

This document includes some recent decisions of the EPO in 2019 with regards to software related inventions and shows relevant extracts from the respective decisions.

T 0891/17 (Goal modules/PHILIPS) of 25.11.2019

European Case Law Identifier: ECLI:EP:BA:2019:T089117.20191125

SELF-ADAPTIVE CARE PLAN GOAL MODULES

Inventive step - (no) (Main request and auxiliary requests 1 to 15)

Application number: 07709904.2

IPC class: G06F 19/00

Applicant name: Koninklijke Philips N.V.

Board: 3.5.05

<https://www.epo.org/law-practice/case-law-appeals/pdf/t170891eu1.pdf>

Claim 1 of the main request reads as follows:

"A health management system (10) comprising:

a host center (16) including a server (42), the server being arranged to store

(i) a plurality of goal modules (78, 198, 298), a goal module (78, 198, 298), including one or more content sessions (80, 82, 200, 202, 204, 224, 300, 318) cooperatively directed toward achieving a projected health management goal;

(ii) at least one patient profile (130) indicating at least which goal modules are assigned to a patient profiled by the at least one patient profile;

a patient station (14) coupled to the host center (16) and including a user interface (84), the user interface (48) being configured for presenting the content sessions (80, 82, 200, 202, 204, 224, 300, 318);

at least one feedback path (48, 86, 140, 142, 210, 234, 312, 322, 410) from the patient station to the host center providing at least one input indicative of a trend in a patient progress toward achieving the projected health management goal, wherein the at least one feedback path (48, 86, 140, 142, 210, 234, 312, 322, 410) includes a biometric device (86, 312) and a survey, quiz, test, or questionnaire including at least one question presented by the user interface (48), wherein the at least one input including a user response via the user interface (48) and a vital sign measurement acquired by the biometric device; and

a care plan manager (84) included in the server (42), which is arranged to at least one of adds, deletes or modifies at least one of the goal modules (78, 198, 298) and content sessions (80, 82, 200, 202, 204, 224, 300, 318) of the goal modules based at least on the one input and intervention rules so that the patient's progress toward the projected health management goal is optimized."

1.1 As auxiliary request 13, among all these requests, is the one having all the features present in various permutations, the contested decision chose to base its assessment of inventive step on auxiliary request 13. The board will do the same.

1.2 The contested decision found claim 1 of auxiliary request 13 to differ from the closest prior art D1 in the following features:

a. "wherein the user interface is further being configured for initiating surveys by rules applied to patient physiological parameter measurements and patient responses to subjective questions;"

b. "a care plan manager included in the server, which is arranged to grade the user response and generate a score indicating how well the patient scored in the survey, and to at least one of adds, deletes or modifies at least one of the goal modules and content sessions of the goal modules based at least on the one input and intervention rules and the score so that the patient's progress toward the projected health management goal is optimized".

1.3 In the statement setting out the grounds of appeal, the appellant argued that, although D1 disclosed the concept of tailoring the information for a specific user at a high level, it was silent on how this tailoring was done. The solution according to the invention combined several parameters to adjust the content of the information presented to the user. The combined input of parameters had the technical effect that the judgement with regard to the content was more reliable and less error-prone (see the statement setting out the grounds of appeal, in particular pages 11 and 12 relating to the main request. The appellant repeats the same formulation of technical effect for auxiliary requests 1 to 15: cf. page 21, last four paragraphs; page 22, penultimate paragraph to page 23, third paragraph; and page 24, second to fifth paragraphs).

1.4 The appellant's submissions do indeed indicate that **the effect of the judgement in claim 1 of auxiliary request 13 is that the cognitive content of the "goal modules", e.g. videos, presented to the user is modified.** It is well-established case law that the **cognitive content of information is not technical.** Therefore, **a decision as to which cognitive content should be presented to the user does not have any technical character.** What the appellant identifies as technical effects of the distinguishing features, i.e. the reliability of this non-technical decision or its being less error-prone, are not technical effects, but merely indicate the semantic or cognitive suitability of the content of the information to the users' needs, which is not a technical effect.

1.5 As its distinguishing features over the prior art do not have any technical effect, claim 1 of auxiliary request 13 does not involve an inventive step (Article 56 EPC). This conclusion also applies a fortiori to claim 1 of the main request and auxiliary requests 1 to 12 and 14 to 15.

T 2574/16 (Integrated management system/BOEING) of 21.11.2019

European Case Law Identifier: ECLI:EP:BA:2019:T257416.20191121

Integrated management system for technical information

Claims - clarity

Claims - main request (yes)

Sufficiency of disclosure - main request (yes)

Application number: 08018638.0

IPC class: G06F 17/30

Applicant name: The Boeing Company

Board: 3.5.07

<https://www.epo.org/law-practice/case-law-appeals/pdf/t162574eu1.pdf>

2. The application

2.1 The application's background section explains that, in a large company, the documentation of a large integrated system can be spread over a large number of buildings and organised according to a large number of indexing schemes. This makes it difficult to locate information about a particular subject. If the information is stored electronically, one has to search one or more databases or electronic documents using differing sets of interfaces, search schemas and hyperlinking criteria.

2.2 To improve the access to relevant information, the application proposes a "technical information portal" that integrates multiple databases and uses a navigational technique centred around a "functional interactive diagram", which is a series of diagrams of the integrated system (page 2, line 18, to page 3, line 2).

3. The contested decision

3.1 The Examining Division decided that the **last step of claim 1 of the main request was unclear within the meaning of Article 84 EPC and caused the claimed invention to be insufficiently disclosed within the meaning of Article 83 EPC.** This step reads as follows:

"modifying at least one graphical element on the selected portal document based upon the simulation graphical element that is selected and the operational electronic information to thereby simulate an operation of at least one of the operational elements of the at least one operational system."

3.2 In respect of Article 84 EPC, it essentially argued that it was unclear how the "operation of at least one of the operational elements of the at least one operational system" was to be simulated on the basis of the selected "simulation graphical element" and the "operational electronic information".

The claim did not specify how the modification of the graphical element and its selection were "tied back" to the selected simulation graphical element and the operational electronic information. Nor did it provide any details about the content or structure of the "operational electronic information". The claim did not contain sufficient details allowing the skilled person to determine both which graphical elements had to be modified and how they had to be modified.

Since **such details were not present in the remainder of the application either, the application also infringed Article 83 EPC.**

3.3 In a section of the decision addressing the appellant's arguments, the Examining Division referred to the online Oxford Dictionary and - apparently adding to the reasons for its clarity objection - noted that the verb "to simulate" could have the meaning "to produce a computer model of" in the field of computing.

It also referred to the example disclosed on page 22, line 3, to page 23, line 9, of the description in combination with Figures 12A and 12B, which made it clear that the invention was not limited to simulating an operation in response to the selection of a single simulation graphical element but encompassed simulating an operation in response to the selection of more than one simulation graphical elements. In view of that example, **the claim could not be interpreted as being restricted to displaying known modifications stored in the operational electronic information.**

3.4 The **Board agrees with the appellant** that the **skilled reader** of claim 1, which is directed to providing users with access to electronic information relating to an operational system by presenting them with an interactive portal document comprising a schematic diagram of the operational system, **would understand that the claim uses the verb "to simulate" in the sense of "to imitate the appearance or character of" rather than "to produce a computer model of".** Indeed, **the expression "modifying at least one graphical element on the selected portal document ... to thereby simulate an operation of ..." has to be understood as meaning that some aspect of the operation of the selected element of the operational system is visually imitated by means of a modification to at least one graphical element.**

3.5 The kind of graphical element to be modified and how it has to be modified for there to be an "imitation of the appearance" of the operation of the operational element will depend on the selected operational element and its role in the operational system, which the claim does not - and need not - specify. The Board has no doubt that, given a particular operational system, **the skilled person would have had no difficulty in implementing, for each operational element to be simulated,** a suitable modification or series of modifications of one or more suitable graphical elements.

The claim includes the added detail that the modification of the at least one graphical element is "based upon the simulation graphical element that is selected and the operational electronic information". Hence, the operational electronic information includes information that - as the appellant has argued - is used to determine and carry out the required modification or modifications. **Since many obvious ways of structuring such information can be envisaged, the Board sees no reason why the claim or description should provide any**

further details on the operational electronic information, whether for the purpose of clarity of the claims or sufficiency of disclosure of the claimed invention.

3.6 As to the example referred to by the Examining Division, the Board notes that the claim is indeed not limited to one simple way of simulating an operational element and in fact encompasses elaborate simulations going beyond any of the examples disclosed in the application as filed. **But this in itself is not a problem of lack of clarity or insufficiency of disclosure. In fact, it is normal for a claim to define the scope of protection in terms that positively define the essential features of the invention.** Any particular embodiment falling within the scope of the claim may have further characteristics that are not mentioned in the claim or disclosed in the application (and could even constitute a patentable further development).

In the present case, any method falling within the scope of claim 1 includes a step of modifying at least one graphical element to thereby simulate an operation of at least one operational element. This simulation may be very elaborate but may also be very simple. **The contribution of this step to the claimed invention is essentially that some simulation takes place, not that such simulation is made possible for the first time.** Given at least one operational element of an operational system, **the skilled person would have no difficulty in implementing some simulation in the form of at least one modification to at least one graphical element. The contribution made by the step is therefore sufficiently disclosed.**

3.7 Hence, the Examining Division's reasons for refusing the main request are unconvincing.

T 0947/14 (Auswählen von Daten für eine Speicherung/VODAFONE)
of 22.11.2019

European Case Law Identifier: ECLI:EP:BA:2019:T094714.20191122

Vorrichtung zum Auswählen von Daten für eine Speicherung

Mangelnde Offenbarung der Erfindung - (nein)

Anmeldenummer: 09169683.1

IPC-Klasse: G06F 11/14

Name des Anmelders: Vodafone Holding GmbH

Kammer: 3.5.01

<https://www.epo.org/law-practice/case-law-appeals/pdf/t140947du1.pdf>

1. Der Kerngedanke der Erfindung besteht darin, die Gesamtheit der möglicherweise zu sichernden Daten in Datenelemente und Dateneinheiten aufzuspalten. Dabei sind die Dateneinheiten mit einem ersten Merkmal versehen und die Datenelemente mit einem zweiten Merkmal. Unter Berücksichtigung der Maximaldauer, welche für die Sicherung vorgesehen ist, bestimmt das Auswahlmittel, ob ein oder mehrere Dateneinheiten und/oder ein oder

mehrere Datenelemente übermittelt werden können. Basis für diese Auswahl ist die Bestimmung einer anzunehmenden Sendedauer aus der zur Verfügung stehenden Datenrate - auch als Übertragungsrate oder Datenübertragungsrate bezeichnet - sowie der Gesamtmenge der zu sichernden Daten. Als Datenrate wird dabei im Rahmen der Erfindung jene Rate bezeichnet, mit der eine digitale Datenmenge innerhalb einer Zeiteinheit über einen Übertragungskanal übertragen wird (vgl. Seite 3, letzter Absatz der Beschreibung der Anmeldung).

2. Die angefochtene Entscheidung ist auf einen **Einwand mangelnder Offenbarung nach Artikel 83 EPÜ gestützt**, wobei in der mündlichen Verhandlung **vor der ersten Instanz und in der Entscheidung lediglich behandelt wurde, ob die Auswahlsschritte für die Dateneinheiten und Datenelemente in der Beschreibung der Patentanmeldung ausreichend offenbart sind**. Weitere Einwände unter Artikel 83 und Artikel 84 EPÜ wurden in der mündlichen Verhandlung nicht diskutiert (vgl. Punkt 5.6 der angefochtenen Entscheidung).

3. Die Prüfungsabteilung argumentiert im Wesentlichen, dass in der Beschreibung keine Offenbarung zu finden sei, wie viele bzw. welche Dateneinheiten im ersten Auswahlsschritt ausgewählt werden sollen, wenn mehrere Dateneinheiten die höchste Priorität haben. Darüber hinaus fehle auch eine Offenbarung, wie viele bzw. welche Datenelemente im zweiten Auswahlsschritt aus den bereits zuvor ausgewählten Dateneinheiten ausgewählt werden sollen, wenn mehrere dieser Datenelemente die höchste Priorität haben. Anspruch 1 bzw. 7 gebe lediglich an, dass jeweils wenigstens eine solche Dateneinheit oder wenigstens ein Datenelement ausgewählt werde (vgl. Punkt 4.4 der Entscheidungsgründe). Die **Funktionsweise der Erfindung werde lediglich anhand eines einzigen simplen Ausführungsbeispiels erklärt** (mit Bezugnahme auf Figur 1 und Beschreibung, Seite 12, Zeile 15; Seite 13, Zeile 6), wobei die Daten in nur zwei Dateneinheiten mit unterschiedlichen Prioritätsmerkmalen unterteilt seien und jede der beiden Dateneinheiten in nur zwei Datenelemente mit unterschiedlichen Prioritätsmerkmalen weiter unterteilt seien. **Dadurch lasse sich die Funktionsweise, die anhand des sehr einfachen Ausführungsbeispiels klar zu sein scheine, nicht ohne weiteres auf den gesamten Bereich des beanspruchten Verfahrens übertragen. Insbesondere sei nicht ersichtlich, wie eine geeignete Kombination von Dateneinheiten auszuwählen sei, die innerhalb des durch die Maximaldauer vorgegebenen Zeitintervalls gespeichert werden kann** (vgl. Punkte 4.5 bis 4.7 der Entscheidungsgründe).

4. Zunächst ist festzustellen, dass der Wortlaut von Anspruch 1 sowohl für Dateneinheiten als auch für Datenelemente vorsieht, dass mehr als eine Einheit ausgewählt werden können ("der wenigstens einen ausgewählten Dateneinheit (110,110)") und "das wenigstens eine ausgewählte Datenelement (120,120)"). Auch sind Mehrfachvergaben gleicher Prioritäten möglich. Dies ergibt sich unter anderem aus der Beschreibung (siehe Seite 9, zweiter Absatz):

...

5. Somit **entnimmt der Fachmann, anders als in den Figuren mit dem vereinfachten Ausführungsbeispiel, dass auch mehr als ein Datenelement ausgewählt und übertragen werden soll und dass zwei Datenelemente das gleiche Merkmal aufweisen können, welches zur Auswahl geführt hat**. Mithin sind Mehrfachvergaben gleicher Prioritäten für unterschiedliche Datenelemente offenbart. Aufgrund der erfindungsgemäßen Lehre schließt der Fachmann

daraus, dass gleiches auch für Dateneinheiten gilt. Somit ergibt sich bei verständiger Würdigung der zitierten Passage der Beschreibung, dass eine Auswahl aller Dateneinheiten oder aller Datenelemente mit zugewiesenem ersten bzw. zweiten Merkmal höchster Priorität erfolgt.

6. Auch sind Beispiele für die Auswahl der ersten und zweiten Merkmale genannt (Größe, Datenrate, Netzwerktyp) und somit sind dem Fachmann Wege für ein mögliches Auswahlverfahren aufgezeigt (entgegen Punkt 5.11 der angefochtenen Entscheidung). Dass eine Auswahl bzw. Priorisierung von Dateneinheiten bzw. Datenelementen anhand subjektiver Kriterien durch einen Benutzer erfolgt, steht der Ausführbarkeit der beanspruchten Auswahlsschritte nicht im Wege (entgegen Punkt 4.8 der angefochtenen Entscheidung). Dies stellt entgegen der Auffassung in der angefochtenen Entscheidung (vgl. Punkte 4.1 und 7.2(b) der Entscheidung) für die Kammer auch kein Klarheitsproblem dar (Artikel 84 EPÜ).

7. Die angefochtene Entscheidung irrt in der Annahme, dass es für die Ausführbarkeit erforderlich sei, eine geeignete Kombination von Dateneinheiten auszuwählen, die innerhalb des durch die Maximaldauer vorgegebenen Zeitintervalls gespeichert werden kann (vgl. Punkt 4.7 der Entscheidung). Eine solche einschränkende Auswahl ist erfindungsgemäß gar nicht erforderlich. Der Fachmann entnimmt der Anmeldung, wie verfahren werden kann, wenn nicht alle ausgewählten Datenelemente übertragen werden können. In diesem Fall erfolgt eine Unterbrechung mit Neustart. Die Aufgabe der Erfindung, nämlich eine Reduktion der Datenmenge, wird damit immer noch gelöst, denn es werden weniger als alle Datenelemente übertragen, indem Dateneinheiten mit niedriger Priorität nicht übertragen werden (in Übereinstimmung mit der Beschwerdeführerin, vgl. Punkt 5.10 der angefochtenen Entscheidung). Vorteilhaft erfolgt eine Anpassung der Priorisierung, wodurch die Effizienz weiter gesteigert werden kann. Eine solche Anpassung erfolgt dabei derart, dass durch entsprechende Prioritätsvergabe nur noch bisher nicht gespeicherte Datenelemente ausgewählt werden und im Rahmen der Sendung an die Speichereinheit übermittelt werden (vgl. zitierte Passage in Punkt 4 oben).

8. Der Fachmann entnimmt den ursprünglichen Anmeldungsunterlagen somit zumindest einen Weg zur Ausführung der beanspruchten Auswahlsschritte für Dateneinheiten und Datenelemente, mit dem die Erfindung im gesamten beanspruchten Bereich ausgeführt werden kann. Die Erfordernisse des Artikels 83 EPÜ sind diesbezüglich erfüllt. Der Einwand, auf den die Zurückweisung der Anmeldung in der angefochtenen Entscheidung gestützt wurde, kann daher nicht aufrecht erhalten werden, da die Beschreibungsseiten die erforderlichen Informationen zur Verfügung stellen.

T 1170/15 (Image processing of hand gestures for issuing commands / Sony) of 23.10.2019

European Case Law Identifier: ECLI:EP:BA:2019:T117015.20191023

Image processing for issuing commands

Inventive step - auxiliary request (yes)

Inventive step - non-obvious modification

Application number: 08252314.3
IPC class: G06F 3/01, G06F 3/03
Applicant name: Sony Corporation

Board: 3.5.05

<https://www.epo.org/law-practice/case-law-appeals/pdf/t151170eu1.pdf>

Claim 1 of the sixth auxiliary request reads as follows:

"An imaging processing method for an image processing apparatus, the image processing method comprising the steps of:

supplying captured images frame-by-frame to a frame buffer (32);

reading captured images from the frame buffer and detecting a first gesture of a user's hand as a trigger and detecting a second gesture of a user's hand as a second trigger within a predetermined period of time after the detection of the first trigger, and supplying to a feature point extraction unit (122) first area information of said images corresponding to the first trigger, and supplies second area information corresponding to the second trigger;

extracting, by the feature point extraction unit (122), a feature point corresponding to a hand of a user in said images defined by said first area information, and extracting a feature point of a hand of a user in said images defined by said second area information,

performing control, based on the current positions of the feature points, to cause a display means (13) to display feature-point pointers (141, 142) indicating the current positions of the feature points in the captured images and predetermined user interfaces (151, 152);

recognizing feature points that are indicated by the feature-point pointers grabbed with a user's hand;

reading, following the step of recognizing, consecutive frames of the captured image from the frame buffer (32) and calculating the optical flow of each feature point to recognize the current position of each feature point;

issuing for each of the feature points, based on the recognized position of the feature point in the captured image, a command corresponding to the position of the feature point, or issuing a command for each of the feature points based on the motion of the feature point from the optical flow of the feature point corresponding to a predefined motion,

said command corresponds to the user interface (151, 152) that is being displayed at the position of the feature point, and

wherein the predetermined user interfaces are shared by the plurality of feature points."

Reasons for the Decision

1. The invention as described uses augmented-reality techniques for supporting user interaction with a device. It concerns an "image processing apparatus" with a camera which captures images of one or more users and which can be controlled by the user by gestures made with the user's hand "in the real world". Those gestures are captured by the camera and translated into commands to control the apparatus.

2. Prior art

Document D1 discloses a user interface for appliances having a display, e.g. a computer, a word processor or a television, which recognizes and simultaneously displays the shape and move of the hand of an operator, and in which the user gestures control the appliance (abstract).

As the user faces the recognizing means of the interface apparatus and shows a hand, "a special shape corresponding to the shape of the hand" and its motion are displayed on the screen. A virtual switch or the like displayed on the display screen can be "selected" by a hand gesture. The display object displayed on the screen "can be grabbed or carried depending on the purpose". In this way, "a very simple manipulation of appliance is realized" without requiring a mouse or another input device

6. Patentability

6.1 Document D1 forms a suitable starting point for inventive-step analysis. It is common ground that this document does not disclose first and second gestures of a user's hand, first and second triggers and two feature points according to a first and second area information.

6.2 Additionally, document D1 does not disclose that "the calculating the optical flow of each feature point to recognize the current position of each feature point" takes place "following the step of recognizing" (claim 1, last paragraph on page 66).

In this regard, the board holds that pointing out one finger of a user's hand (D1, Figures 8 and 10(A), column 9, first eight lines) corresponds to the first gesture and first trigger as claimed, while gripping the hand to form a fist (Figure 10(B), column 9, lines 9 to 11) corresponds to the grabbing with a user's hand. From these passages, in particular from column 9, lines 6 to 11, it is apparent that immediately after the detection of a hand pointing out one finger, an arrow cursor is moved on the display. Furthermore, after the detection of a hand forming a fist, an instruction is given to the computer, but the cursor is not moved afterwards.

Differently, according to claim 1, the recognition of the current position of each feature point and the displaying of feature-point pointers is performed following the recognition of a grabbing gesture.

6.3 Document D1, in the fourth embodiment, discloses grabbing and subsequent movement of a virtual object (column 22, lines 8 to 27). However, in this embodiment the cursor is also moved on the screen before grabbing is detected, in order to approach the virtual object

(column 14, lines 4 to 12). Hence, this part of document D1 does not anticipate the claimed features referred to in section 6.2.

6.4 Document D5 pertains to a virtual mouse driving apparatus which processes gestures based on two-handed gesture information obtained by a video camera. D5 discloses the determination of a selection gesture and the moving of an object so selected (page 3, paragraph 29). Before the selection gesture is recognized, a cursor is moved according to the movement of the right hand and following a pointing gesture (*ibidem*). Therefore, document D5 does not disclose the distinguishing features set out in section 6.2.

6.5 That "the calculating the optical flow of each feature point to recognize the current position of each feature point" takes place "following the step of recognizing" leads to the technical effect of reduced computational effort because the movement of the hand is only detected following, and not before, the recognition of the grabbing gesture.

6.6 Therefore, the objective technical problem to be solved is how to modify the method known from document D1 to reduce the computational effort needed for detecting a hand's movement.

6.7 Facing this problem and considering the teaching of documents D1 and D5, the person skilled in the art would not arrive at these distinguishing features.

In both documents the displaying of a cursor which follows the movement of a hand is needed to inform the user about the position on which a fist gesture (D1) or selection gesture (D5) will take effect. Hence, the detection of the hand's movement before these gestures are recognized is indispensable for the user interaction disclosed in those documents. Consequently, the skilled person would not limit the detection of the hand's movement to the phase following the recognition of the grabbing gesture.

Moreover, the board is not aware of any common general knowledge which would lead the person skilled in the art to modify the method of document D1 accordingly.

6.8 For these reasons, the subject-matter of claim 1 involves an inventive step within the meaning of Article 56 EPC.

6.9 Independent claim 2 comprises all the features of claim 1. Therefore, the subject-matter of claim 2 involves an inventive step for the same reasons.

T 0973/15 (Summarising photos/CYBERLINK) of 24.7.2019

European Case Law Identifier: ECLI:EP:BA:2019:T097315.20190724

Systems and methods for summarizing photos based on photo information and user preference

Inventive step - (no)

Inventive step - mixture of technical and non-technical features

Application number: 09177618.7
IPC class: G06F17/30
Applicant name: CyberLink Corp.
Cited decisions: T 0643/00

Board: 3.5.07

<https://www.epo.org/law-practice/case-law-appeals/pdf/t150973eu1.pdf>

Claim 1 reads as follows:

"A method for generating a summary of photos from a plurality of received photos (115) taken by a digital camera (107), characterized by the steps of:

classifying the received photos (115) into at least two categories according to predefined attributes, wherein the predefined attributes comprise face information;

receiving through a controller on a user interface one or more criteria for generating a summary of photos according to a user preference, wherein the one or more criteria comprises a target ratio of photos for the categories in the summary of photos, wherein the target ratio comprises a specified percentage of photos for the categories that makes up a target number of summary photos;

selecting from among photos in each of the categories according to received criteria;

and

generating the summary of photos by selecting one or more subsets of the selected photos for each of the at least two categories."

Invention

2. The present application concerns the generation of a summary of photos from a plurality of received photos to assist a user in organising and searching through a large volume of photos. This is particularly useful when more photos covering an increasing number of events are continuously added to an individual's archive (see paragraphs [0002] and [0003] of the application as filed).

2.1 The summary of photos is generated by classifying received photos into categories according to predefined attributes, selecting photos from among the photos in each category and generating an album, which corresponds to the summary of photos, for displaying the selected photos. The photos are selected on the basis of a user specified target ratio, or percentage of the number, of photos for each of the categories in the summary of photos (paragraphs [0004] to [0006], claim 8 as filed).

2.2 The categories can relate, for example, to whether the photos are indoor, outdoor, night or day photos or whether the photos comprise geographic location, time, food, photo quality or

photos of scenery; the categories can also be based on the presence of a plurality of individuals, only a single individual, or a specific individual (claim 4 as filed).

In some embodiments a time analysis is performed to cluster the photos in groups which are later on used for selecting photos for the photo summary (paragraphs [0030] and [0031]).

Inventive step - claim 1

3. Document D6 discloses a method for extracting a predetermined number of images from a large amount of image data to create a photo album (abstract, paragraphs [0047] and [0048]). The image data is stored in folders, one for each category (paragraph [0050]). In each folder, the image data is stored **in chronological order** (abstract, paragraph [0050]). To create a photo album, the images are divided by date into a predetermined number of groups. The user may specify the number of images to be extracted from each group or the number of images for creating the album (paragraphs [0093] and [0098]). Then a number of images is extracted from each group and the extracted images are arranged in an album (paragraphs [0053], [0074], [0075] and [0093], Figure 2).

During the oral proceedings, the appellant argued that document D6 only taught building groups of images on the basis of time information, which was very different from the invention. **Face information could not be used to summarise data**. However, the Board disagrees that the method of document D6 is very different from the present invention. In document D6, as in the method of claim 1, the photos are classified into categories for the same purpose of creating a photo album.

3.1 In the decision under appeal, the subject-matter of **claim 1 was considered to differ from the method of document D6** in that

(a) the predefined attributes (on the basis of which the photos are classified) comprise face information; and

(b) the criteria (for selecting photos) comprise a target ratio, i.e. a specified percentage of photos for each of the categories in the summary of photos.

In the statement of grounds of appeal, the appellant, on the one hand, recognised that features (a) and (b) were the features distinguishing the claimed invention from the disclosure of document D6 (see point III.1 of the statement of grounds of appeal and page 2 of the minutes of oral proceedings before the Examining Division). On the other hand, the appellant argued, under point 2 of the statement of grounds of appeal, that document D6 did not disclose the features of the characterising part, which includes all the steps of the claimed method, and that the objective technical problem was to provide a method and system to allow the user to automatically create a summary of photos from a large collection of photos based on individual user preferences.

These **arguments of point 2 of the statement of grounds of appeal are not convincing**. The method of document D6 includes steps of classifying photos, receiving criteria, selecting photos and generating a summary. It allows the user to generate a summary of photos based on individual user preferences, as explained in point 3 above. The Board therefore confirms

the appealed decision's novelty analysis and agrees that features (a) and (b) are the distinguishing features.

3.2 In the oral proceedings, the appellant argued that the distinguishing features were technical. The appellant gave an example of a method to control a blisterstrips packaging machine to create blisterstrips with specific ratios of pills with different colours, for instance, 30% white and 70% blue, by automatic detection of the pills with different colours. There was no difference between choosing a percentage of pills with a specific colour and a percentage of photos containing or not containing faces. It was not clear why a method based on recognising pills with different colours should be considered technical but not the invention.

These arguments are not persuasive. Document D6 already discloses a method of generating a photo album with a specified number of images from each group of images. **Thus, whether the claimed method is technical as a whole is irrelevant.** The distinguishing features are not comparable with the example given by the appellant because claim 1 does not specify how photos are classified according to face information. Moreover, the Board has not decided, and does not have to decide, which features of such a method of recognising pills would be considered to make a technical contribution and why. Therefore, no conclusion can be derived from comparing the present invention with such a hypothetical case.

3.3 At the oral proceedings, the appellant cited decision T 643/00 of 16 October 2003 in support of the technical character of the distinguishing features.

In decision T 643/00, an arrangement of images was considered to be determined by technical considerations aimed at enabling the user to search and select an image in a computer system (see reasons 6 and 15 to 18). The same rationale does not apply in the present case because the automatic selection based on some criteria is already known from document D6, and the photos are not arranged to provide a more efficient search tool in an interactive process as in the case underlying decision T 643/00. Claim 1 does not specify steps of using the summary of photos once it is generated, and the selection of photos is arbitrary within a category. The summary of photos is used for presentation to the user, and **distinguishing feature (a) contributes only to the non-technical purpose of adapting the presented photo album to the preferences of a user or audience. Feature (b) regards the non-technical aspect of expressing the distribution of elements of different categories and is an obvious alternative to a feature of the method disclosed in document D6.** In particular, it is well known that a distribution of elements across different categories can be specified by either the absolute number of elements in each category, as is done in the method of document D6, or by the percentage of elements in each category, as described in feature (b).

The appellant also argued that the two distinguishing features had the surprising synergistic effect of allowing the user to create individual slide shows, photo books and intelligent photo albums which could not be created before and which could be automatically created in different ways for different audiences.

However, in the present invention, the **decision of which photos to include in a photo album is determined by non-technical considerations regarding which type of photos different persons like to see and which photographic content should be presented to different audiences.** The claim does not specify any non-obvious details of an

implementation of the distinguishing features. **There is no synergistic effect, especially not a technical one.**

The distinguishing features do not contribute to the technical character of the claimed invention and cannot contribute to inventive step.

3.4 Consequently, the subject-matter of claim 1 is not inventive (Articles 52(1) and 56 EPC).

T 1372/11 (Issuing machine and issuing system/SATO) of 24.10.2018

European Case Law Identifier: ECLI:EP:BA:2018:T137211.20181024

Issuing machine and issuing system

Inventive step - server-side authentication of hardcopy certificates based on combination of random pattern and cryptographic checksum (yes

Inventive step - non-obvious combination)

Application number: 06011945.0

IPC class: G06Q30/00

Applicant name: Sato, Michihiro

Board: 3.5.01

<https://www.epo.org/law-practice/case-law-appeals/pdf/t111372eu1.pdf>

1. Background

1.1 The invention concerns an issuing system including a plurality of issuing machines for locally and cost-effectively selling, generating, and printing hardcopy certificates for newly-issued securities which are unmodifiable and unforgeable. Each of the issuing machines can also redeem hardcopy certificates and identify whether it is one which was previously issued by an issuing machine of the system.

1.2 Looking at Figure 1 and paragraph [124], a customer uses an issuing machine (ASD) 105 to specify a purchase transaction and identify himself, e.g. by an ID read from a recording medium 106, see paragraphs [94, 97], such as a payment or credit card, see paragraph [68]. The issuing machine sends these details to the issuing institution (ASD host) 101, which computes and returns a cryptographic checksum. The issuing machine then prints out a hardcopy certificate 107 (Figure 15) with details of the transaction and the checksum, see paragraph [124]. The hardcopy certificate is printed on paper with an embedded random pattern, which is recorded by scanning the certificate before issuing it to the purchaser. This scan is sent to the issuing institution for storage, see paragraph [143].

1.3 The terminal can check the validity of the hardcopy certificate by scanning it and comparing the checksum and the random pattern with the stored versions, see paragraph [147]. Such a check occurs when a customer inserts a hardcopy certificate to "sell" or to

redeem it. The checksum makes the certificate "unmodifiable" because any change to the information on the printed certificate can be easily detected, see paragraph [73], while scanning the random pattern makes it "unforgeable" because the printed certificate cannot be easily duplicated with conventional means, see paragraph [74]

2. Article 56 EPC

2.1 Despite the above-mentioned clearly technical aspects of the invention and associated means in the securities issuing machine of the claims, the Search Division issued what was in the Board's opinion a questionable no-search declaration under Rule 45 EPC. After amendment, the division introduced document D1, which concerns printing unforgeable MOT certificates for tested cars.

2.2 In D1, the government Vehicle Inspectorate Data Centre 101 with a central server 104 and a database 105 is connected to a vehicle testing centre issuing machine 102 with a terminal 106 and printing means 108 which includes a barcode scanner. A MOT certificate is a hardcopy certificate with a printed message authentication code (MAC) in the form of a barcode. The MAC is generated by the central server 104 by encrypting with a secret key the vehicle and test data and a unique serial number read from the barcode of the blank MOT certificate. The authenticity of the certificate can be checked at a Post Office by reading the barcode and checking that the MAC corresponds to a MAC generated locally using the vehicle and test information encrypted with the secret key, which is known to the Post Offices [29].

2.3 Claim 1 as amended before the Board differs from D1 by the printing of the random pattern on the hardcopy certificate, and the storage of the random pattern and checksum on the server. Furthermore, there is a centralised verification of the certificates by the issuing institution rather than a local check at the terminal 112 of the Post Office, which is not connected to the issuing institution of the certificate. The subject-matter of claim 1 is therefore novel over D1 (Article 54 EPC).

2.4 While it could be argued that a more efficient way of checking the MAC of a certificate would be achieved by connecting the terminal 112 to the central server 104 in order to realise a centralised verification of the MAC, **based on common general knowledge, there is no incentive to print a random pattern on an MOT certificate, to store this random pattern at the server and to implement a centralised check based on checksum and random pattern.** These two features represent **additional steps which are not obvious to the person skilled in the art.** The Board therefore judges that the subject-matter of **claim 1 involves an inventive step over D1 (Article 56 EPC).**

3. D2 and D3 were introduced by the Board under Article 114(1) EPC in reaction to the argument of the appellant that the MOT certificates of D1 do not correspond to the claimed hardcopy certificates (grounds of appeal, page 9, first paragraph).

3.1 D2 was cited in the search report of the USPTO available on 5 July 2006, prior to the date when the European (no-)search report was drawn up. D2 concerns the printing of unforgeable and unmodifiable certificates for money orders at an ATM or POS terminal, as well as their

redemption. It represents therefore the closest prior art. Each certificate comprises a security label in the form of a printed 2D barcode provided by a service centre.

3.2 In detail, D2 discloses an issuing institution 16, 18 which is connected to an issuing machine, comprising a receiving means and an information retrieving means as well as an input means as part of an input/output section 10 (column 4, lines 9 to 34; column 5, lines 18 to 38), a transaction processing means 12, 14, a computing means 12 and a printing means 20 to print out a hardcopy certificate 22 and a computed cryptographic checksum 24 (column 4, lines 23 to 55), as well as a scanning means 70 as part of the input/output section 10 and determining means to determine whether the hardcopy certificate was issued "by" the securities issuing institution (column 4, line 56, to column 5, line 5). For redeeming certificates, they are scanned and visually verified and thereafter destroyed (column 9, lines 17 to 41, and column 10, lines 18ff.).

3.3 The method of **claim 1 differs** in that:

(random pattern) "the **hardcopy certificate further includes a random pattern**";

(combined check) "**said scanning means scans said hardcopy certificate with the random pattern prior to providing said hardcopy certificate to the purchaser**, wherein said scanning means scans the hardcopy certificate inserted by a holder, wherein the determining means determines whether the hardcopy certificate is valid by checking that the subsequently scanned cryptographic checksum scanned by the issuing machine matches the computed cryptographic checksum computed in the securities issuing institution, and the subsequently scanned hardcopy certificate contains the random pattern."

(remote check on a server) "wherein the **conveying means conveys the result of the scan of the scanning means to the securities issuing institution for storage, the conveying means conveys the result of the subsequent scan of the scanning means to the securities issuing institution**, wherein the computing means and the determining means is in the securities issuing institution."

3.4 The first difference (pattern) defines an additional security element for a hardcopy certificate. It leads to an **improved certificate as an additional security characteristic to protect it against forgery**. It may be self-identifying for a visual check, for example.

The second difference (automatic combined check) defines an automated check of a certificate where a checksum is validated, but also the random pattern. This **improves the accuracy of validation checks**.

The third difference (remote check on server) defines a centralised storage of information and a centralised validation check which leads to a **more efficient system where certificates can be redeemed at various locations different from the location where they were bought**.

3.5 The **objective technical problem** stemming from these three differentiating features can be formulated as **how to provide unforgeable and unmodifiable documents which can be redeemed with an improved validation at various locations different from the location where they were bought**.

3.6 D3 also addresses the problem of providing unforgeable and unmodifiable documents, including stock and bond certificates (page 1, third paragraph, paragraph bridging pages 3 and 4). It is also a sort of reservoir of a variety of prior art techniques that have been used to address these aims in different ways, mostly presented as single solutions in isolation from the other approaches. It discloses, page 44, second last and last paragraph, pages 45 and 46, bridging paragraph, pages 46 and 47, bridging paragraph, various kinds of security measures against counterfeiting, such as, serial number encoding in machine readable form as magnetic ink, barcodes, 2D barcodes, random patterns of magnetic toner, codes having multiplicity of complexity levels and invisible security features.

3.7 Thus D3 proposes an additional security element (pattern) and the person skilled in the art would adapt the generation of the print image of D2, column 8, lines 31 to 43, to include a random pattern, and adapt the validation check, D2, column 9, lines 17 to 34, to include the random pattern in the authentication check.

3.8 In D2 the decoded cryptographic information is displayed, column 9, lines 17 to 23, for a visual check, presumably by a human, as disclosed further down in line 38. There is no disclosure in D2 that the decoded information is checked with previously stored information (automatic combined check). D2 goes rather in the other direction: a service center 16 acts as an independent third party, column 4, lines 28 to 34, to generate the security identification to be printed on the certificate, but it is not involved in the authentication and verification of a certificate, which would imply that the security information is stored and provided to the issuing machine for the validation check. Similarly, although D3 discusses checks of patterns, checks of checksums, e.g. the passage bridging pages 35 and 36, it does not clearly disclose all of these in combination with scanning of the hardcopy on production at the terminal.

3.9 **Concerning a remote check on server, there is no incentive to move away from a local authentication in D2**, see column 9, lines 17 to 23, line 38 and 54, where a representation of an encoded image is displayed at the kiosk and compared to the money order itself. Furthermore, while D3 discloses an online authentication, page 46, second and third paragraph, pages 50 and 51, bridging paragraph, the disclosure remains too general and refers to the logging of security risks. The on-line technique, disclosed in the bridging paragraph of pages 35 and 36, works on remotely stored information of a whole document, such as a hash code. A stored image pattern is not transmitted (e.g. conveyed) for security reasons.

3.10 The **claimed combination of the above features goes a step further by explicitly combining two specific security characteristics and a server-based authentication, namely during issuing, the printing of a hardcopy certificate, the scanning of it to retrieve security information (cryptographic checksum and random pattern) and the storage of this information on a server, and then during redemption a subsequent scan to authenticate it based on a cryptographic checksum and random pattern.**

3.11 Although the person skilled in the art may retrieve some of these features from D3, the Board judges that **this is not a straightforward case of partial solutions to partial problems** because the solutions are not clearly disclosed individually or in the claimed combination. The Board therefore judges that **such a combination would only be possible with hindsight.**

T 0697/17 (SQL extensions/MICROSOFT TECHNOLOGY LICENSING) of 17.10.2019

European Case Law Identifier: ECLI:EP:BA:2019:T069717.20191017

SQL language extensions for modifying collection-valued and scalar valued columns in a single statement

Patentable invention - computer implemented invention
Patentable invention - technical character of the invention
Patentable invention - (yes)

Application number: 04779537.2
IPC class: G06F 17/30
Applicant name: Microsoft Technology Licensing, LLC

Cited decisions: G 0003/08, T 0208/84, T 0107/87, T 0119/88, T 1194/97, T 0049/99, T 0641/00, T 0258/03, T 0424/03, T 0154/04, T 0388/04, T 1242/04, T 1351/04, T 1227/05, T 1569/05, T 0756/06, T 1784/06, T 1025/08, T 1500/08, T 1954/08, T 1003/09, T 1358/09, T 1414/10, T 1902/10, T 2230/10, T 1463/11, T 1965/11, T 2035/11, T 2539/12, T 0650/13, T 2330/13, T 0336/14, T 0489/14, T 0598/14, T 0817/16, T 1924/17

Board: 3.5.07

<https://www.epo.org/law-practice/case-law-appeals/pdf/t170697eu1.pdf>

Claim 1 of the main request reads as follows:

"A method of updating values in a complex structured type column having a hierarchical structure in a relational database system, wherein the complex structured type consists of a set of fields, properties and methods and wherein each field or property is one of a scalar type, a complex structured type itself or a multiset in which each element is a complex structured type, the method comprising the steps of:

parsing by a parser a database modification statement and producing a description of changes to the database proposed by the database modification statement;

producing by a query optimizer an execution algorithm that will implement the database modification;

computing by a query execution engine that uses the execution algorithm a data structure of the database modification statement to determine which values within a complex structured type column are to be updated, wherein the data structure represents values in the complex structured type column as an aggregation of changes to the values at any level of the hierarchical structure of the complex structured type column; and

applying by the query execution engine the changes to the values in the complex structured type column that are to be updated."

Invention

2. The invention concerns a relational database system and a corresponding method for updating values in a complex-structured-type column. According to the description, the purpose of the invention is to achieve complex and partial updates efficiently (see paragraph [0001] of the international publication).

2.1 A complex structured type consists of a set of fields, properties and methods, wherein each field or property can be a scalar type, a complex structured type itself, or a multiset in which each element is a complex structured type (paragraph [0019]).

2.2 The database system of the invention uses a nested extension of the SQL UPDATE statement which supports the modification of collection-valued columns using syntax and semantics analogous to those of the conventional UPDATE statement (paragraphs [0007] and [0026] to [0028]). As explained in paragraph [0009], the system "includes a parser that parses a database modification (query) statement and produces a logical description of changes to the table as specified by the UPDATE statement, a query optimizer that produces the execution algorithm that will perform the modifications, and finally a query execution engine that implements the execution algorithm".

2.3 In order to modify collection-valued columns, the execution algorithm uses a data structure named "change descriptor". The change descriptor "represents an aggregation of changes to the values in the collection-valued column and the location of the values to be updated in the hierarchy of the complex structured type column". It aggregates all changes, both scalar and collection-valued, into a single value. The query execution engine "reads the change descriptor and applies the changes as described by it to the collection-valued columns in addition to using simple scalar updates for the scalar valued columns" (paragraphs [0009] and [0010]).

2.4 According to paragraph [0010], the change descriptor "enables the efficient application of multiple updates at various granularity levels in a single operation", "enables the implementation of efficient index maintenance algorithms" and "has the benefit of separating the computation of the changes from their application itself (known as Halloween Protection)".

...

3.2 In the decision under appeal, the Examining Division was of the opinion that the subject-matter of claim 1 in its entirety described a purely abstract method. The wording of the claim did not describe the method as one that was "technically realised (e.g. computer implemented)", nor did it mention any "technical entities (e.g. a computer, a processor, etc.)". Moreover, the non-technical features did not contribute to the technical character of the invention.

3.4 According to the established case law, a claim directed to a computer-implemented invention avoids exclusion merely by explicitly mentioning the use of a computer, a computer-readable storage medium or other technical means.

...

In decision T 388/04 (OJ EPO 2007, 16), subject-matter or activities that are excluded from patentability under Article 52(2) and (3) EPC were considered "to **remain so even where they impl[ie]d the possibility of making use of unspecified technical means**" (reasons 3). But **that is not the case where the claimed subject-matter does not only merely "imply the possibility of making use of unspecified technical means" but in fact clearly implies the use of concrete technical means**. For example, in decision T 650/13 of 2 October 2018 the board considered that the method of claim 1 was not excluded because "transmitting the symbol in a code word to a decoder" implied the use of technical means (reasons 6.1).

3.5 In the decision under appeal, the Examining Division argued that claim 1 merely enumerated a number of logical entities, for example a "relational database system" and a "parser", fulfilling a certain logical functionality.

The **Board finds the Examining Division's assessment to be incorrect**. Claim 1 defines a "method of updating values in a complex structured type column ... in a relational database system" including steps performed by modules of a database system. **Claim 1 therefore defines a method performed in a relational database system**. In principle, the **terms used in a claim should be given the common meaning they have in the relevant technical field**. In computer science, the term "relational database system" relates to a software system implemented in one or more computers for storing, controlling and processing data. Carrying out a method performed in a relational database system involves the use of a computer system. Therefore, **the claimed method cannot be seen as a purely abstract method**, as argued by the Examining Division, but as a method which uses technical means.

In this context, the Board notes that **describing a technical feature at a high level of abstraction does not necessarily take away the feature's technical character**. As explained in opinion G 3/08, reasons 10.8.5, 10.8.7 and 10.13, the feature "computer-readable storage medium" has the technical effects of being computer-readable and of storing data, even if a more concrete technical implementation is not specified. **Such a feature does not lose its technical nature just because it is too generic or "functionally defined"** (G 3/08, reasons 10.8.7), or commonly known (see T 258/03, reasons 4.3).

Finally, the Board notes that there are several examples in the case law in which **features of a database system have been considered as technical aspects when assessing inventive step** (see e.g. T 1242/04, OJ EPO 2007, 421, reasons 3.2 and 4.3; T 1025/08 of 19 April 2013, reasons 2.12; T 1500/08 of 4 November 2011, reasons 5.9 and 5.10; T 1414/10 of 23 March 2015, reasons 4.9 and 4.10; and T 1924/17 of 29 July 2019, reasons 9 and 11 to 11.8).

3.6 The **Board therefore disagrees with the Examining Division's assessment and is in no doubt, especially in view of the established case law, that the subject-matter of claim 1 must be considered an invention in a field of technology** within the meaning of Article 52(2) and (3) EPC.

3.7 The same applies to independent claim 10, which is directed to a relational database system and defines features corresponding to those of claim 1, and to the dependent claims. It follows that independent claim 10 and dependent claims 2 to 9 and 11 to 19 also claim an invention in a field of technology within the meaning of Article 52(2) and (3) EPC.

4. Inventive-step assessment of mixed-type inventions

4.1 In the decision under appeal, the Examining Division further assessed the inventive step of a hypothetical claim 1 limited to a technical implementation of the method, starting from a general-purpose computer (points 10.1.1.2 to 10.1.1.2.7). According to the contested decision, the Examining Division applied the problem-solution approach for claims comprising technical and non-technical features as described in the Guidelines for Examination, G-VII, 5.4.

4.2 Inventive step can be based only on features that contribute to the solution of a technical problem bringing about a technical effect (T 641/00, OJ EPO 2003, 352, reasons 4 to 6). Features which are non-technical when taken in isolation but which interact with technical features of the invention to solve such a technical problem should be taken into account in assessing inventive step (see e.g. T 208/84, OJ EPO 1987, 14, reasons 4 et seq.; T 154/04, OJ EPO 2008, 46, reasons 5 (F) and (G), and 13 to 15; T 1227/05, OJ EPO 2007, 574, reasons 4; G 3/08, reasons 12.2.1 and 12.2.2). **In assessing a claim it is therefore important to avoid missing any such features that contribute to a technical effect** (T 756/06 of 18 April 2008, reasons 5 and 6).

As mentioned in some decisions, in practice it may be difficult to distinguish between features making a technical contribution and those not contributing, especially in cases in which the non-technical aspects are tightly intermingled with the technical features (T 154/04, reasons 15) or in which "an invention may have technical aspects which are hidden in a largely non-technical context". **Such technical aspects may be easier to identify within the framework of the examination as to inventive step** (T 258/03, reasons 3.6 and 5.8).

4.3 The problem-solution approach to examining mixed-type inventions described in the Guidelines, section G-VII, 5.4, in the current version and in the version of 2015 prior to the contested decision, is based on a "two-level technicality analysis". In a first step (i) of the approach, features are classified as either contributing or not contributing to the technical character of the invention on the basis of the technical effects achieved in the context of the invention. In step (ii) a suitable starting point is selected as the closest prior art with a focus on (or "based on" in the 2015 version) the features contributing to the technical character (Guidelines, G-VII, 5.4 (ii)). And in step (iii) the differences over the closest prior art are identified and further examined. In particular, the technical effects of these differences, in the context of the claim as a whole, are determined in order to identify the distinguishing features which make a technical contribution.

The Guidelines also explain that, due to the complexity of the task, the classification in step (i) may be performed on a first-glance basis ("prima facie" in the 2015 version) only and that the **analysis in step (iii) may "reveal that some features considered in step (i) at first glance as not contributing to the technical character [...] do, on closer inspection, make such a contribution"** (Guidelines, G-VII, 5.4, third last paragraph).

In step (iii) the distinguishing features are identified with regard to all claim features, not only those previously identified as contributing to the technical character. All the distinguishing features are then analysed to identify those making a technical contribution, on the basis of which the objective technical problem is formulated.

In the problem-solution approach as described in the Guidelines, the two-level technicality analysis provides a review in step (iii) of the classification in step (i) of a feature as not making a technical contribution. **It is important to apply the two-level technicality analysis correctly in order to avoid errors in classifying features with regard to technical contribution.** In addition, *if the technical and non-technical features closely interact, the starting point in step (ii) should in principle be selected with all claim features in mind, even if the focus is on those identified as contributing to the technical character.*

Since the result of the classification of features with regard to technical contribution in step (i) is reviewed in step (iii), it could be argued that step (i) is unnecessary. The Board nevertheless agrees that it is useful, for instance in order to direct the search for relevant prior art, to perform a preliminary classification of features contributing to the technical character as a first step where the classification may be performed only on a preliminary basis, especially in complex cases in which the non-technical aspects are tightly intermingled with the technical features.

According to established case law, either a "conventional approach", starting with a selection of the prior art, or an approach relying on an initial analysis of the technical character of the claim features may be adopted depending on the circumstances (T 258/03, reasons 3.5 and 3.6; T 756/06, reasons 5; G 3/08, reasons 10.13.2).

5. Assessment of technical contribution

5.1 In the decision under appeal, the Examining Division was of the opinion that the subject-matter of claim 1 neither defined a technical purpose nor involved any technical considerations. In its inventive-step reasoning, the Examining Division dismissed the technical effects allegedly achieved by the invention without further analysis, merely arguing that effects stemming from the algorithmic definition of a method did not define a technical character of the corresponding features (point 10.2.4 of the decision under appeal). The Examining Division cited passages of the Guidelines referring to decision T 1954/08 of 6 March 2013, reasons 6.2 (which refers to T 1227/05, reasons 3.2.5), according to which "(the sole) processing speed was not a suitable criterion for distinguishing between technical and non-technical method steps since it was always possible to conceive of a slower algorithm than the one claimed" and similarly, that "the sole amount of memory a computer-implemented algorithm requires is equally unsuitable for determining whether or not a method step contributes to the solution of a technical problem since it is always possible to imagine an algorithm demanding more memory".

The Examining Division's argument may be that implementing a "non-technical scheme" on a computer can never be technical because any technical effect produced will be the result of the non-technical scheme.

5.2 General principles

5.2.1 Some decisions have held that in certain circumstances program performance improvements may be unsuitable for distinguishing between technical and non-technical features, and that technical character is assessed without regard to the prior art. For example,

according to T 1784/06 of 21 September 2012 (which cites T 1227/05), "[e]nhanced speed of an algorithm, as compared to other algorithms, is not sufficient to establish a technical character of the algorithm" (T 1784/06, reasons 3.1.2). And decision T 2230/10 of 3 July 2015 (reasons 3.6) reads:

"the determination of the claim features which contribute to the technical character of the invention is made, at least in principle (the question may in practice be left open for features which anyway are part of the closest prior art), without reference to the prior art (see T 154/04, supra, as explained in T 1358/09 of 21 November 2014, reasons 5.4). That the claimed invention might achieve better results than the method of document D1 is therefore in itself not an indication that the algorithmic modification is technical, although it may be important in the assessment of inventive step once technicality has been established. Technicality is hence more about control of technical parameters than about improvement."

5.2.2 The proposition that the issue of "contributing to the technical character" may be determined without reference to the prior art does not imply that technical effects over the prior art never play a role in the process of determining which features make a technical contribution.

More recently this Board considered in T 817/16 of 10 January 2019 (reasons 3.12) that "**if non-technical claim features interact with technical claim features to cause a physical effect over the prior art**, such as an effect on memory usage in a general-purpose computer, **the physical effect is to be regarded as a technical effect for the purpose of assessing inventive step if the non-technical features are based on technical considerations aimed at controlling that physical effect** (see e.g. decisions T 2230/10, reasons 3.8; and T 2035/11 of 25 July 2014, reasons 5.2.3)".

In addition, since **a non-technical feature can only be considered to make a technical contribution if it interacts with the technical features of the invention to solve a technical problem, bringing about a technical effect, it is legitimate to establish the technical contribution of a feature by analysing the effect caused once it is added to the other features of the invention.** Decision T 336/14 of 2 September 2015 affirms that "in the assessment of whether or not a feature provides a technical contribution, the feature shall not be taken by itself, but its technical character shall be decided by the effect it brings about after being added to an object which did not comprise that feature before" (reasons 1.2.2, referring to T 119/88, OJ EPO 1990, 395, reasons 4.1).

5.2.3 With regard to the role of program performance improvements in distinguishing between technical and non-technical features, the Examining Division's a priori reluctance to recognise some effects as technical is not convincing. From none of the above cited decisions can it be concluded that execution time, processing speed, latency, amount of memory required or other such program performance measurements are per se non-technical measurements which cannot play a role in establishing a technical effect and determining whether a technical contribution is present. The above cited decisions merely teach that **an improvement with regard to one of those performance measurements alone ("the sole", "not sufficient", "in itself"), is insufficient to establish technical character.** In order to **decide whether such an improvement is a technical effect it has to be further determined how the improvement is achieved**, for instance *whether it is the result of technical*

considerations (T 258/03, reasons 5.8; T 1358/09, reasons 5.5) *regarding the functioning of the technical context of the invention* (e.g. computer, system, process, transmission channel).

Features that purposively use technical means to achieve such an improvement are technical.

In other words, features make a technical contribution if they result from technical considerations on how to for instance improve processing speed, reduce the amount of memory required, improve availability or scalability, or reduce network traffic, when compared with the prior art or once added to the other features of the invention, and contribute in combination with technical features to achieve such an effect (see also T 1924/17, reasons 21 to 22). In particular, the Board considers that *such an effect on computing efficiency corresponds to a physical effect mentioned in the above-cited passage of decision T 817/16, reasons 3.12, or a change in a physical entity* within the meaning of T 208/84, reasons 5 and 7 (see also interlocutory decision T 489/14, OJ EPO 2019, A86, reasons 11).

On the other hand, **such effects and the respective features are non-technical if the effects are achieved by non-technical modifications to the underlying non-technical method or scheme (for example, a change of the business model, or a "pure algorithmic scheme", i.e. an algorithmic scheme not based on technical considerations).**

Furthermore, **a change in the quality of a program in terms of the user preferences or other subjective criteria in principle do not give indications of a technical contribution.** For example, decision T 598/14 of 6 November 2014, reasons 2.4, did not recognise **query enhancement** (meant as modifying the original user query to obtain semantically "better results"), as a technical effect because it **relied on a semantic distinction and the concept of "better search" was subjective** in the context of retrieval based on semantic similarity.

5.2.4 A possible test for determining whether non-technical features are based on technical considerations is to consider whether the non-technical features would have been formulated by a technical or by a non-technical expert (T 817/16, reasons 3.12). Since computer programming involves technical and non-technical aspects (G 3/08, reasons 13.5.1; T 1463/11 of 29 November 2016, reasons 21), it is difficult to apply that test to distinguish abstract algorithmic aspects from "technical programming" aspects. In that case, the test would have to be whether the features were determined by a "programmer as such" or by a "technical programmer". It may therefore be preferable to directly determine whether the decision to adopt the non-technical features is a technical one (T 1463/11, reasons 21) or whether it required "technical considerations beyond 'merely' finding a computer algorithm to carry out some procedure" (G 3/08, reasons 13.5).

5.2.5 Several decisions of the boards of appeal have considered subject-matter or features which on their own are excluded to nonetheless contribute, in combination with technical features, to the solution of a technical problem bringing about a technical effect. In some of those cases, the relevant technical effect corresponded to one of the above-mentioned efficiency measures.

According to decisions T 650/13 and T 107/87, a compression algorithm contributes to the technical character of the claimed compression method if it is used for the purpose of

reducing the amount of data to be stored or transmitted (T 650/13, reasons 6.3 and 6.4; T 107/87 of 26 April 1991, reasons 3).

Decisions T 1003/09 and T 1965/11 considered that the cost-based optimisation of a query in a relational database system normally had technical character (T 1003/09 of 29 April 2015, reasons 13.3 to 13.5; T 1965/11 of 24 March 2017, reasons 5.1). In particular, decision T 1965/11 found that such a cost-based query optimisation searched for low-cost query execution plans using a cost estimate for the computer resources (such as CPU, main memory or hard disk) needed to execute a query plan, and therefore involved further technical considerations relating to the internal functioning of the computer system (T 1965/11, reasons 5.1 and 5.3).

Even though data structures used to store cognitive data are not considered to contribute to the technical character beyond the mere storage of data, data structures used for functional purposes are considered to contribute to producing a technical effect (see e.g. T 1194/97, OJ EPO 2000, 525, reasons 3.3 or T 424/03 of 23 February 2006, reasons 5.2). In decision T 49/99 of 5 March 2002 the deciding board ruled that information modelling was a non-technical intellectual activity, but that the purposive use of information modelling in the context of a solution to a technical problem could contribute to the technical character of an invention (reasons 7). An object table used for storing "a system catalog supporting the technical functions of the database system" had technical character (reasons 8 to 10). In decision T 1351/04 of 18 April 2007, an index file used for the purpose of controlling the computer "along the path leading to the desired data" was considered to contribute to the solution of a technical problem (reasons 7.2). In decision T 1902/10 of 21 June 2016, a RAM-based hash table of fingerprints of stored URLs was used, in the context of web crawling, to determine whether a URL already existed in a database of processed web pages. The hash table was considered part of the solution to the technical problem (reasons 19 to 22). In decision T 2539/12 of 18 January 2018, search indexes used to provide access to stored data were considered to contribute to the technical character of the claimed method (reasons 5.5). And in decision T 2330/13 of 9 May 2018 the specific choice of the claimed bit strings and matrices and respective operations was considered to be determined by technical considerations concerning how to efficiently perform in parallel the steps of a method for evaluating selection conditions, and hence was considered to contribute to the technical character of the claimed invention (reasons 5.7.9 to 5.8).

5.3 The independent claims

5.3.1 It is clear from the very language of claim 1 that the method steps are performed by components of a relational database system, namely a parser, a query optimiser and a query execution engine.

A database management system uses data structures, software components and processing techniques for storing, controlling and processing data, and for providing an interface to let the user create, read, update and delete data. The internal data structures, such as an index and a query tree, and components, e.g. a parser, a query optimiser and a query execution engine, are used purposively for storing data to a computer storage medium and retrieving data from the medium. As explained above, the established case law considers these to be technical effects (G 3/08, reasons 10.8.5; T 1569/05 of 26 June 2008, reasons 3.6). The data structures

used for providing access to data and for optimising and processing queries are **functional data structures** since they purposively control the operation of the database management system and of the computer system to perform those technical tasks. While a database system is used to store non-technical information and database design usually involves information-modelling aspects which do not contribute to solving a technical problem, the implementation of a database management system involves technical considerations. Therefore, **a database management system is not a computer program as such but rather a technical system** (see also decision T 1924/17, reasons 9, 13 and 14).

5.3.2 The subject-matter of claim 1 differs from standard relational database management systems in that it supports complex structured type columns. It may be questioned whether some aspects of providing complex structured type columns and deciding to support specific update operations on values of that type are technical, but **implementing those operations in a relational database management system which does not support that functionality is a technical problem.**

The claimed method solves that problem essentially by means of a data structure representing "values in the complex structured type column as an aggregation of changes to the values at any level of the hierarchical structure of the complex structured type column". It has to be established whether that data structure is used to control the computer to update data in the database management system and makes a technical contribution. The claim also describes how the different components of the relational database system compute and use the data structure to update the data. It has to be assessed whether these features contribute to solving a technical problem and whether they achieve the effects alleged by the appellant (see also point 2.4 above).

5.3.3 In its decision, the Examining Division expressed the view that the "execution algorithm" was a non-technical feature which served no technical purpose, but instead consisted of a number of steps concerning the logical structure of data stored in the database, said steps being based on logical definitions of update operations. It was argued that the feature did not serve a technical purpose, e.g. it was not directed to a physical implementation, and did not involve further technical considerations, e.g. taking account of physical properties of the technical system.

5.3.4 **In the Board's opinion, however, the "execution algorithm" contributes to the overall technical purpose of implementing the update operation on data stored and managed by the relational database management system and to the computation of the data structure representing "values in the complex structured type column as an aggregation of changes to the values at any level of the hierarchical structure of the complex structured type column" mentioned above, and therefore has to be considered in the inventive-step assessment.**

The Board does agree with the Examining Division that claim 1 provides a rather abstract description of the invention. Besides, many claimed features appear to be standard features of a relational database management system. **But the claimed features do make a technical contribution over a general-purpose computer.** Whether they are generic or well-known, or whether they are obvious in combination has to be judged in the context of an inventive-step assessment.

5.3.5 Since independent claim 10 is directed to a relational database system and defines features corresponding to those of claim 1, similar conclusions apply to claim 10.

6. Inventive-step reasoning of the contested decision

6.1 In the decision under appeal, the subject-matter of (a hypothetical) claim 1 was considered to lack inventive step over a general-purpose computer. That reasoning is not convincing.

Starting from a general-purpose computer, the skilled person would first have to add the technical functionality of a relational database system and **then add more features to it**. The **decision under appeal does not convincingly explain why it would be obvious for the skilled person starting from a general-purpose computer** to arrive at the claimed method in a relational database management system. Since **a general-purpose computer is not even remotely related to the specific problem of the invention and does not include any of the claimed features, it is not a realistic starting point for an attack on inventive step.**

6.2 In the contested decision, the subject-matter of (the hypothetical) claim 1 was also considered to be "rendered obvious by a number of prior-art documents" which related to "efficiently updating individual values of nested data objects within a table of a relational database". The contested decision merely cited some passages of two of those documents, documents D3 and D4, **but it did not explain why those passages were considered relevant for the inventive-step assessment.**

Even though the Board agrees that a document directed to such a problem is in principle an adequate starting point for the inventive-step assessment of the claimed method, the **written decision does not provide a detailed comparison of the claimed subject-matter with the disclosure of one of those documents in respect of any of the claims of any of the requests.**

The decision under appeal states that documents D3 and D4 "relate to essentially the same non-technical rationale involving efficiently updating individual values of nested data objects within a table of a relational database" (point 10.1.3). But **it identifies the distinguishing features only with regard to the claim features considered technical at first glance (instead of taking account of all the claim features, as required in step (iii) of the problem-solution approach described in the Guidelines; see point 4.3 above) and does not address the question of whether the distinguishing features are obvious or achieve technical effects such as those alleged by the applicant or mentioned in the application (see also point 2.4 above). Such an analysis is required for assessing whether the subject-matter of claim 1 is inventive.**

The decision under appeal therefore provides only a very incomplete inventive-step argumentation with respect to the aforementioned prior art.

6.3 The same applies to corresponding independent claim 10, which is directed to a relational database system, and to the dependent claims.

6.4 Hence, **the Board does not find the inventive-step objections set out in the appealed decision persuasive. A general-purpose computer is not a promising starting point for assessing inventive step in the present case.** With regard to the assessment on the basis of

documents D3 and D4, the cursory considerations in the contested decision do not represent reasoning on the basis of which the Board could consider the issue of inventive step.

...

7.4 On the basis of the reasoning in the decision under appeal, the Board cannot establish whether documents D3 and D4 are the relevant documents, as argued by the appellant. It notes, however, that in the inventive-step objection raised in the first communication, the first examiner considered the aim to support nested collections to be non-technical, but treated the other features as technical features. Document D3 was considered to be the closest prior art and the first examiner was of the opinion that other documents, including D4, were relevant for the question of inventive step. There is hence no reason to believe that the search, which was performed by the same examiner, did not cover all the features potentially making a technical contribution, nor that an additional search is necessary.

7.5 **The Board does not uphold the ground for refusal on the basis of Article 52(2) and (3) EPC, and none of the lines of reasoning of the decision under appeal can serve as a basis for considering the issue of inventive step.** In view of that, and in spite of the long duration of the proceedings thus far, the case is to be **remitted to the department of first instance for further prosecution** under Article 111(1) EPC. The Board recommends that the case be dealt with expeditiously.

T 2272/13 (Portable device inventory tracking/SAP SE) of 25.10.2019

European Case Law Identifier: ECLI:EP:BA:2019:T227213.20191025

Portable device inventory tracking

Inventive step - mixture of technical and non-technical features

Inventive step - technical features not properly assessed (yes)

Application number: 12157737.3

IPC class: G06Q10/00

Applicant name: SAP SE

Cited decisions: T 1242/04, T 1351/04, T 0270/05, T 0578/06, T 0690/06, T 1411/08

Board: 3.5.01

<https://www.epo.org/law-practice/case-law-appeals/pdf/t132272eu1.pdf>

Claims 1 of the main request read as follows:

1. A computer-implemented method for enabling a user of a mother device (102) to track one or more satellite devices (104) that are in a short range communication with the mother device (102), wherein respective identity information is assigned to the one or more satellite devices

(104), wherein the mother device (102) and the one or more satellite devices (104) are portable devices, wherein the short range communication comprises a Wireless Local Area Network communication, the method comprising at the mother device:

- storing the identity information on the mother device (102), thereby registering the one or more satellite devices (104);
- sending a reachability request (210) to each of the registered one or more satellite devices (104) by using the short range communication; wherein sending the reachability request (210) is performed according to at least one rule configured on the mother device (102), wherein the at least one rule comprises sending the reachability request in predefined time intervals; and
- alerting the user if at least one satellite device (104) of the one or more satellite devices (104) does not respond to the reachability request (210).

1. Background of the invention

1.1 The invention concerns portable inventory tracking which addresses the problem of tracking personal belongings, so that if they are lost they can be found again. In addition to tracking personal belongings, one may wish to track data stored on a portable device (see page 2, first paragraph of the originally filed application).

1.2 Claim 1 is for a computer-implemented method that enables a user of a portable mother device, e.g. a mobile phone, to track one or more portable satellite devices, e.g. a wallet or a backpack, that are in a short range communication, e.g. via Wireless Local Area Network (WLAN) communication, with the mother device (see page 4, lines 10 to 25).

1.3 Each satellite device is registered with its identity information, e.g. its serial number, on the mother device which sends at predefined time intervals a reachability request to the registered satellite devices and informs the user if a satellite device does not respond (see page 13, lines 10 to 24 and page 14, last paragraph).

2. Article 56 EPC

2.1 **The Board does not agree with the examining division that the features "storing", "sending" and "alerting" of claim 1 are per se non-technical prescriptions of an inventory scheme. These features have within the context of claim 1 clearly technical character.**

2.2 The examining division identified the non-technical process, see decision paragraph 12.1, to be a "generic method of tracking the proximity of things which can be within a short range of a central authority, in a manner similar to a parent's surveillance of his offspring or of a person's tracking of his belongings".

However, **this analogy fails even on a business level**. A parent obviously knows the identity of his or her children and would not require them to register with him or her. The same would apply for his or her belongings.

2.3 Neither the Board nor the appellant disputed that it is common general knowledge that portable devices can be connected by short range WLAN communication. It may further be assumed that it is common general knowledge that each of the devices is identified within the wireless network, usually based on a device's unique MAC address and on an IP address attributed by the DHCP host of the wireless network.

But, in the Board's view, the use of WLAN communication for regular tracking of portable devices goes a technical step further and cannot, without further justification, be considered "notorious" or irrefutable in the prior art of data communication, as no such prior art was cited in the decision under appeal.

2.4 The appealed decision, paragraph 12.3, points out that the specification of WLAN communication in claim 1 does not solve a particular technical problem, because various protocols "are contemplated throughout the application are presented as being freely interchangeable" and concludes that the feature cannot contribute to inventive step.

2.5 The Board notes that the application indeed lists various options, including RFID, infrared, WLAN, Bluetooth and others, for example, on page 3, lines 27 to 30, for realising a "short range communication" between the mother device and satellite devices. However, in the Board's view it cannot be simply concluded that this feature would not contribute to inventive step simply by stating so without any reasoning why this would be the case.

2.6 Moreover, the Board does not rule out that, at the priority date of the application, it was common general knowledge to track satellite devices by reachability requests, sent to them from a mother device which is connected to the satellite devices via a WLAN. Since it was disputed by the appellant during the first instance proceedings as well as in the statement setting out the grounds of appeal, the existence of relevant common general knowledge needs to be proven by evidence.

2.7 In T 270/05, reasons point 6, the present Board in a different composition formulated the following legal principle: *If claimed subject-matter goes beyond what is "notorious", or essentially irrefutable, in the prior art, an (additional) search should be performed (cf. T 690/06, points 2 and 8) to establish the relevant prior art by which to judge the inventive step.* This is based on the generally accepted principle in proceedings before the European Patent Office that whoever raises an objection has the burden of proof for it, see, for example, T 578/06, point 21.

2.8 According to Rule 63(1) EPC 2000 the applicant has to be invited to file a statement indicating the subject-matter to be searched if the European Patent Office considers that the application fails to comply with the Convention to such an extent that it is impossible to carry out a meaningful search. Since, in the present case, such an invitation was not sent, the search examiner apparently considered it to be possible to carry out a "meaningful search" regarding the state of the art. The prior art was then rather seen to be so "notorious", see declaration in the search report, that no documentary evidence was found to be needed. The question then arises if the examining division should have provided written evidence when the "notoriety" of the prior art was challenged by the appellant.

2.9 However, since the **Board takes the view that the subject-matter of claim 1 of the main request is clearly and inherently technical, the statement given in the European Search Report that the "claimed subject-matter, with due regard to the description and drawings, relates to the automation of processes comprised in the list of subject-matter and activities excluded from patentability under Article 52(2) and (3) EPC", appears not to be justified.**

2.10 While it is legitimate to refuse an application for lack of inventive step where the objection is based on knowledge that was "notorious" or indisputably formed part of the common general knowledge (see T 1242/04, reasons 9.2), **in circumstances, such as in the present case, if the notoriety of the prior art was disputed, the existence of such notorious or common general knowledge needs to be proven by evidence.**

2.11 In this context the Board wishes to stress that **the term "notorious" has to be interpreted narrowly** (see: T 690/06 and T 1411/08) and **requires that the technical feature in question should be "so well known that its existence at the date of priority cannot be reasonably disputed" and that the "technical detail is not significant".**

2.12 In the present case, **the Board judges that the usage of short range communication WLAN for tracking devices in regular time intervals does not form part of the common general knowledge.** Therefore claim 1 of the main request and of the auxiliary request cannot be said to lack inventive step (Article 56 EPC) on this basis.

3. Thus, in reaction to the appellant's request that the decision of the examining division "not to perform a search", **the examining division should have performed one in response. Refuting this request with a simple statement that "the notoriety of such prior art cannot reasonably be contested" without providing any reasons, appears to be not in compliance with Rule 111(2) EPC, which requires that a decision has to be substantiated.**

4. According to Article 111(1) EPC the Board may exercise any power within the competence of the examining division or remit the case to that department for further prosecution. It is thus at the Board's discretion whether it examines and decides the case or whether it remits the case to the department of first instance.

5. Since the written prior art has not been assessed during the first instance proceedings and the purpose of appeal proceedings is to review the decision, in the Board's view it is appropriate to **remit the case to the first instance for performing a search and for further examination** on the merits of novelty and inventive step, as requested by the appellant on an auxiliary basis.