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STRATEGIC MANAGEMENT OF
INTANGIBLE ASSETS—A MANAGER’S
OVERVIEW†

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INTRODUCTION

One hundred feet below the World Trade Center in New York
City lies a massive vault. Covering nearly three climate-controlled
acres and protected by walls thirty feet thick, the vault contains
some of the most valuable assets of modern industrialized society.1
These assets are so valuable that the owners pay between $100 mil-
lion and $150 million each year for these possessions to be stored in
this underground sanctuary.2 This vault contains the raw data that
supports contemporary society’s increasing complexity. Raw data,
magnetically encoded on computer tapes, that are processed into
the knowledge and information assets3 essential to manage not only

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research and develop knowledge-related information technologies and a “story
network” comprising a narratological analysis of world literature, science, and
philosophy.

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jor software corporations worldwide in intellectual property and licensing matters.

1. David Tuller, Yet Another Way to Profit from the Computer Age, N.Y. Times,
2. Id.
3. This Article refers to knowledge and information (“KI”) assets throughout.
An “asset” is anything that an organization owns, or has legal rights to use, that
adds value to the organization or its operations. The use of knowledge and informa-
tion, like tangible assets such as machinery, can also add value. For example, a
company acquires rights to a new patented process for producing at a substantially
lower cost one of its products. This right to work the patent clearly has increased
the worth of the company. See infra part III for discussion of differences between
data, information and knowledge.
the colossal corporations, but also the intricate maze of relationships between organizations, both big and small.

Many people have written and spoken about the transformation from an industrial to information society. References to an ever-imminent information revolution or a new and exciting information society conjure up the wrong notion of just how such a change might occur. If the evolution from an agricultural society to an industrial one is any guide, the transformation from an industrial-based society to one increasingly based on KI assets will be neither sudden nor especially dramatic, but rather will consist of many small, incremental changes that will be hard to detect.

This transformation from an industrial to an information society is not manifesting itself as a violent revolution but rather as a slow blending, as the latter overlays the former. The various "societies," agricultural, industrial and information, are inextricably intertwined. In an agricultural society a majority of the population is involved in farming and related work. This is still the prevailing situation in much of the underdeveloped world. As an agricultural society evolves toward an industrial one a smaller and smaller percentage of the population is involved with food production. This does not mean that industrial activity completely replaces agricultural activity. Elements of the agricultural society that preceded the industrial one still survive, and may even flourish. Likewise, it would be a mistake to assume that the emergence of an information society means the elimination of many of the elements of the industrial one; it is not likely that any country's economy will consist solely of a single type of economic activity, be it industrial, agricultural, or informational. Even in highly industrialized societies, such as those found in the United States or Japan, a portion of the population is still engaged in agricultural activities, albeit an increasingly smaller portion.

In an agricultural society one's wealth is based on how much land one owns or controls. In the industrial society one's wealth is based on the capital or other factors of production one owns or controls. In the information society wealth is based on the control or ownership of information and knowledge. Just as the industrial revolution first took hold in areas that had ready access to the factors of pro-


5. One still observes this predominance of the agricultural segment in many countries, even emerging industrialized ones such as China.

6. In the United States, for example, the six percent of the population that is involved in the agricultural sector produces enough food for both domestic consumption and global export.
Intangible Assets

duction, the information society is beginning to grow around the locations that produce the commodities of value, information and knowledge.

The fundamental importance of information and knowledge to the modern economy is reflected in the geographic distribution of today's high-growth businesses. The first manufacturing organizations of the American Industrial Revolution, the early textile companies, began to flourish at sources of water power to run the looms and spinners. As mass production and mass transportation technologies spread throughout the nation in the 1900's, important economic centers flourished around the transportation resources, first the canals and ports, and later the railroads. In modern society, areas of economic vitality have prospered around new resource centers that produce information and knowledge—universities. Like the Mesabi range or the Texas oil fields of old, educational institutions are providing the essential raw material that is fueling the information society: brainpower.

Knowledge and information assets, long important elements in enhancing manufacturing productivity, have become products in and of themselves. Some of the most prosperous sectors of the national economy produce and handle little else. Although the computer software industry is the most obvious illustration, there are others of equal interest. The financial industry is one example. Today the financial world is a world of information. Rarely does the actual physical transfer of money, or its symbolic equivalent, take place. Instead, bits of electronic data are exchanged between debtor and creditor, payee and payor. Even paper money, itself a basically worthless item except for the information it represents, is becoming rare for all transactions but the smallest. In sharp contrast to early industrial society in which the wealth of a nation was based on the size of an actual pile of gold bullion stacked in a vault or fortress somewhere, the wealth of today's modern industrial nation is represented by millions of account entries on a network of thousands upon thousands of computers. It is this cumulative information of

7. Such as water power for the mills, rivers for easy transportation of goods, or cities with cheap and abundant labor.
10. Observe the high levels of entrepreneurial activities in the Cambridge/Boston area surrounding the Massachusetts Institute of Technology, in the Research Triangle area of North Carolina adjacent to Duke University and the University of North Carolina, in the Silicon Valley area in northern California anchored by Stanford and Caltech, and in the Austin area centered on the University of Texas.
11. Software companies are among the most successful and fastest growing companies in the United States. Billion dollar companies such as Microsoft and Lotus did not even exist twenty years ago.
debts and lendings, earnings and liabilities that makes a nation either wealthy or poor. To cite another example, the average American spends over six hours a day consuming a product that has no physical existence and did not exist fifty years ago. That product is the creation and transmission of information assets in the form we call television. To further complicate matters, technology now permits the consumer of these assets to "capture" the product. In the future the user will increasingly be able to modify and manipulate it.  

I. VALUE OF KNOWLEDGE AND INFORMATION ASSETS TO ORGANIZATIONAL MANAGEMENT

The importance of information to the functioning of complex organizations has long been recognized. The early civilizations that grew up in the fertile crescent of the Mesopotamian Valley 6,500 years ago collected and stored information by marking soft clay tablets. Five hundred years ago the Incas managed a society strung along thousands of miles of mountainous terrain with the help of information kept and transmitted by knotted string quipu carried by runners throughout the Empire.

In a 1978 study conducted by the University of Minnesota the value of information assets to various businesses was dramatically demonstrated. For banks, the value of their knowledge assets was so high that the study concluded that if the information stored in their computers was lost, to say nothing of their non-computerized information and knowledge, the banks would be forced out of business within two days. While this is not a surprising finding for the information-intensive financial industry, the study also found that manufacturing and distribution industries would last only a little longer without their information assets: 3.3 and 4.8 days.

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12. Today nearly every home has a video cassette recorder to tape television programming transmitted into the home. The future promises interactive television. See generally Communications Computers and Networks: How to Work, Play and Thrive in Cyberspace, 265 Sci. Am. (Sept. 1991) (a special issue which discusses the coming changes in communications technology).


14. The system of writing consisting of wedge-like strokes impressed on wet clay tablets is referred to as cuneiform. The New Columbia Encyclopedia 697-98 (1975) (examples of various types of cuneiform used by the Babylonians and Assyrians).

15. This pre-Columbian empire centered in Peru used a system of writing which utilized cords with knotted strings of various colors. The New Columbia Encyclopedia 1320-21 (1975).

II. INFORMATION & KNOWLEDGE ASSETS ARE UNIQUE

A. Possession and Ownership

New and largely unanswered legal issues are arising from the increased strategic importance of information and knowledge that go far beyond questions of ownership and copyright; indeed, they raise fundamental questions regarding the rights of privacy, access and use. One of the primary reasons the business and legal communities jointly need to develop new concepts and ideas to deal with the issues and problems of the modern information economy stems from the fact that information and knowledge are unique assets that differ from physical assets.

When a company sells a hard asset with physical existence, whether it is a means of production like a machine tool or a finished product like an automobile, the seller parts with possession of the asset and transfers it to the buyer. Knowledge and information assets are different. A company can sell a KI asset to another company and the end result is that both organizations have the information or knowledge. Possession is not transferred but merely expanded. As a result, the buying and selling of KI assets must take this into account, either in the form of contractual arrangements or managerial control systems and procedures. This unique characteristic of the KI asset helps explain the widespread use of licensing in the software business, in contrast to outright sale that is common for most manufactured products.

Part of the reason for this seemingly anomalous behavior by corporations can be traced to major difficulties surrounding the legal ownership and control of knowledge assets as compared to physical assets. It is easy to understand how one "owns" a physical asset

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17. Id.
20. In the software industry the owner of the software code does not generally sell or transfer title to the code to the buyer, but instead sells the buyer a right to possess and use the code (a license).
21. There are two types of KI assets that are of significance to business: proprietary information and knowledge, and commercially useful information and knowledge. Proprietary information and knowledge can be legally owned or otherwise used to the exclusion of others. Normally these assets came under the purview of intellectual property law. Commercially useful information and knowledge is a more expansive category and encompasses proprietary information and knowledge as well as other knowledge assets that serve to increase the value or productivity of a commercial enterprise. It is knowledge or information that provides an advan-
such as a stapler, a piece of machinery, or a plot of land. The physical asset can be readily located and measured, facilitating ownership and transfer. One can describe in sufficient detail and specificity a tract of timberland or a machine tool on a factory floor to isolate the asset for sale, accounting, or supervision.

Knowledge and information assets, on the other hand, present a more complicated situation. They are often difficult to describe in any degree of detail and specificity. It is a formidable task to isolate one piece of knowledge from another. As new knowledge assets are acquired or developed they tend to blend into the existing knowledge asset base to form one undifferentiated mass. Moreover, knowledge assets often cannot readily be located or measured. This inability clearly to discern the knowledge asset hampers its ownership, control and use.

B. Composition

Knowledge and information assets are divided into three categories: data, information, and knowledge. Data are the fundamental advantage over competition. Often it is information that cannot be "owned" as such and does not come under the intellectual property laws. More often, control of these assets originates in basic contract and employee law.

22. In addition to the fact that knowledge and information assets lack a tangible, physical existence, they often "reside" in the minds of mobile human beings.

23. A story, attributed to Peter Drucker, may help illustrate the data-information-knowledge hierarchy:

A visitor to a building site saw three stone masons, each apparently working on similar pieces of stone. He asked the first what he was doing. "Carving this stone," he replied. The visitor then asked the second. "I am making the lintel for a door," he said. But the third replied, "I am building a cathedral."
building blocks. At the most rudimentary level they are the off-on bits of magnetism on a computer floppy disk or the list of names and addresses on a Rolodex. Information is the next level in the hierarchy. Information results when data are processed. Applying a steel-making analogy, if data are the iron ore, the raw material of steel, information is the slab of pig iron that comes from the first level of processing. The final category is knowledge which is obtained when the various pieces of information are woven together into some understandable and useful pattern.

C. Management

Difficulties in managing KI assets can be traced to important differences between these assets and hard assets. Unlike capital assets (such as buildings and equipment), knowledge assets do not wear out or depreciate with use. Although the value of the knowledge asset to any single owner may diminish as it is more widely disseminated, use of the knowledge by others does not decrease its aggregate value. This is not true of a piece of capital equipment that wears out with each use or of a hard resource, such as oil, that is consumed through use. In fact, it is likely that a KI asset will actually increase in overall value as it is more widely used and the knowledge is added to and refined.

Another difference becomes immediately apparent upon examination of the financial reports of knowledge-intensive companies. Prior to a transfer, when some KI assets get thrown into a catch-all goodwill category, knowledge assets generally do not appear on the balance sheet. Even if we wanted to include all a company's significant knowledge assets on its balance sheet we would run into problems, since value of the KI assets is particularly use-dependent.

Although KI assets, unlike hard assets, do not normally depreciate with use they are often subject to rapid obsolescence. They are also hard to identify, track and measure by traditional means, making control and ownership difficult. To further complicate matters,

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24. See, e.g., Microsoft, 1991 10-K Annual Report (1991). If one examines the stock market valuation of a software company such as Microsoft and compares this valuation to the total value of the assets listed on its balance sheet, one discovers that the stock market valuation is much higher.
25. The value of a patent to a manufacturer depends on the use to which a particular manufacturer puts that patent. If a patent lowers costs by $1 million for one manufacturer but only lowers costs by a nominal amount for another, the patent would be more valuable to the first manufacturer.
26. This rapid obsolescence can readily be seen in the computer industry where today's latest design quickly becomes a commodity product. Specifically, consider the evolution in the IBM-compatible computer market from the 8086 to 80286 to 80386 and, finally, to 80486 chip in a relatively short time period.
they are "leaky" assets that often are easily duplicated and copied. Since a company's KI assets often reside in the heads of its employees they easily blend and combine with other knowledge assets making control of knowledge asset transfer difficult. To complicate our normal methods of bargaining and negotiation, the value of knowledge assets is often difficult to ascertain prior to the actual transfer. It is difficult to "examine" an idea without transferring it since there is no way to erase the human mind once it has learned of the idea under consideration.

These unique properties of KI assets will require the applied creativity of the legal community to help devise the concepts and principals that balance the needs of those producing and creating knowledge and information assets against those using them. To rephrase the classic opening line given in many first-year property law classes: "This morning in a remote lab in New England, an idea was born. To whom does that idea belong?" 27

D. Summary of Why Knowledge and Information Assets Are Unique

1. May not depreciate with use.
2. Often subject to rapid obsolescence.
3. Transfer and copy may be cheaper than creation.
4. Detached transfer difficult. Easily mingled with other KI assets.
5. KI assets may be attached or part of product.
6. Difficult to measure and describe.
7. People often "the container."

III. KNOWLEDGE AND INFORMATION ASSETS MANAGEMENT

Recognition that knowledge and information assets are critical to competitive success is an important first step but does not solve three of the most troublesome difficulties associated with KI asset management: identification, measurement and ownership.

A. Difficulties in Identifying Knowledge and Information Assets

The first step in KI asset management is identification of strategically and operationally important knowledge and information. What do you need to know to produce and sell your product, and where does this knowledge and information reside? With the value

27. The remark on which this is based is generally attributed to Professor Cribbet of the University of Illinois College of Law. The question is usually phrased as "This morning in a remote forest in Wyoming a fawn was born. To whom does that fawn belong?"
of information and knowledge critical to the success of all modern organizations, one would expect to find sophisticated systems and procedures uniformly in place to safeguard and exploit these precious assets. This is not the case. Recognition by executives of the value of information and knowledge to the success of modern business organizations does not necessarily mean that adequate measures regarding ownership, control and use have been taken. It is all too common to find a corporation with extraordinary security and control systems to establish ownership and prevent the employee theft of a ten dollar desk stapler. The same company may have no adequate systems and procedures to deter the same employee from walking off with invaluable information and knowledge assets.

Not all KI assets are as obvious as patents and copyrights, or as complicated as human resources. Consider the routine systems that are necessary to the day-to-day functioning of any business. These valuable but largely hidden and unmanaged KI assets are often ignored. Many businesses are left high and dry when a relatively low-level employee leaves without passing on accumulated knowledge. Even basic information like who to call to repair equipment, or what methods are the cheapest for shipping products can spell the difference between profit and loss. Unfortunately, much of this routine, but competitively significant, knowledge and information is unmanaged, undocumented, and because it most often resides in the heads of employees, extremely mobile.

For the highly automated factory, this may not be much of a problem since the “knowledge” of how to build a car, for example, is built into the assembly line. The loss of a given worker on the line is not a particularly damaging blow to the company’s KI asset base. In contrast, the loss of a worker in a knowledge-intensive environment can be devastating.

A few years ago the Campbell Soup Company faced a situation that is illustrative of this widespread neglect adequately to identify and protect knowledge assets. The company was horrified to discover that one of its employees, Aldo Cimino, a production engineer responsible for “the cookers,” the huge vats that cook the soup, was about to retire. The reason for the company’s sudden concern was the realization that Mr. Cimino had accumulated the equivalent of forty-four years of soup-making experience, and that the hard-won knowledge, critical to the Campbell Soup Company, was about to leave the company with the retiring engineer. In an expensive and experimental project, the company began a seven-month program to extract Mr. Cimino’s extensive knowledge on soup-mak-

This knowledge was subsequently incorporated into an “expert system.”

B. Difficulties in Measuring Knowledge and Information Assets

“You can’t manage what you don’t measure” is an old business maxim. Successful management of KI assets requires their measurement. For most assets, this measurement is ultimately expressed as the assets’ monetary value at some point in time. We have all been exposed to this type of accounting information. If you purchase groceries at the store, you receive a receipt with the various items listed in terms of their price. You could have just as easily received a listing of some other measurement, such as the weights of the items you bought.

Likewise, if we accept the proposition that KI assets are important to an organization and that they need to be managed for most efficient use, we must figure out an appropriate way to measure them. One measurement we might want to establish is their “value” to an organization. In many cases, it will be helpful to measure KI assets in monetary terms. But, it is difficult to determine what criteria and methods should be used to establish this monetary value. Although this attempt is often complicated by the unusual nature of KI assets, the ability to fix a value for KI assets is important, if only to force recognition of the fact that these assets are just as critical to an organization’s operations as hard assets.

The value of a specific KI asset often depends on its particular qualities and uses. A patent may be valued by assessing the net present value of the cash flow generated by its licensing. Knowledge embedded in a production line or office system may be valued by the savings in costs when compared to alternative methods without the knowledge. KI assets that reside in the human resources of an organization are particularly difficult to assess, although there

30. The reason that the grocery receipt tallies prices rather than some other criterion is that the price in ordinary circumstances is a more useful measurement. It provides information the buyer and seller find most necessary. Under different conditions a case could be made for other measurements. For instance, if planning an arduous mountain climbing expedition, an accounting of the weight of the groceries might be more important than their prices.
32. If a patent license generates an annual cash payment of $10,000 to the inventor for the life of the patent, the net present value of this series of seventeen annual $10,000 payments, assuming a ten percent discount rate, would be $80,216 even though the total dollar amount received over the seventeen years would be $170,000.
have been suggestions such as the examination of replacement or training costs. The important point to remember is that difficulty in trying to determine the value of KI assets to an organization should not be a reason for ignoring them.\textsuperscript{33}

\textbf{C. Difficulties in Owning Knowledge and Information Assets}

In the United States there has been a tradition in the law to treat information and knowledge as special types of assets.\textsuperscript{34} In general, there has been a resistance to attach and recognize property interests in information and knowledge.\textsuperscript{35} Of course, this resistance does not mean that any information discovered or knowledge developed is a free good to be used by anyone and everyone. However, the legal relationships developed over the years that are associated with information and knowledge generally fall short of treating the underlying information and knowledge as property (as would be the case with hard assets, such as plant, equipment and inventory). Although some bundle of rights is recognized with intellectual property, this bundle of rights is not the same collection of rights that attaches to more tangible forms of property.\textsuperscript{36}

Consider, for example, the domestic copyright law, one of the

\begin{itemize}
  \item \textsuperscript{33} To help illustrate some of the issues surrounding the valuation of KI assets, ask yourself what the value of your filing system is. Assume that all your files were destroyed in a fire (and you had no back-ups). How much would you be willing to pay for an exact, but randomly organized, duplication of your files, and how much more would you be willing to pay for your files organized as they were before the fire? If your filing system had any merit the latter option should be more valuable than the former, despite the fact that both offer the exact same files. The difference is that in the latter case you get something more, an ordering of your files. This organization, this system, provides some extra knowledge or information that has additional value that is more than just the sum of the value of the random pieces of information or files.
  \item \textsuperscript{34} This tradition can be traced to the Constitution which provides: “To promote the Progress of Science and useful Arts, by securing for a limited Time to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” U.S. Const. art. I, § 8, cl. 8.
  \item \textsuperscript{35} This resistance occurs at both the lay and legal levels. On the lay level the widespread problem of software copying and piracy is one example of the lack of recognition of property rights in KI assets. Individuals who would not normally steal something tangible, would not think twice about copying a proprietary software program. To cite an example from the legal struggle with ascertaining what property rights are tied to KI assets consider the case involving an individual who made copies of songs recorded and copyrighted by Elvis Presley. The Supreme Court held that a provision of the National Stolen Property Act, which imposed criminal penalties for interstate transportation of stolen property did not reach the interstate transportation of “bootleg records” stating that the National Stolen Property Act “clearly contemplates a physical identity between the items unlawfully obtained and those eventually transported.” Dowling v. United States, 473 U.S. 207 (1985).
  \item \textsuperscript{36} See discussion supra part III.D.
\end{itemize}
cornerstones of our intellectual property regime. A copyright specifically does not grant any rights to the author or creator of information in the information itself but merely in its expression. Likewise, trade secret law affords remedies against those who improperly obtain or disclose knowledge in violation of a confidential relationship, but it provides no ownership in the knowledge itself. An independent creator or discoverer of the identical knowledge is equally free to use and possess it. The patent law makes a trade, in effect, with the inventor. In exchange for placing the information and knowledge in the public domain, the inventor can exclude others from using the knowledge for a specified period of time.

D. Legal Regimes and the Ownership Rights in Knowledge and Information

The situation is further complicated because the various nations and legal regimes have devised different relationships between the knowledge and information assets and those who create, discover, possess and use them. Various statutory legal tools offer some grant of ownership or other control over the subset of KI assets traditionally termed "intellectual property." These intellectual property rights (or "IPR" as is often the term of art in Britain and Continental Europe) arise from four conceptual bases: copyright, trademark, patent, and secrecy.

Through broad international conventions, copyright is the most consistent traditional IPR throughout the West, and the world at large. Copyright, which is literally the proprietary ownership of the right to copy, offers companies a valuable tool in the retention of control over a broad range of valuable assets. For example, work products such as marketing literature, computer programs and operation manuals can be competitively protected through copyright. Copyright law is applicable to almost any tangible workproduct that is the original creative work of an individual or group.

Copyrights come into existence at the moment of creation of the work. The international conventions on copyright do not require

filings or registrations, although in most countries, registration is critically important at the stage of enforcing copyrights against others. Even though formalities are not required of the copyright owner, there are serious pitfalls for careless businesses. Establishment of clear ownership and title is crucial. If copyrighted materials are provided by other than bona fide employees, properly drafted and executed "work-for-hire" agreements must be in place. Otherwise, as a matter of law, the author is the copyright owner. The legal and business significance of this cannot be overstated.

Another critical element to maintaining copyright protection is entirely administrative in nature. In-house procedures must be established to ensure that correct notices of ownership are employed and actively monitored for potential infringement. This is particularly important with regard to copyright assignments, since they are valid only for the initial term of the copyright, i.e., prior to renewal, when the copyright reverts back to the author.

Patents offer a conditional governmental grant of limited monopoly to an owner in exchange for both public disclosure, and a limited period of protection. Countries differ significantly in the types of processes and products for which patents may be obtained. They also differ in the enforcement tools available to the patent owner to stop others from making, using or selling whatever the patent covers.

Virtually all countries award patents only after the idea or product has passed various tests. One test is the test of novelty; that is, the idea must not have been published domestically or abroad. In some jurisdictions, publication may include acquiring a patent in another country. Hence, patent programs require careful planning. Novelty also dictates that no one else has developed the same or a similar idea. This requires an extensive screening search prior to

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43. Under the copyright act the author is deemed to "own" the creative work except in two situations: (1) when the work was created within the scope of the author’s employment and (2) when the work was created under a written contract to create the work with ownership explicitly going to the contractor (commonly known as a "work-for-hire" agreement).
44. 17 U.S.C.A. § 201.
46. See Charles R. B. Macedo, First-to-File: Is American Adoption of the International Standard in Patent Law Worth the Price?, 18 AIPLA Q.J. 193 (1990). To note one significant difference, the United States uses a "first-to-invent" priority system to determine which of two or more rival applicants is granted a patent when they file for the same invention. Many other countries use a "first-to-file" priority system.
47. Patent practitioners use the word "publication" in its literal meaning of "to make public."
application. Other tests require that the idea has commercial value and is "non-obvious." 48

The value of a patent depends upon the structure and characteristics of the particular industry to which it applies. Due to ever-escalating application and administration costs, patents are becoming more the tool of large corporations and less the tool of emerging companies. Important exceptions to this are in nascent industries such as biotechnology, where broad pioneering patents are available. Another factor that diminishes the value of patents is that the legal system takes considerable time to evaluate and award a patent. This time period may exceed a product's life cycle. 49

Trademarks and "commercial dress" are universal forms of IPR in various guises. 50 From the beginnings of human society, craftsmen sought to identify their products with some distinctive symbol or mark. 51 As craft guilds developed, distinctive hallmarks were utilized to associate the goods with members of the guilds and as a means of establishing the authenticity of goods originating from a specified source. Trademarks are the difference between doing business anonymously or as a recognized force in the market. 52 As a company grows and prospers, so does the value of its trademarks. Often the value of a company is largely a function of the value of its marks. 53

Today's commerce is to a great extent dependent upon trademarks and trade names. 54 Advertising creates and reinforces consumer preferences for certain products and services and refreshes the consumer's recollection of the sources of those goods through identification of the trade names or marks that identify the goods. People buy what they have come to prefer, and use trade labels to find those preferences. 55 While the secret Coca-Cola formula is undoubtedly valuable, it is overshadowed by the phenomenal value of the "Coke" and "Coca-Cola" trademarks throughout the world. 56

49. The Point of Patents: As a Way of Encouraging Innovation, They Are Becoming Increasingly Irrelevant, Economist, Sept. 15, 1990, at 19.
50. A trademark is a distinctive mark that identifies a product's authenticity.
53. For example, when Ford Motor Company purchased Jaguar PLC in 1989, it paid $2.5 billion for a company that by standard valuations of its financial performance was worth one-fifth that amount. The balance of $2 billion was publicly attributed by Ford to be for the famed Jaguar trademark.
54. A trade name is used by a manufacturer to identify its business, and it symbolizes the business' reputation.
55. Hawes, supra note 52, at 1-3.
56. While an individual might very well have a difficult time selling his own
As a product comes to be preferred by consumers, competitors are tempted to approximate or even copy the trade dress that associates a successful product with its source. Names, colors, shapes, packaging and manner of use are all features that may be appropriated or even parodied to associate a competitor’s goods with that of the preference leader.

Trademark law varies significantly between the United States, the European Community ("EC") and the EC Member Nations. One major difference is that the civil law countries of the EC, in contrast to the United States and the British Commonwealth countries, generally allow registration of trademarks without actual commercial use. So, for example, a French national could "lock-up" future use of the trademark of a United States-made product by registering it prior to the United States trademark owner coming into France. Another area of concern is control of licensees using a trademark. For example, in the United Kingdom, a licensor’s lack of control over the quality of use of a registered mark can lead to its loss.57

While the other traditional forms of IPR require disclosure, trade secrets58 by definition prohibit it.59 Virtually any information that is used in business, creates a competitive advantage, and is treated as genuinely confidential, can be protected.60 It is fair to say that proprietary, confidential information comprises a large percentage of the wealth of all successful companies.

Trade secret law is the most problematic area of intellectual property law, but at the same time, it offers the most promising tool available for innovative and carefully run commercial concerns. The keys to protection are identification of current and future KI assets protectable by trade secret, confidentiality, and careful design and implementation of protection strategies and procedures. This is true throughout the United States and the EC and its Member Nations. Whether trade secret law rests ultimately upon notions of property, contract, tort or employment obligations is perhaps irrelevant to the businessperson; he or she needs only to know that trade secret protection offers great potential for effective control over critical KI assets.61

cola drink, even if he somehow acquired the genuine Coca-Cola formula, that individual might well be successful selling his own formula if he could use the "Coke" trademark and related designs and the Coca-Cola Company did not have the ability to prevent such use.

57. See generally AMANDA MICHAELS, A PRACTICAL GUIDE TO TRADE MARKS (1982).
58. A trade secret is any formula, compound, process, pattern, device or compilation of information that is used in one's business, and gives the possessor a competitive advantage over those who do not know or use it. See Microbiological Research Corp. v. Muna, 625 P.2d 690, 696 (Utah 1981).
59. Id.
60. RESTATEMENT OF TORTS § 757 cmt. b (1939).
The characteristics of a trade secret make it well-suited to technological development. The law in this area protects the information used in development programs, as well as trade secrets immediately capable of industrial application. This flexibility makes the use of trade secrets the ideal intellectual property regimen for business expansion. Secrets, in whatever form they take, give a business a competitive advantage over trade rivals who do not possess access to the information and would like to have it. Thorough internal control systems, however, are required. Some companies are literally giving away competitive advantages to competitors, former employees and contractors every day. Confidential business information is lost largely through distribution and development relationships, employee and contractor mobility, and outright piracy.

Where patents have a fixed life, the know-how and expertise associated with implementation of patented technology is often effectively controlled for a far longer period through confidentiality and strict use licensing. In the EC such licenses must be carefully considered, insofar as the license terms are regulated by the EC Commission in order to monitor anti-competitive behavior.

IV. EC LAW AND KI ASSETS

Cross-Atlantic companies face numerous challenges in managing their KI assets in a consistent manner. While governments have recognized that differing treatment of intellectual properties creates barriers to trade that are just as substantial as tariffs, significant differences exist, as illustrated above. The EC 1992 plan addresses these issues but does not eliminate them. EC's 1992 approach to patent, trademark and copyright law does not feature the concepts of mutual recognition and reciprocity that would give corporations the ability to manage their KI assets in a manner consistent with one set of rules. Rather, the 1992 scenario is one of harmonization on two levels: to the extent possible, implement identical national systems of protection; and beyond the national systems, create a community-wide system of registering trademarks and obtaining patents. In application, this should reduce the overhead cost of effective KI management.

64. See Gary L. Reback & Michael J. Patrick, Trade Secret Issues in the Computer Industry, 276 PLI/PAT. 115 (July 1, 1989).
Inventors seeking patent protection across the EC currently can proceed under the European Patent Convention and apply for patents in some or all of the EC Member States by means of a single application. The problem remains, however, that coverage of the laws in each nation still varies considerably, and the enforcement procedures also vary country-by-country.

Trademark owners currently proceed on a country-by-country basis. The creation of a community trademark has been proposed, but the idea faces considerable hurdles regarding the issue of priority as between first use and first registration. Companies must consider world-wide trademark programs from the outset if they wish to avoid a twelfth-hour finding that a product must be re-labeled and re-marketed, under a different mark, for a specific foreign country.

The law governing works traditionally protected by copyright is uniform throughout the United States, the European Community and individual EC Member States, but it can vary considerably for relatively new mediums such as software, video, and even audio reproductions. In addition, there are substantive differences between the quasi-copyright approach used by many European countries for industrial designs, and the concept of moral rights of the author; these differences can prevent modification of a copyright irrespective of sale or other assignment. Motion picture colorization, for example, would require the express permission of the creator on much of the Continent, in contrast to United States copyright law.

It is entirely possible that the EC may be able to take a leadership role in the modernization of the traditional IPR protection regimes. One example of this is in the July 12, 1990, directive of the European Parliament regarding the protection of computer software; that directive is more expansive than anything yet put forth for consideration in either the United States or Japan. Logic, algorithms and programming languages—none of which currently enjoy protection under mainstream copyright law—would be protected.

The chief contrast between the United States and the EC that must be drawn is in the handling of licensing of proprietary materials. The source of the EC practice is the 1958 Treaty of Rome, under its antitrust law, Article 85. Article 85 provided that agreements restricting competition among member states were void and could be penalized. While the United States, Germany and the United

69. The Green Paper on Copyright and the Challenge of Technology—Copyright Issues Requiring Immediate Attention, Commission of the European Communities, COM(88)172 final (June 7, 1988).
Kingdom generally handle the legality of license restrictions under antitrust law, the EC (and Japan) encourages or requires registration of licenses, and publishes guidelines as to permissible restrictions. These guidelines are referred to as "lists": "white" (permissible practices), "grey" (subject to review, but permissible if the applicant can show both business justification and a lack of harm to market competition), and "black" (seriously anti-competitive restrictions, which rarely are approved). Lists are published for both patent and know-how licenses. In addition, it is EC practice to consider carefully the fairness of the restrictions on the licensee; United States practice focuses almost exclusively on the market-wide effect. This difference can lead to very different results, and can necessitate altering a company's entire technology-exploitation strategy for the EC market.

V. THE KI ASSET AUDIT

It is one thing to acknowledge the critical nature and value of a business' knowledge and information assets. It is another to manage them adequately. As noted above, KI assets typically do not even appear in a financial statement. This is entirely a function of the fact that the commonly used accounting systems are unable to quantify intangible commercial assets. This inability is not and cannot be accepted as an impediment to comprehensive KI asset management. To do so is to imperil the very competitive nature of any commercial endeavor.

There are three steps to effective and profitable management of KI assets: identification, protection, and exploitation. The review of KI assets is a KI asset audit. A KI asset audit is a comprehensive review of these most valuable business assets. It identifies areas where there are weaknesses in protection strategies, providing analysis of the strength of the firm's ultimate competitive advantage—the control and ownership of knowledge and information assets.

A. Steps for Effective Management

1. Identification

Identification of a corporation's KI assets is necessarily the first step. Critical here is the recognition that the investigation is for all forms of strategically important or critical knowledge-information within the company. If the search is limited to the categories of traditionally protected intellectual property, the value of the exercise is diminished and the results artificially restrained.

The objective of this identification stage is a listing of all strategically critical KI assets. This is best obtained by interviewing key

71. See discussion supra part II.
managers within each department of the business, with the clearly stated goal of having them identify the source of value and competitive advantage within their specific area of responsibility. The converse can also be telling—identification of the weakest area of potential competitive advantage on which the department is unable to deliver. The list should at this point be reviewed and agreed upon within the company—either by the active principals in the case of a small concern or by the board of directors. As the foundation stone of the KI asset audit, it is imperative that near unanimity be established at this point.

The next facet of identification is mapping the location and sources of the KI assets. Most will reside in-house, but some, inevitably, will be located externally. The relationship of the asset to the company is critical to design and implementation of the protection strategy. Often a KI asset will be situated in more than one location. For example, a technology company may have as a key competitive advantage both the market-leading quality of its products, and the market's perception of that status. Hence, the competitive advantage will reside within the research and development, production, marketing, sales, and service departments, and it would be disingenuous to limit the KI asset location to fewer than all the departments that are applicable. From this exercise it will be possible to map the flow of the asset, within and without the company.

2. Protection

The second step is determination of the status of the protection of the KI assets identified. Working from a functional analysis—in stead of a legal analysis—of the value and importance of the knowledge and information assets uncovered, it becomes possible to determine the most advantageous legal protection from a business perspective. Starting with a legal analysis is a perfect example of the tail wagging the dog. From habit or convention it is easy to pigeon-hole a specific KI asset into a traditional intellectual property niche, a move which can severely curtail the business importance of the asset ostensibly being "protected." For example, while a patent in the right situation may be ideal, in other situations the mere act of publishing the invention through obtaining a patent may sacrifice a significant competitive advantage that may have been optimized through treatment of the technology as a confidential trade secret.

The protection regimen that will issue from the above steps will be in the form of a process, an initial set of procedures and systems geared to the growth of a business. The regimen will be, by definition, an integral aspect of the company's strategic business plan; it

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72. For example, technical knowledge or marketing information are often sourced outside of the company.
will be subject to the same changes and evolutions that result from the business' incessant responses and reactions to the marketplace. The where, how, and why of business activities will all play a determinative role in the constantly evolving KI asset protection regimen.

3. Exploitation

Next, the third step—exploitation—logically enters the calculus. Those assets, those repositories of competitive advantage, that are identified and protected as such, become the focal points of a business' strengths. A business' competitive advantage in the marketplace can be described in terms of the value of its intangible KI assets. The value of these properties is a function of their inherent usefulness, the company's ability to exploit them profitably, and the security of the control over the assets. This value can be measured quantitatively through the use of the following KI Asset Bubble Chart.\(^{73}\)

B. KI Asset Bubble Chart—Tool for Management

Although management of knowledge and information assets is imperative for competitive success, it is not without cost—particularly in the legal area. It would be wasteful to identify, measure and protect each and every KI asset in the same manner. Some KI assets, such as those of greater strategic importance, require increased attention. Unfortunately, legal counsel may not be in a position to differentiate among the importance of various corporate KI assets. The critical management task in this regard is to balance the needs for KI asset management versus the associated costs.

One tool that can be helpful in mapping out a KI asset management strategy is the KI Asset Bubble Chart. The chart can be one of the most useful management techniques that results from a knowledge and information asset audit. The chart plots a bubble for each identified KI asset along two axes: strategic importance of the KI asset and strength of relationship rights to the KI asset. The former is fundamentally a management question and the latter a legal one. The bubble size is indicative of the particular KI asset's relative value in comparison to the company's other KI assets. Taken together, these three factors mark a clear course for further management action.

The first step is to identify the information and knowledge assets necessary to operate the business under consideration. The next step is to evaluate the strategic importance of each of these identified KI assets. To assist in this effort, a table like the one below is useful. Various factors of strategic importance to the particular business and industry are listed and given weights. The weightings are

\(^{73}\) See discussion supra.
Intangible Assets

applicable to all KI assets. It is important to remember that the weightings from all factors that are important must precisely add up to 1. Once the weightings are completed, each KI asset is individually ranked on a scale of 0 to 5, representing its strategic importance as measured by the identified factors. The weights and ranks are multiplied together to yield a value for each factor. All the values are added to yield a single value from 0 to 5 for the KI asset being examined. This value will be the “x” value when the KI asset bubble is plotted.

Strategic Importance of KI Asset

<table>
<thead>
<tr>
<th>Factor</th>
<th>Weight (0-1)</th>
<th>Rating (0-5)</th>
<th>Value (0-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhances competitive position</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Improves manufacturing</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Product characteristics</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Differentiation</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Enhances market focus</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Improves administration/control</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Improves marketing</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Legal/regulatory requirement</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Other factors</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Weight Must Total Up to -> 1.00
Add up all values and plot on X axis

Next the company’s relationship to the KI asset must be evaluated. The objective is to quantify the relative certainty of control the company possesses over the KI asset. To do this a similar table is developed, generally with the help of legal counsel, using the results developed by the KI asset audit. This assessment of the legal relationship to the KI asset yields the “y” value that corresponds to the “x” value determined earlier. Now the particular KI asset can be plotted on the KI Asset Bubble Chart with other KI assets.

74. See discussion supra part V.
The bubble chart has three zones that offer guidance for management action:

- "Waste Zone" - Resources wasted on building and maintaining legal relationship.
- "Safety Zone" - Good balance of legal relationship and strategic importance.
- "Danger Zone" - Strategically important assets without adequate legal relationship.

Using the example chart above it is apparent that KI asset seven requires attention (legal or otherwise) to strengthen the company's relationship to the asset. By contrast, KI asset eight is over-protected, indicating that valuable resources have been wasted on it. Using this chart, management can quickly identify strategically important KI assets to which the company has an inadequate legal relationship, and with the same ease it can also locate KI assets that are legally over-protected.

**CONCLUSION**

The management of KI assets is strategically critical for a modern business organization operating in the global economy. The laws
and accounting principles guiding businesses today derive from those relevant to and adequate for industrial age organizations which manufactured tangible goods. New information technologies—spawned by new industries—have brought to the fore many novel and largely unanswered legal issues that are associated with the ownership, protection and exploitation of valuable KI assets. Managerial awareness of the importance of an organization's often-ignored KI assets is the first step toward full productive use of the assets. A KI asset audit together with the KI Asset Bubble Chart can be used to review comprehensively an organization's KI assets, serving investors and managers as an essential element of "due diligence" in the information age.