
BOOK REVIEW

Information Technology and Law: Computer Programs and Intellectual Property Law in the US, Europe, Japan and Korea. Edited by Dae-Hwan Koo, Pakyoungsa, 2005, Pp. xvi, 509. ₩28,000

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I. Introduction

INFORMATION TECHNOLOGY AND LAW-COMPUTER PROGRAMS AND INTELLECTUAL PROPERTY LAW IN THE US, EUROPE, JAPAN AND KOREA- (*hereinafter Book*) deals with the protection of software, a subject of essential importance to practitioners as well as legal scholars. There has been a steady flow of literature on this topic in Korea for more than the past decade. Nevertheless, much of the debate has been focused only upon the protection of software from the perspective of particular types of intellectual property such as trade secrets, copyright, patent, and contract law. This Book systematically deals with this topic, and comparatively analyzes the protection of software in the US, Europe, Japan and Korea.

Prof. Koo introduces some alternatives to current regimes to protect software, evaluates them in detail based upon economic analysis, and vindicates the Direct Protection of Innovation alternative suggested by Kingston and Kronz. A proposal suggested by Prof. Koo is based upon the problems of the existing legal regimes he identifies in protecting software, in particular, business methods (BM). The issues on how computer programs should be protected, and which legal regime is appropriate has long been hotly debated all around the world. Since the *State Street Bank & Trust v. Signature Financial Group* case (*hereinafter State Street*),¹⁾ the

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1) 149 F.3d 1368 (Fed. Cir. 1998).

appropriateness of business method patents has been more controversial than anything else. Consequently, the overview of business method patents is essential.

In Part II, this Review provides the general framework of the Book, and the main theme of Prof. Koo's argument. Part III offers a brief recapitulation of the debate on business method patents. In Part IV, I will offer a critical assessment of the theme proposed by Prof. Koo, and in Part V, I will criticize the Direct Protection of Innovation alternative suggested by Kronz and Kingston and vindicated by Prof. Koo. In Part VI, I will summarize my findings.

II. Framework of the Book

According to Prof. Koo, the goals of this Book are as follows (p. 7):

- i. compare the patentability of software-related inventions in the EPO, the US, and Japan;
- ii. answer the question of whether or not software patenting in general, and business method patenting in particular, is desirable from an economic perspective;
- iii. find the most appropriate form of protection for software by evaluating alternative proposals in the light of the characteristics of software and its market as well as modern software development;
- iv. define the subject matter of the alternative protection systems; and
- v. provide suggestions that should be considered in order to introduce the new regime at the international level.

For this purpose, Prof. Koo, raises, first of all, the issue of what the problems are in protecting computer programs in general, and business methods in particular. Prof. Koo indicates problems in both the economics of software innovation and the criteria of software patentability. As to the economics of software innovation, Prof. Koo indicates there are pros and cons in protecting software by patents. As to the criteria of software patentability, Prof. Koo suggests national patent offices apply different criteria in issuing patents relating to business methods. In particular, Prof. Koo argues that the US appears to be more generous in granting patents to software-related inventions, especially for business method inventions than EPO and Japan. I share Prof. Koo's view.

Since the *State Street* case, it has become easy in the US to obtain internet-related

patents for pure business methods, and there is a view that too many trivial patents are granted in the US.²⁾ This will lead to the monopolization of computer-related patents by the US just as Prof. Koo apprehends, and the other countries would follow suit. In turn, this will stifle innovation just as Prof. Koo argues that current regimes do not appropriately protect software-related inventions.

Prof. Koo then turns to what seems to be one of the thrusts of his book, i.e., the problems of the current regime for the protection of software and business methods by patent and the protection of software by copyright. Prof. Koo deals with this issue from an economic perspective, and concludes that existing regimes (patent, copyright law and trade secrecy) do not provide appropriate protection to software innovations. This conclusion naturally leads Prof. Koo to proposals for the new, appropriate legal protection for software innovation.

In Chapter 6, Prof. Koo provides such alternative proposals as Market-Oriented Legal Regime, Compensatory Liability Regimes, Utility Models, Direct Protection of Innovation, and Self-Help System. The Book ends with the real and ultimate thrust of Prof. Koo's response to the issue and resulting proposal. After evaluating alternative proposals to protect software-related invention, Prof. Koo concludes that the Direct Protection of Innovation, an alternative suggested by Kingston and Kronz, is the most appropriate form of protection for software. Prof. Koo's evaluation is based upon the characteristics of modern software development treated in Chapter 2, and the economic review of software protection by existing systems treated in Chapter 5. Prof. Koo argues that the Direct Protection of Innovation should be introduced at the international level, and suggests how it could be.

III. Business Method Patents

A. Introduction

The subject matter of a business method (BM) patent is a method of doing business. Business methods have been historically considered non-patentable subject matter. In *State Street*, however, the United States Court of Appeals for the Federal

2) Robert Bray, The European Union "Software Patents" Directive: What Is It? Why Is It? Where Are We Now? 2005 DUKE L. & TECH. L. REV. 11, 9 (2005).

Circuit (CAFC) has extended patent protection to business methods. Taking into consideration the ever-expanding world of e-commerce, business method patents may present tremendous opportunities for inventive entrepreneurs. At the same time, business method patents present what many on-line businesses, legal scholars, and media critics characterize as a critical economic threat to the prosperity of a wide range of businesses, especially those in service industries and e-commerce.³⁾

The historical examples of business method patents suggest that a pure business method patent might require a manner of doing business unrelated to the design of hardware or software. Because of e-commerce's reliance on technology and software, however, the manner in which claims are made in business method patents has changed. Consequently, patents for business methods performed on the Internet often overlap with software patents. This explains why business method patents are discussed together with software patents. Also, this may be exemplified in *State Street*.

In *State Street*, the CAFC confirmed its strong support for the patentability of software inventions, and held that patents may be obtained on methods of doing business. This case, in effect, triggered profound changes in the role of patent law in electronic commerce. This position of the CAFC was confirmed in *AT&T Corp. v. Excel Communications, Inc.*⁴⁾ Those decisions have had an impact on other countries, including Korea and Japan, because policymakers in other countries followed suit. Furthermore, those decisions caused many to rush to the patent office for business method patent applications. In both Korea and the US, the business method patent applications have drastically increased after the *State Street* decision.

Since the decision of *State Street* eliminated those two obstacles, there have been a flood of business method patent applications in both US and Korea. Until the *State Street* decision, most of the attention paid to software patents had been devoted to the question of whether software was patentable subject matter. Now, current issues for software patent are what the criteria for issuance should be and how the scope of protection should be delineated. In response to this, the Korea

3) Greg S. Fine, To Issue or Not To Issue: Analysis of the Business Method Patent Controversy on the Internet, 42 BOSTON COLLEGE L. REV. 1195, 1196 (2001).

4) 172 F.3d 1352, 50 U.S.P.Q.2d (BNA) 1447 (Fed. Cir. 1999), cert. denied 120 S. Ct. 368 (1999).

Intellectual Property Office (KIPO) adopted the Guidelines for EC-related Inventions in 2000.

Despite the *State Street* decision, the issues on business method patents have not been solved. That decision held only that business methods may be a patentable subject matter, meaning that the application must meet the other requirements, i.e., novelty and non-obviousness for patent issuance. As can be seen in the recent decisions in the US, however, business method applications have difficulty meeting those requirements, in particular, the novelty requirement.

Taking into consideration the worldwide character of the Internet, on the one hand, the novelty requirement will be the most difficult hurdle for patent issuance. On the other hand, this requirement has caused many disputes on business method patents.

B. Birth of Business Method Patent

1. What Is a Business Method Patent?

There has been no precise definition of business method patents. According to the legislative history of the American Inventors Protection Act⁵⁾, the term ‘business method’ is defined loosely as meaning “a method for doing or conducting business.”⁶⁾

The following definition of business method patents suggested by a US attorney seems to be appropriate.⁷⁾ It categorizes business method patents into three classes:

- (a) Computer business-method category: patents that use computers to carry out traditional business functions, some of which previously proceeded without computers. Examples: the Hub-and-Spoke investment patent at issue in the *State Street* case; patents that involve securities trading and mortgage evaluations.
- (b) E-commerce category: inventions that grew out of the Internet and electronic commerce. This category of inventions is growing fast, and derives its value

5) Pub. L. No. 106-113 (1999) (codified as amended in various sections of 35 U.S.C.).

6) Congressional Record at H12805 (Nov. 18, 1999) (comments by Rep. Nadler of Judiciary Committee).

7) Jeffrey A. Berkowitz, Business-method Patents: How To Protect Your Clients’ Interests, 688 PLI/Pat 7, 19-21 (2002).

from the characteristics of the Internet.

Example: reverse auctioning, which Priceline.com has asserted against Microsoft; one-click ordering patent that Amazon.com has asserted against Barnesandnoble.com.

- (c) New business-methods category: patents directed to inventions of new businesses, outside the internet field.

2. The Birth of the Business Method Patent: State Street Bank

In the watershed decision, *State Street*, the CAFC explicitly held that methods of doing business (e.g., business models) were patentable, and effectively broadened the scope of potential subject matter that could be patented for software-related inventions generally. *State Street* involved a patent that enabled mutual funds to pool their assets into a central investment portfolio. Basically, the *State Street* case made it clear that business methods implemented through computer processes were not excluded per se as patentable subject matter. It is a landmark decision in that it broadened the patentable subject matter, that it held “a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program or digital computer,” and that it eliminated the business method exception.

C. US and Korea’s Responses to BM Patent

1. US

Since the CAFC decided *State Street* in 1998, both US Congress and the USPTO have reacted to mitigate the consequences of the decision. In November of 1999, Congress enacted, and President Clinton signed into law, the American Inventors Protection Act (“AIPA”). This Act ameliorated the ambiguity, which the *State Street* decision immediately injected into patent law, by codifying a prior-user defense to business method patents. Section 273(b)(1) of the AIPA provides a defense against patent infringement for a person who, in good faith, reduced the business method to practice at least one year before the patent’s filing date and used it in commerce sometime before the filing date.

On March 29, 2000, the USPTO initiated an “action plan” in response to the

public's concerns regarding business method patents. The USPTO action plan included initiatives to increase industry feedback regarding prior art resources, enhance the technical training of the examiners, pursue business specialists to serve as consultants for examiners on industry practices, expand the sampling size for quality review, and specifically require a second-level of review for business method patents to increase overall quality patents issued.

In response to being criticized for granting business method patents, the USPTO overhauled its approach to examining patent applications falling within Class 705, which is entitled "Data Processing: Financial, Business Practice, Management, or Cost/Price Determination." Most business method patents are classified in Class 705. These new policies are outlined in a Patent Office White Paper entitled "Automated Financial Management Data Processing Methods." First of all, patent examiners working on such patent applications will have to undergo more advanced novelty search training before examining such applications. In addition, the examiners will be required to perform broader novelty searches that include several "nonpatent" prior art databases.

2. Korea

In response to the increase of patent applications on business method, the Korean Intellectual Property Office (KIPO) issued the Examination Guidelines on EC-related Inventions in 2000. This is the only sui generis Guidelines on BM patents in the world.

IV. Problems of the Current Regimes to Protect Software-related Invention

Chapter 5 deals with the economic review of software protection by existing regimes. Prof. Koo evaluates several alternative proposals to protect software-related invention in the light of this economic analysis. Based upon this evaluation, Prof. Koo vindicates one of the alternative proposals, the Direct Protection of Innovation suggested by Kingston and Kronz. How Prof. Koo economically analyzes software protection by current regimes is essential in strengthening the persuasiveness of his proposals as well as the usefulness of the Book.

A. Computer Program

What is a computer program or computer software? According to the US Copyright Act of 1976, computer programs are defined to be "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result" (§ 101). A computer program work is defined to be "a work consisting of a series of indications or instructions to be used directly or indirectly in a machine having information processing capabilities in order to bring about a certain result" under the Korea's Computer Program Protection Act (§2 i). Intellectual property is property that is neither absolute nor a perpetual right that cannot be trumped by anybody.⁸⁾ While considerable human, technical, and financial resources are required to develop computer programs, computer programs may be easily copied almost at no cost compared to development costs.

B. Problems of Current Regimes

Chapter 5 examines, by reviewing the advantages and disadvantages of protection by current regimes, the desirability of patent and copyright protection of software and business methods to encourage innovation. After reviewing characteristics of software, software industry, internet and e-commerce, Prof. Koo presents pros for and cons against software patenting, copyright protection for software, and business method patenting. Those arguments for and against protection of software by current regimes are based upon those of many scholars or commentators as well as Prof. Koo's own in-depth research.

By what are meant the current regimes to protect software? Prof. Koo indicates patent, copyright and trade secrecy. Prof. Koo does not deal with the protection of software by contract which has been, and is still invoked by the licensor to protect his or her software. Furthermore, the relationship between intellectual property, particularly copyright, and contract raises controversial issues as represented by such legislation as the Uniform Computer Information Transactions Act(UCITA),

8) Fernando Piera, IPR Protection of Computer Programs and Computer Software in the Global Market, 12-SUM CURNTS 15 (2005).

and such cases as *Bowers v. Baystate Technologies, Inc.*⁹⁾ If there are problems with the protection of software by current regimes as argued by Prof. Koo and discussed later in this Review, the protection by contract of software could be an appropriate alternative a licensor would choose. There has been a trend for a licensor to adopt the restricted use of terms in a license agreement. The agreement may prevent a licensee from reverse engineering which is permitted under the fair use doctrine in the US or under the Korean Computer Program Protection Act. Although it is very controversial in Korea whether such restricted use of terms is valid or not, a US court held them valid,¹⁰⁾ and the UCITA also provides it may be valid under certain circumstances. If Prof. Koo had dealt with the protection of software by contract and discusses its problems, his argument or theory would have been more persuasive and stronger.

Prof. Koo discusses the characteristics of software, software industry, internet and e-commerce in order to examine the desirability of patent and copyright protection of software and business methods. As unique characteristics, Prof. Koo presents behavioral value of a program, independent program text and behavior, virtual machine, and incremental industrial designs. As for the nature of the Internet, Prof. Koo presents universality of access, high speed of information flows, interactivity, and several other things. Then Prof. Koo indicates in detail the strengths and weaknesses of software patenting, copyright protection for software, and business method patenting. Prof. Koo's discussion on those pros and cons seems to be concentrated upon opposing the extension of protection to software by patent and copyright, and to business methods by patent. For example, Prof. Koo discusses the disadvantages in more detail than the advantages of current regimes in protecting software and business methods. The opposition to the extension of protection is the basis for Prof. Koo's argument against the current regimes.

Prof. Koo's arguments against the current regimes are very well argued as well as organized. By presenting every pro and con of protection by current regimes, Prof. Koo paves the way for his strong argument. A study wishing to discuss the protection of software or business methods should refer to Prof. Koo's well-

9) 320 F.3d 1317 (Fed. Cir. 2003). The Federal Circuit held that copyright act did not preempt or narrow scope of competitor's shrink wrap license agreements that prohibited reverse engineering.

10) Id.

organized statements, statistics, and charts. I agree with Prof. Koo's examination of the advantages and disadvantages of current regimes in almost all respects.

However, I disagree with Prof. Koo's argument in some points. For example, Prof. Koo seems to argue that business method patents will stifle e-commerce by citing Adams and Tang's article published in 2001 (p. 285). Business method patents may suppress electronic commerce which has just begun to rise, transforming business method patents into a threat to the digital economy.¹¹⁾ This argument vindicated by Prof. Koo is persuasive because exclusive rights conveyed by a patent translate into higher prices for consumers. Furthermore, the companies doing business online will have limited rights to continue using business methods without paying royalties. It cannot be denied, however, it is only since the *State Street* decision in 1998 that the business method patent has been widely debated around the world. There is the possibility that business method patents would stifle e-commerce. However, whether business method patents will stifle e-commerce will be confirmed only by some empirical studies.

Prof. Koo seems to raise the problems of non-inventive nature of business methods, business method patents lacking in novelty or non-obviousness, and no proper standard for prior art and examination (pp. 285-287). As a matter of fact, it is questionable whether patent offices are competent to examine software patents. If they are not competent, business method patents will be much more likely to be litigated than patents in other classes. As can be seen in the Amazon.com case, the main sources of disputes will be focused on novelty and nonobviousness requirements.¹²⁾ A number of business method patents are expected to be vulnerable to a claim of invalidation based on novelty. However, those arguments against business method patents may be problems of administration of the patent procedure rather than problems of granting patent to business methods themselves. Those administrative problems may be cured by providing examiners with more data or information to decide patentability, in particular, novelty and nonobviousness requirement. In reality, the USPTO put forth an initiative relating to Class 705 of business method patents in order to improve the quality of the examination

11) James Gleick, *Patently Absurd*, The New York Times, Sec. 6, Page 44, Mar. 12, 2000.

12) Many of the prior art business methods are not documented or published in journals; rather they may have been used by big corporations, or small stores on the internet or off line.

process.¹³⁾ The initiative introduced several changes to help ensure that only useful, novel and non-obvious business method patents are issued. It includes increasing the number of examiners, increasing the training provided for the examiners, expanding search criteria and creating a second round of reviews.¹⁴⁾ It is expected the increased scrutiny implemented by the USPTO would limit the amount of applications approved as patents.

By what are meant the problems of the current regimes presented by Prof. Koo to suggest alternatives and vindicate the Direct Protection of Innovation alternative? It is unclear whether Prof. Koo opposes the protection of software by patent or extension of protection by patent. Prof. Koo argues that it should be assessed according to whether innovations are given protection in proportion to the contribution to the society the invention will make (p. 293-94). If so, the problems are not the current regimes themselves, but the over-protection or under-protection by current regimes. The ultimate solution should be to suggest an appropriate model or alternative to protect software or business methods that would not stifle competition as well as not discourage inventors from innovating.

C. Property Rules and Liability Rules

Prof. Koo is concerned that extending patentability would impose a major burden on software, and argues that software needs an appropriate protection. Prof. Koo seems to argue that the current regimes do not appropriately protect software. Prof. Koo explains this, first, by presenting the pros for and cons against protection by current regimes (throughout in Chapter 5), and, second, by concluding that software protection by current regimes impedes follow-on innovations (p. 294). First, I share the same feeling as Prof. Koo on the discussion of the advantages and disadvantages of software patenting, copyright protection for software and business method patenting. However, I think, in order to make his ultimate argument more persuasive, Prof. Koo should have strongly argued that the protection by current regimes is not appropriate. Discussion on the inappropriate protection by current regimes is

¹³⁾ USPTO, White Paper: Automated Financial or Management Data Processing Methods (Business Methods) (Mar. 29, 2000).

¹⁴⁾ See Russell A. Korn, *Is Legislation the Answer? An Analysis of the Proposed Legislation for Business Method Patents*, 29 FLA L. REV. 1367 (2002).

essential for Prof. Koo's argument for the Direct Protection of Innovation alternative. Prof. Koo only presents both advantages and disadvantages, but seems to emphasize that there are more problems than advantages in the protection of software by current regimes. A detailed and positive argument on the problems of current regimes would have Prof. Koo's vindication for the alternative suggested by Kingston and Kronz stronger and more persuasive.

Second, Prof. Koo asserts software protection by current regimes is problematic because current regimes are based upon the property right rules. Prof. Koo explains the problems from the perspective of the property and liability rule dichotomy as follows (p. 294).

A property right precludes third parties from appropriating the object of protection, whereas a liability rule regulates the means by which they can engage in certain potentially harmful acts on certain conditions. For example, if one has rightful possession of something such as a car or a house under an exclusive property right, another person ordinarily cannot take it without permission, but under a liability rule, others may engage in acts that create risks of harm and thus constitute probabilistic invasions of property interests, while obligating them to pay damages for harm under specified circumstances.

After discussing pros and cons on the protection of software by current regimes in order to underline the problems of current regimes, Prof. Koo concludes that there are problems in current regimes because they are based upon property right rules. Prof. Koo's conclusion on the problems of current regimes is not based upon the discussion of pros and cons. Discussion on property and liability rules is a new, separate ground for arguing that there are problems in current regimes. Then, what are property rules? And what are liability rules? Furthermore, what, or how, do they explain the problems of current regimes? According to Prof. Koo, follow-on innovators can use the first comer's innovation only if they are willing to pay a certain royalty to the first comer under the liability regime, and this lowers transactions costs (p. 294). Is the discussion on the property and liability rules conclusive? Let's just see a brief discussion on the liability and property rules made by another scholar:

Calabresi and Melamed argued persuasively that, when transaction costs make consensual transfer prohibitively expensive, liability rules are likely to dominate property rules because liability rules more closely replicate the outcome that transaction costs preclude. When transacting is costless, Coase tells us that liability and property rules are equally efficient. In the last twenty-some years, numerous law-and-economics scholars have attempted to connect the dots between these efficiency benchmarks characterized by Coase, on the one hand, and Calabresi and Melamed, on the other. In this so-called “economic purgatory,” transaction costs are positive but not prohibitive. Richard Posner has characteristically offered a lucid and powerful theory by arguing that, in settings with “low” transaction costs, property rules are more efficient than liability rules because they channel transactions into the market.¹⁵⁾

Prof. Koo’s discussion on the property and liability rule does not look enough to draw a conclusion on the problems of current regimes. Prof. Koo’s conclusion on the problems of current regimes is a basis for his vindication of one of the alternatives. I think Prof. Koo’s more detailed discussion on the property and liability rules in order to make problems of current regimes prominent would have made his conclusion of the Book stronger and more influential.

V. Direct Protection of Innovation

A. *What Is Direct Protection of Innovation?*

The basic theme of the Book is composed of following factors: innovation in the software industry is largely incremental and cumulative; because of these characteristics, software is over-protected under the patent and under-protected under the copyright system; since an appropriate protection of software is required, an alternative to the current regimes is necessary; and among several alternatives, the Direct Protection of Innovation alternative suggested by Kingston and Kronz is most appropriate.

¹⁵⁾ Ian Ayres & Eric Talley, *Distinguishing between Consensual and Nonconsensual Advantages of Liability Rules*, 105 YALE L. J. 235, 235-236 (1995).

Prof. Koo evaluates five alternatives or reform proposals to correct problems caused by current regimes. Prof. Koo’s evaluation is based upon the characteristics of modern software development treated in Chapter 2 and the economic analysis treated in Chapter 5. Both of the characteristics and economic analysis are so thoroughly researched by Prof. Koo that they may be used as a textbook for teaching software, software industry and software economics.

I am not going to discuss other alternatives than the Direct Protection of Innovation Prof. Koo vindicates. What is then the Direct Protection of Innovation? This alternative tries to extend the exploitation of the principle of patenting by the direct protection of innovation the original patent system intended to protect. Intending to correct the problems of over- and under-protection by current regimes, the Direct Protection of Innovation proposal protects innovation, i.e., the invention actually reduced to practice (commercialized). The common features of the Direct Protection of Innovation suggested by Kingston and Kronz are as follows (p. 366):

- (i) The subject matter of protection should be innovation, not invention;
- (ii) Any economic object, including technology, can be protected;
- (iii) The criterion of novelty should be actual commercial availability;
- (iv) The term of grant should be variable;
- (v) Grants should be incontestable unless obtained by fraud;
- (vi) Terms of grant may differ between regions of a country;
- (vii) Examination relies heavily on third party evidence; and
- (viii) The system can be administered by an independent authority.

As far as I understand the Direct Protection of Innovation proposal presented in the Book, this proposal is supposed to protect software appropriately. This proposal intends to protect innovations which are in a certain stage, i.e., where the innovation is commercialized, or investment turns an idea into concrete reality. The basic theme of the proposal seems to limit the protectable subject matter of innovation, but provides stronger protection once the patent is issued. Further, it arranges the relationship between the first comer and second comers, enabling companies to appropriate the fruits of their investment in sequential innovation without impeding follow-on innovations (p. 391). Finally, it is supposed to give protection to incremental innovations; offer different protection for investment of different risks; provide secure protection to SMEs; make innovation more profitable; and generate a great increase in investment (p. 353). While sustaining

some critiques against the Direct Protection of Innovation alternative, Prof. Koo vindicates this alternative by citing such advantages as reduced fear of litigation, elimination of the warrant-holder's burden of protecting his right, incontestability, feasibility and familiarity (p. 397).

B. Critiques

The Direct Protection of Innovation alternative would be revolutionary if it is realized in the software industry. It would bring many advantages just as Kingston and Kronz expected. The intended goal, however, will be achieved only after some conditions are met which the alternative presupposes. I am going to discuss some premises or conditions of the alternative.

Basically, in the Kronz system, an innovation patent provides a reward to only the invention commercialized (pp. 353-54).¹⁶⁾ How can we differentiate between inventions which are capable of commercialization or not? If the differentiation is possible, how may the patent system sustain the transaction costs associated with the differentiation? Is the patent examination not concentrated upon the decision of commercialization rather than the examination of patentability? How about pioneer inventions which cannot be commercialized right now, but will play an important role in the near future? While it varies depending upon the field of reduction to practice, the rate of commercialization of patented invention is less than ten percent. The number of patents issued under the Kronz system would dramatically decrease. Under those circumstances, would the inventor have enough incentive to invent? There are many variables that determine whether the Kronz system would succeed in the real world.

The Kronz system aims to protect incremental innovations which usually lack an inventive step. While the under-protection of software by the current regimes may be avoided, I am concerned if this system would work in the real world. In these days, a state-of-the-art system or service usually requires a number of patented technologies. For example, the MPEG-2 Patent Portfolio License of the MPEG LA is composed of more than 550 patents owned by Alcatel, Canon,

16) According to Kronz, innovation action seems to mean 'commercialization.'

17) See MPEG LA, INTRODUCTION <[http:// www.mpegla.com/m2](http://www.mpegla.com/m2)>

Columbia University, Samsung, and many companies across the world.¹⁷⁾ A patent pool or a patent platform (for example, 3GPP) is usually formed in the telecommunication service, and a number of patents are involved there. Furthermore, parts of an invention which may be commercialized only with other parts around the world have difficulty meeting the commercialization requirement.

According to the Direct Protection of Innovation alternative, SMEs are the equal of the large firms as far as a particular innovation is concerned due to the monopoly conferred by its innovation patent or warrant (p. 367). It focuses upon the elimination of the burden of protecting rights and pursuing litigation for SMEs. I think the Direct Protection of Innovation proposal is partly right because this proposal takes SMEs into consideration only after patents are issued to them. Under the Direct Protection of Innovation system, the number of issued patents would greatly decrease because of the commercialization or investment requirement. It means that SMEs will have more difficulty having patents issued than under the classical patent system because, compared to big enterprises, the commercialization requirement may be a burden to SMEs. Patents owned by SMEs could be strong weapons in competing with large enterprises. Even according to the Kingston's alternative, the applicant is to make his or her detailed plan, arrange financing, and reach a final decision as to whether or not to make the necessary investment. While large enterprises may easily follow those steps, SMEs, in particular start-up companies, would have difficulty. The Direct Protection of Innovation alternative needs to answer how SMEs deal with this problem before they file applications.

Under the Kronz and the Kingston proposal, the government, i.e., patent office, is deeply involved before, during and even after the prosecution procedure. The Direct Protection of Innovation proposal is argued to have the advantage of public enforcement. Under Kingston's alternative, since an attempt to infringe a warrant is regarded as an attack on the economic policy of the state, the innovation office itself can prosecute infringers on behalf of the warrant-holder (p. 362). The innovation office should constantly carry out empirical investigations to improve statistical assessment of risk in its various categories (pp. 363-64). After the opposition proceedings, the innovation office calculates both project-related and firm-related risks, and offers an option on a warrant for the appropriate term to the applicant (p. 364). Is it appropriate, or, if appropriate,

possible, for a patent office to monitor patent infringement and conduct such a wide range of research or work? In my opinion, it would raise considerable transaction costs. Furthermore, is it efficient for a government agency to enforce rights relating to private property? Is it not more efficient for private parties to enforce their property rights?

The Direct Protection of Innovation alternative would function completely as intended and would replace or supplement the current regimes only after some basic premises of the alternative are proved correct. There still remains a problem needing solution of how to appropriately protect software, in particular, business methods. More research on the premises of proposals Kronz and Kingston made should be carried out, and it should be confirmed whether those premises can be met under the current circumstances. Furthermore, the cost-benefit analysis of the proposal should be conducted. Only then, the Direct Protection of Innovation alternative would prevail over other alternatives, and would be a stronger candidate to replace or supplement current regimes.

VI. Conclusion

In this fantastic book concentrating on software, Prof. Koo vindicates an alternative suggested by Kingston and Kronz, to replace or supplement current regimes protecting software and business methods. Prof. Koo's suggestion is based upon well-researched analysis of the characteristics of software itself, software development, or software industry. According to Prof. Koo, software is over-protected and under-protected under current regimes because innovation in the software industry is largely incremental and cumulative. I am generally in agreement with Prof. Koo's arguments made and views expressed in this Book except mild or trivial ones.

Prof. Koo analyzes and evaluates five alternatives to current regimes in depth. Prof. Koo's evaluation is based upon the characteristics of modern software development and economic analysis. I think Prof. Koo is the first among academics that analyzes characteristics of software, nature of the software industry, internet and e-commerce from the economic perspective systematically and in thorough depth. Prof. Koo finally concludes the most appropriate

alternative is the Protection of Innovation alternative suggested by Kingston and Kronz. Prof. Koo's discussion on issues of software protection and argument for, and introduction of, an alternative to current regimes are expected to entail more discussion on this topic in Korea. In this respect, I think Prof. Koo's book has greatly contributed to the development of debate on software, and will cause more analysis, debates, and alternatives to protect software by academics in Korea.