This document includes some recent decisions of the EPO in 2020 with regards to software related inventions and shows relevant extracts from the respective decisions.

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# T 1247/18 (Search-based application development framework/ORACLE INTERNATIONAL) of 4.9.2020

European Case Law Identifier: ECLI:EP:BA:2020:T124718.20200904

## Search-based application development framework

**Inventive step - (decision under appeal provides no suitable basis for assessing inventive step)**

Application number: 07759453.9
IPC class: G06F17/30
Applicant name: Oracle International Corporation

Cited decisions: T 0697/17, T 1924/17

Board: 3.5.07

https://www.epo.org/law-practice/case-law-appeals/pdf/t181247eu1.pdf

The invention

2. The application describes that it was known to formulate SQL or form-based queries for searching for information in an enterprise application and/or transactional application, but that this required users to follow training courses to allow them to successfully formulate those queries (description as published, paragraph [06]).

Keyword-based queries were relatively fast and efficient if information was accessible. However, if information was not available to the search engine, users did not get satisfactory results to a keyword-based query. Information might not be available if stored in tables that are transactional, i.e. tables that contain descriptive fields for viewing but are not indexed for searching. Moreover, when a search engine showed a client results to a keyword-based query, the results were presented such that the client could read the results but generally could not act upon them without significant developmental effort (paragraph [07]).

The application relates to a framework which allows a user, for example by inputting a natural language search query, to search transactional enterprise applications by means of a search engine and to perform actions using the results of a search (paragraphs [02], [05] to [08], [10] and [35]).

The search engine may be any suitable search engine such as an SQL search engine, Apache Lucene or Oracle Text search engine (paragraph [33]). A semantic interface may translate the query, for example, from natural language into a query that the search engine can use to search applications (paragraphs [11] and [12]).

Crawlers are used to crawl enterprise/transactional applications as data sources (paragraph [42]). An index engine indexes a searchable document constructed by crawlers and makes an index store (locations at which indexes are stored) available to the search engine (paragraph [43]).

A canonical business object may be created to define data and may be stored in a database or a metadata repository. Object attributes stored in the database or in a Java class are mapped to the canonical business object (paragraph [58]). Processing a user-provided query begins with identifying a search category. In other words, a canonical business object that is stored in a metadata repository is selected for identifying a search category (paragraph [0060]).

Inventive step

5.1 In its decision (see points 11.2.2.1 to 11.2.2.4), the Examining Division argued that the only technical feature of the method of claim 1 was that it was computer-implemented, and it stressed that computer-implemented methods were notoriously known. In the Division's view, the overall effect achieved by the features of claim 1 was the satisfaction of a user's interest in a specific kind of search interface, which was a non-technical effect as it was **only manifested in the user's mind**.

5.1.1 As a consequence of its assessment of the technical character of the invention, the Examining Division took a notoriously known general-purpose computer to be the closest prior art and stated that all the features contributing to the technical character of the invention were already known from such a notoriously known system. Hence, the invention lacked inventive step.

5.1.2 Continuing in the context of the inventive-step assessment, the Examining Division provided further comments (see contested decision, point 11.2.2.5) to the effect that all the technical and some of the non-technical features of the subject-matter of claim 1 were disclosed in document D1. As to the technical features, document D1 disclosed software components in Figure 2.

As to the non-technical features, the Examining Division referred to various passages on pages 170 to 174 of document D1: in particular, the conceptual mediation architecture offered query capabilities for searching external data sources, and the domain ontology in combination with the respective mappings of schema objects acted as an index for accessing the data sources. **No detailed mapping of the claim features to passages in document D1 was given.** Nor were features distinguishing the claimed subject-matter over document D1 identified and their inventive merits assessed. The Examining Division's comments on document D1 appear as obiter dicta since the conclusion that claim 1 lacked inventive step had already been drawn; the comments do not amount to an assessment of inventive step over document D1.

5.2 In its statement of grounds of appeal (see point 12), the appellant argued that the Examining Division's analysis of the technical nature of the claimed subject-matter was erroneous.

5.2.1 According to the appellant (see statement of grounds, point 16), the feature of creating an index store concerned the **management of computer resources** used when performing a search. It enabled a more efficient search of a plurality of transactional applications using an index store. Moreover, the feature "interfacing a semantic engine [...]" allowed the search to be performed efficiently using a common search engine (see point 17 of the statement of grounds of appeal). As explained in paragraph [12] of the description, this allowed the performance of a search engine to be leveraged, further increasing the efficiency of searching a plurality of transactional applications. Increasing the searching efficiency provided a "further" technical effect and was not dependent on a psychological effect on a user as alleged by the Examining Division. In view of the technical character of the claimed subject-matter, the appellant felt it was incorrect to use a notoriously known general-purpose computer as the closest prior art.

5.2.2 As to document D1, the appellant argued that, contrary to the Examining Division's assertions in the decision under appeal, this .

In particular, the indexing steps in claim 1 were different from the mapping between data service schemas and the domain ontology disclosed in document D1. As seen on page 173, right-hand column, second paragraph, the mapping between service schemas and the domain ontology disclosed in D1 was merely used to return a query plan based on an original query from the mediator application. In other words, the domain ontology in D1 was not accessed by a search engine to determine if a result associated with the query was indicated in the index store, as seen in claim 1, and thus could not be taken to be equivalent to such an index store (statement of grounds of appeal, point 32).

A key effect of the index store as a distinguishing feature over document D1 was that, by specifying a single index store, data from multiple transactional applications could be searched for using a common search engine, which increased the efficiency of a search for information contained in several transactional applications. Furthermore, using such an index store storing indexes of data from several transactional applications enabled straightforward and efficient searching of further transactional applications, the data in which may be indexed and stored in the index store (statement of grounds of appeal, point 36).

Hence, the Examining Division's analysis of document D1 in point 11.2.2.5 of the contested decision was, in the appellant's view, erroneous.

5.3 **The Board agrees with the appellant that the Examining Division's analysis of the technical character of the claimed subject-matter is fundamentally flawed.**

In particular, the Board considers that at least the steps in the method according to claim 1 that are directed to indexing, creating an index store and accessing the index store using the search engine all contribute to the technical character of the invention since indexing in the context of claim 1 contributes to the technical character of the invention (see for example T 697/17 of 17 October 2019, point 5.2.5, page 20; see also T 1924/17 of 29 July 2019, point

14, page 28). Since the Examining Division did not consider these steps to have technical character, the Board cannot uphold the reasoning in the contested decision.

5.4 Since the Examining Division considered indexing to be non-technical, it relied on a notoriously known general-purpose computer as the starting point for assessing inventive step. However, given the Board's finding that the indexing steps contribute to the technical character of the invention, a notoriously known general-purpose computer is not a suitable starting point for the case in hand. Consequently, the Board does not consider that the contested decision provides a suitable basis for assessing inventive step.

5.5 The Examining Division cited document D1 in the contested decision and argued that this document disclosed all the technical and some of the non-technical features of the claimed method (see reason 5.1.2 above). However, the Examining Division did not provide a complete assessment of novelty including a detailed feature mapping, or any assessment of inventive step when starting from document D1. Hence, the additional remarks on document D1 in the contested decision do not allow for a judicial review of an inventive-step assessment starting from document D1 as the closest prior art.

Moreover, the Examining Division is yet to consider further documents cited as relevant in the European search report.

5.5.1 Nevertheless, with a view to accelerating the further prosecution of the case, the Board agrees with the appellant that the claimed indexing is different from the domain ontology and the mapping between data service schemas disclosed in document D1. In the Board's understanding, the domain ontology according to document D1 serves the purpose of performing query mediation (see for example D1, abstract: "We propose an architecture for conceptual mediation in which the sources' query capabilities are published as web services."). In other words, D1 queries the sources using their query capabilities, whereas the invention appears to index data extracted from transactional sources for searching by means of an index store. Hence, the Board is not convinced that document D1 is a promising starting point for assessing the inventive step of claim 1 of the appellant's sole request.

6. As the Examining Division's objection under Article 56 EPC is not convincing and its objection under Article 84 EPC is no longer relevant in view of the amendments made, the appellant's sole request overcomes all objections raised in the contested decision. Consequently, the contested decision is to be set aside.

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## T 1091/17 (Clinical statistics/PHILIPS) of 4.6.2020

European Case Law Identifier: ECLI:EP:BA:2020:T109117.20200604

## METHOD AND APPARATUS FOR REFINING SIMILAR CASE SEARCH

**Inventive step - (no)**

**Inventive step - mixture of technical and non-technical features**
**Features relating to presentation of information**
**Presentation of information in diagnostic tasks**

Application number: 08868858.5
IPC class: G06F19/00
Applicant name: Koninklijke Philips N.V.

Cited decisions: G 0001/04, G 0003/08, T 0643/00, T 1143/06, T 1749/06, T 1235/07, T 1741/08, T 1214/09, T 1562/11, T 0651/12, T 1802/13, T 0336/14, T 0581/14, T 1442/16

Board: 3.5.05

https://www.epo.org/law-practice/case-law-appeals/pdf/t171091eu1.pdf

Claim 1 of the main request reads as follows:

"A method of searching cases in a database, said method comprising:

- a first step of performing similarity matching between an input case and cases in the database by using a first matching criterion that includes at least one image-based feature to identify a set of cases similar to said input case, the at least one image-based feature including at least one of a shape of a tumor, texture of the tumor, and size change of the tumor;

- calculating statistics on features associated with the set of similar cases, wherein the statistics describe non-image-based clinical information and wherein the features associated with the set of similar cases are image-based and/or non-image-based features;

- presenting the set of similar cases and the statistics to a user;

- receiving a user input including a second matching criterion that includes at least one non-image-based feature derived from clinical information and is based on said statistics, said clinical information including at least one of relevant previous or current diseases, lifestyle facts, genetic profiles, family medical history, a physician's particular knowledge and information of the patient to be diagnosed or treated, weight, allergies, and vital statistics; and

- a second step of performing similarity matching between the input case and the set of similar cases by using said second matching criterion."

1. Main request

1.1 … In its preliminary opinion, the board informed the appellant that inter alia D2, cited in the search report, would be a more suitable starting point. The discussion at the oral proceedings was based entirely on D2.

1.5 …, the board agrees with the appellant that D2 does not disclose calculating statistics on the basis of clinical information associated with the set of similar images, presenting these statistics to the user and receiving subsequent user input based on these statistics.

1.6 At the oral proceedings, the appellant emphasised in particular the fact that the method of claim 1 presents the calculated statistics together with the set of similar cases. In the appellant's view, the case law consistently distinguished between what is presented to the user (statistics) and how it is presented (together with the set of similar cases). Since, in this case, presenting the statistics together with the similar cases involved how the information is presented rather than what is presented, it was not a presentation of information as such.

The board is aware of a few exceptional decisions of the boards of appeal (see T 1749/06, point 4.1.3, second sentence; T 651/12, page 16, first full sentence) expressing the view that the reference to "presentations of information" in Article 52(2)(d) EPC was meant to relate exclusively to the cognitive content of the presented information ("what is presented") and not to the manner in which it is presented ("how it is presented"). Nevertheless, this view has not been adopted by the mainstream case law in the course of legal development (cf. G 3/08, Headnote 4). The predominant view in the case law is what T 1235/07 (see point 11) calls the "wider view", according to which both what is presented and how it is presented are considered to be "presentations of information" (see T 1143/06, points 3.4, 3.5 and 5.4; T 1741/08, point 2.1.10; T 1214/09, point 4.8.1; T 1562/11, point 2.7, last paragraph; T 1802/13, page 10, first full paragraph).

This view has also been adopted by the European Patent Office for its practice (see Guidelines for Examination in the European Patent Office, November 2019 edition, G-II.3.7).

Therefore, the appellant's argument that the distinguishing features do not relate to presentations of information does not convince the board.

1.7 Irrespective of whether an invention relates to "what is presented" or "how it is presented", the test suggested in the case law to judge whether a presentation of information might exceptionally (see T 1741/08, point 3.3, last paragraph) contribute to the technical character of the invention is to assess whether it credibly assists the user in performing a technical task by means of a continued and guided human-machine interaction process (see T 336/14, Headnote and T 1802/13, page 10, second full paragraph).

1.8 A **prerequisite for this test is the proper formulation of the technical task performed by the use**r. The appellant referred in its written submissions to a "**medical task**". This level of generality would not be sufficient since **not every task performed in medicine is a technical task**. Indeed an example given by the appellant ("if the statistics, e.g. show that seven out of eight retrieved cases belong to patients with cancer, then the user can derive that the case under evaluation might have something to do with cancer") illustrates this point. The example implies that the alleged technical task is a diagnostic task. However, besides technical tasks carried out mainly in the examination phase involving the collection of data, **diagnosis involves tasks of a predominantly non-technical nature such as the deductive decision phase, which is a purely intellectual exercise** (see G 1/04, point 6.4.1). The "medical task" in the appellant's example relates to the purely intellectual deductive decision phase and therefore cannot be accepted as a technical task.

1.9 The appellant then argued, in analogy to T 643/00 (see Catchword, second sentence), that searching and retrieving medical cases stored in a database was the relevant technical task. The board could accept this as a suitable formulation. The **question** to be answered then is **whether the invention credibly assists the user in performing this technical task** by means of a continued and guided human-machine interaction process.

1.10 In the appellant's view, the presentation of the calculated statistics together with the set of similar cases assisted the user (typically a physician) in performing the technical task of searching for a medical case more efficiently and reliably. This provided helpful information to guide the physician in concentrating their search and thus obtaining the desired case more quickly, which was a technical effect. The mere fact that mental activities on the user's part were involved did not necessarily render this effect non-technical (T 643/00, Catchword). The presentation according to claim 1 provided information to the physician in the form of a technical tool for an intellectual task that they had to master and hence contributed to the technical solution of the technical problem of an efficient search, retrieval and evaluation of cases.

This argumentation relies heavily on the wording of T 643/00, point 17, but removes it from its proper context. The borrowed wording is preceded by the following text: "the functions/steps of processing the images in a specific format, i.e. a predetermined plural number of images in a side-by-side manner at a low level of resolution, and allowing selection and display of an image at higher resolutions [provide information to the the user in the form of a technical tool for an intellectual task he has to master]". It is thus clear that the deciding board in T 643/00 did not give a carte blanche for deeming technical any information that supports a user in performing a technical task (see also T 1741/08, point 2.1.12, "not everything that supports a technical task has itself a technical character"). It made this statement for the very specific case of a particular display technique defined in terms of an objective technical criterion, namely **image resolution**. This has also been the common understanding in subsequent case law (see e.g. T 1741/08, point 2.1.13; T 336/14, point 1.2.6; T 581/14, point 16.19). The effect of image resolution on the user is an objective physiological effect which can qualify as a credible technical effect (see T 1442/16, point 1.8, last paragraph), unlike the effect of presenting clinical statistics in the case in hand, which relies on a chain broken by semantic or cognitive processing (see T 1741/08, point 2.1.6). Therefore, T 643/00 does not help the appellant's case.

1.11 The appellant was not able to convince the board that the distinguishing features of claim 1 of the main request produced a technical effect. Therefore, claim 1 of the main request does not involve an inventive step (Article 56 EPC).

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## T 0943/16 (Tier assignments/MICROSOFT TECHNOLOGY LICENSING) of 25.6.2020

European Case Law Identifier: ECLI:EP:BA:2020:T094316.20200625

### Determining quality of tier assignments

**Inventive step - claimed subject-matter not rendered obvious by D1**

Application number: 08868759.5
IPC class: G06F17/30, G06F17/00, G06F9/50
Applicant name: Microsoft Technology Licensing, LLC

Cited decisions: T 1965/11, T 0565/17, T 0697/17

Board: 3.5.07

https://www.epo.org/law-practice/case-law-appeals/pdf/t160943eu1.pdf

Claim 1 of the main request reads as follows:

"A computer implemented method, comprising:

receiving user history data including queries that were issued by users and search results provided to the users in response to the queries; and

generating an indication of quality of a tier assignment used to store searchable digital items in a tiered storage system, wherein higher tiers have faster access and retrieval times when compared to lower tiers, and wherein the indication is based at least in part upon a subset of the user history data;

wherein the tier assignment indicates to which of several tiers the searchable digital items are assigned;

wherein the tiered storage system is a search engine index; and

wherein the method further comprises generating an improved tier assignment based at least in part upon the indication of quality, and assigning digital items to the tiered storage system based at least in part upon the improved tier assignment."

The invention

2. The invention concerns the problem of assigning searchable digital items to tiers in a tiered storage system serving as a search-engine index, with higher tiers offering faster retrieval but having smaller capacity.

2.1 According to the application, user history data is used to generate a quality indication of a tier assignment, where a tier assignment indicates to which of several tiers searchable digital items are assigned. An improved tier assignment is generated on the basis of the indication of quality and/or the user history data and is used to update a tiering policy to assign items to tiers in the tiered system (see international publication, paragraphs [0006] and [0008], original claims 2 to 7).

2.2 The user history data may be obtained by monitoring user interaction and may include, for example, queries issued by the users, search results provided to the users or search results selected by the users (paragraphs [0006] and [0021]). The indication of quality of a tier assignment may conform to a defined tier assignment quality metric on the basis of which an improved tier assignment is optimised (paragraph [0008]).

2.3 The indication of quality of a tier assignment is calculated by the quality indicator component which includes four determiner components to determine weight, load, tier and utility with respect to a query. The determiner components determine a weight assigned to a query, the system load observed when the query is executed, a probability that a certain tier will be the last tier searched over for digital items (where retrieval is performed at the highest tier possible), and an indication of search result quality (utility) when retrieval ends in a certain tier (paragraphs [0023] to [0027] and Figure 2). The indication of the quality of a tier assignment can be determined by the [disclosed] algorithm (paragraphs [0028] to [0034] and original claim 10).

3. Inventive step over document D1

3.1 Document D1 concerns the allocation of resources to various applications in a data center which includes a collection of server-class data processing systems. …

Therefore, document D1 relates to the allocation of resources in the form of computing systems to applications with a tiered architecture.

3.2 The Board agrees with the appellant that allocation of computing resources to tiered applications is conceptually quite different from assignment of data items to tiers in a tiered storage system.

In a system such as that in document D1, each application may use data items and each computer system offers storage, but the allocation of computer systems to applications in a tiered architecture does not necessarily correspond to the assignment of the application's data items to the computer systems' storage systems. None of the passages of D1 cited in the contested decision discloses assigning digital items to storage systems.

3.3 In the decision under appeal, the Examining Division considered that the method of claim 1 differed from the disclosure of document D1 in that

(1) the indication of quality used to generate the tier assignment is based at least in part on a subset of the user history data including queries that were issued by users and search results provided to the users in response to the queries,

(2) higher tiers have faster access and retrieval times when compared with lower tiers.

According to the decision under appeal, the feature "tier assignment used to store searchable digital items in a tiered storage system" in claim 1 was disclosed in paragraph [0028] of document D1, the step of generating an improved tier assignment was disclosed in paragraph [0042] and the feature "the tier assignment indicates to which of several tiers the searchable digital items are assigned" was disclosed in paragraph [0045] and Figures 1 and 3.

Figure 1 shows servers in a data center, and applications running on the servers (see also paragraph [0013]). Paragraph [0028] discloses minimising some criteria such as the mean response time of a request, and assigning sessions comprising mostly small requests to different servers from those comprising large requests. Paragraph [0042] refers to allocating hierarchically organised server resources to tiered applications in such a way that communications delays are minimised and bandwidth capacity constraints are satisfied.

With reference to Figure 3, paragraphs [0045] to [0050] describe "an example arrangement for gathering data to be used in analyzing resource requirements and allocations for applications hosted by a data center". The resources of the data center are configured to support a tiered architecture for processing web transactions. The first tier of the web transaction processing architecture is a load balancer 306. The second and third tiers of resources are a web server farm 308 (erroneously indicated as "318" in the drawing) and an application server farm 314. The application servers 314 host the application logic that processes web transactions. The load balancer distributes web transactions amongst the web servers 308. The file system 318 may be used to store the web pages that are served to the user and configuration information for the web and application servers.

However, the description of this embodiment does not disclose any direct association between the web transactions and the "web pages that are served to the user". In addition, it is clear that both the second and third tiers of servers share the file system 318 and database 316. Therefore, the distribution of web transactions amongst the web servers in the tiered system in this example does not correspond to the assignment of data items to a tiered storage system.

3.4 The Board therefore concludes that document D1 does not disclose at least features (1), (2) and a "tier assignment used to store searchable digital items in a tiered storage system".

Furthermore, the Board agrees with the appellant that the idea of document D1 is very remote from that of the invention in this case. Starting from document D1, the skilled person would have to completely change the type of allocation performed in the system in D1 in order to arrive at the invention in this case. Document **D1 is therefore not a suitable starting point for assessing inventive step.**

3.5 The invention of claim 1 is therefore not rendered obvious by the disclosure of document D1. The same applies to corresponding independent claim 7.

Inventive step over the acknowledged prior art

4. In paragraphs [0003] and [0004] of its background section, the present application acknowledges a prior-art method of generating an improved tier assignment for storing searchable digital items in a tiered storage system, where the higher tiers have faster access and retrieval times when compared to lower tiers, the tier assignment indicates to which of several tiers the searchable digital items are assigned, and the tiered storage system is a search engine index. The acknowledged prior-art method further includes a step of assigning digital items to the tiered storage system based at least in part on the improved tier assignment.

The Board therefore agrees with the appellant that the prior art acknowledged in the background section of the application is a more promising starting point than document D1.

4.1 According to paragraph [0004], the acknowledged prior-art method takes into account "the web page's relative importance as determined by some metric, such as a static rank of the web page", or the number of links to a web page, in order "to select a tier of an index in which to place" the web page.

4.2 The method of claim 1 differs from the acknowledged prior-art method in that

(a) user history data is received which includes queries that were issued by users and search results provided to the users in response to the queries;

(b) an indication of quality of a tier assignment is generated based at least in part on a subset of the user history data; and

(c) the improved tier assignment is generated based at least in part on the indication of quality.

4.3 In the contested decision's obiter dictum the Examining Division expressed the view that the claimed method differed from the acknowledged prior art in that it included features (1) (see point 3.2 above). The distinguishing features were dictated by "considerations on particular quality criteria arbitrarily decided from a technical point of view, the effects of which criteria or assignment remaining essentially speculative in view of the definition of the quality defined criteria in the claims and the assumptions on the future, unknown requests". On page 4 of the decision under appeal, in the context of its inventive-step assessment starting from document D1, the Examining Division expressed the opinion that at the level of generalisation of the claim, in which the tier assignment relied only in part on undefined quality criteria, the effects (if any) of the tier assignment policy were essentially implementation-dependent. No additional technical effect was achieved by providing a different tier assignment according to features (1), since the generated tier assignment did not change the properties of the computer system, and since the effects of the generated assignment depended on future, unknown queries issued by users. Any effect provided by the tier assignment thus appeared to be essentially speculative. The use of any quality criteria based e.g. on the quality of results to decide on a resource allocation belonged to non-technical requirements specifications and was arbitrary from a technical point of view.

4.3.1 In its statement of grounds of appeal, the appellant argued that in many technical fields a technical effect could only be ascertained at a statistical level since the systems involved were too complex to allow for easily predictable results. Index design for search engines was one example of such a technical field. The appellant drew a parallel with the medical and pharmaceutical fields.

Efficiency of a search engine (retrieval time of relevant search results) depended on the assignment of the searchable items in the tiered search engine index. The claimed subject-matter made it possible to improve a given tier assignment and, thus, to improve the efficiency of the search engine. For a given future query, the effect might not be able to be conclusively determined. **For a large number of future queries, however, the effect was statistically measurable**.

The claimed method changed the assignment of digital items to the tiered storage system, or in other words, their storage location.

The effect was not implementation-dependent. Assigning the digital items in accordance with the improved tier assignment increased the search engine's efficiency.

In the case in hand, the tier assignment was determined for purposes involving technical considerations, namely for providing a search engine index that allowed the search engine to retrieve relevant search results in less time, or in other words, allowed the search engine to optimise retrieval times.

According to the appellant, in view of the acknowledged prior art the claimed invention solved the problem of providing an improved method for tiering web pages in a search engine index.

4.4 The Board is not persuaded by the reasons given in the contested decision as to why the distinguishing features were not based on technical considerations and did not contribute to a technical effect.

In the claimed method, history data is used for predicting the future use or workload of the system. The Board accepts that, in the present context, analysing history data enables a statistically reliable prediction of the system's operation and does not lead to purely speculative results. Since the claim explicitly and clearly specifies that higher tiers have faster access and retrieval times than lower tiers, an improved tier assignment means improved average access times. Moreover, since the history data is purposively used to improve access times, this improvement is not merely the physical consequence of a non-technical decision but a technical effect to be taken into account in the assessment of inventive step (T 697/17 of 17 October 2019, reasons 5.2.3 to 5.2.5; T 1965/11 of 24 March 2017, reasons 5.1).

4.5 It still has to be determined whether adding distinguishing features (a) to (c) to the acknowledged prior-art method would involve an inventive step. Document D1, which is the sole prior-art document cited in the present case, would not be taken into consideration for solving a technical problem related to tiered storage systems.

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## T 1820/16 () of 25.9.2020

European Case Law Identifier: ECLI:EP:BA:2020:T182016.20200925

## Method for solving multidimensional optimization problems

Application number: 13178377.1
IPC class: G06Q10/04
Applicant name: Siemens AG Österreich

**Patentable invention - (no)**
**Patentable invention - mathematical method**

Cited decisions: T 0914/02, T 0258/03, T 1227/05

Board: 3.4.03

https://www.epo.org/law-practice/case-law-appeals/pdf/t161820eu1.pdf

Claim 1 of the main request reads as follows:

1. Method for solving multidimensional optimization problems on a set of feasible solutions $\{S_1, \ldots, S_n\}$ of a discrete combinatorial problem in a process of configuration of products, comprising steps of:
- calculating optimization values for the set of feasible solutions $\{S_1, \ldots, S_n\}$ by using a set of optimization functions $\{f_1, \ldots, f_k\}$
- calculating mean values $\mu(f_i)$ to the set of optimization functions $\{f_1, \ldots, f_k\}$ according to $\mu(f_i)=\frac{1}{n}*\sum_{j=1}^{n} f_i(S_j)$
- calculating standard deviation values $s(f_i)$ to the set of optimization functions $\{f_1, \ldots, f_k\}$ according to $s(f_i)=\sqrt{\frac{1}{n-1}\sum_{j=1}^{n}(f_i(S_j)-\mu(f_i))^2}$
- normalize the optimization values for the set of feasible solutions $\{S_1, \ldots, S_n\}$ according to $norm(f_i(Sol))=\frac{f_i(Sol)-\mu(f_i)}{s(f_i)}$
- accumulate the normalized optimization values $norm(f_i(Sol))$ according to $f(Sol)=\sum_{i=1}^{k} norm(f_i(Sol))$
- find a minimum for the accumulated normalized optimization values $\min_{i=1}^{n} f(S_i)$

3.2 Articles 52(1), (2) and (3) EPC

The claimed method of solving optimization problems is defined purely in form of a mathematical method. The input and output data including any technical results that could be derived from the output remain unspecified and the field of application may **even be non-technical in nature (economic**). Hence, the method defined in **claim 1 is considered to be an abstract method which falls under the category of non-inventions** set out in Articles 52(2)(a) and (3) EPC (see Case Law of the Boards of Appeal, 9th edition 2019, I.A.2.2.2).

A computer-implementation is neither explicitly specified in claim 1 nor could it be acknowledged as being implicit from the present wording of claim 1 considering the overall context of the application. The word 'computer' is mentioned only once in the entire application documents, namely on page 1, line 26 of the description, where 'computer-based information systems' are mentioned in relation to the background art. Throughout the whole application, the claimed method is presented as an abstract method without any condition of being 'computer-implemented'. The passages to which the appellant refers (i.e. page 4, lines

12 to 24) are not sufficient to render the computer-implementation mandatory, because the presentation remains general and **the verb "to compute" does not necessarily imply the use of a digital computer.** The wording of the claims and the presentation of the matter in the description concerns a mathematical method of a multidimensional optimisation problem as such for which no computer-implementation is defined. Moreover, **a complex formulation of the optimization problem is not sufficient to imply that the method must be computer-implemented**. In accordance with the decision T 0914/02 (Reasons, point 2.3.4), the Board finds that **if the use of computer means were indeed indispensable, then it would have been necessary to include the computer-implementation as an essential feature in the claimed method**.

The optimisation problem itself and the related object defined in claim 1 do also not have technical character either. The entire claim defines the subject matter in an abstract way by a purely mathematical formulation as such. **Neither a specific technical field is specified nor any specific technical input or output data nor any possible technical effects resulting therefrom.**

In addition, an optimisation of economical/financial/ business data is not excluded and the description even includes the economical domain as one possible field of application besides the technical domain. In case of **optimising financial/economical problems which are understood as non-technical business contributions no technical contribution is provided.**

Because the area in which the optimization is carried out and the optimized input and output data itself remain vague and unspecified, the technical character can only reside in the manner how the optimization is carried out. However, since this is defined by pure mathematics as such (Art. 52(2)(a) EPC), no technical character can be acknowledged.

3.3 The appellant cited the decisions T 1227/05, T 258/03 and T 914/02 of the Boards of Appeal in order to support the argument that the claimed subject-matter should be considered technical and not be excluded pursuant to Articles 52(2) and (3) EPC. The Board finds however for the following reasons that the findings of these decisions are not applicable to the present case.

3.3.1 In T 1227/05 the claimed method explicitly related to a computer-implemented method of a simulation of an integrated circuit. All steps relevant to the circuit simulation, as well as the computer-implementation, were considered to contribute to the technical character of the invention. Hence, in contrast to the present case, the claimed method steps as such did not fall under the provisions of Articles 52(2) and (3) EPC.

3.3.2 A similar situation applies for T 258/03 where the claimed method under consideration comprised the technical feature 'executed in a server computer comprising the steps of'. The board held that a method involving technical means was an invention within the meaning of Article 52(1) EPC, contrary to the present case where no such technical means are present.

3.3.3 Finally, in T 914/02 the deciding board held that the involvement of technical considerations (loading nuclear reactor fuel bundles into a reactor core) was not sufficient to escape the exclusion as long as the claimed method defined procedural steps which might

exclusively be carried out mentally (Reasons, point 2.3.3). The deciding Board also questioned if 'an alleged sheer complexity' of a problem and its associated solution automatically implied a technical character through an implicit use of technical means, in particular a computer. Rather, if the computer means were indispensable, they should be included in the claims as an essential feature of the invention (Reasons, point 2.3.4).

3.4 Therefore, the present Board concludes that the main request is not allowable, because it contravenes Article 123(2) EPC and its subject-matter is not regarded as an invention pursuant to Article 52(1) EPC in combination with Articles 52(2) and (3) EPC and therefore not patentable.

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## T 2085/17 () of 25.9.2020

European Case Law Identifier: ECLI:EP:BA:2020:T208517.20200925

# METHOD FOR SOLVING MULTIDIMENSIONAL OPTIMIZATION PROBLEMS

**Patentable invention - (yes)**
**Patentable invention - technical character of the invention**
**Inventive step - (no)**

Application number: 14739834.1
IPC class: G06Q10/04
Applicant name: Siemens AG Österreich

Cited decisions: T 1784/06, T 1954/08

Board: 3.4.03

https://www.epo.org/law-practice/case-law-appeals/pdf/t172085eu1.pdf

Claim 1 as filed reads as follows:

1. Method for solving multidimensional optimization problems on a set of feasible solutions $\{S_1, \ldots, S_n\}$ of a discrete combinatorial problem of a product configuration process by means of a computer program comprising steps of:

- calculating optimization values for the set of feasible solutions $\{S_1, \ldots, S_n\}$ by using a set of optimization functions $\{f_1, \ldots, f_k\}$
- calculating mean values $\mu(f_i)$ to the set of optimization functions $\{f_1, \ldots, f_k\}$ according to $\mu(f_i) = \frac{1}{n} * \sum_{j=1}^{n} f_i(S_j)$
- calculating standard deviation values $s(f_i)$ to the set of optimization functions $\{f_1, \ldots, f_k\}$ according to $s(f_i) = \sqrt{\frac{1}{n-1} \sum_{j=1}^{n} (f_i(S_j) - \mu(f_i))^2}$
- normalize the optimization values for the set of feasible solutions $\{S_1, \ldots, S_n\}$ according to $norm(f_i(Sol)) = \frac{f_i(Sol) - \mu(f_i)}{s(f_i)}$
- accumulate the normalized optimization values $norm(f_i(Sol))$ according to $f(Sol) = \sum_{i=1}^{k} norm(f_i(Sol))$
- find an extremum – minimum or maximum – for the accumulated normalized optimization values $\min_{i=1}^{n} f(S_i)$ or $\max_{i=1}^{n} f(S_i)$
- select and combine parts from a parts catalogue to a product configuration which meets the extremum for the accumulated normalized optimization values.

3. The Board is of the opinion that the subject-matter defined in claim 1 is of technical character and does not fall under the provisions of Article 52(2) and (3) EPC. However, the subject-matter defined in claim 1 cannot fulfil the requirements of Article 52(1) EPC in combination with Article 56 EPC, because the features which contribute to the technical character of the subject-matter defined in claim 1 do not involve an inventive step as will be detailed below.

3.1 Article 52(2) and (3) EPC

3.1.1 Claim 1 defines a "Method for solving multidimensional optimization problems on a set of feasible solutions ... by means of a computer program ..." indicating that the use of technical means, i.e. a computer, is part of the claimed subject-matter. The solution of the optimization problem by means of the computer program is only possible if the computer program is executed on a computer, so that the use of a computer is (at least implicitly) defined and provides the required technical character. The subject-matter defined in claim 1 consequently goes beyond a purely mathematical method as such and is not excluded from patentability pursuant to Article 52(2) and (3) EPC.

3.2 Articles 52(1) and 56 EPC

Concerning Article 52(1) EPC in combination with Article 56 EPC, the non-obvious technical contribution of the technical character shall be examined (see Case Law of the Boards of Appeal, 9th edition 2019, I.D.9.1.3), in particular whether the mathematical method contributes to the technical character of the invention.

A **mathematical method may only contribute to the technical character of the invention** if it serves a technical purpose or if the technical character comes from a specific technical implementation of the mathematical method (i.e. T 1954/08, Reasons, points 5. and 6.1 to 6.3; T 1784/06, Reasons, point 2.1).

None of these two conditions are fulfilled in the present application:

The technical purpose concerns the provision of a selection rule for the last method step defined in claim 1 which reads "select and combine parts from a parts catalogue to a product configuration which meets the extremum for the accumulated normalized optimization values". Therefore, the purpose is the selection and combination of parts for a product configuration. A product configuration is however not conceivable without the steps of selecting and combining parts. Therefore, the question is whether the specific selection criteria being the output of the mathematical method would provide the necessary technical purpose. However, no technical purpose can be derived from an abstract formulation of the product configuration, in particular because the product configuration could concern a purely economic, administrative or even aesthetic or creative purpose.

Not only the output, a product configuration, raises doubts whether it relates to any technical field at all, but also the input of the mathematical method fails to clear these doubts as a number of "feasible solutions" leave the way open for many potential and arbitrary solutions in different fields including various non-technical fields (economical, administrative, aesthetic or design). **No specific technical field of application is defined** and the definition remains completely general and abstract, even arbitrary, so that no technical purpose of the product configuration can be derived.

Finally, the argument that the method has the purpose to increase the reliability and efficiency of the computer is also not convincing. The provision of a 'robust method' is a general, well-known objective for every computer-implemented method and the extremely general formulation of the method makes it **impossible to evaluate any specific technical contribution of the robustness of the defined method.**

The applicant argued that robustness has a well-defined meaning in the field, namely the capacity to deliver correct results even under adverse conditions. The application does not explain what exactly is meant by a robust method in the context of the claimed invention. It can be implied from the disclosure from page 3, line 15 to page 4, line 7 and further on page 4, lines 21 to 29 in the application as filed that a robust method will avoid wrong results, deformed or distorted optimization functions or will avoid disadvantages of a heuristic normalization. Even if these effects are not disputed, ***the Board is unable to identify any technical effect of the stated robustness of the claimed method.*** It is not apparent how robustness in this sense achieves a technical effect beyond the field of pure mathematics, given that no technical effect of the mathematical method itself could be established.

The technical implementation of the mathematical method in the computer program does also not necessitate any special technical input going beyond a generic implementation. A programmer with expected skills would know how to implement the defined mathematical method in a computer program.

The mathematical method and its implementation can consequently not contribute to the technical character of the invention, because they do neither serve a well-defined technical purpose nor necessitate a special technical implementation going beyond a generic implementation.

The remaining features, which do not concern the mathematical method itself, cannot achieve it either, since, as discussed above, the claimed step of selecting and combining parts from a parts catalogue to a product configuration does not necessarily have technical character. It is furthermore noted that **a step of assembling the configurated product, which arguably would contribute to the technical character of the claimed invention, is not part of the claimed method.**

No convincing inventive step argumentation could be based on it, apart from a selection and combination of parts in general, which is well-known and therefore not inventive.

4. To sum up, it is noted that even if the claimed subject-matter has a technical character, the technical contribution of the computer implementation of the defined mathematical method in the abstract field of the application as defined in the claims does not go beyond well-known contributions (no technical purpose, no special technical implementation).

Claim 1 does therefore not fulfil the requirements of Article 52(1) EPC in combination with Article 56 EPC. Therefore, the appeal must fail.

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