



FIG. 3

- 4 The process of filtering records to find those which match a user's query is facilitated by the use of a metadata database 62 containing metadata records which represent corresponding records within each of the federated databases but include much less data. By searching the metadata records only, far less data is being processed which enhances the speed by which queries can be executed and data records extracted.
- 5 Furthermore, user queries are stored in a data event agent 42 which periodically repeats the filtering of metadata records to identify any new records which have been added to the database and any additions or modifications to existing records which meet the original user query. In this way, the user can be supplied with a continuous feed of data records which match their original query. Therefore, if the databases are incomplete, not up-to-date or not responding when the initial query is made, any missing or modified data records are supplied to the user as they become available. This means that remote users are no longer required to re-submit their query to obtain any additional records which may have become available sometime in the future following their initial request as was the case in prior-art federated databases.
- 6 There are a number of additional components which are worth a mention and which may have a bearing on my decision. The application abstraction layer 72 which provides a means for controlling the flow of information between the data event agent and the distributed database using a java messaging service (JMS); the database proxy layer which provides a common interface to each of the federated databases independent of their location and presents results to the user etc. in a standardised format such as XML; and the data description/discovery agent 64 which is responsible for ensuring that the metadata database is up-to-date and contains records corresponding to each of the records stored in the federated databases.
- 7 The most recent set of claims ("*Main Response*") were filed on 28 April 2011 and include two independent claims to a database access system (claim 1) and a corresponding method for processing database queries (claim 5). At the same time, the applicant supplied two additional sets of claims ("*First Subsidiary Response*" and "*Second Subsidiary Response*") for the examiner's consideration. The wording of the independent claims in each case is as follows:

Main Response

1. *A database access system comprising:
a web browser;
a distributed database comprising:
a plurality of federated databases for storage of a plurality of data records; and a metadata database for storage of a plurality of metadata records, each metadata [record] representing a corresponding one of a plurality of data records, each metadata record comprising abbreviated information relative to its corresponding one of the plurality of data records;
a data event agent that is coupled to the distributed database using a database proxy layer, the data event agent also being coupled to the web browser through a firewall, the data event agent being operable to:
receive a query comprising at least one type of filter criteria from the web browser;
store the query in memory;
repeatedly filter at least one of the plurality of metadata records against the query in response to an addition or modification of at least one metadata record; and*

in the event that the at least one metadata record matches the query, transmit the corresponding one of the plurality of data records to the web browser.

5. *A method comprising:
reviewing at a database access system a query generated by a remote client application, the query including at least one type of filter criteria;
the database access system comprising a distributed database comprising:
a plurality of federated databases for storage of a plurality of data records; and
a metadata database for storage of a plurality of metadata records, each metadata record representing a corresponding one of a plurality of data records, each metadata record comprising abbreviated information relative to its corresponding one of the plurality of data records;
storing the query in a memory;
repeatedly filtering at least one of the metadata records against query in response to an or addition or a modification of at least one metadata record; and
in the event that the at least one metadata record matches the query, transmitting the corresponding data records to the remote client application.*

First Subsidiary Response

1. *A database access system comprising:
a web browser;
a distributed database comprising:
a plurality of federated databases for storage of a plurality of data records; and a metadata database for storage of a plurality of metadata records, each metadata [record] representing a corresponding one of a plurality of data records, each metadata record comprising abbreviated information relative to its corresponding one of the plurality of data records;
a data event agent that is coupled to the distributed database using an abstraction layer application, the application abstraction layer operable to control the flow of information between the data event agent and the distributed database, the data event agent also being coupled to the web browser through a firewall, the data event agent being operable to:
receive a query comprising contextual, temporal, or geospatial of filter criteria from the web browser;
store the query in memory;
repeatedly filter at least one of the plurality of metadata records against the query in response to an addition or modification of at least one metadata record; and
in the event that the at least one metadata record matches the query, transmit the corresponding one of the plurality of data records to the web browser.*

- 8 The first subsidiary response includes a single independent claim to a database access system (claim 1) which has been amended to include the use of an abstraction layer application to control the flow of information between the data event agent and the distributed database as described in the specification on page 10, line 17-26. I have indicated where this claim differs from that of the main response by underlining the respective passages.

Second Subsidiary Response

1. *A database access system comprising:
a memory;
a web browser;
a distributed database comprising:
a plurality of federated databases for storage of a plurality of data records; a metadata database for storage of a plurality of metadata records, each metadata representing a corresponding one of a plurality of data records, each metadata record comprising abbreviated information relative to its corresponding one of the plurality of data records; and*

a data event agent that is coupled to the distributed database using an application layer operable to control the flow of information between the data event agent and the distributed database, the data event agent also being coupled to the web browser through a firewall, the data event agent being operable to:

receive a query comprising contextual, temporal or geospatial of filter criteria from the web browser;

store the query in memory;

repeatedly filter at least one of the plurality of metadata records against the query in response to an addition or modification of at least one metadata record; and

in the event that the at least one metadata record matches the query, transmit the corresponding one of the plurality of data records to the web browser.;

wherein the plurality of federated databases are coupled to the data event agent using database proxy layer:

wherein the database proxy layer is operable to convert each of the plurality of data records into a standardized format using an extensible mark-up language schema; and

wherein the distributed database further comprises a data discovery agent that is operable to periodically search each of the federated databases and in the event that a new data record is found, create the corresponding metadata record.

2. A method comprising:

reviewing at a database access system a query generated by a remote client application, the query including at least one type of filter criteria;

the database access system comprising a distributed database comprising:

a plurality of federated databases for storage of a plurality of data records; and

a metadata database for storage of a plurality of metadata records, each metadata record representing a corresponding one of a plurality of data records;

storing the query in a memory;

filtering at least one of the metadata records against query in response to an or addition or a modification of at least one metadata record; and

in the event that the at least one metadata record matches the query, transmitting the corresponding data records to the remote client application;

converting each of the plurality of data records into a standardized format using an extensible mark-up language schema; and

periodically searching each of the federated databases and in the event that a new data record is found, creating the corresponding metadata record.

- 9 The second subsidiary response includes two independent claims to a database access system (claim 1) and a corresponding method for processing database queries (claim 2). Both claims include a database proxy layer for converting data records into a standardized format using an extensible mark-up language schema as described in the specification on page 9, lines 16-32. Furthermore, a data discovery agent has been added, as described on page 8, lines 19 to 30, the function of which is to periodically search each of the federated databases for new or amended records and to create corresponding metadata records which are used to retrieve data records from the database in response to a query from a remote user. Again, I have indicated where these claims differ from the corresponding claims of the main response by underlining the respective passages.

The Law

- 10 The examiner has raised an objection under section 1(2)(c) of the Patents Act 1977 that the invention is not patentable because it relates to a program for a computer as such; the relevant provisions of this section of the Act are shown in bold below:

1(2) It is hereby declared that the following (amongst other things) are not inventions for the purpose of the Act, that is to say, anything which consists of-

(a)

(b)

(c) a scheme, rule, or method for performing a mental act, playing a game or doing business, or **a program for a computer**;

(d)

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

- 11 As explained in the notice published by the UK Intellectual Property Office on 8 December 2008¹, the starting point for determining whether an invention falls within the exclusions of section 1(2) is the judgment of the Court of Appeal in *Aerotel/Macrossan*².
- 12 The interpretation of section 1(2) has been considered by the Court of Appeal in *Symbian Ltd's Application*³. *Symbian* arose under the computer program exclusion, but as with its previous decision in *Aerotel*, the Court gave general guidance on section 1(2). Although the Court approached the question of excluded matter primarily on the basis of whether there was a technical contribution, it nevertheless (at paragraph 59) considered its conclusion in the light of the *Aerotel* approach. The Court was quite clear (see paragraphs 8-15) that the structured four-step approach to the question in *Aerotel* was never intended to be a new departure in domestic law; that it remained bound by its previous decisions, particularly *Merrill Lynch*⁴ which rested on whether the contribution was technical; and that any differences in the two approaches should affect neither the applicable principles nor the outcome in any particular case. But the *Symbian* judgment does make it clear, that in deciding whether an invention is excluded, one must ask does it make a technical contribution? If it does then it is not excluded.
- 13 Subject to the clarification provided by *Symbian*, it is therefore still appropriate for me, to proceed on the basis of the four-step approach explained at paragraphs 40-48 of *Aerotel/Macrossan* namely:
 - 1) Properly construe the claim
 - 2) Identify the actual contribution (although at the application stage this might have to be the alleged contribution).

¹ <http://www.ipo.gov.uk/pro-types/pro-patent/p-law/p-pn/p-pn-computer.htm>

² *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371; [2007] RPC 7

³ *Symbian Ltd v Comptroller-General of Patents*, [2009] RPC 1

⁴ *Merrill Lynch's Application* [1989] RPC 561

3) Ask whether it falls solely within the excluded matter, which (see paragraph 45) is merely an expression of the “as such” qualification of section 1(2).

4) If the third step has not covered it, check whether the actual or alleged contribution is actually technical.

- 14 The operation of this test is explained at paragraphs 40-48 of the decision. Paragraph 43 confirms that identification of the contribution is essentially a matter of determining what it is the inventor has really added to human knowledge, and involves looking at substance, not form. Paragraph 46 explains that the fourth step of checking whether the contribution is technical may not be necessary because the third step should have covered the point.
- 15 In their letter of 11 November 2011, the applicants make reference to the judgment in *Halliburton’s Applications*⁵ where it was held that the “mental act” exclusion should be interpreted narrowly, suggesting that by analogy the computer program exclusion should also be interpreted in this way. However, I do not find this argument compelling and note the comments of Jacob LJ in *Aerotel/Macrossan* at paragraph 9 where he comments on the difficulty to be had in interpreting the exclusions as follows:

9 As the decisions show this is not an easy task. There are several reasons for this:

i) In the first place there is no evident underlying purpose lying behind the provisions as a group — a purpose to guide the construction. The categories are there, but there is nothing to tell you one way or the other whether they should be read widely or narrowly.

ii) One cannot form an overall approach to the categories. They form a disparate group — no common, overarching concept, for example, links rules for playing games with computer programs or either of these with methods for doing business or aesthetic creations.

- 16 In much the same way, I do not think there is any “common, overarching concept” linking computer programs to mental acts to suggest that I should interpret the computer program exclusion narrowly, as I have said already, what matters is whether the program provides a technical contribution.
- 17 I will deal with the rest of the arguments put forward by the applicant as I apply the test set out in *Aerotel/Macrossan* to the present case.

Construing the claims

- 18 The first step of the test is to construe the claims. I do not think this presents any real problems since both the applicant and the examiner appear to agree as to the meaning of the claims.

Identify the actual contribution

- 19 For the second step, it is necessary to identify the contribution made by the invention. Paragraph 43 of *Aerotel/Macrossan* explains that this is to be determined by asking what it is - as a matter of substance not form - that the invention has really

⁵ *Halliburton Energy Services Inc’s Applications* [2011] EWHC 2508 (Pat)

added to human knowledge having regard to the problem to be solved, how the invention works and what its advantages are.

- 20 Having considered the correspondence in some detail, I again think there is a considerable amount of agreement here between the applicant and the examiner. In summary, the contribution appears to reside in a system for more rapidly retrieving records from a plurality of federated databases by comparing a user generated query with records stored in a metadata database which contain abbreviated data representing the contents of a corresponding record within one of the federated databases. Records which match the user generated query are then returned to the user. Queries are stored in the data event agent which periodically repeats the search of metadata records to identify any new records which have been added to the database and any additions or modifications to existing records which meet the original user query. In this way, the user can be supplied with a continuous feed of data records which match their original query. Therefore, if the databases are incomplete, not up-to-date or not responding when the initial query is made, any missing or modified data records are supplied to the user as they become available. This means that remote users are no longer required to re-submit their query to obtain any additional records which may become available sometime following their initial request as was the case in prior-art federated databases. Furthermore, by searching the metadata records only, far less data is being processed which enhances the speed by which queries can be executed and data records extracted.
- 21 The applicant's would also have me believe that the system as a whole is more reliable and secure. However, I would have to disagree. I do not see anything which would make the system more secure than any existing system, as the use of firewalls as claimed is entirely conventional. Whilst I agree that the extent to which the system is capable of retrieving the most up-to-date records would seem to suggest an improvement in reliability of the data, I do not think that the system from an architectural or technical point of view is any more reliable than existing distributed databases, as the network and associated hardware would seem to me to be entirely conventional.

Does the contribution fall solely within excluded subject matter? Is the contribution technical in nature?

- 22 There is no doubt in my mind that the contribution requires a computer program for its implementation. However, the mere fact that the invention is effected in software does not mean that it should be immediately excluded as a computer program as such. What matters is whether or not the program provides a technical contribution.
- 23 The applicant's arguments are laid out in some detail in their letters of the 28 April 2011 and 27 July 2011, and I do not think it necessary to repeat them here in their entirety. However, I will do my best to summarise the key points in the paragraphs which follow.
- 24 The applicants throughout the correspondence have made reference to the judgment in *Symbian* where at paragraph 56 it states:

56. Putting it another way, a computer with this program operates better than a similar prior art computer. To say "oh but that is only because it is a better program – the computer

itself is unchanged” gives no credit to the practical reality of what is achieved by the program. As a matter of such reality there is more than just a “better program”, there is a faster and more reliable computer.

- 25 They would argue that in the present invention “*the “practical reality of what is achieved” is an improved experience for an end user and the database access system operator in that data records and changing data records from a plurality of federated databases are communicated to an end user quickly and efficiently. Thus, the invention is providing more than just a computer program operating as would be expected. It is providing an improved way of returning results from a plurality of federated databases and it does this by use of the computer system architecture consulting a metadata database containing metadata records that contain abbreviated data of records in the federated databases. Instead of searching the complete data records of the federated database, the claimed invention searches the metadata database. The new computer architecture will be faster and more efficient which is a practical reality and a technical effect as clearly set out in Symbian. As mentioned earlier, a further contribution is that the data records in the metadata database are re-filtered so that additions or modifications to the federated database can be accounted for. A problem with federated databases is that incomplete results can be returned, for example, by a component database server timing out. The claimed invention solves this by re-filtering the metadata database so that the results of a query can be completed or further completed as data records become available or are modified. This provides a more reliable system. A computer having improved reliability is also recognised as a technical contribution.*”
- 26 In essence, the applicant is saying that “the contribution made by the invention does not lie solely in a computer program and that the contribution is actually technical in nature. The contribution is the provision of a new, improved, computer system. It is a better machine that retrieves data records from a database more efficiently and can automatically update the retrieved data following additions or modifications to the database. As a matter of practical reality, the invention achieves a faster more reliable computer system.”
- 27 The task of determining whether the invention provides a technical contribution is a difficult one, as is evident from the plethora of case law in this area. However, I think, as did the examiner in his letter of 27 May 2011, it would be useful in this case to use the ‘signposts’ as set out by Lewison J in *AT&T/CVON*⁶ as a guide. which states in paragraphs 40-41:

40. As Lord Neuberger pointed out, it is impossible to define the meaning of “technical effect” in this context, but it seems to me that useful signposts to a relevant technical effect are:

- i) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer;*
- ii) whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the applications being run;*
- iii) whether the claimed technical effect results in the computer being made to operate in a new way;*
- iv) whether there is an increase in the speed or reliability of the computer;*

⁶ *AT&T Knowledge Ventures’ Application and CVON Innovations Ltd’s Application* [2009] FSR 19

v) whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.

41 If there is a technical effect in this sense, it is still necessary to consider whether the claimed technical effect lies solely in excluded matter.

- 28 I will deal with “signposts” (i)-(iii) first. Whilst the computer system is designed to deliver data records to a remote user who is arguably external to the system, I do not think that the mere delivery of the data following execution of the query is anything other than what would be expected in a conventional database access system, and does not constitute a relevant technical effect on a process going on outside of the computer, the contribution to my mind lies in the structuring and manipulation of data within the computer itself.
- 29 There is nothing to suggest that the computer architecture is anything other than conventional, any effects such as the apparent increase in the speed by which queries are executed, result from the way in which the data is structured and manipulated. As I have already said, I think the computer is entirely conventional, not only in its architecture, but in the way it operates.
- 30 Is there an increase in the speed or reliability of the computer? The applicant would have me believe so. There is no doubt that the computer is capable of executing queries more quickly and delivering records to the user faster than in the conventional case. However, I think that the increase in speed does not result from the computer itself being made to operate faster at a technical level. The increase in speed is in fact achieved by restructuring the database so that less data is required to be processed when executing the query which has the effect of retrieving records more quickly. Whilst I agree that the extent to which the system is capable of retrieving the most up-to-date records would seem to suggest an improvement in reliability of the data. I do not think that the system from an architectural or technical point of view is any more reliable than existing distributed databases, as the network and associated hardware would seem to be entirely conventional.
- 31 In relation to signpost (v), the applicant acknowledges that one of the problems associated with federated databases is that incomplete results can be returned, for example, by a component database server timing out. The claimed invention solves this by re-filtering the metadata database so that the results of a query can be completed as and when data records become available or are modified. However, again I do not think this is a technical solution. There is no improvement in the reliability of components within the system which would prevent, for example, the database servers from timing-out. In prior-art systems, this problem would have been solved by the user having to manually resubmit their query, in the present case we are merely automating that process, the invention is circumventing the problem and not solving it in any technical way.
- 32 Furthermore, I do not think the mere addition of an *abstraction layer application*, a *database proxy layer* or a *data discovery agent* to the claims, as in the subsidiary responses, adds anything of a technical nature to the contribution. They are merely components which provide additional software functionality to improve the way in which the data is stored and manipulated.

- 33 Having considered all the evidence made available to me, and all the arguments put to me at the hearing, I do not consider the invention to provide a technical contribution, and as such it would seem to fall squarely within the computer program exemption of section 1(2)(c).

Conclusion

- 34 In the light of my findings above, I conclude that the invention as claimed is excluded under section 1(2) because it relates to a computer program as such. Having read the specification I do not think that any saving amendment is possible. I therefore refuse the application under section 18(3).

Appeal

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

PETER SLATER

Deputy Director, acting for the Comptroller