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**Datasheet for the decision
of 6 March 2013**

Case Number: T 1954/08 - 3.5.01

Application Number: 04727275.2

Publication Number: 1654695

IPC: G06Q 10/00

Language of the proceedings: EN

Title of invention:
Predicting marketing campaigns using customer-specific
response probabilities and response values

Applicant:
SAP AG

Headword:
Marketing simulation/SAP

Relevant legal provisions (EPC 1973):
EPC Art. 56

Keyword:
"Inventive step - no (all requests)"

Decisions cited:
T 0641/00, T 0258/03, T 1227/05, T 1784/06

Catchword:
Insufficient indications of technical character (Reasons point
6.2)

C9165.D
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                     It can be changed at any time and without notice.

Case Number: T 1954/08 - 3.5.01

D E C I S I O N
of the Technical Board of Appeal 3.5.01
of 6 March 2013

Appellant: (Applicant)	SAP AG Dietmar-Hopp-Allee 16 69190 Walldorf (DE)
Representative:	Müller-Boré & Partner Patentanwälte Grafinger Straße 2 81671 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted 27 June 2008 refusing European patent application No. 04727275.2 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman:	S. Wibergh
Members:	K. Bumes
	A. Pignatelli

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Summary of facts and submissions

I.   This appeal is against the decision of the examining
       division to refuse European patent application No.
       04727275.2, entitled "*Predicting marketing campaigns
       using customer-specific response probabilities and
       response values*". The application was filed as
       international application PCT/EP2004/003930 and
       published as

              A2: WO-A2-2004/090765 (21 October 2004).

II.   The examining division refused the application for lack
       of inventive step (Article 56 EPC 1973) over a
       notorious data processing system comprising a plurality
       of terminals and computers connected via a
       communications network. They considered the marketing
       prediction method as a business scheme, an abstract
       administrative plan, an intellectual scheme and a
       mental act for performing mathematical steps. The
       division did not identify any technical detail beyond
       the use of commonplace communication and data
       processing means.

III.   The appellant requests that the decision under appeal
       be set aside and that the case be remitted to the
       department of first instance with an order to grant a
       patent on the basis of one of four amended claim sets
       (main request, 1st to 3rd auxiliary requests) filed
       with the statement setting out the grounds of appeal
       (24 September 2008). Oral proceedings have been
       requested on an auxiliary basis.

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(a)   Claim 1 according to the main request reads:

"1.   A computer-implemented method of predicting
outcomes of marketing campaigns, the method comprising:
        determining a response probability for each of a
plurality of customers, the customers being intended
targets of a marketing campaign;
        determining a response value for each of the
customers that indicates a predicted value of a
response to the marketing campaign by the customer; and
        predicting an outcome of the marketing campaign
using the response probability and the response value,
        wherein at least one campaign step (206) in the
marketing campaign comprises a plurality of alternative
campaign elements (207, 208, 209),
        further comprising assigning the customers to the
campaign elements (207, 208, 209) using an optimizing
algorithm, and
        wherein the optimizing algorithm assigns and
reassigns the customers to the campaign elements (207,
208, 209) while evaluating the predicted outcome of the
marketing campaign, but does not reassign a customer to
a campaign element to which the customer has previously
been assigned, and where each assignment of a customer
to a campaign element is recorded in a binary map, such
that the optimizing algorithm provides a best goal
value for the marketing campaign."

(b)   The first auxiliary request appends the following
        paragraph to the end of claim 1 of the main request:

"and where the optimizing algorithm is terminated
after a user-defined number of customer reassignments
does not improve the most recent best goal value."

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(c)   The second auxiliary request appends the following
        three paragraphs to the end of claim 1 of the main
        request:

            "the customer reassignments are recorded in a list
        after finding the most recent best goal value, where
            the optimizing algorithm is terminated after a
        user-defined number of customer reassignments does not
        improve the most recent best goal value, and where
            upon said termination, the assignment of customers
        to campaign elements corresponding to the best goal
        value is determined by reversing all the assignments
        made since finding the most recent best goal value."

(d)   As compared to the second auxiliary request, the third
        auxiliary request inserts four paragraphs in the middle
        of claim 1 so that the complete claim reads (*italics
        added to highlight the inserted paragraphs*):

        "1.   A computer-implemented method of predicting
        outcomes of marketing campaigns, the method comprising:
            determining a response probability for each of a
        plurality of customers, the customers being intended
        targets of a marketing campaign;
            determining a response value for each of the
        customers that indicates a predicted value of a
        response to the marketing campaign by the customer; and
            predicting an outcome of the marketing campaign
        using the response probability and the response value,
            *wherein the marketing campaign comprises at least
        first and second campaign steps, and wherein predicting
        the outcome of the marketing campaign further comprises:
            using the response probabilities for the plurality*

of customers to predict a number of responses to be
received if the first campaign step were performed
toward the plurality of customers;

selecting a target group (168) of customers from
the plurality of customers using the response
probabilities, where a customer is included in the
target group if a randomly generated number is less
than the customer's response probability, the target
group (168) being substantially equal to the predicted
number of responses; and

predicting an outcome of performing the second
campaign step toward the target group (168); and

wherein at least one campaign step (206) in the
marketing campaign comprises a plurality of alternative
campaign elements (207, 208, 209),

further comprising assigning the customers to the
campaign elements (207, 25 208, 209) using an
optimizing algorithm, and

wherein the optimizing algorithm assigns and
reassigns the customers to the campaign elements (207,
208, 209) while evaluating the predicted outcome of the
marketing campaign, but does not reassign a customer to
a campaign element to which the customer has previously
been assigned, and where each assignment of a customer
to a campaign element is recorded in a binary map, such
that the optimizing algorithm provides a best goal
value for the marketing campaign, where

the customer reassignments are recorded in a list
after finding the most recent best goal value, where

the optimizing algorithm is terminated after a
user-defined number of customer reassignments does not
improve the most recent best goal value, and where

upon said termination, the assignment of customers
to campaign elements corresponding to the best goal

value is determined by reversing all the assignments
made since finding the most recent best goal value."

(e)   *Technical problem presented in the statement setting
        out the grounds of appeal*

The skilled person was a computer scientist or a
computer programmer who received the task of computing
the outcome of a marketing campaign comprising a
plurality of campaign elements. The business manager
who wanted to use the prediction method might require
the optimising algorithm to provide a best goal value
for the marketing campaign. However, in order to
accomplish that task, the computer scientist had to
design and implement an algorithm which computed the
optimum result. Thus, the choice of algorithm was not
dictated by business considerations but was connected
to the particular manner of implementation. The
algorithm taught a technical professional how to find
an acceptable best goal value in a reasonable amount of
time. Thus, the skilled person was confronted with the
objective technical problem of computing the best goal
value for a marketing campaign efficiently and reliably.

(f)   *Inventiveness argumentation presented in the statement
        setting out the grounds of appeal*

A general-purpose computer was provided with additional
functionality without simply choosing an existing
method. Claim 1 taught the skilled person how to design
and implement an optimising algorithm which finds the
best goal value efficiently and reliably. The
innovative algorithm was specifically tailored to
avoiding a sub-optimal assignment of customers to

elements of a marketing campaign. Neither existing
computational algorithms (e.g. iterative improvement or
simulated annealing), nor mathematical formulae (e.g. a
formula for calculating an absolute maximum) suggested
the claimed combination of steps.

IV.   The Board summoned the appellant to oral proceedings,
       scheduled for 6 March 2013. In an annex to the summons,
       the Board voiced its preliminary opinion that claim 1
       (all requests) did not involve an inventive step over a
       general computerised method for processing data
       according to any existing mathematical algorithm.
       Finding a maximum revenue or profit value (A2, page 2,
       paragraph 2) of a simulated marketing campaign appeared
       to be a commercial rather than a technical purpose.
       Therefore, the iterative mathematical algorithm
       according to claim 1 remained a mere mathematical
       contribution which did not enter into the examination
       for an inventive step.

V.   In response to the summons, the appellant defined an
       objective technical problem as how to implement a
       method of predicting outcomes of marketing campaigns on
       a computer. The manner of implementing such a method
       required technical considerations. While the skilled
       person had various ways to implement such a method on a
       computer, the solution of claim 1 was influenced by
       technical limitations of a computer (reference to
       T 258/03-*Auction method/HITACHI*, OJ EPO 2004, 575,
       reasons 5.8).

       In particular, a human seeking to build a target group
       of customers would not consider using random numbers.
       Surprisingly, that method was more efficient than a

human approach, particularly for a large data set (i.e. a large number of customers).

The use of a binary map in the context of an optimisation algorithm made it more likely that an optimal set would be determined, and enabled the determination to be performed efficiently. The binary map was used in consideration of technical limitations of a computer system, since the intuitive approach of a human facing a similar problem was difficult to implement in a computer system.

A list of reassignments to return to a previously found goal value (when subsequent iterations failed to find a higher value) was more efficient than storing each set of customer assignments to campaign elements and showed consideration of the memory limitations of a computer system. A set of customer assignments to campaign elements could require storage of one million values (A2, page 16, lines 16 to 18), whereas the method might terminate if 10,000 reassignments did not improve the most recent best goal value (A2, page 17, lines 4/5).

VI.   By a letter received 12 February 2013, the representative informed the Board that neither the appellant nor the representative would attend the oral proceedings. A decision according to the state of the file was requested.

VII. The Board held oral proceedings in the appellant's absence on the appointed date (6 March 2013) based on the above-mentioned four requests (filed on 24 September 2008).

Reasons for the decision

The application

1. According to the introductory portion of the
   description, companies are often interested in trying
   to predict the outcome of a marketing campaign before
   it is carried out (A2, page 2, paragraph 2).

   However, target groups of customers can be very large
   (several hundred thousands, or even millions).
   Therefore, even a modest number of alternative campaign
   activities may result in a great number of possible
   combinations of customer/activity assignments. It would
   be easy to simply assign the customers to marketing
   activities at random, but this approach is not very
   likely to result in optimum results for the marketing
   campaign (A2, page 2, paragraph 3).

2. The application seeks to improve on iterative
   algorithms which have been used to find a global
   maximum of a goal value of an envisaged marketing
   campaign (A2, page 5, paragraph 2; page 15, line 11 to
   page 16, line 23; page 22, paragraphs 2 and 3; page 24,
   paragraph 2; page 29, paragraph 1; original claim 12).
   The iteration represents a "simulation" of the
   marketing campaign (A2, page 20, paragraph 2; page 29,
   last paragraph).

   Two conventional optimisation algorithms (*Greedy
   approach; Taboo search*) are said to get stuck at local
   maxima and may not be able to locate an overall, global
   maximum (A2, page 2, line 20 to page 4, line 12).

3.   To prevent the search algorithm from revisiting local
      maxima, the application proposes to memorise (in a
      binary map 164) parameter combinations (i.e.
      assignments of marketing activities to customers) which
      have been considered and should not be reconsidered (A2,
      page 8, lines 16 to 21; page 16, paragraphs 2 and 3;
      page 22, lines 9 to 13; page 24, lines 13 to 16).

      Third Auxiliary Request

4.   *C*laim 1 of the third auxiliary request contains all the
      features of claim 1 of the other requests.

      Article 56 EPC 1973 – Inventive step

5.   In the light of Article 52(1)(2)(3) EPC, an inventive
      step according to Article 56 EPC 1973 requires a non-
      obvious technical contribution (T 641/00-*Two
      identities/COMVIK*, Headnote 1, OJ EPO 2003, 352;
      T 1784/06-*Classification method/COMPTEL*).

      The use of computers for automation purposes is
      technical but commonplace.

      A mathematical algorithm may become a technical means,
      i.e. it may go beyond a mere mathematical contribution,
      if it serves a technical purpose (T 1227/05-*Circuit
      simulation/INFINEON*, points 3.1, 3.2, OJ EPO 2007, 574).

6.   However, anticipating a maximum revenue or profit value
      (A2, page 2, paragraph 2) of a marketing campaign is a
      commercial rather than a technical purpose. Therefore,
      the iterative mathematical algorithm of claim 1 remains

a mere mathematical contribution which does not enter into the examination for an inventive step.

6.1   The appellant argues that the choice of algorithm is based on technical considerations as it takes account of technical (e.g. memory) limitations of computers and diverges from a human approach.

6.2   In decision T 1227/05, point 3.2.5 (*supra*) it was held that (the sole) processing speed was not a suitable criterion for distinguishing between technical and non-technical method steps since it was always possible to conceive of a slower algorithm than the one claimed. Similarly, the sole amount of memory a computer-implemented algorithm requires is equally unsuitable for determining whether or not a method step contributes to the solution of a technical problem since it is always possible to imagine an algorithm demanding more memory. Furthermore, whether or not an algorithm is similar to what a human being would do may play a role for the examination for inventive step, but this examination presupposes that the technicality of the feature has been established.

6.3   The appellant further argues that the choice of algorithm is not part of the requirements supplied to the skilled person by the business manager, and concludes that the choice of algorithm is tied to a particular manner of (computer-)implementation.

The Board agrees that the mathematical algorithm is not provided by the business manager who is only interested in an economic forecast on which he can base his decision for a marketing campaign.

However, the Board does not agree with the appellant's conclusion that the algorithm is provided by the implementing programmer. In the absence of a technical overall effect and purpose, the algorithm is provided by a mathematician for mathematical and ultimately commercial purposes. Mathematical definitions do not become technical by defining commercial relationships. For example, response probabilities and response values of customers are based on past customer behaviour (A2, page 26, last paragraph; page 27).

6.4   As to the implementation of the algorithm, no internal function of the computer requires a non-obvious consideration to track and reverse incremental changes in the form of reassignments.

6.4.1   The random number mentioned in claim 1 solves no problem other than splitting a large list of customers into two partial lists, without achieving any external technical effect or implying any technical consideration of the internal functioning of a computer.

On the implementation level, random number generators are well-known. The application implicitly confirms that finding as it is silent on any technical detail of generating random numbers.

6.4.2   A binary map of flags settable for each possible customer-activity assignment (A2, page 8, lines 20/21) does not diverge fundamentally from a human's approach when testing a multiplicity of assignments: a human would obviously mark (i.e. flag) tested assignments so as to test other assignments next.

Nor does the mathematical or commercial meaning of the flagged information imply any non-obvious technical modification of general computer functions.

7.   The step that "*the optimising algorithm is terminated after a user-defined number of customer reassignments does not improve the most recent best goal value*" is considered next.

        As mentioned above, the innovative potential of the algorithmic scheme can be left aside since it does not serve any technical purpose and, thus, does not contribute to the technical character of the claimed method and cannot enter into the examination for an inventive step.

        Said lack of a technical purpose is not altered by defining a mathematical criterion for terminating the algorithm.

8.   The Board concludes that the method according to claim 1 of the third auxiliary request does not involve an inventive step over a general computerised method for processing data according to any existing mathematical algorithm and, thus, does not meet the requirements of Article 56 EPC 1973.

9.   *A fortiori*, the broader versions of claim 1 (main request, first and second auxiliary requests) also lack an inventive step.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

T. Buschek   S. Wibergh