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Protecting Intellectual Property Within Horizontal Exchange Relationships

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PROTECTING INTELLECTUAL PROPERTY WITHIN HORIZONTAL EXCHANGE RELATIONSHIPS

I. INTRODUCTION

The conceptual framework that surrounds this discussion puts intellectual property in the context of an important independent development—that of the horizontal exchange relationship. These relationships involve the exchange of proprietary information between businesses. Unlike traditional exchanges rooted in market transactions, these new horizontal exchanges emerge quickly out of a variety of innovative business relationships. When applied to the legal apparatus of intellectual property, these exchange relationships have definite implications for lawyers and the intellectual property tools they use.

1 The term "horizontal exchange relationship" is a generic description of how business firms that compete in similar markets trade proprietary information in an environment of cooperation and interdependence. Horizontal exchange relationships represent an important development in the field of marketing where they can be seen as an evolution from market independence, to market control through vertical integration, to market cooperation. See Louis P. Bucklin & Sanjit Sengupta, Organizing Successful Co-Marketing Alliances, J. MARKETING, Apr. 1993, at 32.

2 Relationships are frequently born out of a sense of urgency and anxiety. When market changes dictate that participation in rapidly developing technologies requires partners with complementary assets, companies rush into negotiations out of fear of being left out altogether. For example, telecommunications companies and cable firms are desperately trying to find compatible relationships that will sustain long-term partnerships as they jockey for position in the multi-billion dollar opportunity of wireless communication. See John J. Keller & Leslie Cauley, Mad Scramble: Fear of Being Left Out of a Wireless Future Spurs Frantic Alliances, WALL ST. J., Oct. 25, 1994, at A1.

3 There are a variety of names used to describe relationships of exchange between business firms: co-marketing alliances, network organizations, marketing exchange companies, marketing coalition companies, virtual corporations, value-adding partnerships, horizontal corporations. Although the marketing literature has not settled on any one characterization, each is consistent in emphasizing the management of relationships over market transactions. S. Huszagh & F. Huszagh, 74 OR. L. REV. (forthcoming 1995) (not yet titled).
The evolution of the horizontal exchange relationship is a function of the changing organizational structure of business firms. Firms are no longer organized simply to command and control their own actions. The velocity of technological innovation and global competition demands more of the individual firm than it is capable of providing in isolation. Out of necessity, therefore, firms are reorganizing in an effort to foster exchange relationships.

4 Much of the literature written on organizational structure discusses the changing structure within an individual firm. See, e.g., George Stalk, Jr., *Time—The Next Source of Competitive Advantage*, HARV. BUS. REV., July-Aug. 1988, at 41 (noting competitive advantages which Japanese manufacturing firms have enjoyed from utilization of flexible manufacturing strategies); Peter F. Drucker, *The New Society of Organizations*, HARV. BUS. REV., Sept.-Oct. 1992, at 95 (arguing that organizations designed for constant change are best able to compete in new knowledge-based economy). While new forms of internal structure are the starting point for horizontal exchange relationships, this conceptual framework is "closed" in the sense that structural developments between organizations are not discussed. "Vertical relationships receive continued attention in the literature, but relatively little has been written on lateral relationships . . . even though they may now comprise some of the most intriguing and active elements of marketing strategy." Bucklin, supra note 1, at 32. Some work, however, takes on a more "open" viewpoint discussing developments that encompass many different organizations at once. See, e.g., Ravi S. Achrol, *Evolution of the Marketing Organization: New Forms for Turbulent Environments*, J. MARKETING, Oct. 1991, at 77 (describing transorganizational systems based on functional interdependence rather than contractual relationships); Frederick E. Webster, Jr., *The Changing Role of Marketing in the Corporation*, J. MARKETING, Oct. 1992, at 1 (suggesting paradigm shift for marketing management functions toward development of informal network relationships and strategic partnerships between firms and their customers and suppliers); George S. Day, *The Capabilities of Market-Driven Organizations*, MARKETING SCI. INST. Rep. No. 93-123 (1993) (positing that one reason for success of market-driven organizations is their ability to develop collaborative linkages with customers); Richard Normann & Rafael Ramirez, *From the Value Chain to Value Constellation: Designing Interactive Strategy*, HARV. BUS. REV., July-Aug. 1993, at 65 (analyzing success of companies focused on creation of value through strategic integration of function with partners, customers and suppliers).

5 See John A. Byrne, *The Horizontal Corporation: It's About Managing Across, Not Up and Down*, BUS. WK., Dec. 20, 1993, at 76 (cover story) ("[N]o matter what buzzword or phrase you choose, the trend is toward flatter organizations in which managing across has become more critical than managing up and down in a top-heavy hierarchy.").


7 See Kenichi Ohmae, *The Global Logic of Strategic Alliances*, HARV. BUS. REV., Mar.-Apr. 1989, at 143-44 (arguing that traditional information hoarding by companies is no longer competitively feasible).
with their industry peers, thereby putting together a more effective competitive package. 8

This analysis focuses on a subset of the horizontal exchange relationship—that within the computer/technology industry. Intellectual property constitutes the proprietary basis for this industry, and the industry has in large part defined the horizontal exchange relationship. Within this industry, there is a natural interdependence among participants. 9 As a result, firms in the computer industry have been leaders in innovating new forms of dependencies such as horizontally oriented exchange relationships. Within the computer industry subset, the horizontal exchange relationship strains the boundaries of a legal framework. Intellectual property and its implementing procedures were crafted in relatively calm environments and tailored to identifiable constituencies, but out of necessity are now being used extensively in the turbulent environment of the computer industry. This Note will illustrate the phenomenon of the horizontal exchange relationship and some of the significant inadequacies that exist in intellectual property principles and procedures, and among implementing professionals, as regards perhaps America's most important industry that some feel will cause change comparable to that experienced during the Industrial Revolution.

This Note first sketches the basic contours of both a vertical and horizontal exchange relationship. Then it highlights the major forces that initiate and shape such relationships and discusses these forces in the context of the computer industry. The industry discussion features three cases in which actual relationships encountered major problems in their implementation due in large part to the deficiencies in the substantive and procedural features of contemporary intellectual property law—deficiencies with respect to underlying realities of computer industry dynamics. From these cases, an observation is made that coordination of exchange between firms is an increasingly important area of legal concern.

8 Id. at 144.
9 See Mark L. Gordon & Francoise Gilbert, Contracting For Systems Integration Transactions 8 COMPUTER LAW. 13 (1991) ("With the advancement of information technologies and the increased availability of specialized products, it has become virtually impossible for any single provider to satisfy all of the computing and processing needs of a given client.").
The suggestion that follows may require little of the intellectual property laws however; it is certain to require much of the intellectual property lawyer.

II. HISTORICAL EXCHANGES

Horizontal exchange relationships are evolving along a chain of information exchange. Consider a more traditional, vertically integrated corporation. Within the vertically integrated corporation, exchanges of information take place. The exchanges are a necessary occurrence if the corporation is to successfully manage internal relationships. Product manufacturing is related to marketing, marketing is related to product development, and all are related to finance. By means of exchange, information is traded among the related parts of an organization and internal relationships are created. This exchange of information is essential for coordinated action among the many different functions of the corporation. Exchanges facilitate the corporation's creation of value.

In the vertically integrated firm, management coordinates the functions of manufacturing, marketing, research, sales, and finance in pursuit of common ends. No individual component of the firm perceives of itself as totally separate from the firm as a whole. Changes in inputs and outputs occur very slowly within the firm as they are strained through multiple levels of hierarchy.

10 Vertical integration occurs when a firm takes on additional stages in the chain of distribution. The firm substitutes itself for long-term contracts with others. For example, if an automobile manufacturer buys a steel mill, it has vertically integrated backward. If the automobile manufacturer buys a car dealership, it has vertically integrated forward. See Robert D. Klein, Jim R. Crawford & Albert A. Alchian, Vertical Integration, Appropriable Rents, and The Competitive Contracting Process, 21 J.L. & ECON. 297, 326 (1978) (asserting that as quasi rents are created, contracting costs outweigh vertical integration costs).

11 See Normann & Ramirez, supra note 4, at 65 (“Our traditional thinking about value is grounded in the assumptions and the models of an industrial economy. According to this view, every company occupies a position on a value chain. Upstream, suppliers provide inputs. The company then adds value to these inputs, before passing them downstream to the next actor in the chain, the customer.”). See also Oliver E. Williamson, Transaction-Cost Economics: The Governance of Contractual Relations, 22 J.L. & ECON. 233 (1979) (arguing that transactions-cost economics identifies intangible costs associated with relationships and their implications on future behavior).

12 Stalk, supra note 4, at 41, 45.
nation with other firms is limited to arms-length transactions directed under controlled circumstances where each participant predicts with reasonable accuracy, in advance, the worth of its ultimate contribution. In this way, the vertically integrated corporation aids management in controlling the risk associated with long-term contracting.\textsuperscript{13}

Although management has a way to substitute internal planning for external contracting, "[t]he shift of a transaction or related set of transactions from market to hierarchy is not all gain, however. Flexibility may be sacrificed in the process and other bureaucratic disabilities may arise as well."\textsuperscript{14} For a given task, the choices within a vertically integrated firm may be limited. The limiting factors include span of control, information loss, and the costs associated with taller entities. In light of these factors, organizational structure is changing to accommodate horizontal exchange relationships.

III. HORIZONTAL EXCHANGE RELATIONSHIPS

Once the exchange of information is extended outside the boundaries of the corporation in substantial volume and with frequency, a horizontal exchange relationship begins to emerge. This is a more complex relationship, and one that is creating both opportunities and dangers for business.\textsuperscript{15} The exchanges of information in these relationships occur between firms, not within firms—hence horizontal. While exchanges between firms have always occurred, they have been more in the form of defined market transactions instead of exchange relationships.\textsuperscript{16} These relationships are defined only to the extent that an exchange between two or more firms has predictable outcomes. However, the

\textsuperscript{13} Long-term contracts between firms with large amounts of sunk costs create risks of opportunism.

\textsuperscript{14} OLIVER E. WILLIAMSON, MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS 40 (1975).

\textsuperscript{15} See supra note 4.

\textsuperscript{16} Huszagh & Huszagh, supra note 3 ("Although names proliferate for these new organization forms, all stress the management of relationships in place of market transactions; as such they rely on negotiation in lieu of market-based processes to conduct business.").
very nature of relationships is that they are not predictable.

In a horizontally related corporation information from exchanges is coming from all directions. Traditionally, exchanges of information were confined to that between the corporation and its employees or between a corporation and its financiers. More recently however, information travels in a direct horizontal path to other corporations in the contexts of suppliers, manufacturers, and customers. From the individual corporation’s perspective, it is looking for a diversified portfolio of relationships in order to minimize risk and maximize return.

The horizontal exchange relationship resembles a pickup basketball game. Suppliers, customers, and competitors stand on the sidelines as separate entities looking for an opportunity to come together as a team and participate in the game. As the team comes together, introductions are made and talents are revealed. The players exchange information so that they can coordinate their actions.

IV. A SUBSET OF THE HORIZONTAL EXCHANGE RELATIONSHIP—THE COMPUTER INDUSTRY

Nowhere is property so intellectual, and nowhere is intellectual property so valuable than in the computer industry. This industry is also a dynamic environment for the horizontal exchange

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17 Normann & Ramirez, supra note 4, at 65-66.
18 See Bucklin & Sengupta, supra note 1, at 33 ("[G]iven functional specialization and a scarcity of resources, organizations seek to reduce environmental uncertainty by exchanging resources for mutual benefit.").
19 In the multibillion dollar wireless PCS (personal communications services) game, Sprint has picked up some major players that “gives the team an early lead.” In a 3-4 billion dollar joint venture, Sprint has joined TCI, Cox, and Comcast to go four on seven against the Baby Bells. John J. Keller & Mark Robichaux, Sprint Announces Phone-Cable Venture, But Lofty Regulatory Hurdles Loom, WALL ST. J., Oct. 26, 1994, at A3.
20 Recent damage awards in patent infringement cases indicate how valuable such property can be and have shifted the focus of these suits to the issue of damages. For example: Polaroid v. Eastman Kodak, $873.2 million; Smith v. Hughes, $204.8 million; Stac v. Microsoft, $120 million; and, 3M v. Johnson & Johnson, $107.3 million. RUSSELL L. PARR, INTELLECTUAL PROPERTY INFRINGEMENT DAMAGES 7 (1993).
relationship.\textsuperscript{21} Therefore, intellectual property and the horizontal exchange relationship have a unique point of crossing—both are in a vivid state for inspection within the context of the computer industry.

With computer technology, there are material changes in the traditional model of industry organization and behavior. A traditional model of industry would consist of a relatively concentrated hierarchy supported by more numerous smaller participants. But rapidly changing technology yields large numbers of small firms with distinct skills rather than a small number of large firms with coordinated departments. The computer world is no longer composed of IBM at the top with Sperry, Digital, Honeywell, and a few others fighting for niches below.\textsuperscript{22}

Many technological leaders in the computer industry are relatively small. By coincidence or by design, the individual flash of genius occurs as often in the garage workshop as in the million dollar R&D facility. Consider Bill Gates of Microsoft and Steve Jobs of Apple Computer—each started in his garage and went on to revolutionize the computer industry. Also consider more recent entrepreneurs like Scott Cook of Quicken and Craig McCaw of McCaw Cellular Communications. The determinative factor in the success of each of these entrepreneurs was an ability to recognize emerging consumer desires.\textsuperscript{23}

But the entrepreneurial start-ups of the 1970’s and early 1980’s had the time to control their own destiny. Today, technology is expanding exponentially. With the industry moving at such rapid pace, small technological leaders are subject to enormous levels of industrial and consumer demand. In order to meet these demands, small firms must look for help. Out of necessity, small technological leaders have had to become leaders in horizontal exchanges to

\textsuperscript{21} See Bucklin & Sengupta, supra note 1, at 33 ("Alliances such as [horizontal exchange relationships] are common in high technology industries in which even the largest firms cannot hope to maintain cutting-edge positions across all technologies in interest to their end users.").

\textsuperscript{22} See Bucklin & Sengupta, supra note 1, at 16 ("Large firms such as IBM were once inclined to develop their product lines internally. Now, they aggressively seek partnerships with numerous firms to ensure that their core products are linked advantageously to advance technologies created elsewhere.").

cope with the scope and scale of intellectual innovation and customer demand.24

V. ILLUSTRATIONS OF THE HORIZONTAL EXCHANGE RELATIONSHIP

Three forces underlying the horizontal relationship explain its dynamics: knowledge, time, and the customer.25 These independent forces, acting synergistically, have dramatically altered the traditional coordination process within and between firms. First, knowledge is in a constant and rapid state of transformation.26 A large firm with sunk costs in yesterday's technology is at a disadvantage in competing with a new, unencumbered enterprise.27 Likewise, smaller firms may soon find themselves on the losing end of a partnership or joint venture that suddenly realizes the contribution of one of the participants is no longer required. "The potential for opportunism is high as partners may use [an] alliance only as a means to gain market position at the expense of a partner or to build technological skills from exposure to the partner's intellectual property."28

Second, the time frame in which decisions must be made and implemented has been substantially compressed.29 Whereas microprocessor innovations recently occurred at the historically rapid pace of every three years, they now occur in six months or less. Every time parameter—lead time, set-up time, down

24 See Peng S. Chan & Dorthy Heide, Strategic Alliances in Technology: Key Competitive Weapon, SAM ADVANCED MGMT. J., Autumn, 1993, at 9 ("The major factor that prevents many firms from achieving their technical objectives and, therefore, their strategic objectives, is the lack of resources.").

25 See Achrol, supra note 4, at 79 ("With the coming of the age of information, the generic level of almost any kind of business and its core business strategy are intertwined with its knowledge environment."); Webster, supra note 4, at 5 ("The purpose of these new organization forms is to respond quickly and flexibly to accelerating change in technology, competition and customer preferences."); Day, supra note 4, at 1 ("Market-driven firms are distinguished by an ability to create and manage collaborative relationships with customers.").

26 See Drucker, supra note 4, at 95 (arguing that business firms must incorporate flexibility and change into their organizational structure).

27 Id. at 100.

28 Bucklin & Sengupta, supra note 1, at 33.

29 See Stalk, supra note 4, at 41 (arguing time and flexibility will be determinative elements of competitiveness).
time—must be micromanaged.\textsuperscript{30}

Third, customer needs are in the same accelerated state of flux.\textsuperscript{31} At an increasingly faster pace, companies have gone from mainframes to workstations to desktops to laptops to hand-held pads. Now, video and audio must be linked and transmitted at light speeds by wireless technologies and fiber optical wire. No longer is the product designed and the customer educated as to its need and use; the customer is now involved on the front end.\textsuperscript{32} No longer can earned customer loyalty be relied upon as a source of continuing business; if today’s technology cannot be delivered today, the customer will instantly change suppliers.\textsuperscript{33}

A. KNOWLEDGE

In this information age, knowledge is the most important resource of all.\textsuperscript{34} Organizations require knowledge first; then, land, labor, and capital. But reliance on static knowledge for long periods of time is detrimental. “It is the nature of knowledge that it changes fast and that today’s certainties always become tomorrow’s absurdities.”\textsuperscript{35}

Within the computer industry, the need for knowledge is especially intense, and the penalties for reliance, especially as to static knowledge, are severe. Consider the recent developments of the United States Patent and Trademark Office (PTO). Four months after granting a patent to Compton’s New Media, a subsidiary of Tribune Publishing, PTO Commissioner Bruce

\textsuperscript{30} Id. at 43.

\textsuperscript{31} See DAY, supra note 4, at 1, 3 (illustrating that time pressures are not only greater for producers but also for consumers).

\textsuperscript{32} See Webster, supra note 4, at 1 (predicting that close relationships with customers will become most important as strategic assets of business).

\textsuperscript{33} See Bucklin & Sengupta, supra note 1, at 33 (“Only by linking of multiple firms' resources can new systems be developed with sufficient breadth and sophistication to persuade end users to abandon current investments and upgrade to new technology.”).

\textsuperscript{34} See Drucker, supra note 4, at 95, 96 (arguing that rapid turnover in competitive knowledge demands corresponding structural flexibility).

\textsuperscript{35} Id. at 96.
Lehman initiated a reexamination of the patent. Moreover, during Compton's reexamination proceeding, the PTO reversed its standard policy of permitting only the patent applicant to submit prior art in support of its claims. Therefore, third parties were allowed to introduce evidence that Compton's multimedia patent depended heavily on prior art. Appropriately, the PTO rejected the claims of the Compton patent that would have resulted in extensive licensing arrangements for the information superhighway.

The PTO is recognizing that it cannot afford to act in its traditional passive and independent manner. "In periods of rapid change, the secrecy [of patent examinations] works against [the software industry] because it invites opportunism." In other words, knowing that patent examiners are unlikely to discover the true origins of recent innovations within a closed examination proceeding, some industry participants have engaged the PTO in a battle of deception.

The Compton patent proceedings and other reexaminations have exposed the PTO's inability to draw accurate links between innovation and rapid knowledge assembly. Software applications often incorporate existing technology buried within complex computer code that is difficult to decipher. The PTO does not have the knowledge necessary to make informed decisions about how complex software applications make use of prior art. The difficulty the PTO is having with software patents illustrates how

36 In a prepared statement, Commissioner Lehman said: "We're taking a second look at a patent that has prompted a strong and concerned reaction in a particularly dynamic and changeable industry." Victoria Slind-Flor, Rethinking Protection: Software Patents, Copyright Issues Shaped the IP Landscape in '93, NAT'L L.J., Jan. 24, 1994, at S1.


38 Slind-Flor, supra note 36, at S1.


42 Kimberly Patch, PTO Nears Resolution of Compton's Complaint, PC WK., Mar. 7, 1994, at 98.
knowledge, as a dynamic force, is creating dependencies among industry participants. The PTO, as a participant in the software industry, is realizing that it must depend on the industry as much as the industry depends on the patents it issues.43

Once dependencies lead to exchange relationships, knowledge is used more efficiently. Horizontal exchange relationships are established especially to use knowledge without having to create it or be burdened with its cost once it has served its useful life. In other words, these horizontal relationships support flexibility and the capability to make immediate use of technologies as they emerge—both necessities in the computer industry.44

Making knowledge-intensive decisions and forging knowledge networks require horizontal exchange relationships to deal with rapidly changing technology. "The need to organize for change also requires a high degree of decentralization. That is because the organization must be structured to make decisions quickly."45 A lack of structural devices for quick decision making is one source of the current problems facing IBM. IBM's new CEO, Louis Gerstner, has gone so far as to say that "the last thing IBM needs right now is a vision."46 What IBM needs is to be reorganized and structured for change.47

Unfortunately, knowledge exchanges within the context of horizontal relationships pose significant legal risks for intellectual property rights, especially when the relationships are prompted by the dynamic, competitive pressures inherent in the computer industry. The recent patent infringement case, Stac Electronics Co. v. Microsoft Corp.,48 is illustrative of this dilemma of opportunity.

43 According to Commissioner Lehman: "The existing patent database doesn't give you the full picture. We are going to have to re-engineer the Patent and Trademark Office so that we give [examiners] more time and more resources. That has a price tag." George Leopold, Patent Reforms Target High-tech, ELECTRONIC ENGINEERING TIMES, Aug. 1, 1994, at 1.

44 See Drucker, supra note 4, at 95, 96.
45 Id. at 98. See id. at 101 ("No knowledge ranks higher than another; each is judged by its contribution to the common task rather than by any inherent superiority or inferiority. Therefore, the modern organization cannot be an organization of boss and subordinate. It must be organized as a team.").
47 Id.
and risk.

Between Microsoft and Stac, the initial horizontal exchange relationship was prompted by Microsoft’s desire to acquire knowledge rapidly to support its own product development which was being dictated largely by competitive threat and consumer expectation. While Microsoft and Stac are leaders in their respective product markets, they are not economic equals. Stac is the leader in compression technology and holds several key patents in compression software. Sales of Stac's Stacker 3.1 program brought the company thirty-three million dollars in revenue for 1992. In contrast, Microsoft is 100 times larger with revenues of over three billion dollars in 1992. Microsoft’s biggest money maker is MS-DOS, the operating system that runs on 80% of the world’s personal computers.

With regard to its disk operating system performance, Microsoft needed to build a compression feature into the final release of its flagship product—MS-DOS. Towards this end, Microsoft approached Stac about a possible relationship.

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50 One solution to larger and larger memory requirements for running computer software is compression software. Through the use of complex mathematical algorithms, data can be compressed before it is stored into memory.

51 Stacker 3.1 can compress and store 435 megabytes onto a 200-megabyte hard drive. The current version, Stacker 4.0, can have in excess of a 2.5 to 1 compression ratio. For $149, the price of Stacker 4.0, you can get almost three computers for the price of one. Doug Barney, *Stac Boosts Stacker Compression Ratio; Uses Less RAM, Frees Disk Space*, INFOWORLD, Feb. 14, 1994, at 20.


53 Id. at D11.

54 DOS is an acronym for "disk operating system" and is a registered trademark of Microsoft. The competitive protocol is to upgrade DOS periodically to provide new customers with state-of-the-art technology and to persuade old customers to make new investments. The most recent versions for DOS are 6.0 and 6.2. About 20 million copies of these versions currently exist.


56 Burgess, *supra* note 52, at D14 ("During the trial, Stac attorneys grilled Microsoft Chairman Bill Gates for an admission that compression was viewed at Microsoft as key to Version 6.0’s success.").
Microsoft's reputation made the nature of its proposition clear to Stac. Stac had to accept Microsoft's terms or lose the market for its product. The compression technology that Microsoft sought for DOS did not have to be the best; once compression was incorporated into DOS, in virtually any form, the consumer's need to acquire supplemental compression software from Stac would be unnecessary.

The negotiations that followed involved exchanges of information between the two firms. After failing to reach an agreement, each firm was left with the valuable information that had been exchanged. From what Microsoft had learned from Stac, it was able to build a compression feature into its 6.x versions of MS-DOS. When this happened, Stac's sales fell drastically. Understandably, there was no need to purchase Stacker software when compression capability was already built into the operating system of one's computer.

Stac brought suit against Microsoft for infringement of its compression patent. Although Stac won its suit, it was not a wholly innocent party. From the information Stac had obtained from Microsoft during their negotiations, Stac was able to discover some of Microsoft's "hidden calls" that are built into DOS. With these calls, Stac could make its compression software work more efficiently with DOS and gain a competitive advantage over other compression software that could not make use of these hidden

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57 See Sugawara, supra note 55, at H5 (quoting Howard Anderson, managing director, the Yankee Group, that: "You've got three-quarters of the software industry rooting for Gates to fall flat on his face. They say, 'I have this gorilla that may roll over on me.'").

58 Id.

59 Soon after Microsoft's products incorporating compression technology went to market, Stac's per quarter sales fell to $5.7 million from $10 million. Id.

60 A federal jury in the District Court of California for the Northern District awarded Stac $120 million.

61 The court awarded Microsoft $13.6 million for Stac's reverse engineering of undocumented calls within DOS. Such was held to be a misappropriation of a Microsoft trade secret. David Welcher, Small Users Likely To Miss DoubleSpace Most, BUS. TIMES, Mar. 7, 1994, at 9.

62 During its operation, DOS must communicate with the central processing unit of the computer. It does this by making "calls." Software applications use these calls to operate. Microsoft is able to keep some calls hidden ("undocumented") so that they can only be used for the operation of its own software applications.
The essence of the problem is that the overwhelming market imperatives of rapid knowledge assembly precluded Stac and Microsoft from delineating their respective rights and responsibilities. Their quest for knowledge eclipsed the creation of a traditional legal infrastructure intended to suppress opportunistic behavior through mutually-defined expectations regarding their relationship. The immediacy of market demands did not permit the protracted negotiations characteristic of earlier exchanges.

The ending to this story has taken Microsoft and Stac full circle. Both companies have dropped their claims and are participating in a broad cross-licensing agreement that is to cover existing and future patents. This agreement is worth $43 million in royalties to Stac. In addition, Microsoft has obtained an equity share in Stac worth $39.9 million or 15%.

Without an agreement, neither party was in a position to gain. $120 million would have been a hollow and uncertain victory for Stac. With DOS on the way out, Stac would have been faced with much greater competition at the Windows level. Microsoft, meanwhile, had just been issued a permanent injunction on the sale of DOS versions that contained infringing compression technology. Their settlement is not a resolution, but rather the continuation of a horizontal exchange relationship begun years earlier. The exchange has brought Microsoft the superior engineering it required to maintain its position in the market while Stac received an immediate infusion of cash, and more importantly, an alliance that can protect its technological edge.

B. TIME

While the insatiable demand for knowledge may foster ill-defined relationships as regards important matters like intellectual property, the pressures of time clearly exacerbate the problem.

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63 Amy Harmon, Microsoft Loses Patent Lawsuit, Must Pay Rival $120 Million, LOS ANGELES TIMES, Feb. 24, 1994, at D1, D5.

The element of time has always been important to the operations of business, but time has largely been viewed as an uncontrollable force. Because of taking lead times for granted, managers struggled to make their forecasts as accurate as possible. Unanticipated change necessarily meant unanticipated delays and losses. Today, however, time is being met head-on. "Today's new-generation companies compete with flexible manufacturing and rapid-response systems, expanding variety and increasing innovation."

Companies that use time for a competitive advantage are called time-based competitors. "The ways leading companies manage time ... represent the most powerful new sources of competitive advantage." Every job, function, step, and process within a corporation is connected by some amount of time. This time is generally unproductive and may be referred to as lead time, set-up time, down time, or delay. Time-based competitors are successful when they reduce this sum of unproductive time within the organization.

To profit from time as a competitive advantage, corporations change their structure. In the preceding discussion, knowledge was characterized as a transient asset: always changing, knowledge will betray reliance. Corporations using time-based competition are similarly situated. Simply put, their advantage comes from an ability to respond to rapid change and even to create rapid change. Rapid change requires a decentralized organizational structure to accommodate it. "Organization structures should enable fast responses rather than low costs and control. Companies [should] concentrate on reducing if not eliminating delays and using their response advantages to attract the most profitable customers." These corporations "manage[] structural changes that enable[] their operations to execute their processes much faster. As a consequence, time [becomes] their new source of competitive advantage."

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65 See Stalk, supra note 4.
66 Id. at 45.
67 Id.
68 Id. at 41.
69 Id. at 45.
70 Stalk, supra note 4, at 45.
71 Id.
As evidenced by unexpected relationships, fast paced innovations, and accelerating competition, time is being compressed; companies must be prepared to react quickly to change. Less apparent, but equally important, time pressures distort the meaning of relationships and innovation. For example, the Compton patent reversal demonstrates that the tools used by patent examiners are ineffective in tracing the heritage to today's innovations. Professor Paul Goldstein of Stanford University Law School remarks of the Compton patent reversal: "It reflects the inefficacy of the patent office in dealing with software—the lack of a prior art data base to measure software-related inventions against." But even if the PTO establishes such a data base for software, examiners still must interpret the relevancy of innovations through time. The data base needs to be designed so that the patent examiners can accurately link prior art, the heritage of today's art, with today's rapid knowledge assembly; time will continually distort the relevant meaning of prior art.

It is ironic that the lapse of time can be equally as problematic for exchange relationships and intellectual property laws as the compression of time. In essence, the connection between innovation and opportunity is obscured when spread out over time and firms find it difficult to create strategic plans for the future as regards critical aspects of intellectual property. In other words, the implications of knowledge are placed out of focus by time's ability to render use of knowledge unpredictable.

Some of the most complex legal battles in the computer industry today are the result of informal exchanges of information that occurred almost twenty years ago. These exchanges lay like sleeping giants, and then from a bed of exchange relationships, they rise to assert their intellectual property rights. Within the computer industry, future market applications of current knowledge can be especially distorted by time. These distortions result from both rapid changes and long delays. The case of Apple Computer, Inc. v. Microsoft Corp. illustrates how time delays can manipulate relationships.

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72 Slind-Flor, supra note 36, at S1.
73 799 F. Supp. 1006 (N.D. Cal. 1992) (included in the action were claims against Hewlett-Packard Co.).
The litigation between Apple, Microsoft, and Hewlett-Packard had its origins with Xerox. In the 1970's, Xerox was concerned with the visual expression of computer technology.\textsuperscript{74} Towards this end, Xerox began work at its Palo Alto Research Center (PARC). "An overriding objective of Xerox's efforts was to make computer images and usage appealing and intuitive."\textsuperscript{75} In a combination of brainstorming and R&D, the PARC project conceived of what would become the precursor to the Macintosh computer.

The most foundational aspects of the Macintosh screen and operation were pioneered at the PARC facility. The computer screen was made to appear as a series of overlapping windows. In place of alphanumeric representation, computer functions were represented by visual images, or "icons." Manipulation of windows and icons was done by a mouse.\textsuperscript{76}

In 1979, Steven Jobs and other Apple personnel visited the PARC facility in order to see the work Xerox had done and exchange ideas about mice, windows, and icons.\textsuperscript{77} The events that followed indicate that Jobs must have taken more than he gave. Five years later, the first Macintosh was introduced by Apple Computer during the halftime of Super Bowl XVIII.

In 1988 Apple brought suit against Microsoft and Hewlett-Packard for allegedly infringing on various aspects of its Macintosh computer such as movable windows and icons.\textsuperscript{78} Partly as a result of Apple's relationship with Xerox and their exchange of knowledge, Microsoft and HP were able to successfully defeat most of Apple's infringement claims.\textsuperscript{79} Employing "analytic dissection," the court separated the fundamental features of Apple's copyrights and broke them down into their most basic elements.\textsuperscript{80} Each element could then be traced back to its true basic heritage because it was in a simple enough form that it could be recognized.

\textsuperscript{74} See Apple, 799 F. Supp. 1006, 1017; Lawrence J. Magid, POWER COMPUTING—Apple's Copyright Suit Gets to the Core of OS/2 Software Battle, WASH. POST, March 28, 1988, at F26.

\textsuperscript{75} Magid, supra note 74, at F26.

\textsuperscript{76} Id.

\textsuperscript{77} Apple, 799 F. Supp. 1006, 1017.

\textsuperscript{78} Id. at 1015.


\textsuperscript{80} Id. at 1020.
In essence, the horizontal relationship between Apple and Xerox resulted in protectible ideas being traded in an atmosphere of innovation without a full awareness of subsequent consequences and appropriate safeguards. The resulting commingling of ideas among Apple, Microsoft, and Hewlett-Packard distorted evidence of their ancestry and set the stage for subsequent, unseemly opportunistic behavior.

Of course the distorting effects of time were alone not responsible. As in many other computer industry litigations, fundamental principles and procedures of intellectual property protection are insensitive to the economic dynamics of the computer industry as well as the core interests of the customers it serves. Moreover, the intellectual property framework has encouraged litigious behavior that seeks to exploit the escalating interdependencies of industry participants and their customers, and has materially abetted unproductive competitive behavior, especially as regards consumer interests. 81

C. THE CUSTOMER

The theory of marketing is being inverted. 82 "In the traditional view, the firm was a distinct entity whose borders were defined by an organization chart, which clearly delineated the boundary between the firm and the external environment." 83 Today however-
er, this concept is changing. Consider General Electric’s 1990 Annual Report:

In a boundary-less company, suppliers aren’t “outsiders.” They are drawn closer and become trusted partners in the total business process. Customers are seen for what they are—the lifeblood of a company. Customers’ vision of their needs and the company’s view become identical, and every effort of every man or woman in the company is focused on satisfying those needs.84

Traditionally, marketing focused on the product. Initial care would be taken to develop products and services that were in demand.85 From there, the organization’s resources went to market the product to the customer and squeeze the most sales out of every stage of the product life cycle. These were highly centralized organizations that based their relations with other firms on strict market-based transactions.86

Today, the customer is able to interrupt the traditional process. The nature of the computer industry will not allow customers to remain loyal to any one product because product life cycles are too short. Customers will implicitly make more demands on firms for the rapid acquisition of knowledge. Unable to meet this demand alone, firms will look to exchange relationships.

As customers are brought more sharply into focus, firms are changing the nature of their horizontal relationships with other firms such that strict market-based transactions are replaced with mutual trust.87 But this change is taking place within the framework of intellectual property law where substance and procedure are largely based on market transactions between two parties. The incongruence becomes apparent; transactions become a hindrance to relationships based on trust. Several examples illustrate this emerging reality.

84 Id.
85 Id.
86 Webster, supra note 4, at 7.
87 See DAY, supra note 4.
For one, Apple’s suit against Microsoft was largely motivated by the desire to preemptively impair consumers’ rapidly rising reliance upon the Windows operating format. Permanent success was unlikely, but a time advantage was probable. By curtailing Windows’ rate of market share growth, Apple sought to delay its own share decline while preparing a more competitive product strategy and a more competitive product. However, the use of preemptive litigation to manipulate consumer expectations solely to achieve a time advantage is best illustrated by Intel Corp. v. Advanced Micro Devices, Inc.

The relationship between Intel and Advanced Micro Devices (AMD) represents a horizontal exchange of information and rights. Intel and AMD began working together in 1976 when the two companies agreed to share technology with each other. The two firms agreed to second-source each other’s microprocessors. This agreement to second-source was reciprocal in nature such that the right of either firm to produce the other’s invention depended on a reciprocal right in some other product of comparable value. The relationship was controlled by a complex and formal arrangement. It represented a classic market-based transaction: each party’s rights were defined, there was an effort to anticipate all contingencies, and a long-term relationship was expected to ensue.

By 1986, AMD became unable to second source Intel’s new 386 chip because of the failed reciprocal nature of the relationship. Intel had been rejecting AMD’s products and was therefore unwilling to share its own. Pursuant to an arbitration agreement, AMD asked for and was awarded the right to second source

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88 Windows is the popular operating system created by Microsoft.
89 Magid, supra note 74, at F26.
90 12 F.3d 908 (9th Cir. 1993), 29 U.S.P.Q.2d (BNA) 1363.
92 Second-sourcing is an arrangement whereby the inventor of a product licenses its production. The second-source becomes a competitor, but in return provides a more reliable overall market and should thereby increase the total market share.
93 The exchange of microprocessors for production depended on a system of complexity factor points. Each company would earn points based on the complexity of the microprocessor they were offering to have second-sourced. The points were in turn used up in order to obtain the right to second-source.
94 Intel, 12 F.3d at 910-11.
AMD began to produce the 386 chip and Intel sought an injunction as remedy for AMD's alleged copyright infringement.

Despite the arbitration award, Intel won its case in front of a federal jury in 1992. The verdict would have been upheld had not Intel withheld internal documents that supported AMD's rights in Intel's microprocessors.

The history of these two corporations represents what is both common practice and necessity in the computer industry—a horizontal relationship. The dispute represents the inevitable consequence for many of these relationships. Two firms enter into a relationship with the expectation of mutual benefit, but instead, all contingencies are not, and cannot be, anticipated, and litigation ensues. When using formal devices to guide the relationship, conflict is the unavoidable consequence of rapid change. The legal framework is structured to operate after two parties arrive at a conflict, not before as their relative contributions fluctuate.

The intellectual property model was devised to operate, and has operated for centuries, in an environment where relationships are based on market transactions. Relationships based on market transactions have finite quantities and recognizable qualities. Legal tools are well-adapted to shape the boundaries of market transactions and to resolve any resulting market conflicts, but these tools find difficulty in accommodating relationships of continued exchange at varying quantity and quality levels.

Intel and AMD began their relationship when new technology turned over every two or three years. When new technology became obsolete in six months, their rigid, transaction-based agreement began to injure the relationship.

*Intel v. AMD* reveals how the transactional nature of a relationship belies trust and how intellectual property is more of a problem than a solution within the context of the horizontal exchange relationship. Intel and AMD illustrate a horizontal exchange relationship...
relationship gone awry, induced by an intellectual property framework. In a full-page advertisement in the Wall Street Journal, AMD attacked Intel's use of intellectual property as a deterrent to fair competition:

Justice has prevailed!
With a unanimous decision in the AMD 80C287 microcode case, a federal court jury has confirmed AMD's right to sell microchips containing Intel microcode. AMD will continue to supply Am386 and Am486 microprocessors without interruption. That is good for us, good for the industry, and good for you. In that spirit, we call upon Intel to end the legal harassment of AMD in the courtroom and recognize the value of fair competition. 97

The ad is first and foremost a signal to the customer that he is entitled to a new, participatory role within the horizontal exchange relationship, and should not be intimidated by intellectual property disputes.

VI. OBSERVATIONS ABOUT ENHANCED COORDINATION AND EFFICIENT EXCHANGE

The need for coordination between business firms to accommodate all these market realities is greater than ever, but the existing skills and approaches among intellectual property lawyers must be vastly redefined. For example, there will not be time to negotiate the elaborate contract that protects the client against all contingencies; there will be no way even to predict what all the contingencies will prove to be. In addition, going in, there will often be no clear definition of what the end result will be and no way to predict who will contribute what value to that result. Finally, upon entering into a horizontal relationship, there will be no guarantee that the contribution of one or more participants will not be made obsolete by new developments.

Life for the individual firm in a coordinated effort that includes hardware makers and software developers working with customers to solve problems may be highly uncertain: will one member of the group be so successful that it will attempt to swallow up the others; will a change obviate continued contribution by a firm; how can the level of investment, as a function of predicted return, be calculated; what if one participant holds back its best technology or technicians hoping to bring them into play for private gain after the group effort has reached fruition.

The need to afford comfort levels so that cooperation and exchange can optimally occur under such circumstances presents enormous challenges to the intellectual property law and lawyer. The ability to negotiate in advance may need to be replaced by the ability to fairly allocate in the aftermath. The traditional approach may, in effect, need to be stood on its head. Some way will have to be found, after the enterprise has achieved its objectives, to assure minimum levels of compensation and to prevent windfalls.

Clearly, existing approaches are not working. The elaborate contract between Intel and AMD could not keep pace with the rate of change. Microsoft's traditional adversarial approach in attempting to negotiate an arrangement with Stac has resulted in more litigation than progress. Apple's non-competitive behavior buys time, but will eventually subtract from its customer base. Accordingly, a whole new set of rules for horizontal exchange relationships must be developed.

VII. A Suggestion

A meaningful solution may be more directed at lawyers than the intellectual property framework in which they operate. The lawyer who does not understand the importance of relational exchange may sacrifice continuous relationships for immediate property. If only guided by myopic self-interests, "the adversarial nature of negotiation to allocate and distribute surpluses would eventually undermine the trust and relational goodwill necessary for the subsistence of the [horizontal exchange relationship]." The difference is between deal making and relationship building.

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88 Achrol, supra note 4, at 77.
Although both deal making and relationship building involve exchange, each view it differently. To the deal maker, exchange is embodied in the transaction. To the relationship builder, exchange is embodied in governance. Because of this difference, horizontal exchange relationships have redefined exchange and "imply that the traditional spot market, to an increasing extent, is being supplanted with alternative mechanisms for governing exchange." Lawyers must now engage in the governance of horizontal exchange relationships.

Relationship building and governance require a fundamentally new approach on the part of lawyers. The CEO must have the lawyer able to rapidly implement the horizontal exchange relationship. The CEO is going to say to the lawyer "I want to make this relationship." The lawyer will tell the CEO it will take months to structure the deal and will point out the necessity for provisions that will provide protection if the negotiators become competitors. But the CEO will insist: "I want this relationship, and I want it today; I need it today."

The CEO needs two things from the legal profession. He needs a lawyer with a new attitude, not one who will frustrate the deal with an adversarial approach or insistence on a pre-determined, global arrangement. "[T]he [CEO] needs a new breed of lawyer with the skills and outlook on maintaining relationships . . . in this complex and fast-paced environment." Secondly, if the CEO finds this lawyer, will the various aspects of intellectual property law be conducive to maintaining relationships?

The point is not that the legal tools are inadequate to protect intellectual creations as valuable property rights. The horizontal exchange relationship does not obviate copyrights for computer software or patents for microprocessors or trade secrets in the

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99 Interfirm governance can be defined as "a multidimensional phenomenon, encompassing the initiation, termination and ongoing relationship maintenance between a set of parties." Jan B. Heide, *Interorganizational Governance in Marketing Channels*, J. Marketing, Jan. 1994, at 71.

100 Id. at 71.

101 "[G]overnance is a heterogeneous phenomenon and different relationship management strategies are appropriate under different conditions." Heide, *supra* note 99, at 71. Heide offers a detailed look at interfirm governance from a number of perspectives. The different perspectives result in various forms of governance.

102 Huszagh & Huszagh, *supra* note 3.
production of computer programs. These devices of intellectual property will ultimately protect the owner from infringement in any context. Furthermore, exchanges of valuable information within the context of a horizontal relationship between two firms is not inherently conducive to conflict. Nevertheless, exchanges that require fast-paced coordination within a changing business environment are being governed by an intellectual property framework that was designed to operate with fixed, long-term arrangements and to resolve disputes in an adversarial context.

The character of a horizontal exchange relationship may be placed on a continuum. Defining one end of the continuum is reciprocity; the other is solidarity. As relationships move from transactions-based reciprocity towards trust-based solidarity, implementation and governance of the relationship must change. "Within these [exchange relationships], disputes are often resolved without reference to the original contract or even to possible legal sanctions, but rather with reference to the entire relationship as it has developed."

The intellectual property lawyer can facilitate horizontal relationships on one level, but must dramatically alter his or her approach on another. On the first level, firms will be more willing to engage in horizontal exchanges if there is some intellectual property protection in the event the relationship does not prosper. The firm requires confidence in the lawyer's ability to trace the use of its intellectual property in the failed endeavor and demand its value.

On a second level, however, the intellectual property lawyer must forego the traditional effort to totally structure relationships and transactions from the outset. Initially, the most the lawyer may achieve is the negotiation of minimum participation sufficient to induce each participant to exchange information, afford some rational basis for investment decisions, and provide a base level of security irrespective of the direction the venture may take. The bulk of the agreement may have to be an agreement to agree at

103 Ian R. MacNeil, Exchange Revisited: Individual Utility and Social Solidarity, 96 ETHICS 567, 568 (1986); see also, Hussagh & Hussagh, supra note 3.

104 See Heide, supra note 99, at 74-78.

various stages in the future when the total project and the value of each participant's contribution is better defined. Basic fiduciary principles are consistent with the governance of changing relationships and may offer a starting point for the lawyers' new approach to relationship building. "Acting as a standard-form penalty clause, ... the elastic contours of the fiduciary principle reflect the difficulty that contracting parties have in anticipating when and how their interests may diverge." By such flexible arrangements, exchange may be more readily induced. But more importantly, only by flexible arrangements can each venturer continue to have maximum incentive to see the venture succeed to the fullest.

VIII. CONCLUSION

The procedures and mechanisms for applying the intellectual property framework are inconsistent with the underlying business relationships emerging today. Legal restraints are not compatible with the free flow of information. Present intellectual property procedures are not compatible with the timing of relationships today. Preemptive litigation inhibits the customer in fulfilling a new competitive role as a participant in the horizontal exchange relationship.

The cases discussed here are illustrations of how initial exchange leads to eventual conflict within the existing intellectual property framework. At first glance, the disputes appear to be common and without implications beyond the case law that settles them. More appropriately, they can be seen as chemical reactions to a mix of incompatible elements: the horizontal exchange relationship, a rapidly changing industry, and the intellectual property framework.

JERRE B. SWANN, JR.*

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