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Datasheet for the decision of 15 June 2020

Case Number: T 0565/17 - 3.5.07

Application Number: 14183888.8

Publication Number: 2849098

IPC: G06F17/30, G06F19/28

Language of the proceedings: EN

Title of invention:
Cross system analytics for in memory data warehouse

Applicant:
SAP SE

Headword:
Cross-system analytics/SAP

Relevant legal provisions:
EPC Art. 54(1), 54(2), 111(1)
RPBA 2020 Art. 11, 12(2)

Keyword:
Novelty - (yes)
Remittal to the department of first instance - (yes)

Decisions cited:
T 1966/16, T 2710/16, T 0731/17

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Beschwerdekammern

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Case Number: T 0565/17 - 3.5.07

D E C I S I O N
of Technical Board of Appeal 3.5.07
of 15 June 2020

Appellant: (Applicant)	SAP SE Dietmar-Hopp-Allee 16 69190 Walldorf (DE)
Representative:	Richardt Patentanwälte PartG mbB Wilhelmstraße 7 65185 Wiesbaden (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 12 December 2016 refusing European patent application No. 14183888.8 pursuant to Article 97(2) EPC**

Composition of the Board:

Chairman	R. Moufang
Members:	P. San-Bento Furtado
	C. Barel-Faucheux

Summary of Facts and Submissions

I. The appeal lies from the decision of the Examining Division to refuse European patent application No. 14183888.8 for lack of novelty in the subject-matter of the independent claims of the main request and of the auxiliary request over prior art document D1: US 2012/0259809 A1, published on 11 October 2012.

In *obiter dicta* the Examining Division expressed the opinion that the subject-matter of the dependent claims was not inventive.

II. In the statement of grounds of appeal, the appellant requested that:

- the contested decision be set aside and that a patent be granted on the basis of either the main or auxiliary request considered in the appealed decision;
- as a further auxiliary request, that the case be remitted to the Examining Division for further prosecution;
- as a further auxiliary request, that oral proceedings be held.

III. In a communication pursuant to Rule 100(2) EPC, the Board concurred with the appellant and expressed the preliminary opinion that the contested decision's reasoning was not convincing and that inventive step could not be denied on the basis of document D1 alone. The Board invited the appellant to indicate whether it agreed to a remittal without first holding oral proceedings.

IV. With a letter of reply the appellant agreed to remittal for further prosecution without holding oral proceedings.

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

"A method for implementing a data warehousing analysis application on at least a first and a second data table, the data warehousing analysis application comprising one or more programs for performing analysis operations, the method comprising:

- providing an in-memory database system (100) comprising one or more database views (110, 112), wherein a database view comprises instructions that, when executed, perform an analysis operation on a data table (312, 313) to generate result data from the data table;
- storing (1001) in a random access memory of the in-memory database system the first and second data tables;
- selecting (1003) using the first and second data tables at least one database view of the one or more database views (110, 112) whose associated analysis operation performs at least a part of the analysis operations of the data warehousing analysis application;
- for each of the first and second data tables defining (1005) a database schema, wherein the database schema comprises a schema database view of the at least one database view and one of the first and second data tables;
- for each database schema of the first and second database schemas
  - o adapting (1007) the schema database view to run on the data table of the database schema using the data table;

o applying (1009) the schema database view on the data table for generating a respective intermediate result data table;

- creating (1011) a cross database view (635) using the selected at least one database view and applying the cross database view (635) on the intermediate result data tables for performing non-performed analysis operations of the analysis operations of the data warehousing analysis application."

Claims 2 to 9 are directly or indirectly dependent upon claim 1.

VI. Claim 10 of the main request reads as follows:

"A computer program product comprising computer executable instructions to perform the method steps of the method claims 1-9."

VII. Claim 11 of the main request reads as follows:

"An in-memory database system (100) for implementing a data warehousing analysis application on at least a first and a second data table, the data warehousing analysis application comprising one or more programs for performing analysis operations, the in-memory database system (100) comprising one or more database views (110, 112), wherein a database view comprises instructions that, when executed, perform an analysis operation on a data table (312, 313) to generate result data from the data table, the in-memory database system (100) being adapted for:

- storing in a random access memory of the in-memory database system (100) the first and second data tables;

- selecting using the first and second data tables at least one database view of the one or more database views (110, 112) whose associated analysis operation performs at least a part of the analysis operations of the data warehousing analysis application;
- for each of the first and second data tables defining a database schema, wherein the database schema comprises a schema database view of the at least one database view and one of the first and second data tables;
- for each database schema of the first and second database schemas
  - o adapting the schema database view to run on the data table of the database schema using the data table;
  - o applying the schema database view on the data table for generating a respective intermediate result data table;
- creating a cross database view (635) using the selected at least one database view and applying the cross database view (635) on the intermediate result data tables for performing non-performed analysis operations of the analysis operations of the data warehousing analysis application."

Claims 12 to 15 are directly or indirectly dependent upon claim 11.

VIII. The claims of the auxiliary request are not relevant to the present decision.

IX. The appellant's arguments, where relevant to this decision, are addressed in detail below.

Reasons for the Decision

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

Invention

2. The invention concerns an in-memory data warehouse for supporting real-time reporting (see paragraph [0054] of the A2 publication). The claims are directed to the embodiment described in paragraphs [0147] to [0159] with reference to Figure 10. In that embodiment, the in-memory database system comprises at least first and second database tables and views. A database view comprises instructions, e.g. SQL statements, for performing an analysis operation on the data of a data table (paragraph [0149], Figure 1). The two database tables may be received via a replication system (e.g. replication system 620 of Figure 6) from two different data source systems or from two applications of the same source system (paragraph [0150]). According to the method of the embodiment, the database views are used to generate intermediate-result data tables and a cross database view is applied on the intermediate-result data tables for performing the remaining analysis operation of the data-warehousing application that is still to be performed (paragraphs [0153] to [0159]).

Prior-art document D1

3. Document D1 discloses an in-memory data-warehouse system in which a data-warehouse application stores and retrieves data from an in-memory database (paragraphs [0029] and [0037], Figures 1 and 3A).

3.1 As shown in Figure 3A, the in-memory database uses a queue, a "data-storage" structure and a mapping. The queue is used to store data-storage requests from the data-warehouse application in the in-memory database (paragraphs [0037] to [0040], Table 2). The data-storage structure stores data records received from the data-warehouse application and associated in-memory data transactions that caused the data to be stored (paragraph [0041], Table 3). The mapping data structure associates data-storage requests from the data-warehouse application with in-memory database transactions (paragraph [0043], Table 4).

3.2 The data may be transferred from the queue to the data storage in response to an activation signal received at the in-memory database from the data-warehouse application (paragraphs [0044] and [0049], Table 4). The in-memory database may also receive modification rules, e.g. ACCUMULATED(SUM) and ACCUMULATED(MAX), which specify data processing steps to be performed on data in a data-storage request (paragraphs [0050] to [0057]).

3.3 In order to retrieve data, the data-warehouse application sends a data-retrieval request to the in-memory database. The data-warehouse application may use a view (reference sign 308 in Figure 3A) to trigger a calculation of change data values from data stored in the data storage "on-the-fly". The view 308 may be a change-log view of data in the data storage. The retrieval request may be routed to a calculation script, which reads active data (i.e. "after images") stored in the data storage, calculates the corresponding prior values (i.e."before images") on-the-fly, and returns the values to the change-log view 308 (paragraph [0058], Figure 3A).

Main request

4. *Novelty over document D1 - claim 1*

4.1 In the decision under appeal, the subject-matter of claim 1 is considered to lack novelty over document D1. The decision cites paragraphs [0006], [0007], [0039] and [0041] to [0044], Tables 4 to 7, and Figure 1.

4.2 In its statement of grounds of appeal the appellant argued that the Examining Division had used different embodiments of document D1 and had referred to entire paragraphs without identifying precisely where the individual elements of the claim and the combination of features were disclosed. The decision failed to explain the logic behind the mapping of features and used inconsistent mappings.

The appellant analysed each claim feature in accordance with the Examining Division's reasoning and concluded that document D1 did not disclose any of the features of claim 1. In particular, the appellant argued that document D1 did not disclose two schema database views and a cross database view. In the invention, the two schema database views performed a respective part of a data-warehousing analysis application on a respective data table which resulted in intermediate data tables. The cross database view was used to "complete" the warehousing analysis application by using the results of the first and second database views. The appellant also discussed inventive step.

The Board agrees with the appellant that the decision under appeal is not convincing and that claim 1 is novel over document D1, as explained in the following.

4.3 The appellant argued that the Examining Division's mapping of a data-storage request of document D1 to a database view of claim 1 was incorrect because a data-storage request was a simple command for storing or retrieving data.

The Board notes that, with the use of the modification rules, the data-storage requests of document D1 can be used to perform operations such as "ACCUMULATE(SUM)" for obtaining aggregated values (paragraphs [0050] to [0052]), which could be seen as analysis operations within the meaning of the claim. However, the contested decision does not mention the modification rules and does not cite relevant paragraphs of document D1 describing the type of operations supported by the modification rules.

Furthermore, with the modification rules, the analysis results are immediately calculated as the data is received at the in-memory database. Document D1 does not disclose that both the data and the result of the modification are stored in the in-memory database, whereas in the method of claim 1 the intermediate results are calculated from the database tables stored in the in-memory database. Therefore, the modification rules of document D1 are different from the database views in the claimed method.

4.4 The Board further notes that neither the mapping 306 nor the view 308 of Figure 3A of document D1 corresponds to a database view within the meaning of claim 1. Mapping 306 merely associates data-storage requests from the data-warehouse application with in-memory database transactions (paragraph [0041], Table 3) and hence does not comprise "instructions that, when executed, perform an analysis operation on a data table". According to paragraph [0058], view 308 is

a change-log view of data and is used to store prior values (i.e. "before images"). Furthermore, it is clear from Figure 3A that view 308 is not in the in-memory database. Therefore, view 308 of document D1 does not correspond to any of the views mentioned in the claim. There is no disclosure in document D1 of database views being used for performing data analysis operations.

4.5 It follows from the above that the subject-matter of claim 1 of the main request is new over document D1, and the same applies to the subject-matter of the corresponding independent claims 10 and 11.

Further prosecution

5. The reasoning of the written decision is erroneous and the decision under appeal cannot be upheld. The Board agrees with the appellant that document D1, apart from relating to an in-memory data warehouse system, has little in common with the claimed invention. In particular, the Board is not convinced that inventive step can be denied on the basis of document D1 alone.

5.1 Two other documents were cited in the search report, but were not taken into account in the examination proceedings. Furthermore, since the Examining Division has misinterpreted document D1, there is a distinct possibility that the search into the state of the art was stopped too early and is incomplete (see Guidelines for Examination, November 2019, B-IV, 2.6).

5.2 In order to decide on the question of inventive step, the Board would therefore have to consider the question anew in both first- and last-instance proceedings and to effectively replace the Examining Division. That would be contrary to the primary object of the appeal proceedings, i.e. to review the decision under appeal

in a judicial manner (Article 12(2) RPBA 2020). It follows that special reasons for remitting the case present themselves, within the meaning of Article 11 RPBA 2020 (see also T 2710/16 of 10 February 2020, Reasons 5.2; T 1966/16 of 20 January 2020, Reasons 2.1 and 2.2; T 731/17 of 15 January 2020, Reasons 7.3).

5.3 Accordingly, the Board decides to exercise its power under Article 111(1) EPC, second sentence, and to remit the case for further prosecution on the basis of the main request.

5.4 In light of the review character of the appeal proceedings, the Board restricted its examination to the requirements of novelty and inventive step with respect to document D1 alone. In the course of further prosecution of the case, the Examining Division may raise other objections considered necessary.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance for further prosecution.

The Registrar: The Chairman:

S. Lichtenvort R. Moufang

Decision electronically authenticated