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A Comparative Perspective on the Patent Eligibility of Software Inventions

Hung-San Kuo

Submitted to the faculty of the University Graduate School

in partial fulfillment of the requirements

for the degree

Doctor of Juridical Science

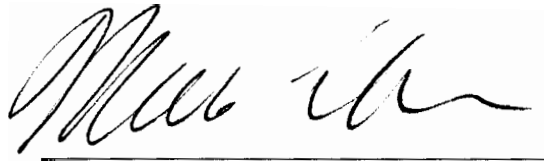
in the Maurer School of Law

Indiana University

May 2011

Accepted by the Faculty, Indiana University, Maurer School of Law, in
partial fulfillment of the requirements for the degree of Doctor of
Juridical Science

Doctoral Committee

A handwritten signature in black ink, appearing to read "Mar Leaffer", written over a light gray rectangular background.

Professor Marshall A. Leaffer

Distinguished Scholar in Intellectual

Property Law and University Fellow

A handwritten signature in black ink, appearing to read "Mark D. Janis", written over a light gray rectangular background.

Professor Mark D. Janis

Robert A. Lucas Chair of Law

May 10, 2011

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behaved well in school and at home without my having to worry about him.

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Abstract

Computer software is considered similar to an algorithm, a mental activity, or an abstract idea, so whether or not it meets patent eligibility is full of controversy. Although computer software products are sold all over the world, each jurisdiction deals with them differently based on individual regulations. If there were an objective and proper way to deal with this subject matter, it would reduce the number of debates and narrow the gap of patent protection among different jurisdictions.

The meaning of “invention” in patent law in each jurisdiction is the most important factor affecting the determination of patent eligibility, which contains some common characteristics of statutory subject matters. Additionally, the explanation of the “invention” in the examination guidelines for computer software inventions promulgated by each patent office also reflects different official attitudes toward this issue. Some external factors will also affect the determination of this issue, such as the development of local industry, the demand for global trade, obligations as a member of international organizations, and so on.

The determination of patent eligibility of software inventions involves subjective and objective considerations; however, some merits of tests or requirements for software patents can be employed as assistant factors in the issue. Since these types of

constraints may limit the scope of rights of each invention, patent offices do not have to exclude them from statutory subject matters due to the reason that they may preempt a very wide range of rights.

List of Abbreviations and Acronyms

CS inventions	computer software-related inventions
CN-Patent Act	China Patent Act
EPC	European Patent Convention
EPO	European Patent Office
JIP High Court	Intellectual Property High Court of Japan
JPO	Japan Property Office
JP-CSG	Examination Guidelines for Inventions in Specific Fields-Chapter 1 Computer Software-Related Inventions (Japan)
JP-EG	Examination Guidelines for Patent and Utility Model (Japan)
JP-Patent Act	Japanese Patent Act
SIPO	China State Intellectual Property Office
TW-Patent Act	Taiwanese Patent Act
TIPO	Taiwan Intellectual Property Office
TW-EG	Substantive Examination Guidelines for Invention Patent (Taiwan)
US MPEP	Manual of Patent Examining Procedure (U.S.)
USPTO	US Patent and Trademark Office

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Chapter 1 Introduction

1.1 Overview

The patent eligibility of software inventions has been a hot issue ever since patent offices recognized this subject matter area.¹ There has always been some skepticism about the scope of computer software patents. This skepticism is reflected by the fact that computer software patents are challenged as being non-statutory. For example, in *Bilski v. Kappos* the Supreme Court held that the “machine or transformation” was not the sole test for process patent involving computer software.² This ostensibly landmark opinion does not get us very far, and the appropriate test for computer software patentability is hardly apparent from the case law.

Generally, when there is no clear article enacted in patent law to exclude a certain subject matter from patent protection, the subject matter is viewed as statutory. Although computer software inventions fall in this category, their nature is similar to those of mathematical algorithms, laws of nature, mental activities, or abstract ideas, which are nonstatutory subject matters under patent laws.

¹ See, e.g., Bradford L. Smith & Susan O. Mann, *Innovation and Intellectual Property Protection in the Software Industry: An Emerging Role for Patent*, 71 U. Chi L. Rev. 241(2004) (arguing that patent protection is important for software industries). Cf. Robert P. Merges, *On the Complex Economics of Patent Scope*, 90 Colum. L. Rev. 839 (arguing that appropriate patent scope can keep the competitive environment without reducing the incentives of inventors).

² *Bilski v. Kappos*, 130 S. Ct. 3218, 3229 (2010).

The gray area between computer software inventions and nonstatutory subject matters needs to be clarified. The issue may be solved through statutory interpretations of patent laws, case laws, or illustrations in the examination guidelines for computer software inventions promulgated by the patent office. For instance, a prospective computer software invention has to conform to the meaning of “invention” in patent law and may meet some requirements based on the statutory interpretations of “invention.”

Additionally, a computer software invention application with different types of claims may affect its patent eligibility. For example, an inventor can claim product or process claims based on demand. Apparatus claims like other conventional subject matters, have physical devices, so they are subject to fewer disputes in patent eligibility. However, process claims that describe a series of steps may be considered algorithms, mental activities etc. due to the fact that textual descriptions are obscure in the claims. Thus, they will be challenged for patent eligibility based on the similarity of these nonstatutory subject matters.

The above solutions may depend on the construction of diverse types of claims. For example, a prospective claim must not be a mere mental activity or a mathematical algorithm per se, but an application of them. Thus, detailed illustrations or exemplary

claims in the examination guidelines are necessary. Some opinions of case laws are also able to clarify the above issue.

Not only the United States, but also other jurisdictions face similar issues since applicants of computer software inventions have to apply for patent rights in individual jurisdictions respectively for comprehensive patent protection. How does each jurisdiction see this subject matter? How do they deal with this issue? Through a comprehensive study on other jurisdictions, we cannot only discover their different policies or tests to treat computer software inventions, but we can also learn of some merits among them.

In this project, I choose five jurisdictions as the foundation of my discussion—Japan, Taiwan, China, the EPO, and the United States. The United States, China, and Japan are the three largest economic powers in the world.³ Taiwan is one of the most important countries for the manufacture and development of information technological apparatuses in the world. The European Patent Office is entitled to grant patents for thirty European member countries. Therefore, the discussions of these jurisdictions can cover most global economic activities and provide us with some useful considerations.

³ See David Barboza, *China Passes Japan as Second-Largest Economy*, N.Y. Times, Aug. 12, 2010; at B1.

Based on the review of the different jurisdictions, I have found some interesting points. For example, provisions of “invention” in patent laws in some jurisdictions are very similar. The statutory interpretations of the meaning of “invention” are also similar. However, the final decisions about what kinds of computer software inventions are patentable are different. The reasoning may vary based on different considerations. For example, technologically advanced countries may prefer stronger patent protection for computer software inventions; however, countries which import software technologies may prefer weaker patent protection in order to avoid the scope of rights being preempted by leading foreign companies.

Additionally, the acceptance of new types of computer software inventions as statutory subject matters is usually affected by other jurisdictions. The amendments to patent laws or the changes of policies of patent grants are perhaps results of the demand stipulated in international agreements, the obligations of members of international organizations, or global tendencies.⁴ The gaps among these different jurisdictions are usually narrowed over time.

In particular, there is no dominant test to determine whether a software invention

⁴ See, e.g., the U.S.-China Memorandum of Understanding on Intellectual Property Rights in 1992, Trade Compliance Center, http://tcc.export.gov/Trade_Agreements/All_Trade_Agreements/exp_005362.asp (last visited on Oct. 25, 2010).

is patent-eligible. In general, current tests can be divided three types—the requirement for software to have close interaction with hardware, the need for software read by computer to have a further technical effect beyond the interaction between software and hardware,⁵ and software having to pass one of the dual tests; i.e., the positive confirmation or the negative exception test.⁶ These tests were developed based on the technical facts of computer software or considerations of the granted scope of rights. Thus, different jurisdictions have their own philosophies or logic to deal with these different types of computer program claims, although final results about what types of claims are patentable may be similar.

1.2 The Methods and Limitations of the Study

The discussion of this article will focus on the patent laws and the examination guidelines for computer software inventions published by respective patent offices, as well as case laws related to the issue. Based on a comprehensive analysis of different jurisdictions, we can find individual merits and drawbacks in each jurisdiction, which may serve as references for the current tests

The guiding principle of this project is to look at each jurisdiction with a neutral

⁵ T 1173/97- *IBM*, OJ 1999, 609 (1998).

⁶ *Bilski v. Kappos*, 130 S. Ct. 3218, 177 L.Ed.2d 792 (2010).

point of view. I will point out their characteristics and initiate detailed discussions of some important subtle items in each respective chapter. Some questions related to particular regulations may be raised in each chapter as well. Comparisons of the characteristics among different jurisdictions will be viewed and discussed as a whole in a separate chapter.

Although my study will focus on a specific subject matter—computer software and its testing—the targets of tests in different jurisdictions are different. For instance, the machine-or-transformation test adopted in the U.S. not only applies to “computer software claims,” but also to all process claims. However, other jurisdictions have their own specific tests that apply to computer software inventions alone.

My suggestions for the current U.S. test are primarily based on the comparison of these jurisdictions as a whole. Although there are some valuable arguments related to individual tests, I will not introduce them particularly, instead focusing more broadly on the viewpoints of comparative legal studies. This method may help us focus on the different characteristics among jurisdictions.

Statutory translations in English in each jurisdiction will be based on the official English versions in each jurisdiction if available. Otherwise, I will translate them word- for-word in English without losing the essence of their meanings. The same

applies to examination guidelines of patent offices and court cases. English versions of the above documents will be adopted as primary sources if available; otherwise, they will be translated into English based on the above principle.

1.3 Framework of the Article

This article has eight chapters, which can be divided into four main parts: an introduction of the project, discussions of different jurisdictions, a comparative analysis, and the conclusion. Chapter 1 is the introductory section, which points out the issue, explains the demand for the understanding of patent protections for this subject matter in other jurisdictions, and outlines the framework of the article.

Chapters 2 to 6 make up the second part, which will include respective discussions over five jurisdictions: Japan, Taiwan, China, the EPO, and the United States. The discussions of different jurisdictions will proceed according to the following sequences: Asian countries, European communities, and the United States. Chapter 2 will be the discussion of Japanese patent laws and regulations since it has a longer patent history in Asia and has significantly affected the enactments and the revisions of patent laws of some Asian countries over time. The content will include the revolution of Japanese patent law, the relevant regulations in the Patent Act, and

those in the examination guidelines for computer software inventions. Some cases related to the determination of patent-eligible software inventions will be discussed at the end of this chapter.

Chapter 3 will be the discussion of Taiwanese patent protection, which will include the evolution of the Taiwanese system of the patent laws, the relevant patent regulations in the Taiwanese Patent Act, and the examination guidelines for computer software inventions promulgated by the Taiwan Intellectual Property Office. Some cases related to the determination of the meaning of “invention” under patent law will be discussed as well.

Chapter 4 will be the discussion of Chinese patent law and relevant regulations in the examination guidelines. This discussion comes after that of Taiwan since it has a shorter patent history.

After the discussions of Asian countries, I will then discuss the regulations under the European Patent Office in Chapter 5. Based on several laws and ideas similar to those of the Asian countries, discussing the EPO regulations after the Asian discussions can help us explore the embedded relationship between these jurisdictions.

Chapter 6 will be the last discussion over an individual jurisdiction—the United States—since it has a common legal system and thus is different from previous

jurisdictions. In addition, after the review of the previous jurisdictions, we may easily find the significant differences between the United States and other jurisdictions.

Chapter 7 will be a comparative analysis. Based on an overview of all of the above jurisdictions, we can examine the characteristics of each jurisdiction and point out their differences. By comparison, we can also find individual advantages and disadvantages in each jurisdiction. Some obscure or incorrect concepts about computer software inventions will be pointed out as well. I will then propose some suggestions for the current tests based on my comparative analysis of the different jurisdictions.

Chapter 8 will be a final conclusion. Based on the previous discussions, we can view the issue as a whole and find a proper way to deal with the patent eligibility of computer software inventions.

Chapter 2 Software Patents in Japan

The Japan Patent Office (hereafter JPO) and the Japanese Intellectual Property High Court (hereafter JIP High Court) deal with computer software-related inventions (hereafter CS inventions) primarily relying on their statutory provisions. The concept of patentable inventions was adopted from those of western countries at the early stage of its enactment and was modified over time according to the demand of new technologies.

In this chapter, I will first introduce the evolution of Japanese patent law affecting the formation of the concept of invention. Then I will illustrate some important provisions in the current Japanese Patent Act in conjunction with the rules and instances in the JPO's examination guidelines associated with computer software-related inventions. In addition, some important court cases affecting the decisions on patent eligibility of subject matters are discussed in the last part of the chapter.

2.1 Historical Overview

2.1.1 Patent Rights and Industrial Property Rights

Conventionally, the Japanese thought that industrial property rights were different from ordinary intellectual rights. For instance, copyrights were not viewed as industrial rights since they could not improve industrial developments.⁷ In contrast, patent rights were granted for industrial developments.

⁷ See, e.g., Nobuhiro Nakayama, *Industrial Property Law*, Part I, at 1-3 (explaining the evolution of Japanese intellectual property rights from which copyrights in Japan were excluded from industrial property rights).

Based on the grounds of the initially enacted patent law, whatever could improve “industrial” techniques or promote “industrial” development would be highly encouraged through the granting of a patent reward.⁸ This idea continued to affect decisions of patent grants for new technologies.

2.1.2 Revolution of the Japanese Patent Act

Japanese patent law has had three significant instances of evolution in its legislative history—the Patent Monopoly Act of 1885, the old Patent Act of 1921, and the current Patent Act of 1959.⁹

A. The Patent Monopoly Act (1885)

The birth of Japanese patent law started with the Meiji Reforms in Japan for the promotion of industrial development.¹⁰ The first patent law—The Patent Monopoly Act—was enacted in 1885 (the 18th year of the Meiji Era) and contained some elements of French patent law as well as U.S. patent law, such as the first-to-invent rule.^{11,12} It was amended and replaced by the Patent Ordinance in 1888.¹³ After Japan joined the Paris Convention for the Protection of Industrial Property in 1899,¹⁴ a new utility

⁸ *Id.* at 2-3 (The current concept of industrial property rights in Japan is no longer limited to industrial products, but also extends to business matters. For instance, the “business method” in the JP-EG is seen as a patent-eligible subject matter because it can also produce commercial innovation or industrial development); Chap I, Part II, at 2 (The updated construction to “industry” in the current Japanese patent law includes mining, agriculture, fishery, transportation, telecommunications, manufacturing and so on.).

⁹ See, e.g., Norio Komuro, *Japan's Patent Law Amendment on Remedies against Patent Infringement*, 1 J. World Intell. Prop. 263, 263 (2005).

¹⁰ Meiji reform or Meiji Restoration is a comprehensive movement to assimilate western civilization for a radical change over social system and economic environments from 1868 to 1912 in Japan's history. See, e.g., Encyclopedia Online Britannica, <http://www.britannica.com/EBchecked/topic/373305/Meiji-Restoration> (last visited on Mar. 17, 2010).

¹¹ See, e.g., JPO, http://www.jpo.go.jp/cgi/linke.cgi?url=/seido_e/rekishi_e/nenpyoe.htm (last visited on Mar. 16, 2010).

¹² See Masaaki Kotabe, *A Comparative Study of U.S. and Japanese Patent Systems*, 23-1 J. Int'l Bus. Stud. 147, 149 (1992).

¹³ *Id.*

¹⁴ See, e.g., Kazuyuki Motohashi, *Japan's Patent System and Business Innovation: Reassessing Pro-patent Policies*, RIETI, www.rieti.go.jp/jp/publications/dp/03e020.pdf (last visited on Mar. 21,

model law was supplemented to fulfill the demand in 1905 (the 38th year of the Meiji Era).¹⁵

B. The Old Patent Act (1921)

In 1921, the Patent Ordinance was replaced by a newly enacted Patent Act, which directly copied some statutes from German patent law to establish a German-like patent system, including the “first-to-file” rule.¹⁶ It was not abolished until the Post-World War II for the new Japanese Constitution. Since it became effective after the end of World War I,¹⁷ the concepts regarding inventions had been embedded deeply in Japanese minds and had a significant affect on the enactment of the follow-up Patent Act, as well as the construction of the meaning of invention.

C. The Current Patent Act (1959)

The current patent law was enacted in 1959 and included a new Utility Model Law to replace the old one (1905) for the consistency of the new Japanese Constitution.¹⁸ Up to now, it has been revised several times for sake of international harmonization as well as the emergence of new technologies, such as computer software-related inventions.¹⁹

Specifically, in 2002, the Japanese Patent Act officially encoded the “computer program” as a legal object in the statute by adding the “computer program” as the definition. It also added an infringed object as a remedy and the way to implement computer software inventions. This implementation extended to transmission through

2010).

¹⁵ See JPO, http://www.jpo.go.jp/cgi/linke.cgi?url=/seido_e/rekishi_e/nenpyoe.htm (last visited on Mar. 16, 2010).

¹⁶ See, e.g., Toshiko Takenaka, *Interpreting Claims: The United States, Germany and Japan* 41 (1995).

¹⁷ See, e.g., Komuro, *supra* note 9, at 264.

¹⁸ See the JPO website, *supra* note 15.

¹⁹ The last amendment was in 2008.

electronic telecommunication wires in addition to the original rights of manufacturing, utilizing, importation and exportation and so on.²⁰

2.1.3 Revolution of the Examination Guidelines

In this section, I will first introduce the changes to patent rights in Japanese patent history, from which we can see the scope of patentable subject matters gradually broadened. Then, I will chronicle some significant changes of the JPO's examination guidelines, and illustrate how they formed and directed official policy to grant patents to software related inventions. Based on this historical review, we can understand the progress of software patents in Japanese patent history and foresee its future development.

A. 1975: The Examination Standard for Computer Program-Related Inventions (Part I)

The JPO published its initial guidelines in December 1975,²¹ declaring that a computer program invention is a patent-eligible subject matter distinct from the computer program itself.²² It required computer program inventions to be the same as other inventions that were able to reach a declared result from the cause-and-effect relationship by utilizing a law of nature under Article 2(1), JP-Patent Act.²³ Thus, an invention related to data processing that merely presents a law of nature, a social phenomenon, or a set of numerical data does not have technical idea so as to be a

²⁰ Art. 2 (3)(i) and (4), JP-Patent Act (2008). The examination guidelines of JPO in 2000 had already promulgated to grant patents on this subject matter. Civil law countries, such as Japan or Taiwan, although their examination guidelines are only administrative rules to instruct patent examiners how to deal with patent applications, the guidelines also advocate the official policy on granting patents. Generally, the guidelines are the final results after debates among scholars, judges and the practice. Judges make decisions relying on the guideline as well, even if there is no text stipulated in the Patent Act.

²¹ *The Examination Standard for Computer Program-Related Inventions*, available <http://www.furutani.co.jp/office/ronbun/soft-standard-1.pdf> (last visited on Apr. 15, 2010) (It was enforced in 1976.).

²² See Sec. 3.41, Guideline (1975).

²³ Sec. 3.3, Guideline (1975).

nonstatutory invention.²⁴ Specially, the guidelines provided that a computer program relevant invention can merely be a method claim rather than a product claim.²⁵

B. 1982: Implementation Guidelines for Microcomputer-Applied Technology-Related Inventions

A supplemented guideline, which included an apparatus invention with microcomputer-applied technology as a statutory invention, was enacted in 1982 on account of a variety of electrical apparatuses. For example, rice cookers and televisions controlled by microcomputers were very popular at that time.²⁶

The regulation of approved claims in the guidelines of 1975 was not completely abolished, so it could not be applied to an invention with functions and means implemented by a combination of configuration elements with a microcomputer device.²⁷ Namely, an invention related to a control device as described as a combination of functions and means would not be a method invention approved under the guidelines of 1975, which were meant to apply to the use of a microcomputer device. Therefore, the guidelines of 1982 offered a different way from that of 1975 to deal with “product claims” of inventions involved in this technology.

C. 1988: Draft of the Examination Method for Computer Software-Related Inventions

In March 1988, the JPO proposed “the Examination Method for Computer Software-Related Inventions,” open-ended arguments that summarized the guidelines of

²⁴ Sec. 3.42, Guideline (1975).

²⁵ See Masako Kikuchi, *Patent Eligibility and Patentability of Computer Software Patents in the United States, Europe and Japan* n.315, CASRIP, V.16, Issue 3 (Summer 2009) (quoting Nobuhiro Nakayama, *Legal Protection for Software* 164-165 (1988)).

²⁶ See, e.g., Tadashi Matsushita, *Notes for the Specification of Computer Software-Related Inventions*, 60 (10) *The Practice of Patent Drafting*, Patent Vol. 60 No.10, 43, 44 (2007), available at JPAA, http://www.jpaa.or.jp/activity/publication/patent/patent-library/patent-lib/200710/jpaapatent200710_043-052.pdf.

²⁷ *Id.*

1975 and 1982.²⁸

D. 1993: Chap.1, Sec. VIII, Examination Guidelines for Patent and Utility Model

The JPO, in 1993, published “Chapter 1 Computer Software-Related Inventions” under Section VII Examination Guidelines in Specific Fields based on the public responses to the draft of 1988.²⁹ The guidelines united previous different examination criteria—the examination standard for computer programs of 1975, the guidelines for microcomputers of 1982 and the draft of 1988—as it would be inappropriate for the same claimed object to be categorized into different categories with different examination criteria.³⁰ That is, the new guidelines could be applied to the following three types under the same criterion: (1) the control over or the accompanied procedures for hardware resources, (2) data processing technology based on the nature or physical property of a claimed subject matter, and (3) the use of hardware resources (not merely for present information) over data processing.³¹

The guidelines of 1993 also clarified that a claimed invention should be judged from a whole viewpoint, so that an invention could be a patent-eligible subject matter even if only a part of the invention is utilized a law of nature.³² Besides this, a storage medium (a computer-readable medium) was categorized into the nonstatutory category because it merely presented the content itself and did not create any technical idea.³³ Thus, a claim for a medium, such as CD-ROM (optical) discs or floppy (magnetic) discs

²⁸ The trend in protection for software-related inventions in trilateral areas, JPO, http://www.jpo.go.jp/shiryoutoushin/shingikai/pdf/tizai_housei2/1306-044_02.pdf.

²⁹ See <http://www.geocities.co.jp/WallStreet/7506/law/shinsa.html> (last visited on Apr. 17, 2010) (the guideline of 1993 in Japanese).

³⁰ See, e.g., Rieko Mashima, *Examination of the Interrelationship among Japanese I.P. Protection for Software, the Software Industry, and Keiretsu*, part I, 82 J. Pat. & Trademark Off. Soc'y 33, 63 (2000).

³¹ See Sec. 1.1, Guideline (1993).

³² *Id.* There will be some instances in the latter sections.

³³ Sec. 1.1(5), Guideline (1993).

storing computer programs, would not be able to obtain patent protection at that time.³⁴ Additionally, programming languages and computer programs as such were restated as nonstatutory subject matters in the revised guidelines.³⁵

E. 1997: Chap.1, Sec. VII, Implementation Guidelines for Patent and Utility Model

Under the new guidelines, a computer-readable medium can be claimed as the form of “product claims” within statutory categories even if it had been rejected on the ground that it was unable to create technical ideas.³⁶ In addition, infringers could assert their rights based on direct infringement and would obtain effective protection so that they could more easily prove infringements for computer programs stored on floppy discs or CD-ROMs in contrast to the indirect infringement under the previous guidelines.³⁷

F. 2000: Chap.1, Sec. VII, Examination Guidelines for Patent and Utility Model

Under this revised and currently effective guidelines, computer programs can be claimed as product claims, so that computer programs are treated as tangible entities and are no longer required to stick to media for patent protections under the guidelines of 1997.³⁸ In contrast to the guidelines of 1997 that opposed the sale of discs with patented computer programs, the new guidelines offer another protective function to prevent unauthorized distribution of patented computer programs through the Internet

³⁴ Cf. Nakayama, *supra* note 7, at Part II p47 (noting that the 1982 guideline clearly accepted medium claims as statutory subject matter).

³⁵ See Sec. 1.1(5) iv, Guideline (1993).

³⁶ Nakayama, *supra* note 7, at p46 n.11 of “2. Utilization of a Law of Nature” (arguing that there is an unsolved legal question for medium claims because it had been refused for non-technical ideas, but it is accepted as a patent-eligible object with a mere change of implementing guidelines instead of revising the Patent Act).

³⁷ See Mashima, *supra* note 30, at 59.

³⁸ Sec. 1.1.1 (2) (b), JP-CSG (2000) (“A program” which specifies multiple functions performed by a computer can be defined as “an invention of a product.”).

and so on.³⁹ The details of the guidelines will be discussed in the later section of this chapter.

2.2 Patentable Inventions

2.2.1 Meaning of Invention

A. Conventional Meaning of Invention

The meaning of “invention” in the Japanese Patent Act affects its policy and rules to grant patents. As mentioned above, the enacted patent law of 1921 was a Japanese copy of the German Patent Act. Namely, the viewpoint over “invention” was learned from the German doctrine.⁴⁰ For instance, an invention must utilize a “law of nature” in the Act, which is meant to use the “elementary forces” or “power of nature” to create something.⁴¹

B. Definition of Invention: Article 2(1)

Although there have been many debates about whether or not to enact the definition of invention in patent law, it was finally enacted in Article 2(1) of the Patent Act of 1959:

“Invention” in this Act means the highly advanced creation of technical ideas utilizing the laws of nature.

The above definition contains two factors in determining whether a claimed

³⁹ See, e.g., Jinseok Park, *Has Patentable Subject Matter Been Expanded? A Comparative Study on Software Patent Practices in the EPO, USPTO and JPO*, 13 (3) Int. J. of Law and Info. Technology 336, 370 (2005) (commenting that the revised guideline can offer the protection to resist the unauthorized distribution of patented computer programs through electric telecommunication).

⁴⁰ See Shimako Kato, *Discussion over Patentable Subject Matter in Japan*, Fordham 2009 IP Conference n2, available at http://www.fordhamipinstitute.com/ip_conference/documents/Shimako_Kato_Discussion_Over_Patentable_Subject_Matter_in_Japan.pdf. (Last visited on Mar. 24 2010) (citing that Japanese learning the concept of invention from German scholar—Josef Kohler—in its early stage of patent enactment).

⁴¹ Nakayama, *supra* note 7, at Part II p44.

invention meets this standard—the creation of technical ideas and utilizing the laws of nature. The first one requires that an inventor employs at least one law of nature to complete his/her invention. The second one requires that the technical idea of the invention has to be a high-level creation. The latter one is an inventive step similar to the non-obvious factor in the U.S. Patent Act.

1. A Law of Nature

The explanation of the “law of nature” varies over time though it has been adopted from German patent law since the 19th century.⁴² Nowadays, the evolved meaning is that an inventor has to employ a theory or a principle of natural science to create his/her invention as a patent-eligible invention. A law of nature excludes mere mental activities,⁴³ pure and simple academic principles,⁴⁴ artificial arrangements, and so on.⁴⁵

2. Technical Idea

Upon the statutory interpretation, this factor introduces two important elements for a qualified invention. An invention is not only a technical idea but also a highly advanced creation. The technical idea can be a technique, or an “art,” which has to be a concrete means to complete a claimed result.⁴⁶ Conversely, an abstract or incomplete means for a claimed invention will not be seen as a technical idea.

Compared to the “creation,” a mere discovery is not enough for a patent. The

⁴² See, e.g., Shimako Kato, *supra* note 40.

⁴³ Nakayama, *supra* note 7, at Part I p44 n.2 (“For example, memorization techniques and methods of displaying and selling goods (these may contribute to greatly increasing sales, but they only utilize people’s psychology; some of them could be protected as trade secrets, but those like display methods, which would become publicly known, cannot be protected as trade secrets), melodies, rhythms, etc.”).

⁴⁴ *Id.* (“For example, mathematical principles are such as the Pythagorean theorem, economic principles, legal principles, etc.”).

⁴⁵ *Id.* (“For example, rules of sport and games, cipher code books, etc.”).

⁴⁶ *Id.* at 52-53.

factor of creation will be examined based on “inventive step” and “novelty” in the later stages of examination. It also implies that when an invention is created, the invention is subjectively a work of creation, according to Professor Nakayama’s opinion.⁴⁷

The above two factors related to the definition of invention seem to be definite; however, Japanese scholars doubt that they are able to apply to all new technology, specifically for computer software inventions.⁴⁸

C. Industrial Applicability: Article 29(1)

Another rule affecting the eligibility of subject matter is Article 29(1) that provides that:

An inventor of *industrially applicable inventions* may be entitled to obtain a patent for the said invention...”

Initially, the meaning of the industry to the Japanese was limited to conventional industry as mentioned at the beginning of this chapter. Gradually, the scope of industry has changed with the emergence of new technologies. The updated definition of “industry” not only broadens the scope of conventional industries but also extends to the fields of commercial business.

The meaning of “industry” is defined neither in the JP-Patent Act nor in the Examination Guidelines for Patent and Utility (hereafter JP-EG). Nevertheless, the JP-EG lists three classes of inventions as industrially inapplicable inventions: (1) methods of surgery, therapy or diagnosis of humans, (2) commercially inapplicable inventions, and (3) practically inapplicable inventions.⁴⁹ The first class is more concerned about medical treatments for humans, so it is rejected primarily on account of

⁴⁷ *Id.* at 54-55.

⁴⁸ *Id.* at 49-50 (arguing that the requirement of utilizing laws of nature should be replaced by a new requirement for new technologies).

⁴⁹ See Sec. 2.1, Chap 1, Part II, JP-EG (2009).

public policy.

In the second class, “commercially inapplicable” invention means that the subject matters are not marketable or tradable characteristics, which can be divided into two different types—an invention applied only for personal use and an invention applied only for academic or experimental purposes.⁵⁰ The former relies more on personal experience, such as a method of smoking or a method of weaving hair.⁵¹ However, if a claimed method of weaving hair is applied in the cosmetology field, it cannot be considered only for personal use.⁵²

In regards to the last type, if a “kit for scientific experiments” is used in an experiment at school, it cannot be seen as an “invention applicable only for academic or experimental purposes” since it is a tradable article.⁵³ Therefore, drafting a proper claim, obviously, is very critical for the patent eligibility of the above inventions.

The last class filters out inventions that are theoretically applicable but practically inapplicable, such as a method of utilizing a plastic film that can absorb ultraviolet rays and cover the surface of the whole earth to prevent the ozone layer from being destroyed by ultraviolet rays.⁵⁴

Applicants have to prove their inventions to be applicable in an industry when they are inquired by JPO examiners.

D. Other Requirements for Patentability

In addition to the above requirements, a claimed invention is also required to

⁵⁰ See Sec. 2.1.2, Chap 1, Part II, JP-EG (2009).

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.*

⁵⁴ The instance is also quoted in the TIPO’s examination guideline. Sec. 2.1.3, Chap 1, Part II, JP-EG. (“A method for preventing an increase in ultraviolet rays associated with the destruction of the ozone layer by covering the whole earth’s surface with an ultraviolet ray-absorbing plastic film.”).

meet other two requirements—novelty and “inventive step”, which are similar to those in other jurisdictions.

An inventor is also required to disclose know-how in the specification to make the person having an ordinary skill in the art able to repeat the claimed invention, a requirement which is stipulated in Article 36(4).⁵⁵ Besides, this requirement sometimes will affect the patent eligibility of subject matter if drafted terms in claims are too vague or too broad to draw a well-defined line for a claimed subject matter. The determination of this requirement is case by case. The later discussions will show how it is decided.

2.2.2 Nonstatutory Subject Matters

There is no clear definition of patent-eligible subject matters in the JP-Patent Act; however, the JPO enumerates six types of nonstatutory inventions in the JP-EG as the exclusion to patentable subject matters based on the context of Article 2(1), JP-Patent Act.⁵⁶ The ambiguity results in flexibility in stipulating the definition in statute because a new subject may need much more discussion to achieve a consistent opinion among scholars, judges, and the practice.⁵⁷ The nonstatutory subject matters are illustrative as follows:

⁵⁵ Art. 36 (4) (i) (“in accordance with Ordinance of the Ministry of Economy, Trade and Industry, the statement shall be clear and sufficient as to enable any person ordinarily skilled in the art to which the invention pertains to work the invention”).

⁵⁶ See, e.g., Chap 1.1 List of Nonstatutory Inventions, Examination Guidelines for Patent and Utility Model in Japan (2009), available at http://www.jpo.go.jp/cgi/linke.cgi?url=/tetuzuki_e/t_tokkyo_e/1312-002_e.htm (last visited on Mar. 14, 2010). See also, John F. Duffy, *Harmony and Diversity in Global Patent Law*, 17 Berkeley Tech. L.J. 685, 712 (“[M]any provisions of Japanese patent law are simply translations of their German counterparts”) (2002).

⁵⁷ See, e.g., Nakayama, *supra* note 7, at Part II pp42-43 (proposing the need for prompt response to the patent protection for new technologies, such as computer software and biological inventions).

A. A Law of Nature as Such

Because of the provision that an invention has to utilize a law of nature to create a technical idea, a law of nature as such is excluded from a statutory invention. Such things as “a law of preservation of energy” or “a law of universal gravitation” cannot be seen as a statutory inventions.⁵⁸

B. Mere Discovery and Not a Creation

Mere discoveries of natural things, such as discoveries of ore or “natural phenomena” cannot be taken as statutory inventions because there was no technical idea created by inventors.⁵⁹

However, with regard to some chemical substances or microorganisms, if they can be isolated artificially from their natural environments, they may be considered statutory inventions.⁶⁰

C. Those Contrary to Laws of Nature

If an invention claims a means in contrary to laws of nature, it cannot be considered a statutory invention since it's obviously impossible for the means to produce an expected result as claimed.⁶¹

For instance, an invention claims a method of plating copper with iron.⁶² The claimed method is to immerse a piece of copper in an aqueous solution of iron ions to form an iron layer on the surface of the copper. However, iron is more easily ionized than copper based on its chemical nature. Thus, it's impossible for the asserted method to achieve the desired result and it cannot be seen as a statutory invention.

⁵⁸ See Sec. 1.1, Chap. 1, Part II, JP-EG (2009).

⁵⁹ *Id.* The provision is similar to EPC Art. 52(2)(a).

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² See Sec. 4.1.1 Chap. 1, Part II, JP-EG (2009) (Example 1).

D. A Law of Nature Is Not Utilized

This is one of the two critical factors in the provision of the JP-Patent Act regarding whether or not a claimed invention qualifies as an “invention” under the JP-Patent Act.⁶³ Computer programming languages are instances that do not utilize a law of nature; however, the patentability of software-related inventions may rely on their diverse claims, and it has provoked many debates in history.⁶⁴ The following items illustrated in the JP-EG do not utilize a law of nature.⁶⁵

- (1) Any law as such other than a law of nature (e.g. economic laws)⁶⁶
- (2) Artificial arrangements (e.g. a rule for playing a game as such)⁶⁷
- (3) Mathematical methods
- (4) Mental activities
- (5) Methods that only utilize these laws (e.g. methods for doing business as such)

The determination of this factor is based on a whole view of a claimed invention. Thus, when part of an invention claims to utilize a law of nature, the claimed invention will be viewed as not using laws of nature if it is judged that the claims as a whole do not utilize a law of nature.⁶⁸

In addition, the characteristic of technology is another factor in whether or not a

⁶³ See Art. 2(1), JP-Patent Act.

⁶⁴ See, e.g., Sec. 1.1, Chap1, Part II, JP-EG (2009) (Example 2: “A method of collecting money for an electricity bill or a gas bill etc., by rounding off the total amount to be collected to the nearest 10 yen unit.”).

⁶⁵ Sec. 1.1, Chap1, Part II, JP-EG (2009). The provision is similar to EPC Art. 52(2).

⁶⁶ *Id.* (Example 3: “A method of plying a container vessel to transport a large amount of fresh water from a region where crude oil is expensive and fresh water is inexpensive to another region where crude oil is inexpensive and fresh water is expensive, and after unloading the fresh water, transporting a large amount of crude oil instead of the water to the homeward voyage.”).

⁶⁷ The JP-EG translates its Japanese texts to “arbitrary arrangements” in English.

⁶⁸ See Sec.1.1, Chap1, Part II, JP-EG (2009).

claimed invention as a whole utilizes a law of nature.⁶⁹

Besides the above-mentioned, using software to do such a business or to play a game may be seen as a patent-eligible invention from the viewpoint of computer-software inventions, though an ordinary invention engaging in method of doing business, playing a game or the like is not seen as a patent-eligible subject matter based on this rationale.⁷⁰

E. Those Not Regarded As Technical Ideas

There are three conditions based on which an invention is not considered to create any technical idea—when it involves a personal skill, a mere presentation of information, or an aesthetic creation.

a. Personal Skill

In order to obtain patent rights, an inventor has to disclose the know-how to allow that the same result can be achieved by a third party with an average level of skill in the field. However, a claimed invention focusing on personal skill lacks objectivity, which makes knowledge unable to be shared with others. For instance, a sports technique—teaching how to hold a ball with one's fingers to throw a split-fingered fast ball, or a musical performance technique is not seen as a technical idea for the objectivity of techniques.⁷¹

b. Mere Presentation of Information

Features of an invention residing only in the content of the claimed information

⁶⁹ *Id.*

⁷⁰ Sec. 4.1.2, Chap. 1, Part II, JP-EG(2009) (Example 4, 5 and 6).

⁷¹ See 1.1, Chap1, Part II, JP-EG (2009). *Cf.*, However, if the method is enabled with a machine, such as a practice machine, its result can be repeatable by the people with an ordinary skill in the art and thus can be viewed as creating a technical idea.

must present only the content.⁷² For example, a written manual that explains the operation of a machine, an audio compact disc of recorded music, image data storing photos, and a program of an athletic meeting listing a series of activities merely present information. A computer program representing program codes on paper also fall within this category.

Besides the above-mentioned, once technical features of a claimed invention reside in the presentation of information, the presentation per se, or a means of presentation, they are not seen as a mere presentation of information.⁷³ That is, when the content of information is read by machines or computers, it may result in technical characteristics of an invention. The following two instances can illustrate this condition.⁷⁴

1. A test pattern for use in checking the performance of a television set (where a technical feature resides in the pattern per se).
2. A plastic card on which information is recorded with characters, letters and figures embossed on it (enabling one to copy the information by affixing the card on paper, in this sense the technical feature resides in the means for presentation).

c. Aesthetic Creations

Aesthetic creations are such things as paintings, carvings, and the like.⁷⁵

F. A Means Unable to Solve a Claimed Problem

If a claimed invention obviously cannot solve a claimed problem based on the

⁷² *Id.* The exclusion is similar to EPC Art. 52(2)(d).

⁷³ Technical features are also critical considerations in the determination over the patent eligibility of invention in the EPC; *see, e.g.*, Rule 29(1) (a), Chapter II, Part III, Implementing Regulations to the Convention on the Grant of European Patents, EPC (1973) ("a statement indicating the designation of the subject matter of the invention and those **technical features** which are necessary for the definition of the claimed subject matter but which, in combination, are part of the prior art;").

⁷⁴ *See* Sec. 1.1(5), Chap I, Part II, JP-EG (2009).

⁷⁵ The exclusion is similar to EPC Art. 52(2)(b) (1973).

asserted method, it means the claimed invention fails to meet the requirement of its object and is not deemed a patent-eligible subject matter at the same time. For instance, a method of utilizing the theory of nuclear fission to resist volcanic eruptions is claimed as an invention; however, its claimed result obviously cannot be achieved.⁷⁶

The above enumerated nonstatutory subject matters have not been amended since the JP-EG was revised to accept software-related inventions as a statutory subject matter. This implies that either computer software-related inventions initially did not fall within the scope of nonstatutory categories based on the statutory interpretation of “invention,” or that software-related inventions might be patentable if they were claimed in a certain way.⁷⁷

2.3 Patentable CS Inventions

2.3.1 The Role of the Examination Guidelines

The Japanese attitude toward computer software inventions can refer to the JPO examination guidelines that have gradually changed over time based on the emergences of new technologies, changes in other jurisdictions, and so on. For instance, the JPO had revised its JP-EG several times to grant patents to various computer software-related inventions prior to the amendment to the JP-Patent Act that added the term “computer program” in the definition of tradable articles and other relevant articles in 2002.⁷⁸ It can be said that its effect is similar to that of JP-Patent Act, even though its nature is only an administrative rule for JPO examiners. Thus, applications based on the

⁷⁶ See, e.g., Sec. 1.1(6), JP-EG (2009).

⁷⁷ See, e.g., Nakayama, *supra* note 7, at Part II p46 (Prof. Nakayama thinks that “computer software itself tends to be regarded as a statutory invention depending on how the claims are described”).

⁷⁸ See, e.g., Art. 2(3) (i), JP-Patent Act (2008) (“in the case of an invention of a product (including a computer program, etc., the same shall apply hereinafter), producing, using, assigning, etc.”).

guidelines are not only dealt with by prosecutors and examiners, but also by court judges, except in some particular cases.

2.3.2 Conditions of CS Inventions

Based upon Article 2 of the JP-Patent Act, the JPO proposes two conditions under which a CS invention may meet “a creation of technical ideas utilizing a law of nature” : (1) data processing applications; (2) equipment and operational methods for data processing.

A. Data Processing Applications

In fact, software itself cannot demonstrate its functions without processing by hardware instruments; neither can creative ideas contained in it. Thus, in order to prove software contains creative ideas for patent grants, it needs a data processing instrument to demonstrate its unique functions.

From the viewpoint of the JPO, the core task of software invention is a kind of data processing that needs hardware—data processing apparatus—to complete the task.⁷⁹ Thus, an invention claiming data processing that is concretely realized by hardware will be seen as a patent-eligible invention.

Software that is “concretely realized by using hardware resources” means that “software and hardware resources are cooperatively working so as to realize arithmetic operations or manipulation of information” for the claimed purpose.⁸⁰

As to “hardware resources,” they can be referred to as an arithmetic unit, like a CPU or a storage unit (i.e., memory).⁸¹

⁷⁹ Sec. 2.2.1, Chap.1, JP-CSG (2005).

⁸⁰ *Id.*

⁸¹ *Id.* at Sec. 2.2.2.

B. Equipment and Operational Methods for Data Processing

In addition to the above condition, an invention claiming information equipment and methods can be viewed as meeting the requirement as well. In addition, a computer readable medium for the first condition is also seen to meet “creation of technical ideas” from this viewpoint.

When determining whether or not software can cooperatively work with hardware, we can refer to the following examples.⁸²

Based upon the above two conditions, the JPO seems to restrict the scope of CS patents by the connection of software with hardware apparatuses; however, a computer medium is seen as a patent-eligible subject matter without being limited to a specified device, which seems to open broader access to computer software per se.

2.3.3 Two Steps to Determine the Patent Eligibility of CS Inventions

There are two steps to examine the patent eligibility of CS inventions: (1) to determine whether or not an application is a CS invention; (2) if so, to determine whether or not a CS invention is concretely realized by hardware resources.⁸³

(1) Whether or not a claimed invention is a CS invention

The initial step is to filter out inventions that are not CS inventions. If a claimed invention is not a CS invention, its examination will be based on ordinary examination guidelines as with other subject matters. The identification will be decided based on claims. The following example illustrates whether or not an invention is a CS invention.

⁸² Sec. 2.2.3 of this article.

⁸³ *Id.*

Example: Image processing method by computer

[What is claimed is]: ⁸⁴

An image processing method by computer for compensating for the blurring of optically read image data is comprised of the following steps:

inputting a pixel matrix A of 3 rows and 3 columns obtained from image data picked up by an optical reading means;

computing a pixel matrix $C = A * B$;

using a matrix B, shown below, which formed by stored filter parameters of 3 rows and 3 columns, and

outputting the pixel matrix C.

$$B = \begin{bmatrix} 0 & -0.5 & 0 \\ -0.5 & 3 & -0.5 \\ 0 & -0.5 & 0 \end{bmatrix} \quad \text{or} \quad B = \begin{bmatrix} 0 & -0.5 & 0 \\ -0.5 & 2.75 & -0.5 \\ 0 & -0.5 & 0 \end{bmatrix}$$

The above claim does not require special judgment and treatment like CS inventions since it utilizes physical characteristics to output image data. The object of the invention is to provide a method for image processing with a fixed filter parameter, matrix B, which can reduce the blurriness of images. The claimed method is to input data A to a computer and output a result C through the computation of $A*B$. Although the calculation is processed by computer hardware, it cannot be categorized as a CS invention based on the fact that matrix B is a physical parameter. Thus, it is seen as an ordinary industrial applicable application.

(2) Whether or not a claimed CS invention is concretely realized by hardware resources

Once an invention is categorized as a CS invention, the second step is to determine whether or not it is concretely realized by using hardware resources. As mentioned above, a CS invention claiming data processing, operation methods,

⁸⁴ *Id.* (Example 2-7).

processing equipment, or a computer readable medium for the claimed purpose has to be implemented by a concrete means in which claimed software needs to work cooperatively with hardware so as to reach the claimed result. Conversely, if the claimed invention is not concretely realized by using hardware resources, it does not meet “a creation of technical ideas utilizing a law of nature.” The following examples can illustrate the determination method.

Example A: Calculation apparatus⁸⁵

	Claims	Concretely realized by hardware resources	Explanation
Claim 1	A calculation apparatus to calculate multiplication “s” of natural numbers “n” and “m” (where, $1 \leq n \leq m < 256$) by the formula $s = \frac{(m+n)^2 - (m-n)^2}{4}$	No	Hardware resources cannot be considered to cooperatively work with software in calculating multiplication.
Claim 2	A calculation apparatus to calculate formula $s = \frac{(m+n)^2 - (m-n)^2}{4}$ comprising, means for inputting natural numbers “n” and “m” (where, $1 \leq n \leq m < 256$), a square function table wherein “k” square value k^2 (where, $0 \leq k < 511$) is stored, arithmetic means comprising of an adder-subtractor and bit shift arithmetic unit, and a means for outputting the sum of “s” by said arithmetic means, wherein the said arithmetic means refers to the said square function table in order to obtain square value, without using a multiplier-divider unit.	Yes	Performs subtraction using the arithmetic means, the square function table; performs subtraction using the adder-subtractor unit and in turn carries out right bit shift operation using the shift arithmetic unit.

⁸⁵ *Id.* at. Sec.3.2.1, Chap. 1 (Claims 1 and 2 are quoted from claims 2 and 4 in Example 2-1.).

Example B: Storing method of articles distributed via network⁸⁶

	Claims	Concretely realized by hardware resources	Explanation
Claim 1	A storing method of articles distributed via a network, comprising the steps of: receiving articles distributed via communication network; displaying the said received articles; checking if intended keywords exist in texts of the said articles <i>by users</i> , and <i>if exist, giving “save” command to an article storing execution means</i> ; and storing the said article given “save” command on the article storage means.	No	The process—if it exists, giving the “save” command to an article storing execution means—is performed based on the mental activity though the claimed invention using a “communication network.”
Claim 2	A storing method of articles distributed via a network, comprising the steps of: receiving articles distributed via communication network; displaying the said received articles; determining whether intended keywords exist in texts of the said articles <i>by article storing determination means</i> , and <i>if exist, giving “save” command from the said determination means to an article storing execution means</i> ; and storing the said article given “save” command on the article storage means.	Yes	The determination process through the determination means, execution means and article storage means cooperatively work with hardware.

2.4.1 Scope of CS Inventions

A. Invention of Method and Product

According to the method of drafting claims, CS inventions can be, for the most

⁸⁶ *Id.* (Example 2-2).

part, be divided into two groups—“invention of a process” and “invention of a product”—according to the JP-CSG.⁸⁷

A claim is related to a procedure or a series of operations over time to complete a claimed invention, which means that the claimed subject matter is an “invention of a process.”⁸⁸

Besides the above types of claims, a CS invention may be categorized as an invention of a product. It can be expressed in two different expressive forms. The first one is “a computer-readable storage medium” with “a program” recorded thereon, or “structured data” recorded thereon.⁸⁹ The second one is a program specifying “multiple functions performed by a computer,” which can be seen as “an invention of a product” as well.

The former form can be expressed in the following instance:⁹⁰

A computer-readable storage medium having a program recorded thereon;
where the program makes the computer execute procedure A, procedure B, procedure C...

From the above, we can infer that the claims focus on dealing with data stored in hardware devices, such as ROMs, hard drives or discs (CDs or DVDs). Both subjects are physical matters; one of the physical matters (computer equipment) operates another physical matter (the computer readable medium).

⁸⁷ *Id.* at Chap1, 1.1.1 Categories of Software-Related Inventions (The categorical method for software inventions looks like the general one to divide inventions into two groups—method and product inventions. Thus, an applicant can claim an invention of method or/and of product according to the features of invention and the demand of the claimed scope.).

⁸⁸ *Id.* This illustration in the JP-CSG is the same as the definition in the Article 2 (3) (iii), JP-Patent Act (“in the case of an invention of a process for producing a product, in addition to the action as provided in the preceding item, acts of using, assigning, etc., exporting or importing, or offering for assignment, etc. the product produced by the process.”).

⁸⁹ *Id.* at 1.1.1(2).

⁹⁰ *Id.* at. 1.1.1(2) (Example 1).

The latter form can be expressed in the following instance:⁹¹

A program which makes a computer execute
procedure A, procedure B, procedure C, ...

Compared with the claim in the former form, the second one is not limited to physical matters. A claim describing a computer program only needs to state its operational steps, means, or functions by a physical matter. As a result, a computer program operated by a computer device can be seen as a patent-eligible subject matter even though it is not stored on a medium.

In addition, a claimed subject matter—system—is also seen as an invention of a product under the category of CS inventions.⁹²

From the above cases, we can conclude that the scope of CS inventions includes processes of data processing, data storage media, processing equipment, information systems and computer programs (or structured data).

B. Exclusions

“Program signals” or “data signals” in claims cannot be categorized into any one statutory category under the JP-CSG because the scope of a claimed subject matter cannot be clearly defined,⁹³ and therefore violates Article 36(6)(ii) of the Japanese Patent Act.⁹⁴ Similarly, if an invention claims “a program product” in claims, the scope of the claimed invention is not so obvious; thus, “a program product” is not a proper

⁹¹ *Id.* (Example 5).

⁹² *Id.* at Sec 1.1.2 Notes (2).

⁹³ *Id.* at Sec 1.1.3 (explaining claimed subject matter may be categorized as a group of products or a group of processes).

⁹⁴ *Id.* at Sec.1.1.2 Notes (1)(a). *See* Art. 36(6)(ii), JP-Patent Act (“[T]he invention for which a patent is sought is clear [.]”).

term in the claim.⁹⁵ The other types of unclear claimed inventions can be shown in the following conditions:⁹⁶

- (1) The statement of claim is unclear
- (2) The technical meaning of matters defining the invention is not comprehensible
- (3) Matters defining the invention are not technically relevant
- (4) Neither a product nor a process is stated in a claim
- (5) The expression in a claim where the standard or degree of comparison is unclear
- (6) No concrete means, concrete articles or concrete processes can be conceived

From the context of these instances, the obscure scope of claims results primarily from the ambiguous terms that in practice are usually used in drafting claims.

2.4 Case Study

2.4.1 Utilizing a Law of Nature

Case: An Advertising Method Using Utility Poles

1. Claimed subject matter: An advertising method
2. Technical features: An advertising method to display advertisements by moving them in rotation around a few sets of utility poles and billboards.
3. Issue: Did the claimed method use laws of nature?
4. Holding and reasoning:

⁹⁵ *Id.*

⁹⁶ *Id.* at Sec. 1.1.3 Examples of Unclear Claimed Inventions.

The Tokyo High Court held that:⁹⁷

[T]he advertising method to increase the advertisement effects by circulating advertisement in a certain period and for that purpose, groups of utility poles and advertisement boards, also holding frame are used. However, ***no power of nature was used for circulating advertisement boards***. In that sense, the present invention does not constitute the industrial invention defined in the Article 1 of Patent Act.

There were two other cases related to the issue. For instance, one invention claimed “an alphabetic single cable code” in 1950 and the other one claimed “a Japanese-character single cable code creating method” in 1953, both of which were rejected based on the same reason as the above case.⁹⁸

5. Analysis:

With respect to a “process” to manufacture a physical product, each stage of the process will output a desirable temporary result that may change its previous physical or chemical state. That change results from the physical or chemical reaction to the product upon applying laws of nature.

However, each step of a computer program is different from the “process” to manufacture a physical product since it does not employ any physical or chemical law that leads to a physical or chemical change to its previous state. If we treat each instruction respectively, each of them is an arithmetic logic that executes basic addition and comparative operations. At each stage it only turns on or off one additive operator or one comparator, or fetches/loads one instruction from/to a resistor and so on, which obeys the logic principle of a von Neumann machine but does not employ any law of nature to change the physical or chemical state.

⁹⁷ Gyôshyû, Vol.7, No.12, p3157, Tokyo High Court (1956). See also, Kato, *supra* note 40.

⁹⁸ See, e.g., Nakayama, *supra* note 7, at Part II p44 n.5.

Notwithstanding, a computer program may form a formula that consists of several mathematical or physical equations by utilizing laws of nature as a whole. That is, a computer program may utilize laws of nature by emulating a circumstance, which can input data and output a desirable result like causation in natural sciences. The following figure can illustrate the differences between one instruction and a set of instructions.

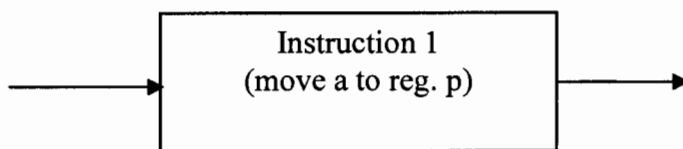


Figure 2 - 1(a) One instruction

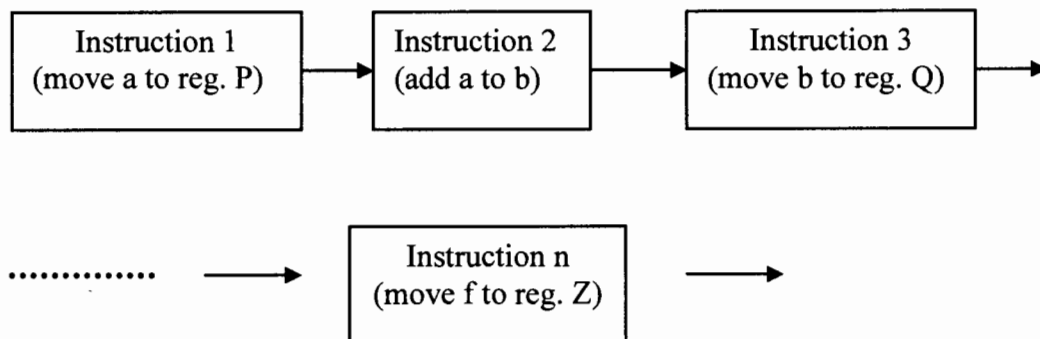


Figure 2 - 1(b) A set of instructions

Figure 2 - 1 Computer instructions⁹⁹

2.4.2 Mental Activities

A. *Shade Analyzing Tech. Inc v. JPO*
(Japan IP High Ct., June 24, 2008)¹⁰⁰

An invention that is to support or replace some mental activities will be deemed

⁹⁹ Registers (reg.) are hardware memory devices storing instructions sent from other devices of a computer.

¹⁰⁰ Case No. H19 (Gyoke) 10369 (2008).

patentable.

1. Judicatory history:

This case is an action for the annulment of the decision of JPO's Board of Appeal.

The plaintiff, an American company, filed a PCT Application—Interactive Dental Restorative Network—on April 10, 1999,¹⁰¹ which entered into the Japanese National Phase as Application No. 2000-579144 on Mar. 7, 2000. The JPO rejected the application on January 21, 2005. The applicant then amended claims and filed an appeal with the Board of Appeal in the JPO. The appeal was rejected by the Board on June 19, 2007, and the plaintiff appealed the decision to the Tokyo Appellate Court (former of the JIP High Court).

2. Subject matter of invention:

The invention was an assistant means for a dentist; it claimed an interactive dental restoration method between a dentist and a dental restoration laboratory. The method included four main steps: identifying a dental restoration need in a patient; designing a preliminary treatment; transmitting the preliminary treatment plan via a network to a dental restoration laboratory, and communicating a final treatment plan.

The implementation of the interactive system required some hardware apparatus, including a network server with a database, a network, and a local computer, etc.

There were twelve claims in the amended claims,¹⁰² where claims 1 and 10 were

¹⁰¹ International Application No. PCT/US1999/022857, *see also*, WO2000/025696, *available at* <http://www.wipo.int/pctdb/en/wo.jsp?WO=2000025696&IA=US1999022857&DISPLAY=STATUS> (The invention was filed with the U.S. priority data, and was sent to three patent offices, including Japan, Canada and EP).

¹⁰² The original claims had 18 claims, where claim 1 was an independent claim and the rest were dependent claims.

independent claims and the rest were dependent claims. Claim 1 was the essence of the invention and included detailed steps of the invention, and claim 10 was a computer readable medium storing relevant data of patients and dental laboratories. Claim 1 was as follows:¹⁰³

A network server with database stores information about materials of dental prostheses, procedures, and preparations;
accessing to the said network server via a communication network;
accessing to the information stored in the database, and at least one or more of the computers where people store the information in a readable form at a dental clinic;
identifying a means for dental restoration;
making a preliminary treatment plan that includes design criteria for the said dental preparation of a dental prosthesis to be placed in the patient to satisfy the need of the dental restoration and the preliminary treatment plan is transmitted to a restoration laboratory via the said communication network;
and
transmitting a final treatment plan that includes modifications to the preliminary treatment plan if it is necessary to the restoration laboratory via the said communication network by the dental restorative computer system.

3. Issue:

(a) Was the rejection of claim amendments appropriate?

(b) Was the invention a patent-eligible invention as prescribed in Article 29(1), main paragraph?

4. Holding:

(a) The JIP Court affirmed the rejection of the claim amendments.

(b) The JIP Court dismissed the Board Decision based on the fact that the claimed invention conformed to the regulation of the Article 29(1), main paragraph.

5. Reasoning:

¹⁰³ *Shade* at 5.

In regards to the first issue, the plaintiff's amendment to claims was beyond the substantive amendment to claims under the JP-EG that only allows amendments to claims or specifications in some conditions, including a cancellation of claims, a restriction of claims, a correction of errors, and clarification of descriptive ambiguity.

As for the second issue, the JIP High Court speculated whether or not the claimed invention had mental activities violated Article 2(1) of the JP-Patent Act as in the following:¹⁰⁴

[H]uman mental activity per se is not a subject matter under the Patent Act, so it cannot be seen as an "invention". However, we cannot think it is an invention merely based on the fact that it contains a mental activity or relates to a mental activity.

In light of all claimed means in claims, when the nature of invention is directed to a human mental activity per se, it cannot be seen as an "invention" regulated in the Article 2(1) of the Patent Act. On the other hand, even though a claim includes or relates to a human mental activity, it should not be excluded from the scope of subject matters under the Article 2(1) of the Patent Act, if the nature of invention is directed to a technical means with either the support of a human mental activity or the replacement of a human mental activity.

According to the above-mentioned method, the court found that:¹⁰⁵

[C]laim 1 "identifying a means of dental restoration" and "making a preliminary treatment plan that includes design criteria for preparation of a dental prosthesis..." contain the elements involving mental activities, but the assessment and decision for the treatment is difficult to implement alone by mental activities according to the description and object of the specification[.]

[I]f we review the claims and the specification as a whole, we will understand that the dental restoration can be made based on a technical means; i.e. computer, such equipment as "the network server with data base", "the communication network",

¹⁰⁴ *Shade* at 25-26.

¹⁰⁵ *Shade* at 35.

“the computer in the dental clinic”, and “the device which can display and process images”.

6. Analysis:

The JIP High Court adopts a flexible viewpoint to examine the patent eligibility of inventions; i.e., the review of the patent eligibility of an invention should be based on claims as a whole and the specifications instead of examining a claim element by element. Thus, when the nature of an invention is not merely a mental activity but has a technical means, it is deemed to conform to the definition of Article 2(1) as to be a patentable subject matter.

In this case, the JIP High Court thought that though some steps of the interactive dental restorative method involved mental activities, the claimed dental restoration was unable to be implemented without cooperative tasks of other computer software and hardware. This viewpoint also means that a claimed technical means with the cooperation of mental activities and computer resources is acceptable. Therefore, if an invention partly involves mental activities, its claims and specifications have to obviously disclose the essence of the invention having a technical means to the JPO.

B. *Sha v. JPO*
(Japan IP High Ct., Aug. 26, 2008)¹⁰⁶

This case is a determination of patent eligibility of invention partly related to mental activities.

1. Judiciary history:

This case is an action for the annulment of the decision of JPO’s Board of Appeal.

¹⁰⁶ Case No. H20 (Gyoke) 10001 (2008).

The plaintiff, Nobuyuki Sha, filed an invention—A bilingual dictionary for English and other languages with a multi-index matrix structure of phoneme—with the JPO on May 30, 2003.¹⁰⁷ The application was rejected by the JPO on Jan. 4, 2005. The plaintiff then amended the specifications and appealed to the Board of Appeal of the JPO. The appeal was rejected by the Board on Dec. 7, 2007, so the plaintiff filed a suit with the JIP High Court.

2. Subject matter of invention:

The claimed invention was a method for an English language beginner consulting a bilingual dictionary based on human abilities. The claimed method utilized the following four elements to look up a word with the claimed method—Element 1: the basic pronunciation elements of English words (vowels, consonants, pronunciations) with the symbols of the International Phonetic Alphabet (IPA); Element 2: isolating the symbols of consonant elements expressed by the IPA and then directly translating them into the Roman alphabet; Element 3: the spelling of English words; and Element 4: the translation of English (into Japanese or other languages).

For instance, prior to finding the correct spelling of “lesson,” a user needs to be able to know the pronunciation of “lesson,” its consonants—l, s, and n, its correct meaning in Japanese, and its vowels. First, a user needs to be able to read the consonants—l, s, and n—from the pronunciation of “lesson”, so that he or she can find five words in the dictionary having “lsn” as “l” in the table below.¹⁰⁸ Then, he or she discerns the vowel “e” to limit the scope to two words that have different translations—

¹⁰⁷ Japan Patent No. 4232957 (filed May 30, 2003).

¹⁰⁸ *Id.* (Redrawing Fig. 3 and 4).

R and S—in Japanese. Then, he distinguishes its meaning in Japanese; in the dictionary, “S” (the meaning of “lesson” in Japanese) will be filtered out. At last, the consulted word—lesson—corresponding to “S” can be found. The above steps can refer to the following table.

Consonant	IPA	English word	Translation in Japanese
lsl	/`lu:sli/	loosely	P
lsn	/`lu:sn/	loosen	Q
lsn	/`lesn/	lessen	R*
lsn	/`lesn/	lesson	S*
lsn	/`lɪsn/	listen	T
lsn	/`lɪsənə/	listener	U
lsns	/`laɪsns/	license	V

Figure 2 - 2 Consulting method for bilingual dictionary

3. Issue: Is the “method for consulting a dictionary” a subject matter under Article 2(1) of the JP-Patent Act?
4. Holding: The JIP High Court negated the decision of the Board and held that the invention conformed to the definition of invention.
5. Reasoning:

The court construed the meaning of Article 2(1) according to the following.¹⁰⁹

A creation of technical ideas is aimed at solving a problem. If it has nothing to do with human mental activities, decision making or such kind of actions, but has something to do with helping human mental activities, etc., it is improper to deny it

¹⁰⁹ *Sha*, at 12-13.

being an “invention” under the Article 2(1) of the Patent Act, based on condition that an invention involving human mental activities rather than utilizing the law of nature to solve the problem.

The JIP High Court further explained why the claimed method did not merely involve mental activities, as in the following.¹¹⁰

The invention claimed that of the human natural competence, humans are capable of recognizing sounds, especially the high ability to recognize consonants. *By improving the ability*, such an effect of the invention will gradually come about, even though those who do not know how to correctly spell English words but can still know the meanings of them. In a sense, “creation of technical ideas utilizing the laws of nature” is a main means to solve the technical problem in the invention. That is the reason why the invention is patentable under Article 2(1) of the Patent Act.

6. Analysis:

A claimed method that can improve the capacities of mental activities will not be categorized as an invention that merely involves mental activities according to the viewpoint of the JIP High Court. In the case of the dental restorative system, the claimed method to support or to replace some mental activities was deemed patentable as well.¹¹¹ Based upon the above reasons, the scope of nonstatutory invention relating to mental activities is narrowed, and thus only those inventions merely involving mental activities are excluded from patent protection.

2.4.3 Concrete Means for CS Inventions

Hirota v. JPO
(Japan IP High Ct., Aug. 28, 2008)¹¹²

This case demonstrates that a concrete means in a CS invention means that

¹¹⁰ *Id.* at 19.

¹¹¹ *See Shade.*

¹¹² Case No. H19 (Gyoke) 10698 (2008).

software is read by computer, and the software and hardware work closely together.

1. Judiciary History:

This case is an action for the annulment of the decision of the Board of Appeal of JPO.

The plaintiff filed an invention—Device and Process for Point Management—with the JPO on October 19, 2000, and the claim was rejected on March 6, 2003.¹¹³ The plaintiff then revised the claims and appealed to the Board of Appeal of JPO, but this rejected by the Board on August 23, 2005. Thus, the plaintiff filed a lawsuit over this rejection with the JIP High Court.

2. Subject matter of invention:

The case is related to a shopping method via the Internet, where a user can accumulate points stored on his/her point account in the database in each round. The claimed method has two primary steps. First, the information transmitted over a network is received; second, in each round, certain points will be added to the accumulated points in a user's point account stored in the database

Claim 11, the method at issue was as the following:¹¹⁴

A method of point management for a user to accumulate points by storing points on the user's point account in each campaign, comprise;
transmitting the user's identity and a symbol sequence entered by the user through the network;
determining the points based on the user's identity and the sequence in each campaign;
accumulating the above adding points to the point account database through the method of point management.

3. Issue: Does the claim at issue demonstrate a concrete means to implement the

¹¹³ Japan Patent Application No. 2000-319884 (filed Oct. 19, 2000).

¹¹⁴ *Hirota* at 2-3.

invention?

4. Holding: The JIP High Court affirmed the JPO Board's decision.

5. Reasoning:

The Board adopted the determination procedure illustrated in the JP-EG that a CS invention has to claim a cooperative relation between software and hardware resources.¹¹⁵

The JIP High Court analyzed the steps of claim 11 as follows:¹¹⁶

In claim 11, the subject matter of the invention is not limited to a computer that can carry out the following acts: "storing (accumulated points)", "receiving", "adding" and so on. On the other hand, human-beings can also carry out those acts.

However, some terms in claim 11 were not clearly directed to computer hardware apparatuses. The JIP High Court reasoned that:¹¹⁷

"Database" and "network" as mentioned in claim 11, however, are not limited to the use by computer due to the fact that "database" simply means data collection being systematically accumulated and "network" being a means of communication or a communication network....Therefore, from the description in claim 11,..., it cannot be confirmed that the information processing for the invention can be merely realized by a concrete means in which software is read to a computer, and works close with hardware.

6. Analysis:

In this case, the Court restated that a concrete means for a CS invention indicates that claimed software needs to work closely with hardware, but the invention at issue did not. However, the reason to reject the invention in part was based on the fact that the claimed steps might be operated by human beings and are not merely limited to

¹¹⁵ *Id.* at 26-27; Sec. 2.2.2, Chap. 2, JP-CSG (2005).

¹¹⁶ *Id.* at 22.

¹¹⁷ *Id.* at 24.

computer hardware. Thus, an ordinary claim drafter can easily avoid the rejection based on this reason by clearly describing what computer hardware is used in claims. That is, by narrowing down the claimed scope of the invention, a CS invention may be patent-eligible.

For example, when two inventions with the same technical means are respectively described in patent applications and only one of them is seen to be patent-eligible since it limits the scope of claim to computer hardware, is it reasonable that without being operated by computer hardware, the steps operated by human beings can be seen as a creation of a technical idea by utilizing laws of nature?

2.4.4 Technical Idea

Lucent Tech. Inc. v. JPO
(Japan IP High Ct., Feb. 29, 2008)¹¹⁸

This case is related to a method consisting of a series of steps in claims, which can be expressed as a mathematical equation and are thus unpatentable.

1. Judiciary History:

This case is an action for the annulment of the decision of the Board of Appeal of the JPO.

The plaintiff, Lucent Technologies Incorporated, filed an application—Method for Generating a Shorted Expression of Bits—with the JPO on October 18, 1999,¹¹⁹ and the application was rejected on October 28, 2003. The plaintiff amended claims and appealed with the Board of Appeals, which rejected the appeal on February 21, 2007. ,

¹¹⁸ Case No. H19 (Gyoke) 10239 (2008).

¹¹⁹ This application claimed an international priority date, which corresponds to the U.S. as 09/175178. Japan Application No.11-295775 (filed Oct. 18, 1999). The corresponding case is—Efficient Universal Hashing Method, U.S. Patent No. 7174,013 (filed Oct. 20, 1998) (issued Feb. 6, 2007). *See also*, Efficient hashing method, EP Application No. 0996092 (filed Dec.10, 1999).

The plaintiff then filed a cancellation suit for the rejection with the JIP High Court.

2. Subject matter of invention:

The claimed invention was related to an efficient technique for representing long strings of data as shorter strings of data. The specification lists some hash equations, such as the following:

$$h(m) = ((m+a)^2 \bmod p) \bmod 2^l \text{ (equation 6)}$$

$$h(m) = ((m+a)^2 + b) \bmod p \bmod 2^l \text{ (equation 7)}$$

$$h(m_1, \dots, m_k) = \left(\sum_i^k ((m_i + a_i)^2 \bmod p) \bmod 2^l \right) \text{ (equation 8)}$$

3. Issue: Can the claimed invention be seen as a creation of technical ideas by utilizing laws of nature under Article 29(1) and Article 2(1) of the Patent Act?

4. Holding: The JIP High Court affirmed the Board's decision.

5. Reasoning:

The JIP High Court analyzed the fact that claims 1, 2, and 3 are mathematical equations that can be expressed as hashing functions. In addition, claim 1 is equal to equation 6; claim 2 is equal to equation 7; and claim 3 is equal to equation 8.¹²⁰

The Court further reasoned that:¹²¹

¹²⁰ U.S. Patent No. 7174,013 Claim 1(issued Feb. 6, 2007)

Claim1: A method for producing a shortened representation of a collection of bits, comprising the steps of:

inputting the collection of "n" bits;

summing a key having at least "n" bits with the collection of bits to produce a sum;

squaring the sum to produce a squared sum;

performing a modular "p" operation on the squared sum, where "p" is at least as large as a first prime number

greater than 2n to produce a modular "p" result;

performing a modular 2l operation on the modular "p" result to produce a modular 2l result

where, "l" is less

than "n"; and

outputting the modular 2l result.

¹²¹ *Lucent* at 29.

The mathematical or computational procedure for solving a mathematical problem (algorithm) itself is a pure academic theory, and the invention has nothing to do with the laws of nature. As a result, the claim cannot be seen as an invention under Article 2(1).

The court proposed another reason to reject a mathematical equation as an unpatentable subject matter based on the fact that equations do not offer any solution to the prior art in claimed steps. The court stated that:¹²²

In addition, calculating by means of the existing equations does not offer a solution to mathematical problems but offer mathematical steps or computational procedures. Moreover, it does not add any technical ideas related to laws of nature. Therefore, it cannot be seen as an invention based on the lack of technical ideas. If it can be referred to as an invention, all of the mathematical equations can be seen as inventions as well.

6. Analysis:

A technical means is an improvement in the prior art. Does the factor have something to do with the “novelty” or “non-obvious factor”? Is the determination of the patent eligibility of subject matter an independent factor or a dependent factor that is determined by a comparison with prior art?

The court thinks that a mathematical equation per se cannot create any technical idea. However, a series of processes is claimed to improve or reduce processes in the prior art, which may involve a technical idea. Thus, why doesn't a mathematical equation proposed to reduce redundant calculation steps in the prior art create any technical ideas?

¹²² *Id.*

Chapter 3 Software Patents in Taiwan

The Taiwan Patent Act (hereafter TW-Patent Act) is a compromised result. The ideas inside of the Act are borrowed from those in different jurisdictions. Thus, the enactment of the Act and the subsequent amendments require the reconciliation of some conflicting legal points among different jurisdictions.

The Taiwanese did not have their own patent law until the KMT government moved from mainland China to Taiwan in 1949. The principle and provisions of the old patent laws and administrative regulations in mainland China, as well as the patent system, were primarily borrowed from other countries, such as Japan, Germany, and the United States.¹²³ Thus, these regulations needed to be adapted to the existing judicial structure and to meet the demand of national industrial development as well.

In the early 20th century, Japan was the country which affected the revision of the TW-Patent Act mostly due to its similarity with respect to the civil law system. Later, some significant legal theories or principles were borrowed from Germany due to the fact that that new concepts were introduced by some distinguished scholars. In the late 20th century, U.S. court decisions were introduced on a large scale to Taiwan and acted as dominant forces, which started to affect newly enacted laws and relevant revisions of existing laws due to the demand of international trade. Therefore, it can be concluded that the current Taiwan Patent Act and relevant regulations are mixed products in which various legal concepts and logic are embedded.

¹²³ Most Taiwanese laws and regulations are inherited from those in China in the early 20th century. Legal terms and concepts in those inherited laws primarily were learned from the neighbor—Japan had learned western civilization and regulations ahead of its Asian contemporary countries and other advanced western countries.

Recently, several amendments to the Patent Act have been based on the fact that Taiwan has joined the World Trade Organization (WTO) and thus is obliged to obey the Agreement on the Trade-Related Aspects of Intellectual Property Rights (TRIPS) as a member of the international organization.

Learned, borrowed, or copied legal concepts or statutes from other jurisdictions are unable to be translated exactly; as a result, some concepts have been misconstrued or mistranslated. More seriously, some terms directly quoted from articles in the similar statutes have resulted in confusing concepts or incorrect construction of the terms.¹²⁴ Thus, vague or incorrect legal constructions resulting from such incorrect legal concepts or statutes usually render judicial practice unable to function smoothly. Notwithstanding, they have been gradually clarified and have been corrected through scholars' efforts in recent years.

This chapter is divided into four sections. First, I will introduce the evolution of the Taiwanese patent laws and the patent systems. Second, I will discuss the definition of "invention" under the TW-Patent Act. Third, I will discuss the detailed requirements for patenting computer software-related inventions based on the TW-Patent Act and the Substantive Examination Guidelines for Invention Patent (hereafter TW-EG) published by the Taiwan Intellectual Property Office (hereafter TIPO). Last, I will

¹²⁴ For instance, some legal terms in Japanese statutes were directly quoted in Chinese because they were written in kanji that had the same character shapes and originated from ancient Chinese. The meaning of these terms in kanji gradually were developed to slightly different meanings from the original ones on account of cultural difference and social environmental changes. Especially, these kanji terms, over several years, are usually literally construed upon their native Chinese meanings which were different from their previous Japanese ones. Such as Article 2, Japanese Patent Act, "invention" means the highly advanced creation of technical ideas by utilizing laws of nature. The pre-2003 Taiwan Patent Act copied Article 2 from Japan, which was latterly literally construed with the Chinese meaning; thus, "invention" was seen as higher-level creation of technical ideas compared with "utility model" that only needed lower-level creation of technical ideas, which was very different from the main idea in the article of the JP-Patent Act. Thus, these legal principles and concepts rooted in these terms have more significant effects on the enacted rules and the practice than other foreign terms that were translated into Chinese.

discuss some court decisions regarding these issues.

3.1 Historical Overview of Patent Law and System in Taiwan

The TW-Patent Act can be divided into two periods based on the Nationalist Government moving to Taiwan: the pre-1950 and post-1950 periods. In the former period, the Republic of China (R.O.C.) government in mainland China merely enacted a formal law, but it had little chance of being enforced as a result of the immature environment in industry and incessant wars—from the establishment of the R.O.C. in 1911 to World War II, and the Chinese Civil War. In the latter period, the R.O.C. government moved to Taiwan then revised the Act several times to keep up with modern patent regulations and to respond to requests from other countries. The government not only passively met the demand for international trade but also actively improved industrial and technological developments in Taiwan.

3.1.1 Pre-1950 Period

The first patent law in R.O.C. history—The Interim Rule for the Reward of Crafts—was enacted in 1911. The Ministry of Industry & Commerce of the R.O.C. published the Rule, which provided thirteen articles and gave five years of privilege or commendations to inventors or improvers of crafts for the improvement of crafts.¹²⁵ The Rule provided an examining process for the reward and meted out a punishment for third parties' manufacturing unauthorized patented products.¹²⁶ Therefore, the Rule could be seen as the first patent law in Chinese patent history.

¹²⁵ The Significant Events of the Patent Act, TIPO, http://www.tipo.gov.tw/ch/AllInOne_Show.aspx?guid=098527fc-4dac-473c-9b83-11dd6b9bc662&lang=zh-tw&path=379 (last visited on May 5, 2010).

¹²⁶ See Art. 4, 10 and 11, The Interim Rule for the Reward of Crafts (1911).

In 1923, a new Act—The Reward Act for Industrial Products—was enacted to replace the previous Interim Rule. In addition to some articles being the same as those in the previous Interim Rule, the patented term was amended to three or five years, and those who were able to apply foreign methods to manufacture products would be commended.¹²⁷ Significant amendments included the adoption of the first-to-file principle,¹²⁸ the grants of patents to re-inventions,¹²⁹ the acceptance of method claims, and the novelty factor.¹³⁰

In 1928, the Nationalist Government published “The Interim Regulation for the Reward of Crafts” to replace the 1923 Reward Act. In addition to the previous provisions, it provided for the submission of affidavits for inventors, an annual fee for patents, liability for patent infringement, the issuance of licenses for patents, and required contents for marking patented products.¹³¹

In 1932, the national government published “The Interim Rule for the Reward of Industrial Technique,” in which main amendments included the terms of patents extending to 5 or 10 years, the ownership of patents for employment, the re-examination of inventions, criminal punishments for counterfeits, and licensing for re-inventions.¹³²

Between 1939 and 1941, there were several amendments to the Rule enacted in 1932, including the following four parts.¹³³ First, inventions were divided into three

¹²⁷ See Wen-Yin Chen, *A Study on State Patent System* 6 (4d ed. 2010).

¹²⁸ See Art. 12, The Interim Rule for the Reward of Crafts (1923).

¹²⁹ See Art. 11, The Interim Rule for the Reward of Crafts (1923).

¹³⁰ See Wen-Yin Chen, *A Study on State Patent System* 7 (4d ed. 2010).

¹³¹ *Id.* at 7.

¹³² *Id.* at 8. The re-examination is a second-run examination of an application by a different examiner when an applicant appeals his/her application based on the rejection by an examiner of the TIPO, which is different from the reexamination under the USPTO.

¹³³ *Id.* at 8-9.

categories: inventions, utility models, and design patents.¹³⁴ Second, the terms for inventions, utility models, and design patents were 5 or 10 years, 3 or 5 years, and 5 years respectively. Third, the rules of administrative appeal to the rejection of the re-examination of a patent application were added to the Act. Fourth, the scope of design patents excluded national flags and party flags.

Later, the Ministry of Economic Affairs drafted a Patent Act in 1942 and finally published the first modern Patent Act in 1944, which integrated both previous reward regulations for inventors of crafts and for industrial products based on the references to those in other jurisdictions, such as the U.K., the U.S., Germany, Japan, and so on.¹³⁵

The Ministry of Economic Affairs, then, commanded the agency—the Trademark Office—to take charge of affairs involving patent prosecution in 1946.¹³⁶ Nevertheless, the Patent Act, in fact, demonstrated less efficiency compared to other laws during this tumultuous period.

3.1.2 Post-1950 Period

Patent grants and relevant affairs were interrupted in 1949 due to the Civil War occurring in mainland China, so that the Trademark Office was unable to move to Taiwan with the central government of the R.O.C in 1949.¹³⁷ Thus, the relocation of the National Bureau of Standards (hereafter NBS) to Taiwan was managed by the Ministry of Economic Affairs, which established an exclusive office under its charge to take over relevant patent affairs in April, 1950.¹³⁸

In 1979, the Patent Act was revised extensively due to demand and included

¹³⁴ The content of a design patent in this category was different from the U.S. design patents.

¹³⁵ See the TIPO, *supra* note 125.

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.*

extending the scope of rights into non-industrial products, adding a new requirement — inventive step (non-obvious factor)—for patent grants, adopting the theory of absolute novelty to distinguish new inventions from prior arts, and excluding new species of animal-plant and microorganism inventions from statutory categories.¹³⁹

In 1986, the TW-Patent Act was revised to accept chemicals, pharmaceuticals, and their combinations as patent-eligible subject matters, as well as breeding methods for new species of plants and micro-organisms.¹⁴⁰

Before 1994, patent rights under the TW-Patent Act were viewed as a monopolistic right in the market. However, they were revised as exclusive rights to prevent unauthorized making, selling, using, and offering patented products for sale in 1994.¹⁴¹ The revised Act also provided for the adoption of international priority,¹⁴² the scope of rights extending into the importing of patented products.¹⁴³

In order to enter the WTO, the Integrated Circuit Layout Protection Act was enacted in 1995 to protect integrated circuit layouts,¹⁴⁴ and the Patent Act was revised again in 1997 to meet the requirements for the protection of intellectual property rights

¹³⁹ *Id.*

¹⁴⁰ See Art.4, TW-Patent Act of 1979 and 1986. See The Plant Variety and Plant Seed Act, Agriculture and Food Agency, Council of Agriculture, Executive Yuan, R.O.C., available at, http://www.afa.gov.tw/content_en.asp?pcatid=1&ycatid=1&lcid=290&hcatid=292&scat=t (The Plant Seed Act was enacted in 1988 to protect the new species of plants. However, the new species of plants and microorganisms were still not approved as patent-eligible subject matters.). See also, Chung-Jen Cheng, *The Discussion on the Revolution and Legislative Policy of the Requirements of Invention*, 32 *Intell. Prop. Rts.* 3, 20 (2001) (commenting that the acceptance of these subject matters was pushed by the U.S. government).

¹⁴¹ See Art. 42, TW-Patent Act (pre-1994) and Art. 56, TW-Patent (post-1994) (The previous concept that “Patent rights are exclusive rights for patentees to manufacture...” is amended as “the patentee of a patented article shall have the exclusive right to preclude other persons from manufacturing”. The amendment to the article is referred to the Art. 28, TRIPS).

¹⁴² See, e.g., Art. 24 and 25, TW-Patent (1994) or Art. 27, TW-Patent Act (2003).

¹⁴³ See, e.g., Art. 103, TW-Patent Act (1994) or Art. 55, TW-Patent Act (2003).

¹⁴⁴ See *The Integrated Circuit Layout Protection Act*, available at, http://www.tipo.gov.tw/en/AllInOne_Show.aspx?guid=d10c3a8e-d605-4abf-a54e-e7d86aeb6224&lang=en-us&path=1479.

requested by the WTO. The requirements included approving new species of microorganisms as a patent-eligible subject matter and the compulsory licensing for semiconductor technology being limited to non-profit-seeking use contemplated to enhance the public welfare.¹⁴⁵

In regards to computer software inventions, Section 2, Chapter 8 for the examination for computer software-related inventions in the TW-EG was promulgated in 1998. This was the first indication that this new technology was approved as a patent-eligible subject matter.¹⁴⁶

In 1999, the NBS was merged into the Intellectual Property Office and took charge of all affairs related to intellectual property rights, such as Copyrights, Trademarks, Patent rights, and so on.¹⁴⁷

In 2001, the amended Patent Act began to accept the state priority,¹⁴⁸ introduced “the early disclosure of invention patents system.”¹⁴⁹

In 2003, the revised Patent Act omitted nonstatutory subject matters in Article 21, such as scientific theories and mathematical methods, rules and methods for games and

¹⁴⁵ See TW-Patent Act (1994) and (1997), TIPO, http://www.tipo.gov.tw/ch/Download_DownloadPage.aspx?path=1621&Language=1&UID=13&ClsID=14&ClsTwoID=16&ClsThreeID=31 (last visited on May, 5 2010). See Art. 76, TW-Patent Act (2003) or Art. 78, TW-Patent Act (1997).

¹⁴⁶ See The Historical Review of the Taiwan Examination Guideline, TIPO, http://www.tipo.gov.tw/ch/AllInOne_Show.aspx?path=626&guid=ef0205c9-d7a5-4dbc-ac27-3e6c19dcbdb6&lang=zh-tw (last visited on Sep. 6, 2010). See, preface of Sec. 2, Chap. 8, TW-EG (In the preface of this new section, the TIPO remarked that the draft of this new guideline is based on the Taiwanese Patent Act and Enforcement Rules of the Patent Act as well as the existing structure of the TW-EG. Besides that, the content is primarily referred to the USPTO MPEP and in part to the JPO JP-CSG.).

¹⁴⁷ See The History of TIPO, TIPO, http://www.tipo.gov.tw/ch/AllInOne_Show.aspx?path=112&guid=914dbce1-1ea6-46e9-856f-62a3f8573b61&lang=zh-tw (last visited on May, 5, 2010).

¹⁴⁸ See Art. 25-1, TW-Patent Act (2001) or Art. 29, TW-Patent Act (2003).

¹⁴⁹ See, e.g., Art. 36-1, TW-Patent Act (2001) or Art. 36, TW-Patent Act (2003) (The “early disclosure system” only applies to invention applications, so that whatever applications passed by the procedure examination and involving no national defense secrets will be published in the early disclosure gazette 18 months from the filing date.).

sports, and those methods or projects implemented by humane analysis or humane memory.¹⁵⁰ The “highly advanced” text in Article 2 of the Patent Act as a non-obvious requirement for patents was omitted in order to diminish a long-standing dispute over the level of creativity of an invention.¹⁵¹ The examination over the utility model inventions was changed, so examiners merely had to examine whether a utility model application conformed to the official form, rather than to substantially examine the patentable requirements.¹⁵² The criminal punishment for patent infringement was also abolished in the revised Patent Act.

In 2008, Sec. 2, Chap. 8, the TW-EG was revised to accommodate “computer program product claims.”¹⁵³ In addition, the Intellectual Property Court (hereafter TW-IP Court) was also set up in 2008 to deal with all IP issues associated with administrative, civil, and criminal cases.¹⁵⁴ The TW-IP court is a unique court compared to other courts in Taiwan and is expected to offer correct and quick decisions on IP-related cases and to increase judges’ professional capabilities in the IP field.

A new draft of the revision of the Patent Act was proposed to legislators in October, 2009. It omitted Sec.1, Article 24 to accept animals and plants as

¹⁵⁰ See Art. 21, TW-Patent Act (2003). See the TW-EG (Although the above-mentioned items have been omitted from the Act, they are still left in Section 2.1.4, TW-EG.).

¹⁵¹ The initial Article was the same as Art.21 of the JP-Patent Act. The term—highly advanced—was used as a requirement—non-obvious factor—for patent grants, which had resulted in much debate over the review standards relying on this abstract textual description.

¹⁵² See Art. 97, TW-Patent Act (2003) (The introduction of this new policy to the patent system was referred to Germany, Japan and Korea because of the amount of applications of utility model inventions so big that the time to examine applications was delayed too much, which could possibly hurt applicants’ benefits.).

¹⁵³ See the TW-EG 2-9-5 (2008), available at http://www.tipo.gov.tw/ch/MultiMedia_FileDownload.ashx?guid=d6564ac6-6867-448b-9cc2-e4286f19901b.doc.

¹⁵⁴ See TW-IP Court, <http://ipc.judicial.gov.tw/en/> (last visited on Sep. 6, 2010) (The establishment of the TW-IP Court is primarily referred from the Japan IP High Court. TW-IP Court judges must make decisions based on the newly enacted law—Intellectual Property Case Adjudication Act.).

patent-eligible subject matters.¹⁵⁵ In addition, the TW-EG also proposed computer generated icons (icons) and graphic user interface (GUI) as patent-eligible subject matters under design patents.¹⁵⁶

The following table lists the significant changes to patent laws and patent systems in Taiwan.¹⁵⁷

¹⁵⁵ See The Comparative Table of the Draft to the Amendments of the Patent Act, http://www.tipo.gov.tw/ch/MultiMedia_FileDownload.ashx?guid=fba61d35-b53a-48f9-bca2-9a56d4d5f262 (last visited on Sep. 2, 2010) (reasoning that the removal of animals and plants under non-statutory inventions will result in the same scope of patentable subject matters as the U.S., Japan, Korea and Australia).

¹⁵⁶ *Id.* (reasoning that although they are patent-ineligible subject matters under the current regulations of design patents, they should be patentable based on the tendency of the development of the IT industry; the U.S., Japan, Korea, EPC, etc. also accept them as patent-eligible subject matters.).

¹⁵⁷ The data is collected from *A study on State Patent System* 5-13 (Wen-Yin Chen), the Significant Events of the Patent Act (TIPO) and the legislative database of the R.O.C.

Year	Scope of statutory items	Patent requirements	Reward & Patented term	Penalty	In-charge agencies
1911	Crafts (§ 1)		5-year period or commendations (§ 4)	Criminal punishment for counterfeit (§ 10) or false marking patented products (§ 11)	The Ministry of Industrial and Commerce (§ 4)
1923	Product or method claims (§ 1)	Only citizens (§ 2); first-to- file (§ 12)	3 or 5 years from the filing date or commendations for those who using foreign methods to manufacture goods (§ 5)		
1928			3, 5, 10 or 15 years from the filing date (§ 2)	Liability for infringement (§ 13)	
1932	Industrial products and methods (§ 1)		5 or 10 years (§ 2)	Resumption of criminal punishment (§§ 23-26)	
1939	No state or party flags for design patents (§ 3)		5 or 10 years for inventions, 3 or 5 years for utility models and 5 years for design patents		

1944	Non-statutory inventions (§ 4): chemicals, food, pharmaceuticals and contrary to public order, morality or public health	Origination, novelty and applicability (§§ 1-3); unity of invention (§§ 1-2)	15 years for patentees (§ 6)		Appointing examiners for examination (§ 27)
1946					The Trademark Office
1949					The National Bureau of Standards
1958		Novelty and industrial applicability (§§ 1-3)			
1979	Extending to all industries (§ 1)	Adding “an inventive step”(§ 2)			
1986	Adding the method to manufacture food, pharmaceuticals and chemicals (§ 4)	National Treatment (§ 14)	15 years from the published date (§ 6)		

1994	Adding food, and microorganisms (§ 21)		20/ 12/ 10 years from the filing date for inventions/ utility models/ design patents (§ 5)		
1995	The enactment of the Integrated Circuit Layout Act				
1997					The Intellectual Property Office
1998	Adding computer software related inventions in the TW-EG				
2001			12 years for design patents (§ 109)	Abolishment of criminal punishment for patent infringement	
2003	Non-statutory inventions (§§ 24, 97 and 120)		20/10/12 years from the filing date for inventions/ utility models/ design patents (§§ 51, 101 and 113)		
2008	Adding “computer program product claims” in the TW-EG				The establishment of the TW-IP Court

Figure 3 - 1 Evolution of patent laws and systems in Taiwan

From this historical review, we can summarize five points from the tendency of Taiwanese patent evolution. First, the concept of patent rights granted to patentees has changed from the monopolistic right in the market to the exclusive right to exclude unauthorized use of patented inventions and so on. Second, the number of patent-eligible subject matters has gradually increased over time on account of new emerging technologies, such as computer software technology and biotechnology. Third, patent terms have been adapted to the standard of the international agreement—TRIPS. Fourth, patent infringers are liable for civil infringement but are exempt from criminal punishment. Fifth, the latest amendments to the Patent Act have gradually met the requests of the TRIPS Agreement, which can be attributed to the fact that Taiwan, as a member of global organizations, is obligated to obey the rules of global society.

3.2 Statutory Interpretation of Invention

Any invention satisfying these three requirements under the TW-Patent Act—Industrial applicability, novelty and an inventive step (non-obviousness)—will be granted a patent except those things provided in Article 24.¹⁵⁸

As a new subject matter, the determination of whether or not a computer software-related invention is patentable primarily relies on the legal construction of the definition of “invention.” The following will illustrate the definition of invention and other significant features under the TW-Patent Act.

¹⁵⁸ See the discussion in Sec. 3.2.2 of this chapter.

3.2.1 Definition of “Invention”: Article 21

A. Revisions of Definition

The definition of “invention” was not enacted until the amendment to the TW-Patent Act in 1993, in which “invention” was defined in Article 19:

The term “invention” as used herein refers to any highly advanced creation of technical concepts by utilizing the rules of nature.

This definition was borrowed from Article 2 of the Japan Patent Act (1959);¹⁵⁹ however, the construction of the above definition was different from the meaning of its counterpart as it only relied on the literal interpretation of the term, not a reference to the Japanese legislative purpose.¹⁶⁰ Based on the incorrect statutory interpretation of the term “highly advanced” a lot of disputes were raised over which level of creation as an “inventive step” was appropriate for invention patents. A later amendment to this Article omitted the terms “highly advanced” in Article 21 (2003) as the following:¹⁶¹

The term “invention” as used herein refers to any creation of technical concepts by utilizing the rules of nature.

On account of the revised Article, the rejection of inventions applications based on a high level of creation will no longer exist; i.e., the rejection based on the obviousness factor to a person having a “high level of skill” in the art is inappropriate.

Notwithstanding, Article 21 requires an invention involving the utilization of laws of nature to create technical concepts, and thus contains two important requirements: an invention must employ laws of nature and must involve technical

¹⁵⁹ See Art.2(1), JP-Patent Act (1959):

Invention” in this Act means the **highly advanced creation** of technical ideas utilizing the laws of nature.

¹⁶⁰ “Highly advanced” creation was not for distinguishing invention patents from utility model patents in the Japan Patent Act.

¹⁶¹ The definition is directed at invention patents.

concepts. Each of them will be respectively illustrated in the following sections.

B. Laws of Nature

Laws of nature are those rules discovered in the natural world, such as water flowing downward and so on.¹⁶² However, such things as human spirit, mental activities, or psychological phenomena cannot be seen as laws of nature.¹⁶³

Some nonstatutory inventions that had been seen not to employ laws of nature are omitted from the Act, such as scientific principles, mathematical formulas, gaming or sport rules, and so on. This is most likely based on the fact that some of them may be patentable in special conditions.¹⁶⁴ For instance, mere computer programs do not meet the definition of invention; however, if a computer software-related invention can contribute to the prior art as a whole, it may not be seen as a nonstatutory invention merely based on the fact that it falls within the scope of nonstatutory subject matters of the Act.¹⁶⁵

Similarly, although an invention related to the control of a machine by computer software or related to the manufacturing processes by computer software involves computer software that merely controls internal operations of the computer, it will be seen to meet the definition of invention in patent law if it has a technical character as a whole.¹⁶⁶

¹⁶² See Ming-Cheng Tsai, *Patent Laws* 24 (2007).

¹⁶³ See the TW-EG 2-2-1 (2009), available at http://www.tipo.gov.tw/ch/MultiMedia_FileDownload.ashx?guid=91ae9411-6a58-4d2a-8905-5f2ad610ed3d.doc.

¹⁶⁴ See, e.g., the TW-Patent Act (2001).

¹⁶⁵ See *Article-by-article interpretation of the Patent Act* 39 (TIPO 2009) (The TIPO illustrates that gaming machines, gaming rules, or process inventions may meet the definition of invention if they are considered to involve technical characters.).

¹⁶⁶ *Id.*

C. Technical Concepts

Technical concepts in this Article mean that an invention is able to achieve a claimed purpose with a claimed technique—a physical means.¹⁶⁷ The technique should be objective and be a type of knowledge conveyable to other people, so that people with a similar skill in the art can apply the same means to achieve the claimed result without extra effort, time, and expenses.¹⁶⁸ That is, the result of the invention should be repeatable by a person having an ordinary skill in the art based on the disclosure of the specification.¹⁶⁹

Especially, the TW-EG illustrates that an invention under the TW-Patent Act is meant to claim a means to solve a problem in the prior art; i.e., the claimed means involves in a “technical character” in a specific technology¹⁷⁰ In other words, an invention may be granted a patent when it is accompanied by a technical character. Some inventions without technical character, such as mere discoveries, scientific theories, mere presentation of information, and mere aesthetic creation, are categorized under the nonstatutory category,¹⁷¹ of which categorical rule and instances illustrated in the TW-EG are similar to those in the JP-EG.¹⁷²

The TW-EG also enumerates five types of inventions lacking technical character, including (1) laws of nature per se; (2) mere discoveries; (3) those violating laws of

¹⁶⁷ *Id.*; see also, Ming-Cheng Tsai, *supra* note 162, at 24-25 (2007).

¹⁶⁸ *Id.*

¹⁶⁹ See Art. 26(2), TW-Patent Act (2010):

The description of invention shall contain a sufficiently clear and complete disclosure of contents of the invention so as to enable person skilled in the art to understand the contents of and to practice said invention.

See also, Tsai, *supra* note 162, at 24 (2007).

¹⁷⁰ See the TW-EG, at 2-2-1 (2009).

¹⁷¹ *Id.* See Sec. 1.1, Chap 1, part II, JP-EG (The JP-EG lists six classes of inventions as non-statutory inventions based on that they are not creations of technical ideas by utilizing laws of nature.).

¹⁷² See Art. 29(1), JP-Patent Act.

nature; (4) those failing to utilize laws of nature; and (5) those failing to involve technical concepts,¹⁷³ which are similar to those in the JP-EG as well.¹⁷⁴ The fourth and last groups are more connected to computer software-related inventions and will be discussed in the following sections.

1. Those Failing to Utilize Laws of Nature

If an invention is a “program language,” the TIPO considered that:¹⁷⁵

[S]uch an invention shall be deemed as failing to conform to the definition of invention owing to the fact that the program language is an artificial arrangement rather than utilizing laws of nature.

The above reasoning is similar to the idea that computer software is essentially a series

¹⁷³ The TW-EG, at 2-9-1 to 4 (2008) (“

2.1.1 Laws of Nature *per se*:

Invention patent must be a creation of technical concepts by utilizing the laws of nature, resolving problems and generating efficacy. The laws of nature *per se* are the rules already existing in nature instead of human creations. Claims claiming the laws of nature *per se* fall under the classes of non-statutory inventions, such as those simply describing the law of nature for $E=mc^2$ or Newton's Laws of Motion.

2.1.2 Pure Discoveries

Discovery mainly refers to the scientific discovery of inherent objects, phenomena and laws. Inventions as defined in Patent Act must be creations with technical characters arising from the human mind. Objects, phenomena and laws inherent in nature are not human creations; discovering unknown objects or phenomena and claims claiming such objects or phenomena *per se* fall under the classes of non-statutory inventions.

2.1.3 Those Violating Laws of Nature

A claimed invention must be technical concepts utilizing the laws of nature. In case the technical features defining an invention violate the laws of nature (*e.g.*, the law of energy conservation); such invention (*e.g.*, a perpetual motion machine) fails to conform to the definition of invention. Because this class of inventions cannot be put into practice, it is also an invention without industrial applicability and shall be rejected on the reason that such invention violates the laws of nature or has no industrial applicability

2.1.4 Those Failing to Utilize Laws of Nature

In case a claimed invention utilizes any rule, method or plan other than the laws of nature, for example, any rule, method or plan of which the implementation must rely on human mental activities (*e.g.*, reasoning and memory), such as any game rule or method (such Chinese chess rules as the Horse moves one point orthogonally followed by one point outward-diagonally and the Elephant moves exactly two points diagonally), any sports rule or method, or any legal contract (*e.g.*, the terms and conditions of life insurance policies), such invention is not a creation by utilizing the laws of nature and fails to conform to the definition of invention...”).

¹⁷⁴ See Chap 1.1 List of Non-statutory Inventions, JP-EG (JP-EG enumerates these six classes as non-statutory inventions based on the provision of the Art. 2, JP-Patent Act. The extra one in the JP-EG is “those for which it is clearly impossible to solve the problem to be solved by any means presented in a claim.”). See the discussion in the Chap 4.3.3 of this article.

¹⁷⁵ See the TW-EG, at 2-9-3 (2008).

of algorithms, so it does not apply any law of nature.¹⁷⁶ The TIPO also categorizes business methods into this category.¹⁷⁷ Thus, when an invention related to a business method is realized by the use of computer software, it may not be seen as an invention without utilizing laws of nature based on the below reason:¹⁷⁸

[A] business method is realized by use of computer technology, and the technical means of such invention in nature does not reside in the business method per se but a specific method of doing business based on computer hardware resources for implementing a certain business objective or function, such invention shall be deemed as technical means in a certain technical field and thus conforms to the definition of invention. For a method of doing business by use of computer software related technology, it may not be deemed as failing to conform to the definition of invention simply because it is applied to business.

In a case such as an “auction method,” a simple description of the steps of auctioning articles is different from “a method of auctioning articles by means of communication networks” since the latter’s use of software completes the steps of auctioning articles.¹⁷⁹ In fact, the former is merely directed to a business method per se that fails to conform to the definition of invention; however, the latter applies the network technology to the business method. Thus, if an adopted means to resolve a problem has a technical character as a whole, it will conform to the definition of invention.

¹⁷⁶ See Japan Guideline of 1993, *supra* note 35.

¹⁷⁷ The TW-EG, at 2-9-3 (2008) (“Business methods are man-made rules of society, rules of experiences or rules of economy. Business methods per se, such as business competition strategies, business operation methods (pure methods of doing business), transaction methods for financial and insurance commodities (pure transaction methods for financial and insurance commodities) shall be deemed as failing to conform to the definition of invention owing to the fact that they fail to utilize the laws of nature.”).

¹⁷⁸ *Id.*

¹⁷⁹ *Id.* at 2-9-3, 4. However, this instance does not explain why “business methods” and “computer software as such” connected together may create a technical character by utilizing laws of nature since each of them does not utilize laws of nature.

Take the method of foreign exchange transaction, for example. A claim simply describing the steps of foreign exchange transactions is different from that of “a method of processing foreign exchange transactions by using a financial information system.”¹⁸⁰ The former is also directed to a business method per se that fails to conform to the definition of invention; however, the latter is a method of doing business by computer hardware resources. Thus, if an adopted means of the latter to resolve problems has a technical character as a whole, then it will be seen as a patent eligible subject matter.

The two instances above demonstrate that an invention related to a business method is carried out by the use of computer software may have a technical character based on a whole viewpoint.

2. Those Failing to Involve Technical Concepts

This class can be divided into two subclasses—mere data processing by computer and the presentation of information.

a. Mere Presentation of Information

There are fewer controversies over this subclass involving no technical character. It includes two modes: (a) the presentation of information per se, and (b) the information carried on recording media, characterized by its contents per se. The former includes computer programs, signals or programming languages, and the latter involves data formats, data frames, packets and databases per se.¹⁸¹ However, the use of invention under this subclass may involve a technical character as in the following.¹⁸²

Only when a computer program or data, upon being read by computers, is functionally or structurally interrelated to the

¹⁸⁰ *Id.*

¹⁸¹ The TW-EG, at 2-9-4 (2008).

¹⁸² *Id.*

processing performed by the computers, would such a computer program or data not be categorized as the mere presentation of information but would involve technical concepts.

That is, if the processing of software by hardware has a functional or structural connection to hardware, then the presentation of data may have a technical character.

b. Mere Data Processing by Computer

Replacing manual activities with computers does not involve in any technical concept, such as the management of paper-based forms relating to classified advertisements by computer or receiving paper-based forms for customer orders through computer networks rather than through phone calls or facsimile transmission that apparently have nothing to do with technical characters.¹⁸³ In contrast, an inventive step of an invention merely using computer software to replace conventional manual activities is obvious to a person of ordinary skill in the art.¹⁸⁴

Nevertheless, although an invention is related to processes by computer, it may not be categorized under this subclass based on the idea that:¹⁸⁵

[A] claimed invention is directed to the steps of “coordinating between software and hardware resources to realize information processing,” so that it is considered one where “the information processed by software is implemented by use of computers in order to produce a technical effect[.]”

The above instance is similar to the case of mere presentation of information, in which both computer software and hardware have significant interactions between them.

3. Examples of Claims:

a. Unclear Technical Meaning of Technical Features

¹⁸³ *Id.*

¹⁸⁴ The TW-EG, at 2-9-28 (2008) (The illustration will be in the next section.).

¹⁸⁵ *Id.*

[What is claim is]:¹⁸⁶

A computer using the right brain inference rule to resolve difficult problems.

The above meaning of “right brain” is not illustrated in the specification and cannot be referred to as general knowledge. Thus, the technical features of the above claim cannot be understood clearly.

b. Claims Failing to Recite Technical Characters

[What is claim is]:¹⁸⁷

A transmission medium for transmitting data packets.

A transmission medium per se, such as a coaxial cable or a telephone line, serves the function of transmitting information-data packets. Although the specification has disclosed a technical means to transmit data packets, the above claim merely states that data packets are transported through transmission media without defining the technical character of the transmission medium. Thus, the above claim will be seen to fail to recite technical features due to the fact that the claim is indefinite.

c. Mere Presentation of Information

[What is claim is]:¹⁸⁸

1. A method for encoding Chinese radicals, for compiling dictionaries and searching for Chinese characters in dictionaries.
2. A method for inputting Chinese characters in a computer, comprising the steps of:

¹⁸⁶ The TW-EG, at 2-9-23, 24 (2008) (The instance is quoted from case 13).

¹⁸⁷ The TW-EG, at 2-9-24 (2008) (The instance is quoted from case 14).

¹⁸⁸ The TW-EG, at 2-9-14 (2008) (The instance is quoted from case 2).

selecting a determined number of specific radicals from all the radicals constituting Chinese characters as encoding code elements;

assigning the encoding code elements to corresponding keys of a specific keyboard; and

inputting Chinese characters by using the corresponding keys of the keyboard.

Claim 1 is a method for encoding Chinese characters; the method per se is a mere presentation of information, so it does not involve technical character.

However, claim 2 is related to an input method for Chinese characters in a computer system, which enables an English-based computer to process Chinese-language information. Thus, claim 2 has a technical character as a whole.

d. Mere Processing by Computer

Invention: A method for booking tickets by computer

[What is claim is]: ¹⁸⁹

A method for accepting ticket bookings by use of computers, using the computers to perform the steps of:

receiving a consumer's booking of a ticket for a train number;

reviewing seats for the train number to be booked;

instructing the consumer to select a seat when the train number to be booked has available seats; and

instructing the consumer to select another train number when the train number to be booked has no available seats

The above claimed method—merely replacing human activities with computer—is seen to involve no technical character as a whole.

¹⁸⁹ The TW-EG, at 2-9-15 (2008) (The instance is quoted from case 5).

4. Comparison on the Claims Drafting

Figure 3-2 shows four types of claims drafted for a method for conducting market study. Case 1 is a business method per se that does not involve any technical character; thus, it is not a patent-eligible subject matter under the TW-Patent Act.

Case 2 is a method using computers to process some of the steps that are undertaken by humans in Case 1, but it still does not involve any technical character based on a whole viewpoint; thus, it is not a patent-eligible CS invention.

Compared with Case 2, Case 3 still does not create any technical idea based on a whole review, in spite of using a computer to process all the steps undertaken by humans recited in Case 1. That is, the claimed method merely replaces manual steps with a computer, which is the same as that in Case 2.

The claims in Case 4 are related to “processing and analyzing data of questionnaires as retrieved and then producing an electronic form of the analysis,” “multi-dimensionally processing data in the electronic form,” and “presenting processed and analyzed results,” which do not only use computers to replace steps undertaken by humans but also disclose a method of “*coordinating between software and hardware resources to realize information processing*.”¹⁹⁰ Thus, case 4 can be seen to have a technical character; therefore, it is a patent-eligible CS invention.

¹⁹⁰ *Id.*

Title	A Method for Conducting Market Study			
	Case 1	Case 2	Case 3	Case 4
Type	A pure business method	Part of steps replaced by computer (no technical concepts)	All of steps replaced by computer (no technical concepts)	Disclose the steps of “coordinating between software and hardware resources to realize information processing,” (having technical concepts)
What is claim is	A method for conducting market study and analysis, including the steps of:	A method for conducting market study and analysis, including the steps of:	A method for conducting market study and analysis by use of computers, using the computers to perform the steps of:	A method for conducting market study and analysis by use of computers, including the steps of:
	determining a commodity to be studied;	determining a commodity to be studied;	determining a commodity to be studied;	determining a commodity to be studied;
	selecting consumer groups that the commodity is intended for;	selecting consumer groups that the commodity is intended for;	selecting consumer groups that the commodity is intended for;	selecting consumer groups that the commodity is intended for and storing a roster of such consumer groups in a recording medium;
	determining questions of questionnaire according to category of the	determining questions of questionnaire according to category of the	determining questions of questionnaire according to category of the	determining questions of questionnaire according to category of the consumer

	consumer groups;	consumer groups;	consumer groups;	groups and storing the questions in the recording medium;
	distributing and then retrieving the questionnaire;	distributing and then retrieving the questionnaire by use of computer networks;	distributing and then retrieving the questionnaire;	distributing and retrieving the questionnaires by use of computer networks;
	summarizing information of the questionnaire; and	summarizing information of the questionnaire; and	summarizing information of the questionnaire; and	processing and analyzing data of questionnaire as retrieved and then producing an electronic form of the analysis by use of computers executing statistic software applications;
				multi-dimensionally processing data in the electronic form; and
	presenting summarized results.	presenting summarized results.	presenting summarized results.	presenting processed and analyzed results.

Figure 3 - 2 Comparison of claims

3.2.2 Scope of Patentable Inventions

A. Scope of Industry

There is no clear definition about what industries will be granted patents; however, we can find that the scope of industries has increased since the revision of statutes. For instance, Article 1 of 1944 provided that:

A patent for any new invention with industrial value can be based on the Act.

And Article 1 of 1979 provided that:¹⁹¹

A patent for any new invention with industrial value can be based on the Act.

However, the TIPO acknowledges that any industry employing laws of nature to implement its activity conforms to this definition, such as conventional industry, farming, forestry, fishing, mining and aquaculture, as well as transportation, communications, and commerce.¹⁹²

B. Nonstatutory Inventions: Article 24

Article 24 enumerates the following as patent-ineligible subject matters:¹⁹³

1. Animals, plants, and essentially biological processes for production of animals or plants, except the processes for producing microorganisms;
2. Diagnostic, therapeutic or surgical operation methods for the treatment of humans or animals;
3. An invention which is contrary to public order, morality or public health.

Some of the above items may conform to the definition of invention under Article 21 of

¹⁹¹ The translations of articles of 1944 and 1979 in English look similar. Art.1 of 1944 was for conventional industries, such as the manufactures of products by machine; however, Art. 1 of 1979, the current effective statute, is for all industries and not limited to conventional ones.

¹⁹² The TW-EG, at 2-3-1, 2 (2009).

¹⁹³ The current TW-Patent Act omitted three types of nonstatutory subject matters, but the TW-EG still considers them as non-statutory subject matters.

the TW-Patent Act (2010),¹⁹⁴ but they are excluded from the scope of patent grants primarily based on various considerations.¹⁹⁵ For instance, the first group related to biotechnology in the field of animals and plants is rejected primarily based on ethical considerations.¹⁹⁶ Furthermore, grants of exclusive rights to the second group of inventions related to the medical treatment of humans and animals may hurt public interests and environmental health.¹⁹⁷ The third group is excluded from the scope of patent protection on account of social morality, similar to the exclusion from patentability under Article 53(a) of the EPC.¹⁹⁸

Obviously, a computer software-related invention does not fall into the above scope. Nevertheless, it still has to satisfy the other requirements under the TW-Patent Act like other statutory inventions.

However, how to examine such an invention is another difficult issue for the TIPO. Thus, the draft of examination guidelines for computer software-related inventions is primarily referred to other patent offices in other jurisdictions, such as the JPO, the USPTO, and so on.¹⁹⁹

¹⁹⁴ The TW-EG, at 2-2-1 (2009).

¹⁹⁵ The proposed amendment about the patenting on animal and plant patents was sent to legislators in 2010.

¹⁹⁶ See Chong-Sen Yang, *Patent Laws* 131-133 (2d ed. 2007). The provision is only to exclude essentially biological processes for the production of animals and plants from patent protection based on the TRIPS Art. 27(3)(b), not for the other non-essentially biological ones.

¹⁹⁷ *Id.* at 148 (reasoning that the U.K., German and France do not grant patents on these subject matters).

¹⁹⁸ Art. 53(a) EPC:

European patents shall not be granted in respect of:

(a) inventions the commercial exploitation of which would be contrary to “ordre public” or morality; such exploitation shall not be deemed to be so contrary merely because it is prohibited by law or regulation in some or all of the Contracting States;

¹⁹⁹ The draft of the Guideline for the Examination of Computer Software primary referred to the USPTO MPEP and the JPO JP-EG in the field of computer software-related inventions, which was supposed to meet both the requests of foreign applicants and the reduction of the impact on the Taiwanese software industry at that time. Thus, how to draw a proper scope of right for this subject-matter without harming the local software industry was a main concern of the TIPO. Another big challenge to grant patent rights on this subject matter was that there were no relevant prior art in the databases of the TIPO, nor did it

3.2.3 Judicial Change for Computers Software Invention

Prior to the revised TW-EG of 1998 that considered CS inventions statutory, the Judicial Yuan at the Ninth Conference on the Research of Judicial Practice in 1986 discussed whether or not a computer program is a patent-eligible subject matter:²⁰⁰

A computer program is a series of instructions that directly or indirectly enable a computer to output a certain result. In our opinions, we suggested to accept it as a patent-eligible material since the provision of the nonstatutory subject matters in the revised 1986 Patent Act did not exempt computer programs from patent grants based on the demand of the global tendency to accept computer programs as a patent-eligible subject matter.

It further reasoned that:²⁰¹

A computer is a mere storehouse prior to the input of software. Once a computer program is input into a computer as part of its physical structure, or there is a dynamic combination of software with hardware, the computer as a whole can be seen as a means or a physical apparatus to accomplish a specific objective. Thus, a computer program in this condition may be viewed as a patent-eligible subject matter applying laws of nature.

According to this opinion, the court considered that a computer program was part of a computer device after it was input into a physical device, which could be seen to be an integral unit for a specific purpose as a whole. Therefore, it might involve the creation of technical features by the application of laws of nature.

have experienced patent examiners at that time. Therefore, how to deal with this subject matter in theory and in practice primarily borrowed from those countries having approved this subject matter. Cf. Some literatures have doubted the legal status of the TW-EG since it is an internal administrative rule for examiners, not an approved Act for the public.

²⁰⁰ The Judicial Yuan is the highest judicial institute that supervises the judicial administrative affairs of all courts in Taiwan. See *Research on Civil Law*, vol.4, pp 509-511 (1986), available at <http://jirs.judicial.gov.tw/index.htm>.

²⁰¹ *Id.*

3.3 Requirements for Computer Software Inventions

There are two amendments to the TW-EG about CS inventions which can illustrate the tendency and changes of the TIPO on patenting this subject matter.

3.3.1 Revision of the Examination Guidelines for CS inventions

A. Examination Guidelines of 1998

A computer software-related invention was not seen as a patent-eligible subject matter until the promulgation of the examination guidelines for computer software inventions—Section 2, Chapter 8 Computer Software Related Inventions in 1998 (hereafter “1998 Guideline”).²⁰²

There were two important features in the 1998 Guideline: the classification of product claims and the requirement of physical transformation in method claims.²⁰³ Product claims are divided into two classes: software combined with non-specific hardware and specific software combined with specific hardware.²⁰⁴ As for the former, the determination of whether or not a claimed invention is a patent-eligible subject matter depends on the means or methods to solve a claimed problem. In the latter, the determination of patent eligibility is based on the physical structure of claimed specific hardware, or the combination of specific software with hardware.

In addition, a patent-eligible method claim is required to have a physical transformation occurring inside a computer or outside a computer in this Guideline; i.e.,

²⁰² See the TIPO, http://www.tipo.gov.tw/ch/ArtHtml_Show.aspx?ID=3bd209e9-efc4-4ad0-88e2-f30c5ffa9768&path=1664#2 (last visited on Oct. 21, 2010).

²⁰³ *Id.* (remarking that the method of classification for product claims was referred to the USPTO MPEP).

²⁰⁴ *Id.* (remarking that an invention related to software combined to non-specific hardware may be seen as mere processing by a computer, the determination of the patent eligibility should be based on a whole viewpoint according to guideline of 1998).

pre-computer process activity or post-computer process activity.²⁰⁵

B. Examination Guidelines of 2008

In 2008, the TIPO revised the previous guidelines and published “Chapter 9 Computer Software Related Inventions,” which included extending the category of CS inventions into computer program products, added a rule of review to the claiming language—Means-Plus-Function Clauses and Process-Plus-Function Clauses—and supplemented the definition of CS inventions in a new section (hereafter 2008 Guideline).²⁰⁶²⁰⁷

The 2008 Guideline replaces the classifications of product claims of CS inventions in the 1998 Guideline as they relate to three types of product claims—apparatus or system claims, computer readable medium claims, and computer program claims.²⁰⁸ Significantly, the category of patent-eligible CS inventions has been extended into virtual computer programs products. Besides, the main principle to review the patent-eligibility of inventions has been changed since it does not require a patent-eligible CS demonstrating a physical transformation proposed in the 1998 Guideline.²⁰⁹

3.3.2 Definition

The definitions below define some specific terms related to computer software and the category of CS inventions under the TW-EG.

²⁰⁵ This test was learned from the USPTO MPEP, but the TW-EG did not have further illustrations about how to apply the test.

²⁰⁶ The category of CS inventions in the 1998 guideline was divided into product claim and process claim.

²⁰⁷ See the TW-EG, at 2-9-1 to 4 (2008).

²⁰⁸ See Sec. 3.3.3 of this article.

²⁰⁹ An advanced discussion will be in the following section.

A. Definition of Specific Terms for Computer Software

Computer software is seen as one means for embodying algorithms under the TW-EG.²¹⁰ A computer software-related invention claims that steps involving a technical means in a certain field may be patentable.²¹¹

Additionally, some specific terms are defined for the subject matter, such as algorithm, program, and software.²¹²

1. Algorithm:

A set of steps or procedures that can be used to resolve problems and are executed step by step.

2. Software:

A set of instructions, which, when stored in a computer readable medium, can induce the computer to have data processing capabilities so as to indicate, achieve, or realize a specific function, task, or result.

3. Program:

An application technique that is mainly composed of program groups developed by human brains for flexible use of computers, as opposed to hardware that is mainly composed of electronic and physical entities, such as the computers and their input/output peripheral devices.

From the above definitions in the TW-EG, we can find three points. First, “software” has the same function as a “program,” and a “program” is a subclass of “software.” Second, software or programs as such are collections of algorithms. Third, software is a general noun for computer program products.

B. Category of CS Inventions

Will any invention related to the use of computer software be treated as

²¹⁰ See the TW-EG, at 2-9-1 (2008).

²¹¹ *Id.*

²¹² The TW-EG, at 2-9-33 (2008).

“computer software related-inventions”? The TW-EG defines this in the Appendix as:

a claimed invention to which computer software is indispensable.

That is, an invention involving computer software that is required to implement the invention itself will be examined based on the criteria of CS invention under patent law. Otherwise, even an invention claiming the use of computer software over the course of invention may be categorized under the category of non-CS inventions and will be examined based on general criterion as with the case of other ordinary subject matters.

3.3.3 Guidance to Claims for CS Inventions

In regards to the patent-eligibility of CS inventions, the review of this subject matter has to rely on the substantive contents in the context of disclosure instead of its form of expression.²¹³

Applicants can claim two types of objects—products and methods—by three types of claims for computer software inventions: product claims (or article claims), process claims, and Means-Plus-Function (or Steps-Plus-Function) language.²¹⁴ Product claims can be divided into computer apparatus or a computer system claim, a computer-readable medium claim, and a computer program claim. In addition to computer program product claims, “data structure products” or other similar products are considered to be within the same category.²¹⁵

Process claims mean that steps or procedures of a claimed method are

²¹³ The TW-EG, at 2-9-1 (2008) (“As to whether a claimed invention conforms to the definition of invention, the substantive disclosure of such invention rather than the form in which such invention is expressed shall be taken into account, so as to determine whether the contribution made by such invention as a whole to the prior art has technical characters.”).

²¹⁴ See the TW-EG, at 2-9-12 (2008).

²¹⁵ See the TW-EG, at 2-9-13 to 16 (2008).

accomplished by computer software.²¹⁶

The last one is a special type used when the former two types of claims cannot express claimed features of invention. The following instances can illustrate the main difference among these different types of claims.

A. Product Claims

1. Apparatus and System Claims

This category can be divided into two main sub-categories—apparatus and system claims. An invention primarily claiming various hardware components connected to each other and/or respective functions of hardware components will be categorized into apparatus claims, such as in Example 1. Otherwise, they will be categorized as system claims, such as Example 2.

Example 1: Apparatus Claim

[What is claim is]:²¹⁷

An apparatus for screening and searching e-mails, the apparatus including:

a flash memory and a storage unit made of a secure digital memory card;

an LCD panel display unit; and

a digital processing device connected to the LCD panel display unit;

wherein the digital processing unit screens e-mails stored in the storage unit according to predetermined e-mail screening rules, in order to screen out qualified e-mails to be displayed on the display unit.

²¹⁶ The TW-EG, at 2-9-12.

²¹⁷ The TW-EG, at 2-9-14 (The instance is quoted from case 2.).

Example 2: System Claim

[What is claim is]:²¹⁸

A point-of-sale (POS) system is capable of delivering a warning signal to the operator upon reading a commodity of which the expiration date has passed, comprising:

a barcode reading device for reading a barcode affixed to the commodity under transaction;

a memory device for storing commodity data such as the name and selling price of the commodity under transaction corresponding to the barcode...

From the above examples, we can find that an apparatus invention consists of various hardware components with unique functions. A system invention, compared with an apparatus invention, is assembled by various apparatuses consisting of various types of hardware components. Generally, a computer system is meant to offer diverse functions compared to a computer apparatus with a single or a simple function.

2. Computer Readable Medium Claim

A computer-readable-medium invention means that computer software or a data structure is stored on a medium such as a hard drive, a floppy disc, an optical disc, and so on. A medium in itself is unable to solve a claimed problem unless it is read through a hardware device. Such an invention will be viewed as a patent-eligible invention with a technical character when a further claimed technical effect occurs. The TW-EG illustrates the effect as that:²¹⁹

which *goes beyond* the normal *physical interactions between the program and the computer* is produced when the program stored in a recording medium is read and executed by the computer, or data structure stored in a recording medium

²¹⁸ The TW-EG, at 2-9-14 (2008) (The instance is quoted from case 3.).

²¹⁹ The TW-EG, at 2-9-15 (2008).

would be read to cause the computer to *perform specific processing* according to the data structure, the means for resolving the technical problem *as a whole has technical characters*.

As mentioned above, a patentable invention associated with software stored on a computer readable medium has to bring forth a different or a better performance than that of a mere connection of software to hardware. It also explains why a mere replacement of ordinary human activities by computer software technology will not be guaranteed to receive a patent if the replacement cannot lead to an unexpected result or a better performance.

Additionally, such a technical effect is considered able to occur in the following situations: the control of processing data, the internal functioning of the computer itself, or the operating interfaces of the computer itself and the like.²²⁰

However, a physical effect resulting from a change in current or voltage in the computer during the course of executing the program is excluded from this category.²²¹

Such an object can be drafted in two types of claims—a computer readable medium claim and a computer readable medium claim in reference-making form, as seen in Example 3 and 4. Example 3 is a computer readable medium claim that has to state each step of the software, such as executing step A, step B, and step C through the use of the computer. Example 4 illustrates that claims are recited in a reference-making form when technical features of different claimed methods are identical.

²²⁰ *Id.*

²²¹ *Id.*

Example 3: Computer Readable Medium Claim

[What is claim is]:²²²

A computer readable medium is for storing a data file, comprising:

at least one first digital data region and one second digital data region, wherein,

the first digital data region includes data for presenting a visual image from a first location,

the second digital data region includes data for presenting a visual image from a second location, wherein the second location is different from the first location; and

an index data region including index data where data of the visual images of a plurality of digital data regions overlaps with each other, for generating three-dimensional image effects.

Example 4: Computer Readable Medium Claim in Reference-Making Form

[What is claim is]:²²³

1. A method of determining and displaying the structure of a compound, comprising the steps of:

(a) solving parameters of the wave function of the compound;

(b) determining the structure of the compound based on the parameters; and

(c) displaying the three-dimensional structure of the compound determined in Step (b).

2. A computer readable medium having a program stored therein, wherein ***the program performs the steps recited in Claim 1*** when the program is loaded into and executed by a computer.

²²² The TW-EG, at 2-9-15, 16 (2008) (The instance is quoted from case 4).

²²³ The TW-EG, at 2-9-16 (2008) (The instance is quoted from case 5).

3. Computer Program Product Claims (for those not stored on a readable medium)

This category, compared to the previous category, is directed to those not stored in computer readable media, especially for those directly transmitted through communication networks.²²⁴ Thus, a computer program product residing in immaterial environments can be protected the same as that stored on physical media.²²⁵

The following two examples can illustrate how to draft claims in this sub-category; the first one is a form of a general computer product claim, and the second one is that a claim is recited in a reference-making form.

Example 5: Computer Program Product Claim

[What is claim is]:²²⁶

A computer program product to be executed by a computer after being loaded into the computer to perform the steps of:

a first program instruction causing a microprocessor to read a request for transmitting data, where the request is submitted by external outer hardware;

a second program instruction causing the microprocessor to respond and validate the request submitted by the external hardware for transmitting data, and to receive the data;

Example 6: Computer Readable Medium Claim in Reference-Making Form

[What is claim is]:²²⁷

1. A method for automatically displaying texts and images of e-mail, comprising the steps of:

a receiving step for receiving e-mail from networks;

²²⁴ *Id.*

²²⁵ *Id.* (“Computer program products are articles carrying computer readable programs without regard to their external forms.”).

²²⁶ The TW-EQ, at 2-9-16,17 (2008) (The instance is quoted from case 6).

²²⁷ *Id.*

a storing step for storing the received e-mail in a recording medium;

a determining step for determining whether the received e-mail contains image data; and

a displaying step for automatically displaying the textual and image data of the e-mail when the e-mail contains image data.

2. A computer program product having a program stored therein for displaying texts and images of e-mail, *wherein the program performs the steps recited in Claim 1* when the program is loaded into and executed by a computer.

All of the above examples associated with product claims demonstrate that the claimed software is combined with hardware no matter in what environment software exists.

B. Process Claims

Process claim or method claim is involved in steps or procedures of a computer software-related invention based on the flow of method to implement the invention. For instance, an invention claims a method of information processing for the transaction of daily business based on the flow chart in the following claim.

Example 7: Process Claim

[What is claim is].²²⁸

²²⁸ The TW-EG, at 2-9-12, 13 (2008) (The flow chart is quoted from example 1.).

A method for processing information of an enterprise's daily transactions, including the steps of:

reading information input from a computer at the client end, the entered information including at least dates, accountant titles, and amounts of money of the transactions;

accessing an electronic form of the general ledger in an account database;

comparing whether the total amount of the debit field of the general ledger is equal to the total amount of the credit field;

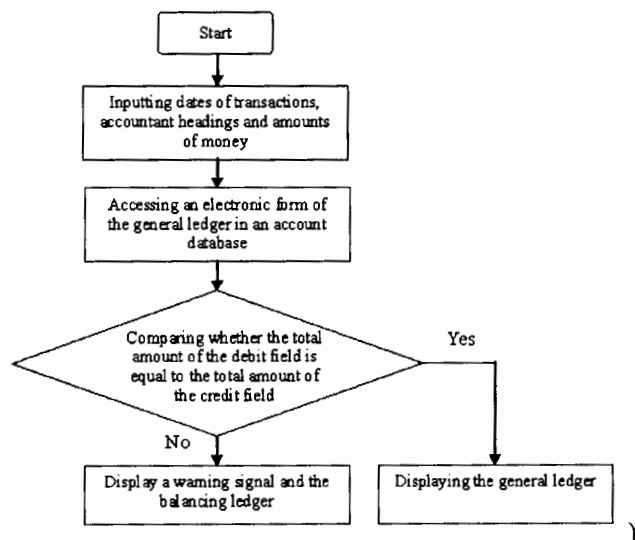
displaying on a display device the electronic form of the general ledger relating to the enterprise's transactions carried out on the current day if the total amount of the debit field is equal to the total amount of the credit field; and

displaying on the display device a warning signal and an electronic form of the balancing ledger of each title relating to the enterprise's transactions carried out on the current day if the total amount of the debit field is not equal to the total amount of the credit field.

The above claim states five processes in claims as indicated in the flow chart and the claim is also critical to the implementation of the invention.

C. Means-Plus-Function Language or Step-Plus-Function Language

Compared to the two types of claims above, some inventions may be better



claimed by their functions that are verified by the experiments or operations in the specifications. Thus, such an invention may use “Means-Plus-Function” or “Step-Plus-Function” language to express its claims that are construed to cover the corresponding structure, material, or acts described in the specifications and equivalents.²²⁹ For instance, Example 8 claims in Step-Plus-Function language and Example 9 claims in Means-Plus-Function language.

Example 8: Step-Plus-Function Language

[What is claim is]:²³⁰

A method for activating a remote server to read/write data, comprising the steps of:

a signaling step for sending out a read/write control command from a local computer;

a forwarding step for forwarding the command to a remote server by use of networks;

an executing step for executing a read/write action after the remote server receives the read/write control command; and

a returning step for returning execution results to the local computer.

Example 9: Means-Plus-Function Language

[What is claim is]:²³¹

A computer device for determining a three-dimensional structure of a compound, comprising:

a computing means for computing the wave function of the compound;

a determining means for determining the three-dimensional structure of the compound represented by the wave function; and

a displaying means for generating and displaying an image of the three-dimensional structure representing the compound.

²²⁹ The TW-EG, at 2-9-17, 18 (2008).

²³⁰ The TW-EG, at 2-9-18, 19 (2008) (The instance is quoted from Case 9).

²³¹ *Id.* at 19 (The instance is quoted from Case 10).

The claimed scope of the above two instances is determined by the corresponding structure, material, or acts described in the specifications and drawings, which should be definite and should be able to support their claims.²³²

D. Summary

According to the above examples, we can draw a table to demonstrate the categories of patentable CS inventions and various claiming languages to draft claims, as indicated in the following table.

Objectives of CS inventions	Subcategory	Claiming Languages	
Product claims	Apparatus or system	Same as left	Means-plus-function language or step-plus-function language
	Computer readable medium	Same as left	
	Computer program product	Same as left	
	Data structure	Same as left	
Method claims	Steps or procedures	Same as left	

Figure 3 - 3 Classifications of patentable CS Inventions in the TW-EG

Besides, we can find that whatever claim language is used, all claims involve operations of hardware; i.e., a claim has to consist of software and hardware. However, hardware in claims is not required to be a specific physical device regardless of the guidelines of 1998 or 2008.

²³² *Id.* at 20-22 (regulating the principle of determination on whether a claim in “means-plus-function” or a “steps-plus-function” language is definite and supported by the description and drawings of the invention; and enumerating that the following are not required to describe the details of technologies corresponding to the function recited in a claim: “(1) A computer which has specific functions and can be realized by hardware, or by hardware and software. (2) A logistic circuit or other components within a computer, which can execute a series of computations specifically designated by a computer program. (3) A computer readable medium for storing and executing instructions, wherein the instructions are a computer program that may enable a computer to operate in a special manner.”).

3.3.4 Statutory Bars for Computer Software-Related Inventions

There is no big difference between computer software-related inventions and other subject matters for the requirements of patent grants. CS inventions also have to meet three important criteria—industrial applicability, novelty, and an inventive step (non-obviousness) as mentioned above. The following discussions will respectively point out the relevant rules related to each criterion as well as their features.

A. Industrial Applicability: Article 22, Paragraph 1

Paragraph 1 of the Article 22:

An invention which is industrially applicable...may obtain a patent[.]

This criterion is similar to the “utility” requirement in §§ 101 and 112 of the U.S. Patent Act and includes two elements: what industries are allowed and what is “industrial applicability.” The former, as mentioned above, covers all current industries and business activities except those nonstatutory inventions.²³³

The latter means that any invention that is able to be utilized or manufactured with a claimed means embedding a technical character will be deemed to be industrially applicable.²³⁴ Notwithstanding, a theoretically applicable invention is not equal to an industrially applicable one; for example, utilizing plastic films that can absorb ultra-violet to protect the earth from harm due to a hole in the ozone layer is not seen as industrially applicable.²³⁵ In order to obtain patent rights, an applicant needs to respond to the office letter regarding where the claimed invention can be used when the

²³³ See *Article-by-article interpretation of the Patent Act*, *supra* note 165, at 42.

²³⁴ See the TW-EG, at 2-3-1, 2 (2009).

²³⁵ *Id.* at 2-3-2. See Sec. 2.1, Chap 1, Part II, JP-EG (The instance is borrowed from that in the JP-EG).

invention is not clearly specified in a certain technology field.²³⁶

In addition, the requirement of “industrial applicability” is different from that of “sufficient disclosure” of an invention that requires an applicant to clearly disclose his/her invention in the specification or drawings for a person of ordinary skill in the art. That is, the above person can repeat the claimed invention without extra tests or effort.²³⁷

Besides the above-mentioned, a test of “industrial applicability” does not require that a claimed technique is compared with other means or technologies. That is, a review of “novelty” or “inventive step” of an invention has to compare with the prior art prior to the filing date, rather than for “industrial applicability.”²³⁸

B. Novelty: Article 22, Paragraph 1-3

The novelty bar is enacted in item 1 and 2 of paragraph 1 of Article 22:

Any invention which is industrially applicable and is free from any of the following conditions may obtain a patent...:

1. Which, prior to applying for patent, has been published or put to public use.
2. Which, prior to applying for patent, has been known to the public.

The standard of novelty adopted under the TW-Patent Act is an “absolute novelty,”²³⁹ thus, any publication or information known to the public prior to the filing date, no matter where it is, will be seen as a prior art to the claimed invention.

However, there are three situations regulated in paragraph 2 of Article 21 which

²³⁶ *Id.*

²³⁷ See the TW-EG, at 2-3-1, 2 (2009) and the TW-CSG, at 2-9-25, 26 (2008) (How to distinguish “industrial applicability” from “sufficient disclosure” had confused the patent practice in Taiwan. Currently, it is clarified by the TIPO. The former means “any activities in any fields that utilize laws of nature and thus have technical characters.” Nowadays, the scope of industries in a broad sense includes business. The latter means that “the description of invention for the claimed invention must be in a form that enables persons having general knowledge in the art to which it pertains to understand the contents of and to carry out the invention.”).

²³⁸ See *Article-by-article interpretation of the Patent Act*, *supra* note 165.

²³⁹ *Id.* (reasoning that the types of novelty adopted are not defined in the TW-Patent Act, and those items without novelty are negatively listed).

are exempted from above regulations:

[If a] patent application has been filed within six months from the date of occurrence of fact of the foregoing causes, such invention will be free from the restrictive conditions set forth in the preceding paragraph:

1. Where the invention is created as a result of research or experiment;
2. Where the invention has been exhibited at an exhibition sponsored or approved by the government; or
3. Where the invention has been disclosed in an occasion not intended by the patent applicant.

The above rule of the novelty grace period can make applicants able to apply for their patents without losing the novelty requirement within six months, since inventions are known to the public based on the above three scenarios.²⁴⁰

C. An Inventive Step: Article 22, Paragraph 4

An inventive step or non-obviousness is an important requirement for invention patents stipulated in Article 22, Paragraph 4:

[I]f the proposed invention can be easily accomplished by a person having ordinarily knowledge in the art based on prior art before the application for patent is filed, no invention patent should be granted for such invention under this act.

As mentioned above, current texts have omitted “highly advanced” in the article, causing fewer disputes over the standard of creativity.²⁴¹

Besides, the TIPO enumerates five modes to illustrate whether or not CS inventions are obvious to a person of ordinary skill in the art when computer software is applied to five conventional activities: an applications to other technical fields, an

²⁴⁰ Item 2 of this article is referred to Art. 11 of the Paris Convention. Art. 11(1), Paris Convention for the Protection of Industrial Property:

(1) The countries of the Union shall, in conformity with their domestic legislation, grant temporary protection to patentable inventions, utility models, industrial designs, and trademarks, in respect of goods exhibited at official or officially recognized international exhibitions held in the territory of any of them.

²⁴¹ See above discussion.

addition or replacement of a well-known technical feature, a design change based on a well-known fact or custom, the systemization of an operation process that a human undertakes, and the implementation by software of functions that are otherwise performed by hardware.²⁴²

1. Application to Other Technical Fields

The application of computer software to different technological fields will generally generate similar functions or effects regardless of the fields in which they are applied. Thus, if a means adopted in one field applies to another technical field with substantially the same function and effect, it will not be seen as an inventive step to a person of ordinary skill in the art.²⁴³ However, if the application can produce an unexpected result or overcome a long-term unsolved problem in the field, the invention may be seen to have an inventive step.²⁴⁴

For instance, a searching method used in the prior art—a medical information searching system—is transferred and employed to a technical field of a claimed invention for a “commodity information searching system.” If the latter invention offers a similar function with the same means to solve a problem, the invention will be seen to be easily accomplished by a person of ordinary skill in the art without an inventive step.²⁴⁵

2. Addition or Replacement of a Well-Known Technical Feature

If the content of an invention is only supplemented by some known technical

²⁴² See the TW-EG, at 2-9-27 and 28 (2008).

²⁴³ The TW-EG, at 2-9-27 (2008).

²⁴⁴ *Id.*

²⁴⁵ *Id.*

features of the prior art or replaces some features of the prior art with known technical features, the invention is seen to be obvious to a person having an ordinary skill in the art unless the outcome of the invention can produce unexpected efficacy or overcome a long-term unsolved problem in the prior art.²⁴⁶ For instance, adding a mouse clicking function or a barcode scanner function to a keyboard as a new input device will be deemed to be obvious to a person having an ordinary skill in the art.²⁴⁷

3. Design Change Based on a Well-Known Fact or Custom

An invention with a slight design change to prior arts based on a well-known fact or custom will be seen to be obvious to a person of ordinary skill in the art.²⁴⁸ For instance, adding a 7-day grace period (7-day free trial) for customers in conventional business activities to a business method will be seen to be obvious to a person having ordinary skill in the art.²⁴⁹

4. Systemization of Operation Processes of Human Undertakings

This mode can be easily illustrated by a practical example; for instance, an invention converts transactional activities or business methods that can be undertaken by humans in the prior art into a computer system.²⁵⁰ If the development of this system uses a general technique of system analysis and system design, then this invention will be seen to be easily completed by a person having an ordinary skill in the art.

²⁴⁶ The TW-EG, at 2-9-28 (2008).

²⁴⁷ *Id.*

²⁴⁸ The TW-EG, at 2-9-28 (2008).

²⁴⁹ *Id.*

²⁵⁰ *Id.*

5. Implementation by Software of Functions that are Previously Performed by

Hardware

An invention merely utilizes software to perform functions that have been accomplished by a hardware device without resolving any further problems occurring in the process of implementation by software, a situation which will be seen to be obvious to a person of ordinary skill in the art.²⁵¹ For instance, a computer software invention merely implements the addition function with the application of software to perform the same function of addition as a logistic circuit in a hardware half adder without resolving the existing problems occurring in the application of the software, which will be deemed as being obvious to a person having ordinary skill in the art.²⁵²

From the above five modes exempted from patent grants, we can conclude that the scope of patent grants to CS inventions is not unlimited. If a mere replacement of ordinary operations undertaken by humans or computer software cannot result in much more or significantly improved functions beyond the originals, it will be seen as obvious to a person having an ordinary skill in the art.²⁵³ Therefore, this criterion is another important threshold that can prevent the granting of patents on CS inventions having no technical feature as well.

²⁵¹ *Id.* at 28, 29.

²⁵² *Id.*

²⁵³ Some traditional manual activities may be replaced with computer operations, so an invention merely applying computer technology to traditional industries or business is not considered to be proper to obtain a patent.

3.3.5 Other Requirements for CS Inventions

A. Sufficient Disclosure

Article 26, Paragraph 2:

The description of invention shall contain a sufficiently clear and complete disclosure of contents of the invention so as to enable a person skilled in the art to understand the contents of invention and to practice a so-called invention.

This Article was revised in 2003 based on the reference to the TRIPS Article 29(1) as well as the JP-Patent Act Article 36(4) (1994),²⁵⁴ which requires an applicant to disclose what he/she claims in the specification and drawings.

Specifically, some diagrams related to computer programs able to illustrate claimed technical features can be depicted in the drawings, such as general flowcharts or functional block diagrams of the computer software data flowchart, pseudo code, and timing diagram.²⁵⁵ As to the functional block diagram, the TW-EG requires that:²⁵⁶

[T]he description of invention shall describe the interrelation among respective software modules and respective hardware components, or the connection relationship among various hardware components depicted in the functional block diagram[.]”

Unclear disclosure of an invention can be divided into the following four types.

1. Without disclosing the procedures or functions implemented by software or hardware

To take, for instance, an information processing system related to a business

²⁵⁴ See TRIPS Art. 29(1):

Members shall require that an applicant for a patent shall disclose the invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art[.]

See JP-Patent Act 36(4)(i) (1994):

[T]he statement shall be clear and sufficient as to enable any person ordinarily skilled in the art to which the invention pertains to work the invention[.]

²⁵⁵ The TW-EG, at 2-9-9 and 10 (2008).

²⁵⁶ *Id.*

method, the description of this invention does not disclose what methods or rules are implemented on a computer.

2. The use of uncommon technical language, abbreviations, or symbols

Commonly known or used technical languages should be used, such as system software used to manage and access hardware resources, as well as operating systems, assemblers, compilers, utilities and etc; and application software assisting users in utilizing computers to resolve problems, including editing software and packaged software in C++ language and so on.

As to a newly created special software or software unknown to the persons in the claimed art, the description of invention should describe its embodiments to make persons having general knowledge in the art able to understand what it claims.²⁵⁷

3. Functional block diagrams or general flowcharts unable to be understood

Although functional block diagrams or general flowcharts are allowed as an assistant means to make an invention related to computer software more readable to persons in the art, they are still unable to make people understand.²⁵⁸

4. Unclear claims in Means-Plus-Function language or Step-Plus-Function language

For instance, an information processing system for business data only claims a work-flow in means-plus-function language without demonstrating a corresponding relationship between the means and the work-flow.

In addition to the above types associated with insufficient disclosure, we can also refer to the following case.

²⁵⁷ *Id.* at 2-9-10.

²⁵⁸ *Id.* at 2-9-11.

1. Judicial History:

International Multimedia Corp. in the U.S. filed an application to the TIPO in 1994 which was rejected based on the reason that the claimed invention violated Article 20, formerly part of paragraph 1 and Article 22, paragraph 3, TW-Patent Act (1997).²⁶⁰ The plaintiff finally appealed to the Taiwan Administrative Supreme Court upon subsequent rejections of the administrative appeals to the Petitions and Appeals Committee of the MOEA and the Petitions and Appeals Committee of the Executive Yuan.

2. Subject-Matter of Invention

The plaintiff's invention was related to a "sub-orbital, high altitude communications system" as an alternative to satellites. The main technical means of this invention was to use balloons or unmanned aerial vehicles as carriers for relay stations, as the abstract of invention indicated in the following,²⁶¹

A sub-orbital, high altitude communications system [is] comprised of at least two ground stations and at least one high altitude relay station. Each of the ground stations including means for sending and receiving telecommunications signals. The relay stations [] include means for receiving and sending telecommunications signals from and to the ground stations and from and to other relay stations. Means are provided for controlling the lateral and vertical movement of the relay stations so that a predetermined altitude and location of each

²⁵⁹ 2000 (judgment) no.1 (Taiwan Adm. Supreme Ct., Jan. 6, 2000).

²⁶⁰ Art. 20, former part of para. 1 Patent Act (1997) ("An invention which is industrially applicable...may obtain a patent.") and Art. 22, para. 3, Patent Act (1997) ("The specification referred to in paragraph 1 of this Article shall contain the scope of claims as well as prior art, objective of invention, technical content or features, and functions so as to enable person skilled in the art to understand the contents of and to practice said invention."). Art. 20, para.1, TW-Patent Act (1997) corresponds to Art. 22, para. 3, TW-Patent Act (2010), and Art. 22, para. 3, Patent Act (1997) corresponds to Article 26 para. 1 and 2 TW-Patent Act (2010).

²⁶¹ WIPO Publication No. 004407, WIPO, <http://www.wipo.int/pctdb/en/wo.jsp?WO=1995004407> (The description of invention is quoted from the abstract in the specification of invention.).

of the relay stations can be achieved and maintained. Means are provided for receiving the relay stations so that they can be serviced for reuse.

3. Issue:

Was the applicant's disclosure about the maintenance of the location of balloons sufficient for a person having an ordinary skill in the art?

4. Holding:

The court rejected the plaintiff's appeal relying on the fact that the disclosure was unable to be understood by a person having ordinary skill in the art.

5. Reasoning:

The court reasoned that the plaintiff failed to answer the questions repeatedly asked by the TIPO and the Appeal Committees, such as the sizes of the balloons, the initial and final weights, capacities of energy, barometric pressures, airflows, wind directions, suitable seasons, and the comparison between systems. Thus, the disclosure in the specification was a mere statement of idea without physical technical means so as to fail to enable a person in the art to understand the content of the claimed technical means to apply the technical means to the associated art.²⁶²

B. Review as a Whole

The TW-EG notes that an invention should be reviewed as a whole instead of claims, as well as whether or not the contribution of an invention to the prior art has a technical character.²⁶³ That is, once the claimed means to solve a problem of the prior art has a technical character, the claimed invention is deemed to be a patentable invention.²⁶⁴

²⁶² The early courts thought that insufficient disclosure violated the industrial applicability as stipulated in Art.20, para.1, TW-Patent Act (1997), or in Art.22, para.1, TW-Patent Act (2010).

²⁶³ The TW-EG, at 2-2-1, 2 (2009) and the TW-EG, at 2-9-1, 2 (2008).

²⁶⁴ The TW-EG, at 2-3-2 (2009).

The above-mentioned rule for reviewing the patent-eligibility of an invention is very flexible and is expected to fit unknown or new technologies, and is similar to those of the JPO not merely relying on claims.²⁶⁵

Instances associated with this factor can be referred to the above section—Comparison of Claim Drafting. Cases 2 and 3 in the above section can be seen as cases that do not involve technical concepts as a whole.

3.4 Case Study

Most of the decisions on patent issues reached by Taiwanese courts are based on the Patent Act and the Enforcement Rules of the Patent Act, as well as the TIPO examination guidelines. However, some new issues may be referred to foreign courts' opinions when there is no rule or precedent to follow. The following cases are related to the construction to “invention” and the patent eligibility of subject matter.

3.4.1 Economical Applicability

Case: 1982 (judgment) no.122
(Taiwan Adm. Supreme Ct., Feb. 9, 1982)

1. Facts:

The invention at issue was related to a “simple operation method and combustion apparatus for the use of water as a fuel.”²⁶⁶ The claimed means was to vaporize water and then to split water molecules into hydrogen and oxygen by the combustion of fuels, causing spontaneous and assistant combustion. Thus, the inventor thought that water

²⁶⁵ The amendment to the TW-EG was proposed in 2010, which requires reviewing applications only based on claims.

²⁶⁶ See the *Collection of Main Idea of Decisions of the Administrative Court*, vol. 3, at 542; see also, court's decision: 1982 (judgment) no.122 (Taiwan Adm. Supreme Ct., Feb. 9, 1982), Judicial Databank of Judicial Yuan, R.O.C., <http://jirs.judicial.gov.tw/Index.htm>.

could be used as a fuel under these conditions.

However, the Administrative Supreme Court found that it was not applicable to ordinary boilers and that the addition of other metal catalysts into boilers to assist the splitting was still unable to reach the expected result since the temperature was too low. Moreover, the addition of other metal catalysts was not economical due to extra costs.

The court restated that an invention was directed at the creation of technical concepts by utilizing the laws of nature, and had to meet the “applicability”; i.e., “the stage of industrial applicability.”²⁶⁷ However, the invention at issue was unpatentable based on the fact that it was impractical in the industry due to diseconomy and the claimed means violating laws of nature.

2. Analysis:

Article 1 is the only rule related to the definition of invention so that the meaning of “invention” needs to be construed by judges.²⁶⁸ In this case, the meaning of “industrial value” in the statute extended into “industrial applicability,” which was a major change. A patented product may have the potential to be implemented in the market; however, it is not a necessary consideration when a patent is granted. Additionally, whether or not an additional cost to the invention will make it unable to be implemented in the real market should not be a main concern of the court or patent office for patenting.

Nowadays, the term “industrial value” has been revised to read “industrial applicability,” the meaning of which has become broader and more flexible.²⁶⁹ The examination on this factor will merely rely on applicants’ illustrations that their

²⁶⁷ See also, Taipei Adm. High court’s decision: 2001 (suit) no. 520 (Taipei Adm. High Ct. Jan. 10, 2002).

²⁶⁸ See Art. 1, Patent Act (1950) (“Any invention having an industrial value shall be granted a patent.”).

²⁶⁹ Cf. Art. 21 and 22 TW-Patent Act (2010); see also, Fig. 3-4.

inventions may be utilized in a certain field.²⁷⁰

The above case demonstrated the initial recognition of an invention in the past, but it might have the potential to affect the determination of this factor in the future as well.²⁷¹

3.4.2 Human Reasoning and Memory

The following four cases involved an input method for Chinese characters, and they were dealt with in different ways over time.

A. Case 1 (1983)

The invention at issue was related to “a coding method for Chinese characters by shapes” that divided 159 types of Chinese characters into 37 categories.²⁷²

The invention was rejected based on the fact that the claimed means needed human reasoning and memory. Thus, the applicant filed an administrative suit in the Taiwan Administrative Supreme Court.

The court rejected the appeal based on the fact that the categorization of Chinese characters involved subjective reasoning and users needed to memorize the categories and correct strokes of Chinese characters prior to the application of the claimed means. Thus, the invention was not designed by utilizing laws of nature and this failed to satisfy the requirements for patent.

B. Case 2 (1989)

This case was related to a Chinese input program that users could use to input

²⁷⁰ The TW-EG, at 2-3-1 and 2 (“If an application for patent can be manufactured or utilized, it will be seen to have the industrial applicability [.]”).

²⁷¹ See the comparison in Fig. 3-4.

²⁷² See *The Collection of Main Points of Decisions of the Administrative Court*, vol. 4, at 905; see also, court’s decision: 1983 (judgment) no. 1217 (Taiwan Adm. Supreme Ct., Sep. 30, 1983), Judicial Databank of Judicial Yuan, R.O.C., <http://jirs.judicial.gov.tw/Index.htm>.

Chinese characters and which referred to a table listing more than 900 characters.²⁷³

The court found that initial users needed to memorize the basic characters in the reference table stored on the computer prior to being familiar with the input method, so the means involved human reasoning and memory. Thus, it did not conform to the requirements for patent.

C. Case 3 (1997)

Chung v. National Standard of Bureau
(Taiwan Adm. Supreme Ct., Aug. 7, 1997)²⁷⁴

The plaintiff applied for a patent for an invention related to a Chinese input method for computer in 1993. The application was rejected by the National Standard Bureau (hereafter NSB, formerly of the TIPO) and the Appeal Committees, so the plaintiff filed an administrative suit in the Administrative Supreme Court.

The input method was to combine Chinese phonetic input with phonemes, such as sounds, rhymes, and tones. The main feature was that initial consonants and vowels could exist on the same keys, reducing the phonetic keys on the keyboard and making spare keys available for other uses. While typing, users could enhance the typing speed without repeatedly switching between English and Chinese input methods.

However, the court held that the claimed means involving the creation by human reasoning did not conform to Article 21, paragraph 2, item 5, as well as Article 19, 1993 Patent Act.²⁷⁵

The rationale of the court was that the claimed means implemented by human

²⁷³ See *The Collection of Main Points of Decisions of the Administrative Court*, vol. 9, at 839; see also, court's decision: 1989 (judgment) no. 1020 (Taiwan Adm. Supreme Ct., May 30, 1989), Judicial Databank of Judicial Yuan, R.O.C., <http://jirs.judicial.gov.tw/Index.htm>.

²⁷⁴ See court's decision: 1997 (judgment) no. 1918 (Taiwan Adm. Supreme Ct., Aug. 7, 1997), Judicial Databank of Judicial Yuan, R.O.C., <http://jirs.judicial.gov.tw/Index.htm>.

²⁷⁵ See Art. 21, Patent Act (1993); see also, the following table at the end of this section.

reasoning and memory did not conform to the above regulations. The disclosure and claims of the invention were merely to claim a Chinese input method that did not consist of physical computer hardware to establish an inventive processing system. Therefore, it did not satisfy the requirements for patent.²⁷⁶

D. Case 4 (2006)

In fact, there have been granted more than 130 patents related to Chinese input methods by the patent office in Taiwan. We can refer to the following instance regarding what kinds of claims will be seen as patentable.

1. Facts:

The following patent is related to an input method for Chinese characters through a numeric keyboard.²⁷⁷ The main feature of the invention is the division of strokes and radicals of a Chinese character into five sets of code that correspond to the five keys of the numeric keyboard respectively, so that a 3 × 3 keyboard can be used as an input terminal.²⁷⁸

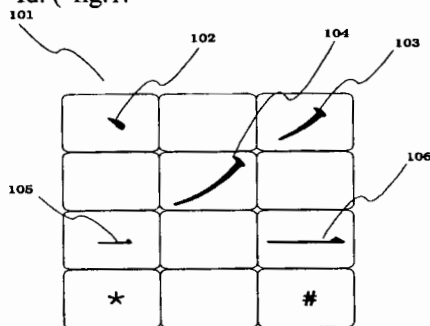
[What is claim is]

1. An input method for Chinese character through a numeric keyboard, 3 × 3 keyboard, which is used as an input terminal,

²⁷⁶ CS inventions were considered nonstatutory at that time.

²⁷⁷ Taiwan Patent No. I320898 (issued Feb. 21, 2010) (Title: Input method for Chinese character through a numerical keyboard).

²⁷⁸ Id. ("fig.1:



”).

and the inventor divides the strokes and radicals of Chinese characters into five sets of code such as “、”, “[103]”, “[104]”, “-” and “—” that correspond to the five keys of the numeral keyboard respectively, keys in the Chinese character by its order of strokes, and chooses the character from the list.

2. The input method as claim 1, wherein the “、” represents a point; [103] represents a short curved slash or reversed slash, [104] represents a long short curved slash or reversed slash, “-” represents short horizontal dash or vertical dash, and “—” represents long horizontal dash or vertical dash.

2. Analysis:

The above means shows that only very few rules and basic Chinese handwriting ability are needed, and it can be quickly learned without involving too much human reasoning and memory. Besides this, the inventor does not claim an algorithm as such since the operations have to be implemented by the combination of software with a keyboard.

E. Summary:

The above cases 1, 2 and 3, show the court’s consistent opinions on input methods for Chinese characters for computers over time. On the basis of subjective human reasoning and memory, the above methods as claimed in case 1 to case 3 are seen to be patent-ineligible. However, there are many cases related to this method that are such as case 4. In case 4, a patent was granted since it required less demand for human reasoning and memory, so it was considered to be patent-eligible.²⁷⁹ All in all, an invention relying too much on personal subjective ability with regard to reasoning or

²⁷⁹ Actually, to some extent, all of these four cases need human reasoning and memory. To draw a bright line to distinguish cases 1-3 from case 4 is difficult.

memory may be challenged over its patent eligibility.²⁸⁰

3.4.3 Features of Inventions

Case: 1988 (judgment) no. 1136
(Taiwan Adm. Supreme Ct., July. 5, 1988)

1. Judicial history:

This case was decided in 1988 by the promulgation of guidelines for CS inventions (1998), so a CS invention was not seen to be statutory at that time.

The invention at issue was related to “a real-time Mandarin text-to-speech system by the connection of morphemes” applied for patent in 1985.²⁸¹ It was rejected based on the reason that it did not involve any inventive step (obvious factor). Subsequently, the applicant appealed to the Administrative Supreme Court.

2. Claimed subject matter:

The claimed invention can be divided into two parts: computer software and computer hardware. The former part includes changing rules of tones in the prior art, 406 terms of data, 4 groups of data, and a driver for speech synthesis that refers to an index table. In the index table reference data can be input—data such as term length, tones, volume, a pause between morphemes, and control parameters to form a speech parameter. The latter part includes a speech synthesis interface card, memory for speech parameters, RAM for attribute data, and a micro-processing system.

A computer program is then written based on several rules that are reduced from the statistics of Mandarin speech. This program can be used to synthesize Mandarin speech by the Mandarin synthesis device in the computer.

²⁸⁰ There is a similar issue related to the input method for Chinese characters for computer in SIPO.

²⁸¹ See *The Collection of Main Points of Decisions of the Administrative Court*, vol. 8, at 1038; see also, court’s decision: 1988 (judgment) no. 1136 (Taiwan Adm. Supreme Ct., July. 5, 1988), Judicial Databank of Judicial Yuan, R.O.C., <http://jirs.judicial.gov.tw/Index.htm>.

3. Court's holding and reasoning:

The court found that the improvement was associated with software due to the fact that the claimed means was implemented by computer programs and did not recite any technical features associated with hardware. Thus, the court agreed with previous opinions that the claimed invention did not involve any inventive step.

4. Analysis

Prior to the promulgation of guidelines for CS inventions, patents had been granted to 795 inventions associated with computer programs claiming apparatuses or systems.²⁸² Some inventions implemented by executing software still had the possibility of being granted patents if their claims could demonstrate technical features of hardware. However, according to instances under the current TW-EG of 2008, software claims still have to recite their functions interacting with hardware, except those written in mean-plus-function. The big difference between them is that technical features of hardware were not a main concern to determine patent eligibility of computer software inventions.

3.4.4 Technical Means to Solve Problems

Chung v. NBS

(Taiwan Adm. Supreme Ct., Dec. 30, 2004)²⁸³

This case was related to a patent invalidation or post-grant opposition.

1. Judicial history:

The plaintiff applied for a patent for an invention related to a “method for the manufacture of bamboo venetian blinds” in 1998. The NBS rejected the invention at

²⁸² The amount is counted by searching the keyword—programs—in claims, and IPC G06 of the invention patents published by Oct. 1, 1998 from the patent database of TIPO.

²⁸³ See court's decision: 2004 (judgment) no. 1701 (Taiwan Adm. Supreme Ct., Dec. 30, 2004), Judicial Databank of Judicial Yuan, R.O.C., <http://jirs.judicial.gov.tw/Index.htm>.

the initial examination but reversed the decision at the stage of re-examination. However, a third party filed a patent invalidation to the NBS and then the NBS overturned the patent. The rationale to overturn the patent was based on the fact that the invention did not meet the requirements—novelty and inventive step (non-obviousness)—relying on the prior art proposed by the third party.

Thus, the plaintiff filed an administrative appeal for the overturn, but the appeal was rejected. Subsequently, the plaintiff filed an administrative suit in the Administrative Supreme Court.

2. Claimed subject matter:

The claimed invention was related to a series of processes to manufacture bamboo venetian blinds, such as selecting proper bamboo, shaving both sides of the selected bamboo, boiling the bamboo to prevent decay, gluing the pieces, and so on.

3. Issue:

Could the reference documents proposed by the opponent be the prior art against the claimed invention?

Did the claimed invention meet the requirement of an inventive step?

4. Court's holding and reasoning:

The court reviewed the case relying on the reference documents proposed by the opponent and held that the claimed invention did not meet the requirement of “inventive step.” The court restated that an invention having a technical nature under the regulations means that the claimed means solve a problem with a means involving a technical field and is a “highly advanced creation” that is applicable in the industry.²⁸⁴

²⁸⁴ In this case, the critical factor to reject the application was based on that the claimed means only met the lower standard of the creativity of invention; i.e., the application might meet the standard for “utility

5. Analysis:

From the above case, the so-called technical concept or technical featured means of invention means that an invention uses a technical method to solve a problem in the prior art. Namely, a physical means or method in claims is required to prove its success in the invention.

3.4.5 Business Method

Trend-go.com Inc v. TIPO
(IP Ct. Aug. 13, 2009)²⁸⁵

1. Judicial history:

The plaintiff filed an application for an invention related to “a method for bargaining during shopping” in 2003. The invention was rejected by the TIPO and later on, the administrative appeal was also rejected by the Appeal Committee, MOEA. Thus, the applicant filed an administrative suit in the TW-IP Court.

The court agreed with the TIPO’s opinions in part and reversed the decision in part, so the invention was returned to the TIPO for prosecution.

2. Claimed subject matter:

The intention at issue claimed a real-time bargaining and shopping system by means of a computer program and a database to give customers real-time suggestions on prices and shopping modes according to individual IDs, shopping history, amounts and types of items, and so on. There were eleven claims in total. Only claim 1 was an independent claim and the rest were dependent claims.

model” patents, but not meet that for invention patents. The amendment to the article omitted – highly advanced – in the text.

²⁸⁵ See court’s decision: 2009 (adm.-patent-suit) no.37 (IP Ct. Aug. 13, 2009), Judicial Databank of Judicial Yuan, R.O.C., <http://jirs.judicial.gov.tw/Index.htm>.

3. Issue:

Did the claimed invention meet the requirements of the novelty and an inventive step?

4. The TIPO's Arguments

The TIPO rejected the invention on account of the invention being obvious to a person having an ordinary skill in the art. The TIPO cited prior arts 1 to 4 to reject the claim 1(b) of the invention, wherein prior arts 1 to 3 were the application of principles of a business method offering a respective bargaining method and prior art 4 was a bargaining mode between a virtual buyer and seller. The TIPO held that the claimed method merely adding the item—promotion for selection—was not a unique invention. Additionally, according to prior art 4, a new promotion could be offered to customers when previous bargaining did not reach a deal. Thus, in comparison with prior arts 1 to 4, the claim 1(b) was obvious to a person of ordinary skill in the art.

In summary, the TIPO concluded that the claimed method in the claim 1(b) was a mere statement of business per se, like that being indicated in prior arts 1, 2 and 3. In addition, it was not involved in the creation of technical function by utilizing a technical means.

5. Court's holding and reasoning:

The court found that claim 1 of the invention at issue was a bargaining system for a real-time transaction by a computer program and a database. The steps included selecting products, selecting bargaining modes, proceeding with bargaining processes, accepting or cancelling a transaction in the final stage, and so on. Thus, the claimed means was implemented by computer, which was a physical means to reach a business

objective or business function so as to conform to the definition of invention.

The court reasoned that the TIPO erred since the claimed means was to operate various bargaining modes in online shopping by means of computer resources and to implement a business method by network technique, so that it was not a business method per se. Additionally, claim 1 at issue had an inventive step.

Since claim 1 did not lack of inventive step, it was improper to reject the rest of the claims (i.e., from 2 to 11) based on the same reason. Additionally, other requirements for the patent still needed to be reviewed. Therefore, the court returned the application to the TIPO for prosecution.

6. Analysis:

An invention related to a business method is accepted as statutory subject matter if it is claimed as a CS invention under the TW-EG (2008). Namely, a patent-eligible business method has to be implemented by computer resources, as illustrated in the case below:²⁸⁶

[A] business method is realized by the use of computer technology, and the technical means of such invention in nature does not reside in the business method per se, but a specific method of doing business is based on computer hardware resources for implementing a certain business objective or function; such invention shall be deemed as technical means in certain technical field, and thus conform to the definition of invention.

The above illustrates two points. First, an invention related to a business method is seen as a patent-eligible subject matter when it is implemented by computer resources.²⁸⁷ Second, such inventions still need to meet other requirements as those for CS inventions.

²⁸⁶ The TW-EG, at 2-9-3 and 4 (2008).

²⁸⁷ The category of patent-eligible business method inventions seems narrower than that in other jurisdictions based on the illustrated example under the TW-EG (2008).

3.4.6 Technical Features by Utilizing Laws of Nature

This case is related to the court's construction of what is a patent-eligible CS invention. The invention at issue was related to a method to assess values of technologies based on stock prices and types of industries.

IP Tech. Inc. v. TIPO
(Taipei Adm. High Court, Mar. 15, 2007)

1. Judiciary history:

The applicant, Intellectual Property Technology Inc., on July 10, 2001 filed an invention patent application, No. 090116909, which was rejected by the TIPO on Sep. 13, 2002. The applicant re-applied for a re-examination and was rejected by the TIPO on July 26, 2005. The applicant then filed an administrative appeal to the Petitions and Appeals Committee of the Ministry of Economic Affairs on January 20, 2006. The Committee rejected the appeal based on the fact that the applicant's claims did not disclose technical features by utilizing the laws of nature.²⁸⁸ Thus, the applicant filed an administrative suit in the Taipei High Administrative Court.

2. Issue: Was the claim a patent-eligible subject matter?

3. Claimed subject matter:

The invention at issue was related to a method and system for the appraisalment of technology for the prediction of the value of a technology based on the data from the values of research and development, patent values, and so on. The invention had twenty four claims, in which claims 1 and 13 were independent. Claim 1 involved the

²⁸⁸ See <http://2k3dmz2.moea.gov.tw/aaweb/index.aspx> (Administrative appeals are decided by the Petitions and Appeals Committee, the Ministry of Economic Affairs. Applicants can file applications for patents through examination and re-examination by the TIPO, and then file administrative appeals to the Appeal Committee of the MOEA when applications are rejected by the TIPO. If applications are rejected by the Appeal Committee of the MOEA, applicants can file suits in the TW-IP Court.).

following:

A system for the appraisalment of technology, serves to predict a value of a technology; the appraisalment system includes using computer hardware resources to operate the following items:

- (1) a first data base, storing stock prices of reference companies over time;
- (2) a second database, storing net assets of the reference companies over time;
- (3) a calculation apparatus for intangible assets, the calculation apparatus being able to create a predicted price of an intangible asset based on the stock prices of reference companies over time and the net assets of the reference companies over time; using computer hardware connected to databases to get data and to make comparisons, making a calculation in the final ...

4. Applicant's arguments:

The claims at issue are statutory subject matter under Article 21, TW-Patent Act, so that the TIPO cannot reject those claims based on the reason that they violate the Article. Moreover, the invention at issue applies laws of nature, rather than claiming laws of nature per se. Thus, the claimed invention does not fall into the scope of nonstatutory subject matter.

According to the examination guidelines published by the TIPO supporting the patenting of computer systems or computer software, the invention at issue conforms to the regulations that involve the creation of technical characters by utilizing laws of nature.²⁸⁹

5. TIPO's arguments:

The invention at issue executes mathematical operations and calculations for the

²⁸⁹ The guidelines are directed to the 1998 Guideline. The main content of the 1998 Guideline related to this issue are similar to that of the 2008 Guideline.

assessment of technology by “the principle of option.”²⁹⁰ However, the applicant’s adopted principle and its relevant formulas were economic rules that did not involve any creation of technical concepts by utilizing laws of nature. Thus, the plaintiff’s claimed method or means was not under the scope of nonstatutory inventions of Article 21.²⁹¹

6. Holding and reasoning:

The Court reversed the TIPO’s decision and ordered that the TIPO should continue to examine other patent requirements instead of this factor.

The court found that:²⁹²

The invention at issue collects data from the published stock price databases, published patent databases and published financial statement databases to execute mathematical operations and calculations by the principle of option and the combination of computer software with hardware for the pricing of technology, which involves a technical means by utilizing laws of nature as a whole, not laws of nature per se.

The court further reasoned that:²⁹³

“[C]omputer software executed by computer hardware associated with the data processing will have a physical transformation effect; that transformation is not completed by humans no matter what a physical or chemical transformation, and which can be seen to be reached by utilizing laws of nature.” (quoting from the 1998 Guideline)... “[C]omputer software is one of algorithms that includes algorithm per se, laws of nature, scientific principles, mathematical methods, gaming or sports rules or methods, analytic steps or the inference of physical phenomena.” (quoting from the 1998 Guideline)... [T]he defendant cannot reject the plaintiff’s application based on that part of claims involve economic principles, humane decisions, mental activities[.]... The claims at issue at least includes: (1) storing stock prices and net assets over time; (2) generating predicted values of intangible assets; (3) generating a group of pricing reference index; (4) inputting

²⁹⁰ This is an economic theory.

²⁹¹ The TIPO’s rejection was based on the 1998 Guideline.

²⁹² Rational 3 of court’s opinions.

²⁹³ Rational 4 of court’s opinions.

a pre-determined period and a pre-determined cost; and (5) transforming data from the operations of above steps and then transferring the state of components during the operations; i.e., generating a kind of physical transformation. And, in claim 1 is not an economical rule per se but “a system for the appraisalment of technology,” and is also directly disclosed physical items operated by computer hardware resources, which obviously conforms to the requirement of utilizing laws of nature under the examination guidelines.

7. Analysis:

The court directly examined the detailed procedures in claims instead of the proposed steps of the TW-EG (1998) that initially distinguished the combination of software with specific hardware from that with general purpose hardware prior to the examination of a CS invention. The TW-EG (2008) omitted the previous classification method and procedures to examine CS inventions as well.

The court’s examination method was based on the review of claimed steps; i.e., how to input data and how to process the input data through the operations of the combination of software with hardware. However, the court did not clearly disclose the test of physical transformation under the TW-EG (1998) that required a physical transformation occurring in a CS invention.²⁹⁴ Similarly, the patent-eligibility requirement for CS inventions—physical transformation—is omitted under the current TW-EG (2008) that reviews each CS invention based on a detailed categorical rule as mentioned in the former section of this chapter. The advantage of the new TW-EG is that it offers a flexible standard for the examination of the patent-eligibility requirement for CS inventions; i.e., the determination of patent-eligibility for CS inventions may primarily rely on a detailed review of claimed steps of each invention. The

²⁹⁴ This test was similar to the machine-or-transformation test adopted in the U.S.

disadvantage is that an applicant may not claim a CS invention beyond the category of the examples of the TW-EG (2008); i.e., a new technology related to computer software may be rejected based on the fact that it cannot be categorized into the category of the examples in the TW-EG.

3.4.7 Summary

The following table shows the courts' interpretation of "invention" over time.

Year of Act	Article related to patent-eligible inventions in the TW-Patent Act	Main points	Cases
1960	Art.1 Invention having an industrial value shall be granted a patent. Art. 3 Industrial values in the Act mean those without the following: (1) Inappropriate items; (2) Failing to reach to the stage of implement. Art.4 The following items shall not be granted an invention patent: (1) Chemicals; (2) Food and hobby goods; (3) Pharmaceuticals and their composites; (4) Those violating law; (5) Those violating public order, good morals and sanitation.		
1979	Revised Art. 4 (6) New species of foodstuff.	Not utilizing the laws of nature	"Chess Rule" does not involve in any creation by utilizing the laws of nature. (Taiwan Adm. Supreme Ct., Aug. 13, 1981)
		"Industrial value" ≡ "Economical	Any invention without an economical value cannot be granted a patent.

		applicability”	(Taiwan Adm. Supreme Ct., Feb. 9, 1982)
		Ineligible subject matters: human reasoning and memory	“Coding method for Chinese characters” relies on human memory and reasoning. (Taiwan Adm. Supreme Ct., Sep. 30, 1983)
1986	<p>Revised Art. 4</p> <p>The following items shall not be granted an invention patent:</p> <p>(1) Food and hobby goods, but not including their methods for manufacture;</p> <p>(2) New species of animal and plants; but not including breeding methods of new species of plants and micro-organisms.</p> <p>(3) Diagnostic, therapeutic or surgical operation methods for the treatment of humans or animals;</p> <p>(4) Scientific theories and mathematic methods;</p> <p>(5) Gaming and sports regulations or methods;</p> <p>(6) Those methods or projects implemented by human reasoning and memory;</p> <p>(7) New uses of articles; but not including chemicals and pharmaceuticals;</p> <p>An invention which is contrary to public order, morality or public health., or the uses of patented articles violating laws;</p>	Requirement of features of hardware in claims	Claimed computer programs combined with hardware having no technical means. (Taiwan Adm. Supreme Ct., July 5, 1988)
		Ineligible subject matters: human reasoning and memory	Chinese input program relies on human memory and reasoning. (Taiwan Adm. Supreme Ct., May 30, 1989)

1993	<p>Art. 19 The term "invention" as used herein refers to any highly advanced creation of technical concepts by utilizing the Rules (laws) of nature.</p> <p>Art. 20 An invention which is industrially applicable and is free from any of the following conditions may obtain a patent upon application in accordance with this Act...</p> <p>Art. 21 The following items shall not be granted an invention patent:</p> <p>(1) New species of animal and plants; but not including breeding methods of new species of plants and micro-organisms.</p> <p>(2) Diagnostic, therapeutic or surgical operation methods for the treatment of humans or animals;</p> <p>(3) Scientific theories and mathematic methods;</p> <p>(4) Gaming and sports regulations or methods;</p> <p>(5) Those methods or projects implemented by human reasoning and memory...</p>	Ineligible subject matters: human reasoning and memory	Input method for Chinese characters relies on human memory and reasoning. (Taiwan Adm. Supreme Ct., Aug. 7, 1997)
1997	Same as above		
2001	Same as above	Technical characters mean to use technical means to solve problems	Invention having technical characters means to use technical means to solve a problem in the prior art. (Taiwan Adm. Supreme Ct., Dec. 30, 2004)
2003	Art. 21 The term "invention" as used herein refers to any creation of technical concepts by utilizing the Rules (laws) of nature.		

	<p>Art. 22 An invention which is industrially applicable and is free from any of the following conditions may obtain a patent upon application in accordance with this Act:...(Former part is the same as Art. 20 (1993))</p> <p>Art. 24 The following items shall not be granted an invention patent:</p> <ol style="list-style-type: none"> 1. Animals, plants, and essentially biological processes for production of animals or plants, except the processes for producing microorganisms; 2. Diagnostic, therapeutic or surgical operation methods for the treatment of humans or animals; 3. An invention which is contrary to public order, morality or public health. 		
2010	Same as above	Business method is a subcategory of CS invention	Business method is needed to be implemented by computer resources. (IP Ct. Aug. 13, 2009)

Figure 3 - 4 Interpretations of “invention”

Chapter 4 Software Patents in China

China has a very young patent law system compared with the previous two jurisdictions. In this chapter, I will first introduce the evolution of Chinese patent law and the examination guidelines for computer software inventions published by the Chinese patent office. I will then discuss the regulations of Chinese patent law and the examination guidelines related to the issue.

4.1 Historical Overview of Patent Law in China

4.1.1 The China Patent Law

The China Patent Law was not enacted until 1984 on account of the reform and open policy proposed in 1979. There had been many controversies over whether or not the patent system could be adapted to China.²⁹⁵ This newly born patent law was later referred to other jurisdictions, and is a compromised product between the obligations as a member of the Paris Convention and the state interests at that time.²⁹⁶

The Patent Law, then, was revised in 1992 according to the U.S.-China Memorandum of Understanding on Intellectual Property Rights in 1992,²⁹⁷ and it was also intended to conform to the TRIPS Agreement.²⁹⁸ The revision includes the extension of statutory subject matter, such as chemicals, pharmaceuticals, food, drinks

²⁹⁵ See *Explication to the Newly-adapted Patent Law* i, 3-4, (SIPO 2001)(The initial thinking was that fruits of inventions should be shared with all state enterprises, so that granting a patent to an individual is improper.).

²⁹⁶ *Id.*

²⁹⁷ *Id.*; see also, Trade Compliance Center, http://tcc.export.gov/Trade_Agreements/All_Trade_Agreements/exp_005362.asp(last visited on Oct. 25, 2010).

²⁹⁸ See *Explication to the Newly-adapted Patent Law*, *supra* note 295, at preface.

and condiments, the term of patent extended to 20 years for an invention, 10 years for a utility model and design patent, the introduction of compulsory licensing in special conditions and so on.

In 2000, the Patent Law was revised in preparation for China's entrance into the World Trade Organization (WTO), including the clarification of state-owned enterprises' rights and obligations related to patents, improvements in patent protection by the cooperation of legal and administrative enforcements, the simplification of application procedures and so on.²⁹⁹

The current effective China Patent Law was revised in Dec. 2008 according to "2008 China's National IP Strategy" (NIPS) that was set up for the improvement of the creation, utilization, protection and administration of intellectual property.³⁰⁰ The revised content of the Patent Law includes the adoption of absolute novelty, the increases of fines for patent infringements, the exemptions of parallel importation and of the patented pharmaceuticals for administrative approval, the introduced protection for genetic resources, and so on.

Additionally, the Guidelines for Examination of State of Intellectual Property Office of the P.R.C. (hereafter CN-Guideline) was initially promulgated in 1993 and was respectively amended in 2001, 2006 and 2010. The latest CN-Guideline is revised to conform to the Patent Law of 2008 and the Implementing Regulations of the Patent Law of 2010 (hereafter CN-Implementing Regulations).³⁰¹

²⁹⁹ *Id.*

³⁰⁰ See National IP Strategy, available at SIPO, http://www.sipo.gov.cn/sipo/ztxx/zscqzl/200806/t20080611_406178.htm (Last visited on Nov. 1, 2010).

³⁰¹ See The Implementing Regulations of the Patent Law, available at SIPO, http://www.sipo.gov.cn/sipo2008/zcfg/flfg/zl/fljxzf/201001/t20100122_488461.html (last visited on

4.1.2 Examination Guidelines for Software Inventions

There is no provision regarding whether or not a CS invention is a patent-eligible subject matter under the China Patent Law.³⁰² A CS invention was not seen as a patent-eligible subject matter until the revised examination guidelines for computer programs promulgated by the State Intellectual Property Office (hereafter SIPO) in 1993, which extended the scope of statutory subject matters into CS inventions. Prior to the CN-Guideline of 1993, computer programs were primarily protected by copyrights.³⁰³

A. Guidelines of 1993

The SIPO added “Chapter 9 Examination for Inventions Having Computer Programs” to the previous guidelines in 1993. According to the new guidelines, an invention related to a combination of computer software with computer hardware may be seen as a patent-eligible invention if it can make an improvement in the prior art, has technical effects, and constitutes a complete technical solution.³⁰⁴ Patent-eligible CS inventions could be divided into three subcategories—an invention related to automatic processing, an invention related to internal performance improvements of a computer, or an invention related to processes of a measure or test.³⁰⁵

However, an invention merely related to a computer program per se stored in a medium, such as tapes, discs, ROMs (Read Only Memory) or PROMs (Programmable

Nov. 1, 2010).

³⁰² See *Explication to the Newly-adapted Patent Law*, *supra* note 295, at 183 (The SIPO thinks that if it does not provide whether or not CS inventions are patentable, then the CN-Patent Law will be more flexible for state demands.).

³⁰³ The Regulations on the Protection of Computer Software was enacted in 1991 according to the China Copyright Law.

³⁰⁴ See Sec. 1, Chap.9, Sec. II, CN-Guideline (1993), available at <http://fagui.mylegist.com/1702/15399.html>.

³⁰⁵ See Sec. 2.2, Chap.9, Sec. II, CN-Guideline (1993).

Read Only Memory) was considered patent-ineligible because a computer program per se is a rule or method involving mental activities.³⁰⁶

The CN-Guideline of 1993 enumerated several instances related to human mental activities as unpatentable inventions as well, such as the following items:³⁰⁷

- a computer program per se
- mathematical theories and calculation methods
- syntax in various languages or Chinese coding methods
- an invention related to a method or a system of organization manufacture, or business implementation
- traffic rules, time schedules or gaming rules
- statistics, accounting and bookkeeping methods
- library classification rules, arrangement of dictionary information retrieval method or classification methods for patents
- methods of information expression

B. Guidelines of 2001

In 2001, the revised “Chapter 9 Questions about the Examination for CS Inventions” enlarged the scope of CS inventions, where an invention related to the external data processing of a computer was seen as an eligible subject matter.

Additionally, the guidelines of 2001 further loosened the restriction on inventions related to mental activities, where part of a method invention related to a mental activity might be considered patent-eligible if a technical contribution of the invention did not merely result from mental activities.³⁰⁸

C. Guidelines of 2006

According to the guidelines of 2006, a CS invention means a solution for an

³⁰⁶ See Sec. 2.1, Chap.9, Sec. II, CN-Guideline (1993).

³⁰⁷ Mental activities excluded from patent protection were encoded in Article 25, paragraph 1, item 2 of the China Patent Law of 1992; *see also*, Sec. 3.2, Chap.1, Sec. II, CN-Guideline (1993).

³⁰⁸ See Sec. 3.2(2)ii, Chap.1, Sec. II, CN-Guideline (2001), *available at* http://www.cnpat.com/cn_pat/exam_guide_2001.htm.

invention, which claims a process related to computer programs in part or in whole.³⁰⁹ CS inventions could be divided into two main groups—the control or process of external objects of the computer and the control or process of internal objects of the computer. Group one includes the control of external operations or of external peripherals, and the process or exchange of external data.³¹⁰ Group two includes the improvements in internal performance of the computer system, management of internal resources of computer system, data transmission rates, and so on.³¹¹

In addition, a change of physical entity was not necessary for CS inventions under the CN-Guideline of 2006,³¹² which meant that a technical contribution of an invention could be merely attributed to computer programs. The threshold of the patent eligibility for CS inventions apparently was lower than that of the other subject matters, since a contribution of invention can be merely attributed to mental activities.³¹³

The following table demonstrates the evolution of CS inventions under the guidelines of SIPO.

³⁰⁹ See the CN-Guideline 252 (2006), available at <http://big5.sipo.gov.cn/www/sipo/zlsc/>.

³¹⁰ *Id.* See also, the CN-Guideline 259 (2010), available at <http://big5.sipo.gov.cn/www/sipo/zlsc/>.

³¹¹ *Id.*

³¹² *Id.*

³¹³ See the CN-Guideline 114-115 (2006), or the CN-Guideline 123-124 (2010).

Year	Valid CS inventions	Invalid CS inventions
1993	1. Auto processing 2. Internal improvements of the computer 3. Control of measure or test procedures	A computer program per se; Mathematical theories or calculation methods'; Medium storing computer programs (discs, or ROM or PROM); Chinese encoding methods
2001	1. Control of industrial procedures 2. Internal improvements of the computer 3. Control of measure or test procedures 4. External data processing of computer. * Parts of inventions related to mental activities are no longer viewed as a mental activity as a whole..	A computer program per se; Mathematical theories or calculation methods; Tapes, discs or these kinds of readable medium storing computer programs; or Chinese encoding methods
2006	A. Internal performance of computer: internal performance of computer, improvement of data transmission, management of internal resources of computer systems. B. External performance of computer: control of certain external operating process or external operating device, and process or exchange of external data. * Part of inventions related to mental activities is not seen as a mental activity as a whole. * not necessarily including changes to computer hardware	Same as the guidelines of 2001
2010	Same as the guidelines of 2006	Same as the guidelines of 2001 and 2006

Figure 4 - 1 Evolution of CS inventions

** The bold characters mean the differences from its former guidelines.

4.2 Patentable Inventions under the China Patent Law

Patent rights are part of the intellectual property rights that are fruits of mental activities and human creativities.³¹⁴

4.2.1 Definition of Invention: Article 2(2)

The definition of “invention” was not defined until the Patent Law of 2008. Article 2, paragraph 2 which provides that:³¹⁵

³¹⁴ See *Explication to the Newly-adapted Patent Law*, *supra* note 295, at 2-3.

³¹⁵ The China Patent Law of 2008,

The term “invention” refers to a new technical solution put forward for a product, method or the improvement thereof.

The above definition contains two factors—acceptable claims of an invention and a new technical solution to prior art. The first factor means that acceptable claims include product and method claims. This classification was not unusual since the initial CN-Guideline took effect and had been encoded in Article 2.1, Implantation Rules of 2001.³¹⁶ The second factor means that an invention is related to a new technique, which is a key requirement to determine the patentability of invention.

A. Technical solution

This factor—a technical solution for an invention—is seen as a primary element in the determination of patent eligibility because it is applied to all invention applications in patent prosecutions.³¹⁷ The examination of this factor is based on the claims and the specifications as a whole.³¹⁸

This factor was learned from other jurisdictions and required an invention offering a new technical solution for prior art.³¹⁹ Corresponding regulations related to this factor are respectively encoded in Rules 8, 17, 20, 21 and 23 of the CN-Implementing Regulations of 2010, and relevant instances are illustrated in the CN-Guideline of 2010.

http://www.sipo.gov.cn/sipo2008/zcfg/flfg/zl/fljxzf/200812/t20081230_435796.html.

³¹⁶ See *Implantation Rules of Patent Law* (2001),

http://www.sipo.gov.cn/sipo/flfg/zl/fljxzf/200703/t20070330_148535.htm.

³¹⁷ See the CN-Guideline 119 (2010).

³¹⁸ *Id.* at 124.

³¹⁹ See EPC, Art. 52(1):

(1) European patents shall be granted for all inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.

B. Technical means

A technical means is used as a physical solution to a specified problem and can create a technical effect by utilizing laws of nature. That is, an invention is a result of implementing mental activities and is a technical means for production, scientific research, or experiments.³²⁰ Thus, scientific discoveries and theories are present materials or phenomena in the world which cannot be considered to apply laws of nature to improve the world.³²¹ The reasoning is the same for rules, methods, or management related to economic activities or administration, since they only involve rules of human activities instead of any technical means by utilizing laws of nature.³²²

A technical means may consist of several technical features. For instance, a technical means of a product invention may include shapes, structures, compositions, or sizes of components, materials, devices, instruments, or apparatuses.³²³ And a process invention may include steps or procedures, which involve time, temperature, or pressure, as well as implemented facilities.³²⁴

C. Utilizing a law of nature

In addition, a “technical solution” has to be created by utilizing “a law of nature” in compliance with the definition of invention.³²⁵ Although there is no relevant rule in connection with “a law of nature,” it has been considered a requirement based on the

³²⁰ See *Explication to the Newly-adapted Patent Law*, *supra* note 295, at 9 (Although an invention is a result from humane intelligence, mere mental activities are unpatentable.).

³²¹ *Id.*

³²² *Id.*

³²³ See *Explication to the Newly-adapted Patent Law*, *supra* note 295, at 10.

³²⁴ *Id.*

³²⁵ *Id.*

CN-Guideline since 1993.³²⁶ Conversely, an invention will be considered patent-ineligible if it does not employ any law of nature to create a technical means for a claimed problem, such as some nonstatutory subject matters.³²⁷

In regards to the examination of “technical means”, there are three points associated with this factor. An invention has to clearly disclose what a claimed technical means is, what a solved technical problem is, and what a produced technical effect is.³²⁸ Namely, the specifications and/or drawings of an invention has to clearly disclose the above items in addition to claiming primary technical features in claims.³²⁹

4.2.2 Nonstatutory Subject Matters

Article 5 and 25 respectively enumerate that some conditions or subject matters are unpatentable under the CN-Patent Law.

A. Article 5

Article 5 provides that:

- (1) No patent right shall be granted for any invention-creation that is contrary to the laws of the State or social morality or that is detrimental to public interest.
- (2) No patent right shall be granted for any invention-creation which is completed on the basis of genetic resources of which the acquisition or use breaches the stipulations of related laws and regulations.

The reason to exclude the above inventions from patent protection is based on the consideration that they are not applicable in industry since their applications may be illegal in other statutes, or their applications may be harmful to public interests or state welfare.

³²⁶ See Sec. 3.2.3, Chap. 5, Part II, CN-Guideline (1993).

³²⁷ *Id.* See the discussion in the next section.

³²⁸ See the CN-Guideline 131-132 (2010).

³²⁹ *Id.* at 119.

B. Article 25

Article 25 provides:

For any of the following, no patent right shall be granted:

- (1) scientific discoveries;
- (2) rules and methods for mental activities;³³⁰
- (3) methods for the diagnosis or for the treatment of diseases;
- (4) animal and plant varieties;
- (5) substances obtained by means of nuclear transformation.

For processes used in producing products referred to in items (4) of the preceding paragraph, patent right may be granted in accordance with the provisions of this Law.

Inventions categorized into items 1 and 2 are excluded from patent protection due to the fact that they do not involve any technical means by utilizing laws of nature. However, inventions related to items 3, 4 and 5 are rejected based on the consideration of state policies or citizen interests.

In regards to the patent eligibility of CS inventions, “mental activity” is the most important factor affecting the legal status of CS inventions under the CN-Patent Law.

1. Mental Activity

An invention involving mental activities will be seen as an invalid invention since it does not utilize any technical means, does not employ laws of nature, does not constitute a technical solution to a prior technical problem, or does not generate any technical effect so as to violate Article 2.2 and 25.1(2).³³¹

What is a mental activity? According to the illustration in the CN-guideline, mental activities are referred to human thinking processes, including thinking,

³³⁰ See Encyclopedia Britannica, <http://www.britannica.com/> (Conscious mental activities to neurologists and neuroscientists are referred to higher cerebral functions and higher cortical functions, including thinking, remembering, and reasoning.).

³³¹ See the CN-Guideline 123 (2010).

expression, judgment, and memorization,³³² which can be divided into two classes—an invention merely concerning mental activities and an invention partially concerning mental activities. The former is considered unpatentable based on the patent ineligibility of mental activities, such as computer programs per se, computer languages, computing rules, mathematical theories and methods of conversion, methods or systems to manage commercial activities, rules for the classification of books, etc.³³³ However, the latter cannot be rejected merely based on mental activities since it may involve a technical solution by utilizing the laws of nature as a whole.³³⁴

In summary, computer programs per se are classified under the former class as mere mental activities, but a prospective CS invention related to mental activities needs to be classified under the latter class, of which patent eligibility is determined as a whole.

4.2.3 Computer Software Inventions

According to the CN-Guideline, a computer program per se is directed to a series of coded instructions that can be operated by an information processing device and can output a certain result, including source codes and object codes.³³⁵

The term of a computer program related invention means to use a computer program wholly or partly to solve a claimed problem, which may involve processing or controlling an external or internal object.³³⁶ The processing of an external object may involve an external data exchange or processing, or the control of peripheral devices or

³³² *Id.* at 123-124.

³³³ *Id.*

³³⁴ *Id.*

³³⁵ *Id.* at 259.

³³⁶ *Id.*

external procedures.³³⁷ The processing of an internal object may lead to performance improvements of a computer, such as the speed or quantity of data transmission, or the efficiency of data management.³³⁸

The above classification implies the scope of CS inventions,³³⁹ so claims categorized to none of the above-mentioned classes may be excluded from patent protection.

4.3 Examination Guidelines for Software Inventions

In China, the determination of the patent eligibility of inventions primarily depends on the definition of “invention” as well as whether or not a claimed subject matter falls into the scope of nonstatutory subject matters, which are respectively encoded in Article 2.2, 5.1(2) and 25 of the Patent Law, as well as Article 2(1) of the CN-Implementing Regulations.

Besides, CS inventions also have to meet three requirements as in the case of other statutory inventions—novelty, inventiveness, and practical applicability, which are respectively encoded in Articles 22, 23, and 24 of the Patent Law

4.3.1 Patentable Computer Software Inventions

CS inventions may roughly be classified into two groups based on the extent of mental activities involved in inventions. The first group—merely involving mental activities, or merely claiming an algorithm, mathematical computing rules, computer programs per se, methods or rules of games—is unpatentable, such as tapes, magnetic

³³⁷ *Id.*

³³⁸ *Id.*

³³⁹ The scope of CS inventions may refer to fig. 4.1.

discs, optical discs, MO discs, ROMs, PROMs, VCDs, DVDs.³⁴⁰ Namely, a computer readable medium is classified to the unpatentable group.

However, the second group—partly claiming methods or articles as above and partly claiming technical solutions to prior art—cannot be rejected merely based on mental activities, but is based on claims as a whole.³⁴¹

As mentioned in Section 4.1, patentable CS inventions can be divided into five subcategories: (1) internal performance of a computer, (2) data transmission by computer, (3) management of internal resources of a computer system, (4) control of external operating processes or peripherals, and (5) process or exchange of external data. Thus, a prospective CS invention will be expected to fall within one of the above subcategories.

4.3.2 Examples of Claims

Claims of computer software-related inventions can be divided into process claims and product claims. Process claims can be claimed in Mean-Plus-Function language as well. As mentioned above, all patent-eligible claims have to meet the definition of invention under Article 2.2, while invalid claims may fall in the scope of Article 5.2 or Article 25.1(2). The following examples can illustrate the differences between them.

A. Ineligible Claims

1. Violating Article 25.1(2)

Inventions violating Article 25.1(2) refer to those merely involving mental

³⁴⁰ See the CN-Guideline 259-260 (2010).

³⁴¹ *Id.* at 260.

activities.

Example A

A method for the automatic computation of the coefficient of kinetic friction

[What is claim is]:³⁴²

A method of automatically computing the coefficient of kinetic friction μ using computer programs, characterized in that it includes the following steps:

calculating the ratio of position variables, S_1 and S_2 , of the friction plate;

calculating the logarithm, $\log S_2/S_1$, of the ratio S_2/S_1 ;

solving the ratio of the logarithm, $\log S_2/S_1$ to e

The above claim is related to a process of numerical computation, which is a mathematical method; i.e., mental activities. Thus, it will be classified in the scope of nonstatutory matters under Article 25.1(2) so as to be unpatentable.

2. Violating Article 5.2

An invention which does not conform to Article 5.2 means that it does not create a new technical solution by utilizing the laws of nature.

Example B

A method for a computer game

[What is claim is]:³⁴³

A computer game method featured with both grown-up type and question-and-answer type for users, characterized in that it includes:

questioning step, selecting question materials corresponding to the game progress from stored question materials, answer materials corresponding to the said question materials and game progress materials when users enter the game environment through computer game device, and displaying the question materials to users;

score determining step, determining whether or not answers input

³⁴² *Id.* at 264 (example 4).

³⁴³ *Id.* at 267-268 (example 8).

by users are the same as the stored answer materials corresponding to the said questions based on presented question materials, if yes, then go to the next step, if no, then go back to the questioning step...

The above claim is related to a series of processes that execute computer programs through a gaming device. However, the gaming device is well-known and the control of the claimed process does not intend to improve the internal performance of the gaming device. Additionally, the objective of the claimed means neither improves the functions of the gaming device nor renovates the composition of the gaming device.

In fact, the main feature of the invention is to combine two different types of games together, which does not involve any technical means. The claimed effect is merely management or control of game processes or game rules and cannot be seen as a technical effect. Thus, it does not conform to the definition of invention under Article 2.2 that requires a claimed invention has to do with creating a technical solution by utilizing the laws of nature.

B. Eligible Claims

Except for the above two types of patent-ineligible claims, CS inventions may claim the following example.

Example C

A method for the removal of image noise

[What is claim is]:³⁴⁴

A method to remove image noises characterized in that it includes the following steps:

³⁴⁴ *Id.* at 265-266 (example 6).

obtaining each pixel data of image to be processed in a computer;
computing the grey mean value and the grey variance of the said
image from the grey values of all image pixels;
reading the grey values of all image pixels, and determining
whether the grey value of each pixel is within 3 times variance
above or below the mean value, if yes, then no modifying the
said pixel grey value, otherwise, regarding the pixel as a noise,
removing it by modifying its grey value.

The above invention claims a method of removing the noise of image data, which needs to balance the noise reduction of the image and the image blur caused by the noise reduction. The primary means is to remove the part that is higher or lower than a specified ratio, and can remove fewer pixels than prior arts; thus, the clarity of the image can be increased. As to the above method, it is mainly to execute computer programs by computer hardware, which involves a technical means by utilizing laws of nature and results in a technical effect that can improve the clarity of images.³⁴⁵

In some conditions, a CS invention claiming a computer program combined with other materials may be patentable. For instance, although an encoding method for Chinese characters primarily depends on a subjective decision—mental activities—to create an encoding rule, the SIPO considers it patentable if it does not merely claim a encoding method per se.³⁴⁶ That is, if an applicant claims a combination of a specified keyboard with an encoding rule for Chinese characters, it cannot be seen to merely claim a mental activity as a whole.³⁴⁷ Such a claim does not merely involve a mental activity but integrates the mental activity into other technical

³⁴⁵ However, if we only see claims alone, we will inquire why the inventor wants to choose three times the variance above or below the mean value, which may depend on a subjective decision; i.e., mental activities. Thus, the claimed means should be reviewed as a whole; i.e., the review to the claim along with the specification.

³⁴⁶ *Id.* at 270-271. The similar issue happened to the TIPO, but the TIPO did not illustrate how to deal with this sort of invention under the TW-EG.

³⁴⁷ *Id.* (An applicant has to disclose technical features of the specified keyboard combined with the encoding method in the claims and in the specification.).

means. Thus, a prospective applicant may use this kind of claims for a patent.

4.4 Summary

The evolution of the CN-Guideline seems to increase the scope of CS inventions, but not by much. Namely, a patent-eligible CS invention may claim the improvements inside or outside computer hardware by applications of software, rather than claiming a computer readable medium.

One of the most important factors affecting the determination of patent eligibility of subject matter is the “technical feature,” which is construed based on the newly enacted definition of invention in the China Patent Law. The factor to determine whether a claimed method is within the meaning of invention under patent law is similar to other jurisdictions, such as the EPO, Japan and Taiwan. Namely, a patent-eligible invention must produce a technical effect; i.e., using a technical means to solve a technical problem.

A CS invention with proper claims may be patent-eligible from the perspective of SIPO if it claims a combination of computer software with hardware without completely involving mental activities. However, compared with other jurisdictions, in China there is no guarantee based on the simple guidelines, which seems to leave room for future technologies and the state’s policy decisions.

Chapter 5 Software Patents in the EPO

5.1 Overview of the EPC

The European Patent Office (hereafter EPO) is a branch of the European Patent Organization,³⁴⁸ which is responsible for the examination of patent applications based on the European Patent Convention (hereafter EPC).³⁴⁹ The EPO is one of the most important patent offices in the world since it can grant patents for forty European countries based on a united process and regulation.³⁵⁰

Like other jurisdictions, the EPC and the Guidelines for Substantive Examination of the EPO are the most important regulations that govern the patentability of inventions. Also, case decisions by the Technical Board of the EPO are another important factor affecting the EPO's ability to deal with patent grants. In this Chapter, I will respectively introduce those regulations and cases related to the patent eligibility of computer software inventions.

5.2 Regulations of the EPC

The EPC was signed in 1973 and has been revised several times since then. The following sections will respectively illustrate the patent eligibility of inventions, nonstatutory matters under the EPC, and the requirements of technical characters for inventions.

³⁴⁸ See the EPO, <http://www.epo.org/about-us/epo.html> (The European Patent Organization was set up on October 7, 1977 based on the EPC signed in Munich in 1973. The EPO and the Administrative Councils are its executing branches.)

³⁴⁹ See Who Are We, EPO, <http://www.epo.org/about-us/jobs/why/who.html>.

³⁵⁰ *Id.*

5.2.1 Historical Review

In the Guidelines of 1978, the construction of the meaning of “invention” under EPC 52(2) stated that: “If the contribution to the known art reside[s] solely in a computer program then the subject matter [is] not patentable in whatever manner it may be presented in the claims.”³⁵¹ That meant that an invention related to a computer program was not considered to be a patent-eligible subject matter.

In 2000, the EPO revised its previous guidelines based on the decision of T 1173/97 (IBM),³⁵² which started to accept computer program products as patent-eligible subject matters under the EPO.

5.2.2 Patentable Inventions: Article 52(1)

Article 52(1) provides:³⁵³

European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.

Within the above regulation, there are three requirements that an invention has to satisfy—susceptibility of industrial application”, novelty, and involvement “an inventive step.” These three requirements are similar to those in other jurisdictions such as Japan, Taiwan and China.

In addition, an implicit requirement—technical character—is generated based on

³⁵¹ Sec. 2.VI, C, Examination Guidelines of EPO (1978), <http://eupat.ffii.org/papri/epo-gl78/index.en.html>(last visited on Feb.24, 2011).

³⁵² See the case discussions in the following section.

³⁵³ See *Case Law of the Boards of Appeal of the European Patent Office* 1 (6d. 2010), available at EPO, [http://documents.epo.org/projects/babylon/eponet.nsf/0/1ae7315e321e933ec12577bd0024d650/\\$file/case_law_of_the_boards_of_appeal_2010_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/1ae7315e321e933ec12577bd0024d650/$file/case_law_of_the_boards_of_appeal_2010_en.pdf); see also, Stefan Schohe, Christian Appelt and Heinz Goddar, *Patenting software-related inventions in Europe*, in *Patent Law and Theory: A Handbook of Contemporary Research* 325 (Toshiko Takenaka ed., 2008) (The EPC of 2007 has the wording, in all fields of technology, which was derived from Art. 27(1), TRIPS. The previous version has no wording, “in all fields of technology,” in the article.).

this Article, and the vague meaning of this requirement makes the determination of patentable inventions more complicated.³⁵⁴

5.2.3 Nonstatutory Subject Matters: Article 52(2) and (3)

Besides the above three requirements, an invention also cannot be categorized into the scope of Article 52(2) and (3) of the EPC.

Article 52 (2) and (3) provide that:

(2) The following in particular shall not be regarded as inventions within the meaning of paragraph 1:

- (a) discoveries, scientific theories and *mathematical methods*;
- (b) aesthetic creations;
- schemes, rules and methods for performing *mental acts, playing games* or *doing business*, and *programs for computers*...
- (d) *presentations of information*.

(3) The provisions of paragraph 2 shall exclude patentability ... only to the extent to which a European patent application ... relates to such subject matter or activities *as such*.

Therefore, a computer program as such, or a method that is related to a mere mathematical computation, a business method, and so on will be deemed to be unpatentable.³⁵⁵

5.2.4 Technical Character

The EPC has no text relating to “technical character;” but the EPO views this factor as an implicit requisite under Article 52(1).³⁵⁶ Additionally, we can refer to the relevant rules regulated in the Implementing Regulations to the Convention on the Grant of European Patents (hereinafter Rule), which can help us to discern some clues about

³⁵⁴ See the case discussion in the following section (*Pension Benefits System* at Headnote1).

³⁵⁵ Detailed discussions will be in the following cases.

³⁵⁶ T 931/95 (*Pension Benefit Systems Partnership*).

this important factor.³⁵⁷

A. Implementing Regulations

Rule 42(1) provides a description of an invention as that which may:

- (a) specify the **technical field** to which the invention relates...
- (c) disclose the invention, as claimed, in such terms that the **technical problem** (even if not expressly stated as such) and **its solution** can be understood...

Rule 43(1) provides the form of claims as follows:

The claims shall define the matter for which protection is sought in terms of the **technical features** of the invention...

Rule 44(1) provides the unity of invention as follows:³⁵⁸

Where a group of inventions is claimed in one and the same European patent application, the requirement of unity of invention referred to in Article 82 shall be fulfilled only when there is a **technical relationship** among those inventions involving one or more of the same or corresponding **special technical features**. The expression “**special technical features**” shall mean those features which define a contribution which each of the claimed inventions considered as a whole makes over the prior art.

From the above Rules, we can conclude that there are three elements for an invention with technical characters: an invention must (1) relate to a technical field, (2) solve a technical problem, and (3) have a solution defined in claims, which relates to technical features for prior art.³⁵⁹

B. Technical Consideration

This is another vague term for the description of the nature of invention under

³⁵⁷ This factor is very important for some decisions, such as the inventive step, technical problem, technical solution, and so on. See *Case Law of the Boards of Appeal of the European Patent Office*, *supra* note 353, Sec. 1.A.1.1 (describing that this requirement is a “*conditio sine qua non*”, an indispensable element for patentable inventions under the EPC).

³⁵⁸ See Dai Rees, *Software Patents-EPO Practice: History and State of Play*, p4, <http://www.ps.uni-saarland.de/~tmueller/reestran.pdf> (commenting that this rule came into effect in 1990 because it was an agreement with the U.S. about unity of invention.).

³⁵⁹ The interpretation of “technical character” has been learned by some jurisdictions as mentioned in the above chapters.

the EPO. For instance, in the case of *PBS (Pension Benefit Systems Partnership)* the Board reasoned that “an invention may be an invention within the meaning of Article 52(1) if [,] for example[,], a technical effect is achieved by the invention or if technical considerations are required to carry out the invention.”³⁶⁰

Technical considerations have nothing to do with mental activities. In case T 914/02, the Board rejected the appeal due to the fact that the claimed means could also be operated alone by mere mental activities.³⁶¹

C. Technical Contribution

Technical contribution is different from “technical character,” as it is used to determine whether an invention meets the requirement of the “inventive step.”³⁶² This factor occurs due to the “problem-and-solution approach” test, which assesses the technical effects of an invention based on the differences between the claimed means and the closest prior art.³⁶³

D. Further Technical Effect

The requirement of the technical contribution for CS inventions is different from ordinary subject matters. The Board acknowledges that the effect of a computer program occurs when it is run on a computer. Namely, the effect is only present in physical reality when a computer program is read by computer hardware. A computer program itself, however, cannot show its effect without the assistance of a physical reality.

Compared with other subject matters, a patentable CS invention must have a

³⁶⁰ *PBS* at Reason 2 (quoting Guidelines for Examination C-IV.2.2 of 1998).

³⁶¹ See *Case Law of the Boards of Appeal of the European Patent Office*, *supra* note 353, Sec. 1.4.2.

³⁶² T 1173/97 and T 931/95 (See the discussion in the section of Case Law).

³⁶³ The EPO Guidelines Chap. IV, 11.5,

http://www.epo.org/law-practice/legal-texts/html/guix/e/c_iv_11_5.htm (last visited on Apr. 1, 2011).

“further technical effect” that “goes beyond the normal physical interaction between the program and the computer.”³⁶⁴ This particular factor is an extra requirement for CS inventions to distinguish them from the ordinary performance of software read to computer hardware.³⁶⁵

5.2.5 Decision of Patent Eligibility

The EPO’s regulations are the same as those in other jurisdictions having no encoded statutes in the determination of patent eligibility, but they only provide principled regulations defining an invention and the subject matters excluded from patent protection.

Nevertheless, we can find two points related to the determination of whether a claimed subject matter is in compliance with the meaning of Article 52(1).³⁶⁶ First, Article 52(2) is only applied to the excluded subject matters as such. Besides, the test over whether an invention is in compliance with Article 52(1) is an independent test that has no connection with those tests associated with the novelty, the inventive step, or the “susceptibility of industrial application.”

Second, the review of the technical features of an invention does not rely on the appearance of claims, but instead relies on the context of the invention as a whole.

The detailed discussion will be in the following section—Case Law.

5.2.6 Computer Software Inventions

An invention related to computer software is named as a computer-implemented

³⁶⁴ Id. (Chap. IV, 2.3.6), http://www.epo.org/patents/law/legal-texts/html/guix/e/c_iv_2_3_6.htm (last visited on March. 20, 2011).

³⁶⁵ T 1173/97 (1998) (See the discussion in the following case law).

³⁶⁶ See Sec. 2.2, Chap. 4, Part C, EP-EG. (2010).

invention under the EPO.³⁶⁷

What is an “invention”? What is a “computer software invention”? There is neither a definition of “invention” under the EPC, nor of “software invention.” However, we can find some clues according to the illustration in the Guidelines of the EPO:³⁶⁸

a “computer-implemented invention,” an expression intended to cover claims which involve computers, computer networks or other programmable apparatus whereby *prima facie* one or more of the features of the claimed invention are realized by means of a program or programs.

This points out two factors for CS inventions: (1) the implementation of an invention must involve computer devices, computer communication networks, or programmable devices, and (2) technical features of this kind of invention are wholly or partly realized by software.

Condition 2 is more difficult to deal with and will be our issue of main concern in this chapter since apparatus claims have fewer issues related to the patent eligibility of subject matter than method or process claims.

5.3 Case Law

The following cases have been decided by the Technical Boards of Appeal of the EPO, and can be divided into two groups—one group is required to have a “technical effect,” and the other one is required to have a “further technical character.” A “technical effect” is the physical requirement of “technical character” for a

³⁶⁷ *Id.* (Sec. 2.3.6).

³⁶⁸ *Id.*

patent-eligible ordinary subject matter. A “further technical character” is the same requirement for computer software inventions according to the *IBM I* decision.³⁶⁹

5.3.1 Technical Effect

A. *Vicom*

Vicom was a leading case related to computer software inventions.³⁷⁰

1. Claimed subject matter:

The claimed invention was related to a method for the enhancement of a digital image by computer software.³⁷¹ Claims 1-7 and 12 are related to methods of digital image processing.

Claim 1 is claimed as follows:

A method of digitally processing images in the form of a two-dimensional data array having elements arranged in rows and columns in which an operator matrix of a size substantially smaller than the size of the data array is convolved with the data array, including sequentially scanning the elements of the data array...;
the small generating kernel remaining the same for any single scan of the entire data array ...

2. Issue:

Is a claim constituted of mathematical computations by computer software a mathematical method under 52(2)(a) and (3) of the EPC?

3. Holding and reasoning:

The Board held that the claimed method was patentable since it did not seek protection for a mathematical method as such. The Board further reasoned that:³⁷²

³⁶⁹ T 1173/97- *IBM*, OJ 1999, 609 (1998).

³⁷⁰ T 0208/84 – *Vicom*, OJ 1987, 14 (1986).

³⁷¹ EPO Patent Application No.0005954 (filed May 22, 1979).

³⁷² *Id.* at Reason 5.

A basic difference between a mathematical method and a technical process can be seen, however, in the fact that a mathematical method or a mathematical algorithm is carried out on numbers (whatever these numbers may represent) and provides a result also in numerical form[.]

The above meant that an invention claiming a mathematical algorithm could only produce numerical data; however, a technical process using a mathematical algorithm can result in a physical change in entity.³⁷³

In regard to what is a patentable process, the Board pointed out two conditions under which a process claim might not be viewed as a computer program as such—first, a process “carried out under the control of a program,”³⁷⁴ and second, a process related to a specific program for controlling or carrying out a technical process operated by a computer.³⁷⁵

4. Analysis:

The Board decided that the difference between a technical process and a mathematical algorithm is that a technical process can produce a non-numerical result or a physical result. In other words, it is implied that as long as results of mathematical computations are present in the form of non-numerals on a physical entity, the mathematical algorithm maybe seen as a patent-eligible process. However, claims involving in a “post-solution activity” may be seen to be statutory based on the above method,³⁷⁶ which will extend the scope of statutory subject matter.

³⁷³ *Id.*

³⁷⁴ *Id.* at Reason 12.

³⁷⁵ *Id.* at Reason 15.

³⁷⁶ *See, e.g., In re Phillips*, 608 F.2d 879 (C.C.P.A. 1979).

B. *Koch & Sterzel*

1. Claimed subject matter

The claimed invention was related to an X-ray apparatus for radiological imaging using a new program on a conventional computer, a development which was different from the prior art.³⁷⁷

2. Issue: Was a claimed invention of which features in part involve non-technical means patentable?

3. Holding and reasoning:

The Board held that the claimed invention was patentable. The Board examined the technical means of invention based on the method below:

An invention must be assessed as a whole. If it makes use of both technical and non-technical means, the use of non-technical means does not detract from the technical character of the overall teaching.

The Board further reasoned that it is “unnecessary to weigh up the technical and non-technical features” and that “if the invention . . . uses technical means, its patentability is not ruled out.”³⁷⁸

A computer program per se is excluded by EPC 52(2)(c), but the Board considered that a computer program operated by ordinary computer hardware might be a patent-eligible subject matter as a whole based on the reason that:³⁷⁹

[I]f the program controls the operation of a conventional general-purpose computer so as technically to alter its functioning, the unit consisting of program and computer combined may be a patentable invention.

Thus, operations of computer hardware by software cannot be excluded from

³⁷⁷ T 0026/86 – *Koch&Sterzel*, OJ 1988,19 (1987).

³⁷⁸ *Id.* at Reason 3.3 and 3.4.

³⁷⁹ *Id.* at Reason 3.3.

patents merely based on the fact that the computer program per se is unpatentable.

4. Analysis:

The board treated claims as a whole, so it is unnecessary to distinguish non-technical features from technical ones for the determination of subject matter eligibility. Thus, when computer hardware executes computer software and results in a functional improvement, the improvement should be counted upon the whole of computer hardware and software.

C. *Sohei*

This case is the first time that the EPO Board held that computer programming involved a technical art.³⁸⁰

1. Claimed subject matter:

The appellant claimed a system and a means for financial and inventory management by means of computer resources.

Revised claim 2 was claimed as below:

2. A method for operating a *general-purpose computer* management system including a display unit (4), an input unit (3), a memory unit (2), an output unit (4, 5) and a processing unit (1), for plural types of independent management including at least financial and inventory management comprising the steps of: said display unit (4) displays, in the form of an image on the screen of the display unit (4)... first processing means for causing said display unit (4) to display said transfer slip and for automatically displaying data entered through said input unit (3)...

2. Issue:

Was an invention with functional features implemented by software excluded

³⁸⁰ T 0769/92 – *Sohei*, OJ 1995, 525 (1994).

from patentability under Article (2) (c) and (3) of the EPC?

3. Holding and reasoning:

The Board held that the invention was within the meaning of Article 52(1) of the EPC, and returned the application for further prosecution.

The Board found that the appellant did not claim specific devices but intended to claim “a plurality of independent ‘managements’ of different types;” the scope of claim even extends to personnel and construction managements. Furthermore, the claimed method was close to a business method as such, a kind of abstract idea that is unpatentable; however, the Board considered that:³⁸¹

“no hardware unit which as such would be novel from a technical point of view is contained in the system claimed as such” ...However, the implementation, in the claimed system and by the claimed method, of the said “interface” in the form of said “transfer slip” is **not merely an act of programming** but rather concerns a stage of **activities involving technical considerations to be carried out** before programming can start.

That is, this decision followed the opinion in *Koch & Sterzel* that functions of a computer resulted from the cooperation of computer hardware and software, in which software programming was designed for the improvement of the computer system based on technical considerations. Thus, computer programming may involve technical considerations.

4. Analysis:

The Board of EPO was not concerned about the idea that a computer program is designed for general-purpose or specific computer hardware but was instead concerned that some technical features were genuinely presented by the software.

³⁸¹ *Id.* at Reason 3.4 and 3.7.

Nevertheless, whether or not all computer software may involve technical considerations is another issue. For instance, computer software involving a mere presentation of data has no technical consideration.

D. Pension Benefit Systems

1. Claimed subject matter:

The invention was related to a method for the management of pension benefits.

Claim 1 of the invention was as below:³⁸²

1. A method of controlling a pension benefits program by administering at least one subscriber employer account on behalf of each subscriber employer's enrolled employees each of whom is to receive periodic benefits payments, said method comprising: providing to a data processing means...; determining the average age of all enrolled employees by average age computing means; determining the periodic cost of life insurance...;

2. Issue: Was an invention claiming a method for doing business patentable?

3. Holding and reasoning:

The Board held that the claimed invention was not an invention under Article 52(1) of the EPC based on the notion that it only involved economic concepts and practices of doing business.

The Board found that claim 1 did not involve any computing means, but that:³⁸³

All the features of this claim are steps of processing and producing information having purely administrative, actuarial and/or financial character. Processing and producing such information are typical steps of business and economic methods.

Thus, the above claimed steps were a business method as such encoded in Article 52(2)

³⁸² T 0931/95 – *PBS Partnership*, OJ 2001, 441 (2000).

³⁸³ *Id.* at Reason 3.

(c) of the EPC. In addition, the Board further reasoned that:³⁸⁴

A feature of a method which concerns the use of technical means for a purely non-technical purpose and/or for processing purely non-technical information does not necessarily confer a technical character to such a method.

This meant that it was impossible to turn a patent-ineligible invention without technical features into a statutory invention having technical features by adding some steps related to technical means.

The Board also explained that the product claim of invention related to business transactions was a patent-eligible invention due to the fact that:³⁸⁵

“[S]chemes, rules and methods” are non-patentable categories in the field of economy and business, but the category of “apparatus” in the sense of “physical entity” or “product” is not mentioned in Article 52(2) EPC.

Besides, the Board clarified that the “technical contribution” was different from “technical character,” and held that examiners should not determine whether a claimed means met the patent eligibility based on the idea that:³⁸⁶

[“]If this contribution is not of a technical character, there is no invention within the meaning of Article 52(1)”. This confuses the requirement of “invention” with the requirements of “novelty” and “inventive step.”

That is, based on the incorrect point of view, examiners would be confused by the meaning of EPC 52(1) and those of the “novelty” and the “inventive step,” but EPC 52(1) does not contain any meaning associated with those requirements. Additionally, the Board further clarified that the new and known features had nothing to do with the

³⁸⁴ *Id.*

³⁸⁵ *Id.* at Reason 5.

³⁸⁶ *Id.* at Reason 6.

determination of the patent eligibility of subject matter either.³⁸⁷

4. Analysis:

A means to solve a non-technical objective or to execute non-technical information cannot demonstrate a technical character embedded in the means. However, a computer system with load software—for example, a business method—will be considered patentable since it is an apparatus having a physical entity and is within the meaning of EPC 52(1).³⁸⁸ Thus, a business method implemented by computer software may be patentable.

E. *Comvik*

In this case the Board pointed out that a patent-eligible invention was seen to have technical characters as a whole and may contain technical and non-technical features.³⁸⁹

1. Claimed subject matter:

The invention at issue was related to a method of using a multi-identity IC card as a Subscriber Identity Module (SIM card) in the GSM type system. Through this method, a mobile phone user could conveniently switch to one of several telephone lines stored on the multi-identity IC card, and then make a phone call without pulling out the original SIM card and installing another one.

The question in claim 1 was that it not only had technical features, but also had the following steps:³⁹⁰

- (1) the SIM card is allocated at least two identities
- (2) at least two identities being selectively usable

³⁸⁷ *Id.* at Reason 6.

³⁸⁸ *Id.* at Reason 5.

³⁸⁹ T 0641/00 – *Comvik*, OJ 2003, 352 (2002).

³⁹⁰ *Id.* at Reason 12.

(3) the selective activation is used for distributing the cost for service and private calls or among different users

2. Issue:

Was the claimed method unpatentable due to a lack of an inventive step?

3. Holding and reasoning:

The Board rejected the appellant's appeal based on the fact that it did not meet the requirement of the inventive step.

The Board adopted a problem-solution approach to determine the "inventive step,"³⁹¹ which requires an examination of whether a technical problem is formed in an applicant invention.³⁹² Since claim 1 included some non-technical features, the Board needed to decide whether or not the claimed invention presented a technical problem in the prior art. The Board reasoned that:³⁹³

The approach adopted in this decision thus accepts it as correct to formulate the technical problem to include non-technical aspects whether novel or not: these nontechnical aspects are thus not to be regarded as contributing to the solution.

Although, based upon the opinions, expressed in the precedent, a patent-eligible subject matter allows that the non-technical features can be a "dominating part" or "greater part" of the mixture of non-technical and technical features, the claimed invention may fail the requirement of "inventive step" due to the fact that the novelty assessment only relies on technical features.³⁹⁴

³⁹¹ *Id.* at Reason 5 (Four steps to determine the inventive steps: "(1) An identification of the technical field of the invention; (2) An identification of the closest prior art in this field; (3) An identification of the technical problem in the closest prior art which is solved by the invention; and (4) finally an assessment of whether the technical features presenting the solution could be derived in an obvious manner from the state of the art by a skilled person.").

³⁹² *Id.* at Reason 5 ("an invention is to be understood as a solution to a technical problem").

³⁹³ *Id.* at Reason 7.

³⁹⁴ *Id.* at Reason 4.

4. Analysis:

A technical problem may be constituted of technical and non-technical features, in which non-technical features cannot contribute to the inventive step. Namely, “technical contributions” are related to novelty or the non-obvious factor and are different from “technical features.”³⁹⁵

F. *Philips*

This case was related to the patent eligibility of data structure products.³⁹⁶

1. Claimed subject matter:

The appellant invention was related to a picture retrieval system and a record carrier having relevant functional data read to the system to enable the claimed functions.

Claim 4 was related to a computer readable medium as below:

A record carrier for use in the system as claimed in claim 1, *a coded picture* composed of consecutive variable length *coded picture lines* being recorded in a contiguous track of *the record carrier*, which track has been provided with *addresses*, characterized in that together with the coded *picture lines* line *synchronizations* and *line numbers* have been recorded on *the record carrier*, each *line number* specifying the sequence number of the relevant *coded picture line* in the *coded picture*, and each line *synchronization* specifying the beginning of the relevant *coded picture line*, the *coded picture lines* having a variable code length,...

2. Issue:

(1) Did independent claim 4, a record carrier on which a coded picture was recorded in a novel format, lack novelty?

³⁹⁵ See France PTO, <http://clients.cabinetbeaudelomenie.fr/gb/documentation/etudes/imprimer/computeur.html> (last visited on Feb. 18, 2011) (summarizing that a claim merely mentioning a computer, a server, a network and so on is sufficient to prove the inventions having technical features based on the decision of *Comvik*).

³⁹⁶ T 1194/97–*Philips*, OJ 2000, 205 (2000).

(2) Was claim 4 excluded from the statutory classes by Article 52(2)(d) and (3), EPC?

3. Holding and reasoning:

The Board held that amended claim 4 was clear and met the novelty requirement, and it was not excluded from the patentability under Article 52(2)(d) and 52(3) of the EPC.

The Board restated the meaning of “for use” in claim 4 as that:³⁹⁷

The standard interpretation in EPO practice is that *for use* means suitable for the specified use. In the present case this means that the record carrier must be readable by the read device specified in claim 1.

Thus, claim 4 was limited to the system in claim 1 and was not a computer program per se.

The Board also found that claim 4 was clear since line numbers, coded picture lines and addresses, and synchronizations in the claim were used to adapt to the claimed means that was operated by the system of claim 1 to provide a picture retrieval function.³⁹⁸

In particular, the record carrier in the claim having functional data recorded on it was related to data structures of picture line synchronizations, line numbers, and addresses, which had technical features and were not excluded from the patentable scope.

4. Analysis:

A computer readable medium containing functional data is not a mere presentation of data as such. Functional data stored on media has technical features

³⁹⁷ *Id.* at Reason 2.2.

³⁹⁸ See above claim 4.

that can be read to a computer to demonstrate technical effects.

The following table demonstrates the elements related to technical characteristics according to the above cases.

Elements	Eligible technical character	Ineligible technical character
Technical process	A. A process using a mathematical algorithm can result in a physical change in entity. B. (1) a process is “carried out under the control of a program;” (2) a specific program for controlling or carrying out a technical process	A mathematical algorithm (mathematical algorithm is carried out on numbers and the output is in numerical form.
Technical considerations	Yes	No
Computer readable medium	Functional data	Mere presentation of data
Computer software	Performance improvement of hardware	A. Computer program per se B. Non performance improvement of hardware
Technical features	A. Problem-solution approach B. Mixture of technical and non-technical features C. (1) line numbers (2) coded picture lines (3) addresses (4) synchronizations	A. pure non-technical features - Mental steps

Figure 5 - 1 Elements related to technical characters

5.3.2 Further Technical Effect

This factor was proposed by the Board of EPO to distinguish computer software inventions from ordinary subject matters in the determination of the patent eligibility of software inventions.

A. *IBM I*

In this case, the Board proposed an extra requirement—a further technical

effect—for CS inventions.³⁹⁹

1. Claimed subject matter:

The invention at issue was related to a method and system for resource recovery in a computer system running an application program. Claim 20 was related to a computer program stored on the internal memory of computer, and claim 21 was related to a computer program stored on a computer readable medium.

2. Issue: In which condition is a computer program claim not seen to be a computer programs as such?

3. Holding and reasoning:

The Board viewed that technical features may result from the physical modifications of computer hardware. However, what was caused from the operation of computer programs? The Board considered that:⁴⁰⁰

Although such [hardware] modifications may be considered to be technical, they are a common feature of all those programs for computers which have been made suitable for being run on a computer, and therefore cannot be used to distinguish programs for computers with a technical character from programs for computers as such.

Based on the above viewpoint, an extra factor is required for an invention related to a computer program to filter out a computer program as such. The Court found that:⁴⁰¹

It is thus necessary to look elsewhere for technical character in the above sense: It could be found in the *further effects* deriving from the execution (by the hardware) of the instructions given by the computer program.

Namely, a computer program per se executed by a computer can only lead to a normal

³⁹⁹ T 1173/97–IBM, OJ 1999, 609 (1998).

⁴⁰⁰ *Id.* at Reason 6.3.

⁴⁰¹ *Id.* at Reason 6.4.

technical effect; however, a patent-eligible computer program can result in a different technical effect compared with a computer program per se.

Thus, a software invention can be seen to have technical features if:⁴⁰²

[I]t produces a further technical effect which goes beyond the “normal” physical interactions between program (software) and computer (hardware).

Therefore, the extra element, a “further technical effect,” then becomes a very critical factor to assess the patent eligibility of computer software inventions in this case.

Moreover, the Board tried to find the scope of unpatentable subject matter, so it reinterpreted the term “as such” in Article 52(2) and (3) of the EPC. The Board considered “as such” to be “such programs are considered to be mere abstract creations, lacking in technical character, ” rather than the invention per se.⁴⁰³ The Board also respectively compared the above reinterpretation with the meanings of Article 52(1), 52(2) and 52(3) of the EPC, and held that there were no inconsistencies. Based on the above statutory construction, the original interpretation of Article 52(2) and (3) of the EPC under the examination guidelines of EPO should be revised as well.⁴⁰⁴ Therefore, a computer program per se was seen to be patent-eligible subject matter in this case.

4. Analysis:

A computer program claim only causing normal technical effects will be seen as a computer program as such; however, it may be seen as a patentable subject matter if it can cause a “further technical effect” as mentioned above. Even so, how to distinguish “further technical effects” from “ordinary technical effects” will be another tough issue for the EPO.

⁴⁰² *Id.* at Headnote.

⁴⁰³ *Id.* at Reason 5.2.

⁴⁰⁴ *Id.* at Reason 11.

B. IBM II

This was the second case involving IBM,⁴⁰⁵ the year after the above case. In this case, the Board held that a computer program comprising all the features of a patentable method was not excluded from patentability.

1. Claimed subject matter:

The invention was related to a “method and system in a data processing system windowing environment for displaying previously obscured information.”

Claim 7 was as follows:

A computer program product comprising a computer readable medium, having thereon:
computer program code means, when said program is loaded, to make the computer execute procedure to display information within a first window in a display...

2. Issue: Whether or not the above claim met the requirements of patent under the EPC?

3. Holding and reasoning:

The Board held that claims 1 to 6 were valid, but returned claims 7 to 10 for further prosecution about whether or not they were not excluded from patentability under Article 52(2) and (3) of the EPC.

The Board explained the condition that a computer program was not excluded from patentability as in the following:⁴⁰⁶

A computer program product which (implicitly) ***comprises all the features of a patentable method*** (for operating a computer, for instance) is therefore in principle considered as not being excluded from patentability under Article 52(2) and (3) EPC. ...When this computer program product is loaded into a computer, the programmed computer constitutes an apparatus

⁴⁰⁵ T 0935/97 (1999).

⁴⁰⁶ *Id.* at Reason 9.6.

which in turn is able to carry out the said method.

Namely, the “features in the claimed method” become a required factor for a patent-eligible computer program.

The Board took a view at a computer readable medium as follows:⁴⁰⁷

Claim 7 was directed to a computer program code stored on a computer readable storage medium,..., the subject matter claimed was distinguished from that prior art only by the information pattern represented by the stored program code.

The Board further reasoned that:⁴⁰⁸

[I]t does not make any difference whether a computer program is claimed by itself or as a record on a carrier.

From the above viewpoint, a computer program invention will be seen as patent-eligible primarily relying on the features of a patentable method embedded in the program, rather than whether it claims a computer program medium or a computer program per se.

4. Analysis:

Based on the two IBM cases above, the Board held that the technical feature—a further technical effect—that resulted from a computer program executed by computer hardware was a dominant factor in the determination of whether a computer program is within the scope of patentable subject matter. Based on this point of view, it is not important to distinguish whether or not a claim is related to a computer program stored on a medium or a computer program per se.

However, some scholars commented that the Board did not illustrate the status of a computer program expressed in other forms, which might have resulted in a very wide

⁴⁰⁷ *Id.* at Summary I.

⁴⁰⁸ *Id.* (citing T 163/85).

scope of statutory inventions related to computer program only if a computer program claim adds some steps having technical features.⁴⁰⁹

C. *Hitachi*

In this case, the Board lowered the threshold of “invention” of Article 52(1); however, the claimed method was rejected due to a lack of an inventive step.⁴¹⁰

1. Claimed subject matter:

The claimed invention was related to an automatic auction method, by which bidders do not have to remain before terminals until the end of the auction.⁴¹¹ The method collected some information, such as a desired price, number of purchases, and a highest possible price in competition for the desired price and so on for the automatic bidding.

Claim 1 was as below:

1. An automatic auction method executed in a server computer comprising the steps of:
 - a) transmitting information on a product to be auctioned to a plurality of client computers via a network, each client computer belonging to a bidder;
 - b) receiving a plurality of auction ordering information pieces, each including a desired price and a maximum price in competitive state, for purchase of said product, from the plurality of client computers via the network;
 - c) storing the received auction ordering information pieces in the server computer for respective bidders...

2. Issue:

(1) Was the claimed auction method seen as a business method as such so as not

⁴⁰⁹ See *Schohe*, *supra* note 353, at 329-330 (commenting that such as source code, any abstract representation of program, flow diagrams and the like will not be excluded from patentable subject matters based on the holding of this case).

⁴¹⁰ T 0258/03 – *Hitachi*, OJ 2004, 575 (2004).

⁴¹¹ See U.S. Patent No. 6061663 (filed Sep. 2, 1997) (The similar application has been granted a patent by the USPTO.).

to be a patentable invention according to Article 52(2) and (3) of the EPC?

(2) Did the claimed invention meet an inventive step?

3. Holding and reasoning:

The Board held the claimed invention was an invention under Article 52(1); however, it did not have an inventive step.

The Board initially clarified some points that a patentable invention had to meet four requirements; i.e. it must be new, inventive, industrially applicable and patent-eligible.⁴¹² The last requirement was based on the construction of “invention” under Article 52(1) of EPC. However, the Board held that the decision about whether subject matter is excluded by EPC 52(2) could be made by anyone without any relevant technical knowledge according to the structure of the EPC.⁴¹³ It means that in this stage, what is patent-eligible does not require one to look up what kind of technology a claimed invention involves.

In the consideration of the patent eligibility of subject matter, the Board restated that prior art should not be considered since a mixture of technical and non-technical features may be seen as an invention under EPC 52(1).⁴¹⁴

Thus, based on the above viewpoint, the claimed means in claim 3 (including “server computer”, “client computers” and a “network” in the claims) were sufficient to demonstrate that the claimed apparatus had technical features.⁴¹⁵

Additionally, the Board held a very wide viewpoint in the interpretation of EPC

⁴¹² *Id.* at Reason 3.1.

⁴¹³ *Id.*

⁴¹⁴ *Id.* at Reason 3.5.

⁴¹⁵ *Id.* at Reason 3.5, 3.7 and 4.3.

52(1) as stated below:⁴¹⁶

[T]he presence of technical character [] may be implied by the physical features of an entity or the nature of an activity, or may be conferred to a nontechnical activity by the use of technical means. In particular, the Board holds that the latter cannot be considered to be a non-invention “as such” within the meaning of Article 52(2) and (3) EPC.... [A]ctivities falling within the notion of a non-invention “as such” would typically represent purely abstract concepts devoid of any technical implications.

According to the above interpretation, the scope of patentable subject matter might be extended to nontechnical activities that in part involved a technical means. Nevertheless, the Board was aware that the broad interpretation might cause some problem in that:⁴¹⁷

[I]ts comparatively broad interpretation of the term “invention” in Article 52(1) EPC will include activities which are so familiar that their technical character tends to be overlooked, such as the act of writing using pen and paper. Needless to say, however, this does not imply that all methods involving the use of technical means are patentable.

For instance, “writing using pen and paper” might be deemed to have technical features based on the above viewpoint, which will result in the lowering of the threshold of technical features.

In spite of the lowered threshold of technical features, the claimed method was rejected based on the lack of an inventive step as follows:⁴¹⁸

Method steps consisting of modifications to a business scheme and aimed at circumventing a technical problem rather than solving it by technical means cannot contribute to the technical character of the subject matter claimed.

⁴¹⁶ *Id.* at Reason 4.5.

⁴¹⁷ *Id.* at Reason 4.6.

⁴¹⁸ *Id.* at Reason 5.7.

4. Analysis

In this case, the “entry hurdle” of the requirement for invention seemed to be lowered by the Board; however, it was rejected later by the other requirement—an inventive step. Thus, there are some arguments in support of the re-arrangement of examination processes, in which the examination of the patent-eligibility of an invention should be put aside when the decision of patent-eligibility is hard to make.⁴¹⁹

D. *Microsoft*

1. Claimed subject matter:

The appellant claimed a method invention—Data Transfer with Expanded Clipboard Formats—that could facilitate the data transfer of non-file data in a clipboard format.⁴²⁰ The clipboard was that found in a “Microsoft Windows 3.1” platform offering the functions such as “cut”, “copy” and “paste.” The claimed method was to expand clipboard formats, including holding the contents of a file and holding a file group descriptor, which could make clipboard functions not limited to the type of file.

Claim 1 was as follows:

A method in a computer system (10) having a clipboard for performing data transfer of data in a clipboard format, said method comprising the steps of:
providing several clipboard formats including a text clipboard format, a file contents clipboard format and a file group descriptor clipboard format, selecting data...

2. Issue:

Was the claimed method an invention under Article 52(1), (2) and (3)?

⁴¹⁹ See, e.g., Mark A. Lemley, Michael Risch, Ted M. Sichelman and Michael Risch, *Life After Bilski* 28 (Dec. 13, 2010), available at <http://ssrn.com/abstract=1725009> (proposing that the determination of whether an invention is statutory should not be a “gatekeeper” to exclude invalid claims).

⁴²⁰ T 0424/03 (2006).

3. Holding and reasoning:

The Technical Board held that the amended claims met the requirements of the novelty and inventive step, and the claimed methods were not excluded from the scope of patentable subject matters.

The Board held that claim 1 had a technical character based on the fact that it involved a physical entity. The Board reasoned that:⁴²¹

A computer system including a memory (clipboard) is a technical means, and consequently the claimed method has technical character in accordance with established case law.

Additionally, the Board distinguished a method claim implemented by a computer system from a computer program claim. The Board considered that “a method implemented in a computer system represents a sequence of steps actually performed and achieving an effect.”⁴²² However, a computer program “was a sequence of computer-executable instructions,” which “just had the potential of achieving” the claimed result.”⁴²³

The Board held that the claimed method had a technical character due to the fact that clipboard formats could “be used independently of any cognitive content” to “facilitate[] the exchange of data among various application programs”, which “enhance[d] the internal operation of a computer system.”⁴²⁴

The Board also held that claim 5 had a technical character since it was related to a computer-readable medium,⁴²⁵ and resulted in a further technical effect that “goes

⁴²¹ *Id.* at Reason 5.1.

⁴²² *Id.*

⁴²³ *Id.*

⁴²⁴ *Id.* at Reason 5.2

⁴²⁵ *Id.* at Reason 5.3 (citing T 258/03 (*Hitachi*)).

beyond the elementary interaction of any hardware and software of data processing.”⁴²⁶

4. Analysis:

In this case, the Board took a slightly different viewpoint of a “computer program claim” from the opinion in the case of *IBM I* and held that it only has the possibility of technical character. This point of view might raise confusion in the patent eligibility of a computer program, a point which was also questioned in the later referral G 3/08.

5.3.3 Summary

Referral G 3/08 appears to be a good reference to EPO’s opinions in dealing with the patent eligibility of an invention related to computer software.

A. G 3/08

1. Introduction

In October 2008, the President of EPO, Alison Brimelow, proposed four questions associated with computer-implemented inventions and asked the Enlarged Board of Appeal (hereafter EBA) to clarify the patentability of computer programs through these answers. Subsequently, the EBA invited public opinions regarding the referral of the President. As a result, there were more than one hundred amicus curiae letters sent to the Enlarged Board. Later, on May 12, 2010 the EBA issued its opinion about these questions based on the precedent cases of the Board as well as the reference to the submitted opinions.

2. Issue

The four questions were the following:

⁴²⁶ *Id.* (citing T 1173/97(*IBM I*)).

1. Can a computer program only be excluded as a computer program as such if it is explicitly claimed as a computer program?
2. Can a claim in the area of computer programs avoid exclusion under Art. 52(2)(c) and (3) merely by explicitly mentioning the use of a computer or a computer-readable storage medium ?
3. Must a claimed feature cause a technical effect on a physical entity in the real world in order to contribute to the technical character of a claim?
4. Does the activity of programming a computer necessarily involve technical considerations?

3. Decision and reasoning

The EBA held that the referral and the questions were not admissible since there was no divergence in the cases supporting these questions. The EBA did not answer the questions; however, its viewpoint on computer-implemented inventions can be found in the course of consideration of the admissibility.

The opinions can be divided into two main groups. In one, we will consider the EBA's competence under Article 112, and in the other we will consider the proposed questions. The following are briefs of the EBA's discussions related to the four questions.

In regard to question 1, the EBA considered that the reasoning regarding the "invention" issue according to T 424/03 (*Microsoft*) was a "legitimate development of case law" from T 1173/97 (*IBM I*).⁴²⁷ As mentioned above, the *Microsoft* Board was more concerned about claim types, a difference from *IBM I*, which was concerned about functions of a computer program.⁴²⁸ Based on *Microsoft*, when a claim is related to a "computer program for method x", it could be excluded from patentability; however, when a claim is illustrative of a "computer implemented method", or "computer program

⁴²⁷ G 3/08, at Reason 10.10.

⁴²⁸ *Id.* at Reason 10.2.

product storing executable code for method x”, it will be seen as a patent-eligible subject matter.⁴²⁹

In regard to question 2, the EBA recognized that a computer program claim merely reciting the use of a computer or a computer readable medium can avoid exclusion by EPC 52(2) and (3) according to present case opinions.⁴³⁰ In spite of the lower threshold of Article 52(1), the EBA considered that the above mentioned claim would be rejected upon the lack of “inventive step” as provided in Article 52(1) and 56.⁴³¹

In regard to question 3, the EBA considered that in cases T 163/85 and T 190/94, the Board “merely accepted this as something sufficient for avoiding exclusion from patentability,” and did not mean that it was necessary.⁴³² In the determination of technical character, the EBA expressed the view that case law considered “all the features that are claimed,” and avoided adopting methods that “involve weighting of features or a decision which features define the ‘essence’ of the invention.”⁴³³

In regards to question 4, the EBA noted that “although it may be said that all computer programming involves technical considerations,” it was “not enough to demonstrate that the program which results from the programming has technical character” since “technical considerations [needed] to be beyond ‘merely’ finding a computer algorithm to carry out some procedure.”⁴³⁴ Namely, a computer programmer’s technical considerations in programming may lead to a technical feature,

⁴²⁹ *Id.*

⁴³⁰ *Id.* at reason 10.13.

⁴³¹ *Id.*

⁴³² *Id.* at Reason 12.3.

⁴³³ *Id.* at Reason 12.2.1

⁴³⁴ *Id.* at Reason 13.5.

but a patentable computer program invention needs “a further technical effect” as a technical character.⁴³⁵

B. Discussions

If we review the substantial content of a computer program, we can find that it is inappropriate to distinguish an apparatus claim from a computer program claim in the determination of patent-eligible subject matter upon the EPO’s test. A computer program claim needs to achieve “a further technical effect” as a technical character, whereas an apparatus claim only needs a “technical effect” to meet the requirement. Thus, a computer system having an internal memory that executes the same claimed steps will be statutory only if it can generate an ordinary technical effect.

Similarly, the substantial content of a computer readable medium storing a computer program is not different from that of a computer program operated by a computer system, or when a computer program claims a series of steps implemented by a computer system. The main difference among them is that the claimed scope of rights is different, but not what an inventor invented. However, there exists a different viewpoint to deal with the issue of patent eligibility based on the above case opinions.

The following table is a list of cases related to computer implemented inventions decided by the EBA.

⁴³⁵ Technical character = further technical effects in computer software inventions = technical effects in ordinary patent-eligible subject matter.

Claimed Subject	Technical	Not Technical
Data Processing Physical data	data representing an image (T 208/84)	
	data representing parameters and control values of an industrial process (T 26/86)	
Data Processing Not physical data		monetary values (T 953/94)
		business data (T 790/92)
		text (T 38/86)
Processing which effects the way in which a computer operates is technical	Saving memory, increasing speed, improving security, operating a user interface (T 236/91, T 59/93)	
	configuring the operating system (T 265/92)	
	coordinating and controlling internal data (T 6/83),	
	assisting in solving diagnostic problems in data communication (T 216/89)	
Processing which is based on considerations of how a computer works is technical	financial management software for general-purpose computer (T 769/92)	
Apparatus	a computer loaded with a program (T 931/95)	
Computer program	Computer program as such (T 0935/97)*	
	Computer readable medium (T 0935/97, T163/85, T 0424/03)*	

Figure 5 - 2 CS Inventions with technical character⁴³⁶

* have the potential

The following figure demonstrates the differences in technical character requested by the EPO. A technical problem may be consisted of technical and non-technical features. A patent-eligible ordinary subject matter must generate a

⁴³⁶ See <http://www.iusmentis.com/patents/businessmethods/epc/> (last visited on Feb. 18, 2011) (Data are collected from that article and cases in this chapter).

technical effect in the claimed solution. A patent-eligible computer program claim must produce a further technical effect from the interactions between computer software and hardware, which is beyond a technical effect.

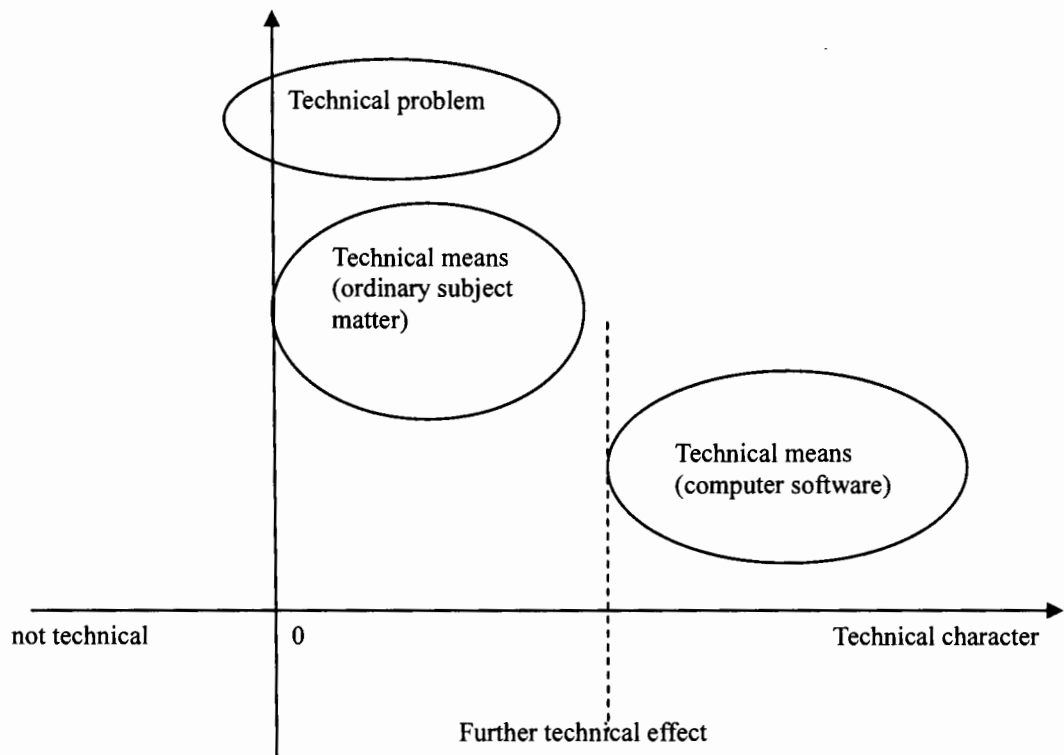


Figure 5 - 3 Technical character under the EPO

Chapter 6 Software Patents in the U.S.

A computer software invention was not seen as a patent-eligible invention falling within the meaning of § 101 of the U.S. Patent Act during the 1960s.⁴³⁷ In the case of *Benson*;⁴³⁸ however, the U.S. Supreme Court started to positively view the demand for patent protection for software inventions. Although the USPTO has granted patents on this subject matter for more than four decades, there have been many controversies related to its patent eligibility under patent law, especially in the recent case of *Bilski*.⁴³⁹

In this Chapter, I will introduce the evolution of software patents in the U.S. and then review the regulations of the Patent Act related to the patent eligibility of subject matter. Some relevant cases affecting the determination of statutory subject matter will be discussed as well. Furthermore, a comparison of tests will be discussed followed by a conclusion.

6.1 Statutory Bars

In order to be a patent-eligible subject matter under the U.S. Patent Act, an

⁴³⁷ See, e.g., Robert Patrick Merges and John Fitzgerald Duffy, *Patent Law and Policy: Cases and Materials* 131 (4d. 2007).

⁴³⁸ *Gottschalk v. Benson*, 409 U.S. 63 (1972).

⁴³⁹ 130 S. Ct. 3218, 177 L.Ed.2d 792 (2010).

invention has to meet several regulations. The following sections will discuss each of them related to the patent eligibility of subject matter.

6.1.1 Meaning of Invention: § 101

There is no statutory definition of “invention;” however, § 101 provides the following:⁴⁴⁰

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent.

Based on the above texts, those materials invented or discovered have potential to be granted patents. In *Chakrabarty*,⁴⁴¹ the Court held that “anything under the sun that is made by man” could be a statutory subject matter based on Congressional reports.⁴⁴²

The below figure illustrates the changes of § 101 over time. We can find that it had been revised to make it clearer and more definite and adapt to the demand. The word “new” to the requirements was added, and the word “art” was modified as “process”.

⁴⁴⁰ The texts in the current article are similar to those in 1793.

⁴⁴¹ *Diamond v. Chakrabarty*, 447 U.S. 303, 100 S. Ct. 2204 (1980).

⁴⁴² *Id.* at 2208 (citing S.Rep.No.1979, 82d Cong., 2d Sess., 5 (1952); H.R.Rep.No.1923, 82d Cong., 2d Sess., 6 (1952)).

Year	§ 101 in history	Changes
1790	any useful art, manufacture, engine, machine or device, or any improvement therein	
1793	any new and useful art, machine, manufacture, or composition of matter	Added “new” requirement
1952 (Current)	any new and useful process, machine, manufacture, or composition of matter, or improvement thereof	art → process, <i>Cochrane v. Deener</i> (1877)

Figure 6 - 1 Evolutions of 35 U.S.C. 101

6.1.2 Scope of Inventions

A. Scope of Statutory Subject Matter

Statutory inventions are encoded in § 101, which enumerates four types of inventions under patent protection—process, machine, manufacture, or composition of matter. These four groups seem to be very clear; however, many disputes have arisen from the meaning of “process.”

1. Meaning of “Process”

It will be much more difficult to determine the patent eligibility of an invention when it claims a means, a method, or a series of steps rather than a product. The meaning of “process” is encoded in 35 U.S.C. 100(b):⁴⁴³

The term “process” means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

⁴⁴³ Cf. Interim Patent Subject Matter Eligibility Examination Instruction in Aug. 2009 (“Process – an act, or a series of acts or steps that are tied to a particular machine or apparatus or transform a particular article into a different state or thing.”).

The above definition of process seems well-defined; however, it cannot discern whether any type of non-product claim is within the process category due to the vagueness of claim terms and the emergence of new technologies. The Supreme Court found that the scope is very broad, and concluded that it was only limited by “the abstract ideas, laws of nature, and the like.”⁴⁴⁴

2. Rejections under § 101 in the MPEP

The Manual of Patent Examining Procedure (hereafter MPEP) of USPTO lists three types of subject matters that are deemed unpatentable subject matters under 35 U.S.C. 101—printed matters, naturally occurring articles, and scientific principles.⁴⁴⁵

a. Printed Matter

The USPTO rejects mere arrangement of printed matter as a patentable subject matter due to the fact that it is not a kind of “manufacture” within patentable classes.⁴⁴⁶

The reason is based on the idea that merely non-functional descriptive materials cannot create patentable distinction over the prior art. A music medium merely storing data is just a typical non-functional descriptive material, but a computer readable medium with

⁴⁴⁴ *Bilski*, at 3238 n. 5.

⁴⁴⁵ 706.03(a) Rejections under 35 U.S.C. 101 [R-5], MPEP.

⁴⁴⁶ 706.03(a) Rejections under 35 U.S.C. 101 [R-5], MPEP (citing *In re Miller*, 418 F.2d 1392, 164 USPQ 46 (CCPA 1969); *Ex parte Gwinn*, 112 USPQ 439 (Bd. App. 1955); and *In re Jones*, 373 F.2d 1007, 153 USPQ 77 (CCPA 1967).).

software is not.⁴⁴⁷

b. Naturally Occurring Article

An invention related to a naturally occurring article without being substantially altered will be rejected based on the fact that it is not within the category of “manufacture.” This rejection also responds to the principle—anything under the sun that is *made by man* is patentable—in *Chakrabarty*. Thus, an invention related to a shrimp with the head and digestive tract removed is unpatentable;⁴⁴⁸ however, an invention related to a genetically engineered bacterium capable of eating oil is patentable.⁴⁴⁹

Computer software inventions apparently cannot be rejected on this account since they are definitely not naturally occurring articles.

c. Scientific Principle

This rejection is similar to the rejection of laws of nature based on the idea that it may exclude others from applications of scientific principles to other items. For example, the claiming of the principle of electro-magnetism in Morse code is unpatentable.⁴⁵⁰

⁴⁴⁷ Sec. II. Particular practical application, Interim Guideline (Aug. 2009).

⁴⁴⁸ *Ex parte Grayson*, 51 USPQ 413 (Bd. App. 1941).

⁴⁴⁹ See *Chakrabarty*, 447 U.S. 303.

⁴⁵⁰ *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 86 (1854).

B. Exceptions to Subject Matters under Case Law

There are no coded statutes providing unpatentable subject matters in the U.S. Patent Act; however, there are three classes deemed to be unpatentable subject matters based on case law—abstract ideas, laws of nature, and natural phenomena.⁴⁵¹ These three classes are excluded from patent protection based on the fact that they are fundamental principles, so patents granted to them may “‘wholly pre-empt’ the public’s access to the ‘basic tools of scientific and technological work.’”⁴⁵²

1. Abstract Ideas

The determination of whether a claim involves abstract ideas is more difficult than the other two exceptions due to the vagueness of claim terms. One reason to reject an invention related to abstract ideas is based on the idea that it does not have a practical application when in fact it does. Another reason to exclude abstract ideas from patent protection is due to the fact that vague claims may preempt a wide range of application of those ideas.

Upon a historical review, an abstract idea may be present with an idea itself, an intellectual concept, a principle, a mathematical formula, and so on. The following table demonstrates abstract ideas expressed in various forms over time.

⁴⁵¹ See, e.g., *Benson*, 409 U.S. at 67.

⁴⁵² *Bilski v. Kappos*, 130 S.Ct. 3218, 3258 (2010).

Cases	Abstract Ideas
<i>Le Roy v. Taham</i> (1853)	A principle, in the abstract, is a fundamental truth; an original cause; a motive
<i>Rubber-Tip Pencil Co. v. Howard</i> (1874)	An idea itself
<i>Gottschalk v. Benson</i> (1972)	Mental processes, and abstract intellectual concepts
<i>Diamond v. Diehr</i> (1981)	Formula in the abstract
<i>In re Alappat</i> (1994)	Abstract mathematics
<i>State Street</i> . (1999)	Mathematical algorithms

Figure 6 - 2 Abstract ideas expressed in various forms

2. Laws of Nature

There are two main reasons that the “laws of nature” cannot be granted patents. The first one is that laws of nature are not created by man, even though they may be unknown to the public. The second one is that granting patents to these items will exclude applications of these laws to other items.⁴⁵³ For example, in the Case of *Funk*,⁴⁵⁴ the Court saw the “laws of nature” as “part of the storehouse of knowledge,” so that they should be “free to all men and reserved exclusively to none.”⁴⁵⁵

Laws of nature include electrical laws, physical laws, logarithms, and even the whole science principle. The following table demonstrates the meaning of laws of nature in case law.

⁴⁵³ Cf. *Arrhythmia Res. Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1066 n.3 (Fed.Cir.1992). (remarking that laws of nature are unpatentable due to they are not related to “process” under § 101).

⁴⁵⁴ *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948).

⁴⁵⁵ *Id.* at 130.

Cases	Laws of nature
<i>O'Reilly v. Morse</i> (1854)	laws of Physics (electromagnetic waves)
<i>Marconi Wireless T. Co. of America v U.S.</i> (1943)	"The discoveries of science are the discoveries of the laws of nature."
<i>Diamond v. Diehr</i> (1981)	"[A]n algorithm is laws of nature"
<i>Taser Intern., Inc. v. Stinger Systems, Inc.</i> , (2010)	Electrical laws (Ohm's law)

Figure 6 - 3 Meanings of laws of nature

3. Natural Phenomena

The reason why natural phenomena or physical phenomena are excluded from patentable subject matters is slightly different from those of the above two classes.⁴⁵⁶ The court rejects this class as statutory subject matter not because it is not a process, but because "[it is] not the kind of discovery that the patent statute was enacted to protect."⁴⁵⁷ Thus, applications of them are patentable since they are similar to those applications of laws of nature.

The scope of natural phenomena is very broad, including the discovery of mines, energies, mathematical formulas and laws of physics, and even extending to any discovery in the natural world. The following table enumerates some instances that are seen as natural phenomena in case law.

⁴⁵⁶ Interim Guideline of 2010 uses the wording "physical phenomena" to replace natural phenomena.

⁴⁵⁷ *Parker v. Flook*, 437 U.S. 584, 593, 98 S. Ct. 2522, 57 L.Ed.2d 451 (1978).

Cases	Natural Phenomena
<i>Armour Pharmaceutical Co. v. Richardson-Merrell, Inc.</i> (1967)	Discovery of a natural phenomenon (the molecule could penetrate the intestinal wall)
<i>Diamond v. Chakrabarty</i> (1980)	A new mineral discovered in the earth, a new plant found in the wild, mathematical formulas ($E=mc^2$) or laws of physics (the law of gravity)
<i>In re Bonczyk</i> (2001)	Energy itself (a fabricated energy structure)

Figure 6 - 4 Meanings of natural phenomena

C. Mathematical Algorithms

Process claims involving mathematical algorithms are more complex than the above classes. The concept of a mathematical algorithm may cover a mathematical computation, an “abstract idea”,⁴⁵⁸ a law of nature,⁴⁵⁹ and so on. The Supreme Court has no consistent term to describe it; thus, such things as mathematical algorithms, mathematical formulas, or mathematical equations have ever been seen as nonstatutory subject matters.

There are three conditions for which mathematical algorithms in process claims will be seen as unpatentable processes under the MPEP.⁴⁶⁰ First, a mathematical algorithm in process claims has to be pure mathematical operations rather than practical

⁴⁵⁸ *Gottschalk v. Benson*, 409 U.S. 63, 71-72 (1972).

⁴⁵⁹ *Diehr*, 450 U.S. at 186.

⁴⁶⁰ 2106.02 **>Mathematical Algorithms< [R-5], MPEP.

applications of a mathematical algorithm. Second, it must represent an abstract idea. For example, a bid method in *Schrader* was unpatentable.⁴⁶¹ Third, it must represent a mathematical formula, such as $E = mc^2$. This is unpatentable since the patenting would prevent other applications of the formula.

D. Summary

In addition to the above types of exceptions, mental processes listed in the MPEP of USPTO are deemed to be unpatentable.⁴⁶² The Court in *Chakrabarty* further held that people “should not read into the patent laws limitations and conditions which the legislature has not expressed,”⁴⁶³ which meant that exceptions to subject matters are beyond the above classes.

The above boundaries among different classes are not very clear although judges and the USPTO try to classify them into different categories. In some conditions, boundaries of the above classes overlap as indicated in the above three tables. For instance, the boundaries between laws of nature and scientific principles and those between natural phenomena and naturally occurring articles are obscure. Even the

⁴⁶¹ *In re Schrader*, 22 F.3d 290, 293 (Fed.Cir.1994) (“Perform a mathematical calculation which a) determines possible combinations of items and/or groups with the provision that each item only appear once in each combination. b) selects the combination with prevailing (i.e. highest or lowest) value.”).

⁴⁶² Interim Guidelines for §101 (Aug. 2009). See *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1066 n.3 (Fed.Cir.1992) (“a mathematical algorithm does not appear in nature at all, but only in human numerical processes.”).

⁴⁶³ *Chakrabarty*, 447 U.S. at 308.

boundaries between laws of nature and natural phenomena are not easy to distinguish.

Most disputes over subject matter eligibility arise from the reasoning that claimed inventions are drafted in vague or abstract terms. Especially, when a claimed subject matter is related to a new type of subject matter or new technology, the classification will be more difficult. In some extreme cases, a claimed subject matter cannot be categorized into any category of statutory or nonstatutory subject matters, which makes the classification method even more useless. Therefore, it can be understood why the judges in *Bilski* refuted the steps of the MPEP in the determination of the eligible-subject matter.⁴⁶⁴ Based on the instructions in the MPEP, the categorization of a claimed subject matter must occur prior to other steps.⁴⁶⁵

6.1.3 Other Requirements of Patentability: §§ 102 to 103

In addition to satisfying the meaning of invention under § 101, an invention also has to meet other requirements of patentability, such as utility, novelty and non-obviousness under §§ 101, 102 and 103. Some of these regulations related to the issue will be discussed in later sections.

6.1.4 Specification Limit: § 112

⁴⁶⁴ The Interim Guidelines of USPTO (July 2010) (After *Bilski*, the USPTO issued an interim guideline that the determination of subject matter eligibility on process claims is based on the machine-or-transformation test and then the abstract idea test.)

⁴⁶⁵ See the comparison of steps to determine the subject-matter eligibility before-and-after *Bilski* in the next section.

Sufficient disclosure is another requirement for patent applications, in which the know-how of inventions has to be clearly disclosed in the specifications. 35 U.S.C. 112 provides that:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains.

This article also offers another tool for examiners to clarify what the real essence of the invention is and what an inventor wants to claim upon office actions in the course of prosecution. Thus, the scope of claimed subject matter can be constrained upon the doctrine of prosecution history estoppel.⁴⁶⁶

6.2 Computer-Related Nonstatutory Subject Matter: 2106.01 of MPEP

The contents of computer software inventions can be divided into two classes—functional descriptive and non-functional descriptive materials.⁴⁶⁷ The former may be patentable if it does not claim itself and is stored on a computer readable medium. The latter is not patentable due to a lack of utility requirement under § 101. This includes musical works, literary works, and photographs, as well as those works that are mere compilations or arrangements of data or facts.

⁴⁶⁶ *Festo Corp v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 568 (Fed. Cir. 2000).

⁴⁶⁷ 2106.01 Computer-Related Nonstatutory Subject Matter [R-6] MPEP (July, 2010).

6.2.1 Functional Descriptive Material

A functionally descriptive material has to meet three requirements as a patentable subject matter under § 101. First, its contents must consist of data structure or computer programs. Second, it is stored on a computer readable medium. Third, it is employed as a computer component. That is, when it is read to a computer apparatus, its functionality can be realized through the apparatus; thus, it acts as a part of computer hardware. However, a functional descriptive material itself cannot be statutory due to the fact that its functional effects cannot be realized without computer hardware. In the case of *Lowry*, a claimed computer readable medium that stored functional data structures and enabled improvement of the performance of a computer was seen as a physical entity.⁴⁶⁸

Based on the above requirements, there are two conditions under which functional descriptive materials are not statutory. First, claiming a descriptive material per se cannot lead to the functional change of computer hardware when the claimed data structures are not stored in a computer readable medium. Second, the contents of a claim are unable to be operated as executable instructions due to the fact that they are

⁴⁶⁸ *In re Lowry*, 32 F.3d 1579, 1584 (Fed. Cir. 1994) (Claim 1: “A memory for storing data for access by an application program being executed on a data processing system, comprising: a data structure stored in said memory, said data structure including information resident in a database used by said application program and including: a plurality of attribute data objects stored in said memory, each of said attribute data objects containing different information from said database;...”).

mere descriptions or expressions of the programs when a computer program is claimed as a computer listing per se. In the case of *Warmerdam*, an invention claiming data structures per se was just an abstract idea, thus it was a nonstatutory subject matter.⁴⁶⁹

6.2.2 Nonfunctional Descriptive Material

Nonfunctional descriptive materials are not patentable due to a lack of functionality; however, they may present a functional interrelationship in the course of data processes when they are combined with functional descriptive materials.⁴⁷⁰ For instance, a photograph recorded on a computer readable medium may be seen to be statutory when it not only presents the original content of the photo, but also has some functional or structural interrelationship among the data and the processes operated by computer hardware. For instance, the final product may be a clearer image through noise reduction processing, which may be patentable.

The USPTO notes that the functionality of materials subject to this subclass is not as evident as that of functional descriptive materials; thus, examiners have to review these materials more prudently.⁴⁷¹

The following table represents the classification of patent eligibility based on

⁴⁶⁹ *In re Warmerdam*, 33 F.3d 1354, 31 U.S.P.Q.2d 1754, 1759 (Fed. Cir. 1994) (Claim 1: “1. A method for generating a data structure which represents the shape of [sic] physical object in a position and/or motion control machine as a hierarchy of bubbles, comprising the steps of: first locating the medial axis of the object and then creating a hierarchy of bubbles on the medial axis.”).

⁴⁷⁰ 2106.01 Computer-Related Nonstatutory Subject Matter [R-6].

⁴⁷¹ *Id.*

functional and non-functional descriptive materials according to the above discussions.⁴⁷²

Descriptive materials	Contents	Patentable	
Functional	Data structures	Yes (impart functionality when employed as a computer component)	1. No (descriptive material per se) 2. No (not claimed as embodied in computer-readable media)
	Computer programs	Yes (a claimed computer-readable medium encoded with a computer program)	No (not claimed as embodied in computer-readable media, or claimed as computer listings per se)
Nonfunctional	Music	Yes (in combination with other functional descriptive multi-media material on a computer-readable medium)	No
	Literary works		
	Photographs		
	Mere compilations or arrangements of data or facts		

Figure 6 - 5 Patent eligibility of functional and nonfunctional descriptive materials

6.3 Determination of the Patent Eligibility of Subject Matter

Computer software inventions initially were not seen as statutory subject matters.

In 1968, the USPTO issued a guideline, stating that any kind of an invention related to a

⁴⁷² *Id.*

computer program in the form of a process or an apparatus was not patentable.⁴⁷³ In 1972, the court in *Benson* viewed that computer programs were like mathematical algorithms within the same category of non-statutory subject matter.⁴⁷⁴

The positive attitude toward the patenting of software began in *Diehr*,⁴⁷⁵ a development suggesting that a computer software invention could be granted a patent as long as it met the requirements of other subject matters. Since then, several tests have been proposed by the court to check the patent eligibility of an invention. The following will introduce these tests as well as their advantages and disadvantages.

6.3.1 Freeman-Walter-Abele Test

This test was established and modified by the court based on three deferent cases sequential. The following will respectively introduce the rise and the modification of the test.

A. *In re Freeman* (1978)

This test originated in *Freeman*,⁴⁷⁶ in which the invention at issue was related to a computer-based control typesetting system for printing mathematical symbols. The

⁴⁷³ Fed. Reg. 15581, 15609-10 (1968) (The USPTO rejected computer programs per se as a statutory subject matter, but computer programs might be eligible if combined with other patentable subject matters.).

⁴⁷⁴ *Benson*, 409 U.S. at 71-72 (holding that the patenting of computer programs was like the patenting of mathematical algorithms, which would preempt the use of the mathematical formulas).

⁴⁷⁵ *Diamond v. Diehr*, 450 U.S. 175 (1981).

⁴⁷⁶ *In re Freeman*, 573 F.2d 1237 (1978).

inventor tried to claim an apparatus, while the term “means for” in claims was considered indistinguishable from that of a method claim by the Court of Customs and Patent Appeals (CCPA).⁴⁷⁷ In applying the method adopted in *Benson*, the court found that in consideration of the claims as a whole the invention involved an algorithm, which further raised an inquiry about whether it would preempt the algorithm.

The CCPA adopted the two-step test. The first step was to determine whether an algorithm was directly or indirectly recited in the claim; if so, then second, whether the claims preempted the algorithm.

In applying the test, the court reversed the Board’s rejection and held that the apparatus and method claims were not algorithms, thus they would not be prevented by the applications of algorithms.

B. *In re Walter* (1980)

The second step of Freeman test was clarified in *Walter*,⁴⁷⁸ in which the court emphasized that the analysis of the patent eligibility under § 101 should consider the claim as a whole.

The invention at issue was a system and method for seismic prospecting and surveying, in which the “partial product signals” for the claimed purpose could be

⁴⁷⁷ *Id.* at 1247 (Claims 1-8 are system claims and 9-10 are method claims).

⁴⁷⁸ *In re Walter*, 618 F.2d 758 (1980).

generated through several mathematical computations by various mathematical formulas. Some of the claims were drafted in Jepson format or in vague terms, in which some steps were considered mathematical algorithms.⁴⁷⁹

The Court of Customs and Patent Appeals (CCPA) clarified that the determination of subject matter eligibility should be based on the claim as a whole.⁴⁸⁰

As a consequence, the CCPA affirmed the rejection by the Board and reasoned that the invention was to claim a mathematical algorithm itself with a whole viewpoint, even though some of the claims were limited to a “particular art or technology”.

C. *In re Abele* (1982)

In this case, the CCPA expanded the scope of statutory inventions.

The invention at issue was related to a computerized axial tomography (CAT scan) that could improve image quality through mathematical computations. The applicant broadened the scope of rights in independent claims,⁴⁸¹ but narrowed down the scope of rights in dependent claims by limiting them to physical apparatuses.⁴⁸²

The CCPA clarified that the *Water* test did not limit nonstatutory subject matter

⁴⁷⁹ *Id.* (finding that “the improved method of correlating” or “the improved method of cross-correlating” in claims was neither directed to a process or an apparatus, but to an algorithm).

⁴⁸⁰ *Id.* at 766 and 767 (commenting that the second step of Freeman test was not incompatible with the opinion in *Flook*).

⁴⁸¹ *Id.* at 908 (Claim 5: “A method of displaying data in a field comprising the steps of calculating the difference between the local value of the data at a data point in the field and the average value of the data in a region of the field which surrounds said point for each point in said field...”).

⁴⁸² *Id.* (Claim 6: “The method of claim 5 wherein said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner.”).

to algorithms having “structural relationships between physical elements or process steps.” It then made the broad interpretation that an “algorithm [] ‘applied in any manner to physical elements or process steps’” was statutory.⁴⁸³

Based on the modified test, the CCPA partly affirmed the rejection since the broad independent claim was a mathematical algorithm but also partly reversed the rejection since the dependent claim was statutory.

The following table demonstrates the evolution of Freeman-Walter-Abele test.

<i>Freeman</i>	<i>Walter</i>	<i>Abele</i>
(1) Whether the claim directly or indirectly recited an algorithm? (2) If so, whether the claims preempt the algorithm?	(1) Same as left (2) Consider the claim as whole	(1) Same as left (2) Algorithm be applied in any manner to physical elements or process steps is statutory

Figure 6 - 6 Evolution of Freeman-Walter-Abele test

The Freeman-Walter-Abele test had been challenged by several cases primarily based on the vague meaning of “mathematical algorithm”. For instance, in the case of *Arrhythmia Research*, the court considered that the meaning of “mathematical algorithm” was obscure and was difficult to constrain “without a statutory anchor.”⁴⁸⁴ In *Schrader*, the court also held that the “mathematical algorithm” had no consistent

⁴⁸³ *Id.* at 907. *In re Walter*, 618 F.2d 758, 767.

⁴⁸⁴ *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1063 (Fed.Cir.1992).

meaning and thus might bring more confusion in the determination of the scope of statutory subject matter.⁴⁸⁵

6.3.2 Useful, Concrete and Tangible Test

The useful, concrete and tangible test was proposed in *State Street*.⁴⁸⁶ This case was related to a business method invention.

Business Method: *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* (1998)

1. Judicial History:

The respondent, Signature Financial Group Cooperation, obtained a patent—a data processing system for hub and spoke financial services configuration—on March 9, 1993.⁴⁸⁷ The appellant, State Street Bank, had negotiated with the respondent regarding the licensing of the patented method, but failed. Later, the appellant filed a patent invalidity suit as well as for unenforceability and non-infringement in the district court. The District Court made a summary judgment in favor of the respondent. Thus, the appellant appealed in the Court of Appeals for the Federal Circuit.

⁴⁸⁵ *In re Schrader*, 22 F.3d 290, 293 n.5 (Fed. Cir. 1994). See also, *In re Warmerdam*, 33 F.3d 1354, 1359 (Fed. Cir. 1994).

⁴⁸⁶ *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* 149 F.3d 1368, 1373-74, 47 USPQ2d 1596, 1601-02 (Fed. Cir. 1998).

⁴⁸⁷ U.S. Patent No. 5,193,056 (issued March 9, 1993).

2. Claimed subject matter:

The invention at issue was to claim a data processing system, a so-called “Hub and Spoke” model, in which holders of mutual funds (Spoke) pooled their investment assets into a central investment portfolio (Hub).

Claim 1 was described as below:

A data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:

- (a) computer processor means for processing data;
- (b) storage means for storing data on a storage medium;
- (c) first means for initializing the storage medium...

3. Issue: Was the claimed invention statutory under § 101?

4. Court holding and reasoning:

The court reversed the decision of the district court, and held that the claimed subject matter was statutory under § 101 and reasoned that:⁴⁸⁸

[T]he transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces “a useful, concrete and tangible result”[.]

Based on the above holding, a method claim is deemed to be statutory under § 101 as long as it involves a practical application of a mathematical algorithm and can lead to a useful, concrete and tangible result.

⁴⁸⁸ *Id.* at 1373.

In this case, the CAFC initially surveyed the precedents associated with § 101.

Upon the review, the Court considered that the Freeman-Walter-Abele test had little help for the determination of subject matter eligibility since:⁴⁸⁹

After *Diehr* and *Chakrabarty*, the Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter.

Additionally, mathematical exception could not appropriately apply to each of the inventions involving mathematical algorithms.⁴⁹⁰ The court also considered that the business methods exception was not excluded by § 101 based on the idea that:⁴⁹¹

[The business method exception] is ... an unwarranted encumbrance to the definition of statutory subject matter in section 101, that [should] be discarded as error prone, redundant, and obsolete. It merits retirement from the glossary of section 101.

Instead, the Court adopted the broad interpretation of § 101 in *Diehr*, *Benson* and *Flook* based on the idea that:⁴⁹²

As the Supreme Court expressly stated in *Diehr*, its own holdings in *Benson* and *Flook* “stand for no more than these long-established principles” that abstract ideas and natural phenomena are not patentable.

The above interpretation of § 101 apparently narrowed down the scope of nonstatutory subject matter. Thus, the exception to patent was only limited to abstract ideas and

⁴⁸⁹ *Id.* at 1374.

⁴⁹⁰ *Id.* (“after *Diehr* and *Alappat*, ... a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a “useful, concrete and tangible result.””).

⁴⁹¹ *Id.* at 1375 n.10.

⁴⁹² *Id.* at 1374 n.7.

natural phenomena that originated in this case.

5. Discussions:

In this case, the court announced that inventions related to computer software and business methods were no longer excluded from patent protection and underlined the scope of nonstatutory subject matter for post-*Bilski* as well. Thus, we can image that the abstract ideas rejection test is an alternative to the machine-or-transformation test in *Bilski*.

Additionally, the judges also clarified some principles of the determination of the meaning of § 101. First, the determination of whether or not a claimed subject matter is statutory should not be based on the idea that the scope is too broad since other articles of patent law can require applicants to restrain the claimed scope of rights.⁴⁹³ It means that the determination of subject matter eligibility is an independent decision.

6.3.3 Machine-or-Transformation Test

This test is for the determination of the patent eligibility of process claims; however, the Supreme Court in *Bilski* held that this test is not the sole test for patent eligibility.

⁴⁹³ *Id.* at 1377 (“Whether the patent’s claims are too broad to be patentable is not to be judged under § 101, but rather under §§ 102, 103 and 112..., it has nothing to do with whether what is claimed is statutory subject matter.”).

A. Computer Software: *Gottschalk v. Benson* (1972)

The invention at issue claimed a method that can transfer BCD numbers to pure binary format by means of mathematical computations.⁴⁹⁴

1. Judicial History:

Benson, the respondent, filed a patent application, which was rejected by the USPTO. The application was appealed to the Court of Customs and Patent Appeals (CCPA) and was reversed. Thus, Gottschalk, the petitioner as the Commissioner of Patents, filed a petition for writ of certiorari to the Supreme Court.

2. Claimed subject matter:

The patent applicant claimed a method for converting binary-coded decimal (BCD) numerals into pure binary numerals. The claimed scope of rights might have covered all the uses of the claimed method in a general-purpose digital computer.

Claim 8 was described as:

The method of converting signals from binary coded decimal form into binary which comprises the steps of

- (1) storing the binary coded decimal signals in a reentrant shift register,
- (2) shifting the signals to the right by at least three places, until there is a binary '1' in the second position of said register...

⁴⁹⁴ *Gottschalk v. Benson*, 409 U.S. 63, 93 S. Ct. 253 (1972).

Claim 13 was described as:

A data processing method for converting binary coded decimal number representations into binary number representations comprising the steps of

(1) testing each binary digit position “1,” beginning with the least significant binary digit position, of the most significant decimal digit representation for a binary “0” or a binary “1” ...

3. Issue:

Did claims 8 and 13 fall within the category of non-statutory subject matter?

4. Court holding and reasoning:

The Supreme Court reversed the previous decision by the Court of Appeals and held that the claimed methods were nonstatutory subject matters based on the fact that the patent applicant tried to claim a process not limited to specified computer apparatuses, a process which was seen as an algorithm as such. Namely, the patent would prevent use of the algorithm from the whole-field use.

The court dealt with the case upon the following considerations: what is a general-purpose computer; what is a process; what is the test of patent eligibility for process claims; and what would happen if a patent was granted for an algorithm.

The court construed the meaning of a general-purpose computer as a computer that has the capacity to operate various computer programs.⁴⁹⁵ Then, it interpreted the

⁴⁹⁵ *Id.* at 256.

term “process” as “an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing.”⁴⁹⁶

Based upon the above viewpoints, it outlined a requirement for statutory process; i.e., a statutory process was able to transform a material and result in a change of the nature or state of the material.

Then, the court reviewed the opinions of precedent cases and held that the test of the patent eligibility of a process claim was as follows:⁴⁹⁷

It is argued that *a process patent must either be tied to a particular machine or apparatus or must operate to change articles or materials to a ‘different state or thing.’* We do not hold that no process patent could ever qualify if it did not meet the requirements of our prior precedents.

Based on the above viewpoint, the so-called machine-or-transformation test for a process claim was established. But, it reserved room for other tests since it was not an exclusive test.

The Supreme Court then analyzed the claimed methods and found that they had no substantial practical application of the algorithm, even though the claimed methods involved computer apparatuses. In addition, the claimed invention “can be done mentally,” since it was not limited to any particular apparatus and was “so abstract and

⁴⁹⁶ *Id.* at 256 (citing *Cochrane v. Deener*, 94 U.S. 780, 787-788, 24 L. Ed. 139).

⁴⁹⁷ *Id.* at 257.

sweeping as to cover both known and unknown uses.”⁴⁹⁸ Thus, the court considered that patenting the claimed method was just like patenting an algorithm itself, which might preempt the use of the algorithm.

5. Discussion:

The main question of the test is why a process claim has to pass the test to be a statutory subject matter. Yet, in this case the court did not explain this issue, even though it had diligently traced the opinions of precedents.

Another point is, what is qualified as a “particular” machine or apparatus was not clarified in the case although the court had illustrated what is defined as a “general-purpose computer.” In contrast with the meaning of “general-purpose computer”, the “specific” or “particular” machine or apparatus perhaps means that those computers can only operate limited software. If so, this test will forbid most software inventions from getting patents since nowadays most of them are developed for general-purpose computers.

The court had thought of what the scope of subject matter was and held that only congressmen could make such a policy decision.⁴⁹⁹ Thus, resolving whether

⁴⁹⁸ *Id.* at 255.

⁴⁹⁹ *Id.* at 257 (“It may be that the patent laws should be extended to cover these programs, a policy matter to which we are not competent to speak.”).

some specific subject matters are statutory or nonstatutory is better decided by Congress, rather than being interpreted by judges.

In addition to *Benson*, *Deener* was the oldest case that had articulated the transformation test for process claims.⁵⁰⁰

B. Process: *Parker v. Flook* (1978)

The *Flook* court had mentioned the machine-or-transformation test, but did not illustrate it.⁵⁰¹ The invention at issue had been considered a mathematical algorithm by the CCPA; however, the Supreme Court rejected it due to a lack of novelty.

1. Judicial History:

The respondent applied for a patent and was rejected by the USPTO based on the fact that the claimed method was a nonstatutory subject matter. In the appeal, the Court of Customs and Patent Appeals (CCPA) reversed the decision based on the idea that the claimed means involved some post-solution activities instead of a mere mathematical formula. Thus, the Commissioner of Patents filed a petition for a writ of certiorari to the CCPA in the Supreme Court.

⁵⁰⁰ See *Cochrane v. Deener*, 94 U.S. 780, 788 (“A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing.... The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result.”).

⁵⁰¹ *Parker v. Flook*, 437 U.S. 584 (1978).

2. Claimed subject matter:

The respondent claimed a method for updating alarm limits by monitoring the parameters in the course of a catalytic conversion, including temperature, pressure, and flow rates. When the parameters were over pre-determined reference values—the alarm limits—an alarm would signal the abnormal status. It contained three main steps: measuring the variables in the present condition, using an algorithm to calculate the values of the updated alarm-limits, and updating the calculated values. The main difference between this method and prior arts was a mathematical algorithm.

Claim 1 was as below:⁵⁰²

A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the *catalytic chemical conversion* of hydrocarbons wherein said alarm limit has a current value of

$$Bo + K$$

wherein Bo is the current alarm base and K is a predetermined alarm offset which comprises...

3. Issue: Was the claimed means a patentable subject matter under §101?

4. Court holding and reasoning:

The Supreme Court agreed with the CCPA's decision over the patent validity, but held that the claimed means was unpatentable based on the following:⁵⁰³

⁵⁰² *Id.* at 596.

⁵⁰³ *Id.* at 595.

Respondent's process is unpatentable under § 101, not because it contains a mathematical algorithm as one component, but because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention.

Based on the above reasoning, the Court considered the algorithm at issue a lack of novelty, which commingled the meanings among §§ 101, 102 and 103. The same viewpoint held by the Court could be found in the following statement.⁵⁰⁴

The obligation to determine what type of discovery is sought to be patented must precede the determination of whether that discovery is, in fact, new or obvious.

Additionally, the Court in the illustration of why an existing law of nature is unpatentable mentioned the same concept as well.⁵⁰⁵

Such 'mere' recognition of a theretofore existing phenomenon or relationship carries with it no rights to exclude others from its enjoyment. . . . Patentable subject matter must be new (novel); not merely heretofore unknown.

Nevertheless, based on the above illustration, the discovery of an existing law of nature that may be unknown to the public is deemed to be unpatentable under patent law.

The Court also considered that a post-solution activity in connection with a claimed method would not make an unpatentable subject matter statutory.⁵⁰⁶ Thus, the

⁵⁰⁴ *Id.* at 593.

⁵⁰⁵ *Id.* at 593 n.15.

⁵⁰⁶ *Id.* at 590 (holding the concept that "A competent draftsman could attach some form of post-solution activity to almost any mathematical formula" is error).

determination of patent eligibility would not be circumvented by the claim draft's art.⁵⁰⁷

Namely, the essence of the nonstatutory subject matter cannot be changed by an alternative drafting style.

5. Discussion

The Court admitted the machine-or-transformation test,⁵⁰⁸ but added the “point of novelty” adopted by the USPTO in the determination as mentioned above.⁵⁰⁹ In the case of *Bergy*, Judge Rich commented on the opinions of *Flook* as:⁵¹⁰

an unfortunate and apparently unconscious, though clear, commingling of distinct statutory provisions which are conceptually unrelated, namely, those pertaining to the categories of inventions in § 101 which may be patentable and to the conditions for patentability demanded by the statute for inventions within the statutory categories, particularly the nonobviousness condition of § 103.

C. Computer Software: *Diamond v. Diehr* (1981)

This was the first case in which the Supreme Court granted a patent for a computer-related (software) invention. The *Diehr* Court also adopted the *Benson* test to determine the patent eligibility of process claims.⁵¹¹ This invention was to claim a

⁵⁰⁷ *Id.* at 593 (“It would make the determination of patentable subject matter depend simply on the draftsman's art and would ill serve the principles underlying the prohibition against patents for “ideas” or phenomena of nature.”).

⁵⁰⁸ *Id.* at 589 n.9.

⁵⁰⁹ *Id.* at 587 n.5 (“The Board also concluded that the “point of novelty in [respondent's] claimed method” lay in the formula or algorithm described in the claims, a subject matter that was unpatentable under *Benson*”).

⁵¹⁰ *In re Bergy*, 596 F.2d 952, 959 (C.C.P.A. 1979).

⁵¹¹ *Diamond v. Diehr*, 450 U.S. 175, 101 S. Ct. 1048 (1981).

process involving a mental process and other statutory processes within the classes of statutory subject matters.

1. Judicial History:

The respondent, Diehr, filed a patent application that was rejected by the USPTO. In the Appeal, the CCPA reversed the decision of the UPSTO. Thus, the Commissioner of Patents filed a writ of certiorari with the United States Supreme Court.

2. Claimed subject matter:

The invention at issue was related to process claims that could automatically control the modeling time for rubber compounds.⁵¹² Claim 1 was claimed as below:⁵¹³

A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising:

providing said computer with a data base for said press including at least, natural logarithm conversion data (ln), the activation energy constant (C) unique to each batch of said compound being molded, and...

3. Issue:

Was the claimed process a patent-eligible subject matter under § 101?

4. Court holding and reasoning:

The Court adopted the machine-or-transformation test in *Benson*, and held that

⁵¹² U.S. Patent No. 4344142 (filed Aug. 6, 1975).

⁵¹³ *Id.* (Claim 1).

the claimed process was patentable due to the fact that:⁵¹⁴

That respondents' claims involve the transformation of an article, in this case raw, uncured synthetic rubber, into a different state or thing cannot be disputed... Industrial processes such as this are the types which have historically been eligible to receive the protection of our patent laws."

The Court emphasized that the determination of subject matter eligibility should base on claims as a whole.⁵¹⁵

Additionally, the Court also pointed out that the *Flook* court's determination of whether or not a subject matter is patent-eligible relying on the novelty was erroneous in connection with other statutes.⁵¹⁶

5. Discussion:

Although the above two cases were based on the same test, *Flook* was not as successful as *Diehr*. *Flook* was claiming a method using the formula— $B \cdot I + K = B \cdot 0(1-F) + PVL(F) + K$ —which was similar to the formula— $\ln v = CZ + x$ —in the claims of *Diehr*, and both methods were useful and tied to a specific practical apparatus as well; however, the method in *Flook* was considered unpatentable based on the same

⁵¹⁴ *Diehr*, 450 U.S. at 184.

⁵¹⁵ *Id.* at 188 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole.").

⁵¹⁶ *Id.* at 193 ("one or more of the steps in respondents' process may not, in isolation, be novel or independently eligible for patent protection is irrelevant to the question of whether the claims as a whole recite subject matter eligible for patent protection under § 101.").

test.⁵¹⁷ The problem could be attributed to the “point of novelty” as mentioned above.⁵¹⁸

D. Mental Steps: *In re Comiskey* (2007)

Comiskey was related to the determination of the patent eligibility of mental process.⁵¹⁹

1. Judiciary history:

The appellant, *Comiskey*, filed a patent application and was rejected by the USPTO and the Board of Appeal based on the fact that the claimed means did not meet the requirement of obviousness.⁵²⁰ Thus, the appellant appealed to the Court of Appeals for the Federal Circuit.

2. Claimed subject matter:

The invention at issue was related to a method and system for mandatory arbitration legal documents, such as wills and contracts. The invention had 59 claims, wherein claim 1, 17, 32 and 46 were independent claims, and the rest were dependent claims. Claim 1 and 32 were respectively directed to the method associated with

⁵¹⁷ Milde, Karl F. Jr, *Life after Diamond v. Diehr: The CCPA Speaks Out on the Patentability of Computer-Related Subject Matter*; 64 J. Pat. Off. Soc'y 434, 438 (1982) (comparing the formula involved in the claim between *Flook* and *Diehr*).

⁵¹⁸ *Id.* at 439-434 (taking three cases—*In re Taner*, *In re Abele*, *In re Pardo*, and *In re Meyer*—as examples).

⁵¹⁹ *In re Comiskey*, 554 F.3d 967 (Fed.Cir.2009).

⁵²⁰ Patent Application No. 09/461,742 (filed Oct.16, 1999).

unilateral and multilateral (contract) documents. Claim 1 was described as below:

A method for mandatory arbitration resolution
regarding one or more *unilateral documents* comprising the
steps of:
enrolling a person and one or more unilateral documents ...;
incorporating arbitration language,...;
requiring a complainant to submit a request for arbitration
resolution...

3. Issue: Were claim 1 and 32 and their dependent claims unpatentable subject
matters?

4. Court holding and reasoning:

The Federal Circuit Court held that claims 1 and 32 and most of their dependent
claims were not patentable subject matters due to the reason that the applicant wanted to
claim “the use of human intelligence.”⁵²¹ The court further reasoned that the claimed
arbitrary system relied “entirely on the use of mental processes.”⁵²²

The court considered that the mental process per se was not statutory based on
the fact that:⁵²³

[T]he patent statute does not allow patents on particular systems
that depend for their operation on human intelligence alone[.]

Additionally, the Court stated that the machine-or-transformation test was a clue

⁵²¹ *Id.* at 981.

⁵²² *Id.*

⁵²³ *Id.* at 980.

for the determination of patent eligibility as below.⁵²⁴

The Court concluded that “[t]ransformation and reduction of an article ‘to a different state or thing’ is the clue to the patentability of a process claim that does not include particular machines.”⁵²⁵

5. Discussion:

In this case, the court admitted that a claim involving a mental process might be patentable as long as a mental process per se was not claimed in a claim. It also needed to meet the requirements of a patent as in the case of other subject matters.

Except for the above claims, the CAFC left some questions unanswered for the USPTO. For instance, for dependent claims 15, 30, 44, and 58 it was respectively added “wherein access to the mandatory arbitration is established through the Internet, Intranet, World Wide Web, software applications, telephone, television, cable, video [or radio], magnetic, electronic communication, or other communications means,” corresponding to their independent claims.⁵²⁶ The CAFC remanded the USPTO to consider whether they were subject matters or not. Did it imply that the CAFC did not consider that those things mentioned above were machines, or that those claims were

⁵²⁴ *Id.* at 978 and 979.

⁵²⁵ *Id.* at 978-979 (quoting USPTO Supp. Br. 4 (quoting *Flook*, 437 U.S. at 588 n.9, 98 S. Ct. 2522)).

⁵²⁶ *Id.* at 981.

claimed as “the use of machine”?

6.3.4 Business Method: *Bilski v. Kappos* (2010)

The *Bilski* court affirmed the CAFC’s decision and held that the machine-or-transformation test (hereafter MoT test) was just one of many tests to determine patent eligibility.⁵²⁷

1. Judiciary history:

The appellants filed a patent application, which was rejected by the USPTO based on a nonstatutory subject matter under § 101. The rejection of patent eligibility was sustained by the BOA of USPTO and then affirmed by the CAFC. Thus, the appellants appealed to the Supreme Court.

2. Claimed subject matter:

The claimed invention was a business method, a risk management for the transaction of energy.⁵²⁸

Claim 1 was described as below:⁵²⁹

A method for managing the consumption risk costs of a commodity sold by a commodity provider at a fixed price comprising the steps of:

- (a) initiating a series of transactions between said commodity provider and consumers of said commodity wherein said

⁵²⁷ 130 S.Ct. 3218, 177 L.Ed.2d 792 (2010).

⁵²⁸ U.S. Patent Application No. 08/833,892 (filed Apr. 10, 1997).

⁵²⁹ *Ex parte Bilski*, No.2002-2257, 2006 WL 5738364 (B.P.A.I. Sept. 26, 2006).

consumers purchase said commodity at a fixed rate based upon historical averages, said fixed rate corresponding to a risk position of said consumer;

- (b) identifying market participants for said commodity having a counter-risk position to said consumers; and
- (c) initiating a series of transactions between said commodity provider and said market participants at a second fixed rate such that said series of market participant transactions balances the risk position of said series of consumer transactions.

3. Issue: Was the claimed business method a statutory matter?

4. Court's holding and reasoning:

The court affirmed that the claimed methods were unpatentable subject matters under § 101 due to the fact that the claims encompassed “both the concept of hedging risk and the application of that concept to energy markets.”⁵³⁰ The court also held that the MoT test was a clue, rather than a sole test, in the determination of whether a process claim was a statutory subject matter under § 101.⁵³¹

The following five points are related to how the court dealt with this case.

a. How should the scope of patentable inventions under § 101 be construed?

The *Bilski* court relied on *Chakrabarty* court's opinion that “Congress plainly contemplated that the patent laws would be given wide scope.”⁵³²

⁵³⁰ *Bilski v. Kappos*, 130 S.Ct. 3218, 3229.

⁵³¹ *Id.* at 3258.

⁵³² *Chakrabarty*, 447 U.S. at 308.

Additionally, a better principle of patent grants should have the flexibility to encompass new and unforeseen inventions.⁵³³

Thus, the court contemplated that the scope of patentable subject matters should be as broad as possible. Upon this consideration, the better way is to adopt the negative exception test for the broadest breadth of statutory subject matter.

b. Why is the MoT test not a sole test?

Since future technologies cannot be predicted, there is no ground that “require[s] courts to confine themselves to asking the questions posed by the machine-or-transformation test.”⁵³⁴

c. Are “business methods” statutory subject matter?

Business methods are not excluded from patent protection based on the fact that § 273 of the Patent Act provides that “business methods” are one of the infringed subject matters.⁵³⁵

d. The adoption of a negative approach

The negative approach to determine the scope of subject matters under § 101 may be the adoption of the abstract ideas exception test as an alternative to the MoT test.

⁵³³ *Id.* at 3227 (citing *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 135, 122 S.Ct. 593, 151 L.Ed.2d 508 (2001)).

⁵³⁴ *Id.* at 3228.

⁵³⁵ § 273(a) (3) : (“the term “method” means a method of doing or conducting business”).

e. Comparison of Justices' opinions

Justice Kennedy delivered the Court's opinion, and Justice Stevens and Justice Breyer respectively filed concurring opinions.

Justice Kennedy delivered the Court's opinion except part II-B-2 and C-2, and Justice Roberts, Justice Thomas, and Justice Alito concurred with the Court's opinion. Part II-B-2 explains that the MoT test is not a sole test since it is not well-defined; thus, it cannot be applied to some new technologies in the Information Age. Namely, if the MoT-test is applied to these technologies (computer software), it will result in most software inventions being prohibited from patent grants.⁵³⁶

Part II-C-2 illustrates why a business method was seen as unpatentable based on historical reasoning. Although it is not excluded from patent protection, a business method has to pass the other requirements of a patent, in addition to meeting the patent eligibility, which can also prohibit patenting invalid process claims.⁵³⁷

Therefore, a high threshold test for process (business method) is required, even though the MoT test is not an exclusive test.

Justice Stevens' concurring opinion was concerned with this idea that the patenting of business methods "not only may stifle innovation," but also may "stifle

⁵³⁶ *Id.* at 3227-3229.

⁵³⁷ *Id.* at 3229.

competition.”⁵³⁸ Additionally, Part II of his opinion commented that the Court’s interpretation of § 101 was inappropriate and the inquiry as to why the MoT test is a proper approach to determine whether a subject matter is within the meaning of § 101 was not clearly answered.⁵³⁹

Justice Breyer’s concurring opinion emphasized that § 101 has a limited boundary and that the MoT is a clue for the patent-eligibility test. Additionally, the threshold for the useful, concrete and tangible result” test was too low, resulting in too many inappropriate patents.⁵⁴⁰

In short, in spite of the consistent opinions in the determination of the claimed business methods as nonstatutory subject matters, there were some divergences among judges, such as the method of the interpretation of § 101, the attitude toward the illustration of MoT test, and so on.

The following Figure demonstrates the opinions held by judges in this case.

Opinions	Court’s opinion			Concurring opinion	
	I, II-B-1, II-C-1 and III	II-B-2	II-C-2	Stevens	Breyer
Kennedy	+				

⁵³⁸ *Id.* at 3256-3257.

⁵³⁹ *Id.* at 3234 and 3235.

⁵⁴⁰ *Id.* at 3259.

Roberts	+	+	+		
Thomas	+	+	+		
Alito	+	+	+		
Scalia,	+				+(Part II)
Stevens				+	
Ginsburg,				+	
Breyer				+	+
Sotomayor				+	

Figure 6 - 7 Opinions of judges in *Bilski*

“+”: the judge joins the opinion

5. Analysis:

The Supreme Court’s opinion was based on policy considerations. The court implicitly accepts amicus curiae opinions that the MoT test will materially exclude many inventions that are statutory now. In order to keep patent stability, the court is inclined towards the interpretation that present patented subject matters will not be drastically changed based on a moderate test.

Based on a historical review of precedents’ opinions, there is no best test among

the existing tests that is able to be utilized to determine the patent eligibility of subject matter. Thus, the negative abstract ideas exception test may act as an alternative to the MoT test.

6.4 Post-*Bilski* Test

Computer Software: *Research Corp. Techs. v. Microsoft Corp.* (2010)

This was the first case to adopt *Bilski* opinions to determine patent-eligible subject matter; however, the *Research* court applied the abstract idea exception test rather than the MoT test.⁵⁴¹

1. Judiciary history:

The plaintiff, Research Corp. Corporation Technologies, Inc. (hereafter RCT), filed an infringement of six patent suits against Microsoft Corporation.⁵⁴² The District Court held that the plaintiff had been involved in inequitable conduct. The RCT appealed. The Court of Appeals for the Federal Circuit (hereafter CAFC) reversed the decision and remanded to the District Court. The District Court, then, held that 5,111,310 ('310 patent) and 5,341,228 ('228 patent) were nonstatutory subject matters under § 101, and 5,726,772 and 5,477,305 claimed priority date were invalid as well.

⁵⁴¹ 627 F.3d 859, 868 (Fed.Cir.2010).

⁵⁴² U.S. Patent Nos. 5,111,310; 5,341,228; 5,477,305; 5,543,941; 5,708,518; and 5,726,772.

Thus, the patentee appealed to the CAFC.

2. Claimed subject matter:

The claimed methods were related to a method of digital halftoning, which can allow computer displays and printers to generate black-and-white images by using fewer shades of gray than in original images. Thus, the claimed methods could allow computers save more memory space and processor power than in the prior arts.⁵⁴³

Claim 1 of '310 patent was described below:⁵⁴⁴

A method for the halftoning of gray scale images by utilizing a pixel-by-pixel comparison of the image against a blue noise mask in which the blue noise mask is comprised of a random nondeterministic, non-white noise single valued function which is designed to produce visually pleasing dot profiles when thresholded at any level of said gray scale images.

Claim 1 of '228 patent was described below:⁵⁴⁵

A method for the halftoning of color images, comprising the steps of utilizing, in turn, a pixel-by-pixel comparison of each of a plurality of color planes of said color image against a blue noise mask in which the blue noise mask is comprised of a random non-deterministic, non-white noise single valued function which is designed to provide visually pleasing dot profiles when thresholded at any level of said color images, wherein a plurality of blue noise masks are separately utilized to perform said pixel-by-pixel comparison and in which at least one of said blue noise masks is independent and uncorrelated with the

⁵⁴³ *Microsoft*, 627 F.3d 859, 865.

⁵⁴⁴ U.S. Patent No. 5,111,310 (issued May 5, 1992).

⁵⁴⁵ U.S. Patent No. 5,341,228 (issued Aug. 23, 1994) (The '228 patent is an improvement of the '310 patent; i.e., so-called CIP patent (continuation-in-part)).

other blue noise masks.

3. Issue:

Were the claimed methods of '310 and '228 patents subject matter under § 101?

4. Court's holding and reasoning:

The court held that the claims at issue were statutory based on the fact that plaintiffs "[did] not seek to patent a mathematical formula, but '[sought] patent protection for a process of' halftoning in computer applications."⁵⁴⁶

The CAFC relied on the *Bilski* court's opinion to adopt the principle of the broad scope of patentable subject matter, which only excluded "laws of nature, physical phenomena, and abstract ideas" from statutory categories.⁵⁴⁷

The court found that the claimed methods in '310 and '228 patents had "nothing abstract" but demonstrated "functional and palpable applications in the field of computer technology."⁵⁴⁸ Additionally, the court viewed that "inventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract."⁵⁴⁹

In regards to the significant use of algorithms and formulas in invention claims,

⁵⁴⁶ *Microsoft*, 627 F.3d 859, 869.

⁵⁴⁷ *Id.* at 867 (citing *Chakrabarty*, 447 U.S. at 309).

⁵⁴⁸ *Id.* at 868-869 (reasoning that where the claims not abstract due to the fact that a "high contrast film," "a film printer," "a memory," and "printer and display devices" in the specification are required elements for some of '310 and '228 claims).

⁵⁴⁹ *Id.* at 869.

the court held that they did not “bring this invention even close to abstractness that would override the statutory categories and context” based on the opinion in *Diehr*.⁵⁵⁰

Some claims, nevertheless, look like abstract ideas, but they in fact are not, since it is common for a claim drafter to use vague or obscure terms in drafting claims to procure a broad scope of right. As for this problem, the court held that it could be eradicated by § 112, which “provides powerful tools to weed out claims that may present a vague or indefinite disclosure of the invention.”⁵⁵¹

5. Discussion:

In this case, the court applied the abstract ideas exception test to the methods at issue instead of the MoT test without any explanation, in spite of the fact that the court realized that the Supreme Court did not provide “a rigid formula or definition for abstractness.”⁵⁵²

In fact, the halftoning process apparently could pass the “transformation” as the first prong of the MoT test; i.e., the transformation of data to images. It implied that the CAFC was more confident in the negative exception test, which followed the guidance of *Bilski*.

⁵⁵⁰ *Id.* (“even ‘a well known mathematical equation’ do not lose eligibility because ‘several steps of the process [use that] mathematical equation.’” (citing *Diehr*, 450 U.S. at 185)).

⁵⁵¹ *Id.*

⁵⁵² *Id.* at 868.

6.5 Comparison of Pre- and Post-*Bilski* Tests

We can analyze the difference among the pre and post *Bilski* tests in the determination of patent eligibility of subject matter under § 101. There are three different guidelines announced by the USPTO, including Section 2106 of R6 version before *In re Bilski*,⁵⁵³ the revised interim guidelines related to the issue after *In re Bilski*,⁵⁵⁴ and the latest interim guidelines after *Bilski*.⁵⁵⁵ The following table lists the procedures of these three guidelines.

⁵⁵³ 2106 Patent Subject Matter Eligibility [R-6], MPEP, http://www.uspto.gov/web/offices/pac/mpep/documents/2100_2106.htm (last visited March 14, 2011).

⁵⁵⁴ Interim Examination Instructions For Evaluating Subject Matter Eligibility Under 35 U.S.C. § 101, http://www.uspto.gov/patents/law/comments/2009-08-25_interim_101_instructions.pdf.

⁵⁵⁵ Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of *Bilski v. Kappos*, http://www.uspto.gov/patents/law/exam/bilski_guidance_27jul2010.pdf.

Comparison of Examining Procedures for Patent Subject Matter Eligibility		
Before <i>In re Bilski</i> (2007)	After <i>In re Bilski</i> (Aug. 2009)	After <i>Bilski v. Kappos</i> (July, 2010)
1. Consider the breadth of § 101 2. Determine whether the claimed invention falls within an enumerated statutory category 3. Determine whether or not the claimed invention is categorized as laws of nature, natural phenomena and abstract ideas: (1) Determine whether the claimed invention covers either a § 101 judicial exception or a practical application of a § 101 judicial exception (2) Determine whether the claimed invention is a practical application of an abstract idea, a law of nature, or natural phenomenon	1. Determine the meaning of the claim 2. Determine if the claim as a whole falls within one of the four categories of invention 3. Determine if the claim as a whole is directed to a particular practical application of a judicial exception a. Product claim b. Process claim (1) be tied to a particular machine or apparatus (machine implemented); or; (2) particularly transform a particular article to a different state or thing.	Principle: 1. MoT Test a. Machine test b. Transformation test 2. Abstract idea exception test Factors: a. Whether the method involves or is executed by a particular machine or apparatus. b. Whether performance of the claimed method results in or otherwise involves a transformation of a particular article. c. Whether performance of the claimed method involves an application of a law of nature d. Whether a general concept is involved in executing the steps of the method.

Figure 6 - 8 Comparison of patent-eligible tests of the USPTO

First, we can find that in the 2007 version, patent examiners initially used the categorical rule to determine whether a claimed subject matter belonged to statutory classes; if it was not on the list, then they would determine whether it contained a nonstatutory subject matter or if it was an application of nonstatutory subject matter.

In the 2009 version, we can find apparent differences between the 2007 and 2009 versions, in which the third step in the version of 2009 requires that a process claim has to pass the MoT test as a statutory subject matter. Based upon this rigid test, many version 2007 patentable software claims would become unpatentable under the 2009 version.

The latest 2010 version is even more different from the previous two versions, as it abandons the categorical rule but adopts two different angle tests—a positive affirmation test and a negative exception test. For the former, the MoT test requires that a statutory subject matter has to meet either one of two prongs—the machine test or the transformation test. The latter one, the abstract ideas exception test, requires that a process claim cannot be a nonstatutory subject matter per se, but all applications of them are valid.

6.6 Summary

The latest test in the determination eligible-subject matter demonstrates a more flexible way to deal with this issue since the court mentioned that neither the MoT test nor the abstract ideas exception test can be used as the sole test.

Compared to other tests, the negative exception rule is moderate and at the very

least will not endanger the status of existing patented subject matters. Although the negative test apparently allows a wide range of statutory matter, it is likely that more limitations will be added soon if federal judges find its threshold is too low and it is unable to filtering out many inappropriate patents.

The following table lists those significant cases related to 35 U.S.C 101.

Year	Case	Subject matter	Test	Patentable
1853	<i>O'Reilly v. Morse</i> , 56 U.S. 62 (1853)	all printed type of information transmission by electromagnetism		No, broader claim
1888	<i>Dolbear v. American Bell Tel. Co.</i> , 126 U.S. 1 (1888)	transmitting voice by causing electrical undulations		Yes, the practical use of principle
1939	<i>MacKay Radio & Tel. Co. v. Radio Corp. of Am.</i> , 306 U.S. 86 (1939)	claiming the length of antenna by the application of the Abraham formula to predict the optimal wire lengths		Yes
1972	<i>Gottschalk v. Benson</i> , 409 U.S. 63 (1972)	a process for converting BCD into pure binary format	Machine test	No, too broad and untied to any application,
1978	<i>Parker v. Flook</i> , 437 U.S. 647 (1978)	method for updating an alarm limit in catalytic conversion using a specified algorithm		No, lack of novelty
1981	<i>Diamond v. Diehr</i> , 450 U.S. 175 (1981)	rubber-curing process	Transformation test	Yes
1982	<i>In re Abele</i> , 684 F.2d 902 (C.C.P.A. 1982)	digital x-ray data processing for better image	Freeman-Walter-Abele	
1995	<i>In re Beauregard</i> , 53	software stored on a medium		Yes

	F.3d 1583 (Fed. Cir. 1995)			
1998	<i>State Street</i> , 149 F.3d 1368 (Fed. Cir. 1998)	investment management method	a useful, concrete, and tangible result	Yes
2009	<i>In re Comiskey</i> , 554 F.3d 967 (Fed.Cir.2009)	legal arbitration process	MoT	No, abstract ideas
2010	<i>Bilski v. Kappos</i> , 130 S. Ct. 3218 (2010)	A risk- hedging method for energy transactions by collecting weather data		No
2010	<i>Research Corp. Techs. v. Microsoft Corp.</i> , 627 F.3d 859, 868 (Fed. Cir.2010)	A process for digital halftoning image	abstract ideas exception	No
2010	<i>In Ex Parte Tse-Huong Choo</i> , 2010 WL 2985362 (B.P.A.I. July 28, 2010)	Mere data or instructions stored on a computer medium		No, no functionally interrelate the medium
2010	<i>Ex Parte Heuer</i> , 2010 WL 3072973 (BPAI August 4, 2010)	a improved decoding method for a binary XML document	MoT and abstract ideas exception	No
2010	<i>Ex Parte Justin Monk</i> , 2010 WL 4601413 (BPAI Dec. 30, 2010)	A method for detecting stored-value card fraud	MoT and abstract ideas exception	No

Figure 6 - 9 Cases relating to 35 U.S.C. 101

Chapter 7 Comparative Analysis

I have respectively discussed the meaning of “invention” and tests for patent eligibility developing from the interpretation of “invention” in different jurisdictions in the previous chapters.

In this Chapter, I will compare the characteristics of the tests as a whole, which can foster on understanding of their main differences. Then, I will analyze respective advantages and disadvantages in each jurisdiction. In addition, I will discuss some paradoxical concepts related to the tests, which may help us clarify the issue. Finally, I will propose some suggestions to present tests to assist the decision of statutory computer software inventions

7.1 Overview of Tests

The following table lists the respective statutes related to the meaning of invention as well as critical elements in the determination of the patent-eligibility of software inventions in each jurisdiction.

Jurisdiction	Statutes	Critical elements	Check lists for CS inventions
Japan	Art. 2 (1): “Invention” in this Act means the highly advanced creation of technical ideas utilizing laws of nature.	1. Technical ideas 2. Utilizing laws of nature	* software concretely realized by hardware resources - no pure mental activity - to support, improve, or replace mental activities
Taiwan	Art. 21: The term “invention” as used hereafter refers to any creation of technical concepts by utilizing the rules of nature.	1. Technical concepts 2. Utilizing laws of nature	1. Technical character - technical solution for prior art - no mere presentation of information - no mere processing by computer - human reasoning and memory 2. Further technical effect - computer readable medium (effect beyond the normal physical interactions between the program and the computer) * on-line computer program * coordinating between software and hardware resources to realize information processing
China	Art. 2(2): The term “invention” refers to a new technical solution put forward for a	1. Technical solution - technical means - no pure mental	1. Internal performance of a computer: - improvement of data transmission - management of internal resources of

	<p>product, method, or the improvement thereof.</p> <p>Art. 25: For any of the following, no patent right shall be granted:</p> <p>(1) scientific discoveries;</p> <p>(2) rules and methods for mental activities...</p>	<p>activity</p> <p>2. Utilizing law of nature</p>	<p>computer systems</p> <p>2. External operations of computer:</p> <ul style="list-style-type: none"> - the control of certain external operating processes or external operating devices - processes or exchanges of external data. <p>* no computer readable medium</p> <p>* part of inventions related to mental activities is not seen as a mental activity as a whole</p> <p>* changes of computer hardware not necessary</p>
EPO	<p>EPC 52:</p> <p>(1) European patents shall be granted for any inventions which are susceptible of industrial application, which are new and which involve an inventive step.</p> <p>(2) The following in particular shall not be regarded as inventions within the meaning of paragraph 1:</p> <p>(a) discoveries, scientific theories and mathematical methods;</p> <p>(c) schemes, rules and methods for performing mental acts, playing games or</p>	<p>Technical character</p>	<p>1. Technical effects for computer software related inventions</p> <p>2. Further technical effects for computer program claims</p>

	doing business, and programs for computers; (d) presentations of information.		
U.S.	35 U.S.C. 101: Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.		MoT test and abstract ideas exception test

Figure 7 - 1 Meanings of the “invention” of different jurisdictions

Based on the above comparison, we can find that there is a consistent characteristic of the statutory interpretation of “invention” among the patent laws of Japan, Taiwan, China and EPC; i.e. a technical character is necessary for a patent-eligible subject matter. A “technical character” may be expressed in different terms, such as a technical feature, a technical means, a technical solution, a technical effect, a technical concept, and so on. More particularly, a “further technical effect,” beyond a normal technical effect is necessary for a computer program claim by the Board of the EPO,⁵⁵⁶ and for computer readable media by the TIPO.⁵⁵⁷

Otherwise, exclusions of inventions from patent protection are primarily based on the idea that they merely involve mental activities and thus fail to meet the meaning of invention under patent law.

In the U.S., Federal judges employing mental activities against nonstatutory subject matters can be traced back to early court’s opinions;⁵⁵⁸ however, that reasoning is not prevalent and is no longer a dominant opinion against nonstatutory subject matters since many inventions associated with mental activities, such as sports patents, have been granted patents for many years.⁵⁵⁹ It implies that the test of patent

⁵⁵⁶ T 1173/97- *IBM*, OJ 1999, 609 (1998); see Sec. 5.3.2, Chap. 5 of this article.

⁵⁵⁷ The TW-EG, at 2-9-15 (2008); Sec.3.3.3, Chap.3 of this article.

⁵⁵⁸ See, e.g., *Benson*, 409 U.S. 63.

⁵⁵⁹ See, e.g., U.S. Patent No. 5498162 (issued Mar. 12, 1996) (claiming a method for lifting materials). See Derek Bambauer, *Legal Responses to the Challenges of Sports Patents*, 18 Harv. J. L. & Tech. 401

eligibility in the U.S. is ahead of other jurisdictions.

Additionally, the scope of statutory subject matters in the U.S. seems to be broader than that in the other jurisdictions in the field of computer software related technologies. The consideration of the extension of the scope of statutory subject-matter is in part based on the construction of the U.S Constitution,⁵⁶⁰ and in part based on the demands of industrial development.

In order to deal with each invention application fairly, many methods have been proposed as objective tests; however, they soon become obsolete after new technological matters emerge.⁵⁶¹ The refined tests are expected to work better; however, they still cannot solve the issue without debates.

In summary, these tests are like twins or cousins, which have implicit close relationships. If we respectively discern the evolution of patent grants between the U.S. and Japan or between Japan and Taiwan over time, the determination of the statutory subject matter has apparently been affected by the other jurisdictions.⁵⁶² That is, when one jurisdiction starts patenting new subject matters, the other jurisdiction will

(2005) (arguing that patenting on sports inventions is a balanced consideration to improve the developments of professional sports. Cf. Jeffrey A. Smith, Comment, *It's Your Move - No It's Not! The Application of Patent Law to Sports Moves*, 70 U. Colo. L. Rev. 1051 (1999) (discussing the problems associated with the patenting of sports invention.).

⁵⁶⁰ See *Chakrabarty*, 308-09, 206 USPQ 193, 197 (1980) (“[A]nything under the sun that is made by man” is patentable.).

⁵⁶¹ See Chapter 6 of this article.

⁵⁶² See Trends in Patent Protections for Software in Three Jurisdictions, <http://www.meti.go.jp/report/downloadfiles/g10613gj.pdf> (last visited on Mar. 30, 2011).

be pressed to consider accepting or rejecting them.⁵⁶³ Then, their examination guidelines will be revised, or courts will issue new opinions when they consider extending patent protection for new subject matters. Therefore, we can conclude that the tests for determining patent-eligible subject matters have no compelling reasons, and the adoption of tests is primarily based on subjective or policy considerations.

Nevertheless, an objective test upon the determination of this issue is still necessary at least for contemporary mainstream technologies. In addition, the type of test can also serve as a foundation to develop a new test in the next period.

7.2 Advantages and Disadvantages of Each Test

The following section will present advantages and disadvantages of each test adopted in different jurisdictions.

7.2.1 Japan

The JPO develops its unique test upon learning from other jurisdictions. The JP-EG illustrates its test for determining patent-eligible software inventions with the reasoning that if an invention is categorized as a computer software invention, it is then examined based on the criteria of whether it is “concretely realized by hardware

⁵⁶³ See, e.g., Sec. 4.1, Chap. 4 (for instance, the US-China agreements).

resources” or not.⁵⁶⁴ Mental steps or mental activities are common factors against the patent eligibility of process claims. However, the JIP High Court gradually lowered the threshold as long as a process claim involves mental steps in part, and the steps at issue are to improve, replace, or support human mental activities; then the process claim is deemed to be a patent-eligible process.⁵⁶⁵

The adopted test requires software claims to demonstrate their close relationship with hardware, which apparently limits the claimed scope of rights to a very narrow scope. Thus, such inventions will not exclude many follow-on applications of the same algorithms or mathematical formulas, and they can also reduce arguments against patenting software.

Additionally, the JP-EG enumerates several conditions involving the idea that conventional activities replaced with the use of computer software will be seen obvious to the person having ordinary skill in the art.⁵⁶⁶ This method can serve as another threshold to exempt many inventions from taking advantage of software for patent procurements.

⁵⁶⁴ Sec. 2.2.2, Chap. 1, JP-CSG (2005); *see* Sec. 2.3, Chap. 2 of this article.

⁵⁶⁵ *See* Sec. 2.4, Chap. 2 of this article.

⁵⁶⁶ *See* Sec. 2.2, Chap. 2 of this article.

7.2.2 Taiwan

The TIPO has not demonstrated a consistent reason to adopt a certain type of test. The TIPO initially adopted the MoT test in the examination guidelines of 1998, which required that a software invention resulted in a “physical transformation” or was “tied to a specific apparatus” so as to meet the requirement of utilizing laws of nature to create a technical concept.⁵⁶⁷ However, the requirement originated from the statutory interpretation of “invention” under Article 21 of the TW-Patent Act was different from the meaning of “invention” under 35 U.S.C. 101. That is, the MoT test was applied to examine different requirements generated from the construed meanings of “invention” in different jurisdictions. So, we can conclude that the statutory interpretation was formal and did not have consistent logic in the test adoption.

In the subsequent revised guideline of 2008, the MoT test disappeared; instead the new guideline provides detailed types of computer software claims as reference. It demonstrates that the TIPO adopts a categorical rule by a detailed classification to exclude some strange or unknown claims from statutory subject matters. The categorical rule had been applied for a prolonged period of time, but was not successful. The new classification method is purported to cover all existing types of inventions

⁵⁶⁷ The TW-EG (1998); Sec. 3.3.1, Chap. 3 of this article.

associated with software. The new classification method also purported to cover all existing types of inventions associated with software.

In addition, it also implies that drafting similar types of claims as enumerated in the TW-EG is better if patent applicants want to obtain patents. The TIPO also implicitly intends to limit the scope of software inventions by the enumerated examples in the TW-EG.

As to computer program process claims, applicants must describe the interrelationship between software and hardware,⁵⁶⁸ which is similar to the JPO's requests as well.⁵⁶⁹ Moreover, a computer readable medium claim has to result in a "further technical effect" that is beyond the ordinary interaction between software and hardware, which is similar to the EPO's requirement for software claims as well.⁵⁷⁰

The TIPO also employs the requirement—inventive step—to exclude many inventions that merely replace some steps with software as the JPO does.

The TIPO adopts both of the characteristics of the JPO and the EPO as examination grounds, which are assumed to efficiently exclude some patent-ineligible software claims without any extra tests or controversies; however, its mixed-blood

⁵⁶⁸ See the TW-EG, at 2-9-9 and 10 (2008); Sec. 3.3.5, Chap. 3 of this article.

⁵⁶⁹ Sec. 2.2.2, Chap.1, JP-CSG (2005); Sec. 2.3.2, Chap. 2 of this article.

⁵⁷⁰ The TW-EG, at 2-9-15 (2008).

guideline will not work for new types of inventions associated with software.

7.2.3 China

In comparison with the above two jurisdictions, the SIPO has no clear test and offers fewer examples in its examination guidelines than those of other jurisdictions. Nevertheless, the consistent feature, as in the above two jurisdictions, is that mental activities are the main concern against software inventions. In particular, the SIPO clearly excludes computer readable media from the statutory scope in its guidelines, except for some inventions that can improve internal or external functions of computer apparatus by the use of a software method as statutory subject matters.⁵⁷¹

Limited examples and obscure tests, however, offer flexible ways to deal with software inventions. Tracing back to its initial objective to establish the patent system, we can infer that once the granting of software patents endangered state interests, the SIPO would increase the threshold of patent eligibility as much as possible.

7.2.4 EPO

The EPO develops its unique factors based on the long long-term efforts of

⁵⁷¹ See the CN-Guideline 259 (2010); Sec. 4.1 of this article.

member countries in the patent field.⁵⁷² A “further technical effect” for computer program claims serves as a threshold to exclude many inventions merely replacing some processes with computer software,⁵⁷³ and is used as another requirement for the TIPO to exclude many computer readable medium claims.⁵⁷⁴

However, the referral G3/08 demonstrates its unclear opinions in dealing with relevant computer software inventions, which makes the public unable to predict clearly whether a computer program claim is patent-eligible or not.⁵⁷⁵ Thus, a clear test will be welcomed by the European Community.

7.2.5 United States

To propose a test that is objective and well-defined for the issue is not easy for any of the above jurisdictions. However, the U.S. is in the minority with a willingness to propose these kinds of tests, although they are not always successful. The proposed tests had their individual honorable periods. Even so, they were almost always replaced by new tests. It can be inferred that when some new technologies emerge, the contemporary test will suffer severe challenges if they do not have a solid basis.

The USPTO seems to be one of the best patent offices for inventors since both

⁵⁷² See Schohe, *supra* note 353, at 326 (remarking that German cases affected the case laws of the EPO).

⁵⁷³ T 1173/97- IBM, OJ 1999, 609 (1998). See Sec. 5.3.2 of this article.

⁵⁷⁴ The TW-EG, at 2-9-15 (2008); Sec. 3.3.3 of this article.

⁵⁷⁵ See Sec. 5.3.3-A, Chap.5 of this article.

legitimate and unconventional patents have been granted here. However, its standard has not always been consistent on account of the variation in opinions of federal judges. Some scholars criticize that judges' opinions are just like a clock pendulum going back and forth over time.⁵⁷⁶ The problem may be attributed to the fact that the interpretation of the U.S. Constitution is very flexible.⁵⁷⁷ Nevertheless, whenever a new test is proposed, it is a refined result and is expected to solve new issues.

The Supreme Court did not seem to succeed in *Bilski* this time, but it diminished the immediate danger in the software industry as a whole.⁵⁷⁸ Additionally, the assistant test—an abstract idea exception test—serves as another threshold that is lower than the MoT test and other tests. The result based on the abstract idea exception test not only broadens the scope of statutory subject matter, but also offers a sound legal ground for controversial items.

⁵⁷⁶ See, e.g., Sean B. Seymore, *Rethinking Novelty in Patent Law*, 60 Duke L.J. 919 (2011) (arguing that the reform of the patent system on the novelty requirement is alternate solution for the stability of the patent system).

⁵⁷⁷ U.S. Const. art. I, §8, cl. 8 (“To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries”).

⁵⁷⁸ See Lemley, *supra* note 419.

7.3 Paradox Concepts Related to the Testing

7.3.1 Scope of Rights

The main concern regarding patenting on a computer program claim or an algorithm is how to avoid that the granted scope of rights excluding other applications of the computer program or the algorithm. However, there are three reasons why connecting a patent-eligible issue to the scope of right is improper. First, there are no regulations in patent law or in the examination guidelines to instruct that patent examiners should evaluate patent-eligibility based on whether the scope of rights is too broad or not. The scope of rights is dependent on claims, which are usually delineated after a claim is admitted to be a statutory item.

Second, a decision about whether the scope of rights is too broad prior to substantially examining the content of claims may be a hindsight point of view. A patent examiner is unable to delineate the boundary of rights of a claimed invention when he or she begins to discern whether an invention is statutory or not. The task is part of other testing processes and has nothing to do with the determination of whether a claimed subject matter is statutory. The *State Street Bank* Court also held that whether or not the scope is too broad “has nothing to do with whether what is claimed is

statutory subject matter.”⁵⁷⁹

Third, algorithm patents may cover a wide range of rights. However, a patented invention with a wide range of rights does not mean that it is an algorithm.

The following figure can illustrate the causation of the scope of rights:

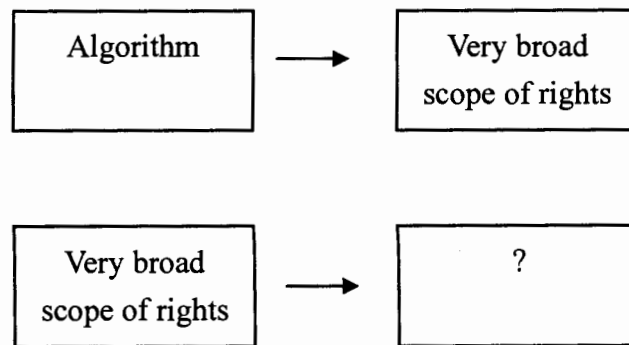


Figure 7 - 2 The causation of the scope of rights

7.3.2 Obscure Terms

Patent drafters often draft claims in broader terms, and they can accumulate their credits through this kind of drafting technique. Generally, when a claim is drafted in very broad terms, we cannot comprehend an inventor’s idea about what an invention is. Since we cannot realize which physical means is in the claim, can we infer that the claim is an algorithm or a similar kind? A claim has a very abstract meaning in that it cannot be directed to any specific technique, neither to an algorithm. Such a claim in abstractive terms should be viewed as an abstract idea, instead of being tagged as any

⁵⁷⁹ *State Street Bank*, 149 F.3d 1368, 1377.

physical item.

The solution for the obscure terms is to make applicants clearly describe what their technical means are and how the purposes of their inventions are intended by office actions.⁵⁸⁰ The tasks are inherited rights of patent examiners under patent law or relevant regulations in all jurisdictions. Based on these laws, most applicants will be forced to choose more definite terms to describe their inventions in order to avoid rejections by patent examiners. Additionally, the scope of rights will be naturally narrowed down upon the Estoppel Principle during prosecutions.⁵⁸¹

7.3.3 Mathematical Algorithms or Formulas

A patented computer program that is considered a mathematical algorithm or formula may cover a wide range of rights. However, if a mathematical formula is not a well-known equation but a specified one in a particular field, it is not evident that the patenting of this formula will result in the same effect.

In fact, each human activity may be described as an equation. For instance, we like to search for the shortest way from our school to a bus station. First, we need to collect different lengths of different routes. Then, we can easily find the shortest one

⁵⁸⁰ See 35 U.S.C. 112, *See also, Microsoft*, 627 F.3d 859, 869.

⁵⁸¹ *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 122 S. Ct. 1831 (2002).

based on our normal human intelligence.⁵⁸² Let's image that there are four different distances based on different routes—X1, X2, X3, and X4. If the steps are written with mathematical formulas, they can be expressed as the following:

Step 1: calculate $y1 = (X1 - X2)$, if $y1 < 0$, take X1; otherwise take X2

Step 2: calculate $y2 = (Xi - X3)$, if $y2 < 0$, take Xi; otherwise take X3 (Xi means the number taken in step 1)

Step 3: calculate $y3 = (Xj - X4)$, if $y3 < 0$, take Xj; otherwise take X4 (Xj means the number taken in step 2)

Then, the final value y3 is the smallest one, which is the shortest route we want.

The above steps can also be expressed by the logic in computer languages as shown in the following:

Step 1: compare X1 with X2, and the smaller one is expressed as Xa;

Step 2: compare Xa with X3, and the smaller one is expressed as Xb;

Step 3: compare Xb with X4, and the smaller one is expressed as Xc;

Finally, Xc is the smallest one among the four numbers.

The other instance, such as subway commuters looking for speedy routes to offices in a complex subway network, shows that many invisible mathematical

⁵⁸² When there are too many routes, we cannot easily find the shortest way by manual calculations.

algorithms are employed in our daily lives as well. Since this type of algorithms is a basic mathematical calculation, the patenting of them may prevent people from employing them in daily activities.

However, if they are directed to a specific field and their calculations are more complex rather than basic mathematical formulas, can they be seen as mere algorithms? For instance, is a claimed invention like the above examples in the operating system of GPS navigators statutory? Is there a possibility that patenting such an invention will prevent people from figuring out the shortest way back home?

On one hand, we cannot distinguish basic formulas that can be applied in many fields from specific formulas that can be applied in a very narrow field. On the other hand, as a result of too many steps involved in computer programs, patent examiners are unable to figure out which formulas involve the kind of claims affecting public use if inventors do not clearly disclose the characteristics of the claimed methods. Thus, a safer way to avoid granting too broad a range of rights with regarding to algorithms is to ask inventors to connect their claimed processes to specific hardware apparatuses.⁵⁸³

⁵⁸³ 35 U.S.C. 112. See Lemley, *supra* note 419, at 23-24 (arguing that overclaiming can be cured by § 112).

7.4 Suggestions

7.4.1 Prime Number Test

Prime numbers, such as 2, 3, 5, and 7, cannot be divided by other small prime numbers. When mathematicians try to find a large, new prime number, they have to prove that large numbers cannot be divided by other small prime numbers.⁵⁸⁴ *Conversely, if the number is able to be divided by a small prime number, then it is a non-prime number.* For instance, 12 can be divided by 2 or 3, so 12 is not a prime number.

The above prime numbers are just like nonstatutory items, and non-prime numbers are like statutory items. Theoretically, each nonstatutory item is an independent group and cannot be dissembled by other nonstatutory items. Thus, an inventor has to prove that his/her claims are applications of nonstatutory items; i.e., an invention is a result of the application of nonstatutory items. Otherwise, the invention is nonstatutory; i.e., it cannot be dissembled since it is a basic element or nonstatutory item (a prime number).

⁵⁸⁴ See, e.g., Atle Selberg, *An Elementary Proof of the Prime-Number Theorem*, 50(2) *The Annals of Mathematics* 305 (1949).

7.4.2 Dilemmas in the Current Testing

The problems in dealing with the current issue can be illustrated by the following instances. Half a century ago, we had no idea about DNA technology. If we wanted to identify a child's birth parent, what could we do? We might examine whether their blood types were the same, examine the birth records in the hospital, or check whether they looked alike in appearance. This type of evidence was indirect, and the solutions were superficial since it was not known which evidence was key. However, upon the development of current DNA paternity testing, family relationships can easily be discerned without errors.

Take another case: doctors want to evaluate whether or not patients have inherited diseases. The assessments can only be based on patients' family health and medical records if there are no advanced genetic technologies dealing with diseases.

Similarly, in regards to new types of technologies, or to obscure types of claims, we have insufficient information about them, so we are unable to understand what they really are. Additionally, we must acknowledge that general-purpose rules are unable to be applied perfectly in a specific field. Thus, other means may be employed as supplements as long as they can reduce the deficiencies of the general-purpose tests.

7.4.3 Positive and Negative Tests

The U.S. Supreme Court in *Bilski* adopted two opposite tests—the machine-or-transformation test and the abstract ideas exception test.⁵⁸⁵ The MoT test is a rigid test that positively confirms a claimed process to be statutory; however, the abstract ideas exception test is a loosen test that negatively proves that a process claim is not an abstract idea. Since the threshold of the latter test is lower than the former one, the former test looks redundant. In other words, there is a gray area between these two opposite tests, and we still need to exert more effort to clarify it.⁵⁸⁶

A similar method is also adopted in many jurisdictions, such as statutory items and nonstatutory items enumerated in statutes or in examination guidance. This kind of categorical method cannot be successful in distinguishing between many dispute claims due to the fact that those claims are purposely drafted in broader terms except that inventors obviously intend to claim nonstatutory items. A better solution is to have patent laws where applicants must disclose their inventions in claims and in the specifications clearly.⁵⁸⁷

The requirement for software patents in other jurisdictions—software has to

⁵⁸⁵ See *Bilski*; Sec. 6.3.3; see Chap. 6 of this article.

⁵⁸⁶ See Lemley, *supra* note 419, at i.

⁵⁸⁷ See 35 U.S.C. 112.

work cooperatively with hardware, or the combination of software with hardware can result in an unusual function—may be a good reference to deal with the issue.⁵⁸⁸ Additionally, a specific test for a certain subject matter may diminish disputes in the testing since most jurisdictions have their unique tests or specific requirements for computer software inventions. Using the above methods, the determination for patent-eligible claims will be more appropriate and reasonable.

⁵⁸⁸ The requirements for software patents in Japan, Taiwan, and the EPC are good references.

Chapter 8 Conclusion

The purpose of the patent system is to encourage the creativity of inventors by granting exclusive rights for their inventive fruits. The best model occurs when the scopes of rights granted to inventors match what they invent. However, there are inherent drawbacks in the patent system; i.e., the scope of rights is dependent on claims, whose ranges may range from literal meanings of the claims to very broad ones interpreted based on the doctrine of equivalences.⁵⁸⁹ Moreover, professional patent drafters usually draft claims in very broad terms, which makes the scope of rights more difficult to draw.

As for new technologies or the combination of prior arts with new technologies, it is improper to employ the same tests or same requirements for conventional statutory subject matters to examine the patent eligibility of new types of subject matters. Especially for computer software technologies, incessant innovations present different types to the public and may be totally new to the public, or may be embedded in conventional products that go unnoticed. Thus, issues will naturally arise when the tests are inapplicable for these new types of inventions.

⁵⁸⁹ *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 607-08, 70 S.Ct. 854, 855-56, 94 L. Ed. 1097 (1950).

Another issue is that although each jurisdiction acknowledges that computer software needs patent protection, it cannot be predicted whether or not the patenting of this subject matter will improve or deter the development of the software industry. A safer way to deal with the issue is that although we allow a wide range of inventions to be considered statutory subject matters, we only grant each of them a narrow scope of rights. For instance, software claims have to be combined with hardware to complete an invention. Thus, patentees can only claim constrained scopes of rights based on this principle.

Based on the reviews of different jurisdictions, although each jurisdiction has its own philosophy in dealing with the issue, the essential characteristics of those methods are similar. In Japan, the Japanese patent office and the IP High Court have developed their requirements or tests for computer software inventions based on several amendments to their patent laws and guidelines as well as the evolution of case laws. A patent-eligible computer software invention has to demonstrate an interactive relationship between software and hardware. In addition, an invention partly involving mental steps is seen as patentable as long as the claimed means are to replace or improve mental activities.

In Taiwan, the Taiwanese patent office mixes various concepts to deal with

computer software inventions. It once adopted the MoT test employed in the United States, but this has changed. The current examination guidelines for computer software inventions adopt a different policy, offering detailed types of claims for reference in order to minimize disputes. Additionally, a computer-readable medium is required to result in a further technical effect, which has been learned from the EPO. Moreover, court judges sometimes adopt the opinions of other jurisdictions when there are no clear rules to follow.

China has very young patent laws and examination guidelines for computer software inventions. The Chinese patent office offers a general outline to deal with this subject matter without rigid tests. The policy implies that they hope to make the determination of the issue more flexible; however, it may make patent predictability less possible for patent applicants.

The EPO generates its unique test based on developments in member countries. However, the technical character requirement for computer software inventions, or the “further technical effect” for computer program claims enmeshes itself in the issue. Although the EPO hopes to illustrate the meanings of these concepts, the interpretation and the similarities of the terms make them more obscure. The referral G3/08 demonstrates the dilemma.

In the United States, the USPTO and the U.S. Federal judges have tried several tests to deal with the patent-eligibility issue. Those proposed tests seemed to be objective in the testing, but why they were chosen is not clear. As for the currently adopted tests—Machine-or-Transformation test and the abstract ideas exception test—they are two opposite tests; one positively confirms that a process claim is statutory, the other one proves that a process claim is not nonstatutory. A big gray area obviously exists between both tests and needs to be clarified. No matter which test is adopted, they still cannot touch the essence of the issue. The dilemma may be attributed to two reasons. One reason is that the preference of non-rigid tests may be based on a broad interpretation of the U.S. Constitution, which allows a wide range of patentable inventions. The other reason for this preference may be due to the fact that those tests are not only offered for computer software inventions alone, but for all process claims.

Based on the above reviews of jurisdictions, although their tests are different, there are implicit correlations among them; i.e., each jurisdiction would adjust its tests by learning the merits from each other, which helps its test keep up with the dominant trends. Thus, the primary criteria of the tests in different jurisdictions would not be far from each other. In practice, whatever changes in tests in any jurisdiction will draw

the high attention of other jurisdictions.

On account of the principle to accept any kinds of inventions as statutory subject matter, the better way is to limit the scope of rights of each invention without excluding it from patentable categories. Thus, patent applicants must clearly disclose what their inventions are in the specifications and drawings and specify the scope they want in claims. By these methods, patent examiners or court judges can clearly understand the essence of claimed inventions without the worry of granting too wide a range of rights to them.

Additionally, a specific test for a specific subject matter is necessary since each different technology has its own technical characteristics. It is impractical to evaluate all types of inventions based on an independent general test. Thus, other tests or assistant requirements may be employed to assist the primary test, so long as they are useful. For instance, the novelty or an inventive step may serve as an alternate solution for the issue when the determination of a patent-eligibility issue can not be easily reached. This method can also exclude some inappropriate claims without touching the issue of patent eligibility.

In summary, a clear and objective test is necessary for the determination of patent-eligible subject matter. Each jurisdiction can learn the merits of other

jurisdictions and amend its method or policy to deal with this issue much better. When a primary test cannot solve the issue by itself, other assistant tests should be employed as supplements for the primary test, as long as they can compensate for the deficiencies.

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