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Datasheet for the decision
of 15 February 2017

Case Number: T 1451/11 - 3.5.07

Application Number: 09251223.5

Publication Number: 2113853

IPC: G06F17/30

Language of the proceedings: EN

Title of invention:
Method and system for database query term completion

Applicant:
Verint Systems Ltd.

Headword:
Database query term completion/VERINT SYSTEMS

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:

Catchword:

Case Number: **T 1451/11 - 3.5.07**

D E C I S I O N
of Technical Board of Appeal 3.5.07
of 15 February 2017

Appellant: Verint Systems Ltd.
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Decision under appeal: **Decision of the Examining Division of the**
                          European Patent Office posted on 21 February
                          2011 refusing European patent application
                          No. 09251223.5 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman   R. Moufang
Members: M. Jaedicke
                    M. Rognoni

Summary of Facts and Submissions

I.   The applicant (appellant) lodged an appeal against the
         decision of the Examining Division refusing European
         patent application No. 09251223.5.

II.   The Examining Division decided that the subject-matter
         of claims 1, 3 and 7 contained added subject-matter and
         that the subject-matter of all claims of the sole
         request on file lacked inventive step in view of the
         following document:

         D2:   Bast, Holger et al.: "Type Less, Find More: Fast
                Autocompletion Search with a Succinct Index",
                Proceedings of the 29th Annual International ACM
                SIGIR Conference on Research and Development in
                Information Retrieval, Seattle, Washington, USA,
                6 to 11 August 2006, pages 364 to 371,
                ISBN: 978-1-59593-369-0.

III.   With the statement of grounds of appeal, the appellant
         maintained its sole substantive request. The appellant
         requested that the decision under appeal be set aside
         and that the application proceed to grant.

IV.   In a communication accompanying a summons to oral
         proceedings, the Board expressed the provisional
         opinion that the subject-matter of independent claims 1
         and 7 of the sole request lacked inventive step in view
         of document D2.

V.   With a letter dated 13 December 2016, the appellant
         informed the Board that it would not be attending the
         oral proceedings and requested "a decision based on the
         correspondence to date".

VI.   Oral proceedings were held as scheduled, in the absence
        of the appellant. At the end of the oral proceedings,
        the chairman announced the Board's decision.

VII.   Claim 1 of the main request reads as follows:

        "A system for automatically providing a plurality of
        additional database query terms to a user, the system
        comprising:
        a user interface; and
        a processing system coupled to the user interface;
        wherein the user interface is configured to: receive a
        query term from the user and transfer the query term to
        the processing system;
        characterised in that
        the user interface is configured to: after receiving
        the query term, receive a plurality of characters from
        the user and transfer the plurality of characters to
        the processing system;
        and the processing system is configured to:
            perform a search of a database using the query
            term, resulting in a set of records from the
            database, wherein the database comprises records,
            and the records comprise text translated from
            audio;
            determine a plurality of additional query terms
            using the plurality of characters;
            process at least a portion of the set of records
            resulting from the search of the database to
            determine a relevance of each of the additional
            query terms to the query term; and
            transfer the plurality of additional query terms to
            the user interface for display to the user, in an
            order corresponding to the relevance of each of the
            plurality of additional query terms."

Claims 2 to 6 are dependent on claim 1. Claim 3 reads
as follows:

"The system of claim 1, wherein at least one of the
plurality of additional query terms is determined at
least in part based on a semantic relationship with the
query term."

Claim 7 of the main request reads as follows:

"A method for automatically providing a plurality of
additional database query terms to a user, the method
comprising:

receiving a query term from the user;

and being characterised by:

receiving a plurality of characters from the user after
receiving the query term;

performing a search of a database using a query term,
resulting in a set of records from the database,
wherein the database comprises records, and the records
comprise text translated from audio;

determining a plurality of additional query terms using
the plurality of characters;

processing at least a portion of the set of records
resulting from the search of the database to determine
a relevance of each of the additional query terms to
the query term; and

displaying the plurality of additional query terms to
the user for selection, in an order corresponding to

the relevance of each of the plurality of additional
query terms."

Claims 8 to 10 are dependent on claim 7.

VIII.   The appellant's arguments relevant to the decision are
         discussed in detail below.

Reasons for the Decision

1.   The appeal complies with the provisions referred to in
         Rule 101 EPC and is therefore admissible.

2.   *The invention*

2.1   The application relates to the field of database
         queries, and more specifically to the suggestion of
         additional database query terms to a user.

2.2   According to the technical background as described in
         paragraphs [0003] and [0004] of the application,
         operations such as contact centres may generate large
         databases of records containing text translated from
         audio data. For example, a contact centre may record
         each call initiated or received by the contact centre
         for later analysis. Typically, these recordings are
         translated from audio data to text data for storage and
         retrieval as records in a database.

         Database queries are used to access sets of records
         from the database, based on one or more query terms
         within the database queries. Commonly, a user enters a
         plurality of query terms into a user interface for the
         database system. For complex queries containing a large
         number of terms, this task may be complicated and
         difficult. Also, users unfamiliar with the contents of

the database may enter a query term without realising
that the use of other related query terms may improve
the quality and quantity of the set of records
retrieved from the database.

2.3   The invention concerns the autocompletion of an
       incomplete query term after a first search term has
       been entered. According to paragraph [0028] of the
       application, the prior-art systems do not consider the
       relevance of the suggested terms to the current search.
       By determining their relevance, the invention provides
       the user with the most relevant suggestions, while
       avoiding irrelevant query terms.

       To this end, the invention proposes to automatically
       provide a plurality of additional database query terms
       to a user. In order to define the user query, a first
       query term (for example "credit"; see description,
       paragraphs [0036] and [0044]-[0045]) and after that a
       plurality of characters (for example, "car") are
       received from a user (see Figure 5 of the application).
       These characters represent a possibly incomplete
       further part of a query. The query term is used to
       retrieve text records from a database, where the text
       was translated from audio data. For example, the
       records might contain text corresponding to telephone
       calls. The plurality of characters are used to
       determine a plurality of additional query terms
       (including for example the term "credit card") "in any
       of a very wide variety of methods" (see description,
       paragraphs [0039]-[0041]). The relevance of each of the
       additional query terms to the received query term is
       then determined by processing the text records
       retrieved from the database. The relevance may be
       determined using "any of a very wide variety of
       methods" (see description, paragraphs [0042]-[0045]).

Finally, the additional query terms are displayed to
the user in order of their determined relevance (see
Figure 5 of the application).

3.   *Added subject-matter – Article 123(2) EPC*

The Board agrees with the appellant that the subject-
matter of the claims meets the requirements of
Article 123(2) EPC (see the communication accompanying
the summons issued by the Board).

4.   *Inventive step – Articles 52(1) and 56 EPC*

4.1   The Examining Division refused claims 1 and 7 for lack
of inventive step over document D2. In the view of the
Examining Division, D2 disclosed all features of the
method of claim 7 except for the following feature:

"the records comprise text translated from audio".

The Examining Division argued that the origin of the
data was not a technical feature and was not the result
of technical considerations. Since no technical reasons
for the particular choice of text were apparent, the
Examining Division assumed that the choice was due to a
non-technical requirement, which could be legitimately
added to the technical problem as a constraint. In view
of this constraint, the method of claim 7 lacked
inventive step. The same applied, *mutatis mutandis*, to
the subject-matter of claim 1.

4.2   The closest prior art D2 discloses an autocompletion
method for a text retrieval system where the user
enters query terms (words or word beginnings) in a user
interface (see D2, section "1. Introduction" and
Figure 1).

For example, the user might enter the string
"conference sig" as input. The method of D2 would then
suggest possible completions for the last query term
"sig" which would lead to "good hits" in combination
with the first query term "conference".

4.3   Consequently, the closest prior art D2 discloses a
        method for automatically providing a plurality of
        additional database query terms to a user.

4.4   In the Board's opinion, D2 teaches *inter alia* the
        following: when the user types in characters, a search
        is performed using the characters. For example, when a
        first query term "conference" is typed, the method of
        D2 searches the database for records containing this
        query term. A search is done for every letter typed.
        This is explained in D2, section "1. Introduction", on
        page 364, right column, second full paragraph (emphasis
        added by the Board):

        "More informally, imagine a user of a search engine
        typing a query. Then with every letter being typed,
        we would like an instant display of completions of
        the last query word *which would lead to good hits*.
        At the same time, the best hits for any of these
        completions should be displayed. All this should
        preferably happen in less time than it takes to
        type a single letter. For example, assume a user
        has typed conference sig. Promising completions
        might then be sigir, sigmod, etc., but not, for
        example, signature, assuming that, although
        signature by itself is a pretty frequent word, the
        query conference signature leads to only few good
        hits."

When the user types the characters "sig" after entering
"conference" as query term, the process of D2 searches,
in the database records containing the first query term
"conference" (that is the records resulting from the
search for the first query term), for those records
containing also the string "sig" as a prefix of content
(finding for example siggraph, sigmod, sigir, etc).
This is for example disclosed in D2, caption of Figure
1, which describes an autocompletion example with
"conference sig proc" as input. D2 states that the
completions and hits for "proc" (corresponding to the
received characters in claim 7) would be from
the 185 hits for "conference sig" (corresponding to the
received query term in claim 7).

Document D2 discloses this technique of repeated
searches in the result of a database search for the
first received query term(s) on page 365, right column,
last line, to page 366, left column, line 5 and on
page 366, left column, section 2, second and third
paragraph, containing the "Definition 1" and its
exemplary illustration.

The application explains in paragraph [0039] that the
"additional query terms may be determined in any of a
wide variety of methods", and describes in paragraphs
[0040] and [0041] such methods based on different
concepts such as synonyms, stemming variations,
statistical information, semantic networks or lists of
terms. Moreover, it discloses in paragraph [0041] that
"additional query terms may be found within records in
the database by using the plurality of characters to
select a set of records from the database". This
specific method corresponds directly to the technique
disclosed in D2.

4.5   Consequently, D2 discloses the following steps (with
       comments from the Board linking these steps to the
       example from D2 discussed above):

       -    receiving a query term from the user (in the
            example of D2, the term "conference" is received as
            input);

       -    performing a search of a database using a query
            term, resulting in a set of records from the
            database, wherein the database comprises records,
            and the records comprise text (in the example of
            D2, the database is searched for the term
            "conference");

       -    receiving a plurality of characters from the user
            after receiving the query term (in the example of
            D2, the characters "sig" are received); and

       -    determining a plurality of additional query terms
            using the plurality of characters (in the example
            of D2, additional terms such as "siggraph",
            "sigmod", and "sigir" are determined).

4.6   D2 discloses also that the relevance of the determined
       additional query terms is evaluated. D2 proposes on
       page 364, right column, second full paragraph, "an
       instant display of completions of the last query word
       which would lead to good hits". Moreover, "the best
       hits for any of these completions should be displayed".
       In order to know what the best hits are, the relevance
       is determined by counting the number of hits in the
       results of the database search for the first entered
       query term(s), as shown in Figure 1 of D2: 16 hits for
       siggraph, 8 hits for sigmod, 4 hits for sigplan etc.
       The best completions are then displayed to the user in

order of their relevance.

The Board notes that according to paragraph [0042] of the description, the relevance of the additional query terms "may be determined using any of a wide variety of methods". Claim 1 specifies that "at least a portion of the set of records resulting from the search of the database" with the initial query term is processed. Hence, a search for an additional query term in the results of the search with the initial query term as disclosed in D2 falls under the wording of the claim.

4.7   Hence, in the Board's opinion, D2 discloses the following steps of the method of claim 7:

"processing at least a portion of the set of records resulting from the search of the database to determine a relevance of each of the additional query terms to the query term; and
displaying the plurality of additional query terms to the user for selection, in an order corresponding to the relevance of each of the plurality of additional query terms."

4.8   As a result of this analysis, the Board concludes that the method of claim 7 differs from the closest prior art D2 in that the database of claim 7 contains text translated from audio. The Board agrees in this regard with the contested decision.

4.9   The Board cannot see any functional interrelationship of this difference over D2 with the further features. The fact that the text was translated from audio has no influence on the technical functioning of the method. The claimed method operates in the same manner for text translated from audio or for text originating from

documents, for example. It is only important that the
database contains text data as compared to audio data
or image data, for example.

Moreover, claim 7 does not specify how the audio data
are translated into text. At the filing date, a
manually generated translation or an automatically
generated translation might have been possible. As the
claim is silent about the details of the translation,
it specifies only that the origin of the text in the
database is audio data.

4.10   In the Board's view, the technical problem to be solved
        can be formulated as how to use the process of D2 for
        audio data such as recorded telephone calls (see
        description, paragraph [0003]).

4.11   According to the technical background described in
        paragraph [0003] of the description, it was well known
        in the field to translate audio data to text data for
        storage and retrieval as records in a database. In the
        Board's opinion, it follows that a skilled person
        aiming to solve the problem identified above would
        immediately recognise that the audio data can be
        translated and stored as text data in the database in
        order to use the process of D2. Consequently, the
        solution proposed by claim 7 is straightforward.

4.12   The Board observes that the statement of grounds of
        appeal contains no argument in favour of inventive step
        based on the difference identified above.

5.   In the statement of grounds, the appellant submitted
        that there were at least three differences between the
        process of D2 and the method of claim 7.

5.1   The first alleged difference is that the claimed
        invention performs a search of a database using only
        the received query term, whereas the process of D2
        performed a search of a database using the received
        query term and the received characters in combination.

5.2   It is true that the process of D2 performs a search
        using the received query term (in the example of D2,
        Figure 1, the word "conference") and the received
        characters (in the example of D2, Figure 1, the
        characters "sig"). However, D2 also discloses a search
        using only the query term. In particular, D2 discloses
        in the caption of Figure 1 on page 365 that the search
        engine performs an implicit prefix search (emphasis
        added by the Board): "if, for example, the user
        continued typing **conference sig proc**, completions and
        hits for **proc**, e.g. **proceedings**, would be from
        the 185 hits for **conference sig**". The result of this
        implicit prefix search is computed when the last letter
        of the word is typed (see D2, page 366, left column,
        first, fourth and fifth paragraphs). For example, when
        the last letter of the word "conference" is typed, the
        search results for "conference" are computed. Moreover,
        the process of D2 processes the set of documents
        matching the query term (for example, "conference") to
        accelerate the search for the hits of the received
        characters (see D2, page 366, left column, lines 1 to
        5).

5.3   The second alleged difference is that the claimed
        invention determines a plurality of additional query
        terms using the plurality of characters, whereas
        document D2 determines the additional query terms (the
        suggested completions) using the plurality of
        characters and the first query term.

The Board agrees that document D2 determines the
additional query terms using the plurality of
characters and the first query term. However, the
method of claim 7 does not exclude this possibility
(see also the description, paragraphs [0041] and
[0042]), since the expression "using the plurality of
characters" does not exclude the first query term(s)
being used in addition.

5.4   The third alleged difference concerns the determination
of the relevance of the additional terms. According to
the appellant, the processing step of claim 7
determines the relevance of the additional query terms
based on the set of records retrieved using the first
query term, whereas the process of D2 determines the
relevance based on the hits associated with the
combination of the first query term and the additional
query terms.

As stated above, document D2 discloses determining the
relevance of the additional query terms by searching
the additional query terms in the text of the database
records retrieved using the first query term (see D2,
page 366, left column, lines 1-5 and section 2,
"Definition 1" in the same column). In order to
efficiently implement this search within a query
result, D2 even proposes a new index structure (see
abstract, section 3.2 and in particular page 368, right
column, first full paragraph).

5.5   Hence, in the Board's view, the alleged differences
between the method of claim 7 and the prior art D2 do
not exist.

6.   It follows that the method of claim 7 and the system of
claim 1, which corresponds in system terms to the

method of claim 7, lack inventive step (Articles 52(1)
and 56 EPC).

Conclusion

7.   As the appellant's sole request cannot form the basis
         for the grant of a patent, the appeal has to be
         dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Cañueto Carbajo   R. Moufang

Decision electronically authenticated