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**Datasheet for the decision  
of 19 July 2022**

**Case Number:** T 1560/19 - 3.5.03

**Application Number:** 13195858.9

**Publication Number:** 2881820

**IPC:** G05B23/02, G06F9/50

**Language of the proceedings:** EN

**Title of invention:**

Data processing device and method for characterizing behavior of equipment under observation

**Applicant:**

Blue Yonder Group, Inc.

**Headword:**

Monitoring equipment behaviour/BBLUE YONDER

**Relevant legal provisions:**

EPC Art. 56, 84

**Keyword:**

Clarity - all requests (no)  
Inventive step - all requests (no): claimed device defined merely as a "black box"

**Decisions cited:**

G 0001/04, G 0001/19, T 0256/19, T 2764/19



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Case Number: T 1560/19 - 3.5.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.03**  
**of 19 July 2022**

**Appellant:** Blue Yonder Group, Inc.  
(Applicant) 15059 N. Scottsdale Road  
Scottsdale, AZ 85254 (US)

**Representative:** Zahn, Matthias  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 3 January 2019  
refusing European patent application  
No. 13195858.9 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** K. Bengi-Akyürek  
**Members:** K. Peirs  
N. Obrovski

## Summary of Facts and Submissions

- I. The appeal is against the decision of the examining division refusing the present European patent application on the grounds of, *inter alia*, lack of inventive step (Article 56 EPC) and lack of clarity (Article 84 EPC) with respect of the claims of a main request and first to eighth auxiliary requests.
- II. The appellant (applicant) was summoned to oral proceedings before the board. A communication was issued under Article 15(1) RPBA 2020 including the board's preliminary opinion concerning clarity (Article 84 EPC) and inventive step (Article 56 EPC).
- III. Oral proceedings before the board were held on 19 July 2022 by videoconference. At their end, the board announced its decision.
- IV. The appellant's final requests were that the decision under appeal be set aside and that a patent be granted on the basis of the claims of one of the **main request** and **first to eighth auxiliary requests** underlying the appealed decision.
- V. Claim 1 of the **main request** reads as follows (board's feature labelling):
  - (a) "A data processing device (100, 200, 900) for characterizing behavior properties of equipment under observation (105),
  - (b) the data processing device (100, 200, 900) comprising a plurality of processing units (210, 220, 910, 920, 930, 940, 950) that are adapted to process input values ({a}, {b} ... {d}) to output

- values {b}, {c}, {d}, {e}) according to numerical transfer functions ({FI}, {FJ}, {FK}, {FL}, {FM}),
- (c) wherein the numerical transfer functions implement an input-to-output mapping specified by a configuration ({C}),
- (d) wherein the data processing device (100, 200, 900) is adapted to load the configuration ({C}) prior to processing time, and
- (e) wherein the configuration ({C}) is related to the behavior properties of the equipment (105) so that some of the output values ({e}) represent the behavior properties of the equipment (105) under observation".

VI. Claim 1 of the **first auxiliary request** includes all the features of claim 1 of the main request and further includes, between features (c) and (d), the following feature:

- (f) "wherein the numerical transfer functions have elements indicative of a function type ( $t\sim$ ), indicative of input values ( $i\sim$ ), and indicative of output values ( $o\sim$ ),".

VII. Claim 1 of the **second auxiliary request** includes all the features of claim 1 of the main request and further includes, between features (c) and (d), the following feature (the difference vis-à-vis feature (f) is underlined by the board):

- (g) "wherein the numerical transfer functions have elements, specified by the configuration, indicative of a function type ( $t\sim$ ), indicative of input values ( $i\sim$ ), and indicative of output values ( $o\sim$ ),".

VIII. Claim 1 of the **third auxiliary request** includes all the features of claim 1 of the second auxiliary request and further includes, at the end, the following feature:

(h) "the data processing device (100, 200, 900) further comprising configuration buffers (281-1...281-j...281-N, 282) associated with the processing units (210-1...210-j...210-N, 220) and adapted to receive the configuration ( $\{C\}$ ), wherein the configuration buffers (281-1...281-j...281-N, 282) are coupled to the processing units (210-1...210-j...210-N, 220)".

IX. Claim 1 of the **fourth auxiliary request** includes all the features of claim 1 of the third auxiliary request and further includes, at the end, the following feature:

(i) "wherein the association is implemented by any of the following:  
- combinational logic,  
- look-up tables, and  
- binary trees".

X. Claim 1 of the **fifth auxiliary request** includes all the features of claim 1 of the third auxiliary request and further includes, at the end, the following feature:

(j) "wherein the configuration buffers (281-1...281-j...281-N, 282) are adapted to receive a configuration ( $\{C\}\alpha$ ) of a first processing context ( $\alpha$ ) and to receive a configuration ( $\{C\}\beta$ ) of a second processing context ( $\beta$ ), and wherein the data processing device (100, 200) is adapted to select (191, 192) the associated processing units (210-1...210-j...210-N, 220) to process data values

accordingly".

XI. Claim 1 of the **sixth auxiliary request** includes all the features of claim 1 of the fifth auxiliary request and further includes

- the following feature between features (h) and (j):

(k) "wherein the configuration buffers ({{C}}) are adapted to cache the configuration ({{C}}),"

and

- the following feature at the end:

(l) ", wherein input data values are being processed in the first processing context and subsequently being processed in the second processing context".

XII. Claim 1 of the **seventh auxiliary request** includes all the features of claim 1 of the sixth auxiliary request but with feature (c) replaced with the following feature (the amendment vis-à-vis feature (c) is underlined by the board):

(c') "wherein the numerical transfer functions implement an input-to-output mapping specified by a configuration ({{C}}) that is obtained by pre-processing historic data (114) from a plurality of master equipment (104),".

XIII. Lastly, claim 1 of the **eighth auxiliary request** includes all the features of claim 1 of the sixth auxiliary request but with feature (c) replaced with the following feature (the amendment vis-à-vis feature (c) is underlined by the board):

(c'') "wherein the numerical transfer functions implement an input-to-output mapping specified by a configuration ({{C}}) that corresponds to a behavior of the equipment under observation that is of interest to be detected,".

## **Reasons for the Decision**

### 1. *Technical background*

The present application relates to monitoring a technical equipment's "behaviour". The proposed solution does so by defining numerical transfer functions to provide a mapping of input to output values. These numerical transfer functions are programmed into a multi-processor device or a multi-core processor. The mapping can be used to characterise the equipment's behaviour. During this characterisation, the equipment can operate under different behaviour conditions (referred to as "context" in the present application).

According to the application, when the mapping is determined using a model based on historic data, it can identify "trends" indicating a failure in the equipment's functioning.

### 2. *Main request: claim 1 - clarity and inventive step*

2.1 With respect to clarity, it is apparent from Reasons 2.3.1 and 2.3.2 of the appealed decision that a major issue in the present case concerns whether particular embodiments of the description as filed should be considered when construing claims. Regarding claim construction, or, more specifically, clarity of



the claims, it is noted that Article 84 EPC requires the claims to define the subject-matter for which patent protection is sought. The meaning of the features of the claims should therefore be clear for the person skilled in the art from the wording of the claims alone (see e.g. **G 1/04**, Reasons 6.2). In other words, given that claims of a patent application are typically directed to a person *skilled* in the field of the application, the claims should essentially be read and interpreted by such a skilled reader on their own merits, rather than with the aid of the description and drawings (see e.g. **T 256/19**, Reasons 3.1; **T 2764/19**, Reasons 3.1.1, and the decisions cited therein).

2.2 The skilled reader to whom the present application is addressed is from the field of "data processing for monitoring technical equipment", as is immediately apparent from **feature (a)** and the term "a plurality of processing units" of **feature (b)**. For the sake of completeness, it is noted that this is also in line with paragraph [001] of the present application as filed. This skilled reader would not be able to construe properly several aspects of **features (a), (c) and (e)**. In particular, the clause "for characterising behaviour properties of equipment under observation" (emphasis added) of **feature (a)** is unclear because it is not apparent

- how the equipment's behaviour properties are characterised by the data processing device

and

- by whom or by which entity the equipment is under observation.

2.3 More specifically, the following unclarities are apparent:

2.3.1 **Feature (e)** is, apart from feature (a), the only feature in claim 1 that concerns the "equipment's behaviour properties". Contrary to what was stated by the appellant at the hearing before the board, the interaction between the data processing device and the equipment as defined in features (a) and (e) does not render the aspects of "how" and of "by whom or by which entity" of point 2.2 above clear to the skilled reader. This is because no details are provided in claim 1 of the main request regarding the relationship between the "equipment's behaviour properties" and the "configuration", other than the vague indication that some of the output values represent the behaviour properties: feature (c), for instance, merely requires these properties to be related to a "configuration" specifying an "input-to-output mapping" that is performed by the processing units of the "data processing device" of feature (a). Moreover, the board emphasises here that the "input" of the "input-to-output mapping" of **feature (c)** is completely arbitrary. In particular, the claimed "data processing device" does not comprise any features that would enable an input based on an observation according to feature (a).

The board does not agree with the appellant that, according to feature (e), at least one output value would inform the skilled reader of the equipment's behaviour. This is because the skilled reader would not immediately see how the result that "some of the output values represent the behaviour properties of the equipment under observation" according to feature (e) can be achieved. The amount of options encompassed by

the vague terms of features (a), (c) and (e) is namely such that the skilled reader would be in the dark as to whether (some of) the "output values" of feature (e) can, in fact, characterise the equipment's behaviour properties, i.e. describe the distinctive nature of these properties. It must be appreciated here that, in claim 1, the equipment's behaviour could relate to a behaviour over a certain time span or to a behaviour in the *past*, the *present* or even the *future*. These types of behaviour are all to be characterised differently in order to describe their distinctive nature, but claim 1 is entirely silent in this regard.

2.3.2 Hence, claim 1 of the main request is unclear (Article 84 EPC).

2.4 As to inventive step, the appellant stressed that features (a) to (f) must be interpreted with the knowledge that the skilled reader had at the present application's date of filing. In the appellant's view, that knowledge would have allowed the skilled reader to understand the equipment's behaviour properties of features (a) and (e) to have been characterised by pattern recognition performed on the behaviour of a master equipment. The appellant concluded that, after a training period, the claimed data processing device would have been able to achieve the technical effect of "re-recognising certain signal patterns".

This technical effect is, however, not credibly achieved by features (a) to (e). These features are silent about any "pattern recognition", "master equipment" or about any "training period". Instead, they use general terms such as "numerical transfer functions", "input-to-output mapping" and "configuration", which are inherent to any processing

unit like one of those mentioned in feature (b). Furthermore, the board cannot recognise any other technical effect that could credibly be brought about by features (a) to (e). In fact, the claimed data processing device acts as a "black box" using abstract mathematical method steps, without achieving any credible technical effect. In this respect, the board recalls that, according to Reasons 124 of **G 1/19**, "only those technical effects that are at least implied in the claims should be considered in the assessment of inventive step".

Therefore, notwithstanding the above-identified deficiencies under Article 84 EPC, the subject-matter of claim 1 of the main request does not involve an inventive step (Article 56 EPC).

- 2.5 As a consequence, the main request is not allowable under Articles 84 and 56 EPC.
  
- 3. *First to eighth auxiliary requests: claim 1 - clarity and inventive step*
  
- 3.1 **Features (f) to (l), (c') and (c'')** of present claim 1 do not resolve any of the clarity deficiencies mentioned for claim 1 of the main request in points 2.1 to 2.3 above. On the contrary, some of these features even aggravate the lack of clarity (Article 84 EPC).
  
- 3.1.1 As to **feature (c')**, the appellant emphasised that the prefix "pre" of the term "pre-processing" implies a monitoring in the past. This in turn would make it clear, in the appellant's view, that a training period was present such as the one mentioned in point 2.4 above for the main request. However, the board holds that the skilled reader would not have been able to

verify, from a particular "configuration", whether it was in fact obtained by pre-processing historic data from a plurality of master equipment as required by feature (c'). As a result, this feature cannot lend itself to properly expressing that any monitoring or training period is involved.

- 3.1.2 Likewise, as regards **feature (c'')**, it is unclear how the skilled reader could actually discern that a given configuration reflects the behaviour "of interest to be detected". The appellant explained that the term "of interest" meant that one is interested in the equipment's behaviour rather than in, for instance, its colour. This, however, still does not allow the skilled reader to understand which specific aspects of the equipment's behaviour would be "of interest". These specific aspects could range from a behaviour under *normal operation* over a behaviour under *programming* to a behaviour under *failure*. They could, alternatively, relate to a behaviour under *different working conditions*, such as varying pressure, temperature or humidity. Or they could relate to *past, present* or *future* behaviours. Features (a) to (l), (c') and (c'') are however silent as to which of those behaviours would be "of interest".
- 3.1.3 Claim 1 of the present auxiliary requests is therefore not clear (Article 84 EPC) either.
- 3.2 Moreover, **features (f) to (l), (c') and (c'')**, as far as they can be understood, do not contribute to an inventive step. This is because they are either already implied by features (a) to (e) or constitute obvious implementation details to the skilled person.

- 3.2.1 The appellant argued that these features would allow for a "more accurate pattern recognition". The board does not hold this to be credible, given that features (f) to (l), (c') and (c'') do not imply any teaching whatsoever to this effect.
- 3.2.2 Hence, the subject-matter of claim 1 of the first to eighth auxiliary requests does not involve an inventive step (Article 56 EPC).
- 3.3 In sum, the auxiliary requests on file are not allowable under Articles 84 and 56 EPC either.

## Order

### **For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chair:



B. Brückner

K. Bengi-Akyürek

Decision electronically authenticated