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

DECISION
of Technical Board of Appeal 3.5.07
of 15 February 2017

Appellant: Verint Systems Ltd.
(Applicant)
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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:


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