

- 4 The invention of '300 is directed to an extensible framework which presents a common application program interface (API) to the client so that it does not need to communicate directly with the parser or generator. Following amendment on 26 June 2007, claim 1 of '300 reads:

“A computing device programmed with an extensible framework that accepts one or more mark-up language parsers and/or generators, each implemented as plug-ins to the framework, with different plug-ins enabling different kinds of mark up languages to be handled by the device, wherein the extensible framework enables a parser or generator to access data from any source that conforms to a generic data supplier API, the generic data supplier API acting as an intermediary layer to de-couple the parser or generator from the data source.”

(plug-ins are replaceable items of executable code that can be loaded or invoked at run-time without recompiling or changing the framework). There are also independent claims to methods of parsing and of generating a mark-up language document (claims 18 and 19) using the extensible framework so defined. I observe that claim 19 omits the wording from “wherein” onwards which was incorporated into claim 18 from a subsidiary claim, but I assume this is an oversight.

- 5 Ms Harper directed me especially to the advantages of this approach which are set out in the specification at page 3 lines 13-21:

“This approach has many advantages over the conventional approach of hard-coding clients to specific parsers and generators. Because of the extensible plug-in design, it is possible to allow new kinds of parsers and generators to be loaded onto a device after that device has been shipped to an end-user. The only requirement is that they are implemented as plug-ins that are compatible with the extensible framework. This is especially useful in the context of mark up language parsers and generators since there are many potential languages that might need to be handled by a device but it is impractical to hard-code the capability to handle all of these when the device is designed because of the memory overhead.”

and at page 11 lines 13-19:

“The present invention allows parsing and generation to be carried out with any data source. For example a buffer in memory could be used, as could a file, as could streaming from a socket (hence enabling the ability to parse in real-time from data streamed over the internet). Instead the system allows any source that can use the generic data supplier API to be adopted. New types of data sources can be used by computing device, even after those devices have been shipped to end-users.”

6 I note also that, as stated at page 8 line 28 – page 9 line 2:

“The present invention may provide a flexible and extensible file conversion system: for example, the device could parse a document written in one mark up language format and then use the parsed document data to generate an equivalent document in a different file format. Because of the extensible plug-in design of an implementation of the system, it is possible to provide far greater kinds of file conversion capabilities than was previously the case.”

7 The invention of '298 enables mapping to both a token and to a string associated with a predefined element, attribute or attribute value so that both text and binary mark up languages can be handled. Claim 1 reads:

“A computing device programmed with a client that can operate with a parser for both text and binary mark up languages; in which the client uses a unique integer value that can be interpreted in an index of elements, attributes and attribute values needed to describe a particular type of mark-up document, the index mapping that unique integer value (a) to a token associated with a predefined element, attribute or attribute value to enable a token based mark up language to be handled and also (b) to a string associated with a predefined element, attribute or attribute value to enable a string based mark up language to be handled.”,

and there are also independent claims to methods of parsing and of generating a mark-up language document (claims 8 and 9) using the unique integer value so defined.

8 Ms Harper directed me to the advantages stated at page 3 lines 10-23:

“The invention in effect provides for there to be a common API to parse binary (e.g. WBXML) as well as text (e.g. XML) mark-up language. This greatly simplifies the implementation of clients. Further clients that require parsing of different mark-up languages will require less memory, as they will communicate with only one common API to parse both binary and text mark-up languages. Also clients will not need to know what the source document is (i.e., text or binary) as the APIs are the same.Hence a core technical advantage offered by the present invention is that it reduces device memory requirements; this in turn can lead to faster loading of code and/or less use of virtual memory.”

9 In both specifications the detailed description is identical and explains how the inventions are embodied in the “Mark-Up Language Framework” system which is used in the “SymbianOS” operating system for smart phones, advanced mobile telephones and other kinds of portable computing device.

The law and its interpretation

10 Section 1(2) reads:

“It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of –

- (a) a discovery, scientific theory or mathematical method;
- (b) a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever;
- (c) a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer;
- (d) the presentation of information;

but the foregoing provision shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that a patent or application for a patent relates to that thing as such.”

11 It is not disputed that the assessment of patentability under section 1(2) is now governed by the judgment of the Court of Appeal in *Aerotel Ltd v Telco Holdings Ltd* and *Macrossan’s Application* [2006] EWCA Civ 1371, [2007] RPC 7 (hereinafter “*Aerotel*”). In this case the court reviewed the case law on the interpretation of section 1(2) and approved a four-step test for the assessment of patentability, namely:

- 1) Properly construe the claim
- 2) Identify the actual contribution (although at the application stage this might have to be the alleged contribution)
- 3) Ask whether it falls solely within the excluded matter
- 4) Check whether the actual or alleged contribution is actually technical in nature.

12 The operation of the test is explained at paragraphs 40-48 of the judgment. In particular:

- Paragraphs 41 and 47 explain that the test is consistent with the principles established in previous decisions of the Court of Appeal, and is a re-formulation in a different order of the approach in *Fujitsu*¹, asking the same questions but in a different order.
- Paragraph 43 states that identification of the contribution is “an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are”; it is essentially a matter of determining what it is the inventor has really added to human knowledge, and involves looking at substance, not form.

¹ Fujitsu Ltd’s Application [1997] RPC 608

- Paragraph 44 accepts that at the application stage the Office will generally have to accept what the inventor alleges to be his contribution, but that in the end the test must be what contribution has actually been made.
- Paragraph 45 explains that the third step - whether the contribution is “solely” of excluded matter - is merely an expression of the “as such” qualification of section 1(2).
- Paragraph 46 explains that, although the fourth step of checking whether the contribution is technical may not be necessary because the third step should have covered the point, it is a necessary check if *Merrill Lynch*² is to be followed.

13 At the hearing, Ms Harper suggested that arguments put forward by the Office in certain cases had suggested that it was not necessary to look at technical effect because the fourth step was merely a cross-check. Whatever may have been said in earlier cases, I do not see how a check for technical effect can be completely bypassed in the light of paragraph 46 saying that it is a necessary check. I think the paragraph is merely making the point that the check for technical effect will in many cases have been disposed of in the third step. Thus, an invention will be excluded at the third step if any technical contribution is of purely excluded matter, and the fourth step is then unnecessary³.

14 Ms Harper referred to a number of other authorities in developing her argument and I think that it will be helpful to mention some of them at this stage to illustrate the interpretation of the computer program exclusion by the courts. A useful starting point is Lewison J’s summary in *Autonomy Corpn.* [2008] EWHC 146 (Pat), [2008] RPC 16 at paragraph 29. I do not need to go into this in detail, and clearly it would be wrong to regard it as a check-list to be applied rigidly in all cases without regard to the particular circumstances. Nevertheless I think that it does highlight the considerations which should govern my approach. Thus, on the one hand, a program which reduces the load on the processor, makes more economical use of the computer’s memory or more efficient use of the computer’s resources, or manipulates data stored on a computer is likely to need something more to escape the exclusion. On the other hand, a contribution which goes beyond the mere running of a program to embody a technical process lying outside the computer, provide new hardware or a new combination of hardware, or solve a technical problem in the functionality of the computer is unlikely to be regarded as consisting solely of a computer program, even if (as in the present case) the only practicable way of implementing the contribution is by means of a computer.

² Merrill Lynch’s Application [1989] RPC 561

³ Oneida Indian Nation [2007] EWHC 954 (Pat), paragraphs 10-11

- 15 In *Symbian Ltd* [2008] EWHC 518 (Pat), which is currently under appeal, Patten J (see paragraphs 59-60) took the view that a program which indexed the functions in a dynamic link library (DLL) that were called on by executable programs, in such a way that the computer continued to operate reliably after making changes to the library, did solve a technical problem affecting the functionality and reliability of the computer, even if it was a software problem. He observed at paragraph 63:

“..... This is not a case where the invention is limited to the processing of data. If an increase in the speed at which the computer works can take the program out of Art 52(3) (see *Aerotel* at paragraph 92) it is difficult to see why the improved reliability of the machine brought about by the re-organisation of the DLL in its operating system does not.”

- 16 I discuss this case further below. As regards increased speed, I note what is said in *Aerotel* but I think it is important not to confuse this with improvements in operation simply brought about by designing a program which causes the computer to operate faster because it reduces the load on the processor or makes more economical use of computer memory (see *Aerotel* at paragraphs 90-91 commenting on *Gale's Application* [1991] RPC 305; also *Raytheon Co* [2007] EWHC 1230 (Pat), [2008] RPC 3 at paragraph 37, referred to in *Autonomy Corpn* at paragraphs 25 and 29 (viii).

Argument and analysis: application of the *Aerotel* test

Step 1 – construction of the claims

- 17 There was no dispute about the construction of the claims. I do not think that this raises any problems other than the point noted above concerning claim 19 of '300, and my decision does not turn on that.

Step 2 – identifying the contributions

- 18 Ms Harper thought that in identifying the contribution the examiner had in each case taken an unduly narrow approach by concentrating on the wording of the claims. In her view, having regard to paragraph 43 of *Aerotel* the determination of the contribution was not simply an exercise in asking how the invention was implemented and it was necessary to look also at the consequences - factors such as the problem to be solved, the advantages of the invention, and what it actually achieved. She referred me to *Symbian*, where on the basis of *Aerotel* Patten J stated at paragraph 53:

“... But the assessment of the contribution made by the computer program used to carry the invention into effect does seem to me to involve some reference to and consideration of the problems which the invention solves albeit by the interposition and use of the interface. This would include improvements in reliability consequent upon modifications to the operating system. ...”

19 The *Symbian* judgment is under appeal, but irrespective of Patten J's conclusions as to what the contribution actually was in that case and whether it was technical, I agree with his view of how the contribution should be assessed. I accept that, as the examiner pointed out, he had taken these factors into account when determining whether the contributions related solely to excluded matter in step 3. Nevertheless, I think that to avoid any perception that such factors have merely been dismissed as irrelevant, they should go towards the assessment of the contribution in step 2.

20 Along the lines suggested by Ms Harper at the hearing but with some further refinement to bring out more clearly how the invention works and how the advantages come about, I consider the contributions as alleged in the specifications, and as a matter of substance irrespective of whether the inventions are claimed as devices or methods, to be as follows:

- for '300: programming a device with an extensible framework, which accepts one or more mark-up language parsers and/or generators in the form of plug-ins so that the device can handle different kinds of mark-up language, and which enables a parser or generator to accept data via a generic API that decouples the parser or generator from the data source; this has the advantages of greater flexibility and more efficient use of the device's memory and other resources in that:

- any data source can be used so long as it is compatible with the API,
- new kinds of parser or generator can be added as needed without having to hard-code a client to cope with them, and
- there is increased capability for file conversion between different mark up language formats.

- for '298: programming a device with a client which uses a unique integer value capable of being mapped to both the tokens in binary languages and the strings in text languages so that the client can parse both binary and text mark-up languages; this has the advantages of lower device memory requirement and faster processing, because the client operates through what is in effect a common API and does not need to know what language is being used and can therefore be more streamlined.

Step 3 – do the contributions relate solely to excluded matter?

21 For '300, the examiner took the view that the hardware aspects of the invention were entirely conventional and that the invention lay wholly in software. Bearing in mind that it was well-known to add a plug-in to a web browser so that it could deal with different applications and data sources (which Ms Harper accepted), the examiner did not think that the extra functionality added in this case went beyond computer programming and was merely a matter of data processing.

- 22 For '298, the examiner thought that the mapping technique was essentially to do with data processing that could handle different mark-up languages and there was no contribution outside a computer program. As I understood it, his argument was that the mapping technique was simply a matter of program design that did not give rise to sufficient technical effect to make it patentable.
- 23 Although the two inventions are distinct, the arguments that Ms Harper deployed to persuade me that the contributions did not relate solely to excluded matter were broadly similar, and it will be convenient for me to consider them together. She thought that the examiner's view followed from an incorrect assessment of the contributions (see discussion above under step 2), as a result of which he had incorrectly deduced that because the inventions were implemented in software on conventional hardware then the substance of the invention lay in software. She accepted that although in theory other methods of implementation might be possible, in practice the inventions would be implemented in software by writing a computer program. However, she thought that it was necessary to take into account what actually happened when the invention was implemented. Accordingly she directed me to the technical effect of the inventions which she believed would take the contributions outside the program exclusion having regard to previous case law.
- 24 Referring to paragraph 92 of *Aerotel*, Ms Harper thought that in both cases there was actually a change in the speed with which the computer worked, as in *Gale* where a computer program calculated a square root more quickly. She distinguished *Gale* as relating to a mathematical method, whereas in the present inventions there was a technical process which was being improved, namely the processing of data that represented a physical embodiment of information in a particular form so as to enable it to be displayed on a screen. The examiner however argued that the computer itself was not operating any faster, rather the software had been arranged for more efficient computing. Ms Harper thought that if the improved reliability of a physical device could be a relevant technical contribution, as in *Symbian*, then an improvement in its physical efficiency should be equally relevant.
- 25 Ms Harper also drew analogies with the EPO Board decisions in *VICOM* (T 208/84) and *Microsoft Corporation* (T 424/04). Thus, just as *VICOM* was concerned with processing image data, the present inventions were concerned with processing data similarly representing something physical, i.e. an embodiment of text data. In *Microsoft*, the Board held (paragraph 5.2) that the use of functional data structures (clipboard formats) to facilitate the exchange of data amongst various application programs added a functionality to a computer by assisting the user to transfer data into files, so that it was not excluded as a computer program. Ms Harper argued that there was a similar addition of functionality in the '298 invention which enabled a client to input a document in one language and output it in a different language, so that there was easier communication between different devices or applications in respect of text data.

- 26 She also argued, distinguishing *Gale*, that there here there was the solution of a technical problem lying within the computer, namely the physical limit on the physical resources that are available within the device. Thus the invention enabled the device to display documents that it would otherwise not be able to and to function using smaller amounts of ROM and RAM.
- 27 Ms Harper also took me to a decision of the comptroller, *Sun Microsystems Inc* (BL O/057/06); although this predated *Aerotel* she thought that the reasoning was still persuasive. The hearing officer held that the provision of a single virtual machine instruction which represented two or more Java Bytecode[®] executable instructions, so that a reduced set of Bytecode instructions could still represent the operations performed by the full set, constituted a patentable advance. He reasoned that although the invention would ultimately be implemented by a computer program, it had nothing to do with how the program would be structured or written, but with what it had to do. Almost certainly in his view the invention had been conceived before any program was written.
- 28 To illustrate the point that an invention was not excluded simply because it related to data processing, Ms Harper referred me to my recent decision in *IGT* (BL O/149/08). She thought that this was a clear case where nothing was happening other than data processing, yet the invention was held to be a technical process.
- 29 Clearly each case must be decided on its own merits and, as has often been stated by the courts, there is little to be gained by trying to make direct comparisons between the circumstances of different inventions. Nevertheless, in reaching my conclusion, I have carefully considered the authorities quoted by Ms Harper.
- 30 In my view the contribution in each case is solely a computer program. I fully accept that the inventions yield advantages in that data can be processed more efficiently and flexibly, but I consider that at bottom any increase in the speed of processing arises because in each case a program has been devised which makes more efficient use of the computer's resources and economises on the use of memory. In my view there is insufficient technical effect in the fact that data is being processed in a way which enables it to be displayed on a screen, since this is a conventional feature of computers. Although neither case is binding on me, I think this can be distinguished from *IGT* where I held that there were technical advantages (perhaps not immediately apparent from a reading of the specification in suit) arising from the correction of distortions in a 3D image, and from *VICOM* where, not only did the data represent something physical, but the invention was a digital filtering technique which was applied to the pixels of a 2D image to enhance its quality, irrespective of any increase in processing speed.

- 31 I am not therefore convinced that there is a “technical” effect to the inventions which distinguish them from *Gale* on the grounds that Ms Harper suggested. Like *Gale*, they are in my view directed to something which does not represent any technical process outside the computer or solve any technical problem within the computer (see the judgment of Nicholls LJ as quoted in paragraph 91 of *Aerotel*). Pending any resolution of the matter on appeal, I have to say that on this point I do not find the judgment in *Symbian* easy to reconcile with the higher authority of *Gale* and I do not therefore think it right to extend the principle of *Symbian* to the present cases, even though the contribution of ‘300 at least may be implemented as part of the computer’s operating system.
- 32 In fairness to Ms Harper, I should say that she did not argue her case on the basis that the contributions formed part of the operating system. In her view, there was not always a clear distinction between the operating system of a computer and the applications above it, and she did not think that Patten J had rested his decision on whether or not the program was part of the operating system.
- 33 I note the decision of the Board of Appeal in *Microsoft Corporation* but I do not think that I can place any reliance on it in view of the clear doubts of the Court of Appeal in *Aerotel* (see paragraphs 114-116) as to its correctness. As the Court observed, the decision appeared “to open the way in practice to the patentability in principle of any computer program”.
- 34 Finally, in regard to the decision in *Sun Microsystems*, this is not binding on me. However, it seems to me that having regard to the description in ‘298 at pages 43-44 the contribution in ‘298 is in fact part of how the program is structured or written, rather than a conception existing independently of the program. I note that in the described embodiment the mapping table is essentially part of a plug-in - which as explained above is an item of executable code.
- 35 Ms Harper reminded me that the protection sought was for a device and a method, not merely a program, but in my view this goes to the form of the claims rather than the substance of the contribution.

Step 4 – are the contributions technical in nature?

- 36 Having decided that the contributions in each case fail the third step I do not think that there is any need for me to go on to the fourth step. I have in any case considered in the third step whether the contributions are sufficiently technical in nature to avoid exclusion and concluded that they are not.

Conclusion

- 37 The inventions of ‘298 and ‘300 are therefore excluded under section 1(2) in that each relates to a computer program as such. Having read the specifications I do not think that any saving amendment is possible. I therefore refuse the applications under section 18(3).

Appeal

- 38 Under the Practice Direction to Part 52 of the Civil Procedure Rules, any appeal must be lodged within 28 days.

R C KENNELL

Deputy Director acting for the Comptroller