability of computer software has been particularly problematic in light of recent technological advances in the computer industry). In response to *State Street*, the article stated that the "ruling is a welcome decision in light of the continuing struggle by the courts to distinguish between patentable subject matter and unpatentable abstract ideas, and in particular, the notion that 'mathematical algorithms' and 'business methods' constitute unpatentable subject matter." *Id.* More recently, in *AT&T Corp. v. Excel Communications Inc.*, the Federal Circuit extended *State Street* and reinforced the holding that specific, practical applications of algorithm-based software are patentable. 172 F.3d 1352, 1356 (Fed. Cir. 1999). The court pointed out that "[s]ince the process of manipulation of numbers is a fundamental part of computer technology, we have had to reexamine the rules that govern the patentability of such technology." *Id.* at 1356.

[172] *See* Peter H. Lewis, *Web Concern Gets Patent for its Model of Business*, N.Y. TIMES, Aug. 11, 1998, at D1 (recognizing that the Priceline patent is one of the first patents issued since the *State Street* ruling that protects a method of doing business on the Internet); Leigh Buchanan, *A Business Model of One's Own*, INC., Nov. 1998, at 82 (expressing concern for other entrepreneurs in light of the recent patents issued to Priceline and CyberGold); Scott Thurm, *Online: A Flood of Web Patents Stirs Dispute Over Tactics*, WALL ST. J., Oct. 9, 1998, at B1 (explaining that with patents on electronic commerce innovations, Web merchants fear that the patent holders will demand licensing fees).

protecting methods of doing business on the Internet.[173] The patents issued are unique in that they are among the first to explicitly detail processes for Internet applications.[174] Reacting to the PTO's actions, many businesses and entrepreneurs began racing to patent their potentially innovative business models.[175] Awarding e-commerce patents is necessary to encourage innovation and the growth of the industry. By implementing guidelines and developing a body of case law, the PTO and the courts are learning to accurately assess the validity and enforceability of these patents.

A. The Expansion of E-commerce Patents

E-commerce patents are quickly becoming mainstream. The PTO issued seventy-one e-commerce patents in 1998, followed by eighty-eight by October of 1999.[176] If this rate continues, by the end of 1999, the PTO will issue nearly 130 e-commerce patents, an eighty percent increase from last year.[177] Less than one month following the *State Street* decision, Priceline.com[178] received one

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[173] Brenda Sandburg, *Madness In PTO's E-Commerce Method?: Doubt Over Breadth of E-Commerce Patents* (last modified Aug. 27, 1998) <http://www.ljx.com> (describing recent patents issued to electronic commerce companies).

[174] *Id.*

[175] The PTO has experienced a boom in business-method-related patent applications. *See* Tony V. Pezzano, *State Street Court Case Opens News World for Tech Patents*, AMER. BANKER, Jan. 18, 1999, at 2 (predicting a boom and explaining that 20 new patent examiners were recently hired for the division responsible for reviewing most electronic commerce patents). *See also* Van Dyke, *supra* note 14, at C19 (explaining that as a result of *State Street*, almost all companies, especially e-commerce firms, "have begun to evaluate their technology in light of the benefits of seeking patent protection for their innovative endeavors").

[176] Scott M. Alter, *"State Street" Sets Stage for New Patents, Battles*, NAT'L L.J., Oct. 25, 1999, at C8.

[177] *Id.*

[178] The patent was issued to Priceline.com on August 11, 1998, protecting a reverse auction bidding system that enables a customer to set a price that he or she would be willing to pay for the purchase of an airline ticket or a car. Lewis, *supra* note 172, at D1. The "name your own price" system, which initially allowed consumers to bid on the price they would be willing to pay for

of the first e-commerce patents issued by the PTO.[179] Priceline's patent protects its reverse auction "name your own price" bidding system, which the PTO found to be a new system of transacting business on the Internet, distinguishable from other existing systems.[180] At the time of the issuance of the Priceline patent,

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an airline ticket, has since expanded to home mortgages, hotel rooms, and automobiles. *See* Paul Davidson, *Web Site Lets You Decide How Much To Pay Priceline Books Mortgage, Hotel or Airfare Meeting Your Demands*, USA TODAY, Sept. 16, 1998, at 12B (discussing Priceline's services). Some critics suggest that there is really nothing new about this system. *See* Peter Elkind, *The Hype Is Big, Really Big, at Priceline: Before You Buy the Idea That Priceline is a Net Breakthrough and Jay Walker is a New Edison, See How He and His Company Really Work*, FORTUNE, Sept. 6, 1999, at 193 (explaining Priceline's travel system and suggesting that it is the airlines, rather than the customers, who actually set the bids). Under the travel system, Priceline negotiates for special prices for access to its participating airlines' unsold seats and the prices are entered into Priceline's private computer database prior to the arrival of a bid. *Id.* When a customer enters a bid, computers check for an available match and then notifies the bidder by e-mail. *Id.* Because the airlines can change the prices several times a day, the author points out that the notion that customers "name their own price" is a fallacy. *Id.*

    [179] *See* Lewis, *supra* note 172, at D1 (recognizing that the Priceline patent was one of the first issued that protects a method of doing business on the Internet since the *State Street* ruling).

    [180] Priceline's airline system is unique compared to other on-line travel agencies. Others include Previewtravel.com, Expedia.msn.com, and Travelocity.com which all function to locate low fares. *See* Jane L. Levere, *It Can Be Tough Getting Cleared for Takeoff; On-Line Airline Ticket Services Are Convenient, But Their Restrictions Make the Process Frustrating*, CHI. TRIB., Aug. 5, 1998, at 3 (discussing bargain travel services on the Internet). Preview-travel.com is an on-line travel service that offers low fares and announcements of airlines' latest specials, Expediamsn.com e-mails travelers with the lowest published fares on the routes of their choice and Travelocity.com also e-mails travelers with a list of each day's lowest fares. *Id.* Additional discount services which locate bargain fares include "Cheaptickets.com," and "Bestfares.com," and "1travel.com." *Id.* "Bestfares" has certain sections only available to subscribers who must pay an annual $60 fee and "Cheaptickets" requires credit card information prior to conducting a fare search and that search results in a choice of 25 fares from which a customer can accept or decline. *Id.* In addition, most major U.S. airlines such as American, Continental, Delta, Northeast, Southwest, Trans World, United, and U.S. Airways offer special weekly Internet fares available at their Web-sites. *Id.* Although Priceline is distinguishable from all of

two additional patents protecting Internet technology received attention. CyberGold, for its method of paying consumers to look at advertisements on the Internet, and NetDelivery, for its electronic delivery management ("EDM") technology.[181] CyberGold's patent covers methods of attention brokerage, which is the business of buying and selling consumer's attention, in an electronic information delivery network using incentives or compensation.[182] NetDelivery's patent protects a system for the delivery of personalized electronic data including bills, invoices, statements, and catalogues.[183]

While the patents issued to Priceline, Cybergold, and NetDelivery were proximal in time to the *State Street* decision, patents in this field continue to issue.[184] Almost a year after receiving its initial patent, Priceline obtained a second patent for its business method that lets consumers name their own price for airline tickets and hotel rooms. This second patent covers the type of airline ticket the company sells, while the first patent protects the name your own price system.[185]

Along with these smaller start-up companies, larger companies have also realized the potential in the field of e-commerce patents. For example, Microsoft recently received a patent for its merchandising system. In particular, the patent covers the architecture that

these services, arguably, there are many obstacles one must overcome when using the Priceline system.

[181] On December 29, 1998, Cybergold was awarded Patent Number 5,855,008, entitled, "Attention Brokerage" patent. *See Business Practice Patents* (visited Aug. 27, 1999) <http://www.public-domain.org/patent/business/> (providing an abstract to the invention).

[182] Lewis, *supra* note 172, at D1.

[183] Lewis, *supra* note 172, at D1.

[184] Seth Ostrow, *Trying to Issue Better Net Patents*, COMPUTER LAW STRATEGIST, July 1999, at 8.

[185] Bloomberg News, *Priceline Receives Another Patent*, (visited Nov. 4, 1999) <http://news.cnet.com/news>. Priceline received a third patent allowing a person to subscribe to a magazine while at a retail outlet, enabling the subscriber to receive the purchased magazine at the retail rate, while the retailer receives a percentage of each subscription sold. Alter, *supra* note 176, at C8. The invention facilitates on-line transactions for immediately obtaining a subscription to a magazine. Alter, *supra* note 176, at C8.

enables a merchant to adapt the merchandising system to its existing business practices.[186] Amazon.com, the largest retailer on the Internet, was awarded a patent for its "one-click" technology that stores a customer's mailing and billing information so that repeat buyers do not have to re-enter this information when ordering merchandise.[187] Amazon.com's technology allows consumers to make their purchases with one click of a computer mouse button.[188]

The Chairman and Chief Executive Officer of one of the most well-known e-commerce companies has said that e-commerce patents:

> [Are] a tremendously positive next step for all U.S. companies involved in creating internet based applications. . . . Traditionally, patents have been the bedrock on which inventors built long-term, thriving businesses. E-commerce is no-exception. The PTO's actions support our nation's policy that cyberspace innovators should be encouraged and rewarded for advancing America's lead in Internet based applications.[189]

The trend toward obtaining patents on e-commerce business methods continues to increase,[190] and since it takes an average of two years from the time an application is filed to the time a patent is granted, it is assumed that many more patents in this area are pending.[191]

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[186] Alter, *supra* note 176, at C8.

[187] Alter, *supra* note 176, at C8.

[188] Alter, *supra* note 176, at C8.

[189] Don Sussis, *Autumn Signals A Harvest of Opportunity On (and Off) the Net*, SILICON ALLEY REP. Oct. 1998, at 88 (statement of Jay Walker, Chairman and CEO of Priceline and founder of Walker Digital). He describes Walker Digital as "a research center, an invention factory and a patent law office." *Id.*

[190] Alter, *supra* note 176, at C8.

[191] *See* Eoin Licken, *U.S. Firms Move Quickly To Patent Technology*, IRISH TIMES, Sept. 11, 1998, at 58 (stating that the issuing of e-commerce patents in the last year has "sent shock waves around the world of e-commerce"). *See also* Thurm, *supra* note 172, at B1 (listing Internet companies that are racing to patent online versions of offline processes). A sample includes: "Amazon.com" for its method of on-line ordering using a credit card and "Citibank" for its method of issuing, using and tracking electronic money. Thurm, *supra* note 172. Recent

B. The Benefits of Patents to E-commerce

The availability of patents are critical to the growth of e-commerce. As with any industry, patents are necessary to enable the creator of a novel system or product to benefit from that invention. Without patent protection of the fruits of one's labor, there is no incentive to innovate.

A company can use its patent offensively and seek an injunction to stop others from infringing its patented invention. Patents may also be used defensively against others who hold patents. For instance, if a patent infringement claim is asserted against a company, that company may gain a stronger position in the dispute if it can assert some patents of its own.[192] Furthermore, obtaining a patent may deter potential competitors from copying a product or its features, and force competitors to innovate themselves.[193]

Patents can be used for various marketing purposes. If a company can describe its product in promotional material and advertisements as "patented," that may convey to consumers that the product is cutting edge, and perhaps more desirable than a competitor's unpatented model.[194] A good patent portfolio can affect a company's market value.[195] This enables patent possessing companies to gain a competitive advantage, and through this "reward" continued innovation may be encouraged.

Other financial benefits may accompany patent protection, particularly those companies in search of capital. The legal monopoly over an aspect of e-commerce that a patent affords can

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applications were filed by "Proflowers.com" for its system of distributing flowers ordered over the Internet and Digital River for patents on six technologies related to buying and downloading software over the Internet. Justin Hibbard, *IT Systems Are More Valuable Than Ever, So CIOs Are Guarding Their Companies' Investments,* INFO. WK., Feb. 22, 1999, at 50.

[192] *See* Hayes, *supra* note 168, at 3 (discussing the various offensive and defensive benefits of patents).

[193] Hayes, *supra* note 168, at 4.

[194] Hayes, *supra* note 168, at 4.

[195] Hayes, *supra* note 168, at 4. For example, following the PTO's news that it had granted three e-patents to Open Market, Inc. the company's stock reached new records. Hayes, *supra* note 168, at 4.

provide a start-up with a significant advantage in operating and expanding its business.[196] Patents on business methods are especially beneficial to Internet start-up companies by protecting them from larger competitors imitating their potentially successful methods.[197] Moreover, patents can also be marketing tools to make it possible for start-up companies to attract capital, launch products, and compete with more established players.[198] A common and desirable method of attracting venture capitalists' is through possession of a product, service or technology, that is patented.[199] Many venture capitalists will not consider investing in an e-commerce venture unless it holds a patent.

Finally, because patent protection is awarded in return for public disclosure of an inventive business method, business and commerce as a whole will benefit as opposed to being left ignorant of improved business methods.[200] Thus, publicity of a patented business model can benefit not only the start-up in attracting a market but other companies or individuals who can license the patented technology.

While it may be likely that future patent litigation will ensue,[201] the case law that develops in this potentially nebulous

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[196] Gary M. Lawrence & Charles B. Lobenz, *Tech Start-Ups Must Assess Intellectual Property Before Pursuing Cash Venture Capitalist's Success in Early-Stage Investing depends on Protection of Vital IP Assets*, NAT'L L.J., June 21, 1999, at C2.

[197] *Id.*

[198] *See* Jay S. Walker, *How Patents Spur Innovation*, BUS. WK., Nov. 16, 1998, at 12 (stating that "protecting intellectual property is the only way to generate more of it"). *But see* Mark Gimein, *How Many Inventors Does it Take to Patent a Light Bulb?* (visited Aug. 27, 1999) <http://www.salon.com> (critiquing Walker's ownership of 18 patents with 250 more pending).

[199] Gimein, *supra* note 198.

[200] Michael T. Platt et al., *Patenting Business Genius*, METRO. CORP. COUNS., Feb. 1999, at 19. *But see* Andrew B. Katz, *'State Street' May Place Start-Ups in Peril*, N.Y.L.J., Jan. 19, 1999, at C2 (warning that start-ups will be at the mercy of big businesses who hold software patents). Patent litigation, however, can be costly, thus, even if the start-up is the owner of the software patent, a larger business can continually challenge the patent's validity and scope, while the small business many not be able to afford lengthy litigation. *Id.*

[201] Gimein, *supra* note 198 (pointing out that Jay Walker, founder of Priceline, holds 18 patents on Internet business concepts and has 250 more

area will serve as precedent to guide courts in limiting the availability of patents and determining whether infringement has occurred. Although it is an early stage in the development of e-commerce disputes,[202] the PTO and the courts are learning to deal fairly and effectively with challenges related to technology. On October 21, 1998, the PTO released additional training materials to its 1996 application guidelines for computer related inventions.[203] Just three months after *State Street*, the PTO announced that it had "recently determined" the need for additional training materials on how to apply the *1996 Examination Guidelines* in computer-related

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pending). *See also* Jaret Seiberg, *Docket: Ruling Threatens Banks with Patent Lawsuits*, AM. BANKER, Sept. 2, 1998, at 3 (advising financial companies to start doing due diligence and to see if their systems infringe existing patents). Seth Ostrow, *Trying to Issue Better Net Patents*, COMPUTER L. STRATEGIST, July, 1998, at 8 (suggesting that the controversy over Internet patents is similar to the controversy over software patents in that the PTO lacks sufficient prior art to assess Internet innovations). *See, e.g.*, Wendy R. Leibowitz, *E-Businesses Discover the Joys of Patents*, N.Y.L.J., June 8, 1999, at 5 (expressing the concern of Robert M. Kunstadt, an intellectual property lawyer in New York, that "patents are being granted for familiar business models merely because they are appearing on the Web").

[202] Recently, e-commerce patent owners have asserted their patents against others. For example, Priceline filed suit in October 1999 against Microsoft for patent infringement and unfair trade practices alleging that Microsoft is violating its software patent that allows consumers to bid for plane tickets and hotel rooms. The Standard-Intelligence for the Internet Economy, *Microsoft to Priceline.com: You Wanna Piece O'Me?* (visited Nov. 1, 1999) <http://-www.thestandard.com>. Also, Amazon.com has accused its rival on-line Bookseller, Barnesandnoble.com, of copying its patented "one-click" check out system, and is currently seeking an injunction and money damages. Leslie Kaufman, *Amazon Sues Big Bookseller Over System for Shopping*, N.Y. TIMES, Oct. 23 1999, at C1.

[203] *Training Materials Are Issued for Applying Computer Invention Examination Guidelines*, 56 PATENT, TRADEMARK & COPYRIGHT J., 756 (1998). The additional materials cover patent applications in business, mathematical processing, and artificial intelligence. *Id.* In 1996, the PTO substantially revised its examination guidelines for evaluating the patentability of computer-related inventions. *Id.* (citing 51 PATENT, TRADEMARK & COPYRIGHT J., 409, 422 (1996)). The guidelines emphasized the requirement of utility under 35 U.S.C. § 101 and the need for examiners to identify the "practical application" of the claimed invention in their assessment of statutory subject matter. *Id.*

business and mathematical processing applications.[204] Given the PTO's awareness of the increased examining complexity that new technology presents, the PTO is educating itself to be competent in handling computer-related claims.[205] Moreover, according to the Patent Commissioner, patent examiners have better database access and training than they did in the past few years, which ensures that software considered for patentability is unique.[206]

Potential disputes can be avoided or at least reduced if e-commerce businesses make themselves aware of the potential patentability of the their business models.[207] Before a technology start-up is in an early stage of financing, it should have an intellectual property attorney assess whether patent protection is available,[208] and whether it might be infringing on another company's patent.[209] If infringement is likely, there are many

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[204] *Id.* The training materials provide examples of computer-related inventions to illustrate proper application of the 1996 guidelines. The claims from each application should be analyzed for patentability through a series of questions. *Id.*

[205] *Id.*

[206] *See* Rodney Ho, *Patents Hit Record in '98 as Tech Firms Rush to Protect I.P.*, WALL ST. J., Jan. 15, 1999, at A2 (quoting Q. Todd Dickinson, acting Patent Commissioner). The author points out that the number of software patents increased to 17,500 in 1998 from 1600 in 1992, which is attributed to the growing acceptance of software patents. *Id.*

[207] *Id.*

[208] *Id.*

[209] *See* Tim Clark, *Who's Got the Patent?* (visited Oct. 14, 1999) <http://www.news.com> (explaining that Internet merchants may be violating several recently issued e-commerce patents). The author presents the scenario of a merchant who accepts credit card payments, offers airline frequent flyer miles for purchases, provides a "shopping cart" for buyers to select purchases, and pay people to click on banner ads or lets consumers name their own price on a particular item. *Id.* That merchant may be violating six e-commerce patents. *Id.*

It should be noted that other industries in addition to e-commerce, may be able to benefit from *State Street*'s broadened scope of protection and should also do due diligence so they are not infringing any other patents. Richard A. Kaplan, *Intellectual Property Patenting Business Methods a More Viable Option*, CHI. LAW., Jan. 1999, at 7. It is predicted that the *State Street* decision will result in an expansion of patent law beyond the traditional fields of manufacturing, engineering, and technology. *Id.* Patent laws of the future may affect banks, brokerage firms, insurance companies, mutual funds, as well as other business

alternatives available, including investigating the validity of the potentially infringed patent in an attempt to develop a defense to infringement claims, contacting the patent owner to negotiate a license agreement, or, modifying the product or service to avoid infringement.[210]

CONCLUSION

Although e-commerce technology is in its infancy, the debate that currently dominates the patent industry echoes the debates of the days of Thomas Edison and Alexander Graham Bell.[211] The question of patentability that is being raised with e-commerce was raised with the advent of the telegraph and the telephone.[212] In an earlier era, PTO guidelines essentially rejected the notion that computer programs could be patented.[213] As technology progressed, courts began to interpret the statutory subject matter of the Patent Act more expansively, to adapt old principles to the modern era of computer technology.[214]

The court in *State Street* was correct to jettison the business method exception from patent law. The exception, born out of dicta almost a century ago, lacked justification, caused confusion and unfairly limited the scope of patentable subject matter. The PTO's

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and financial securities. *Id. See also* Alter, *supra* note 176, at C8 (explaining that a patent clearance investigation should be conducted by a registered patent attorney).

[210] Alter, *supra* note 176, at C8.

[211] Teresa Riordan, *E-Commerce Patents Reopen Legal Questions from the Past Debate: Should a Business Method be Made Property?*, CHI. TRIB., Jan. 11, 1999, at 2.

[212] *Id.*

[213] AT&T Corp. v. Excel Communications Inc., 172 F.3d 1352, 1355 (Fed. Cir. 1999) (citing Fed. Reg. 15581, 15609-10 (1968)).

[214] *AT&T*, 172 F.3d at 1355. The Federal Circuit acknowledged the disagreement of the Court of Customs and Patent Appeals with the PTO's limiting principles. *See, e.g., In re* Tarczy-Hornoch, 397 F.2d 856 (C.C.P.A. 1968) (overruling the "function of a machine doctrine"); *In re* Bernhart, 417 F.2d 1395 (C.C.P.A. 1969) (discussing the patentability of a programmed computer); *In re* Musgrave, 431 F.2d 882 (C.C.P.A. 1970) (analyzing process claims encompassing computer programs). *See Diehr*, 450 U.S. at 193 (Stevens, J., dissenting) (further reviewing the history of the patentability of computer programs).

issuance of patents protecting e-commerce reflects the fact that e-commerce is currently becoming the prevailing method of doing business. Patents are as necessary for e-commerce as for any other industry. Patents provide the incentive to innovate. While fears of patent protection will always surround new innovations, patentability of e-commerce technology will not stifle competition. As the Federal Circuit recognized in *AT&T*, "[t]he sea-changes in both law and technology stand as a testament to the ability of law to adapt to new and innovative concepts, while remaining true to basic principles."[215]

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[215] *AT&T*, 172 F.3d at 1356.