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**Datasheet for the decision
of 9 February 2023**

Case Number:	T 1632/19 - 3.4.03
Application Number:	11769597.3
Publication Number:	2558988
IPC:	G06Q10/00, G06F17/30
Language of the proceedings:	EN

Title of invention:
ASCRIBING ACTIONABLE ATTRIBUTES TO DATA THAT DESCRIBES A
PERSONAL IDENTITY

Applicant:
The Dun and Bradstreet Corporation

Headword:

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 13

Keyword:
Inventive step - main request - (no)
Amendments after summons - not all justified by possible
exceptional circumstances - raised new objections - not
admitted

Decisions cited:

Catchword:

Case Number: **T 1632/19 - 3.4.03**

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 9 February 2023

ppellant: The Dun and Bradstreet Corporation
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Decision under appeal: **Decision of the Examining Division of the**
                             European Patent Office posted on 8 January 2019
                             refusing European patent application No.
                             11769597.3 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman   T. Häusser
Members: M. Papastefanou
                    D. Prietzel-Funk

Summary of Facts and Submissions

I.   The appeal is against the decision of the examining
        division refusing the European patent application
        No. 11 769 597 (published as WO 2011/130526 A1) on the
        ground that the sole request before it lacked clarity
        (Article 84 EPC) and did not involve an inventive step
        (Articles 52(1) and 56 EPC).

II.   Reference is made to the following document, cited in
        the decision under appeal:
        D1: US 2009/0164454 A1

III.   At the end of the oral proceedings before the board,
        the appellant's (applicant's) requests were that the
        decision under appeal be set aside and that a patent be
        granted on the basis of the claims of the main request,
        filed with the statement setting out the grounds of
        appeal, or of the auxiliary request, filed with the
        letter dated 8 February 2023, or that the case be
        remitted to the examining division for further
        prosecution. The appellant further requested that the
        expert declaration filed with the letter dated
        8 February 2023 be admitted into the proceedings.

IV.   Claim 1 of the main request, reads as follows:

        A method comprising:
        *(a) receiving an inquiry (103) to initiate a search for
            data concerning a specific individual;*
        *(b) extracting, from said inquiry (103), an attribute
            that is relevant to a search of a reference
            database (110), wherein said inquiry (103)
            includes an inquiry value for said attribute;*

(c) obtaining, from a first table, a weight that is indicative of aa [sic] relative impact of said attribute in finding a match to said inquiry in said reference database;

(d) obtaining, from a second table, a number of records in said reference database that have said inquiry value for said attribute;

(e) modifying said weight based on said number of records in said reference database that have said inquiry value for said attribute, thus yielding a predictive weight for said attribute, where $K = W \times F$, where K is said predictive weight, W is said weight, and F is said total number of records;

(f) setting K_1 <field1> = K, wherein said attribute is a first attribute;

(g) repeating operations (b) through (e) for a second attribute through an N_{th} attribute, thus yielding K_2 <field2> through K_N <fieldN>;

(h) establishing a function that characterizes a relationship among said field1 through said fieldN as an indication of a degree of relationship of said field1 through said fieldN to said inquiry, wherein said establishing is performed prior to retrieving candidates for said match from said reference database;

(i) searching said reference database for said match, wherein said searching comprises:
retrieving from said reference database, based on said function, candidates having attribute values that indicate likely matches to said inquiry;
determining a best candidate from said candidates; and
returning said best candidate as said match;

(j) outputting said match; and

*(k) outputting an indicator of a level of confidence
    that said match is an appropriate match to said
    inquiry.*

V.   Claim 1 of the auxiliary request is worded as follows
        (added features with respect to claim 1 of the main
        request underlined by the board; numbering (i)-(v) by
        the board):

A method comprising:
*(a) receiving an inquiry (103) to initiate a search for
    data concerning a specific individual; <u>and
    wherein process (120) analyzes data to identify
    specific data fields that are associated to
    attributes in order to enhance the opportunity to
    identify matches from reference database (110) by
    using those data fields singularly or in
    pluralities, and
    wherein said attributes can be learned by
    updating with data from data fields (140) to
    include attributes that have not previously been
    recognized, to which predictive weighting and
    other information is defined to recognize not
    previously recognized attributes for future
    execution of said process (120) for said inquiry
    (103)</u>;*
*(b) extracting, from said inquiry (103), an attribute
    that is relevant to a search of a reference
    database (110), wherein said inquiry (103)
    includes an inquiry value for said attribute;*
*(c) obtaining, from a first table, a weight that is
    indicative of a relative impact of said attribute
    in finding a match to said inquiry in said
    reference database;*

(d) obtaining, from a second table, a number of records in said reference database that have said inquiry value for said attribute;

(e) modifying said weight based on said number of records in said reference database that have said inquiry value for said attribute, thus yielding a predictive weight for said attribute, where $K = W \times F$, where K is said predictive weight, W is said weight, and F is said total number of records;

(f) setting K_1 <field1> = K, wherein said attribute is a first attribute;

(g) repeating operations (b) through (e) for a second attribute through an N_{th} attribute, thus yielding K_2 <field2> through K_N <fieldN>;

(h) establishing a function that characterizes a relationship among said field1 through said fieldN as an indication of a degree of relationship of said field1 through said fieldN to said inquiry, wherein said establishing is performed prior to retrieving candidates for said match from said reference database; and

(i)   wherein said function (150) and/or f(x) is a listing of weighted attributes, where the weight of a particular attribute or combinations of attributes is indicative of a predictiveness, and therefore an importance, of that attribute or combinations of attributes in identifying an appropriate match to a record in said reference database (110); and

(ii)   wherein said predictiveness is a value of said function (150) and/or f(x) equal to a frequency of attribute multiplied by a weight and/or relative impact given to said attribute, which equals a value of K and/or

*said predictive weight of said attribute
and/or attributes; and*

(iii)   *wherein said value of K is a representation
of said established function that
characterises a relationship among said
field1 through said fieldN; and*

(iv)   *wherein said lower value of K would make
for a more effective and efficient search
to be performed to find and provide the
desired results; and*

(v)   *wherein said lower value of K would make
for a less effective and efficient search
if said function (150) and/or f(x) was
limited in the listing of weighted
attributes and therefore number relative to
predictiveness;*

(i) *searching said reference database for said match,
wherein said searching comprises:*
*retrieving from said reference database, based on
said function, candidates having attribute values
that indicate likely matches to said inquiry;
determining a best candidate from said candidates;
and
returning said best candidate as said match;*

(j) *outputting said match; and*

(k) *outputting an indicator of a level of confidence
that said match is an appropriate match to said
inquiry; and*
*wherein said indicator is feedback expressed in
three components: (1) Confidence Code, which
indicates the relative degree of confidence in
similarity between data fields (140) and
candidates in reference database (110); (2) Match
Grade String, which indicates the degree of
similarity between attributes of data fields
(140) and candidates in reference database (110);*

and (3) Match Data Profile which indicates the type of data in reference database (110) that was used in the match experience.

VI.   The appellant argued essentially that the defined function was directing the search algorithm to specific addresses in the computer's memory and, hence, it produced a technical effect. It should therefore not be considered a non-technical mathematical method. Regarding the admission of the auxiliary request, the appellant argued that the board had raised new objections for the first time in its preliminary opinion and it should be given an opportunity to respond. There were, thus, exceptional circumstances which justified the admission of the auxiliary request.

Reasons for the Decision

1.   The claimed invention

1.1   The claimed invention relates to searching an individual in a database. A user enters an inquiry comprising specific values for the attributes to be used in the search (e.g. name, address, telephone number, etc.; the attribute is e.g. the family name and the value is "Smith").

1.2   Before the search is carried out, the attributes are extracted from the inquiry and a weight is obtained from a table, the weight being indicative of the relative impact of the attribute in the search. For example, a first name would have a lower impact than the last name, because it is more probable that many people have the same first name than the same last

name. From a second table the number of records in the
database that have the same value for said attribute
(e.g. how many individuals with last name "Smith" are
in the database) is obtained. A predictive weight for
the attribute is calculated as product of the obtained
weight and number of records.

1.3   After such predictive weights are calculated for all
        the attributes in the inquiry, a function is
        established based on the results, and this function is
        used for the search in the database.

2.   Main Request, inventive step

2.1   It was common ground that D1 represented the closest
        prior art.

        D1 describes a system and a method for searching venues
        such as restaurants. The search is based on attributes
        such as venue-type, cuisine-type, price range, payment
        method, etc. (see paragraphs [0018] to [0034]). D1 uses
        in addition factors (corresponding to the weights of
        the present application) such as importance factor,
        uniqueness factor, prominence factor, etc. These
        factors are applied to the attributes (see paragraphs
        [0038] to [0040]). The "importance factor" *is used to
        specify the relative importance of an attribute among a
        set of attributes* ([paragraph 0041]). The "uniqueness
        factor" *is a measure of uniqueness of a particular
        attribute relative to other attributes. The uniqueness
        factor is venue-independent, but attribute-specific.
        For example 5,000 venues may exist in a database but
        only 500 of those venues may offer the "Karaoke"
        attribute. Accordingly ... the "Karaoke" attribute may
        be weighted by a uniqueness factor ... [1-500/5000]; or
        0.9* ([paragraph [0042]).

The "importance factor" is taken thus to correspond to the *weight that is indicative of a relative impact of said attribute in finding a match* (i.e. "W", see features (c) and (e)) of claim 1, while the "uniqueness factor" to the *number of records in said reference database that have said inquiry value for said attribute* (i.e. "F", see features (d) and (e)).

According to D1, the search is carried out first and then the results are weighted with the factors (see paragraphs [0046] and [0047]).

It was thus common ground that the difference between claim 1 of the main request and D1 lied essentially in the definition of the function and the modified weights and that the (modified) weights were applied before the search is performed in the database. In D1, the weights were applied after the search in the database has been carried out, in order to "filter" the results.

2.2   In the decision under appeal, the examining division held that the features relative to the calculation of the modified weights and the establishment of the function before the search was carried out related to a mathematical method which involved no technical considerations nor produced any technical effect. According to established case law and practice it would have been given to the skilled person for implementation in the method and system of D1, which they would have done without exercising any inventive skill (see points 14.8 to 14.12 of the Grounds).

2.3   According to the appellant, the features distinguishing the claimed method from D1 provided the technical

effects that (see statement of the grounds of appeal,
page 4, second paragraph):
-    there was a nexus between the operations such that
     (i) obtaining the weight, modifying the weight, and
     establishing the function were performed before the
     searching, and therefore (ii) the searching was
     performed after the obtaining, modifying, and
     establishing; and
-    by the modification step, the computer was
     technically controlled by being directed to a
     certain memory location.

The appellant argued further that the *obtaining,
modifying and establishing operations facilitate[d] the
act of searching. The resulting method of searching for
a record in a database that best matche[d] a given
inquiry therefore identifie[d] and select[ed] match
results in a more efficient and effective manner
compared with the specific prior art method as
disclosed by D1* (see *ibid.,* page 4, third paragraph).

2.4   Regarding the order of the operations, the board agrees
       that indeed there is a difference between the claimed
       method and D1.

       From the point of view of the user, however, there is
       no technical effect from the different order of
       operation. The user enters an inquiry based on specific
       attributes and receives the results of the search,
       which have been weighted using predetermined weights/
       factors. Whether the weighting is done before the
       search is executed or after has no effect on the final
       results of the search. The user receives the weighted
       results in both cases. So, the different order of
       carrying out the searching and the calculating/
       establishing the function does not provide any

technical effect itself.

2.5   The next question is whether the use of the predictive
          weights and the function according to claim 1 of the
          main request produce any technical effect.

2.5.1   As a first remark, the board notes that neither the
          claims nor the application as a whole provide any
          information about how the search is carried out using
          the function established based on the calculated
          predictive (i.e. modified) weights. Claim 1 mentions
          only "retrieving from said reference database, *based on
          said function,* candidates ..." (see feature (i)).

          According to the claims and the description, the
          attributes used for the search are weighted using the
          predictive weights (K). According to the board's
          understanding, in case of using e.g. the attribute
          "First name" and the value "John" this would mean that
          instead of the inquiry being "First name=John" it would
          be K times "First name=John", where K is a number
          (K=WxF), so for example 2500 times "First name= John".
          The application does not provide any information, how
          this search query is to be understood.

2.5.2   During the oral proceedings, the appellant explained
          that K was to be taken as an indication of the
          importance of the search term, and that it could be
          defined, for example, that if K were under a
          predetermined threshold (e.g. 150) the specific
          attribute/search term would not be taken into account.
          The search result would then be based only on
          attributes, which according to their corresponding
          predictive weights were considered important.
          Exceptions could be made when there was only one or
          very few attributes used in the search function and

omitting one of them would render the search impossible
or meaningless.

2.5.3   There is nothing in the application, however, that
        could support or hint at this explanation by the
        appellant. Moreover, it cannot be considered that such
        an understanding of the search function would be part
        of common general knowledge. In the board's view, the
        skilled person remains with no real information as to
        how to use the defined function in carrying out a
        search.

2.6   Moreover, the information provided in the application
        is contradictory or at least not clear. In paragraphs
        [0034] to [0047] the application describes how the
        predictive weights for the various attributes are
        calculated. This calculation is a multiplication of a
        predetermined weight for each attribute (see Table 4)
        with the frequency of the specific value of the
        attribute in the database (see Table 5). The function
        f(x) is a summation of the products of the respective
        multiplications for each attribute in the inquiry. It
        is to be understood that the higher the product/
        predictive weight ("K"), the more impact the specific
        attribute has in the summation and hence to the
        established function.

2.6.1   Paragraph [0048], however, provides contradicting
        information on this point. Comparing an example based
        on the first name "John" (which has a relatively low
        weight of 0.25 and a high frequency of 10.000;
        predictive weight K=0.25x10.000=2500) with the mobile
        number "1234567890" (which has a higher weight of 1 and
        a frequency of 1; predictive weighting K=1x1=1), the
        application concludes that *it appears that in f(x),
        first name "John" has a greater predictive weighing*

that mobile phone number "1234567890". However, based
on the actual logic that is executed, the lower f(x)
may be more predictive than the higher f(x).

2.6.2   The board notes that the application does not give any
        information regarding when it would be that the lower
        f(x) may indeed have a higher predictive weighting than
        the higher f(x). During the oral proceedings, the
        appellant explained that the establishment and the use
        of the function is left to the skilled person. The
        skilled person would select which attributes to include
        and which not and would also decide whether a low or a
        high f(x) is more predictive, and assess the results
        accordingly.

2.6.3   The board cannot accept this argument. Claim 1 defines
        that a function has to be established using the
        calculated predictive weights and this function is used
        in carrying out the search. It cannot be left to the
        skilled person to decide on a case by case basis, and
        without predetermined, unambiguous criteria when a low
        predictive weight is more important than a high
        predictive weight. Otherwise, the whole concept of
        establishing a function using calculated predictive
        weights would not have any purpose at all.

2.6.4   The board's conclusion is, thus, that the skilled
        person does not get any concrete information about how
        the function f(x) is actually established and used in
        the search. The appellant's assertions that the claimed
        method *facilitates the search* or that it provides for a
        more *efficient* and *effective* search are thus not
        supported by the application and remain mere
        allegations without proof, which the board cannot
        accept.

2.7   Regarding the second technical effect identified by the appellant (see point 2.3 above), the appellant, referring to the submitted expert's opinion, reiterated its argument that by the modification step, the computer was technically controlled by being directed to a certain memory location. Hence, there was a technical effect from the calculation of the predictive weights, and the related features should not be considered a mathematical method as such.

2.7.1   The board, for the sake of discussion, admits the expert opinion into the proceedings. It notes, however, that the opinion is rather general, stating that *the whole idea of the Search ... is to direct the attention of an algorithm into a large corpus of data. In this particular case, that corpus of data is held in memory, therefore, it is intuitively obvious for the skilled person that the search,* by the claimed features *relating to the recalculation of the weights before the Search is carried out, is directed to a specific address in the memory* (see last paragraph of the expert's opinion filed with the letter dated 8 February 2023; highlighting omitted by the board).

2.7.2   If it were to be accepted that any search instruction/ query directs the corresponding search algorithm to certain data, stored in specific memory locations, then any search query would produce a technical effect. Irrespective of whether it is true or not, this would be valid for the search in D1, as well.

        However, the relevant question is rather whether the calculation of the predictive weights and the use of the function f(x) as defined in claim 1 directs the algorithm to a different memory location. In other words, whether the recalculation of the weights and the

use of the function changes/affects the memory location
where the algorithm is directed to by the search
instructions. As explained above, the application does
not provide any information about how the function and
the recalculated ways are (to be) used in the search or
how they might affect the execution of the
corresponding search algorithm. The expert's opinion -
taken into account although it was late filed - does
not provide any relevant explanations, either. Hence,
the answer to the question, has to be negative.

2.8   Summarising, the board agrees with the examining
       division that the features distinguishing the claimed
       method from D1 are not technical, and would be given to
       the skilled person for implementation. As purely
       mathematical features, their implementation is
       considered obvious.

       The board's conclusion is that the subject-matter of
       claim 1 does not involve an inventive step (Articles
       52(1) and 56 EPC).

3.   Auxiliary request

3.1   The auxiliary request constitutes an amendment of the
       appellant's case which was filed after the board had
       issued the summons to oral proceedings. Whether it is
       taken into account is to be decided under Articles
       13(1) and (2) RPBA 2020.

3.2   The appellant argued that the auxiliary request was
       filed to address the board's objection that the
       application did not give any information regarding when
       it would be that the lower f(x) may indeed have a
       higher predictive weighting than the higher f(x). This
       objection was raised for the first time in the board's

preliminary opinion and constituted exceptional
circumstances in the sense of Article 13(2) RPBA 2020.
Since the auxiliary request addressed this objection,
it should be admitted into the proceedings.

3.2.1   Without going into the discussion on whether or not the
        identified objection was raised for the first time by
        the board and whether or not it constitutes exceptional
        circumstances, the board notes that claim 1 of the
        auxiliary request includes extensive amendments which
        do not relate to that particular objection. For example
        the features added in (a) and (k) (see point V. above)
        do not relate to that objection. Also the features
        added in (h), points (i), (ii) and (iii) do not relate
        to that objection, either.

        Hence, even if it were accepted that there were indeed
        exceptional circumstances, these circumstances would
        not justify the filing of all the amendments included
        in claim 1 of the auxiliary request.

3.3   The board refers also to the criteria under Article
        13(1) RPBA 2020 and notes that amended claim 1 raises
        prima facie several new objections, such as:

3.3.1   Point (ii) in feature (h) corresponds essentially to
        feature (e). Both features define the same subject,
        i.e. that K=WxF, albeit in different wording. This is
        against the requirements of clarity and conciseness
        (Article 84 EPC).

3.3.2   Point (iii) in feature (h) defines that "wherein said
        value of K is a representation of said established
        function **that** characterises a relationship among said
        field1 through said fieldN" (emphasis by the board).

It is not clear to what "that" refers to.
- If it refers to "said value of K" then it is in
  contradiction to the first sentence of feature (h),
  according to which the function (and not K)
  characterizes a relationship between said field1
  through said fieldN;
- If it refers to the "established function" then it
  repeats the definition of the first sentence of
  feature (h) in slightly different wording.
In either case, this feature does not fulfil the
requirements of clarity and/or conciseness (Article 84
EPC).

3.3.3 Points (iv) and (v) in feature (h) are not directly and
       unambiguously disclosed in the originally filed
       application. In particular, paragraph [0048], which
       describes an example of when a lower value of K may be
       more predictive than a higher one, does not provide the
       sufficient support for this feature, as it discloses no
       general criteria.

3.4   Regarding clarity, the appellant argued that even if
       features were repeated in the claim, they were clear to
       the skilled person. Any small differences in the
       wording between the newly added paragraphs and the
       existing ones in feature (h) served to better define K.
       In addition, the skilled person would understand that K
       and the function had the same importance.

       The board does not follow these arguments. Defining the
       same feature twice in the same claim with different
       wording does not help to define the feature better. On
       the contrary, it creates ambiguity to the skilled
       person as to what exactly this feature is supposed to
       mean. Even if the individual definitions were

considered to be clear themselves, this does not change the fact that there are two different definitions for the same feature in the same claim rendering the claim not clear and not concise in the sense of Article 84 EPC.

3.5   Regarding the disclosure in the originally filed application, the appellant acknowledged that there was not literal disclosure of points (iv) and (v). It argued however that for the skilled person who knew that logic had to be programmed according to personal wishes they were implicit in paragraphs [0048] and [0049]. In any case, it was the skilled person that would decide when a low value for K would be more or less effective.

        The board does not accept this argument, either. Paragraphs [0048] and [0049] describe an example when a low value of K may be more predictive than a high value. There is no hint of any general criteria that could be directly and unambiguously derived from those paragraphs and, more specifically, not the criteria defined in points (iv) and (v).

3.6   Summarising, the board does not take the auxiliary request into account under Articles 13(1) and (2) RPBA 2020 because not all the included amendments would be justified by exceptional circumstances (assuming there were such circumstances) and because it gives rise to several new objections.

4.   Regarding the request for remittal of the case to the examining division for further prosecution, the appellant did not put forward any reasons for such a remittal.

As the board does not see any such reasons, either, and since there is no allowable request on file on the basis of which the application could be prosecuted further, the board decides the case on its merits, pursuant to the powers conferred by Article 111(1) EPC.

5.   Since there is no allowable request on file, the appeal must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Sánchez Chiquero   T. Häusser

Decision electronically authenticated