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7/5/99

The European Commission have suggested that the European Patent Convention should be amended to remove the prohibition against the award of a patent for a program for a computer. In the United States, the Patent and Trademark Office have issued guidelines to examiners which are seen as liberalising the availability of patents for software related inventions. Considering the nature of the patent system indicate whether you consider that its wider application to software related inventions is desirable?

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Introduction

The patent system in the UK at present has been the subject of much criticism in recent times primarily concerning the existence of prohibitions on the patentability of certain items. These prohibitions include mental acts, mathematical methods, literary works but more importantly, a program for a computer. In considering whether this latter exclusion from patentability should be removed, it is necessary to examine the nature of the patent system in general throughout the UK and Europe drawing comparisons with the position in the USA where a more liberal approach to patents for software related inventions has also drawn criticisms which will be examined in detail later.

Why do we have Patents?

The essence of the patent system is the award of a monopoly limited by a period of time over the patented article. The benefit of this for successful applications is potentially very financially rewarding. The system is in place to encourage not only improvements in society but the disclosure of improvements so as to enable others to develop these ideas further once the patent has ended. The very first patent was awarded to Filippo Brunelleschi in Florence in 1421[1] and by the 17th Century in England, the practice of granting monopolies became so widespread that it became necessary to limit the practice to inventions with the Statute of Monopolies in 1623. After centuries of gradual alteration, the present patent law is governed by the Patents Act 1977.

The Position in the UK

The Patents Act 1977 amended the previous act of 1949 and brought the UK patent system in line with the European Patent Convention. The requirements which must be met in order for an application to be successful are that

(a) the invention is new;
(b) it involves an inventive step;
(c) it is capable of industrial application;[2]

These requirements appear straightforward and to a certain extent are but problems arise as the section continues, providing that certain classes of applications are expressly excluded from being inventions.[3] As already mentioned, a program for a computer[4] is excluded. The Act though, contains no definition

[1]Greg Aharonian - Internet Patent News Service
[2]Patents Act 1977 s1(1) (a)-(c)
[3]Patents Act 1977 s1(1) (d)
[4]Patents Act 1977 s1(2) (c)

of a computer program. A more helpful approach is taken by Sir Iain Glidewell in *St Albans City & District Council v International Computers Ltd*[5] in opining that,

"Programs are the instructions or commands that tell the hardware what to do... A program in machine readable form must be contained on a machine readable medium, such as paper cards, magnetic tapes, disks, drums or magnetic bubbles."[6]

A program is by its nature, a human creation, expressed in letters, symbols and numbers which a machine treats as instructions. Without the program, a machine cannot function in the way that the program would enable it to do. Could it be possible, therefore to patent a program by reference to what it does rather than how it does it? An example of this is the 'Nudge' feature on fruit machines in casinos. The 'nudge' feature was invented in the 1970s and originally consisted of a series of switches to achieve this aim. In the later years of the patent, the process was done by a program on the main computer of the machine which too remained covered by the original patent. As Aldous LJ opines,

> *"Generally speaking, an invention which would be patentable in accordance with conventional patentability criteria should not be excluded from protection by the mere fact that for its implementation modern technical means in the form of a computer program are used."*[7]

The application of the above in practice does serve to limit the exclusion of computer programs somewhat. If such were not the case, the patent system would soon become useless as more and more machines and other inventions in everyday life utilise computer software. The approach though does lead to a great deal of confusion in the courts since it is necessary to ask whether an invention is based more on a computer program than on something else. This produces different consequences with each test.

A new invention

An invention is new if at the date of application, *"it does not form part of the state of the art"*[8] which consists of all matter which has been made available to the public anywhere and for any use[9] including any applications to the Patent Office preceding the application in question.[10] The extent of its availability to the public was discussed at length in *Windsurfing International Inc v Tabur Marine (GB)*

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[5]1996 4 All ER 481
[6]1996 4 All ER 481
[7]In the matter of Application No 9204959.2 by Fujitsu Ltd, 6/3/97 CA
[8]Patents Act 1977 s2(1)
[9]Patents Act 1977 s2(2)
[10]Patents Act 1977 s2(3)

Ltd[11] in which, the creation of a wind surfboard by a young boy prior to Windsurfing International's patent invalidated it. Similarly, in *Quantel Ltd v Spaceward Microsystems Ltd,*[12] the court said that a primer written in a thesis in a Californian University would equate to making available to the public.

This places considerable doubt upon software's patentability since by their nature, it is impossible to conceal from another expert programmer the detailed list of instructions which make up the program once the product is released. A common aspect of developing software is that at some stage, a demo version is made available as shareware or freeware over the internet or through some other means for individuals to test and report faults back to the programmer. If software were to become patentable, this practice may have to be delayed until after the application has been successful and the programmer would miss out on valuable tips, hints and suggestions on improvement before making the application which may result in an inadequate patent.

An inventive step

A step is inventive if it is not *"obvious to a person skilled in the art"*[13]. This leads to problems where an invention is simply the logical progression of the particular art, a natural extension of existing rules and principles. Any development, in a word processor, therefore, unless exceptionally inventive, could simply be an obvious extension of the existing program. This though is a relatively easy statement to make with hindsight but the task facing the examiners of the patent office is to consider whether the actions of the inventor at that time were obvious.

A more important aspect of this is raised in the case of *Genentech Inc's Patent*[14] a very lengthy and complex case. Where a large number of people are all working towards one goal, the fact that one person reaches that first does not necessarily indicate an inventive step. Although Genentech Inc were unsuccessful in the UK, it has raised interesting points. It applies where the goal is clear and the means of achieving the goal, also clear but in a situation such as the race to find a cure for cancer or for aids, has met with many unsuccessful attempts, it may not apply. As in *Parks-Cramer Co v Thornton & Sons Ltd*,[15] there had been many unsuccessful attempts by others to devise a solution to the problem and this along with the evident commercial success of the product led to the application being found to be valid.

Capable of industrial application

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[11] 1985 RPC 59
[12] Ch Div 11/09/99
[13] Patents Act 1977 s3
[14] 1989 RPC 147 CA 31/10/88
[15] 1966 RPC 407

An invention will be capable of industrial application if it can be *"made or used in any kind of industry"*[16]. This can include almost every product which could be sold emphasising the principle of the patent system of rewarding inventors. An intangible concept, idea, theory or such like is not patentable unless an invention is made which will put the theory into practice.

The exclusion of software

In 1967, the Banks Committee[17] was appointed to investigate the patent system then in operation.[18] Chapter 17 of that report considered *"The Protection of Computer Programs"* and recommended, having examined the then position in Europe and in the USA that,

"A computer program, that is: a set of instructions for controlling the sequence of operations of a data processing system, in whatever form the invention is presented e.g. a method of programming computers, a computer when programmed in a certain way and where the novelty or alleged novelty lies only in the program; should not be patentable."

These were in light of trends in the US at that time quite a strict approach, but as is illustrated below, a logical one.

"Computer programs are basically methods of mathematical calculation or sets of instructions for carrying out such calculations. Methods of mathematical calculation have never been held to be patentable and there is no reason to recommend a change in this position."

A distinction was drawn by the committee between patents for a computer program and patents for items which involve a program where the novelty does not reside solely in program. This led to a great deal of case law interpretation of the Act which followed the committee's proposals. Due to developments in Europe and the UK patent system, it is unlikely that any alterations to the UK Patent system will stem from Parliament. Instead, change is more likely and practical to stem from the European Commission.

UK Case Law

In the UK, cases concerning software related inventions have often been harshly treated. Computer programs more recently have been compared with schemes for performing mental acts[19], regardless of whether it is practical for the human mind to complete the act. In *Merrill Lynch's Application*[20] the

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[16]Patents Act 1977 s4(1)
[17]The Banks Committee Report on Reform of the Patent System, 1970
[18]Patents Act 1949
[19]also prohibited under Patents Act 1977 s1(2)(c)
[20]1989 RPC 561

courts accepted that the test of a 'technical effect' must be considered since its adoption by the European Patent Office in *Vicom Systems Incorporated's Patent Application*[21]. If the application concerns a technical process carried out under the control of the program then it cannot be held to be related to a computer program as such. In *Merrill Lynch* though, there was found to be no technical process, the application being entirely related to computer software and not the technical effect. *Merrill Lynch* was a claim for a data processing system for setting up a trading market in securities which the court decided related primarily to a method of doing business[22] but the claim was not excluded simply because the novelty lay in an excluded thing[23] and instead, the court looked at its application as a whole. However, since the actual technical effect itself was excluded, being a method for doing business, the claim still failed. As was highlighted in *IBM/Document Abstracting and Retrieving*[24] though, advances in the field of business cannot be considered to be technical advances and while this was also the view with computer programs, it has more recently been accepted that computer programs can constitute technological advances.

In *Gale's Application*[25] an attempt was made to almost bypass the prohibition by storing the program on the hardware of the computer and in this case, creating, it claimed a new type of ROM Chip. This would have meant that the storage medium would have been crucial to any software patent application. A program was still a program, regardless of its mode of storage and as Nicholls J opined,

"It would equally be nonsense if a floppy disc containing a computer program was not patentable that a ROM characterised only by the instructions in that program should be patentable."[26]

This again shows a tendency of the courts in the UK to examine an application in an extreme depth to discover the extent and effect of a computer program in the invention. This has also been greatly emphasised in cases such as *Wang Laboratories Inc's Application*[27] a claim for an expert system program. The contribution to the state of the art was by the program alone and again in *Wang*, it was emphasised that the program's physical presence in a permanent form on the hardware of the computer should not automatically lead to patentability.

The realm of virtual reality programs was dealt a harsh blow in *Fujitsu's Application*[28] although in *Vicom*, manipulating technical images was viewed to be technical, in *Fujitsu*, the application concerned

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[21] 1987 OJ EPO 14
[22] also excluded under Patents Act 1977 s1(2)(c)
[23] this was in accordance with the ruling in Genentech Inc's Patent
[24] 1990 EPOR 99
[25] 1991 RPC 305
[26] 1991 RPC 305 but see also Burrough's Corporation (Perkin's) Application 1974 RPC 147 in which a similar technique was patentable although it was in that case clearly a greater extent of permanency in the hardware existed.
[27] 1992 RPC 463
[28] Re Patent Application No 9204959.2 by Fujitsu Lt 1996 Times Law Reports, 18/06/96

a program enabling scientists to create and manipulate chemical compounds on a computer screen without the need to create them in real life first. This was the use of a computer program in an area previously performed by humans and as such, similar to a mental act and therefore also prohibited. Fujitsu had avoided the program exclusion but according to Justice Laddie,

"The real issue it seems to me, is whether the application avoids the other exclusions under Section 1(2). If it does not, the application will fail. Whether, in those circumstances, the grounds of failure are stated to be that the invention is only for a program or that is, for example a method for performing a mental act is a matter of semantics."[29]

This appears rather constrained when we consider the inherent benefits of producing a system which produces human functions and the potential commercial success of such a program. It was also suggested in Fujitsu that a mental act should be limited to a process which the human mind **carries** out and not to one which the human mind **could** carry out. Whether this would take account of time and practicality of a human mind carrying out such a process is unclear but the advantages of a quicker method of performing many human tasks are undoubtedly significant. A person who invents such a scheme should by all exercise of logic be rewarded in the same way as a person who invents a quicker mode of transport or a machine which reduces the length of time required to construct buildings. Even a robot created would in essence by its sheer end result be mimicking a human mental thought process although the actual construction of the object to do so rather than the use of a computer alone may allow it to remain patentable.

In *Raytheon Co's Application*[30] the company sought to patent an application which was able to identify a type of ship from a distance by comparing it with a database of images of ships which it checked to find a match. In essence, this was a way of performing a mental act. Mr J Jeffs QC commented that,

"What is being done is to carry out a comparison such as is done in the mind in recognising an object but doing it by electronic means."[31]

However, it was suggested in the case that a human mental act, by the use of the word 'act' must entail a conscious and not subconscious process. The practice of recognition of objects and smells through the use of our senses is a subconscious effort. However, if an alternative method[32] of recognition was used, this would constitute a technical advance and be patentable. The position remains unclear and greatly

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[29]at http://www.194.223.116.203/casebase/ at page 8 of the printed judgment.
[30]1993 RPC 427
[31]1993 RPC 427
[32]for instance, the recognition of a smell by the use of chemical analysis

confusing. It may though be possible to obtain a European Patent where the technical manner of conducting the process was an advance in the state of the art.[33]

European developments

The Patents Act also enforced the result of the European Patent Convention[34] held in 1973 in Munich out of which was also created the European Patent Office. However, as yet, there is no European Patent, the Office simply hands out a bundle of patents in whichever country is requested. It should be noted that the Convention is not a child of the European Community and as such, lacks much of the enforcement procedure such as Direct Effect and harmonisation. As a result, cases which have been successful in Europe are not always successful in the UK.[35] Although UK courts have strived to maintain a similar approach as courts in Europe, this has not always possible. In *Gale's Application*[36] the problems were highlighted by Nicholls LJ,

> *"It would be absurd if, on the issue of patentability, a patent application should suffer a different fate according to whether it was made in the United Kingdom under the Act or was made in Munich for a European Patent under the Convention."*[37]

This discrepancy has caused several problems over the years and it is hoped that the Commission will tackle the problem in the next few years.

At present in the European Community, a Green Paper[38] has been adopted by the Commission which proposes to improve and modernise the European Patent System and introduce directives through the Commission which would ensure that businesses and inventors alike could secure patent protection throughout the single market on the basis of a single patent application. This would also allow the European Court of Justice to take a role in the harmonisation of Community patent law and create a single approach to the issue. There is also a proposal for a directive to harmonise the conditions for the patentability of a computer program throughout the Community, indeed in a recent communication, it was clear that the position would be to encourage Member States to adapt to technological advances and allow computer software to be patentable. Consequently, it is necessary to consider how far this should go and whether the proposals are desirable.

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[33]IBM Corp/Reading Age, 1990
[34]see especially, Article 52 of the Convention which also excludes a program for a computer
[35]see especially Genentech Inc's Patent which was successful in Europe
[36]1991 RPC 305
[37]Gale's Application 1991 RPC 305
[38]The Commisssion approved the Green Paper on Patents in June of 1997.

The advantages of a patentability of software could be great for one of the world's largest industries but to alter the existing state of Europe's Patent System in this field without considering the American position would be ludicrous.[39]

The Position in the USA

The American system is generally considered as more liberal in regard to software related inventions than Europe and as such have encountered numerous problems which will be examined later. The US though does not allow the patentability of a computer program unless as in *Gottschalk v Benson*[40] it can be applied to some practical and useful end which is specified. This prevented the application in *Gottschalk* being successful as it was a new mathematical formula which would have covered all applications of the formula. This was highlighted in *Parker v Flook*[41] which proceeded to the Supreme Court. In this case the application was unsuccessful as the novelty lay solely in the mathematical formula but at the same time it had limited the application to a particular outcome which led to the greater consideration of the case. The court did not however rule out the patentability of software related inventions.[42]

As the decades progressed, more and more software related patents have been allowed in the US[43] and in *Iwahashi*[44], a voice recognition system was patentable where the novelty lay in the application of a mathematical formula and indeed the content of the program. In the case of *In re Alappat*,[45] it was held that mathematics was,

"simply another means whereby technological advancement is achieved"

With this in mind, the need for exclusions seems futile, provided technological advancement is achieved. Indeed the US Patent and Trademark Office issued guidelines to examiners relaxing the treatment of software related inventions.[46] Indeed, the guidelines state that,

"The Guidelines alter the procedures Office personnel will follow when examining applications drawn to computer-related inventions and are equally applicable to claimed inventions implemented in either

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[39]It is estimated that some 20,000 software patents were issued in 1998 by the USPTO
[40]34 L Ed 2d 273 1972
[41]57 L Ed 2d 451 1978
[42]see also Diamond v Diehr 67 L Ed 2d 155 1981
[43]a scheme for financing motor car loans Patent No 4736294
[44]In re Hiroyuki Iwahashi, Yoshiki Nishioka and Mitsuhiro Hakaridani 888 F 2d 1370 1989
[45]92 - 1381
[46]a full text of the guidelines is available for download at the USPTO website

hardware or software. The Guidelines also clarify the Office's position on certain patentability standards related to this field of technology."[47]

The overall view in the guidelines is that examiners in reviewing claims are to look at the intended aim of the patent and not solely the program inside it. It is the combination of software with its material transformation of the hardware or data that is patentable. The result has been a dramatic increase in the number of software related patents in the US in recent years. Indeed, a conference held by the UK Patent Office in 1994[48] was alarmed by the fact that,

"UK and European industry was handicapped, both because they were not protecting their own innovations, and because they were coming up against patent monopolies of their overseas competitors."[49]

The Problems encountered in the US are though numerous and do not relate entirely it should be noted to the legal side of the arguments. Software Patents may be legally desirable but may not be desirable in practice.

Problems in the USA

One organisation, the League for Programming Freedom adopts a position staunchly against software patents and while they may lack the necessary degree of legal authority for their argument, the examples listed are extremely concerning for the software industry. One major concern is that unless action is taken by the legislature,

"small companies will effectively be barred from the marketplace, while large, established firms will become embroiled in litigation that will have a stultifying effect on the entire industry."[50]

The problem, it claims stems from the fact that software patents cover algorithms and not entire programs and as such anyone using these will be in breach of a patent being issued. Companies like Microsoft and Lotus are all being targeted for breaching a patent in their spreadsheets owned by another company. In some cases, the situation has become so exaggerated that a claim of a breach of one patent has been fended off by a counter claim that another patent is being breached by the original company who sought to enforce their patent.

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[47]USPTO guidelines adopted in February, 1996
[48]Legal Protection for Software Related Inventions UKPO 19th October, 1994
[49]highlighting the view in the UK that all software related inventions are unpatentable and consequently a trend in industry to ignore this field altogether in terms of software.
[50]Article on the Web Site of the League for Programming Freedom by Simon Garfinkel, Richard Stallman and Mitchell Kapor

The League heavily criticises the nature of many of the patents issued in that they are so obvious that a first year programming student could have produced the same result. What is more concerning is that up until recently, examiners in the USPTO were not computer programmers but instead engineers, lacking the requisite expertise to determine whether something was indeed novel or unobvious.[51] As a result, searching the databases for examples of prior art[52] has been complicated due to a lack of consistency and is now impractical for a small company to do. It is viewed that the possibility of a lawsuit is growing rapidly and discouraging many young programmers from achieving desired results. What is clear is that if the European Community is to legislate in this area, it must take account of developments in the USA to try and avoid such problems arising here.

Other Considerations

GATT/TRIPS

It is possible to hold the view that at present in the UK, we are not complying with our international obligations in patent law. The TRIPS Convention[53] which the UK is signatory to states that patents should be available for,

"any inventions, whether products or processes, in all fields of technology"[54]

This contradicts Article 52 of the European Patent Convention and indeed the Patents Act 1977, but which law should the UK comply with? Since the EPC is not formulated by the European Community, neither is more binding on the UK. Consequently, it is plausible that the UK could review its own Patent legislation before the Community takes action. However, Community action does not seem far away and it may be more advisable to wait for such changes to take place rather than complicate matters.

Copyright v Patentability

As already mentioned, a computer program is excluded from patentability, instead, the program is protected to a certain extent by copyright law. However though, copyright, in treating computer programs, treats the program as a literary work and protects the actual content, order and so on. If the

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[51] the comparatively low wages in the USPTO are not encouraging computer scientists into the office as their potential to earn in the private sector is significantly larger.
[52] http://www.spi.org
[53] Agreement on Trade-Related Aspects of Intellectual Property Rights
[54] Art 27 of the Convention organised by GATT note software is not excluded.

prohibition on software patents were lifted, programs may fall foul of the Act once more. For literary works are also excluded from being an invention[55] and computer programs, if they are to continue to be copyrightable would fall foul of this. Can the law treat programs differently in copyright than patent law? This may have to be the case, since a computer program has a function which is absent in the realm of literary works. Their patentability would therefore lead to protection of the function as well as the content since any significant copying would clearly not involve an inventive step.

An alternative approach would simply be to leave the exclusion of literary works as it stands since if computer programs are being patented simply for their content rather than application, it is the actual writing which is being patented and this would be to extend the law too far. The literary exclusion would serve to limit the extension and ensure that only worthy programs could be patentable.

There are many obvious reasons for patenting software products. One of the most important is time of protection, that being significantly greater for copyright than patents although the twenty year length of a patent may also be far too long. It is suggested that five years should be the length of protection for computer programs since the stage of development in this field is far greater than in any other.[56] This encourages both the inventing and at the same time successful marketing to be performed quickly aiding the advance of this fast growing field of technological advancement.

Software, logically can be new, can involve an inventive step and certainly can be capable of industrial application but were it not to be excluded in many of the cases already discussed, it may fall foul of the other exclusions, notably a method of business or a mental act. Perhaps the greater the first three criterion are satisfied, the less attention should be paid to the exclusions. For instance, if a computer program is invented which is the most significant invention this century, revolutionising the state of the world, an inventor should surely be rewarded in a similar way to the inventor of say, the musical condom.[57]

Copyright is also more useful in protecting a particular screen layout or similar end result. As a result, Microsoft chose to use the word 'Recycle Bin' in Windows 95 instead of 'Trash' as used by Apple. This allows a user to become familiar with a particular user interface and encourage a greater degree of loyalty in customers who prefer a particular screen layout. For example, Apple computers may arguably be better than IBM compatible PCs but Windows looks better in many people's opinion.

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[55]Patents Act 1977 s1(2)(b)
[56]the expansion of the computer industry in the last 10 years has been far greater than in the previous 60 years.
[57]Patent on IBM's Intellectual Property Network.

Furthermore, an advantage of copyright is the defence for infringement that you simply did not copy the work and instead developed it creatively without reference to the other product. This leads to a greater degree of protection for young programmers.

However, patents seem to fit the growing expansion of the computer industry. As more techniques can be achieved in the same way by reverse engineering or simplifying an original program or altering lines of code to achieve the same result, copyright law is proving to be increasingly inadequate protection for modern computer related software inventions. A more clear exercise of logic is the fact that copyright protects art, patents protect inventions and reward inventors, not enhance one's artistic integrity. Many programs are capable of being classified as inventions and as such ought to be patentable.

Conclusion

In considering the nature of the patent system, it is desirable to extend its application to software related products. The method which is used to do this would need considerable detail to ensure the European system functions efficiently. If the European model were to alter, which is desirable, it must be limited to take account of the possibility of general computer program patents which may be too broad to offer protection or so broad that the development of the industry would be restricted. Furthermore, the UK position has reached a stage of confusion whereby if anything, it requires clarification. By allowing inventions done one way but refusing to allow inventions through the use of a computer, an identical result may be achieved but the latter would be unpatentable. The real problems arise when deciding to what extent software should be patentable. It is clear that this is a legislative decision and that any legislation which results must have clearly defined definitions to avoid any ambiguity. Furthermore, it should be decided whether the existing exclusions should be removed in their entirety for, if they are not, several may block the patentability of software regardless of its removal from the exclusions list. It may be that the three pronged test alone is sufficient or that the remaining exclusions be reduced or altered in some way. Provided expert computer scientists are appointed by the Patent Office, and an efficient method of searching is made possible, a program for a computer may indeed be efficiently patentable in the next millenium. In the interests of competiveness, promotion of innovation and employment, this change should happen sooner rather than later.

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