

('users') to the different roles. The computer-based system uses a 'combinatorial optimisation routine' to automatically assign particular roles to each user profile using a suitability score. The suitability score is calculated using user profile data (e.g. training records, user experience), and the geographical location of the user.

- 7 The automatic assignments and an indication of the relative suitability of the user profiles to their allocated roles are displayed to a human incident manager for checking. A manual input reassigns a user to a different role, and the machine learning is retrained by the reassignments.
- 8 Each user has a communications device (smartphone or similar device) which is used to inform them of their assignment. The user devices can function differently depending on the role assigned. The system is adaptive so that should the incident requirements change, the users can be deployed/redeployed differently.
- 9 The latest claims were filed on 22 April 2020 (the main request), having two independent claims which differ in form but are substantially the same (claim 1 being to a method and claim 9 being to a system). Claim 1 is set out below:

A computer-based method for assigning roles to user profiles for an incident using a neural network and retraining the neural network based on manual role reassignment, the method comprising:

identifying, by a computer-based system, a plurality of user profiles assigned to the incident;

identifying, by the computer-based system, a plurality of roles required for the incident;

applying the neural network to each user profile of the plurality of user profiles, wherein the neural network is configured to receive as input stored data associated with a user profile of the plurality of user profiles,

calculating a set of suitability scores indicating a relative suitability of the user profile for each role of the plurality of roles,

automatically assigning, by the computer-based system, one or more roles of the plurality of roles to each user profile of the plurality of user profiles based at least in part on the set of suitability scores for each user profile as determined by the neural network;

displaying on a screen the role automatically assigned to each user profile of the plurality of user profiles;

displaying on the screen an indication of the relative suitability of a first user profile of the plurality of user profiles for each role of the plurality of roles based on the set of suitability scores produced by the neural network;

receiving through an input device a manual reassignment selection of a different role of the plurality of roles to be assigned to the first user profile in response to displaying the indication of the relative suitability; and

retraining, by the computer-based system, the neural network based on the manual reassignment selection, and

determining a current geographic location of a communication device associated with a user profile of the plurality of user profiles based on information from a global positioning system receiver of the communication device, and wherein calculating the set of suitability scores includes calculating the set of suitability scores for the user profile associated with the communication device based on the determined current geographic location of the communication device.

- 10 The supplementary request included with the letter of 10 November 2020 narrows the independent claims to include the feature of modifying the operation of a user communications device based on the role assigned to the user (based on previous dependent claims). The two independent claims are again substantially the same. Claim 1 reads as the main request above plus the below:

identifying a communication device associated with a user profile of the plurality of user profiles assigned to the one or more roles for the incident; and

modifying an operation of the communication device based on the one or more roles assigned to the user profile.

The law

- 11 The examiner has raised an objection that the invention is not patentable because it relates to one or more of the categories of subject-matter which are not considered to be inventions under the Act. This 'excluded matter' is set out in section 1(2) of the Act:

1(2). 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.

- 12 The Court of Appeal's judgement in *Symbian*¹ tells us that in order to determine whether an invention falls solely within the any of the exclusions listed in section 1(2), the four-step test set out in its earlier judgement in *Aerotel*² must be used. The four steps are:

- (1) properly construe the claim(s);
- (2) identify the actual (or alleged) contribution;
- (3) ask whether it falls solely within the excluded subject-matter;

¹ *Symbian Ltd. v Comptroller-General of Patents* [2008] EWCA Civ 1066

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

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

- 13 The fourth step of the test is to check whether the contribution is technical in nature. In paragraph 46 of *Aerotel* it is stated that applying this fourth step may not be necessary because the third step should have covered the question. I shall consider whether the contribution is excluded alongside the question of whether the contribution is technical in nature, meaning I will consider the third and fourth steps of *Aerotel* together.

Argument and analysis

Step 1 - Properly construe the claim

Main request

- 14 There does not seem to be any difficulty construing the meaning of the claims. They define a computer-based method for assigning incident roles to user profiles using a neural network, the neural network being retrained based on manual role reassignment. For the avoidance of doubt, the final section of the claims relating to geographical location is construed as meaning that the suitability score for each role for a particular user profile takes account of the geographical location of the user.

Supplementary request

- 15 The claims of the supplementary request include the additional features of identifying a communication device associated with a user profile assigned to the one or more roles for the incident and modifying an operation of the communication device based on the one or more roles. These features require a little more consideration regarding construction.
- 16 Although the identification step is not explained in the description, it is implicit that the system would need to know which device is associated with a specific user profile. Also, the claim does not make it clear whether the communications device here is the same as that mentioned in the previous part of the claim relating to geographical location. While there does not appear to be explicit mention of this, I think it is clear from the description as a whole that it could be, although doesn't have to be.
- 17 The description at paragraph 25 states that the user device can be "configured to operate differently" and gives two examples of this, namely adding the device to a team talk group or the device displaying a map. I therefore construe the meaning of the communications device being configured to operate differently not as making a fundamental change to the device, but as the device performing a particular function.

Step 2 – Identify the actual (or alleged) contribution

Main request

- 18 Paragraph 43 of *Aerotel* suggests that the contribution can be assessed from the point of view of the problem to be solved, how the invention works and what the advantages are. Noting that no search has been performed for the invention in this application, the examiner and Dr Tolfts appear to be in general agreement on the

alleged contribution the invention makes to the state of the art. While the contributions suggested by the examiner (in her examination report of 2 September 2020) and Dr Tolfts (in her letter of 10 November 2020) are worded differently, they appear the same in substance.

- 19 For completeness, I consider the contribution to reside in an improved and more efficient method for assigning roles to users in an incident by using a neural network that takes account of user profiles for the incident, potential roles required for the incident and the current geographical location of each of the potential user profiles, and assigning a suitability score for each user profile for each role, displaying the suitability scores to a user, accepting a manual reassignment of a different role for one or more profiles and, based on the manual reassignment selection, retraining the neural network.
- 20 I note that in a previous round of amendment the question of whether the contribution does or does not include retraining a neural network based on manual role reassignment was considered (the contribution suggested by Dr Tolfts in her letter of 22 April 2020 did not include this). The examiner argued that while the contribution does not extend to a new way of training a neural network, the application of known machine learning techniques to assigning user roles in an incident is an integral part of how the invention works and I consider that this should be included in the contribution.

Supplementary request

- 21 Dr Tolfts essentially suggests that the contribution of the supplementary request is the same as that for the main request but including the additional identification and modification steps of claim 1.
- 22 Following on from the way in which I have construed these additional steps, I consider the contribution to be an improved and more efficient method for assigning roles to users in an incident by using a neural network that takes account of user profiles for the incident, potential roles required for the incident and the current geographical location of each of the potential user profiles by assigning a suitability score for each user profile for each role, displaying the suitability scores to a user, accepting a manual reassignment of a different role for one or more profiles, and based on the manual reassignment selection, retraining the neural network; where a communications device associated with a user profile performs a particular function depending on the role assigned to the user profile.

Steps 3 & 4 - Whether the actual or alleged contribution falls solely within the excluded matter and check whether it is actually technical

Program for a computer

- 23 To assist in determining whether the contribution relates solely to a program for a computer, the examiner used the signposts to technical contribution set out in *AT&T/CVON*³ and by the Court of Appeal in *HTC/Apple*⁴. These 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 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.
- 24 These signposts are guidelines, providing a list of some of the factors that can indicate whether a contribution may be technical.

Main request

- 25 Dr Tolfts suggests that signposts (i), (iii) and (v) are the most relevant and demonstrate that the invention does involve a technical contribution.
- 26 Looking to signpost (i), Dr Tolfts argues that this signpost is met because the display of the suitability score on the user device (where the suitability score itself takes account of geographical location of the user) and the input of parameters via an input device in response to the scores are clearly technical steps that have an effect on a process carried on outside the computer. Dr Tolfts says that both of these technical steps are new and inventive but then does not explain how this effect, i.e. providing guidance as to the suitability of a user profile to a specific role based on geographical location information, is technical.
- 27 A similar argument has been made by Dr Tolfts regarding signpost (iii) - that the invention provides a novel and inventive way of assigning and allocating users to roles (where the users are at specific geographical locations) and thus results in the computer system operating in a different way. Again, Dr Tolfts does not directly address the question of whether the invention provides a technical effect, but relies instead on identifying the problem that the application addresses (how to provide effective allocation of resources for an incident that takes account of geographical

³ *AT&T Knowledge Venture/CVON Innovations v Comptroller General of Patents* [2009] EWHC 343 (Pat)

⁴ *HTC Europe Co Ltd v Apple Inc* [2013] EWCA Civ 451

information) and an implication that a computer-implemented solution to this resourcing problem should be regarded as technical.

- 28 As no search has been performed, we cannot determine the novelty and inventiveness of the information that is displayed, nor of the method of assignment and reallocation of users to roles in the incident. However, the display and computing equipment used is without doubt conventional. The displayed information itself relates to allocating users to roles in an incident, thus any effect outside of the computer resides in being able to better allocate personnel to roles in an incident. In my view, this better allocation of personnel to a role cannot be considered to be a technical improvement; the improvement falls within the field of administration and business, as the examiner sets out at paragraphs 20-25 of her report dated 2 September 2020. Similarly, causing the computer system to be able to assign and allocate users does not cause the computer to operate in anything other than a standard manner, and I find myself in agreement with the examiner's arguments at paragraphs 27-30 of her September 2020 report.
- 29 I note that a similar argument was provided in the Office decision of [O/633/20](#), which relates to dispatching different types of law enforcement patrols in order to achieve a desired deterrent effect on patrol routes. In this case it was argued that the display of relevant dispatch instructions based on real-time geographic information and resource allocation information amounted to a technical effect outside the computer. The Hearing Officer found this not to be the case. While the facts of *O/633/20* differ slightly from those here, it does lend support to my finding that the invention here does not provide a technical effect on a process outside of the computer or results in the computer operating in a different way.
- 30 Considering signpost (v), Dr Tolfts argues that the problem addressed by the invention is how to provide effective allocation of resources for an incident. It is clear from *AT&T/CVON* that signpost v) relates to a situation where a technical problem is circumvented by the invention as opposed to being solved directly. The judgment quotes from the EPO Board of Appeal decision in *Hitachi (T 258/03)*: "Method steps consisting of modifications to a business scheme and aimed at circumventing a technical problem rather than solving it by technical means cannot contribute to the technical character of the subject-matter claimed."
- 31 The important point here is that a technical problem needs to be overcome, not just a non-technical one. This is evident from step iv) of *Aerotel*, which requires there to be a technical contribution. In the present case, I consider that resource allocation is not a technical problem but is instead one of administration, so signpost (v) is not met.
- 32 Signposts ii) and iv) were not discussed by Dr Tolfts, and I agree that they are not relevant to the application.

Supplementary request

- 33 I must consider whether the addition to the contribution of the communications device associated with a user profile performing a particular function depending on the role assigned to the user profile confers any technical effect.
- 34 Looking to signposts (i) and (iii), the only examples provided relating to the particular functions that the device might perform (being added to a team talk group or

displaying a map) are ones that might help the user perform their role more effectively. Also, the device itself is not caused to operate beyond the conventional manner in accordance with instructions provided by the computer program. Thus, I do not consider there to be a technical effect outside the computer, nor do I consider that the device operates in a new way, at least not in a technical sense. With regard to signpost (v), Dr Tolfts says that the problem the application addresses is how to provide effective allocation of resources for an incident and ensure that a device assigned to a user is configured in such a way that it allows the user to act in the role most efficiently. In my view the problem addressed remains broadly the same as for the main request, i.e. how to provide effective allocation of resources for an incident, which I have already said is non-technical. Providing the user with helpful resources to ensure that the role is performed as efficiently as possible does not alter the fact that the problem being addressed is not technical.

- 35 None of the signposts point to any technical contribution in either the main or supplementary requests. I therefore consider that the invention is excluded as a program for a computer.

Method of doing business

- 36 I note that Dr Tolfts has made no specific arguments as to why the claims are not a method of doing business beyond the discussion associated with the computer program exclusion. Dr Tolfts argues that the invention is a computer-based system, i.e. technical, and is significantly more than a mere business method.

- 37 The contribution provided in both main and supplementary requests is that of ensuring efficient allocation of personnel in an incident based on the information available and in providing personnel with the relevant tools to perform their roles effectively. As is evident from my discussion above, I consider this relates to administrative or organisational activity and thus to a method of doing business. I believe this conclusion is consistent with the Hearing Officer's decision in *O/633/20*, where the provision of patrol instructions to provide a required level of deterrence was considered an administrative or organisational activity within the meaning of a method of doing business.

Conclusion

- 38 Having carefully considered the arguments, I am of the view that the invention is a computer-implemented method for doing business that provides no technical effect, the problem addressed by the claimed invention being purely administrative. Therefore, the contribution made by the invention falls solely within the business method and computer program exclusions.
- 39 I therefore find that the invention claimed in GB1720232.6 is excluded by section 1(2)(c) both as a program for a computer as such and a method for doing business as such. I therefore refuse the application under section 18(3).

Appeal

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

HUW JONES

Deputy Director, acting for the Comptroller