



PATENTS ACT 1977

APPLICANT Google Inc.

ISSUE Whether patent applications GB1423360.5 and GB1609028.4 comply with Section 1(2) of the Act

HEARING OFFICER

DECISION

Introduction

- 1 This decision concerns patent applications GB1423360.5 and GB1609028.4, both entitled “Adaptive clustering of locations” and both in the name of Google Inc. It addresses the question of whether the invention set out in each application relates to subject matter excluded under Section 1(2) of the Patents Act 1977 (hereinafter ‘the Act’). The first application was filed under the Patent Cooperation Treaty on 23 June 2013 claiming an earliest priority date of 25 June 2012 and was published as WO 2014/004529 on 3 January 2014. The second application is a divisional application and consequently is treated as having been filed on the same date as the first application. It also claims the same priority. The extended compliance period of each application expires 25 February 2017, as I indicated during the hearing.
- 2 In his first examination report on the ‘360.5 application, the examiner objected that the claimed invention relates to the presentation of information as such and is thus excluded from patentability under Section 1(2). The applicant provided persuasive arguments to the contrary, this argument was accepted in respect of the presentation of information, but on reconsideration the examiner came to the view that the invention falls entirely within the excluded field of computer programs. As regards the divisional application, no search has been performed to date. Instead the examiner reported under Section 17(5)(b) that a search would not serve any useful purpose and issued an abbreviated examination report that the claimed invention is similarly excluded from patentability, being a computer program as such. The applicant filed observations in response to both examination reports but was unable to persuade the examiner in either case.
- 3 As no agreement could be reached in either case, and since the inventions claimed in the two applications are similar, the applicant requested a joint hearing of the two applications. At the hearing the applicant was represented by Mrs Laura Garlick and

Dr Jonathan Palmer, both of Boulton Wade Tennant. Also present at the hearing were the Examiner Dr Stephen Otter, the Hearing Assistant Ms Amanda Mason and observers Mr Jody Fellows and Dr Katy Nelson.

The Law

- 4 During prosecution of each application under consideration the examiner raised objections under Section 1(2) of the Act stating that the invention is not patentable because it relates to one or more categories of excluded matter. The most 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.

- 5 These provisions are designated in Section 130(7) as being so framed as to have, as nearly as practicable, the same effect as Article 52 of the European Patent Convention, to which they correspond. I must therefore also have regard to the decisions of the European Patent Office Boards of Appeal that have been issued under this Article in deciding whether the present invention is patentable although I am not bound to follow them. Conversely I am bound to follow the decisions of the UK Courts.

- 6 There is a large amount of case law in relation to the provisions of Section 1(2). The most significant recent judgments of the Court of Appeal on the matter are *Aerotel/Macrossan*¹ and *Symbian Ltd's Application*². Following the guidance in *Symbian* I will use the four-step approach explained at paragraphs 40-48 of *Aerotel* and ensure in my consideration of steps (3) and (4) that I determine whether the invention makes a technical contribution. The steps are:

(1) Properly construe the claim;

(2) Identify the actual contribution;

(3) Ask whether it falls solely within the excluded subject matter;

(4) Check whether the actual or alleged contribution is actually technical in nature.

- 7 The Court said in *Symbian* (see paragraphs 8-15) that the structured four-step approach to the question in *Aerotel* was not a new departure in domestic law and that it remained bound by its previous decisions, particularly *Merrill Lynch*³. The

¹ *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371; [2007]

² *Symbian Ltd v Comptroller-General of Patents* [2009] RPC 1

³ *Merrill Lynch's Application* [1989] RPC 561

Aerotel test is intended to be equivalent to the prior case law test of “technical contribution”.

- 8 When considering the computer programme exclusion it can be helpful to refer to the ‘signposts’ set out in paragraph 40 of *AT&T/CVON*⁴. These provide guidelines which may indicate whether a computer program makes a relevant technical contribution beyond the exclusion. The fourth signpost was subsequently reworded by the Court of Appeal in paragraphs 50-51 of *HTC v Apple*⁵. The five reworded signposts are 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*

- 9 Prior to the hearing, Mrs Garlick sent a letter dated 16 January 2017 noting the potential relevance of decision BL O/595/16 (*Shenzhen Audaque Data Technology Ltd*).

The inventions: application GB1423360.5

- 10 The inventions claimed in the ‘360.5 application and the divisional application are very similar, the latter being slightly broader than the former. Consequently there was common ground with Mrs Garlick and Dr Palmer that the two applications would stand or fall together on the same arguments in relation to Section 1(2). The arguments were presented predominantly in relation to the ‘360.5 application. I will therefore also consider the ‘360.5 application first on the basis that the same considerations apply in respect of the divisional application.
- 11 During the hearing Mrs Garlick and Dr Palmer did not formally address the four-step approach set out in *Aerotel* but instead concentrated on the contribution made by the inventions and what they considered to be their technical nature. Nonetheless for completeness I will consider all of the four steps.

(1) Properly construe the claims

- 12 The invention is defined by the amended claims filed with the letter dated 8 April 2016. These comprise three independent claims 1, 13 and 25 which are of substantially the same scope and which I will therefore consider together. Independent claim 1 is given below:

⁴ *AT&T Knowledge Ventures/CVON Innovations v Comptroller General of Patents* [2009] EWHC 343 (Pat)

⁵ *HTC v Apple* [2013] EWCA Civ 451

*A computing device comprising:
one or more processors; and
a cluster module operable by the one or more processors to:
receive a plurality of location identifiers corresponding to a plurality of locations
at which a mobile computing device was previously located;
define a plurality of geographic regions based at least in part on the plurality of
location identifiers, wherein at least one of the plurality of locations is located in
each of the plurality of geographic regions;
determine respective distances between the mobile computing device and a
respective reference point within each of the geographic regions;
compare the distances between the current location of the mobile computing
device and each of the respective reference points to a threshold;
select at least a subset of the plurality of geographic regions, wherein each of
the geographic regions of the subset have a distance greater than the
threshold, and wherein selection of the subset of the plurality of geographic
regions comprises selecting one or more smaller geographic regions for shorter
distances between the current location and respective reference points of the
plurality of geographic regions and selecting one or more larger geographic
regions for longer distances between the current location and respective
reference points of the plurality of geographic regions, the one or more smaller
geographic regions being smaller than the one or more larger geographic
regions and the shorter distances being shorter than the longer distances; and
output, for display at a display device, the subset of the plurality of geographic
regions.*

- 13 The latest examination report (dated 26 August 2016) sets out the examiner's understanding of the claim, which Mrs Garlick and Dr Palmer agreed was "broadly correct" and with which I also concur. This construes the part of the claim relating to the selection of the subset of the geographic regions as meaning that (1) only geographic regions for which the distance between the mobile device and a reference point in each respective region exceeds a threshold are selected and (2) for 'shorter' distances at least one 'smaller' geographic region is selected and for 'longer' distances at least one 'larger' geographic region is selected.
- 14 Mrs Garlick and Dr Palmer also emphasised the "dynamic" nature of the claimed invention – i.e. that the specified relative distances change as the mobile device moves, thus changing the subset of geographic regions selected for output. I agree that in order for the references to the "*current location* of the *mobile* computing device" in the claim to have any meaning there must be an implication that the geographic regions are redefined in response to at least some movements of the mobile device; and indeed the specification makes clear (at paragraph [0068] for example) that the geographic regions may be updated in response to each movement of the mobile device; in response to movement greater than a threshold (e.g. 1000 m); or only upon request from a user. Finally I note that claim 1 is not limited to displaying the subset of geographic regions, let alone to displaying them on the mobile device, but merely to outputting them "for display at a display device".

(2) Identify the actual contribution

- 15 Assessing the contribution was stated in *Aerotel* to be an exercise of judgement "probably involving the problem said to be solved, how the invention works, what its

advantages are". The Court also said that determining the contribution involves looking at the substance of the invention and not the form. Dr Palmer emphasised the need to avoid 'Falconer reasoning' (or less formally salami-slicing) and I agree that it is the claim as a whole which must be considered when assessing the contribution which the invention has made.

- 16 As regards the substance and form of the invention I note that the embodiments described in the application all rely on computer systems which are entirely conventional in the field of location-aware mapping and navigation systems (e.g. the arrangement of a smartphone and networked server shown in Figure 1). These are therefore incidental to assessment of the contribution. This point was not touched upon during the hearing.
- 17 As regards the problem and solution, I note first that paragraphs [0001] and [0014]-[0018] of the '360.5 application present them in terms of providing "geographic information such as a map or navigation instructions between two locations". More specifically the application addresses the question of how to present multiple locations to a user of a mobile device when "presentation of each of the individual locations may be overwhelming or impractical for a ... user to digest". The solution proposed by the application is to aggregate multiple of these locations and present this aggregated location information instead – to allow its selection as a navigation destination, for example. A key feature of this solution is that it changes or redefines the geographic regions as the user moves from location to location.
- 18 Mrs Garlick set out how the invention works. According to her explanation, the invention relies on a mobile computing device, such as a mobile phone, whose location is determined as it moves. Multiple geographic regions are generated from locations at which the mobile device was previously located such that each of the geographic regions contains one or more of the previous locations. A subset of the geographic regions is then output for display on the mobile device, the subset being selected according to a current distance of the mobile device from each geographic region. This allows display of smaller geographic regions that are relatively close to the mobile device (but still beyond a threshold) and larger geographic regions that are relatively far from it. This is illustrated in Figures 4A and 4B of the application, which show mobile device 14 at a 'current' location; multiple locations at which it was previously located (i.e. the points shown in the figures); and a subset of multiple geographic regions generated therefrom (shown as circles outside a threshold 84). The previous location points are identical in the two figures, but the geographic regions selected for display differ because of a change in the 'current' location of the mobile device. Mrs Garlick also pointed out that these geographic regions may be displayed graphically as per Figure 6 but might equally be shown textually as per Figure 5. I agree with this characterisation of the invention except in relation to the display, having already determined that the independent claims are not limited to displaying the subset of geographic regions on the mobile device (or indeed anywhere) but merely to outputting them "for display". However this issue is not determinative, as will become clear.
- 19 Mrs Garlick and Dr Palmer argued that the invention provides the user with a "view of the real world" which changes as he moves so as to reflect his distance from the real world locations displayed. The invention does not simply filter the 'previous location' data for display to the user; instead it dynamically clusters that data to

generate new geographic data (i.e. the variously-sized geographic regions of the claims) which better represents the previous locations of the mobile device *relative to the user's current location*. Dr Palmer likened this to “a telescope”, which I take to mean that the invention allows the user to see a more or less detailed view of the previous locations as the mobile device moves closer to or further from them. Thus Mrs Garlick and Dr Palmer emphasised that *dynamic* creation of *user-centric* geographic region data is a key part of the contribution made by the invention, which they described as providing “geographical context mapping”.

- 20 I agree that the creation of the geographic region data forms part of the contribution made by the current invention and that this data represents (the locations of) physical entities in the world. In this context I think it is important to distinguish between what the data *represents* and what it *is*. The previous location data and the geographic region data specified in this case represent physical entities but are not themselves physical (digital) entities. Consequently, although I consider the contribution to include a computing process carried out on the previous location data to create the geographic region data, this should not be confused with a technical process carried out on a physical entity or the creation of such an entity.
- 21 Regarding the ‘dynamic’ nature of the geographic region data, I do not consider the contribution to extend to any technical process of determining the location of the mobile device or mapping the surrounding geographic features (nor was this argued during the hearing). I agree that the geographic region data is ‘dynamic’; but only in the sense that it varies according to the spatial relationship of the underlying point location data to a current location of a mobile device.
- 22 Finally, although Mrs Garlick mentioned that geographic region data of the kind specified in the ‘360.5 application could, in principle, be created manually, it was common ground that the invention relates in substance to a computer-implemented method.
- 23 In summary, I consider the contribution made by the invention to be: a computer-implemented method of creating (for display) a dataset representing geographic regions which meet specified criteria, the geographic regions being defined in relation to the current location of a mobile device and being redefined to account for changes in the device’s location. The criteria are those specified in the claims, namely that multiple geographic regions are defined from the previous locations of the mobile device (each region containing one or more of the locations) and a subset of these is selected for representation in the dataset such that each is further than a threshold distance from the device’s current location and the subset includes smaller regions closer to the current location and larger regions further from it.

(3) Does the contribution fall solely within the excluded matter?

- 24 Having determined that the contribution made by the invention is a computer-implemented method, the relevant question under Section 1(2)(c) is whether the invention is a program for a computer *as such*.
- 25 The principal argument presented during the hearing was that the geographic region data created by the invention is not mere “intellectual data” but rather represents real-world locations and is consequentially technical in nature. The dynamic creation

of this ‘technical data’ – particularly in response to movement of the mobile device – was accordingly argued to constitute a non-excluded technical effect. I do not agree that the nature of this data alone can determine whether the inventive method is or is not excluded. A computer-implemented method which manipulates data and displays the results of that manipulation does not appear to me to avoid the exclusion simply because the data represents something in the real world; instead the method must provide a technical contribution. Since the previous location data and the geographic region data specified in this case are not themselves physical (digital) entities, their manipulation or creation cannot constitute such a technical contribution.

- 26 In a further argument, Mrs Garlick referred me to paragraph 30 of the decision in *Shenzhen* in which the Hearing Officer said

“The attorneys’ submissions state that the data produced by the method or system can be output to an external device such that the external device can operate in a more efficient manner. However, no external device is claimed or discussed in the application, thus I am unable to consider the efficiency impact on the external device caused by the present invention.”

By analogy Mrs Garlick argued that the current invention has a technical effect related to processing the location and geographic region data on a display device. Specifically where the location data is processed on a server (as per Figure 1 of the application, for example), any device receiving and displaying the resultant geographic regions would operate more efficiently than if it were to receive and display the larger dataset of previous locations. This efficiency was argued to be two-fold: firstly due to the “better use of the real-estate of the device” (i.e. the limited screen space available on many devices); and secondly due to grouped data being “easier to process”. Mrs Garlick explained the latter as meaning that a display device would require less processing time (as opposed to less processing power) to process the data output by the inventive method than to process conventional point location data.

- 27 As regards the first purported efficiency, I agree that the display of geographic regions in place of multiple individual ‘points of interest’ may indeed make better use of screen space on any device displaying them (as alluded to in paragraph [0019] of the description, for example) – but only in the sense that a user of that device may be better able to understand and interpret what he sees on the display. In my view this is not a technical effect of the invention on the device (or indeed on any technical process).
- 28 As regards the assertion that a display device would require less processing time to display data representing the claimed geographic regions than to display data representing the individual corresponding points, I am unable to find any reference in the specification to any such problem within the display device or to any corresponding improvements resulting from the invention. Nor does the assertion seem to me to be self-evidently true; for example displaying a geographic region representative of a single past location (as is contemplated by the claim) might if anything imply a greater processing burden than displaying the point itself. Nonetheless I will consider the argument on the assumption that it holds true for some cases at least. Thus the inventive method may output less (or perhaps

simpler) data for display than some conventional mapping or navigation applications, which might require correspondingly less processing time to display. The display device itself is not changed so as to operate more efficiently or effectively (indeed it is not changed at all). Providing more or less data to a conventional display process running on a conventional device cannot constitute a relevant technical contribution of a computer program. Consequently I am not persuaded by this argument.

- 29 During the hearing I asked Mrs Garlick and Dr Palmer whether they wished to make any submissions in relation to the 'signposts' set out in *AT&T/CVON*. They pointed to their earlier arguments (at paragraphs 24 above) as meeting the first and third signpost. I have considered these arguments but do not agree with them for the reasons set out above. For the avoidance of doubt I agree with the view set out by the examiner in his report of 26 August 2016 that none of the signposts indicate that the current invention provides a technical contribution. In respect of the fifth signpost I would add that even if (contrary to my view) the invention were considered to address a technical problem in the speed of processing location data on a display device, then the invention merely circumvents it (by requiring less data to be displayed) rather than providing a technical solution to it.
- 30 Having considered the arguments presented I am of the opinion that the contribution made by the invention specified in the independent claims of the '360.5 application lies entirely within the scope of the computer program exclusion.
- 31 The dependent claims specify further constraints on, or features of, the geographic region data; or specify generating navigation directions to a user-selected one of the regions. None of these adds anything beyond the excluded field.

(4) Check whether the contribution is actually technical

- 32 I have in effect already answered this question at step 3 but, for the avoidance of doubt, I am content that there is no relevant technical contribution in the invention of application GB1423360.5.

The inventions: divisional application GB1609028.4

- 33 As I have already said, the inventions claimed in the two applications under consideration are very similar. The invention of the divisional application is defined by the claims originally filed. These comprise three independent claims 1, 13 and 25 which are of substantially the same scope so that I can again consider them together. Independent claim 1 is give below:

*A computing device comprising:
one or more processors; and
a cluster module operable by the one or more processors to:
receive a plurality of location identifiers corresponding to a plurality of locations at which a mobile computing device was previously located;
define a plurality of geographic regions based at least in part on the plurality of location identifiers, wherein at least one of the plurality of locations is located in each of the plurality of geographic regions;
select a subset of the plurality of geographic regions based on respective distances between a current location of the mobile computing device and a*

respective reference point within each of the geographic regions, wherein selection of the subset of the plurality of geographic regions comprises selecting one or more smaller geographic regions for shorter distances between the current location and respective reference points of the plurality of geographic regions and selecting one or more larger geographic regions for longer distances between the current location and respective reference points of the plurality of geographic regions, the one or more smaller geographic regions being smaller than the one or more larger geographic regions and the shorter distances being shorter than the longer distances; and output, for display at a display device, the subset of the plurality of geographic regions.

- 34 As regards claim construction, I note that this claim differs from the corresponding claim in the '360.5 application only in that it does not require (1) the step of comparing the distances between the current location of the mobile computing device and each of the respective reference points to a threshold or (2) each of the geographic regions of the subset to have a distance greater than the threshold. Consequently I consider the contribution made by this invention to be the same as that made by the invention specified in the '360.5 application except that the distance threshold criterion does not apply. This difference is manifestly irrelevant to the arguments presented at the hearing and my considerations of them. I am therefore of the view that the contribution made by the invention specified in application GB1609028.4 also lies wholly within the scope of the computer program exclusion.

Proposed amendments

- 35 During the hearing, Mrs Garlick and Dr Palmer proposed three amendments for consideration should the current claims be found to fall within the excluded field. I am grateful to them for providing marked-up copies of the first two proposed amendments and have relied on my notes in relation to the third proposal. I agreed to consider whether amending the current claims in any of these three ways would result in the invention making a non-excluded contribution. My conclusion is that it would not, for the reasons which follow.
- 36 The first proposal was to amend claim 1 as follows (changes highlighted by underlining) and to make equivalent amendments to the other independent claims:

A system comprising a computing device and a display device, the computing device comprising:
one or more processors; and
a cluster module operable by the one or more processors to:
receive a plurality of location identifiers corresponding to a plurality of locations at which a mobile computing device was previously located;
define a plurality of geographic regions based at least in part on the plurality of location identifiers, wherein at least one of the plurality of locations is located in each of the plurality of geographic regions;
determine respective distances between the mobile computing device and a respective reference point within each of the geographic regions;
compare the distances between the current location of the mobile computing device and each of the respective reference points to a threshold;

*select at least a subset of the plurality of geographic regions, wherein each of the geographic regions of the subset have a distance greater than the threshold, and wherein selection of the subset of the plurality of geographic regions comprises selecting one or more smaller geographic regions for shorter distances between the current location and respective reference points of the plurality of geographic regions and selecting one or more larger geographic regions for longer distances between the current location and respective reference points of the plurality of geographic regions, the one or more smaller geographic regions being smaller than the one or more larger geographic regions and the shorter distances being shorter than the longer distances; and output, for display at a display device, the subset of the plurality of geographic regions;
the display device being configured to display the plurality of geographic regions.*

- 37 Since there was no suggestion at the hearing that the hardware might be anything other than conventional I must conclude that the inclusion of the display device in the claims would limit the form of the invention but not its substance. Consequently the contribution made would be unchanged by such a limitation. Moreover I have already considered and rejected an argument that the invention might make a relevant technical contribution to a process of displaying the geographic region data.
- 38 The second proposal was to amend claim 1 as follows and to make equivalent amendments to the other independent claims:

A system comprising a computing device and a display device, the computing device comprising:
*one or more processors; and
a cluster module operable by the one or more processors to:
receive a plurality of location identifiers corresponding to a plurality of locations at which a mobile computing device was previously located;
define a plurality of geographic regions based at least in part on the plurality of location identifiers, wherein at least one of the plurality of locations is located in each of the plurality of geographic regions;
determine respective distances between the mobile computing device and a respective reference point within each of the geographic regions;
compare the distances between the current location of the mobile computing device and each of the respective reference points to a threshold;
select at least a subset of the plurality of geographic regions, wherein each of the geographic regions of the subset have a distance greater than the threshold, and wherein selection of the subset of the plurality of geographic regions comprises selecting one or more smaller geographic regions for shorter distances between the current location and respective reference points of the plurality of geographic regions and selecting one or more larger geographic regions for longer distances between the current location and respective reference points of the plurality of geographic regions, the one or more smaller geographic regions being smaller than the one or more larger geographic regions and the shorter distances being shorter than the longer distances;
calculate a respective distance between the display device and the reference point within each region; and*

output, for display at a display device, the subset of the plurality of geographic regions;
the display device being configured to display the plurality of geographic regions.

- 39 I am unable to make sense of the second proposal unless I take it to mean that the display device and the mobile device are one and the same; otherwise the additional 'calculating' step appears pointless. In that case the same considerations apply as to the first proposal.
- 40 The third proposal was to further require several of the steps of the invention to be repeated following a change in the location of the mobile device, those steps being: (1) defining the geographic regions, (2) determining their relative distances to the mobile device, (3) comparing these to the threshold and (4) selecting the subset of geographic regions. Based on the construction of the claims set out above, this proposed amendment would not change the scope of the claims in any substantial way since it would have the effect of stating explicitly what is implied by the claims in their current form. Consequently I am of the opinion that it cannot constitute a saving amendment.

Decision

- 41 I have found that the contributions made by the inventions claimed in patent applications GB1423360.5 and GB1609028.4 both fall solely in matter excluded from patentability by virtue of Section 1(2) of the Act, each being a program for a computer as such. I am unable to see any basis for a saving amendment in either application, nor in the amendments proposed during the hearing. I therefore refuse these applications under Section 18(3).

Appeal

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

Deputy Director, acting for the Comptroller