Intellectual Property Office

BL O/461/17

26 September 2017

PATENTS ACT 1977

APPLICANT	ProProcure Limited
ISSUE	Whether patent application GB1521897.7 complies with section 1(2)(c)
HEARING OFFICER	Ben Buchanan

DECISION

Introduction

1 This decision considers the issue of whether the invention claimed in patent application GB1521897.7 satisfies the requirement for patentability as defined by section 1(2) of The Patents Act 1977.

2 Patent application GB1521897.7 was filed on 11 December 2015 in the name of ProProcure Limited entitled “Improved querying method for ORM database”. The claims under consideration in this decision are those originally filed on 11 December 2015.

3 The Examiner determined that the invention as claimed relates to a program for a computer as such, which is excluded from patentability by section 1(2)(c) of the Act. He reported under section 17(5)(b) that a search would search no useful purpose and issued an Abbreviated Examination Report under section 18(3) on 13 May 2016. The Applicant responded on 16 June 2016 arguing that the application was not a program for a computer as such and that the correct determination could only be correctly made following search. The Examiner responded on 31 August 2016, restating his opinion taking into account the Applicant’s comments and suggested that the Applicant request a hearing.

4 The application came before me at a telephone hearing on 18 July 2017. The Applicant was represented by Dr. Frazer Bye of Franks and Co. accompanied by an observer. Also attending were the Examiner Kalim Yasseen, hearing assistant Jason Scott and two further observers.

The Application

5 The application addresses problems associated with object orientated (more commonly referred to as object-oriented) programs being required to interrogate a relational database when they are not compatible with each other. The solution provided uses a Query Planner to optimise queries sent to the relational database

which are then executed by an object-relational mapping (ORM) module in a single batch.

The claims

6 The original claims filed on 11 December 2015 are those under consideration. There are two independent claims.

7 Claim 1 reads: A method of processing a database query in a data processing terminal, comprising the steps of

> providing a layered data processing architecture comprising an Application Programme Interface (API) layer including a web service, a domain layer including a domain manager, a data access layer including a Query Planner module and an Object Relational Mapping (ORM) processing module, and a database layer including the database to query, at the data processing terminal,
>
> inputting at least one data query string to the API layer, wherein the string embodies the database query, and processing the string with the web service into a Data Transfer Object Request (DTO-R) object, and
>
> processing the DTO-R with the domain manager into a Domain Model Request (DM-R) representative of the query string, and
>
> passing the DM-R to the data access layer, processing the DM-R with the Query Planner into one or more queries and executing the one or more queries with the ORM module against the database in a single data batch.

8 Claim 8 reads: A database querying architecture for processing by a data processing terminal at runtime, comprising:

> a layered data processing architecture comprising an Application Programme Interface (API) layer including a web service, a domain layer including a domain manager, a data access layer including a Query Planner module and an Object Relational Mapping (ORM) processing module, and a database layer including the database to query,
>
> input means for inputting at least one data query string embodying the database query to the API layer, wherein
>
> the web service is configured to process the string into a Data Transfer Object Request (DTO-R) object,
>
> the domain manager is configured to process the DTO-R into a Domain Model Request (DM-R) object representative of the query string,
>
> the Query Planner module is configured to process the DM-R into one or more queries and

the ORM module is configured to execute the one or more queries against the database in a single data transaction.

9 I consider the substance of the claims to clearly relate to the same inventive concept and I note the Examiner has raised no objection to plurality or to the clarity of the claims.

The Law

10 The Examiner has raised an objection under section 1(2)(c) of the Patents Act 1977 that the claimed 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 The starting point for determining whether a claimed invention is excluded from patentability by section 1(2) is the judgment of the Court of Appeal in *Aerotel/Macrossan*[1].

12 The interpretation of section 1(2) has been considered by the Court of Appeal in *Symbian*[2]. *Symbian* arose under the computer program exclusion, but as with its previous decision in *Aerotel/Macrossan*, 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/Macrossan* approach. The Court was quite clear (see paragraphs 8-15) that the structured four-step approach to the question in *Aerotel/Macrossan* was never intended to be a new departure in domestic law; that it remained bound by its previous decisions, particularly *Merrill Lynch*[3] 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.

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[1] Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application [2006] EWCA Civ 1371; [2007] RPC 7
[2] Symbian Ltd v Comptroller-General of Patents, [2009] RPC 1
[3] Merrill Lynch's Application [1989] RPC 561

13 Therefore, subject to the clarification provided by *Symbian*, it is appropriate for me to proceed on the basis of the four-step approach set out in *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).*
> *3) Ask whether it falls solely within the excluded matter.*
> *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 judgment. 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 *Symbian*, the Court of Appeal stated that a computer program may not be excluded if it makes a technical contribution. The judgment in *AT&T/CVON*[4] (hereafter *AT&T*) provided guidance in the form of a number of signposts which may indicate that a computer program provides a technical contribution. The signposts were updated in *HTC v Apple*[5] and are considered as follows: (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 the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer; (v) whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.

16 Dr. Bye agreed that following these precedents and guidance was the correct approach to take to determine whether the claims define an excluded thing *as such* under section 1(2).

Arguments and analysis

Step 1: Properly construe the claim

17 The claims have been construed by the Examiner in the Abbreviated Examination Report of 13 May 2016. The Applicant has not disputed this construction in either the letter of 20 June 2016, or during the hearing. I agree that the claims are clear and may be readily construed to define the inventive concept which is:

[4] AT&T Knowledge Ventures LP and Cvon Innovations Ltd v Comptroller General of patents [2009] EWHC 343 (Pat)
[5] HTC Europe Co Ltd v Apple Inc [2013] EWCA Civ 451

Processing a database query, by inputting a data query string to an Application Programming Interface (API) layer including a web service, which processes the string into a Data Transfer Object Request (DTO-R) object; a domain manager within a domain layer processing the DTO-R into an Domain Model Request (DM-R) object representative of the string; *processing the DM-R into one or more queries using a Query Planner module within a data access layer; the data access layer also including an Object Relational Mapping (ORM) processing module which executes the one or more queries against a database in a single transaction.*

18 The *italicised* portion represents what was subsequently discussed as the characterising feature of the invention, giving rise to the alleged technical contribution.

Step 2: Identify the actual contribution

19 It is important to note that no search has yet been performed and the basis of assessing the contribution is therefore the *alleged* contribution. In his Examination Report of 13 May 2016, the Examiner has stated the alleged contribution to be:

"Processing a database query which includes an object relational mapping (ORM) process, inputting at least one data query string to an API layer, wherein the string embodies the database query, and processing the string with a (API) web service into a Data Transfer Object Request (DTO-R) object, a Query Planner module processes the DTO-R into one or more queries and the ORM executes queries against the database in a single data transaction/batch."

20 Dr. Bye stated that the contribution could be defined as lying within the provision of a Query Planner, which allows the query string to be optimised into one or more query strings which are sent to the ORM in a single batch.

21 He added that the benefit of removing redundant query operations and optimising the query sent to the database, according to the invention, meant that when translating between an (otherwise incompatible) object orientated program and a relational database, the disadvantages of traditional object instantiation associated with lazy loading and eager loading[6] are overcome.

22 Dr. Bye confirmed that he and the Examiner were broadly in agreement with the assessment of the contribution. He also confirmed that the contribution was implemented as a computer program.

23 The contribution itself then, is not in dispute and I will summarise the definition which I will use based on the italicised portion of the inventive concept I have identified above:

Using a Query Planner module within a data access layer to process a query string expressed as a Domain Model Request (DM-R) into one or more queries; the data access layer also including an Object Relational Mapping (ORM) processing module which executes the one or more queries against a database in a single transaction.

[6] see for example https://stackoverflow.com/questions/1299374/what-is-eager-loading

This reduces redundant queries and optimises the processor resources necessary to return the query response.

Step 3: ask whether it falls solely within excluded subject matter

24 As acknowledged above, the invention is implemented by a computer program. However, that does not preclude the invention from being patentable if provides a technical contribution. The question to be determined then is whether it is anything more than "a program for a computer...*as such*".

25 Consideration of whether a claimed invention provides a relevant "technical contribution" which renders it more than "a program for a computer...as such" may be assisted by reference to the *AT&T* signposts. The Examiner briefly considered each of the five signposts in his first examination report. The Applicant responded, arguing in detail that signposts (iii)-(v) affirmed the existence of a technical contribution. In his most recent examination report, the Examiner expanded on his reasoning in respect of signposts (iii)-(v).

26 Of particular interest, was the Applicant's assertion that a determination of whether the computer operated in a *new* way according to signpost (iii) cannot be made without a search of the prior art and that the Applicant was disadvantaged in this regard. Also of interest was the reference to case law by the Applicant in support of signpost (v) and the reference by the Examiner to two Intellectual Property Office decisions in response. These points were not discussed at length in the hearing, but I will consider them at the appropriate points below.

27 The Examiner had reported that there was no effect outside the computer and that therefore signpost (i) is not relevant. Dr. Bye agreed, and discussion at the hearing concentrated on the remaining four signposts.

Signpost (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;

28 The Examiner reported in his first examination report that the effect arises at the application level processing of data, rather than at the architectural level. Dr. Bye admitted during the hearing that the processing was implemented at a higher, program-implemented, level than the architecture per se. However his argument was that the latter half of signpost (ii) was satisfied. That is that the effect would apply irrespective of data being processed or irrespective of which applications were being run because it would apply to any object orientated application which needed to query a relational database; by virtue of the use of the Query Planner making fewer procedure calls, he alleged that there was an effect at the level of the architecture. He returned to this point at the end of the hearing to emphasise that the effect is produced irrespective of the data being processed or the applications being run, and that because any object orientated model querying a relational database would "benefit", the effect must be at the level of the architecture. I have reflected on these points in my reasoning below.

29 In my opinion, the Applicant has overstated the case here. The effect does not appear to arise irrespective of the data being processed or the applications being run. It applies specifically to an object orientated program querying a relational database. Whilst the effect may apply to any data query string destined for a database and any data returned in response, there same can be said of any method of processing a database query, because it applies specifically to the data passed to the query and returned in response (no matter what that data is). The effect does not apply irrespective of data being processed by the computer and does not operate at the level of architecture of the computer. The computer architecture is conventional and the only change to the way data is processed occurs at the application layer.

30 It should be noted that at paragraph [0052] the application refers to “architecture” meaning the processing software architecture. This is distinct from the architecture of the computer per se which may include the architecture of resources or components, their management and the operating system.

31 The effect arises as a consequence of the way data is processed and is dependent upon the applications being run. The program runs within the application layer of the computer and makes no changes to the way the computer itself operates or uses its architectural resources or components. In other words, the computer is conventional and runs conventionally.

Signpost (iii)

whether the claimed technical effect results in the computer being made to operate in a new way;

32 The Examiner had argued in his first examination report that the computer was only working in a new way in the sense that running different (new) applications on the same computer makes the computer work in different (new) ways. The difference is in accordance with the way the computer is programmed to run under the control of the program, which produces the effect of the contribution. The computer itself does not operate differently as a result of the effect per se; therefore this signpost is not indicative of the effect being technical.

33 In response the Applicant stated that (in the absence of a section 17(5) search) it was not possible to ascertain whether the computer does indeed operate in a new way. They then set out the difference between the operation of the invention and the acknowledged prior art, specifically removing redundancy to optimise database queries and thereby reduce processor resources. During the hearing Dr. Bye expanded on this to explain the role of the Query Planner and how it sits in a data access layer and therefore makes the different operation available to any (suitable) application wishing to query the relational database. He argued this meant that the effect of implementing the Query Planner like this results in the new operation being available to any relevant application, and therefore to mean that the computer operates in a new way.

34 Firstly I should say that in the absence of a search for prior art I am content to accept Dr. Bye’s description of the alleged newness of operation. This is consistent with accepting the *alleged* contribution – although the two are not necessarily the same thing. Nonetheless, whether the operation is *actually* new or inventive is a separate

issue. Here I am concerned with whether or not the *effect* of the alleged contribution is to make the *computer* operate in a new way, and thereby to assess whether the alleged contribution is *technical*.

35 It is clear from reading the application that, as Dr. Bye explained, the Query Planner and its implementation are critical to enabling the alleged contribution to take effect. What is equally clear is that the implementation is within the "layered data processing architecture" claimed, which I have noted above is an software-architecture level programmatic implementation, not a change to the architecture of the computer itself. The computer operates under the control of the program-implemented layered data processing architecture – as it would for any application program – as the Examiner reported originally. It does not operate in a new way other than running under the control of the (new) program. It operates conventionally, running in accordance with the program instructions implementing an allegedly new way of processing data within the application level software architecture. Whether or not the implementation of the program is new then – and I have assumed that it is – the *operation of the computer* itself is unchanged as a consequence of the contribution and the contribution is therefore not indicative of a technical effect.

Signpost (iv)

whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer;

36 Consideration of signpost (iv) is closely related to signpost (iii). Indeed the two were discussed together by the Examiner in his first report and signpost (iv) was only discussed briefly at the hearing. In his first report, the Examiner commented that the computer did not operate more efficiently or effectively as a computer, adding that "it is only operating more effectively in reading data files". During the hearing I invited the Examiner to explain his reasoning for the benefit of the Applicant. The Examiner confirmed that he was acknowledging the advantages of query optimisation, but arguing that this was as a result of a more effective computer program, not a more efficient or effective computer per se.

37 The Applicant, however, contended that the effect of the contribution was to make the computer better because it was more effective at operating any procedure where an object orientated program is retrieving data from a relational database. It achieves this by implementing more efficient and effective queries via the data access layer including the Query Planner and ORM. The result was to make the computer operate in a more efficient and effective manner.

38 As with signpost (iii), I find that the computer is running under the control of the computer program and so as a computer is operating conventionally. The implementation of the program enables object orientated database data string queries to be more efficiently and effectively processed and returned from a relational database courtesy of the Query Planner. The program itself may make fewer data query requests than prior art programs but below the software-architecture application layer the computer processes data and uses resources conventionally – under the control of the program – and the step of obtaining data in response is unchanged. The computer itself runs no more efficiently or effectively as

a computer to implement the instructions of the program and so this signpost is not indicative of a technical effect.

Signpost (v)

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

39 The fifth signpost looks at the technical character of an alleged invention by means of the problem addressed. When the problem is a technical one, the alleged invention can be considered to have a technical nature leading to it falling outside the exclusion if (but not only if) it solves the problem.

40 In *Lantana*[7] Birss J considered the fifth signpost, and stated that "[i]t makes sense to think of something which is a solution to a technical problem as itself having technical character because it takes that character from the technical nature of the problem to be solved. But if a thing is not solving the technical problem but only circumventing it, then that thing cannot be said to have taken any technical character from the problem".

41 In correspondence the Applicant has defined the problem as:

"How to improve data extraction from a relational database to an object-oriented model when using lazy loading of data".
In the hearing Dr. Bye explained it as how to remove redundant queries, for example repeat or duplicate queries, which are inefficient to process.

42 I think between them, and having read the application, the problem can be summarised as:

How to optimise one or more relational database queries by an object-oriented model by removing redundant queries and executing the optimised queries as a single transaction.

43 The Examiner has conceded in correspondence, and at the hearing, that the problem seems to have been overcome. However, as noted above, that is only relevant for suggesting the existence of a technical effect if the problem itself is deemed to be technical.

44 At the hearing, Dr. Bye explained that the Applicant believed that the problem of translating between object orientated and relational structures is a technical problem. It is known that prior art procedures can give rise to problems of redundant queries being processed, and in aiming to remove redundant queries, the current problem ought to be regarded as technical. In support of this, he referred to *IGT/Acres Gaming Inc.*[8] where, in the circumstances of that case, he argued, "the principle of data extraction is technical".

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[7] Lantana Ltd v The Comptroller-General of Patents, Designs and Trade Marks [2013] EWHC 2673 (Pat)
[8] IGT/Acres Gaming Inc, Re [2008] EWHC 568 (Pat)

45 Although not discussed at length during the hearing, I note that in *IGT/Acres Gaming Inc*. Prescott QC (sitting as a Deputy Judge) stated that the specific patent application in that case may have been held to be non-excluded if it were new and not obvious. On the one hand this does not assist the present application because no such determination has been made. On the other hand, Dr. Bye did emphasise that he considered that in fairness to the Applicant the application should be remitted for search and examination accordingly. I note his request, but it does not prevent my consideration of whether or not the alleged contribution is technical, nor the guidance provided by signpost (v). Indeed at paragraphs 52 & 53, Prescott QC acknowledges the validity of action under section 17(5)(b) in appropriate circumstances.

46 The Examiner has cited two Office decisions in correspondence, the first (*BL O/349/12*) to illustrate that circumventing a technical problem does not suggest a technical effect; the second (*BL O/056/13*) specifically referencing *IGT/Acres Gaming Inc*. and concluding that the Judge's comments apply to the very specific facts of that case, and no general precedent on the technical nature of addressing database problems is set. These decisions were not discussed at the hearing, but I am obliged to be guided by them.

47 Having reviewed *IGT/Acres Gaming Inc*. I do not agree that it supports the general principle that accessing and extracting data from databases was found to be technical. As noted by the Examiner in his examination report of 31 August 2016, in *BL O/056/13* at paragraph 17, the Hearing Officer held "I am afraid that I cannot draw such a broad conclusion from [*IGT/Acres Gaming Inc*.]. To my mind what the Judge is saying is that in that case the method of addressing a database was technical due to the contribution of using encrypted data without having to decrypt it. Nowhere in the decision can I see a more general precedent that henceforth any and all methods of addressing databases are to be considered technical." The Applicant has not provided me with any reason not to follow the guidance in *BL O/056/13*.

48 The question remains then, whether even unpersuaded by *IGT/Acres Gaming Inc*. I am of the opinion that the problem solved by the instant invention is technical. On balance, I am not persuaded that it is. The problem arises because of incompatibility between two different software models; object orientated programming and relational database administration. In translating a query from one to the other, the problem of optimising the query is solved by using configuration and mapping information to optimise the translation (see for example the description paragraphs [0059]-[0062]). This is implemented in a data access layer and whilst it takes account of the database architecture it does not seem to be necessarily technical.

49 I am of the opinion that the problem to be solved is not technical and therefore, notwithstanding that the invention overcomes rather than circumvents the problem, signpost (v) does not indicate the presence of a technical effect.

50 Having considered the alleged contribution in light of the *AT&T* signposts, I am of the opinion that it falls solely within the excluded subject matter of a program for a computer. None of the signposts suggests that the contribution is more than a program for a computer *as such*.

Step 4: check whether the contribution is actually technical in nature

51 In light of fully considering the signposts of AT&T, I believe the question has been answered above: the alleged contribution is not technical in nature.

52 I have fully considered the claims and do not consider that they define a technical contribution. Furthermore I have considered the application as a whole and can find no basis for an amendment which might be incorporated in the claims to define an invention which provides a technical contribution.

Conclusion

53 I find that the claimed invention is excluded under section 1(2)(c) because it relates to a program for a computer as such.

54 Having read the specification I do not think that any saving amendment is possible. I therefore refuse the application under section 18(3).

Appeal

55 Any appeal must be lodged within 28 days after the date of this decision.

Deputy Director, acting for the Comptroller