ID: Text5

Below you can find an excerpt from the specification of a single process for a single organization. In the specification, the process is stated to end after a trouble-shooting report is sent from Resource Provisioning to Service Management. However, the specification describes the control flow continuation after Service Management receives the trouble-shooting report, and that the process ends after some other activities are completed.

Note that the specification states that both Resource Provisioning and Service Management are departments of the same organization, hence this specification refers to a single process within one organization.

According to the taxonomy, what type of ambiguity is this?

```
Please find the specification at:
Text 5 in Friedrich, F.: Automated Generation of Business Process
Models from Natural Language Input. Master's thesis, Humboldt-Univer-
sität zu Berlin (2010) https://frapu.de/pdf/friedrich2010.pdf
```

ID: RTFMP

The following is an excerpt from a process log in XES format, showing one trace for a road traffic fine management process. For all events in the trace, the associated timestamp is specified. However, these timestamps specify the date with no time (hours, minutes, milliseconds) information. Thus, events occurring on the same day are recorded with the same timestamp, regardless of the time of occurrence, making it impossible to reconstruct at what time each event occurred. According to the taxonomy, what type of ambiguity is this?

```
...
    <event>
        <float key="amount" value="131.0"/>
        <string key="org:resource" value="25"/>
        <string key="concept:name" value="Create Fine"/>
        <string key="lifecycle:transition" value="complete"/>
        <date key="time:timestamp" value="2002-09-07T00:00:00+02:00"/>
    </event>
    <event>
        <string key="concept:name" value="Send Fine"/>
        <string key="lifecycle:transition" value="complete"/>
        <float key="expense" value="15.16"/>
        <date key="time:timestamp" value="2002-09-07T00:00:00+02:00"/>
    </event>
    <event>
        <string key="notificationType" value="P"/>
        <string key="concept:name" value="Insert Fine Notification"/>
        <string key="lifecycle:transition" value="complete"/>
        <date key="time:timestamp" value="2002-09-07T00:00:00+01:00"/>
    </event>
    <event>
        <float key="amount" value="262.0"/>
        <string key="concept:name" value="Add penalty"/>
        <string key="lifecycle:transition" value="complete"/>
        <date key="time:timestamp" value="2003-01-03T00:00:00+01:00"/>
    </event>
...
```

ID: VDA51

Below you can find the specification of a claim handling process. As pointed out in [van Der Aa, 2018], from the specification we do not know whether it is allowed that the claims officer records the claim information before reviewing the request, or if the two tasks could be executed at the same time.

According to the taxonomy, what type of ambiguity is this?

```
Please find the specification at:
Figure 1 in van der Aa, H.: Dealing with ambiguity in textual process
descriptions. In: Comparing and Aligning Process Representations, pp.
77-101. Springer (2018) https://doi.org/10.1007/978-3-319-45348-4_16
```

ID: Text20

Below you can find the specification of a process for invoice processing. The specification states that if the invoice amount exceeds EUR 20,000, the Board wants to check it again, according to the 4-eyes principle. However, the process specification only mentions the Board at this point, without further explaining it. For instance, it is not obvious whether the Board is a specific role in the process or a set of other roles. Therefore, it is uncertain how the Board should be modelled.

According to the taxonomy, what type of ambiguity is this?

```
Please find the specification at:
Text 20 in Friedrich, F.: Automated Generation of Business Process
Models from Natural Language Input. Master's thesis, Humboldt-Univer-
sität zu Berlin (2010) https://frapu.de/pdf/friedrich2010.pdf
```

ID: 2080197990

The following BPMN diagram excerpt shows two xor gateways, each with annotated outgoing branches to make the xor condition explicit. Considering the upper gateway, notice that these conditions overlap on the edge case, thus if Age=14 both branches will be followed. Nevertheless, the labels of the following activities suggest mutual exclusion between the two branches. Thus, from the model it is unclear which is the intended behavior in such case. Note that this model is syntactically correct, as BPMN gives freedom in the definition of gateway conditions.

According to the taxonomy, what type of ambiguity is this?

```
Please find the diagram at:
Process model 2080197990 in Weske, Mathias, Decker, Gero, Dumas, Mar-
lon, La Rosa, Marcello, Mendling, Jan, & Reijers, Hajo A. (2020).
Model Collection of the Business Process Management Academic Initia-
tive    (Version    BPMAI-29-10-2019    [Data    set].    Zenodo.
https://doi.org/10.5281/zenodo.3758705
```

ID: 2012BPIC

The following is an excerpt from a process execution log in XES format, showing one trace for a process execution. Notice that for most events in the trace the associated resource is recorded (see highlighted lines). However, for the last event, no resource is recorded. Thus, it is impossible to fully reconstruct the execution, i.e., it is unclear which resource executed the last two events.

According to the taxonomy, what type of ambiguity is this?

```
...
<event>
        <string key="org:resource" value="112"/>
        <string key="lifecycle:transition" value="COMPLETE"/>
        <string key="concept:name" value="A_SUBMITTED"/>
        <date key="time:timestamp" value="2011-11-21T14:18:02.822+01:00"/>
</event>
<event>
        <string key="org:resource" value="112"/>
        <string key="lifecycle:transition" value="COMPLETE"/>
        <string key="concept:name" value="A_PARTLYSUBMITTED"/>
        <date key="time:timestamp" value="2011-11-21T14:18:02.993+01:00"/>
</event>
<event>
        <string key="org:resource" value="112"/>
        <string key="lifecycle:transition" value="SCHEDULE"/>
        <string key="concept:name" value="W_Afhandelen leads"/>
        <date key="time:timestamp" value="2011-11-21T14:18:48.116+01:00"/>
</event>
<event>
        <string key="concept:name" value="W_Completeren aanvraag"/>
        <string key="lifecycle:transition" value="START"/>
        <date key="time:timestamp" value="2011-11-21T16:49:41.988+01:00"/>
</event>
```

ID: F426

Below is the specification of an order handling process. The specification only defines the role for the customer; no information is given about the roles responsible for the activities of receiving order, registering order, etc. Indeed, the specifications uses verbs in the passive form for these activities. Thus, it is impossible to associate each of these activities with a clearly defined role. If you were to translate the specification into a BPMN model, you would not be sure, into which pool/lane to place these activities.

According to the taxonomy, what type of ambiguity is this?

Please find the specification at:
Exercise 4.26 in Dumas, M., La Rosa, M., Mendling, J., Reijers, H.A.:
Fundamentals of Business Process Management. Springer (2018)
https://doi.org/10.1007/978-3-662-56509-4

ID: Storage3

Below is an excerpt from an execution log of a smart factory process. The process handles the storage of a workpiece; the BPMN model used for the enactment of the process is shown here. Notice that the model presents an activity "Read color" to be executed once by "VGR_1" (see red ellipse). However, the log presents two occurrences of the "Read color" activity for the same process instance. The two activities read two different colors for the same workpiece (first blue, then red: see highlighted lines in the log). Because of this, it is unclear whether the color of the workpiece manipulated in this process instance is blue or red.

According to the taxonomy, what type of ambiguity is this?
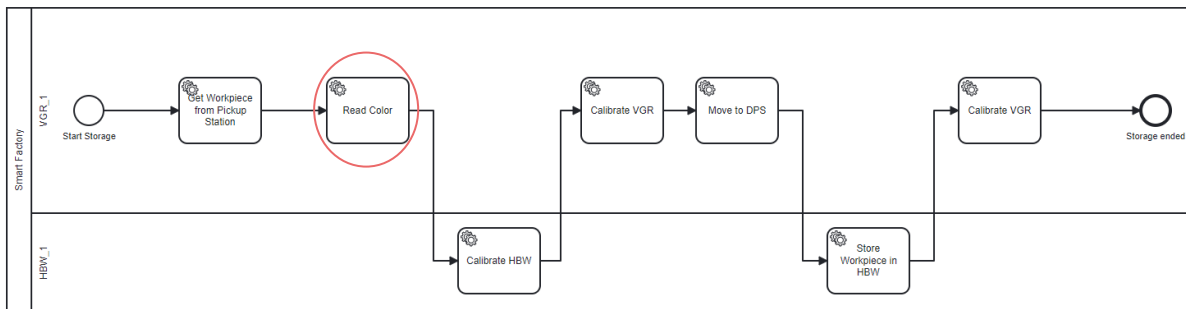

```
...
{ "activityName": "Get Workpiece from Pickup Station",
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",
  "resource": VGR_1,
  "startTime": "2023-03-20T09:45:45.927+0100",
  "endTime": "2023-03-20T09:46:11.155+0100"},
{ "activityName": "Read Color",
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",
  "resource": VGR_1,
  "startTime": "2023-03-20T09:46:11.155+0100",
  "endTime": "2023-03-20T09:46:11.176+0100",
  "color":"blue"},
{ "activityName": "Read Color",
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",
  "resource": VGR_1,
  "startTime": "2023-03-20T09:46:11.213+0100",
  "endTime": "2023-03-20T09:46:11.233+0100",
  "color":"red"},
...
```

ID: 3095760

Below you can find an excerpt from an order-to-cash process, modelled in standard EPC no-tation for communication between stakeholders. EPC model process events and functions (i.e., tasks) as pink hexagons, resp. green boxes. Assume that the process specification from which this model is derived specifies also which resources and data objects are associated with the tasks. These, however, could not be included in the standard EPC model. Thus, looking at this model, stakeholders are not sure about which resources and data are involved in the process.

According to the taxonomy, what type of ambiguity is this?

ID: Storage1

Below is an excerpt from a process execution log from a smart factory storage process, showing a single trace. The following BPMN diagram shows the process model used for the enactment of the process that generated the log. In the log, for all activities the associated resource is specified: for activity "Store Workpiece in HBW", the recorded resource is "VGR_1" (see highlighted lines in the log). However, this log entry contrasts with the process model, which assigned the activity to resource "HBW_1" for execution (see the position of the activity in the lane of "HBW_1" in the red ellipse). Therefore, we are not sure whether the activity was executed by HBW_1 and logged wrongly, or executed by VGR_1 and logged correctly.

According to the taxonomy, what type of ambiguity is this?
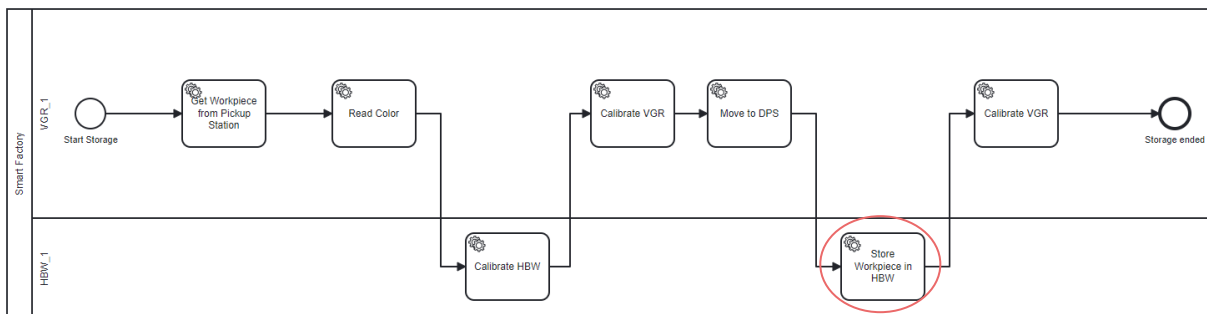
{ "activityName": "Start Storage",

 "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "resource": "VGR_1",

 "startTime": "2023-03-20T09:45:45.926+0100",

 "endTime": "2023-03-20T09:45:45.926+0100"},

{ "activityName": "Get Workpiece from Pickup Station",

 "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "resource": "VGR_1",

 "startTime": "2023-03-20T09:45:45.927+0100",

 "endTime": "2023-03-20T09:46:11.155+0100"},

{ "activityName": "Read Color",

 "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "resource": "VGR_1",

 "startTime": "2023-03-20T09:46:11.155+0100",

 "endTime": "2023-03-20T09:46:11.176+0100"},

{ "activityName": "Calibrate HBW",

 "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "resource": "HBW_1",

 "startTime": "2023-03-20T09:46:11.176+0100",

 "endTime": "2023-03-20T09:46:11.193+0100"},

```
{ "activityName": "Calibrate VGR",
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f"
  "resource": "VGR_1",
  "startTime": "2023-03-20T09:46:11.193+0100",
  "endTime": "2023-03-20T09:46:12.146+0100"},
{ "activityName": "Move to DPS",
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",
  "resource": "VGR_1",
  "startTime": "2023-03-20T09:46:12.146+0100",
  "endTime": "2023-03-20T09:46:35.940+0100"},
{ "activityName": "Store Workpiece in HBW",
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f"
  "resource": "VGR_1",
  "startTime": "2023-03-20T09:46:35.940+0100",
  "endTime": "2023-03-20T09:47:33.601+0100"},
{ "activityName": "Calibrate VGR",
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f",
  "resource": "VGR_1",
  "startTime": "2023-03-20T09:47:33.601+0100",
  "endTime": "2023-03-20T09:47:44.227+0100"},
{ "activityName": "Storage ended"
  "processInstanceId": "9b148ef9-c6fb-11ed-8b25-2a1b4c3d6e5f"
  "resource": "VGR_1",
  "startTime": "2023-03-20T09:47:44.228+0100",
  "endTime": "2023-03-20T09:47:44.228+0100"}
```

ID: C8

In Camunda 8.0 the BPMN element "Terminate end event" was not supported. Therefore, for process models requiring to handle cases that could be solved by introducing such an event, a workaround was proposed. The workaround required writing a worker (i.e., a service) to be invoked by a service task for accessing the Camunda API and terminating the process instance based on its id. However, with this workaround, the termination is not explicit part of the process model, which makes it difficult to understand how the process behaves in the cases in which a terminate end event is expected.

According to the taxonomy, what type of ambiguity is this?

```
Please find the case description at:
https://forum.camunda.io/t/terminate-end-event-is-not-supported-by-
camunda-8/39225
```

ID: Storage2

Below is an excerpt from an execution log of a smart factory storage process. The process model used for the enactment of the process is shown in the following BPMN diagram. Among data on activity execution, the log includes also numerous events related to measurements of environmental data by an environment sensor (station "EC_1", see highlighted lines). These environmental data are completely unrelated to the process execution; looking at the model, you can notice that the environment sensor does not take part in the process. Looking at the log, it is unclear how these environmental data should be treated with respect to the process.

According to the taxonomy, what type of ambiguity is this?
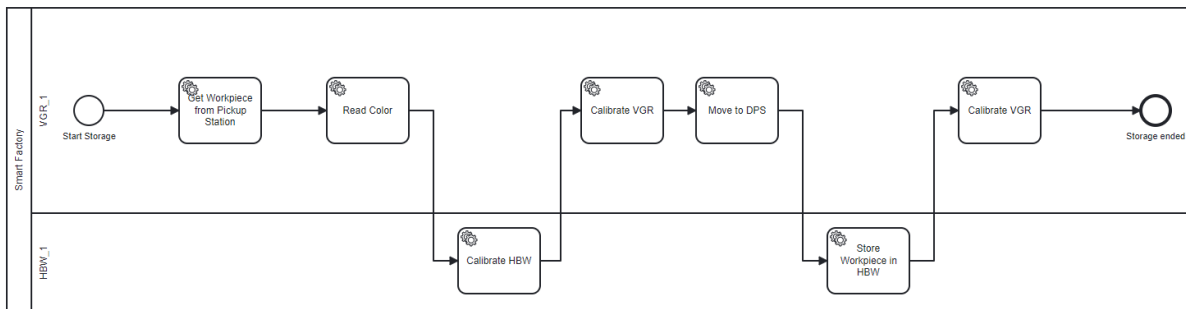

```
...
{"id": "Activity_0sy1do2:fe1b82c7-c6fb-11ed-8b25-2a1b4c3d6e5f",
 "activityName": "Get Workpiece from Pickup Station",
 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",
 "resource": VGR_1,
 "startTime": "2023-03-20T09:48:32.066+0100",
 "endTime": "2023-03-20T09:48:57.005+0100",},
{"id": "2993c5e2-8d4a-45d4-adc8-17028e7923ef",
 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",
 "station": "EC_1",
 "timestamp": "2023-03-20 09:48:32.58",
 "i1_pos": 0,
 "i2_pos": 0,
 "i3_photoresistor": 2206,
 "i5_joystick_x_f": 0,
 "i6_joystick_y_f": 0,
 "i7_joystick_x_b": 0,
 "i8_joystick_y_b": 0},
{"id": "cbacffaa-3213-4284-ad86-7a7597eafe4c",
 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",
```

    "station": "EC_1",

    "timestamp": "2023-03-20 09:48:34.59",

    "i1_pos": 0,

    "i2_pos": 0,

    "i3_photoresistor": 2212,

    "i5_joystick_x_f": 0,

    "i6_joystick_y_f": 0,

    "i7_joystick_x_b": 0,

    "i8_joystick_y_b": 0},

{"id": "Activity_1og4zsv:0cf8e678-c6fc-11ed-8b25-2a1b4c3d6e5f",

 "activityName": "Read Color",

 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "resource": VGR_1,

 "startTime": "2023-03-20T09:48:57.005+0100",

 "endTime": "2023-03-20T09:48:57.022+0100"},

{"id": "88001ddf-126e-42ac-a801-3064b6a8cd39",

 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "station": "EC_1",

 "timestamp": "2023-03-20 09:48:58.72",

 "i1_pos": 0,

 "i2_pos": 0,

 "i3_photoresistor": 2214,

 "i5_joystick_x_f": 0,

 "i6_joystick_y_f": 0,

 "i7_joystick_x_b": 0,

 "i8_joystick_y_b": 0},

{"id": "25695f83-7b85-4a96-920c-b346d9c346ce",

 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "station": "EC_1",

 "timestamp": "2023-03-20 09:49:00.74",

 "i1_pos": 0,

 "i2_pos": 0,

 "i3_photoresistor": 2208,

 "i5_joystick_x_f": 0,

 "i6_joystick_y_f": 0,

    "i7_joystick_x_b": 0,

    "i8_joystick_y_b": 0},

{"id": "239052e2-81ec-4f05-91aa-195b6ebfe6bc",

    "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",

    "station": "EC_1",

    "timestamp": "2023-03-20 09:49:02.75",

    "i1_pos": 0,

    "i2_pos": 0,

    "i3_photoresistor": 2199,

    "i5_joystick_x_f": 0,

    "i6_joystick_y_f": 0,

    "i7_joystick_x_b": 0,

    "i8_joystick_y_b": 0},

{"id": "Activity_0lzthoo:152de20c-c6fc-11ed-8b25-2a1b4c3d6e5f",

 "activityName": "Calibrate VGR",

 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "resource": VGR_1,

 "startTime": "2023-03-20T09:49:10.774+0100",

 "endTime": "2023-03-20T09:49:11.718+0100"},

{"id": "a383edf7-99e8-476d-92a2-a0ee0849d312",

 "processInstanceId": "fe1b82c5-c6fb-11ed-8b25-2a1b4c3d6e5f",

 "station": "EC_1",

 "timestamp": "2023-03-20 09:49:10.77",

 "i1_pos": 0,

 "i2_pos": 0,

 "i3_photoresistor": 2153,

 "i5_joystick_x_f": 0,

 "i6_joystick_y_f": 0,

 "i7_joystick_x_b": 0,

 "i8_joystick_y_b": 0},

...

ID: Storage4

Below is an excerpt from an execution log of a smart factory process. Specifically, the excerpt shows events that represent the execution of the "Sorting machine sort" activity by resource "SM_1" in different traces. We may assume that the activity duration should be 20 seconds ± 1 second, as for most executions this is reflected in the logged data (attribute `durationIn-Millis`). However, for process instance with id `6a7ad64b-c711-11ed-8b25-2a1b4c3d6e5f`, an activity duration of 38.5 seconds is recorded (see highlighted line).

According to the taxonomy, what type of ambiguity is this?

```
{ "activityName": "Sorting Machine sort",
 "processInstanceId": "5008f375-c6fe-11ed-8b25-2a1b4c3d6e5f",
 "resource": SM_1,
 "startTime": "2023-03-20T10:08:01.623+0100",
 "endTime": "2023-03-20T10:08:22.230+0100",
 "durationInMillis": 20607}


{ "activityName": "Sorting Machine sort"
 "processInstanceId": "1f9cb927-c702-11ed-8b25-2a1b4c3d6e5f"
 "resource": SM_1,
 "startTime": "2023-03-20T10:35:30.890+0100",
 "endTime": "2023-03-20T10:35:51.807+0100",
 "durationInMillis": 20917}


{ "activityName": "Sorting Machine sort",
 "processInstanceId": "b4625b67-c702-11ed-8b25-2a1b4c3d6e5f",
 "resource": SM_1,
 "startTime": "2023-03-20T10:39:37.689+0100",
 "endTime": "2023-03-20T10:39:57.816+0100",
 "durationInMillis": 20127}


{ "activityName": "Sorting Machine sort",
 "processInstanceId": "3ec11b43-c705-11ed-8b25-2a1b4c3d6e5f",
 "resource": SM_1,
 "startTime": "2023-03-20T10:57:53.343+0100",
 "endTime": "2023-03-20T10:58:13.615+0100",
 "durationInMillis": 20272}
```

{ "activityName": "Sorting Machine sort",
 "processInstanceId": "d40f2757-c705-11ed-8b25-2a1b4c3d6e5f",
 "resource": SM_1,
 "startTime": "2023-03-20T11:01:49.194+0100",
 "endTime": "2023-03-20T11:02:09.154+0100",
 "durationInMillis": 19960}

{ "activityName": "Sorting Machine sort",
 "processInstanceId": "6a7ad64b-c711-11ed-8b25-2a1b4c3d6e5f",
 "resource": SM_1,
 "startTime": "2023-03-20T12:24:47.592+0100",
 "endTime": "2023-03-20T12:25:26.092+0100",
 "durationInMillis": 38500}