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***This is an outline of a lecture that I gave in 1994 to the Computer Law and Patent Sections of the Connecticut Bar. I reviewed this lecture in 1999, and brought it up to date before posting it on my Internet Site.***

**George C. McKinnis**

## **A LEGAL HISTORY OF THE SOFTWARE INDUSTRY**

The Software Industry has grown like a black hole by attracting other industries into its permanent thrall by the gravitational force of the microprocessor chip. No lawyer or businessperson can be free from its language, requirements and use.

I was drawn into that black hole as a professional and business participant in the Software Industry since its early formation. I was a telecommunications lawyer for ITT Corporation for 14 years, during which time I was General Counsel of ITT's R&D Laboratories and the ITT Programming Technology Center. In addition, I was assigned to ITT's personal computer and computer peripheral manufacturing operations. I got my feet wet in business as general manager of a project that developed early office automation systems and tools.

Now, I am in private practice concentrating in domestic and overseas technology transactions. I represent companies in the Telecommunications, Software (SW) and Health Care Systems Industries and have been a Director of four companies in those fields. These industries are closely related to the point of merger due to the most important technological advance of the Century: the microprocessor chip.

Because of my background, I propose to review the history of the SW Industry and the personality and "pathology" of its childhood, as I experienced it, and its current teenage phase, as I am suffering it. Then, I will discuss from a general practice lawyer's prospective how SW is transferred and protected in contract and intellectual property law. My comments as to intellectual property matters are hornbook oversimplifications, at best, and prejudiced statements colored by experience, at worst.

Should any of you have a question regarding my remarks or this outline that did not surface until I was out of range, please call me at the Bronxville office.

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## 1.0 Background to SW

1.1 Binary nature of computer operation

1.2 Manifestations of binary technology:

Mainframes

Mini and Microcomputers

Plug compatible peripherals

Modem communications

Computer driven telecommunications (central office equipment/cellular telephony/PABXs/ISDN, Cable and DSL wide bandwidth, high-speed connectivity)

Information Highway

- Present: CompuServe, Internet, etc.
- Future: Fiberoptic national channels with high speed ISDN, DSL, and Cable delivery systems. Voice, data and Internet communications will be integrated (and are close to full integration in 1999).

1.3 Gaul is Divided Into Three Parts:

HW            Microprocessors/storage media/backplanes  
                 motherboards/plug-in boards

SW            Object and source code, systems SW (Windows) and  
                 Application SW (MS Word).

FW            Microcode instructions “burned” into a semiconductor device. Firmware has the characteristics of both HW and SW. Firmware is now in many cases user downloaded into the chip, in a process called flashing.” Many VLSI devices that run telecommunications switches and that provide voice and data facilities will be programmable by flashing the chip. Key elements of applications SW will be installed in the semiconductor chip’s firmware, which will allow significant system performance improvement.

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## 1.4 Psychology and Pathology of SW

### 1.4.1 Childhood Abuse Phase (1960 - 1980)

IN THE BEGINNING WAS THE MICROPROCESSOR. The emergent computer world was dominated by HW development, production and sales. This troubled childhood was fathered by electrical engineers to whom SW was secondary to the microprocessor and the calculating machines that used it.

Should you have any doubts as to the abusive relationship of the HW mentality, regard the pathology of IBM's decision to let Microsoft own the DOS operating system for the first IBM PC. That decision was made by electrical engineers and MBAs who mistakenly thought that iron and silicon were the message. As late as the 70s, IBM management considered SW applications to be secondary to the business of designing, building and selling mainframe computers. (Today, 1999, I am pleased to say that IBM has plunged into the world of SW with all of its management expertise.)

The Legal System viewed HW contracts as being subject to Article 2 of the UCC and protected by Patent Law. SW was viewed as not being "goods" which are subject to Article 2 of the UCC. The license was adapted to SW and code was protected in the typical SW license by both trade secret and copyright (although the license must dance between destroying trade secret by filing a copyright, which is public.)

Product developers and contract experts were confused by the process of creating "goods" or things that could only operate by proprietary instructions. Development contracts emphasized the HW design process over the SW process. SW developments were isolated from the development of the HW on which the SW was to run. HW/SW integration would occur after completion of the HW by Team A and the SW by Team B. Cost and time overruns were normal in this disjointed method of developing a new product.

The business, scientific and legal communities were confused by a property that integrated the physical and the intellectual, the corporal and the incorporeal, iron and thought.

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## 1.4.2 Teenage Rebel Phase (1980 - 2000)

SW programmers and engineers are now taking a very aggressive role in product development.

Today in 1999, many SW houses are making more money and have more power than the HW houses that gave them birth: for instance, look at Microsoft (and its gigantic market cap). Microsoft was spawned by IBM's invention and commercialization of the personal computer, for which IBM lost market dominance at a time when Microsoft was growing at a phenomenal rate. This is the decade of the SW developing and marketing company. HW/SW integration begins now at the earliest stage and throughout the design of a new product.

SW developers and SW houses do not appear to be mature businesses when compared to traditional HW manufacturing and design companies. HW entrepreneurs find it unforgivable, as they strive for bump after bump of investment capital, that the SW startup needs far less capital and generally has a higher profit margin on its licensing income than a HW house expects to have on its equipment or components. SW houses tend to be dominated by creative talent rather than professional business school and financial managers. Many very good programmers are musicians who became programmers. As a result, SW houses and their managers are sometimes thought of as "brats" by the HW dominated business and financial world.

Now, with SW at the core of Ecommerce and Internet companies, many very young programmers and creative SW people have gained extraordinary wealth. Ecommerce companies are easier to fund and to sell at a high multiple over earnings than traditional HW companies. In many cases, the average age of the founders of an Ecommerce company is significantly younger than VP level executives at mature HW companies.

Once, on a trip to Boston to negotiate a three million-dollar compiler SW development agreement, I arrived at the headquarters of a large compiler development company. While negotiating the development contract, I noticed key SW engineers who were assigned to my client's project were absorbed in a public game of

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Japanese GO, which lasted from noon into the late afternoon. The general manager of my client's project told me that he did not dare complain, as, if he indulged the SW engineers, they would work all night on my client's project. Conversely, if he ordered them back to work, they be very unhappy and would be very welcome additions to another SW company's staff.

Another example: a successful telecommunications SW development and sales company that I was General Counsel of installed a professional billiards table in the engineering area of the building. I saw that company's best SW engineers day after day taking an hour break late afternoon to play a competitive game of billiards. The CEO told me that his SW engineers were frequently working until dawn on crash projects and they needed some relaxation at the office to encourage them to keep working. You would never see that approach at a HW manufacturing company.

Despite its rapid expansion and fast maturation, the SW Industry does not enjoy a legal system that offers it dedicated tools that map to the industry's requirements.

## 1.4.3 Adult Phase (beginning year 2000)

The Software Industry's problem with the legal system will be corrected by legislation. At present, there is pending a proposed SW Article that may be added to the Uniform Commercial Code that will make break-open licenses enforceable and will define the essential terms of a SW license similar to how Art. 2 of the UCC defines the basic terms in a purchase of goods. There is also a movement to create uniform state legislation that better protects the intellectual property that underlies SW and semiconductor design.

The Information Highway will be completed and in full use by all. It will be visited by holistic regulation and maintenance. This communications network can be used for evil (we all recall the exposure of multiple pederast rings that exchanged child porno on the Internet. Issue - should police monitor electronic mail?)

HW and SW will not be thought of as components or separately studied topics. They will be seen as a holistic unity. Applications programming will be installed on VLSI chips to free up memory. Applications will go into Firmware, as semiconductor technology

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acquires more and more on-board memory.

## 2.0 Intellectual Property Protection and Contract Techniques

### 2.1 Patent Protection

#### 2.1.1 Patent Provides Powerful Protection

A patent attempts to protect the underlying "IDEA" or innovation against use of the idea by others in a similar product or application by protecting applications of the idea. Once patent protection is granted, the innovation may be publicly disclosed without loss of rights, unlike trade secret protection.

Patent infringement litigation is the most powerful weapon in competition. It is a nuclear strike.

#### 2.1.2 The Very Bad News

Patent protection is confusing, arcane, non-intuitive and historically dangerous; it requires a specialty BAR to understand and implement it. That is difficult enough, but consider the following message upon which you bet your company:

You will never know whether you are infringing another party's intellectual property, even if you do a patent search and file patents that are issued by the Patent Office on all of your innovations.

#### 2.1.3 Patent Protection of HW, SW and Firmware

##### A. HW patent protection is normal to Patent Law

Computer HW is treated no differently in the US Patent Office than are automobile brakes and TV sets and other "things" that have a corporal body that perform mechanical or electrical functions.

There is a historic body of case law and mature statutory law to support patenting computer HW.

##### B. Patent Protection of SW and Firmware is Difficult

The first SW patents were tied to a machine that the SW would cause to operate or would change a state in the

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machine. SW patentability has been steadily improved by the court system to the point that now you can now obtain patent protection of a programming algorithm.

However, cases defining a SW claim as patentable are close to incomprehensible. Courts must strain to find patentability of pure SW.

Notwithstanding the difficulties of obtaining patent protection of SW, it is very wise for the SW owner to try to obtain all the patent protection that is possible.

## 2.2 Copyright Protection of HW, SW and Firmware

2.2.1 CR covers the “expression” only, not the idea. It comes from the art world. CR was designed to protect literature from being copied without authorization of the owner. Without CR, the book and music publishing industries would not exist. You can CR protect the layout of a board product in the electronics industry, but that CR will not protect the underlying inventions and ideas that the board layout represents. Copyright is a weak protection for HW products.

2.2.2 SW, including source and object code, operating system and application programming, can be copyright protected. Courts now tend to find more abstract expressions protectable, such as the “look and feel” of a program’s proprietary user interface, rather than code that creates user interface. If only the code is protected, then a competitor could clone a market dominant program’s menus, colors, keystrokes and features for so long as the competitor’s SW is not a copy of the market dominant SW.

2.2.3 Disadvantages to a SW owner: to attack an unlicensed user of your SW, you must file a CR with the US Copyright Office in Washington. A copy of the code that you desire to protect is filed with the copyright application. That copy is available to the public. That means that a competitor could study your code. That also means that you will have trouble claiming Trade Secret, as when your code is filed in Washington and available to the public, it is no longer a secret.

Solution: The CR Office allows applicants to withhold key elements of the code so that a competitor will not have access to

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your entire code. That part of your code that is not filed in the CR Office is protected by Trade Secret. Your SW licenses will then state that your SW is “protected by the Law of Copyright and Trade Secret, where applicable.”

## 2.2.4 Disadvantages to HW Owner

CR only protects a literal copying of the layout of a board or chip or machine. A competitor can change the layout and achieve the same innovation, quality and function as your board. That is why patent is a more powerful protection. Note: CR case law is growing to protect the owner of a CR from third party cloning without copying the exact code. For instance, CR law now protects the owner of the CR against a scoundrel taking the owner's source code and recompiling it in a different language so that the scoundrel ends up with substantially the same product.

## 2.3 Trade Secret Protection of HW, SW and Firmware

2.3.1 Trade Secret protects the idea and the expression of the idea, but you must keep the expression of the idea a “secret.” Customers and others can only receive a right to see or use the idea and expression under a confidentiality agreement.

2.3.2 Trade Secret is not a good protection for the Computer Industry as it is difficult to do business with an electronic commodity under confidentiality. Owners of HW use patents to protect their innovations and preserve market exclusivity.

2.3.3 Trade Secret has been used from the beginning to protect SW.

The basic SW license agreement contains a confidentiality statement that protects the owner's claim to Trade Secret protection. But, it is difficult to invoke Trade Secret without obtaining a signed agreement between the owner and the recipient in which the recipient agrees to honor confidentiality.

Once the cat is out of the bag - only one time - the information that you hope to protect is public domain. This means that should one person receive the information without being subject to a confidentiality agreement or a license agreement containing a confidentiality obligation, the information becomes and shall

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remain forever public domain.

You will recall in my discussions of SW protection that Trade Secret and CR are combined in the modern SW license.

## 3. Contract Techniques

### 3.1 Survey of Contracts

Generally, HW is treated as “goods,” Firmware (FW) is a form of SW that is bundled with a semiconductor product and treated more like a chip or a component. SW is treated like an “off the wall” unique creature that has special rules for transfer that are historically based on protecting works of art.

Because HW is “goods” under Article 2 of the UCC, HW sales and distribution contracts have much in common with other products unrelated to the digital world. HW contracts are subject to traditional contract formation rules.

FW is transferred along with the chip that it is “burned” into. Chip documentation generally states that the buyer receives ownership of the physical property and not the underlying intellectual property. The microcode that is internal to the chip is generally covered by copyright and is not, with a few exceptions, such as commercial computer microprocessors (Intel 586), of value to others as it is dedicated to one proprietary chip.

SW is a modern, unique product that suffers from a Legal System that thinks clearest and has the most reported history when dealing with physical objects.

### 3.2 SW Contracts

#### 3.2.1 Standard SW Licensing

The contract of license relies on Copyright and Trade Secret, where applicable. A license is used when the customer receives only a right to use rather than ownership of the code. The contract of license clearly states that the contract will be breached by not treating the SW as confidential and by letting an unlicensed party use it in a manner that violates the restrictions of the contract.

The SW owner can sue those who use the SW without license rights thereto. Lotus was the first SW house to aggressively litigate

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against large companies whose employees copied Lotus 123 and send the illegal copies to other employees for business use. There is a national SW trade association that rewards disgruntled employees to turn in their employers for the SW license violations of other employees.

The Law of Contracts prevails in contract formation and interpretation of a contract of license, except that the owners of standard packages such as MS Windows and WordPerfect cannot be expected to obtain license agreements signed by every licensee. The transaction is too small and the volume of transactions too high to administer traditional contract formation through signed license agreements. Hence, the shrink-wrap license came into uneasy being.

## 3.2.2 Shrink-wrap Licensing

The licensee "buys" (really licenses) a SW package at a computer store or by mail order. The SW package contains a shrink wrap package or sealed envelope that has a mini license agreement glued to it or printed on it that explains that you agree to abide by the license restrictions when you open the package and take out the SW disks or CD contained in it. The break-open license usually states that should you not agree to abide by the restrictions, you must immediately send the package back to the SW house for a full refund.

Issue: can the SW house show by evidence that "informed consent" to a contract has occurred merely by proving that the user opened the SW package?

Issue: what if a minor without the capacity to contract opens the package?

The best solution to this problem is for each state legislature to pass SW license enforcement legislation. Some States have enacted legislation that creates a presumption in favor of enforcement of shrink-wrap licenses and a uniform SW licensing law is being proposed in 1999.

## 3.2.3 License with a Right to Sublicense

When a license contract grants the licensee the right to sublicense,

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the licensee can pass the licensed program to customers under a contract of license. For example, a telecom developer will buy a semiconductor chip that is a microprocessor for a PABX. The microprocessor will have its own operating system SW. The telecom HW house will sublicense its customers to use the operating SW that is owned by the original SW developer.

## 3.2.4 Runtime Program

SW database developers will license their database ("DB") program to an applications developer. The SW applications developer negotiates the right to sublicense its customers with a "runtime program" which does not appear to the user to be part of the package that the user bought. The runtime program is a miniaturized version of the DB package that must be used whenever a specific DB application is run.

Example: my PIM (personal information manager) is designed to run under WP and MS Word for Windows. My PIM loads as a proprietary package designed and developed by the vendor. But, after loading it, I found in my Windows subdirectory a large "DLL" Windows program -a Paradox for Windows engine that the developer transferred to me under a "runtime" agreement with Paradox. The same PIM loaded another runtime program in my Windows directory: Microsoft's Visual Basic.

## 3.2.5 SW Development Contract

Consider a buyer who engages a SW developer to produce SW for the buyer. Who owns the newly developed SW? It will not be automatically the buyer. The buyer must have a contract that states that the developer is developing SW for the exclusive ownership of buyer and that seller cannot use it or license or sell copies of it to third parties without the advanced written permission of the buyer.

Usually SW and know-how that a SW developer owned before the developer engaged in an assignment for a customer that is needed to operate the SW developed for the buyer remains the intellectual property of the developer and the customer gets a royalty-free license to use and to sublicense the SW. This presumption is overcome by contract.

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The following general business or trade rules may aid you in analyzing who should own what SW; but, these rules are mere guides to allocating ownership and must be documented in a properly drawn contract.

- A. SW that was produced by the developer for the buyer, for which the buyer paid fair market value for the programming services, is usually contractually stated to be owned by the buyer.
- B. SW that was developed and owned by the developer before the development commences and must be embedded into the programming deliverables is usually reserved by the developer and licensed to the customer in the development contract.
- C. SW that was subsidized by the developer, who works for substantially less than the fair market price for the development services, is usually stated in the development contract that it is jointly owned.

## 3.2.6 Consultancy Agreements (or Worse) to Engage SW Developers

### A. General Rule

SW is an artistic expression, like a publishable book. An artistic work is subject to the rule of law that a work of art can be commissioned by the buyer and the work is owned by the artist unless there is a written agreement that the WORK will be owned by the buyer. For example, a sculptor can create a piece for a customer and deliver it against payment but without documentation. Under these conditions, the sculptor may duplicate the piece and sell the duplicates to others as the underlying artistic concept was not passed in fee title to the buyer of a statue. On the other hand, the Museum of Modern Art may commission a statue and, in a bill of sale, can specify that the work will be wholly owned by the museum and the artist cannot duplicate the statue for other customers.

### B. Safest Approach

Use a Consultancy Agreement that states that the work and

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its underlying intellectual property are to be owned by the company engaging the consultant and attach an Assignment of Inventions Agreement that will either be separately signed or incorporated by reference into the Consultancy Agreement.

The ubiquitous Assignment of Inventions Agreement states that the signatory assigns all of his or her right, title and interest in the work to the customer. Use it frequently.

## 4. Conclusions

The typical lawyer's training and experience must catch up to this chaotic and high growth industry, or we and our clients will suffer. Unfortunately, chaos is a permanent part of this industry and we lawyers must adapt to it.

I have a sign hanging in one of my offices that I found when I supervised the liquidation of a closed and emptied R&D laboratory - an acquisition casualty:

***In the beginning, God was a computer scientist.***

***If not, where did the Chaos come from?***

*George C. McKinnis  
McKinnis Law Offices  
40 Oriole Avenue  
Bronxville, NY 10708  
Phone (924) 793-9215  
Fax (914) 793-9433  
[www.mckinnis-law.com](http://www.mckinnis-law.com)*