**3GPP TSG-SA5 Meeting #143eS5-223394**

**09 - 17 May 2022, E-meeting**

**Source: Nokia**

**Title: pCR 28.105 Add requirements for handling erroneous data & decisions**

**Document for: Approval**

**Agenda Item: 6.6.5**

# 1 Decision/action requested

***The group is asked to discuss and agree on the proposal.***

# 2 References

[1] 3GPP TS 28.105-110 “Management and orchestration; AI/ML management”.

# 3 Rationale

The AI/ML training needs to support the capabilities for handling errors in input data or in the learned decisions. This pCR presents the corresponding requirements.

# 4 Detailed proposal

|  |
| --- |
| **Start of modifications** |

## 6.N Handling errors in data and ML decisions

### 6.N.1 Description

Traditionally, the machine-learning-enabled Functions (e.g., MLApp1 and MLApp2) are trained on good quality data, i.e., data that was collected when the network was working correctly, to represent the expected context in which the MLApp is meant to operate. Good quality data is void of errors, such as:

* Imprecise measurements, with added noise (such as RSRP, SINR, or QoE estimations).
* Missing values or entire records, e.g. because of communication link failures.
* Records which are communicated with a significant delay (in case of online measurements).

Without errors, MLApps can depend on a few precise inputs, and don’t need to exploit the redundancy present in the training data. However, during inference, MLApps are very likely to come across these inconsistencies. When this happens, MLApps show high error in their inference outputs, even if redundant and uncorrupted data is available from other sources.

ML App1

MLApp2

Network

ML Consumer

p

KPIs

**Error**

p

 Fig 3. The propagation of erroneous information

As such the system needs to account for errors and inconsistencies in the input data and how the consumers of ML decisions should deal with decisions that are made based on such erroneous and inconsistent data. The system should: 1) enable functions to undertake the training in a way that prepares the MLApps to deal with the errors, i.e. to identify the errors in the data during training; and 2) enable the ML consumers to account for the possibility of erroneous input data into the ML decision makers.

### 6.N.2 Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement label** | **Description** | **Related use case(s)** |
| **ML\_Error\_Req\_1** | The 3GPP management system shall enable an authorized consumer of data services (e.g., an ML-enabled function) to request from a producer of data services a **Value Quality Score of the data, which is t**he numerical value that represents the dependability/quality of a given observation and measurement type. | Handling errors in data and ML decisions |
| **ML\_Error\_Req\_2** | The 3GPP management system shall enable an authorized consumer of ML decisions (e.g. a controller) to request **ML decision confidence score which is t**he numerical value that represents the dependability/quality of a given decision generated by the ML-based function. | Handling errors in data and ML decisions |
| **ML\_Error\_Req\_3** | The 3GPP management system shall enable a producer of data services (e.g., a gNB) to provide to an authorized consumer (e.g., an ML-enabled function) a **Value Quality Score of the data, which is t**he numerical value that represents the dependability/quality of a given observation and measurement type. | Handling errors in data and ML decisions |
| **ML\_Error\_Req\_4** | The 3GPP management system shall enable a producer of ML decisions (e.g. an ML-enabled function) to provide to an authorized consumer of ML decisions (e.g. a controller) an **ML decision confidence score which is t**he numerical value that represents the dependability/quality of a given decision generated by the ML-based function. | Handling errors in data and ML decisions |

|  |
| --- |
| **End of modifications** |