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Registry of the Enlarged Board of Appeal
Case Number G3/08
European Patent Office
80298 München
GERMANY

27 April 2009

Dear Sirs

**Re: Referral of the President of the European Patent Office
under Article 112(1)(b) EPC**

G3/08

**Brief of *Amicus Curiae*
International Business Machines Corporation**

International Business Machines Corporation (IBM) respectfully submits the following brief as *amicus curiae* in the Board of Appeal case G3/08.

Introduction

Technology advances quickly and unpredictably with new fields of technology emerging all the time. Legislative activity cannot be expected to mirror the pace of technology development so the law needs to be flexible enough to adapt to changes as they arise. For these reasons it is appropriate that the meaning of the exclusions in Article 52 EPC are left open to interpretation by the EPO and national courts.

The interpretations of the Convention offered so far have led to a lack of clarity and, in some instances, a lack of consistency. The case law relating to the patentability of computer programs includes a mix of criteria: *technical character*; *technical contribution*; *technical effect*; *further technical effect*; *technical considerations*; *technical problems*; *technical solutions* and others. Understanding, let alone reconciling, the various criteria can be extremely difficult and the volume and diversity of terminology is confusing and not conducive to an inclusive and open patent system.

The confusion is compounded by apparent changes to the practical approach for determining whether subject matter constitutes an invention in view of Article 52. In particular, there has been a shift from the so-called *technical contribution* approach (T208/84 Vicom, then T26/86 then T115/85 IBM and T6/83) to an approach where the technical character of a claim as a whole is considered, irrespective of the prior art (T258/03 Hitachi, then T424/03 Microsoft). This approach shall be referred to as a *hardware oriented approach*, for convenience.

Applying the technical contribution approach, inventions are excluded from patentability under Article 52 if there is no technical contribution to the known art. Thus, by definition, the contribution approach requires an assessment of an invention under Article 52 with respect to the state of the art. The hardware oriented approach, on the other hand, specifically avoids any assessment of the state of the art when considering the exclusions of Article 52. Applying the hardware oriented approach, subject matter is considered to be a non-excluded invention if it has a technical character, such as by the inclusion of technical features (see, in particular, T258/03 Hitachi). The hardware oriented approach results from the structure of the EPC which requires that claimed subject-matter is an invention within the meaning of Article 52(1) as a prerequisite for examination with respect to novelty and inventive step, since these latter requirements are defined only for inventions (T258/03 Hitachi, reason 3.1).

On the face of it, the technical contribution approach and the hardware oriented approach are at odds. In practice, however, this is not the case since the approach to assessing inventive step (the principles of which are set out in T 641/00 Comvik) takes account of only those features which contribute to a technical character. Consequently, the technical contribution and hardware approaches reach the same conclusion on practical application. One approach allows a claim to be patentable if it makes a technical contribution to the state of the art. The contribution would need to be new and inventive or else it would not be a contribution worthy of patent protection. The other allows a claim to be patentable if it includes technical features which are assessed in terms of novelty and inventive step.

While the approach to determining whether subject matter is an invention in view of Article 52 appears to have changed, the changes are somewhat academic. Despite this, the existence of different practical approaches creates confusion. Decisions of national courts demonstrate difficulty in reconciling the two approaches, further compounded by their inclination to harmonise. In particular, the UK courts have developed binding precedent applying the technical contribution approach despite the later, seen to be somewhat diverging, EPO cases. The issue was described in Aerotel/Macrossan at paragraph 29, in Symbian (UK High Court Decision) at paragraphs 36 and 37, and in Symbian (UK Court of Appeal Decision) at paragraphs 43, 44 and 46. In view of this, an opinion of the Enlarged Board of Appeal that clearly and concisely articulates the state of the law in respect of computer program inventions will be extremely helpful.

IBM's observations provided here draw upon IBM's broad experience in the field of information technology research, development, design, manufacturing and related services. IBM's primary recommendation is that the approach defined in the "Guidelines for Examination in the European Patent Office" (the Guidelines) with respect to computer program inventions is confirmed by the Enlarged Board of Appeal. The Guidelines present the current state of the law

clearly and in a way which, if applied rigorously and consistently on the basis of an effective search of the prior art, provide appropriate assessment of computer implemented process inventions under Article 52.

Observations and Recommendations

As an appropriate standard for assessing the patentability of computer process inventions IBM supports the view that a patentable process is one that involves a technical contribution to produce technically beneficial results¹. This view is compatible with the standard normally applied by the EPO Examining Division in assessing patent applications relating to computer-related inventions. The standard is well articulated in the Guidelines at C-IV-3, 2.3.6 and C-IV-25, 11.7.2 which navigate a path through the case law of the boards of appeal to provide an approach that can be applied by examiners.

In particular, the Guidelines outline that a *technical character* is required for claimed subject matter not to be excluded by Article 52(2)(c) and (3). In practical application, the Guidelines put forward the approach of T258/03 (Hitachi) such that any technical means serve to take claimed subject matter outside the scope of the exclusion of Article 52(2)(c) and (3), and patentability is conferred if there is an inventive step taking account of only those features which contribute to a technical character (applying T 641/00, Comvik). It is IBM's primary recommendation that the approach described in the Guidelines is confirmed by the Enlarged Board as the approach of choice for assessing patent applications relating to computer programs.

Notwithstanding this primary recommendation, IBM recommends that the Enlarged Board of Appeal present the criteria for applying Article 52 in a more clear and straightforward way with an emphasis on simplicity. To achieve this, the board should confirm that a claimed invention must have a technical character that can be conferred by the inclusion of any technical features. The Board should also confirm that an assessment of inventive step take account of only those features which contribute to the technical character of a claim. Criteria presented in a clear and straightforward way such as this serves to remove confusion and complexity while remaining consistent with the current practice of EPO examiners. More subtle details of the criteria, such as particular mechanisms by which technical character is conferred, can only be appropriately discussed once these fundamental overarching requirements are clearly presented and understood.

The referral is framed in view of perceived concerns that some decisions of the boards of appeal have given too restrictive an interpretation of the scope of the exclusion for computer programs in Article 52(2)(c). In this regard it is helpful to revisit the nature of computer programs and how they fit into the technical field.

Computer programs enable the generalisation of computing machines, decoupling those machines from their particular applications. What was once hard-wired in logic circuits within application-specific apparatus became virtualised as software instructions affecting the

¹ see, for example, Brief of *Amicus Curiae* IBM In Re Bernard L. Bilski and Rand A. Warsaw

operation of generalised logic circuits. Despite the generalised nature of these computing machines it is nonetheless a design choice that programmable apparatus are employed over application-specific apparatus. In most cases this design choice is made on the basis of ease of implementation and cost but it is by no means necessarily the most efficient or effective design choice in all instances. A vast array of applications is embodied entirely in application-specific apparatus. Arithmetic and logic units, graphics processing logic, networking logic, even compression and encryption technologies are often implemented as physical circuits and dedicated devices.

The conception of a new logic arrangement is not necessarily dependent on its final implementation and the specification of a logic arrangement as a series of method steps does not predispose such an arrangement to be implemented as a computer program. Application specific implementations such as hard-wired logic circuits and Application Specific Integrated Circuits ("ASICs") are routinely specified using hardware description languages. Similarly, software programming language can be converted to machine code instructions for execution by a generalised computing machine.

Method steps specifying a new logic arrangement are therefore not necessarily a computer program, and accordingly, method steps characterising what are regularly referred to as *computer implemented inventions* are not necessarily computer programs *as such*. Claims directed to novel logic arrangements that can be implemented otherwise than as a computer program are therefore not necessarily excluded by Article 52.

The perceived concerns regarding a supposed overly-restrictive interpretation of the breadth of the exclusion in Article 52 may arise in relation to claims directed in some respect to a "computer program", such as claims specifically including a computer program feature or computer program steps. It is in respect of these claims especially that an approach based on the contribution of an invention serves to distinguish claims to computer programs *as such* and claims having a technical character that produce technically beneficial results. Whether the contribution of an invention is assessed using the approach starting with T208/84 Vicom or the approach of T258/03 Hitachi is not significant since any difference between these approaches has been shown to be largely academic. Still, IBM has noted and appreciated the impact of the approach in T258/03 from a practical point of view. What matters is that the contribution of the invention to the state of the art is technical in nature such that a new technical benefit is realised. The rigour with which the assessment of the contribution is made is dependent on the extent to which the state of the art is understood. It follows that a comprehensive search of the state of the art is required – only then can the contribution of an invention be properly assessed.

In this regard the perceived restrictive interpretation of the exclusion of Article 52 may result from a partial understanding of the state of the art in the field of computer programs. In particular it is of concern to all participants in the patent system that patents have been granted for computer related inventions by patent offices that do not employ an effective mechanism for appropriately searching publicly available computer program source code. With a substantial and growing volume of software available publicly in source code form it is essential that patent office search strategies adapt to search this prior art. An effective assessment of the contribution

of an invention based on a comprehensive understanding of the state of the art is required to rigorously apply the standard for patentability defined in the EPC.

Turning now to the particular questions raised in the referral, IBM's observations are provided below drawing on the approach of the Guidelines, notably applying the principles of T258/03 (Hitachi).

Question 1

Question 1. Can a computer program only be excluded as a computer program as such if it is explicitly claimed as a computer program?

The answer is "no". The technical character of an invention is generally accepted as an essential requirement for patentability as illustrated, for example, by Rules 42(1)a, 42(1)c and 43(1) EPC, the Guidelines, C IV 1.2ii, C IV 2.1, etc., and well established case law including the decisions cited in the text of the referral. Accordingly it is established that an invention relating to a computer program, be it of the form "computer program" or not, may be excluded from patentability as a *computer program as such* if it does not exhibit the requisite technical character. Further, an invention relating to a computer program may not be excluded from patentability if it makes a contribution that provides a technical benefit. The contribution of an invention is assessed as part of an assessment of inventive step taking account of only those features which contribute to a technical character (T641/00 Comvik).

The existing approach followed by the Examining Division and summarised above applies these principles. At one extreme, a claim characterised by literal program code, without identifiable technical character, is not compatible with Article 52, be it explicitly claimed as a computer program as such or not.

Question 2

Question 2(A). 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 computer-readable data storage medium?

The approach of the Guidelines and T258/03 (Hitachi) is suitable for assessing patentability in respect of Article 52. T258/03 (Hitachi) requires a technical character for claimed subject matter not to be excluded by Article 52(2)(c) and (3), subject to a further assessment of the contribution of an invention as part of inventive step. A computer or computer-readable data storage medium are technical features and confer a technical character. Accordingly, the answer to question 2(A) which is specifically asked in respect of Articles 52(2)(C) and (3) is "yes" subject to the observations below which would cause such a claim to be rejected as lacking inventive step under Article 56 if it does not include a technical contribution to the art.

An assessment of inventive step will take account of only those features which contribute to a technical character (T641/00 Comvik) and accordingly the contribution of an invention is properly assessed as part of an assessment of inventive step. For example, a claim comprising

an entirely non-technical method (such as a pure business method) implemented on a computer is not excluded under Article 52 but lacks inventive step under Article 56 since the only technical feature is the computer itself. Notably, a rigorous assessment of inventive step depends entirely on a comprehensive understanding of the state of the art.

Question 2(B). If question 2(A) is answered in the negative, is a further technical effect necessary to avoid exclusion, said effect going beyond those effects inherent in the use of a computer or data storage medium to respectively execute or store a computer program?

Notwithstanding the answer to question 2(A) above, any answer to question 2(B) must be "no".

Decision T1173/97 IBM says that a computer program product is not excluded from patentability under Article 52 if, when it is run on a computer, it produces a *further technical effect* which goes beyond the "normal" physical interactions between program (software) and computer (hardware). The decision in T1173/97 must be understood as placing the condition of further technical effect as a condition *sufficient* for patentability and not a condition *necessary* for patentability. This is reflected in the Guidelines, C IV 2.3.6, where further technical effect is not the sole criterion. For example, technical considerations required to carry out an invention (following T769/92 Sohei) may also be sufficient to confer technical character.

Question 3

Question 3(A). 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 the claim?

The answer is "no". In accordance with the approach set out in the Guidelines and, in particular, the approach of T258/03 Hitachi, claimed subject-matter must be an invention within the meaning of Article 52(1) as a prerequisite for examination with respect to novelty and inventive step since these latter requirements are defined only for inventions (T258/03 Hitachi, reason 3.1). In this regard, current criteria are set forth in the Guidelines for assessing technical character under Article 52. While a number of sufficient conditions for determining technical character are discussed in the Guidelines, such as *further technical effect*, no necessary condition is put forward. Accordingly, the condition specified in question 3(A) should not be made a necessary condition.

The requirement for a technical effect with respect to a real world physical entity arises from case T208/84 Vicom and is assessed in that case in terms of the industrial application of process inventions that might otherwise constitute mathematical methods. In particular, T208/84 considers that mathematical methods as such produce no technical result since they operate only on numbers (reason 5). To the extent that T208/84 relates to claims that may be implemented by a suitably programmed computer, the board stated that a claim directed to a technical process which process is carried out under the control of a program cannot be regarded as relating to a computer program as such (reason 12). Thus, even the case law that introduced the principle of a technical effect on a physical entity in the real world applied technical character criteria to a determination under Article 52, and this case law is not incompatible with the more general criterion of *technical character*.

Question 3(B). If question 3(A) is answered in the positive, is it sufficient that the physical entity be an unspecified computer?

Notwithstanding the answer to question 3(A) above, a contribution that produces a technical benefit for a computer is a technical benefit nevertheless. Accordingly, there is no reason to distinguish an unspecified computer from any other physical entity in the real world.

Question 3(C). If question 3(A) is answered in the negative, can features contribute to the technical character of the claim if the only effects to which they contribute are independent of any particular hardware that may be used?

The answer is "yes", provided the features have a technical character. Accordingly, such features are considered in an assessment of inventive step.

Question 4

Question 4(A). Does the activity of programming a computer necessarily involve technical considerations?

While the activity of programming a computer often does involve technical considerations, it does not *necessarily* involve technical considerations and so the answer must be "no".

Despite this it is important to highlight how programming often *can* provide a technical benefit based on technical considerations. Such technical considerations can include a knowledge of the configuration and capacities of a computer to achieve a particular outcome. At a lowest level, computer programming requires a detailed understanding of the *primitive* operations that can be performed by a computer along with the arrangement of registers and storage in the computer. Alternatively, at least some level of generalisation of the primitive operations (such as assembly language instructions) is required.

At higher levels of generalisation the required level of understanding of, for example, primitive operations, can recede, but a need for understanding the technical features of operating environments grows. Operating environments, such as operating systems, are computer programs managing software and hardware resources in a computer. Operating systems are normally tightly coupled to the organisation and arrangement of computer hardware including processors, input and output interfaces, devices and storage. The activity of programming software to execute with an operating system will often involve technical considerations relating to the organisation and arrangement of the computer, at least to the extent that the computer is reflected by the operating system.

At even higher levels of generalisation, such as generalised programming environments, technical considerations are still often required. Programming activities to address requirements that computer programs operate more efficiently, use less storage, or interoperate with particular devices or other programs will often require a knowledge of the configuration and capacities of a computer. The need for technical considerations can even arise where the activity of

specifying a method for a computer is undertaken at a highest, most generalised level. In particular, the need to fully appreciate the manner in which instructions are carried out by a computer underlies programming activities, and is in itself a technical consideration arising from the capacity of the computer. For example, the fact that instructions are carried out exactly as specified, with no deviation, can lead to unintended results. Resolution is only possible with full and proper consideration of the technical capacities of the computer.

The rationale in T833/91, T204/93 and T769/92 that computer programming requires performing mental acts as such and is therefore excluded from consideration could equally be applied to the approach taken by any skilled persons in any technical field. The conception of any invention always starts in the mind of the inventor. In particular, T769/92 considers activities involving technical considerations that are carried out before programming can start, suggesting that design or preparations before programming might involve technical considerations where programming itself might not. This raises a question as to what is meant by "programming a computer" – is it the writing of computer program code in accordance with a provided detailed specification, where the author of the specification conceived method steps required to address a technical problem (akin to constructing a building based on detailed blueprints); or is it the very conception of the method steps required to address a technical problem, where those steps can be embodied in a computer program (akin to the architect or designer of the blueprints)? Both definitions involve, at some point, the technical ability of a skilled person to conceive method steps (either algorithmically, by way of a logic arrangement, as a circuit or otherwise) to address a technical problem.

Question 4(B). If question 4(A) is answered in the positive, do all features resulting from programming thus contribute to the technical character of a claim?

Notwithstanding the answer to question 4(A) above, any answer to question 4(B) must be "no". While programming can involve technical considerations, not all features resulting from programming can be assumed to contribute to the technical character of a claim. For example, a claim directed to a method run on a computer for performing steps of a pure business method includes merely the technical feature of a computer. The features relating to method steps for the pure business method do not contribute to the technical character of the claim. Moreover, an assessment of inventive step with respect to the technical feature would render the claim unpatentable.

Question 4(C). If question 4(A) is answered in the negative, can features resulting from programming contribute to the technical character of a claim only when they contribute to a further technical effect when the program is executed?

The answer is "no". Further to the observations with respect to question 2(B), further technical effect is a *sufficient* condition but not a condition *necessary* for patentability under Article 52.

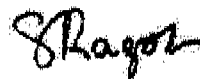
Conclusion

A patentable process is one that involves a technical contribution to produce technically beneficial results. In this respect, an approach drawing on the Guidelines that can be applied

rigorously and consistently on the basis of an effective search of the prior art provides an appropriate assessment of computer implemented process inventions with respect to Article 52. Confirmation is required that a claimed invention must have a technical character. Various criteria exist each of which makes a sufficient condition for establishing the technical character of a claim, such as the inclusion of technical features. Confirmation is also required that an assessment of inventive step takes account of only those features which contribute to the technical character of a claim. To facilitate an effective and rigorous assessment of an invention, a comprehensive search of the state of the art including, in particular, computer programs available in source code form such as open source software, is required.



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