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PATENTABILITY OF COMPUTER SOFTWARE  
AND BUSINESS METHODS

*Prepared by the International Bureau*

## I. BACKGROUND

### Computer software

1. Computer technology plays an increasingly important role in our society today. It enters more areas of our life, not only in technological environments and offices, but also in daily surroundings, such as household appliances, cars, watches and toys.
2. A computer cannot operate without instructions. These instructions, so-called computer programs or software, may be incorporated in the computer (for example, ROMs). But often, they are created, reproduced and distributed in media which are separate from the computer hardware, such as diskettes or CD-ROMs.
3. The investments needed for the creation of computer programs are often very high. On the other hand, once created, it is generally possible to reproduce computer programs easily at very low cost. Therefore, without appropriate protection against unauthorized copying and use, producers of computer programs would not be able to regain their investments and thus, the creation and development of this technology may be hampered. This is why, during the 1970s and the first half of the 1980s, intensive international discussions regarding the protection of computer programs took place, mainly aiming at resolving the question of whether such protection should be provided under copyright law or patent law, or possibly under a *sui generis* system of protection. Today, it is generally accepted worldwide that computer programs should be protected under copyright. This is reflected in Article 10(1) of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) and Article 4 of the WIPO Copyright Treaty (WCT).
4. The debate on intellectual property protection of computer software, however, is far from its end at the national and international levels. This is due to the unique nature of computer software that performs function through expression. Although copyright protects “literal expressions” of computer programs, it does not protect “ideas” behind the computer programs, which often is a core part of their commercial value. For example, two programs with different text (that is, different “expressions”) can provide a completely identical function. Under copyright protection, the second comer can develop a program having an identical function but a completely different text. Since, in fact, ideas behind programs often provide technical functions such as controlling machinery or regulating room temperature, program developers started to seek protection of computer software through the patent system.

### Business methods

5. Recently, another issue arose, further complicating the questions regarding patent protection of computer software. Traditionally, business methods were either in public domain or protected under trade secrets. They were not considered patentable because they were mere concepts without any connection to physical objects. As the term “industrial applicability,” which is one of the fundamental patentability requirements, suggests, patent law developed hand in hand with the industrial revolution and focused more on technological development. Today, however, many businesses are carried out with computers. Financial services heavily rely on computers to process and transfer enormous amounts of data. Further, the Internet has provided new ways of doing business on-line, rather than physical contacts and transactions between a seller and a purchaser. Due to high economic stakes put

on these new business methods and the growing importance of e-commerce in our society, the debate on the feasibility and possibility of patenting business methods has continued at both the national and international levels.

6. It should be noted that the term “business method patents” requires some explanation. In general, business methods may be performed either in manual ways in a physical environment (for example, how to minimize a queue at a cashier) or by computer software in the cyberspace (for example, a method of searching the cheapest air ticket in a minimum time on the Internet). As regards the latter, it could be a mere translation of physical operations to a computer system, or the operation via computer software could be an integral part of an invention. Therefore, when discussing patentability of business methods, those different types of business methods should be kept in mind.

## II. Objectives of the patent system

7. Before starting the discussion on the patentability of computer software and business methods, it may be worth recalling the general objectives of the patent system, since it is relevant to the question as to whether, and to what extent, computer software and business methods should be protected under the patent system.

8. A patent provides its owner the exclusive right over the commercial exploitation of the invention for a limited period of time in return for disclosing the invention to the public. The theory behind the system is that the financial reward flowing from the exploitation of the patent and the public disclosure of the resulting inventions would encourage further innovation, thereby raising the technical level of a nation’s industry with the obvious resultant trade advantages. For example, Article 1 of the Patent Law of the People’s Republic of China (hereinafter referred to as the “Chinese Patent Law”)<sup>1</sup> states that “the Patent Law is enacted to protect patent rights for inventions-creations, to encourage invention-creation, to foster the spreading and application of inventions-creations, and to promote the development and innovation of science and technology, for meeting the needs of the construction of socialist modernization.”

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<sup>1</sup> Patent Law of the People’s Republic of China, last amended on August 25, 2000 [http://www.sipo.gov.cn].

### III. Arguments for/against patent protection of computer software and business methods

9. Because of the unique nature of computer software, various arguments supporting and opposing patent protection of computer software have been put forward.<sup>2</sup> One of the major arguments supporting patent protection of computer software is that a patent can protect a concept underlying the computer program, and thus would promote the development of the software industry and computer-related industry.

10. A further argument supporting patent protection of software relies on the technical interaction between hardware and software. Software provides a set of instructions that allow a machine to indicate, perform or achieve a particular function, task or result. In that sense, both hardware and software exhibit technical behavior.

11. On the other hand, there is opposition to patent protection of software from the viewpoint of social and economic policy. One argument is that computer programs are already protected by copyright, and thus it is not necessary to provide any other titles of protection. Some argue that smaller software developers would not be able to enjoy expensive patent protection, and would be put in a position to pay royalties to patents owned by big corporations. On the other hand, some others claim that exclusive rights conferred by a patent owned by small and medium enterprises would strengthen their market position and negotiation power with the possibility to license or assign patents.

12. However, the strongest disagreement with respect to patent protection of software is that patent protection of computer programs would inhibit competition in this field due to the characteristics of software innovation. It is said that software innovation typically involves cumulative, sequential innovation and re-use of others' work. The open-source software initiative, in particular, believes that a regime without patents with participation and competition of many independent developers is preferable to stimulate innovation in this field. Further, it is argued that the need to preserve interoperability between program, system and network components constrains the range of options available to the second comer. As a result, it is feared that almost all authors of software will involuntarily infringe software patents of others.

13. As regards business methods, since many of the innovations in this field are performed by way of using computers and are controlled by software, arguments similar to those put forward in the area of patent protection of software are also applicable to business methods. A strong argument supporting business method patents relies on the economic rationale of the patent system. It is argued that, in view of a changing economic environment, there is no reason not to grant a patent to an innovative business method, such as a financial service or instrument, since such an innovation equally contributes to the economic development of countries.

14. However, undesirable aspects of business method patents are also highlighted. Again in a similar manner as for computer programs, opponents of business method patents argue that patenting business methods would distort the competitive marketplace. In their view,

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<sup>2</sup> See, for example, Daniel J. M. Arridge, Challenging Claims! Patenting Computer programs in Europe and the USA, *Intellectual Property Quarterly*, No. 1 [2001], pages 22 to 35 and Daehwan Koo, Patent and Copyright Protection of Computer Programs, *Intellectual Property Quarterly*, No. 2 [2002], pages 188 to 211.

business methods must be in the public domain (just like the laws of nature), because of their fundamental role to economy. It is feared that the exclusive rights conferred by a business method patent under the current patent law are not proportional to the inventor's investment and contribution to the society, and thus the cost might be borne by the society at large.

15. As it is the case in the field of biotechnology, patenting new technology always brings about some uncertainty. Apart from policy objectives and the compatibility with the existing patent law, there are a number of challenges at the pragmatic level. Patent Offices would need experts who are familiar with the new field as well as a good collection of prior art in order to maintain the quality of search and examination of patent applications. In practice, at the early stage of a new technology, there is not enough experience on how the inventive step criteria or the disclosure requirement under the patent law should be applied to that new technology. Similarly, the patent profession should be also equipped and trained to meet the requests of inventors seeking patent protection in such a new field of technology.

#### IV. Patentability of Computer Software and Business Methods (Overview)

16. Article 27.1 of the TRIPS Agreement provides that, in principle, "patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application."<sup>3</sup> Article 27.2 and 3 of that Agreement specify certain inventions that Members may exclude from patentability. They are "inventions the commercial exploitation of which is necessary to protect order public or morality," "diagnostic, therapeutic and surgical methods for the treatment of human or animals" and "plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes." Further, Members should provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination of those.

17. In short, the TRIPS Agreement does not expressly provide the exclusion of computer programs in general or business methods in general from patentability. On the other hand, neither the term "invention" nor the term "technology" is defined under the TRIPS Agreement.

18. In effect, in certain countries, patents have been granted to inventions concerning financial services, electronic sales and advertising methods and business methods, including business methods performed on the Internet. In the United States of America, a business methods for managing an investment portfolio was found patentable subject matter in *State Street Bank & Trust v. Signature Financial Group*.<sup>4</sup> Further, patents are also granted to the inventions such as a system called "virtual sales personnel" and a method of gripping a golf putter. In Europe, in the SOHEI case, the Boards of Appeal of the European Patent Office (EPO) decided that a computer system involving a number of independent management tasks, including financial and inventory management and a system operation method, was patentable subject matter.<sup>5</sup> In those countries where a patentable invention should have a technical

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<sup>3</sup> Further information concerning the TRIPS Agreement can be found on the web site of the World Trade Organization (WTO) at: [http://www.wto.org/english/tratop\\_e/trips\\_e/trips\\_e.htm](http://www.wto.org/english/tratop_e/trips_e/trips_e.htm).

<sup>4</sup> *State Street Bank v. Signature Financial*, 149 F. 3d 1368 (Fed. Cir. 1998).

<sup>5</sup> T769/92, OJ 1995, 525.

character, since those inventions are often executed by a computer system, drawing a line between inventions that belong to a field of technology and non-inventions is not an easy task.

19. In some countries, claims defining a computer program itself or a computer program embodied on a machine readable medium (such as diskettes and CD-ROMs) are accepted. This is due to the fact that software products are often marketed in the form of computer readable media or directly over the Internet, separately from the computer hardware. In order to prevent unauthorized commercialization of such software products, it is felt necessary to claim the software itself or a machine-readable medium storing the software that performs the claimed functions.

20. In general, patent law is applicable to inventions in any field of technology without discrimination. In that sense, patent law is technology neutral. In most countries, the question is not whether software and business methods in general are patentable or not. Rather, the inquiry is what are software-related inventions and business method-related inventions that merit patent protection under national/regional patent laws.

## V. Patentability of Computer Software and Business Methods in China

### Patentability requirements under the Chinese Patent Law and Regulations

21. As indicated in paragraph 8, the Chinese Patent Law aims to “protect patent rights for inventions” and to “promote the development and innovation of science and technology.” As in the case of the TRIPS Agreement, Article 22 of the Chinese Patent Law states that any invention for which patent rights may be granted “must possess novelty, inventiveness and practical applicability.” According to Rule 2 of the Implementing Regulations of the Chinese Patent Law,<sup>6</sup> the term “invention” means “any new technical solution relating to a product, a process or improvement thereof.”

22. Under the Chinese Patent Law, certain inventions are not patentable. Inventions that are “contrary to the laws of the State or social morality or are detrimental to public interest”<sup>7</sup> are expressly excluded from patentability. Further, in accordance with Article 25, the following subject matter is excluded from patent protection: (i) scientific discoveries; (ii) rules and methods for mental activities; (iii) methods for the diagnosis or for the treatment of diseases; (iv) animal and plant varieties; and (v) substance obtained by means of nuclear transformation.

23. Therefore, computer programs and business methods as such are not expressly excluded from patentability in China, as long as they are “inventions,” meaning “any new technical solution relating to a product, a process or improvement thereof.” However, in connection with computer programs and business methods, attention should be paid to non-patentable subject matter, “rules and methods for mental activities.” Does a computer program controlling a manufacturing robot constitute “rules and methods for mental activities”? How about a computer program that calculates the shortest route from point X to point Y? Do

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<sup>6</sup> Implementing Regulations of the Patent Law of the People’s Republic of China (entry into force: July 1, 2001) [<http://www.sipo.gov.cn>].

<sup>7</sup> See Article 5 of the Chinese Patent Law.

business methods that simplify an e-banking procedure on the Internet constitute “rules and methods for mental activities”?

#### Examination Guidelines and practice in China

24. The Examination Guidelines,<sup>8</sup> issued by the State Intellectual Property Office (SIPO), provide further explanation about the term “rules and methods for mental activities” under the Law, and clarifies how computer-implemented inventions are treated under the Chinese Patent Law.

25. According to the Examination Guidelines, “methods and systems of organisation, production, business operation and financial management,” “methods for teaching and training,” “methods for games and entertainment” and “computer programs as such” all fall under “rules and methods for mental activities,” and thus are not patentable subject matter.<sup>9</sup> They clarify that if a patent application for an invention involves only a computer program *per se*, or merely a computer program recorded on a carrier (such as a magnetic disk, CD-ROM or any other machine-readable storage medium), so far as the computer program itself is concerned, regardless of the form in which it appears, a patent will not be granted.<sup>10</sup>

26. However, if the above methods or computer programs go beyond mere “rules and methods of mental activities,” then such methods or computer programs may be patentable. This means that where the claimed invention utilizes technical means or uses the laws of nature, solves any technical problem and provides any technical effect, then the patentability of the invention should not be denied merely because it contains such a method or a computer program.<sup>11</sup> For example, when executed in a computer, if the combination of the software and the computer solves any technical problem and provides any technical effect, the invention, which is the combination of software and the computer as a whole, is no longer considered as mere “rules and methods of mental activities”.<sup>12</sup>

27. In assessing whether a software-related invention solves a technical problem and provides a technical effect, the claimed invention must be considered as a whole.<sup>13</sup> Therefore, for example, if an invention concerns a computer program that is employed together with a known hardware, the patentability of the invention should not be examined by way of considering the part of the computer program and the part of the known hardware separately. Rather, the invention should be looked at in its entirety.

28. Although no concrete definition of the terms “technical problem” and “technical effect” may be possibly provided, examples in the Examination Guidelines may be helpful to understand the underlying concept. They state that patentable inventions include an invention

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<sup>8</sup> SIPO Patent Examination Guidelines [<http://www.sipo.gov.cn>] In this document, the English text of the Examination Guidelines is based on publications such as Tian Furong and K. H. Pun, Patent protection for computer software: an under-explored avenue in China, CTLR 172, 1999 and Joy Y. Xiang, How wide should the gate of “technology” be? Patentability of business methods in China, 11 Pac. Rim L.& Pol’y J. 795, 2002.

<sup>9</sup> SIPO Examination Guidelines, Part II, Chapter 1, Section 3.2

<sup>10</sup> SIPO Examination Guidelines, Part II, Chapter 9, Section 2

<sup>11</sup> SIPO Examination Guidelines, Part II, Chapter 1, Section 3.2

<sup>12</sup> SIPO Examination Guidelines, Part II, Chapter 9, Section 1

<sup>13</sup> SIPO Examination Guidelines, Part II, Chapter 1, Section 3.2

using a computer program for real-time control in sulfuring rubber products (thus improving the quality of such products)<sup>14</sup> and an invention using a computer program for measuring the viscosity of liquid (leading to high precision in measurement)<sup>15</sup>. The technical effect can be either an external effect produced outside the computer or an internal effect created within the computer. For example, an invention that employs a virtual memory management program to increase the memory capacity and the processing speed of a known computer is patentable subject matter<sup>16</sup>.

29. In other words, if the invention's contribution to the current technology comes only from the mental activity elements, it is not considered as patentable subject matter.<sup>17</sup> On the other hand, when the technical contribution of the invention as a whole does not, or not only, come from the rules and methods of mental activities, the patentability of the whole invention cannot be denied just because it contains a form of rules and methods for mental activities.<sup>18</sup>

30. In short, in China, in order for a software-related invention being patentable subject matter, it is stressed that a software-related invention should have a technical feature utilizing technical means (utilizing laws of nature), solve any technical problem and produce any technical effect.

31. The above criteria would also be applicable to business-methods. That is, certain business methods that are combined with technical means to solve any technical problem and produce any technical effect may be patentable subject matter.

## VI. Situation in Europe

32. In Europe, the European Patent Convention (EPC)<sup>19</sup> expressly excludes "computer program *per se*" and "methods of doing business *per se*" from patentable subject matter.<sup>20</sup> Although there is no definition of the term "invention" in the EPC, it is generally understood that inventions under the patent law should have a technical character. For example, methods of controlling an industrial process, processing of data representing physical entities (temperature, size, shape etc.) and internal function of the computer itself are considered to have a technical character. A computer system used in the field of finance may have a technical character if the process is based on technical consideration of how a computer works (for example, improvement of security), rather than a simple consideration of how financial system works.<sup>21</sup>

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<sup>14</sup> SIPO Examination Guidelines, Part II, Chapter 9, Section 2.2.1

<sup>15</sup> SIPO Examination Guidelines, Part II, Chapter 9, Section 2.2.3

<sup>16</sup> SIPO Examination Guidelines, Part II, Chapter 9, Section 2.2.2

<sup>17</sup> SIPO Examination Guidelines, Part II, Chapter 1, Section 3.2

<sup>18</sup> SIPO Examination Guidelines, Part II, Chapter 1, Section 3.2

<sup>19</sup> European Patent Convention (EPC), provides procedures for filing a single patent application before the European Patent Office (EPO) which may grant a European patent with effect in the Contracting State(s) designated by the applicant. Currently, 27 States are members of the EPO.

<sup>20</sup> See Article 52 of the EPC.

<sup>21</sup> See document WIPO/IP/BEI/00/6(b).



33. In short, “computer program-related” inventions and “business method-related” inventions that have a technical character are patentable subject matter. When assessing whether the claimed invention has a technical character, it should be determined by the claimed invention *as a whole*.<sup>22</sup> Therefore, the invention may comprise a mixture of technical and non-technical features.

34. Further, the case law under the EPC<sup>23</sup> established that, in order to involve an inventive step, computer program-related inventions and business method-related inventions should make a technical contribution to the state of the art. For example, if an invention lacks a technical problem to be solved but involves only aesthetic or commercial problem, no inventive step can be acknowledged.

35. The new features of a computer-related invention are often realized by means of a new computer program run by a specific computer, computer network or other conventional programmable apparatus. Following the decision by a EPO Boards of Appeal,<sup>24</sup> claims in a patent application may take the form of a method of operating a computer or other apparatus, a computer or other apparatus set up to execute the method (loaded with the program), or a computer program itself, including a computer program embodied on a machine readable media.

36. At the European Union (EU) level, the draft Directive on the Patentability of Computer implemented Inventions has been discussed in view of harmonizing the interpretation of patentability requirements with respect to computer software related inventions, including the business methods that are implemented via computer, among the EU member States. The differences between the text of the first draft proposed by the European Commission in February 2002,<sup>25</sup> which basically followed the practice established by the EPO, and the text adopted by the European Parliament with various amendments on September 24, 2003<sup>26</sup> show divergent views concerning this topic among the stakeholders in Europe.

## VII. Situation in the United States of America

37. Under the law of the United States of America, there is no specific exclusion of software or business methods from patentable subject matter. The law states that the subject matter, to be capable of being patented, must be a useful process, machine, manufacture or composition of matter. According to the decisions of the Supreme Court, the Congress intended the statutory patentable subject matter to include “anything under the sun made by

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<sup>22</sup> T26/86 OJ 1988, 19.

<sup>23</sup> T1173/97 OJ 1999, 609.

<sup>24</sup> T1173/97 OJ 1999, 609.

<sup>25</sup> COM (2002) 92 final-Official Journal C 151 E, 25.06.2002. See [http://www.europa.eu.int/comm/internal\\_market/en/indprop/comp/02-277.htm](http://www.europa.eu.int/comm/internal_market/en/indprop/comp/02-277.htm).

<sup>26</sup> European Parliament legislative resolution on the proposal for a directive of the European Parliament and of the Council on the patentability of computer-implemented inventions (COM (2002) 92-C5-0082/2002-2002/0047(COD)). See <http://www.europarl.eu.int>.

man,”<sup>27</sup> but laws of the nature, natural phenomena and abstract ideas are three specific areas which are not patentable.<sup>28</sup>

38. This means that, if the claimed invention is more than a manipulation of an abstract idea, that is, a practical application of an abstract idea, it is patentable subject matter. In the case *in re Alappat*, the Court of Appeals for the Federal Circuit (CAFC) found that an invention including a software program (mathematical algorithm) to create a smooth display of numeric data on an oscilloscope was patentable subject matter, because the claimed invention *as a whole* was a practical application providing a “useful, concrete and tangible result.”<sup>29</sup>

39. Noting that a business method exception does not exist under US patent law, the CAFC decided, in the *State Street Bank* case, that the same patentability criteria should apply to inventions in any field, including business methods.<sup>30</sup> Therefore, in the United States of America, whether the invention concerns a business method or not and whether the invention has a technical character or not are not relevant to the determination of patentable subject matter. Business method inventions, which provide a useful, concrete and tangible result, are recognized as eligible for patent protection, although it does not mean that all such inventions would be patented. Needless to say, other substantive requirements, such as novelty, non-obviousness and utility requirements must be complied with.

40. The *State Street Bank* decision in 1998 significantly affected business. Companies began to file more patent applications to protect their financial innovations and e-commerce related innovations. Facing the reactions by the private sector, the United States Patent and Trademark Office (USPTO) responded with various initiatives, such as the establishment of “Electronic Information Center,” collection of larger and more complete prior art with respect to business methods, training examiners and the creation of new patent classification, class 705 (Data processing: Financial, business practice, management, or cost/price determination). Table I shows the number of applications filed and patents issued under the class 705 from fiscal year 1996 to 2002.<sup>31</sup>

	FY 1996	1997	1998	1999	2000	2001	2002 <sup>32</sup>
Applications Filed	584	927	1340	2821	7800	8700	5000
Patents Issued	144	206	420	585	899	433	492

Table I: Number of applications filed and patents issued in the United States under class 705 (Source: USPTO)

<sup>27</sup> *Diamond v. Chakrabarty*, 447 US 303 (1980).

<sup>28</sup> *Diamond v. Diehr*, 450 US 175 (1981).

<sup>29</sup> *In re Alappat*, 33.F.3d 1526 (Fed. Cir. 1994).

<sup>30</sup> *State Street Bank v. Signature Financial*, 149 F. 3d 1368 (Fed. Cir. 1998).

<sup>31</sup> Class 705 Application Filing and Patents Issued Data (<http://www.uspto.gov/web/menu/pbmethod/applicationfiling.htm>)

<sup>32</sup> The data in fiscal year 2002 are an estimate.

In fact, the number of applications filed in FY 2001 under class 705 constitutes only 2.7% of total number of applications in the same year.

#### VIII. Enforcement issues

41. As in other fields of intellectual property, jurisdictional questions and enforcement of rights are also relevant to patent protection. The Internet raises complex issues in this regard, as patent protection is provided on a country-by-country basis, and the patent law of each country deploys effects only within its borders, in accordance with the traditional principle of territoriality. For example, where patented software is sold and delivered over the Internet internationally, any infringement action would require a consideration of the jurisdictional and choice of law issues. Moreover, the first practical issue may be that of detection, since the unauthorized importation of such software by means of the Internet, unlike the importation of tangible goods, cannot be detected and stopped by customs authorities.

42. One of the questions specific to patent protection may be the case where a patented product invention consists of elements that are physically located in different territories. Or, for example, in the case of process patents for a method to process and transfer certain data using computerized networks (for example, the Internet), distinct elements in the claimed process could be performed in different territories. If an alleged infringer operates a system containing all of the claimed elements within the territory in which the invention is protected, there would be a straightforward claim for infringement. However, the questions of infringement and jurisdiction would be more difficult where a patented invention involves activities in several countries by several individuals. In particular, Article 28 of the TRIPS Agreement requires that a patent confer on its owner the right to prevent others from 'using' the patented product or process. What constitutes 'using' a patented product or process is increasingly complicated in the case of Internet-related e-commerce patents.

43. Such questions are not hypothetical any longer. Real cases have emerged.<sup>33</sup> Thus, increasing consideration must be given to these issues in the future in order to ensure the legal certainty for both right-holders and third parties.

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<sup>33</sup> Menashe hold a UK patent for a interactive game system comprising of a host computer interconnected with remote terminal computers and operated by communication software. William Hill began operating a similar game system by supplying a program to UK users, which allows their computers to act as terminals via the Internet for the host computer of William Hill (note that William Hill did not supply the entire patented system). Further, the William Hill's host computer carried out the functions of the Menashe patent, but was not located in the United Kingdom, but abroad. The Court of Appeal ruled that William Hill was putting the invention into effect in the United Kingdom by supplying the software in the United Kingdom in the sense that the invention was operational, or used, within the United Kingdom. It stated that the physical location of the host computer was immaterial in this case. It was the input to and the output of the host computer that is relevant to the UK users, and in a real sense the users used the host computer in the United Kingdom. On the basis of this, the Court decided that William Hill infringed Menashe patent. [*Menashe Business Mercantile Ltd v William Hill Organization Ltd*, Court of Appeal, November 28, 2002]