

1. A method of transferring an electronic medical image, comprising:

receiving by a computing device having one or more processors a request to move the electronic medical image from an electronic database of a first picture archiving and communication system to a second electronic database of a second picture archiving and communication system;

receiving by the computing device the electronic medical image over the internet from the electronic database of the first picture archiving and communication system;

in response to the receiving the request to move and the receiving the electronic medical image, transforming by the computing device, metadata associated with the received electronic medical image to conform to the second electronic database of the second picture archiving and communication system by dynamically modifying the metadata associated with the received electronic medical image to match a format of metadata stored in the second electronic database of the second picture archiving and communication system;

wherein dynamically modifying the metadata associated with the received electronic medical image comprises enforcing length limits and content restrictions on the modified metadata; and

sending by the computing device the electronic medical image and the modified metadata over the internet to the second electronic database of the second picture archiving and communication system;

wherein receiving the electronic medical image over the internet from the electronic database of the first picture archiving and communication system includes:

receiving a request to move the electronic medical image from the electronic database of the first picture archiving and communication system to the electronic database of the second picture archiving and communication system; and

retrieving the electronic medical image over the internet from the electronic database of the first picture archiving and communication system;

wherein dynamically modifying metadata of the received electronic medical image includes:

receiving modification instructions including an identification of metadata fields to be modified using one or more predefined modification commands and modifications to be made using the one or more predefined modification commands; and

modifying metadata of the received electronic medical image according to the received modification instructions;

wherein the modification instructions comprise:

an identification of a metadata tag to be modified using the modification instructions;

one or more references to data of a database table specifying the modifications to be made to the metadata tag; and

a call to one or more of the predefined modification commands to be used in making the modifications to the metadata tag;

wherein the metadata tag added to the electronic medical image in response to determining the error occurred identifies a metadata modification command that failed and a type of the error; and

maintaining a log documenting metadata modification activity;

wherein the log comprises one or more entries related to one or more errors; and
wherein each of the one or more entries related to the one or more errors comprise:

an error message describing the one or more errors;

an identifier of an electronic medical image that experienced the one or more errors;

an identifier of a patient associated with the electronic medical image that experienced the one or more errors; and

an identifier of a medical imaging modality that generated the electronic medical image that experienced the one or more errors.

2. A method of transferring an electronic medical image, comprising:

displaying by a computing device having one or more processors an interface to a user for entry of a request to move the electronic medical image from an electronic database of a first picture archiving and communication system to an electronic database of a second picture archiving and communication system;

receiving by the computing device the request to move the electronic medical image from the electronic database of the first picture archiving and communication system to the electronic database of the second picture archiving and communication system;

displaying by the computing device an interface to a user for identification of a metadata modification to be performed on the electronic medical image to be moved, the metadata modification performed in response to the receiving the request and includes transforming metadata associated with the electronic medical image to conform to the electronic database of the second picture archiving and communication system by modifying the metadata associated with the electronic medical image to match a format of metadata stored in the electronic database of the second picture archiving and communication system;

wherein modifying the metadata associated with the electronic medical image comprises enforcing length limits and content restrictions on the modified metadata; and

communicating by the computing device the received request to move the electronic medical image and the modified metadata over the internet to a web service for execution of the move request, the communication including identifications of the electronic medical image to be moved, the electronic database of the first picture archiving and communication system, the electronic database of the second picture archiving and communication system, and the metadata modification to be performed;

determining whether an error occurs when modifying the metadata of the received electronic medical image and if an error occurs, adding a metadata tag to the electronic medical image documenting the error;

wherein adding the metadata tag to the electronic medical image documenting the error includes creating a temporary metadata tag documenting the error.

6. A method of transferring an electronic medical image, comprising:

periodically querying by a computing device having one or more processors whether an expected electronic medical image is present in a first electronic database;

upon determining that the expected electronic medical image is present in the first electronic database, receiving by the computing device a request to move the expected

electronic medical image from the first electronic database to a second electronic database of a second picture archiving and communication system;

in response to the receiving the request, retrieving by the computing device the expected electronic medical image from the first electronic database;

in response to the receiving the request and the retrieving of the expected electronic medical image, transforming by the computing device, metadata associated with the expected electronic medical image to conform to the second electronic database by dynamically modifying the metadata associated with the retrieved electronic medical image to match a format of metadata stored in the second electronic database;

wherein dynamically modifying the metadata associated with the retrieved electronic image uses one or more temporary metadata tags to manipulate and store metadata information; and

sending storing the retrieved electronic medical image and the modified metadata to the second electronic database;

determining whether an error occurs when modifying the metadata of the received electronic medical image and if an error occurs, adding a metadata tag to the electronic medical image documenting the error;

wherein adding the metadata tag to the electronic medical image documenting the error includes creating a temporary metadata tag documenting the error.

9. A computer system for use in transferring an electronic medical image, comprising:

a vendor neutral archive having one or more processors for:

receiving a request to move the electronic medical image over the internet from an electronic database of a first picture archiving and communication system to an electronic database of a second picture archiving and communication system;

receiving the electronic medical image from the electronic database of the first picture archiving and communication system;

in response to the request to move and the receiving of the electronic medical image, transforming metadata associated with the electronic medical image to conform to the electronic database of the second picture archiving and communication system by dynamically modifying the metadata associated with the received electronic medical image to match a format of metadata stored in an electronic database of a second picture archiving and communication system;

wherein dynamically modifying the metadata associated with the received electronic medical image comprises enforcing length limits and content restrictions on the modified metadata; and

sending the electronic medical image and the modified metadata over the internet to the electronic database of the second picture archiving and communication system;

determining whether an error occurs when modifying the metadata of the received electronic medical image and if an error occurs, adding a metadata tag to the electronic medical image documenting the error;

wherein adding the metadata tag to the electronic medical image documenting the error includes creating a temporary metadata tag documenting the error.

The law

- 6 The relevant provision is section 1(2)(c) of the Patents Act 1977, which says that certain things cannot be protected by a patent:

1. 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) ...

(b) ...

(c) a scheme, rule or method for...doing business, or a program for a computer;

(d) ...

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.

- 7 There is well-established case-law providing guidance on determining whether an invention falls within this exclusion. In *Aerotel Ltd v Telco Holdings Ltd & Ors Rev 1*¹ the Court of Appeal set out the following four-step test for determining whether a proposed invention is excluded under section 1(2):

- 1) properly construe the claims;
- 2) identify the actual or alleged 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.

and in *Symbian Ltd's Application*², the Court made it clear that when determining whether a proposed invention is excluded, it does not matter whether the question of "whether the contribution is technical" is asked at step (3) or (4).

- 8 The examiner has based his analysis on *Aerotel* and *Symbian*. He has also made use of the set of signposts of *AT&T v CVON*³ and *HTC/Apple*⁴. There is no disagreement between the examiner and the applicant as to the relevant law.

Arguments and analysis

- 9 The examiner has set out his objection clearly in his final examination report dated 8 June 2021. I have considered this carefully, along with the previous correspondence on file. I confirm that I have fully reviewed the applicant's arguments in the course of reaching my decision.
- 10 The four independent claims have a significant amount of subject matter in common but they are overlapping in scope. In addition, claim 1 arguably lacks conciseness (it is repetitious) and it is not free of clarity issues (one of which the examiner has pointed out in his most recent report). This makes the task of identifying the contribution considerably more onerous than it needs to be, but ultimately it does not prevent the analysis of the issue before me.

¹ [2006] EWCA Civ 1371, [2007] RPC 7

² [2008] EWCA Civ 1066, [2009] RPC 1

³ [2009] EWHC 343 (Pat)

⁴ [2013] EWCA Civ 451

Construing the claims

- 11 Given the overlapping nature of the independent claims I will start by considering what is common to the claims. They all involve transferring an electronic medical image from a first PACS to a second PACS, and they all use a computing device to do this. The computing device receives a request to move a medical image, and the image is received by the computing device. The computing device then transforms the metadata associated with the received medical image to make it match the format expected by the second PACS. The computing device identifies if an error occurs when modifying the metadata and keeps a record of such an occurrence.
- 12 Claim 1 provides additional detail on the metadata modification process. It involves receiving instructions which identify the metadata to be modified and specify the modifications to be made according to a set of modification commands. The instructions include a reference to a database that specifies the modifications.
- 13 Claim 1 also provides some further detail as to what the record of an error in the metadata modification process comprises. It includes adding a metadata tag to the medical image which identifies which command failed. It further includes maintaining a log which includes an error message and identifies the medical image which gave rise to the error, the patient associated with the image, and the medical imaging modality which generated that image.
- 14 Claims 1, 2 and 9 recite that length limits and content restrictions are placed on the modified metadata. Paragraph [0037] of the description provides a helpful explanation of this. While the metadata values may not be standardised across multiple PCAS it would seem that the DICOM protocol does place some limitations on metadata length and content. In view of the description it appears that the claims are simply trying to say that the modified metadata must still comply with the DICOM standard.
- 15 Claim 2 adds that the computing device presents an interface to a user. This provides two functions: it allows the user to choose a medical image to be moved from one PACS to the a second PACS, and it allows the user to select a metadata modification to be performed.
- 16 Claim 6 involves the additional step of periodically querying whether an expected medical image is in the database of the first PACS and only requesting the move when the image is found to be present.
- 17 There are several other minor discrepancies between the four claims. For example, they do not all require that the computing device receives requests to move medical images over the internet, or require the use of a web service or a vendor neutral archive, or record the occurrence of an error in a temporary metadata tag, or make use of temporary tags when modifying the metadata. I do not consider that such discrepancies have any bearing on the issue under consideration, and the applicant has not made any arguments on these points.

Identifying the contribution

- 18 The examiner and applicant have not reached agreement on the contribution.

19 The applicant says that the contribution resides in

the provision of a more reliable image transfer process and system that will make two different picture archiving and communication systems compatible with each other and will minimise the amount of extraneous data for transmission to and storage at the second picture archiving and communication system, thereby reducing unnecessary usage of computing resources such as storage and bandwidth.

20 It is of course true that identifying the contribution should involve looking at what the advantages of the invention are, but the applicant's version of the contribution here appears to do little else. Paragraph 43 of *Aerotel* reads:

"How do you assess the contribution? Mr Birss submits the test is workable— it is an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are. What has the inventor really added to human knowledge perhaps best sums up the exercise."

The applicant has, in my view, overlooked what the problem is and how the invention works.

21 The examiner says that the contribution is

a method comprising: receiving by a computing device an electronic medical image from a first database of a first PACS, and at the computing device, dynamically modifying electronic medical image metadata when the electronic images are transferred from a first database to a second database, wherein dynamically modifying the metadata comprises enforcing length limits and content restrictions on the modified metadata; determining whether an error occurs when modifying the metadata, wherein a metadata tag is added to the electronic medical image documenting an error and a log of metadata modification activity is maintained, the log recording entries for each of the errors including an identifier of the medical image that experienced the error, and identifier of the patient associated with the medical image, and an identifier of a medical imaging modality that generated the image; and sending the electronic medical image and the modified metadata to the electronic database of a second PACS.

22 The examiner's view of the contribution is very much based on claim 1. The examiner has taken the view that the other independent claims have substantially the same inventive concept as claim 1 and that as such the contribution of claim 1 can be used to judge the patentability of the other claims. I am not convinced that this the case. The independent claims are of different scope, as I have set out above. So while the examiner's version of the contribution is conceivably appropriate when assessing whether claim 1 lies within the excluded fields, it cannot be appropriate when considering the other independent claims; it includes elements which are not in those claims, and omits elements which are in those claims, and those may be the elements which give rise to a technical contribution.

23 Given the overlapping nature of the independent claims I think it would be helpful to first identify the contribution that is common to the claims, and then to determine what, if anything, each independent claim contributes in addition to that. The application clearly sets out the underlying problem; a lack of standardisation in

metadata format between different PACS. All the claims define how that problem is solved; a computing devices which acts as an interface between the two PACS modifies the metadata as the medical image is being transferred to ensure that it is in a format that the recipient PACS is expecting. But the solution to the problem is evidently not completely reliable; the modification of the metadata may fail, in which case the error is logged in the form of a metadata tag. With that in mind I consider the contribution common to the four independent claims to be

A method of transferring a medical image containing metadata from a first archive and communication system to a second archive and communication system in which a computing device seeks to overcome a lack of standardisation in metadata format by modifying the metadata to conform to the metadata format of the second archive and communication system, and the computing device logs any error in the metadata modification process as a metadata tag.

24 Claim 1 adds to this that

the metadata modification is carried out according to instructions obtained from a database, the modified metadata is subject to length and content restrictions, and an error log is maintained which stores details of the error

25 Claim 2 adds to the common contribution that

the computing device has a user interface via which the user specifies requests that a medical image is moved and identifies a metadata modification to be performed, and the modified metadata is subject to length and content restrictions

26 Claim 6 adds to the common contribution that

the computing device periodically queries whether an expected medical image exists in the first archive and communication system and transfers it when it is available

27 Claim 9 adds to the common contribution that

the modified metadata is subject to length and content restrictions

Does the contribution fall solely within excluded subject matter, and is the contribution technical in nature?

28 One argument advanced by the applicant is that the invention may be implemented by an application-specific integrated circuit (ASIC) or dedicated hardware, as discussed in paragraph [0020] of the description. The implication is that because the invention could be implemented without a computer it must therefore relate to something more than a computer program.

29 Paragraph [0020] makes clear that the invention can be implemented by processors which execute computer executable program instructions residing on a storage medium, a possibility that very clearly falls within the ambit of the claims and one which I am sure the applicant seeks patent protection for. The claims are certainly

not limited to appropriately wired hardware. Moreover, there is no disclosure of what such hardware might be and how it would work.

- 30 Had the applicant genuinely provided an enabling disclosure of some new hardware and directed claims towards such an arrangement then I doubt this decision would have been necessary, but the invention is quite clearly intended to be implemented on a suitably programmed computer and as such the examiner was correct to consider whether it relates to a computer program as such.
- 31 At this point in office decisions the hearing officer will turn their attention to a consideration of the *AT&T* signposts. It is well established that the *AT&T* signposts are merely guidelines. They are often a very useful aid in assessing whether a contribution in the case of a computer related invention falls inside or outside the exclusion of section 1(2). The examiner has certainly considered each of the signposts when issuing his reports, but it is not entirely clear to me from the papers which of these signposts the applicant is relying upon. Rather than formally dealing with the signposts in order, I will simply consider the applicant's arguments, but with the signposts very much in mind.
- 32 The applicant argues that the contribution is in the field of image archival systems, and that this is clearly a technical field. While I would not disagree that there are technical aspects to image archival systems, that does not necessarily mean that any contribution in this field must inherently be technical, as the applicant appears to suggest. It is necessary to consider what the actual contribution is, and to ask whether that contribution is technical in nature.
- 33 The applicant has argued that the invention is a transfer process and thus the first signpost is satisfied because medical images with modified metadata are transferred from a first PACS to a second. The examiner is of the view that, in line with *Lantana*⁵, the first signpost is not relevant because the transfer is achieved within a computing arrangement consisting of multiple conventional computers communicating by conventional means. The invention may well mean that the second PACS can make sense of the metadata associated with a received medical image and that this in turn provides a user of the second PACS (e.g. a medical professional) with useful data (e.g. patient identity in a recognisable format) that might otherwise have been unavailable, but I cannot see how such an effect on the user, while advantageous, can be characterised as technical. In my view there is plainly no technical effect on anything outside a computing arrangement.
- 34 The applicant has also argued that their invention involves a non-conventional technique for transferring data. The applicant has not made clear which of the signposts (if any) this line of argument relates to, but to my mind it is not correct to characterise the invention as improving the transfer of data. The invention is simply not solving a problem relating to technical limitations of a process or apparatus for transferring data. On the contrary, this invention is about solving the problem of inappropriately formatted metadata being transferred.
- 35 Much of the applicant's argument is directed towards the assertion that the invention minimises the amount of extraneous data which is transferred. The applicant's arguments are somewhat confused in that they are not consistent in what they mean by "extraneous". On the one hand they seem to equate extraneous with metadata in

⁵ *Lantana Ltd* [2014] EWCA Civ 1463

a format that doesn't conform with the requirements of the second PACS. On the other hand, they draw attention to the portion of the claims which refers to restriction on the size and content of the data to be transferred. The applicant says that minimising the amount of extraneous data which is transferred reduces unnecessary usage of computing resources such as storage and bandwidth, and also makes for a more reliable image transfer process. Though there is a conflation of arguments here which requires some untangling, it seems that the applicant has the fourth *AT&T* signpost in mind. What I need to consider is whether either the limitation on the size and content of the modified metadata or the avoidance of the transfer of incompatible metadata results in any improvement in the efficiency or the reliability of the computer.

- 36 The examiner has responded to the applicant's submissions on the issue of the restriction of the size and content of the metadata (which of course does not play any part in the contribution of claim 6). The examiner accepts that the invention could conceivably give rise to a reduced amount of metadata being transmitted, but that is not a given and would clearly depend upon the particular metadata value that is to be modified and the modification to be made. Paragraph [0028] of the description makes this very clear. There is nothing in the contribution that requires that the modified metadata contains any less data than the unmodified metadata. All that is required is that the modified metadata is subject to length and content restrictions. Though the claims do not say so in terms, these restrictions are merely to ensure that the modified metadata complies with the DICOM standard in the same way that the unmodified metadata presumably would. The invention quite clearly encompasses the possibility that modified metadata contains more data than the unmodified version, in which case bandwidth and storage requirements are increased, not decreased. Even in the case of a reduction in the size of the metadata to be transferred I do not accept that there is any efficiency improvement to the function of a computer of the sort that is envisaged by the fourth signpost. Any reduction in the size of the metadata is transferred is fortuitous, but excessive metadata size is not a problem that the applicant set out to solve but simply one that they do not want to create. It does not form part of the contribution here.
- 37 What certainly is part of the contribution though is the avoidance of transferring incompatible metadata to the second PACS by modifying it first. The applicant observes that the medical image transfer process is quicker in the sense that a user of the second PACS (e.g. a doctor) can more efficiently access the metadata associated with the image they wish to access. Presumably, in the absence of the applicant's method, the doctor would be faced with metadata that they might need to interpret or translate, or which they would need to ask a user of the first PACS to interpret. While I accept that there is an advantage of the applicant's method from the end user's point of view, this does not mean that the contribution is a more efficient computer. On the contrary, all we have here is a better computer program. The computer itself is not more efficient per se, it has simply been programmed to do something more helpful for the end user, i.e. to modify metadata so that it can be sent in an expected format rather than in an incompatible format.
- 38 What then of the reliability question - can the contribution be characterised as a more reliable image transfer process? I do not believe that it can. The contribution here is not about improving the reliability of a computer or of a process. The contribution is undoubtedly a better image transfer process in that the second PACS receives appropriate metadata rather than inappropriate metadata, but the computer itself is no more reliable.

- 39 The applicant has pointed out that their application addresses a problem, and teaches how to solve that problem. I cannot dispute this. But that does not mean, as the applicant would no doubt contend, that the fifth *AT&T* signpost is satisfied. It is a solution to a problem, but the problem is not a technical one. The problem is simply that whoever settled upon a particular metadata format in one PACS did not choose to make sure that the format matched that of another PACS. In other words the problem stems from an unfortunate design choice, not from something inherently technical.
- 40 The applicant has asserted that the tracking and logging of errors in the metadata modification process provides a technical contribution. They have provided no argument to substantiate this other than to draw attention to paragraph [0036] of the description which provides the necessary support for what has been claimed but does not assist me in determining why the applicant considers the error tracking features to provide a technical contribution. The examiner has considered this aspect of the contribution with respect to the *AT&T* signposts in his latest examination report and I agree with the examiner's conclusion. No doubt the tracking and recording of errors in the metadata modification process is a useful additional feature to the applicant's method, but I cannot see any sense in which it might make the contribution technical and therefore outside the computer program exclusion.
- 41 For completeness I confirm that I have considered all the various features I have identified as forming part of the contributions of the four independent claims, including any that the applicant has addressed in their arguments. I have also considered dependent claims and the rest of the specification. I have been unable to identify anything which would shift the contribution beyond a computer program as such.
- 42 The examiner's primary objection was that the invention is excluded as a computer program, but he has also noted that it is also objectionable under the business method exclusion. Having decided that the invention is excluded as a computer program I do not see the need to consider the business method exclusion.

Conclusion

- 43 Having fully considered the applicant's arguments, I am in full agreement with the examiner's conclusion. I am not persuaded that the application relates to anything beyond a computer program as such. The application is therefore refused under section 18(3).

Appeal

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

Huw Jones

Deputy Director, acting for the Comptroller