



Spiders and Crawlers and Bots, Oh My: The Economic Efficiency and Public Policy of Online Contracts that Restrict Data Collection

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I. BACKGROUND

¶1 Recent trends reveal the search by companies for a legal hook to prevent the undesired and unauthorized copying of information posted on their websites. This quest has sparked a fundamental controversy over the ownership of information and the Internet itself. Some believe that information published on websites should be used only in a manner sanctioned by the publisher, so that “businesses can proceed without fear of unwanted trespassers that will steal or profit from the fruits of their labor.”¹ Many argue, however, that the efficient exchange of factual information, unhampered by any legal or technological barrier, unquestionably benefits society and weighs strongly against the enforceability of any restrictive mechanism.²

¶2 Especially troublesome to those who struggle against this unwanted copying of website information are software robots. Also referred to as “bots,” “spiders,” and “web-crawlers,” these small programs automatically and rapidly search, copy, and retrieve information from websites.³ Prevalent and controversial among software robots are shopbots or pricebots, which comb through commercial websites, extracting pricing and product information.⁴ Typically, shopbots are used in

¹ May Wong, *eBay, Bidder's Edge End Lawsuit*, at <http://the.honoluluadvertiser.com/2001/Mar/03/33business18.html> (posted on Mar. 3, 2001) (quoting eBay spokesman Kevin Pursglove).

² See Brief of Amici Curiae Mark A. Lemley et al. at 3-8, *eBay, Inc. v. Bidder's Edge, Inc.*, 100 F. Supp. 2d 1058 (N.D. Cal. 2000) (No. C-99-21200 RMW), available at http://jurist.law.pitt.edu/amicus/biddersedge_v_ebay.pdf.

³ See Stephen T. Middlebrook & John Muller, *Thoughts on Bots: The Emerging Law of Electronic Agents*, 56 BUS. LAW. 341, 342-43 (2000); Martijn Koster, *The Web Robots FAQ*, at <http://www.robotstxt.org/wc/faq.html> (last visited May 24, 2002); Martijn Koster, *A Standard for Robot Exclusion*, at <http://www.robotstxt.org/wc/exclusion.html> (last visited May 24, 2002). Search engines illustrate a fundamental use of software robots; these robots traverse the Internet, recursively following hyperlink after hyperlink and indexing the web pages at the end of the links. The indexed web pages are then stored in the search engine's database so that a user may later query the search engine to discover the indexed page. BotSpot, *What's a Bot?*, at http://www.botspot.com/bot/what_is_a_bot.html (last visited May 24, 2002).

⁴ See *infra* Part II.C.

conjunction with a metasite, a website that displays prices from a variety of vendors for an identical item.⁵ While shopbots and metasites tend to revolve around pricing information, these systems have been employed to compile and exploit information ranging from the schedules of ticketed events to the contact information of website proprietors.⁶

¶3

Websites attempting to thwart price/information indexers may invoke technological methods to prevent access by robots.⁷ First, a website may incorporate a robot exclusion header, a text file that indicates that the site does not allow unauthorized robotic activity.⁸ However, compliance with a robot exclusion header is entirely voluntary; a robot must be programmed to read the header and conform to its control directives before searching a website.⁹ Second, if a website detects a robot's presence from repeated and rapid requests generated from a single server, the website may then block inquiries from that server's Internet Protocol address.¹⁰ However, attempts to block queries from a specific IP address often prove unsuccessful because robot information requests may be effected through proxy servers, which frustrate efforts to locate the originating IP address.¹¹ Finally, a website might employ password technology to limit its contents to authorized viewers.¹² However, password mechanisms currently fail to distinguish between human users and robots, and furthermore, this procedure may hinder legitimate access.¹³ No technological method, therefore, currently exists to effectively prevent robot searches of websites while maintaining the site for sanctioned public use. Furthermore, the risk with any technological advancement remains: the blocked robot will find a way to circumvent the new technological barrier, causing the searched site to become even more restrictive, and resulting in a "technological arms race."¹⁴

⁵ Metasites offer little original content, but rather aggregate and organize the content of other websites. *See id.*

⁶ *See generally* Ticketmaster Corp. v. Tickets.com, No. 99CV7654, 2000 WL 1887522 (C.D. Cal. Aug. 10, 2000) (presenting a claim against website that placed deep hyperlinks to plaintiff's ticketing and event information web-pages); Register.com v. Verio, Inc., 126 F. Supp. 2d 238 (S.D.N.Y. 2000) (presenting a claim against website that used data robots to extract names, physical addresses, email addresses, and telephone numbers of plaintiff's patrons).

⁷ Maureen A. O'Rourke, *Shaping Competition on the Internet: Who Owns Product and Pricing Information?*, 53 VAND. L. REV. 1965, 1984-85 (2000).

⁸ *See* Koster, *A Standard for Robot Exclusion*, *supra* note 3. To implement a robot exclusion header, the website administrator must create a text file available on the "[local URL]/robots.txt." The file consists of only two elements: 1) the types of robots that the exclusion header is aimed at, and 2) the portion of a URL that is not to be visited by the robot. This approach has generated momentum because of its ease of implementation and the ability of a robot to access the information with only one query. *Id.*

⁹ *See* Martijn Koster, *Robots Exclusion*, at <http://www.robotstxt.org/wc/exclusion.html> (last visited Mar. 24, 2002).

¹⁰ eBay, Inc. v. Bidder's Edge, Inc., 100 F. Supp. 2d 1058, 1061 (N.D. Cal. 2000); *see* David Kramer & Jay Monahan, *To Bot or Not to Bot: The Implications of Spidering*, 22 HASTINGS COMM. & ENT. L.J. 241, 245-46 (2000). Every server maintains a unique Internet Protocol ("IP") address. When a server queries another server, the requesting computer must furnish its IP address so that the information requested may be sent. If a server detects quickly repeated queries from a specific IP address, this may indicate that the server is hosting a robot. Once robotic activity is confirmed, the requested computer may simply block queries from that specific IP address. O'Rourke, *supra* note 7, at 1984.

¹¹ eBay, 100 F. Supp. 2d at 1061. Proxy servers act as a locus for outgoing server queries and preserve system resources by centralizing outgoing and incoming data. Generally, use of proxy servers is limited to local users. Often due to inadequate maintenance, however, remote users may employ proxy servers. By exploiting this feature, remote users can route outgoing queries through a proxy server, thereby effectively concealing their location. *Id.* Thus, a server hosting a robot may send its robotic queries through a proxy server and attach the proxy server's IP address to all of its inquiries. Any server detecting robotic activity will be lead to the proxy server and not to the actual server hosting the robot.

¹² O'Rourke, *supra* note 7, at 1985.

¹³ *Id.*

¹⁴ *Id.* Currently, companies exist that create and sell software with the specific purpose of evading any kind of defensive mechanism implemented to block data robots. *See* Kramer & Monahan, *supra* note 10, at 247.

¶4

In response to the failure of these technological barriers, website owners have asserted a variety of legal claims to protect their posted information.¹⁵ In particular, recent cases illustrate the use of the common law doctrine of trespass to chattels to block further searches by data robots. Trespass to chattels occurs when one intentionally interferes with the personal property of another, and thereby proximately causes injury.¹⁶ In *eBay, Inc. v. Bidder's Edge, Inc.* and *Register.com v. Verio, Inc.*, two different courts found that the use of shopbots to scour websites constituted a trespass to chattels when the unauthorized robotic activity drained the plaintiffs' system resources, thereby causing injury.¹⁷ In a criticized aspect of these two cases, the courts disregarded the fact that Bidder's Edge's and Verio's shopbots generated a maximum of 1.53% and 2.3% of the system queries, respectively, and essentially aggregated the hypothetical drain on system resources that would occur if multiple robots combed the plaintiffs' websites simultaneously.¹⁸ In this fashion, the courts satisfied the requirement of actual injury with the possibility of future harm.

¶5

Given the precarious injury criterion of the trespass to chattels doctrine, dicta in both *eBay* and *Register.com* reveal that contract law may provide a less demanding legal method of preventing the search of websites by data robots. In *eBay*, the court notes that eBay requires consumers to accept a user agreement, which, among other things, prohibits the use of any robot to monitor or duplicate content contained within the website.¹⁹ The court then suggests, implicitly, that while Bidder's Edge never agreed to comply with the user agreement, if it had consented, the terms of the contract would have been binding.²⁰ In *Register.com*, the court explicitly relies upon the enforceability of a user contract to find that Verio breached the agreement when it employed the robotically extracted information in an unauthorized manner.²¹ Furthermore, the court indicated that while Register.com's user agreement failed to prohibit the use of robots to search its website,²² a contract limiting the use of robots would be enforceable.²³ Therefore, both *eBay* and *Register.com* imply that online contracts offer a legally viable mechanism to prohibit

¹⁵ Several of these legal claims have generally proved to be unreliable and are beyond the scope of this paper. First, while copyright law may provide a remedy for some robotic replication of website data, most shopbots only extract factual information, which is not protected under copyright. *See* Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340 (1991). Second, while the Digital Millennium Copyright Act criminalizes the circumvention of "technological measure[s] that effectively control[] access to a work protected [by copyright]," 17 U.S.C. § 1201(a)(1)(A) (2000), it is unclear that circumventing either a robot exclusion header or an IP address block would invoke the DMCA's protection. Finally, while the Computer Fraud and Abuse Act ("CFAA") criminalizes the knowing transmission of a program with the intent to cause damage to the recipient computer, 18 U.S.C. § 1030(a)(5)(A)(i) (2000), those who attempt to invoke the CFAA may find it difficult to demonstrate damages and the necessary intent.

¹⁶ *Thrifty-Tel v. Bezenek*, 54 Cal. Rptr. 2d 468, 473 (Ct. App. 1996); *see* W. PAGE KEETON ET. AL., PROSSER AND KEETON ON THE LAW OF TORTS § 14 (5th ed. 1984); *cf.* *Register.com*, 126 F. Supp. 2d at 249 ("One who uses a chattel with the consent of another is subject to liability in trespass for any harm to the chattel which is caused by or occurs in the course of any use exceeding the consent. . .").

¹⁷ *Register.com*, 126 F. Supp. 2d at 249-50; *eBay*, 100 F. Supp. 2d at 1070.

¹⁸ *See* Brief of Amici Curiae Mark A. Lemley et al., *supra* note 1, at 14. The *eBay* court hypothesized that if the defendant's use of robots were to proceed unchecked, such use would encourage others to engage in similar robot activity. And if others began to use similar robots to collect data from eBay's website, system use would skyrocket, and the website would suffer "irreparable harm from reduced system performance, system unavailability, or data losses." *eBay*, 100 F. Supp. 2d at 1066; *cf.* *Oyster Software Inc. v. Forms Processing Inc.*, 2001 U.S. Dist. LEXIS 22520, at *39-41 (N.D. Cal. 2001) (finding that a plaintiff in a trespass to chattels claim need not demonstrate a substantial interference with the functioning of a computer system, but only use of the plaintiff's computer system).

¹⁹ *eBay*, 100 F. Supp. 2d at 1060.

²⁰ *Id.* at 1068 n.17.

²¹ *See Register.com*, 126 F. Supp. 2d at 245-48.

²² *Id.* at 249.

²³ *Id.*

shopbots from scouring websites and extracting information, regardless of how the information is ultimately used.

¶6 If blocking shopbots is as simple as posting a mandatory user agreement on a website, the question arises whether this end result is acceptable and desirable. Part II of this paper argues that contrary to popular belief, enforceability of contracts that restrict shopbots (“robot restriction contracts”) will aid in achieving economic efficiency, rather than hindering its progress. Part III of this paper reviews the application of common law contract doctrine and the Uniform Computer Information Transactions Act (“UCITA”) to robot restriction contracts. Both the trends in contract common law and UCITA sanction the enforceability of robot restriction agreements. Part IV of this paper integrates the results of the economic efficiency analysis of Part II and the contract law analysis of part III to gauge whether public policy is served by the enforcement of robot restriction contracts. This investigation indicates that the creation of a technical standard to accommodate fair use robotic activity is necessary to preserve public interest pursuits.

II. ROBOT RESTRICTION AND ECONOMIC EFFICIENCY

¶7 Conventional “brick and mortar” market systems have failed to achieve economic efficiency and perfect competition.²⁴ However, features of electronic markets and the Internet may reduce the frictions of traditional commerce, which have heretofore prevented an efficient market. Specifically, metasites potentially offer the consumer a costless mechanism to determine pricing and product information for any commodity offered for sale by any vendor.²⁵ While many have championed metasites as the panacea for imperfect competition, economic modeling and empirical evidence suggest that a rash transition to consumer reliance on metasites may impede economic efficiency instead of promoting it.²⁶ In contrast, an unhurried transition to a market controlled by metasites will enhance economic efficiency.²⁷ Therefore, online retailers limiting access to their pricing and product information will further the transition to greater economic efficiency, rather than hinder it.

A. Economic Efficiency and Perfect Competition

¶8 Richard Lipsey defines perfect competition as “[a] market structure in which all firms in an industry are price takers and in which there is freedom of entry into and exit from the industry.”²⁸ Economic efficiency incorporates three elements.²⁹ First, *efficiency in distribution* requires that the market distribute products among consumers so that the items are allocated in a manner in which no consumer would prefer a different available item.³⁰ Second, *efficiency in production* involves the maximization of

²⁴ See *infra* Part II.A (discussing the elements of economic efficiency).

²⁵ See *infra* Part II.C (discussing the reduced search costs of metasites).

²⁶ Economic modeling illustrates that an abrupt transition to metasites may result in either monopolistic pricing through vendor collusion or cyclical price wars effected through harmful mass-robot proliferation. See *infra* Part II.C.1. Empirical evidence suggests that factors unrelated to search costs contribute to price dispersion. Thus, eliminating search costs will not produce economic efficiency. See *infra* Part II.C.2.

²⁷ A controlled transition to metasites will eliminate the dangers of mass-robot proliferation while providing an opportunity for price-dispersing factors unrelated to search costs to dissipate. Only when these factors fade, will reduced search costs lead to economic efficiency. See *infra* Part II.D.

²⁸ RICHARD G. LIPSEY ET AL., ECONOMICS G-13 (10th ed. 1993).

²⁹ See ROBERT DORFMAN, PRICES AND MARKETS 114 (1967).

³⁰ See *id.* at 114-16.

the production of desired goods to the extent that resource variables permit.³¹ Third, *consumer sovereignty* requires the production of items most desired by consumers.³² A market economy characterized by homogenous products, perfectly informed consumers and the absence of search or transaction costs will theoretically generate market prices equal to the marginal cost of production, thereby satisfying the three elements of economic efficiency and creating an environment of perfect competition.³³

¶9 To illustrate why prices equaling the marginal cost of production are necessary for an efficient economy, consider two consumers, *X* and *Y*, buying two products, *a* and *b*. Assume *X*'s marginal rate to substitute *a* for *b* is 2 and *Y*'s marginal rate to substitute *a* for *b* is 4. *X* will then substitute 1*b* for 2*a* with indifference. However, *X* would advantageously seek to exchange 1*b* for 3*a*. At the same time, *Y* will gain if *Y* can substitute 3*a* for 1*b*, because *Y*'s marginal rate of substitution of *a* for *b* is 4. This situation, where a mutually advantageous opportunity for substitution exists, is not economically efficient.³⁴ Rather, efficient economics requires that all consumers maintain the same marginal rate of substitution for all products.³⁵ When all consumers purchase products at the same price, the consumers' marginal rates of substitution necessarily converge.³⁶ Thus, a consumer enjoys the greatest utility when the marginal rate of substitution between a pair of products equals the ratio of the products' respective prices.³⁷

¶10 Given that comprehensive price equality is a necessary condition for economic efficiency, why must that price equal the marginal cost of production for an item?³⁸ Economic efficiency requires efficiency in production as well as distribution.³⁹ As noted above, efficiency in production exists when the production system of all commodities is maximized; in other words, production is efficient when as much of

³¹ See *id.* at 114, 116-20.

³² See *id.* at 114-15, 120-26.

³³ Karen Clay et al., Pricing Strategies on the Web: Evidence from the Online Book Industry 8 (Jan. 5, 2001) (unpublished manuscript, available at <http://www.contrib.andrew.cmu.edu/~wolff/pub/NBER010300.pdf>) (citing Joseph Bertrand, *Théorie Mathématique de la Richesse Sociale*, 67 JOURNAL DES SAVANTS 499-508 (1883)). In the Bertrand economics model, firms produce identical products, consumers are perfectly informed, and firms will elect to set prices at the marginal cost of production. In the Bertrand model, if a firm charges a price higher than the marginal cost of production it will face zero demand. Conversely, if a firm charges a price less than the cost of production, it will capture the whole market but will be unable to sustain itself as it generates losses. Therefore, all firms will fall into equilibrium, charging marginal cost of production for all items. See *id.*

In a perfectly competitive environment, no vendor has any control over price. A vendor may sell as much or little of an item as it chooses at that item's established price, but may not charge more or less. Where prices equal the marginal cost of production, a vendor has no choice but to sell its goods at that price. If economic efficiency requires that goods be priced at their marginal cost of production, then economic efficiency necessarily produces perfect competition because vendors must then charge marginal cost of production or fail. See PAUL A. SAMUELSON, *ECONOMICS* 457-58 (11th ed. 1980).

Note that economic efficiency and perfect competition will not necessarily be the most profitable framework for a seller. A perfect monopoly and perfect price-discrimination yield the most profitable result, but both of these characteristics are inherently inconsistent with economic efficiency and perfect competition, because here, sellers would have absolute control over prices. See *infra*, Part II.C.2.

³⁴ DORFMAN, *supra* note 29, at 115.

³⁵ *Id.*

³⁶ *Id.* What seems like an impossibility, having equal marginal rates of substitution among consumers, becomes a reality with uniform pricing of items. Consumers select quantities of different items so that their marginal rate of substitution between each pair of items equals the ratio of their prices, thus equating marginal rates of substitution between consumers. *Id.*

³⁷ See *id.* Efficient distribution exists when all consumers share the same marginal rate of substitution between all items, because then no exchange could benefit any consumer without harming others. *Id.*

³⁸ Marginal cost is "the increment of Total Cost that comes from producing an increment of one unit of *q*." SAMUELSON, *supra* note 33, at 442. It can be calculated by subtracting the total costs of adjacent outputs. See *id.*

³⁹ DORFMAN, *supra* note 29, at 116.

product *a* is created as possible, without lessening the production of product *b*.⁴⁰ Now, assume that 2 consumers, *X* and *Y*, are interested in purchasing *a*, which has a marginal cost of production of 10. *X* is willing to pay up to 10 for *a*; *Y* is willing to pay up to 20 for *a*. If the manufacturer of *a* prices it at any value above 10, then to maximize profits, the manufacturer will produce only 1*a*, whereas production efficiency necessitates the maximum possible output, or 2*a*. Thus, economic efficiency requires that product *a* be priced uniformly, at the marginal cost of production.

B. Why Sellers Object to Price Indexing

¶11 The question arises as to why companies would object to shopbot price indexing of their products. One might initially presume that vendors would appreciate the free publicity offered by metasites. For example, a vendor would benefit when a consumer who had not considered purchasing from that vendor elects to do so based on metasite use. Numerous factors, however, outweigh any benefits from shopbot price indexing.

¶12 First, if, contrary to economic modeling,⁴¹ shopbot and metasite use will inevitably lead to marginal cost of production prices through lower search costs, this in turn will reduce seller profits. By preserving elevated search costs, vendors maintain market power, through which they exploit price dispersion.⁴² Specifically, sellers occupying a dominant market position have an incentive to impede the flow of pricing, product, and vendor information.⁴³ What would Amazon.com, which charges prices substantially higher than its competitors, gain from permitting consumers to view an item by item, price by price, and vendor service by vendor service comparison?⁴⁴ Amazon.com would, in fact, gain little if it were revealed that it offers the same package of products and services for a higher price. Conversely, reputed brand retailers may fear that metasites will deliver to consumers an inaccurate comparison of sellers.⁴⁵ For example, if a metasite only displays two sellers offering the same item for the same price, the seller that has expended significant funds developing an exceptional customer service and delivery system has wasted this cost.⁴⁶

¶13 Second, shopbot and metasite use may upset a seller's revenue model.⁴⁷ In addition to product sales, online retailers earn money through the sale of advertising space, as well as commissions received when they link customers to other related websites.⁴⁸ Use of metasites necessarily diverts consumer traffic away from the

⁴⁰ See *id.* Efficient production requires that the value of every product be the same in every firm that employs it, "for then no reallocation of resources among firms could increase the total value of the economy's output or could increase the output of any commodity without reducing the output of some other." *Id.* at 144.

⁴¹ See *infra*, Part II.C.

⁴² See O'Rourke, *supra* note 7, at 1976-77.

⁴³ See *id.*; see also J. Bradford DeLong & A. Michael Froomkin, *Speculative Microeconomics for Tomorrow's Economy*, in INTERNET PUBLISHING AND BEYOND 6, 25 (Brian Kahin & Hal R. Varian eds., 2000) (couching the reluctance of established vendors to participate in price indexing as the vendors' exploitation of consumer ignorance about the availability of cheaper alternatives).

⁴⁴ Assume, for example, that a competitor offers the identical item at a lower price with the same quality of service and warranty.

⁴⁵ O'Rourke, *supra* note 7, at 1977.

⁴⁶ This is the weaker of the two arguments. As metasites progress they will offer more and more seller information. In addition to price, metasites currently offer information about products, seller delivery track records, seller warranty and return policies, and customer satisfaction ratings. See, e.g., <http://www.MySimon.Com>.

⁴⁷ See O'Rourke, *supra*, note 7, at 1981-82.

⁴⁸ See *id.*

retailers' sites, disrupting the integrity of their revenue models. Metasite use would effectively redistribute income from the seller to the middleman, thereby creating incentives for sellers to increase product prices to compensate for the lack of indirect revenue.

¶14 Finally, sellers may fear (as expressed in the trespass to chattels cases) that unauthorized robot use will drain the resources of their systems.⁴⁹ While current shopbot use, as represented in *eBay v. Bidder's Edge*, constitutes only an inconsequential use of system resources,⁵⁰ the proliferation of metasite use and the corresponding increase in robotic activity may tax sellers' systems, causing unnecessary expense.

¶15 Therefore, despite the potential benefits of shopbot use for established sellers, several additional factors indicate that metasite prevalence will produce negative consequences for their businesses.

C. Metasite Inefficiency

¶16 Given that products priced at their marginal cost of production is a condition for economic efficiency, the question arises whether the reduced search costs associated with shopbots and metasites will inevitably lead to lower prices, unvarying among vendors. Shopbots automatically request pricing and product information from multiple online retailers. In response to a consumer's query, a shopbot can, within seconds, retrieve the product and pricing information for the item selected by the consumer.⁵¹ Thus, a shopbot performs in a matter of seconds what a human consumer would be unable to accomplish in hours. Shopbots, therefore, appear to promise a substantial reduction in the costs of obtaining and distributing product and pricing information, a generally accepted economic boon, which will reduce market friction and enhance economic efficiency.⁵² While negligible search costs (generating a free flow of product and pricing information) are a prerequisite for prices set at the marginal cost of production, these frictionless searches do not by their nature alone generate economic efficiency. Rather, economic modeling and empirical evidence suggest that: 1) unrestrained shopbot implementation may lead to either monopolistic practices or price wars, which would unduly tax the Internet infrastructure, and 2) factors unrelated to search costs preserve price dispersion, frustrating any move toward economic efficiency.

1. Economic Modeling of Unmonitored Shopbot Proliferation

¶17 Traditional economic models commonly assume that consumer search costs are negligible.⁵³ Furthermore, in a market system of homogeneous products and inconsequential search costs, the conventional Bertrand economics model predicts that price competition among vendors will reduce prices to the marginal cost of production, with sellers generating zero profits.⁵⁴ While such a result is commonly

⁴⁹ See *eBay*, 100 F. Supp. 2d at 1071.

⁵⁰ *Id.*

⁵¹ Websites like Shopper.com and mySimon.com collect, sort, and display pricing, product, and other information on items ranging from groceries to consumer electronics. For example, when I searched for a VHS version of *Mary Poppins* (one of my favorite films) on March 26, 2001, mySimon.com presented me with a list of thirty-four results. The list included the name of each vendor, a merchant review, and the price.

⁵² See STANLEY FISCHER ET AL., *ECONOMICS* 176, 235 (2d ed. 1988).

⁵³ *Id.*

⁵⁴ J. Yannis Bakos, *Reducing Buyer Search Costs: Implications for Electronic Marketplaces*, 43 *MGMT. SCI.* 1676, 1682 (1997); see Clay et al., *supra* note 33, at 7-8; cf. Michael D. Smith et al., *Understanding Digital Markets: Review and Assessment*, in *UNDERSTANDING THE DIGITAL ECONOMY: DATA, TOOLS, AND RESEARCH* *2 (Erik

considered desirable,⁵⁵ positive search costs have until now resulted in above marginal cost pricing. It has been theorized that a radical decline in search costs, such as that associated with shopbot and metasite use, may lead to the destabilization of oligopolistic pricing practices and eliminate seller profit.⁵⁶ However, economic modeling suggests that a mass destabilization will bring adverse economic consequences, resulting in higher prices through the formation of new oligopolies or through a mass encumbrance of the Internet's infrastructure.

¶18 To illustrate why unrestrained shopbot mechanics may result in either monopolistic pricing practices or substantial burdens on the Internet, consider a market with a product a , offered for sale by several vendors, S , to a significantly larger number of potential purchasers, B .⁵⁷ The value of a to a particular purchaser b is v_b . Therefore, a consumer will purchase a when the price, p , is less than or equal to v_b , thus obtaining a utility of $v_b - p$ when a transaction occurs and a utility of zero otherwise.⁵⁸ Further, assume that consumers contemplate the price of a product based on one of two different approaches: the type 1 consumer will purchase from the first seller that offers a for a price less than or equal to v_b ; the type 2 consumer will search all vendors and select the vendor that has priced a at the lowest value, assuming the price is less than or equal to v_b .⁵⁹ Note that the second option is available only with a shopbot/metastite scheme; in a traditional market, consumers would be forced to employ the first approach or a drastically diluted form of the second approach, thus fundamentally altering the model.

¶19 A particular seller's profit is equal to the difference in price and cost multiplied by the demand for a of that seller.⁶⁰ The demand of a particular seller becomes a probability function involving two components: consumers of type 1 have a $1/S$ probability of selecting the specific seller, s ; consumers of type 2 will select a seller based on the probability that s offers a at a lower price than other sellers, or, if priced at the same low value as other sellers, $1/(\text{all sellers who have achieved the lower price})$.⁶¹

¶20 When all purchasers are of type 1, seller collusion effects an oligopolistic pricing scheme above the marginal cost of production.⁶² When all purchasers are of type 2, the result is the traditional economic model, where all consumers are perfectly informed of all vendors and a is priced at the marginal cost of production.⁶³ The shopbot/metastite scheme promises a balance between type 1 and type 2 consumers, as a shift to shopbot use will occur gradually rather than suddenly and completely.

Brynjolfsson & Brian Kahin eds., 2000) ("If electronic markets allow consumers to more easily determine retailers' prices and product offerings, these lower search costs will lead to lower prices for both homogeneous and differentiated goods?"), available at <http://ecommerce.mit.edu/forum/papers/ERF140.pdf>.

⁵⁵ See, e.g., Bakos, *supra* note 54, at 1684.

⁵⁶ Bakos, *supra* note 54, at 1690; cf. Robert Kuttner, *The Net: A Market Too Perfect for Profits*, BUS. WK., May 11, 1998, at 20 (arguing that instantaneous access to information on the Internet weakens the ability of vendors to preserve price dispersion through lack of consumers' knowledge of competition, product differentiation, and brand loyalty).

⁵⁷ See generally Jeffrey O. Kephart & Amy R. Greenwald, *Shopbot Economics* (last modified Mar. 20, 2000) (providing a thorough economic modeling of electronic marketplaces and shopbots), at <http://www.research.ibm.com/infoecon/paps/html/aama00/shopbot.html>.

⁵⁸ *Id.*

⁵⁹ *Id.* The buyer population is composed of both type 1 and type 2 consumers, with type 1 consumers initially outnumbering type 2 consumers. The distribution of type 1 and type 2 consumers may be derived in multiple ways but both types will always exist initially.

⁶⁰ *Id.*

⁶¹ *Id.* Both elements of the demand function must also take into consideration whether a is priced at or below v_b .

⁶² *Id.*

⁶³ *Id.*

What then is the effect of this mix of consumers? Computations based on the above model reveal that, as expected, vendor competition will lead to decreased prices through shopbot stimulation of competition.⁶⁴ The reduction in price does not occur instantaneously, however, and does not immediately achieve marginal cost. Rather, the reductions will be incremental based upon consumer reaction and the pricing of other vendors. The question then arises as to how vendors will adjust their prices to maximize profits.

¶21 If vendors were able to price products according to an idealistic game-theoretic model, prices would decrease to the marginal cost of production.⁶⁵ Imperfect information, however, forces vendors to choose from a “myopically optimal method,” a “derivative-following method,” or a combination thereof.⁶⁶ A seller adhering to the derivative-following method tests incremental increases and decreases in its price, continuing to adjust in the same direction until profitability decreases, and then reversing directions.⁶⁷ The myopically-optimal seller fixes its price to maximize profits by using the available information about buyer characteristics and competitors’ prices.⁶⁸ Simulations reveal that use of the derivative-following method leads to oligopolistic practices,⁶⁹ whereas use of the myopically optimal model leads to cyclical price wars, with one vendor always offering the product at the marginal cost of production.⁷⁰

¶22 While a combination of these two pricing methods will most likely lead to price reduction, vendors operating in a shopbot/metasite environment will increase profits with quicker price resetting.⁷¹ To accomplish quicker price resetting, vendors will invoke robots of their own to exploit metasites and learn other vendors’ prices.⁷² Given the vendors’ incentive to make these requests as frequently as possible, vendor robot use will likely overshadow consumer shopbot use. This situation generates two undesirable results: 1) shopbots will begin to charge vendors for the pricing information of other vendors, and vendors in return will begin to charge shopbots for their own pricing information, essentially reinstating search costs; and 2) the presence of millions of pricing robots executing millions of requests will overtax the Internet to a significant degree.⁷³

¶23 Therefore, economic modeling of metasites suggests taking a cautious approach to the use of shopbots and supports the development of a robot pricing protocol to avoid harmful price wars.

⁶⁴ See generally Amy R. Greenwald & Jeffrey O. Kephart, *Shopbots and Pricebots* (last modified Nov. 18, 1999), at http://www.research.ibm.com/infoecon/paps/html/amec99_shopbot/shopbot.html.

⁶⁵ See WILLIAM J. BAUMOL & ALAN S. BLINDER, *ECONOMICS: PRINCIPLES AND POLICY* 601-06 (5th ed. 1991).

⁶⁶ Greenwald & Kephart, *supra* note 64.

⁶⁷ *Id.*

⁶⁸ *Id.* This strategy does not take into account competitor pricing strategy, but supposes that competitors’ prices will remain unresponsively fixed. *Id.*

⁶⁹ *Id.* Even though derivative followers disregard seller and consumer characteristics, their behavior nevertheless results in a collusive state of oligopolistic pricing. This occurs because, under this method, downward pricing trends prove to be far more fragile than upward trends. “For example, if *A*’s price is currently above *B*’s, but *A* reduces its price by an amount insufficient to undercut *B*, then *A*’s profits decrease, so that *A* raises its price in subsequent time steps.” *Id.*

⁷⁰ *Id.* Under the myopically optimal pricing scheme, regardless of the initial distribution of the pricing vector, a configuration soon appears where all sellers price significantly above the marginal cost of production. This state sparks one seller to reduce its price by a minimal amount. This trend of reduction is repeated among the sellers until it would be unprofitable for the next seller to further reduce its price, at which point the next seller resets its price to the original monopolistic value. The other sellers follow the same process, thereby generating a cyclical price war. *Id.*

⁷¹ *Id.*; see also Kephart & Greenwald, *supra* note 57.

⁷² Greenwald & Kephart, *supra* note 64.

⁷³ *Id.*

2. Other Factors Causing Above Marginal Cost Prices

¶24 Even if reduced search costs encourage market efficiency, factors unrelated to search costs maintain price dispersion.⁷⁴ Empirical studies illustrate that price dispersion in Internet markets parallels price dispersion in traditional brick and mortar systems.⁷⁵ For example, Brynjolfsson and Smith found that prices for compact discs and books offered for sale through online vendors typified Internet price dispersion: prices differed as much as forty-seven percent for identical products⁷⁶ and the average price dispersion was thirty-three percent for books and twenty-five percent for CDs.⁷⁷ Even if one maintains that lower search costs reduce prices, other factors present in Internet markets neutralize the effect of diminished search costs and contribute to conspicuous price dispersion.

¶25 Product heterogeneity is one source of price dispersion. It is logical to assume that two distinct products generate two different prices. However, differences in the physical characteristics of products cannot adequately explain the significant price dispersion in Internet markets because many online vendors offer physically identical products for sale. Product heterogeneity also takes into account those merchant services that accompany the sale of products.⁷⁸ For example, a favorable return policy may distinguish one bookseller from another with a less favorable return policy. But these primary service characteristics tend not to vary significantly among online retailers, and any differences are negatively correlated with price.⁷⁹ Thus, product heterogeneity cannot explain why price dispersion exists online even in a market of homogeneous products.

¶26 Others have suggested that consumer convenience might also contribute to price dispersion among online vendors.⁸⁰ Time-sensitive consumers may value a seller's web interface if it provides uncomplicated product location and evaluation tools.⁸¹ Sellers that offer these aids may charge consumers a premium for this convenience.⁸² Factors relating to convenience among online retailers include the facility of search mechanisms, product suggestion devices,⁸³ product reviews,⁸⁴

⁷⁴ Price dispersion results when different prices exist for the same item at the same time. As noted above, the traditional Bertrand economics model assumes that as search costs are eliminated, price dispersion will vanish.

⁷⁵ See Joseph P. Bailey, *Intermediation and Electronic Markets: Aggregation and Pricing in Internet Commerce* (1998) (unpublished Ph.D. dissertation, Massachusetts Institute of Technology) (finding high price dispersion and higher costs generally for books, software and CDs sold online), available at <http://www.csd.uch.gr/~hy405/lectures/phdthesis.pdf>; Erik Brynjolfsson & Michael D. Smith, *Frictionless Commerce? A Comparison of Internet and Conventional Retailers*, 46 MGMT. SCI. 563 (2000) (finding lower prices but high dispersion for Internet vendors of books and CDs), available at <http://ecommerce.mit.edu/papers/friction/friction.pdf>; Eric K. Clemons et al., *The Nature of Competition in Electronic Markets: An Empirical Investigation of Online Travel Agent Offerings* (June, 1999) (unpublished manuscript) (finding high price dispersion for online airplane ticket sales), available at <http://cbi.gsia.cmu.edu/Conferences/1999SFconference/Hann/Hannpaper.pdf>. When I performed my search for *Mary Poppins*, see *supra* note 51, the thirty-four results I received ranged in price from \$11.20 to \$28.47.

⁷⁶ Brynjolfsson & Smith, *supra* note 75, at *21.

⁷⁷ *Id.* at *3.

⁷⁸ *Id.* at *26; Smith et al., *supra* note 54, at *9.

⁷⁹ Brynjolfsson & Smith, *supra* note 75, at *27.

⁸⁰ See, e.g., DeLong & Froomkin, *supra* note 43, at 26.

⁸¹ See *id.* at 29-32.

⁸² See *id.* at 26, 29; Smith et al., *supra* note 54, at *10-11.

⁸³ For example, Amazon.com employs several mechanisms to provide consumers with suggestions. A consumer can enter general criteria and Amazon.com will then offer selections based on these criteria. Furthermore, Amazon.com will suggest products based on past purchases of a specific consumer.

⁸⁴ For example, Amazon.com displays both professional and consumer critique of its products, viewable adjacent to the basic product information.

product samples,⁸⁵ and rapid checkout procedures.⁸⁶ These convenience elements are distinct from the differences in physical characteristics (or accompanying services) encompassed within the product heterogeneity factor. Because these convenience tools are separate from the physical product, retailers should not gain a pricing advantage by offering them; a consumer could exploit the convenience offered by one vendor while purchasing from another. However, high search and switching costs may compel a consumer to remain with the vendor that offers these convenience tools. Website design characteristics, such as background wallpaper, also influence a consumer's perception of a product.⁸⁷ Therefore, construction of an visually agreeable and efficient online purchasing forum may allow certain vendors to charge a premium over sellers that fail to offer similar conveniences, resulting in price dispersion unrelated to search costs.

¶27 Branding and consumer trust may also preserve price dispersion in the absence of search costs. The economic model described in Part II.C.1., above, assumes that when a consumer exploits a metasite, he or she will purchase from the vendor that offers the lowest price. Shopbot executives, however, have revealed that metasite visitors frequently purchase from recognized brands, even when these vendors charge a substantially higher price than other retailers.⁸⁸ In the nascent Internet market, trust and brand play an important role "because of the spatial and temporal separation between buyers and sellers imposed by the medium."⁸⁹ Transactions for physical goods over the Internet involve disjointed payment and delivery and consumers may be willing to pay a premium to purchase from a trusted vendor that will protect their credit card information and deliver the purchased products effectively. Furthermore, the general aversion to personal data mining, which is often associated with online retailers,⁹⁰ suggests that consumers will opt for a trusted brand that will safeguard their personal information. Factors such as online communities located on the retailer's website, links to the retailer from other trusted websites or portals, extensive advertising, and existing brick and mortar brand names all contribute to Internet brand recognition and the ability to charge and receive higher prices.⁹¹

¶28 Vendors may also succeed in charging higher prices when they have implemented loyalty programs that effectively lock in the consumer.⁹² These programs offer consumers incentives to remain with the vendor and discourage use of a different retailer that may have lower prices. For example, a retailer may offer the equivalent of frequent flier miles, where the consumer accumulates bonuses with each successive purchase. Additionally, online vendors may utilize collaborative filtering tools, which compare a consumer's past selections with those of other

⁸⁵ For example, Amazon.com offers consumers audio clips from tracks of musical selections offered for sale.

⁸⁶ Online retailers may offer "one-click" checkout, where a consumer's shipping and payment information is stored by the vendor to facilitate the administrative aspects of purchases.

⁸⁷ See Naomi Mandel & Eric J. Johnson, Can Web Pages Change Choices? Priming, Search and the Construction of Preferences (August 14, 2001) (unpublished paper), at <http://www.cebiz.org/Papers/Constructing%20on-line%20preferences.PDF>.

⁸⁸ O'Rourke, *supra* note 7, at 1974. Well branded Internet vendors such as Amazon.com and CDNow charge prices that are 7-12% higher than lesser known vendors, yet are frequently selected by consumers. *Id.*

⁸⁹ Smith et al., *supra* note 54, at *12.

⁹⁰ See generally Federal Trade Commission, *FTC announces Settlement with Bankrupt Website, Toysmart.com, Regarding Alleged Privacy Policy Violations*, (July 21, 2000) (describing claims that a company misrepresented to consumers that their personal information would not be disclosed to third parties), at <http://www.ftc.gov/opa/2000/07/toysmart2.htm>.

⁹¹ Smith et al., *supra* note 54, at *13.

⁹² *Id.*

consumers and generate personalized recommendations.⁹³ Consumer lock-in may also occur in the absence of direct loyalty programs, through the ease of use of a particular vendor's interface. Consumers familiar with one online retailer's website may avoid switching to an unfamiliar website. Therefore, lock-in mechanisms, both intentional and unintentional, may contribute to price dispersion.

¶29 Finally, price discrimination provides another source of price dispersion unrelated to search costs. Price discrimination exists when markets have been segmented between high and low valuation consumers, "such that the sellers can post a high price that high demand consumers will find attractive given their knowledge about the products in question."⁹⁴ To illustrate price discrimination consider a product, a , with a marginal cost of production of 9. Consider 10 consumers, Q , all of whom are willing to pay up to 13 for a . Further, consider consumer R , who is willing to pay up to 60 for a . How does the vendor price a ? To maximize profits, the vendor will price a at 60, sell it to R , and realize a profit of 51. If the vendor were able to sell a for 13 to Q but at 60 to R , the vendor would realize a profit of $(10*4)+(1*51)=91$. In this manner, retailers may achieve greater income through price discrimination.

¶30 Two characteristics of the Internet make price discrimination more practicable in online markets than in brick and mortar markets. First, Internet vendors may easily track consumer characteristics.⁹⁵ Second, lower menu costs allow online vendors to change prices with greater ease.⁹⁶ An example illustrates the ease with which merchants can practice price discrimination on the Internet. Books.com offered consumers a price matching policy; it presented customers with a mechanism that compared its price for a specific item with the prices of several other vendors, and changed its price if another vendor offered the same item for a lower price.⁹⁷ While initially this strategy appears to provide economic efficiency, it in fact price discriminates. Books.com failed to maintain the new price for future transactions. Consumers who elected not to engage in the price comparing process risked missing the pricing benefit, but also avoided a potentially lengthy price comparison procedure and the possibility of a fruitless search.⁹⁸ While price discrimination obviates economic efficiency (as it necessarily leads to different marginal rates of substitution), it may offer some consumers lower prices and the ability to purchase where none existed before.

¶31 Therefore, even if the reduced search costs of the Internet would consequently lead to lower prices, other factors impede this reduction. Product heterogeneity, convenience tools, trust in brands, consumer lock-ins, and price discrimination all contribute to price dispersion on the Internet—dispersion unrelated to search costs.

⁹³ See DeLong & Froomkin, *supra* note 43, at 32-35.

⁹⁴ ALAN E. WISEMAN, FED. TRADE COMM'N, ECONOMIC PERSPECTIVES ON THE INTERNET, 38 (July 2000), available at <http://www.ftc.gov/be/economicissues.pdf>.

⁹⁵ See *id.* at 39 (citing Hal R. Varian, *Price Discrimination*, in 1 HANDBOOK OF INDUSTRIAL ORGANIZATION 597, 599 (Richard Schmalensee & Robert D. Willig eds., 1989) (noting that a necessary condition for price discrimination to occur is the ability to sort customers)).

⁹⁶ See *id.* at 31.

⁹⁷ *Id.* at 40.

⁹⁸ A study of Books.com found that the average savings to a consumer who used the price comparison mechanism was \$.15 and that the procedure could take up to one minute. Smith et al., *supra* note 54, at *16. Thus, in essence, Books.com discriminated on the basis of convenience and potential savings. It apparently discovered that enough consumers would find the comparison process too time-consuming to justify the savings.

D. Summary of Economic Analysis

¶32 The economic analysis of metasites yields surprising observations. First, it is often in the sellers' interests to initially limit shopbot extraction of their pricing and product information, and sellers will presumably take steps to effect this preference. Second, economic modeling demonstrates that shopbot use will not inevitably lead to lower prices and economic efficiency, but will likely induce price wars characterized by uncontrolled and damaging robot use. Finally, factors other than search costs contribute directly to price dispersion, thereby negating any reduction in price resulting from diminished search costs.

¶33 Because comprehensive shopbot access would overly tax a system without reducing prices and potentially redistribute income in a seller- and consumer-detrimental manner, a combination of legal and technical mechanisms that will safeguard the Internet markets during the transition to metasite use is warranted. The economic modeling of metasites reveals that the pacing of price resetting is a crucial issue directly related to robot proliferation. Given the reluctance of established sellers to participate in price indexing, if they were able to invoke and rely upon legal and technical mechanisms to prohibit robot use on their websites, this would curtail the potential threat of system overload while permitting metasite functioning.⁹⁹ With the advancements of metasites to compare elements in addition to price, the other factors producing price dispersion will fade, thus leading to lowered search costs without robot proliferation.¹⁰⁰ Therefore, as metasites become a staple for consumers, branded retailers that had prevented shopbot access will find it in their interest to permit shopbot indexing.¹⁰¹ In this fashion, we realize a complete transition to metasite use, while avoiding cyclical and taxing price wars, by establishing a time control mechanism.¹⁰² While this end could be accomplished by legally requiring online retailers to permit robot access and then mandating and enforcing a shopbot protocol,¹⁰³ seller limitation of shopbots through contract and technical standards appears to offer the same result.¹⁰⁴

III. CONTRACT LAW AND ROBOT EXCLUSION

¶34 The explosive growth in personal computer and Internet use has ushered in a new breed of contracts. Gone are the handshake deals and ornate signatures of yore, replaced by shrinkwrap and clickwrap agreements. The hazy realm of intellectual property rights in computer information has motivated data owners to

⁹⁹ Presumably, metasites would continue to index retailers for which the benefits of price indexing outweighed the negative aspects, specifically the less branded retailers.

¹⁰⁰ If these other factors continued to cause price dispersion, then consumers would persist in choosing well-branded but more expensive retailers, even though the desired product is offered for less by other vendors. This presumably is a preferred state to the cyclical price wars, which would occur if vendors could not invoke legal mechanisms, such as contract law, to limit robot access to their websites.

¹⁰¹ When the elements other than search costs that affect pricing disappear, established retailers will find it necessary to compete with indexed retailers because consumers will otherwise simply select the indexed vendor with the lowest price.

¹⁰² Presumably, sellers who have avoided metasite price indexing will switch only when consumers are wholeheartedly relying on metasites and the vendors who are listed by the metasites offer products for substantially less than non-listed vendors' \approx marginal cost of production. At this point, vendors will not need to engage in a price resetting race, as the prices will have already been set. The taxing price wars predicted in the economic model are thus avoided by tempering the transition to metasite use.

¹⁰³ For example, the law could impose criminal or civil liability for one who failed to heed a robot exclusion header.

¹⁰⁴ Other steps a retailer might take to protect profits would have a more harmful effect on economic functioning. For example, sellers might charge user fees for access to the market, raise the costs of acquiring the information, or increase product differentiation. See WISEMAN, *supra* note 94, at 30.

eschew governmental protection and to embrace security through private agreement.¹⁰⁵ Initially, to prevent the pirating of software, companies implemented shrinkwrap contracts—unsigned licensing agreements accompanying the sale of computer software, which bind the purchaser when he or she opens the software package.¹⁰⁶ Clickwrap agreements soon followed, referring to contractual terms present on websites.¹⁰⁷ These web-based contracts range from chat-room access agreements to software-downloading arrangements, and include terms ranging from indemnity to forum selection.¹⁰⁸ While some websites induce users to express consent by having them click on an “I accept” button, other websites simply condition use of the site on an implicit acceptance of displayed contractual terms.¹⁰⁹

¶35 If passive clickwrap agreements are valid, a website could theoretically prevent robots from indexing the site’s data by displaying a simple notice, which reads: “by accessing this website, the user agrees not to employ any robot to copy the content of the website.”¹¹⁰ Can it be that simple? Were all the arguments invoking trespass to chattels and the Computer Fraud and Abuse Act unnecessary? Three elements may stand as obstacles to the enforceability of robot restriction contracts: 1) the doctrines of consent, contract of adhesion, and unconscionability; 2) copyright preemption; and 3) the questionable validity of contracts assented to by robots. Despite these ostensible barriers, both contract case law and the Uniform Computer Information Transactions Act indicate that robot restriction contracts are enforceable.

A. Shrinkwrap and Clickwrap Caselaw

¶36 While for years shrinkwrap licenses were of questionable legality, *ProCD v. Zeidenberg*¹¹¹ marked a dramatic shift in the courts’ thinking about these contracts. In *ProCD*, the defendant purchased a software compilation of telephone numbers, extracted the phone records from that compilation, and incorporated them into his own computer program, thereby breaching the shrinkwrap agreement.¹¹² Judge Easterbrook, writing for the Seventh Circuit, declared that the shrinkwrap license at issue was valid and enforceable.¹¹³

¶37 Many argue that shrinkwrap and clickwrap agreements constitute unenforceable contracts of adhesion, wherein the offeree is frequently unaware he or she is

¹⁰⁵ See James Boyle, *Cruel, Mean, or Lavisb? Economic Analysis, Price Discrimination and Digital Intellectual Property*, 53 VAND. L. REV. 2007, 2010 (2000).

¹⁰⁶ See generally Katy Hull, Note, *The Overlooked Concern with the Uniform Computer Information Transactions Act*, 51 HASTINGS L. J. 1391, 1392-99 (2000).

¹⁰⁷ See *id.*

¹⁰⁸ See generally Dawn Davidson, Comment, *Click and Commit: What Terms Are Users Bound To When They Enter Web Sites?*, 26 WM. MITCHELL L. REV. 1171 (2000).

¹⁰⁹ For example, users of eBay must agree to a seven page contract and click on an “I accept” button positioned at the end of the agreement. eBay, 100 F. Supp. 2d at 1060. Register.com, on the other hand, publishes terms of use for its WHOIS database on the home page of its Internet website and conditions entry into the WHOIS database on assent to those terms. Register.com, 126 F. Supp. 2d at 245.

¹¹⁰ While this presents the most extreme example of clickwrap enforcement, recent case law supports its validity. See Register.com, 126 F. Supp. 2d at 248. *But see* Specht v. Netscape Communications Corp., 150 F.Supp.2d 585, 591-96 (S.D.N.Y. 2001) (distinguishing between click-wrap agreements and browse-wrap agreements, and finding that browse-wrap agreements, which require no affirmative manifestation of assent, fail to constitute valid contracts). Nonetheless, a more likely scenario is for websites to rely on a robot exclusion header to bind robots to the terms of website use. By relying on the Robot Exclusion Standard, websites essentially force robots to face the terms of the contract before accessing the content of the website.

¹¹¹ 86 F.3d 1447 (7th Cir. 1996).

¹¹² *Id.* at 1449-50.

¹¹³ *Id.* at 1455.

entering into a contract.¹¹⁴ The court in *ProCD* disregarded contract of adhesion and lack of consent arguments, however, noting that the offeror, as master of the offer, may invite acceptance by conduct, and may dictate the category of action or conduct that constitutes an acceptance.¹¹⁵ The court pushed contextual unconscionability concerns aside by stressing that “[s]hrinkwrap licenses are enforceable unless their terms are objectionable on grounds applicable to contracts in general....”¹¹⁶ Clickwrap agreements have received similar, but more limited, judicial treatment. In *Hotmail Corp. v. Van\$ Money Pie, Inc.*, the court found that Hotmail was likely to succeed on its breach of contract claim when the defendant failed to abide by Hotmail’s online service agreement.¹¹⁷ In *Caspi v. Microsoft Network*, the court affirmed the validity of a forum selection clause within an online agreement.¹¹⁸ Finally, the court in *Register.com* enforced a clickwrap agreement where use of the plaintiff’s website was conditioned upon assenting to terms posted on the site, requiring no affirmative manifestation of assent.¹¹⁹

¶38 Similar to the contract in *ProCD*, a robot restriction agreement would protect the unauthorized use of factual data, namely prices. Furthermore, a website could implement a consent scheme similar to that validated in *Register.com*, where use of the website was conditioned upon consenting to terms of the contract. Despite *Register.com*’s holding, however, the automatic nature of data robots suggests a more prudent approach would be to incorporate the Robot Exclusion Standard within a clickwrap template. Under this scheme, a data robot would be forced to confront and process robot restriction terms.¹²⁰ Given the direct parallels between robot restriction contracts and the shrinkwrap agreement upheld in *ProCD*, as well as the supplemental weight of the clickwrap caselaw, robot restriction contracts appear to be enforceable under contemporary contract law.

¶39 Copyright preemption presents another potential obstacle to the enforcement of robot restriction contracts under state contract law. Copyright law attempts to maintain a balance between the creators’ and users’ interests by protecting works of authorship, while leaving elements such as ideas, facts and procedures within the

¹¹⁴ Davidson, *supra* note 108, at 1194-1201; Mark A. Lemley, *Shrinkwraps in Cyberspace*, 35 JURIMETRICS J. 311, 317-19 (1995). The humorist Dave Barry satirized the length and complexity of shrinkwrap and clickwrap agreements, commenting:

By breaking this seal, the user hereinafter agrees to abide by all the terms and conditions of the following agreement that nobody ever reads, as well as the Geneva Convention and the U.N. Charter and the Secret Membership Oath of the Benevolent Protective Order of the Elks and such other terms and conditions, real and imaginary, as the Software Company shall deem necessary and appropriate, including the right to come to the user’s home and examine the user’s hard drive, as well as the user’s underwear drawer if we feel like it, take it or leave it, until death do us part, one nation indivisible, by the dawn’s early light, in the name of the Father, the Son, and the Holy Ghost, finders keepers, losers weepers, thanks you’ve been a great crowd, and don’t forget to tip your servers.

DAVE BARRY, DAVE BARRY IN CYBERSPACE 98 (1996).

¹¹⁵ 86 F.3d at 1452.

¹¹⁶ *Id.* at 1448.

¹¹⁷ 1998 WL 388389, at *6 (N.D. Cal. April 16, 1998).

¹¹⁸ 732 A.2d 528 (N.J. Super. Ct. App. Div. 1999); *see also* *iLAN Systems, Inc. v. Netscout Service Level Corp.*, 183 F. Supp.2d 328, 338 (D. Mass. 2002) (upholding validity of clickwrap agreement).

¹¹⁹ 126 F. Supp. 2d at 248. While Verio argued that the contract was unenforceable because Verio was not asked to click on an icon indicating it accepted the terms, the court found that the presence of clearly posted contractual terms was sufficient. *Id.* However, in *Specht v. Netscape Communications Corp.*, the court distinguished between click-wrap and browse-wrap agreements. In a browse-wrap agreement, the terms of the agreement are merely posted on the website, and no affirmative consent by the user is required. The court in *Specht* found that browse-wrap agreements do not constitute valid contracts because no affirmative manifestation of assent is required. 150 F. Supp. 2d at 595-96.

¹²⁰ A clickwrap scheme avoids the facial problems of browse-wrap contracts addressed in *Specht*.

public domain.¹²¹ The question thus arises as to whether this balance is subject to variation by contract or whether this balance embodies unwavering federal policy positions. In other words, may private parties create intellectual property rights through contract where no right existed before? In the context of robot restriction agreements, the issue becomes whether the factual pricing information, which is planted in the public domain by copyright law, may be rendered proprietary through contract law.

¶40 In *ProCD*, the district court found that allowing parties to contract around copyright law would alter this delicate balance.¹²² Judge Easterbrook reversed, however, finding that the contract rights at issue were not “equivalent to any of the exclusive rights within the general scope of copyright.”¹²³ The court reasoned that while copyright law provides a “right against the world,” contract rights affect only the parties to the contract, and that “strangers may do as they please.”¹²⁴ The court further illustrated this distinction by emphasizing that if somebody found a copy of ProCD’s database on the sidewalk, the shrinkwrap license would not limit the finder.¹²⁵ Therefore, Judge Easterbrook concluded that, “whether a particular license is generous or restrictive, a simple two-party contract is not ‘equivalent to any of the exclusive rights within the general scope of copyright’ and therefore may be enforced.”¹²⁶ For similar reasons, copyright law would presumably not preempt a robot restriction agreement under contract law.

¶41 Whether a robot may enter into contracts that bind the robot’s implementer presents a final obstacle to the enforceability of robot restriction agreements. Some have turned to agency law principles to address this concern.¹²⁷ Agency describes a relationship between two parties where an agent party consents to act on behalf of, and under control of, the principal party.¹²⁸ When an agent acts according to his or her authority, the agent has the power to affect the legal status of the principal to the same extent as if the principal had acted.¹²⁹ As a result, when an agent enters into a contract with a third party, that third party may subsequently enforce the contract against the principal.¹³⁰ Thus, under agency law, it appears that a robot that enters into a clickwrap agreement, either by clicking on an “I accept button” or disregarding the express protocol set forth in a robot exclusion header, would bind the person who designed and implemented the robot to the terms of that clickwrap agreement.¹³¹

¹²¹ Dennis S. Karjala, *Federal Preemption of Shrinkwrap and On-line Licenses*, 22 DAYTON L. REV. 511, 518 (1997).

¹²² *ProCD, Inc. v. Zeidenberg*, 908 F. Supp. 640, 658 (W.D. Wis. 1996), *rev’d*, 86 F.3d 1447 (7th Cir. 1996).

¹²³ *ProCD*, 86 F.3d at 1454.

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ *Id.* at 1455. Judge Easterbrook’s stance on copyright preemption has generated significant controversy. For example, Professor Karjala draws a distinction between widely accessible and generally inaccessible works. Karjala, *supra* note 121, at 518. For widely accessible works, Professor Karjala argues that the copyright scheme does not merely serve as a default position that may be reordered through private contract. Rather, “[t]o allow private reordering of these rights by agreement between the copyright owner and the direct users . . . would be to ignore the interest of the general public that the copyright balances have been so carefully designed to protect.” *Id.* Furthermore, Judge Easterbrook’s opinion has been criticized for failing to address whether the enforcement of state contract law may be preempted by the Supremacy Clause of the Constitution. *Id.* at 522.

¹²⁷ *See, e.g.*, Middlebrook & Muller, *supra* note 3, at 354-59.

¹²⁸ REST. (SECOND) OF AGENCY § 1 (1957).

¹²⁹ *Id.* at § 12 cmt. a.

¹³⁰ *Id.* at § 140.

¹³¹ Furthermore, the recently enacted federal E-SIGN statute states that “[a] contract . . . may not be denied legal effect, validity, or enforceability solely because its formation, creation, or delivery involved the action of one or more electronic agents so long as the action of any such electronic agent is legally attributable to the

¶42 Therefore, the doctrines of assent, contract of adhesion, copyright preemption, and robot contracting fail to present concrete obstacles to the enforceability of robot restriction agreements under current contract common law.

B. UCITA and Robot Restriction Agreements

¶43 Spurred by the need for uniformity within the realm of non-tangible information contracting, the National Conference of Commissioners on Uniform State Laws (“NCCUSL”) composed and disseminated the Uniform Computer Information Transaction Act (“UCITA”).¹³² UCITA has garnered significant support,¹³³ but also engendered strident opposition.¹³⁴ A model contract law to be adopted by individual states, UCITA governs agreements that involve “computer information transactions.”¹³⁵ Computer information refers to “information in electronic form which is obtained from or through the use of a computer”¹³⁶ UCITA’s coverage includes contracts to license software, create computer information, distribute computer information, and gain access to online databases.¹³⁷ The concept of a robot restriction contract appears to fall squarely within UCITA’s definition of a viable access agreement as “a contract to obtain by electronic means access to, or information from, an information processing system of another person, or the equivalent of such access.”¹³⁸ Furthermore, UCITA expressly addresses the three concerns present at common law: 1) the doctrines of consent and contract of adhesion, 2) copyright preemption, and 3) the validity of robot assent.

¶44 UCITA offers liberal rules of contract formation, providing that a contract may be effected by any method sufficient to show agreement, including offer and acceptance or conduct by the parties.¹³⁹ “An offer to make a contract invites acceptance in any manner and by any medium reasonable under the circumstances.”¹⁴⁰ The question then becomes: What constitutes a reasonable acceptance of robot restriction terms? While the affirmative clicking of an “I agree” button would presumably satisfy this provision of UCITA, it is questionable whether the conditioning of website use on assent to posted terms would prove reasonable under the circumstances. Rather, the use of a robot exclusion header, in combination with posted terms, would prove more efficient and reliable. Use of the Robot Exclusion Standard would compel robots to confront contractual terms without beleaguering legitimate website users with burdensome consent provisions.

person to be bound.” 15 U.S.C. § 7001(h) (2002). While E-SIGN does not expressly validate contracts formed by robots, it appears to yield to their enforceability.

¹³² Carlyle C. Ring, Jr., *Uniform Rules for Internet Information Transactions: An Overview of Proposed UCITA*, 38 DUQ L. REV. 319, 320-23 (2000).

¹³³ See generally Mary Jo Howard Dively, *The New Laws That Will Enable Electronic Contracting: A Survey of the Electronic Contracting Rules in the Uniform Electronic Transactions Act and the Uniform Computer Information Transactions Act*, 38 DUQ L. REV. 209, 253 (2000).

¹³⁴ See generally Hull, *supra* note 106; Apik Minassian, Comment, *The Death of Copyright: Enforceability of Shrinkwrap Licensing Agreements*, 45 UCLA L. REV. 569 (1997).

¹³⁵ UNIFORM COMPUTER INFORMATION TRANSACTIONS ACT § 102(a) (1999).

¹³⁶ UCITA § 102(a)(10).

¹³⁷ Carlyle C. Ring, Jr. & Ray Nimmer, *Series of Papers on UCITA Issues*, (last modified Aug. 26, 1999), at <http://www.2bguide.com/docs/q&capm.html>.

¹³⁸ UCITA § 102(a)(1).

¹³⁹ UCITA § 202(a). While UCITA contains a special provision governing mass-market licenses, robot restrictions would arguably not constitute such agreements under § 209. And even if one could argue that robot restriction agreements represent mass-market licenses, the extra safeguards provided would prove inconsequential in this context.

¹⁴⁰ UCITA § 203(1).

¶145 UCITA explicitly asserts that federal preemption applies.¹⁴¹ As with all state laws, those provisions of UCITA that are preempted by federal law become invalid.¹⁴² Nonetheless, UCITA renders shrinkwrap and clickwrap agreements generally enforceable,¹⁴³ despite the inherent nature of information licensing to implicate values embodied in federal copyright law.¹⁴⁴ The primary goal of clickwrap and shrinkwrap agreements is to limit the copying and use of proprietary material.¹⁴⁵ Therefore, while UCITA claims to be neutral in the debate over whether copyright law should preempt private information contracts,¹⁴⁶ it in fact noticeably slants toward Judge Easterbrook's view in *ProCD*. Raymond Nimmer, the reporter for UCITA, claims that copyright law functions as a default standard, which may be contracted around by consenting parties.¹⁴⁷ Therefore, if UCITA's implicit endorsement of clickwrap agreements that implicate copyright privileges becomes established, robot restriction agreements would not be stymied by federal preemption under UCITA.

¶146 Finally, UCITA strengthens the ability of data robots to form contracts. UCITA confirms that robots or electronic agents may enter into contracts with other electronic agents or individuals.¹⁴⁸ Furthermore, UCITA contains an attribution rule, which states that an electronic authentication is attributed to the person who implemented the electronic agent.¹⁴⁹ "A person that uses an electronic agent that [he or she] has selected for making an authentication, performance, or agreement, including manifestation of assent, is bound by the operations of the electronic agent, even if no individual was aware of or reviewed the agent's operations or the results of the operations."¹⁵⁰ Therefore, if a pricebot validly forms a contract pursuant to UCITA, its implementer is bound by the contract's terms.

¶147 Under UCITA, an electronic agent manifests assent if it authenticates a contract or engages in operations or conduct that indicate acceptance of the contractual terms.¹⁵¹ Proof that a robot obtained or used information where the robot must have engaged in specific conduct to access the information verifies assent to a contract that limits access to the information.¹⁵² Moreover, a website provides an electronic agent with the opportunity to review a contract if it makes it available in a

¹⁴¹ UCITA § 105(a).

¹⁴² BLACK'S LAW DICTIONARY 1177 (6th ed. 1990).

¹⁴³ Garry L. Founds, Note, *Shrinkwrap and Clickwrap Agreements: 2B or Not 2B?*, 52 Fed. Comm. L.J. 99, 102 (1999). UCITA § 209 establishes a template for mass-market contracts involving computer information. This in essence is the definition of a shrinkwrap or clickwrap agreement.

¹⁴⁴ See Pratik A. Shah, Note, *The Uniform Computer Information Transactions Act*, 15 BERKELEY TECH. L.J. 85, 97-104 (2000).

¹⁴⁵ Shrinkwrap and clickwrap agreements, which were developed to protect the unlicensed copying and distribution of software, as well as to circumvent the first sale doctrine, have traditionally involved intellectual property rights. See Hull, *supra* note 106, at 1393-94. As the Internet gains popularity as a retail medium, clickwrap agreements have progressed to include non-intellectual property aspects, such as a user agreement dictating appropriate conduct in a chat-room. See Davidson, *supra* note 108, at 1173. Nevertheless, UCITA's mass-market licensing scheme was designed with the traditional shrinkwrap and clickwrap contracts in mind. See UCITA §§ 102(a)(11), 103; Ring, *supra* note 132, at 332-33.

¹⁴⁶ Founds, *supra* note 143, at 102.

¹⁴⁷ Raymond T. Nimmer, *Breaking Barriers: The Relation Between Contract and Intellectual Property Law*, 13 BERKELEY TECH. L.J. 827, 827-31 (1998).

¹⁴⁸ UCITA § 206(a).

¹⁴⁹ UCITA § 213.

¹⁵⁰ UCITA § 107(d).

¹⁵¹ UCITA § 112(b).

¹⁵² UCITA § 112(d).

manner that a reasonably configured electronic agent would react to.¹⁵³ Therefore, placing the contractual terms of a robot restriction agreement within the robot exclusion header would notify a reasonably configured robot of the website's policy.¹⁵⁴ Consequently, UCITA's strong robot attribution rules and its robot assent provisions appear to sanction pricebot restriction agreements when implemented through a robot exclusion header.

¶48 Therefore, UCITA essentially sanctions the use of robot restriction agreements. It provides liberal contract formation policies, implicitly approves of private contracting around federal copyright law, and offers liberal robot assent specifications. A properly formulated robot restriction agreement, designed to prevent shopbots from gathering pricing information, thus appears to fall squarely within the realm of UCITA.

C. Summary and Conclusion of Current Law Regarding Robot Exclusion Contracts

¶49 Dicta in *eBay* and *Register.com* suggest that web-based contracts, which users would encounter upon entering a website, would prove effective in preventing price data collection by shopbots.¹⁵⁵ While elements of clickwrap agreements have sparked controversy surrounding these contracts' enforceability, contract common law and the momentum gained by UCITA promote the enforceability of properly couched robot restriction contracts. In practice, a robot restriction agreement could either compel consumers to click on an "I accept" button or to incorporate its terms into the code of a robot exclusion header. By relying on the Robot Exclusion Standard, a website offers a legally viable shopbot restriction agreement without burdening legitimate human web users with unavoidable clickwrap language.

IV. INTEGRATION OF PUBLIC POLICY, ECONOMIC EFFICIENCY, AND CONTRACT LAW: THE NEED FOR A FAIR USE STANDARD

¶50 The combination of computing technologies and the Internet has revolutionized the production and dissemination of information, while obscuring the border between the public and private domains. Improvements in the calculation and compilation of factual information, in combination with the drastic lowering of search costs, have facilitated consumer access to information.¹⁵⁶ Intellectual property law has traditionally recognized a dual function of information: on the one hand, information should exist as a proprietary entity under the control of the creator, and on the other hand, information should function as an unprotected element to promote knowledge exploration and growth.¹⁵⁷ While federal intellectual property law establishes a balance between these two ends of the spectrum, the question arises as to whether the use of contract law as a proxy for intellectual property law disregards the public-use aspect of information. In the context of robot restriction agreements, the question becomes whether denying robots access to pricing and product information frustrates valuable public use.

¶51 Contract common law and UCITA both support the enforceability of robot restriction agreements. This contracting regime thus places pricing and product

¹⁵³ UCITA § 112(e)(2).

¹⁵⁴ See *supra* Part I (discussing robot exclusion headers and text files).

¹⁵⁵ *eBay*, 100 F. Supp. 2d at 1060; *Register.com*, 126 F. Supp. 2d at 245-48.

¹⁵⁶ WISEMAN, *supra* note 94, at 25-27.

¹⁵⁷ J.H. Reichman & Jonathan A. Franklin, *Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contract with Public Good Uses of Information*, 147 U. PA. L. REV. 875, 884 (1999).

information at the extreme proprietary end of the dual information spectrum; these legal systems permit uncomplicated formation of contracts that grant wide-ranging control of factual information and restrict even potentially beneficial public uses of the data. The question then arises whether any beneficial use of product and pricing information outweighs the need to afford proprietary rights to the records. Economic analysis has revealed the following: 1) that unencumbered metasite activity leads to price wars, which may well result in mass system strain or price premiums; and 2) that even if reduced search costs necessarily lead to lower prices, factors unrelated to search costs will maintain price dispersion. Therefore, economic analysis provides an incentive to lean in favor of proprietary interests over the public use of pricing and product data.

¶52 Nevertheless, it is not difficult to imagine beneficial uses of pricing and product data. First, while pricing data itself may prove of little use in the progress of education, science, and research, data robots and metasites are not used only to collect and compare pricing information. Rather, data robots can potentially collect and compile information regarding any subject matter, including addresses and contact information, research results, and event and transportation scheduling. Furthermore, metasites continue to offer consumers increasingly more information in addition to price: information such as warranty provisions, shipping processes, and consumer satisfaction. Thus, the ease of formation of robot restriction agreements may limit valid and worthwhile public access to an unlimited range of data. For example, research on factors—unrelated to search costs—that maintain price dispersion may promote the elimination of these factors, thereby allowing lower search costs to lead to marginal cost of production pricing through controlled shopbot implementation.

¶53 Second, the detrimental first prong of the economic analysis was predicated upon shopbots and metasites acting as profit-seeking enterprises. Under this model, metasites have incentives to satisfy as many queries as rapidly as possible, thus furthering disadvantageous price wars. However, a public interest, non-profit metasite might sidestep this obstacle by limiting its queries, thereby removing an essential link in the perpetration of retailer price-query/price-resetting functions.¹⁵⁸ Furthermore, if such a non-profit, public interest metasite existed, it might provide improved opportunities for the price-affecting factors unrelated to search costs to wane. Therefore, concrete public-use interests exist for product and pricing information.

¶54 How, then, should contract law permit acceptable public use of pricing and product information, while still permitting retailers to control access to pricing data and thereby preserve the integrity of online markets? A potential solution would be the development of a technical standard modeled after the principles of the fair use defense to federal copyright infringement. The fair use defense permits courts to avoid rigid application of the law when it would unfairly restrict dissemination of useful works to the public.¹⁵⁹ Section 107 of the Copyright Act lists four factors to consider when deciding whether a public use is justified: 1) the purpose and character of the use, 2) the nature of the protected work, 3) the effect of the use upon the potential markets for the work, and 4) the amount of the work used. A viable fair use standard of robot accommodation could directly parallel the federal

¹⁵⁸ If, for example, a metasite updated its prices only once an hour, or once a day, this would eliminate the possibility of retailers relying on metasites to check other retailers' prices and adjusting their own prices accordingly. Enforceability of robot restriction agreements, which rely upon the Robot Exclusion Standard, would, as discussed, also result in a limitation of shopbot queries, thereby accomplishing this same result.

¹⁵⁹ See generally 17 U.S.C. § 107 (2002); *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569 (1994).

copyright provisions and include a condition limiting the frequency of robot use. This technical standard could be incorporated within the robot exclusion header, which would already be used to couch the robot-restrictive contractual terms.

¶55 Therefore, if one were to contemplate a non-profit metasite that performed only a limited number of inquiries (as opposed to a commercial metasite that had an economic incentive to maximize its inquiries), such a use would satisfy a technical standard that focused on the character of the information collected and the process used to collect it. The purpose and character of the use reflect strong economic policy. The nature of the work—factual pricing data—engenders less sympathy if taken than other forms of protected work because prices are inherently intended to be disseminated to consumers. Furthermore, the technical standard could indicate the maximum frequency of robot queries that the fair use standard will tolerate.¹⁶⁰ Therefore, a technical standard accommodating fair use shopbot operation would prove viable and beneficial in restoring the balance of the dual nature of information, while preserving the economic and proprietary incentives.

V. CONCLUSION

¶56 While the Internet offers the potential to radically transform economic markets and consumerism, we must not be rash in assuming that by its nature it will inherently accomplish this goal. Rather, the law should recognize that the reduced search costs of the Internet create as many dangers as they offer remedies. While reduced search costs are inherently beneficial, to impose them upon a market and technological structure unprepared to accommodate them—while ignoring the potentially adverse consequences—could be as harmful as inhibiting the reduction in search costs in general. The uncertain direction of Internet markets encourages a more balanced approach to pricebots and metasites. Enforceability of robot restriction contracts and the addition of a fair use technical standard offers a stable and evenhanded approach to encouraging economic efficiency and avoiding the dangers of reckless reliance on the Internet.

¹⁶⁰ The hypothetical non-profit metasite, because it moderates its robot use, could satisfy the robot frequency element within the technical standard. Contrarily, a commercial metasite will have economic incentives that urge it to deploy robots as frequently as possible.