|  |
| --- |
|  |

|  |
| --- |
| Input Contribution |
| Meeting ID\* | RDM#54 |
| Title:\* | Requirement analysis and key issues for TR-0068 |
| Source:\* | JaeSeung Song, KETI, jssong@sejong.ac.kr |
| Date:\* | 2022-05-12 |
| Input related to\* | WI-0105 oneM2M System Enhancement to AI capabilitiesTR-0068 V 0.4.0 |
| Intended purpose ofdocument:\* | [x]  Decision[ ]  Discussion[ ]  Information[ ]  Other <specify> |
| Impacted other TS/TR(s) |  |
| Decision requested or recommendation:\* | Agree for inclusion in TR-0068 |
| Template Version: January 2017 (Do not modify) |

**oneM2M Notice**

The document to which this cover statement is attached is submitted to oneM2M. Participation in, or attendance at, any activity of oneM2M, constitutes acceptance of and agreement to be bound by terms of the Working Procedures and the Partnership Agreement, including the Intellectual Property Rights (IPR) Principles Governing oneM2M Work found in Annex 1 of the Partnership Agreement.

# Introduction

This contribution analysis proposed potential requirements and identify key issues.

### -----------------------Start of change 1-------------------------------------------

# 8 Requirement Analysis of the Current oneM2M System to Support AI/ML

*Editor’s Note: The section provides key issues of the current oneM2M system to enable AI/ML features.*

## 8.1 Overview

Table 8-1-1 presents a collection of potential requirements and their corresponding use cases specified in the previous chapters.

|  |  |
| --- | --- |
| Use case | Potential requirements |
| Use case #1.Data augmentation for autonomous driving | The oneM2M System shall be able to handle *data augmentation* requests for AI/ML purposes. |
| The oneM2M System shall be able to generate *augmented data resources* from a given source data and data augmentation technique.  |
| The oneM2M System shall be able to *manage data for AI/ML* purposes such as model training and augmentation of training dataset.  |
| Use case #2.Last mile delivery | The oneM2M System shall be able to *manage structured and unstructured data for training*, for example, preprocessing data, describing data and inferring meaning. |
| The oneM2M System shall be able to *update trained AI/ML model* according to continuous measuring data e.g., location, time series and historical data. |
| The oneM2M System shall be able to provide *a classification function* (e.g., split data into two parts, training and validating) in supervised Machine Learning. |
| Use case #3.Smart virtual store using metaverse | The oneM2M System shall be able to synchronize between real and virtual world devices |
| The oneM2M System shall enable Edge/Fog Nodes to *run AI/ML models* to retrieve information from the real world |
| Use case #4.Detection of patterns in video streams | The oneM2M system shall be able to support the *creation and management of classifiers for AI/ML* application as follows:* Predefined-classifier function comes with a predefined and pretrained classifier for Object detection, Object tracking, Semantic Segmentation, Instance Segmentation, etc. from data generated by IoT devices (e.g., smart city camera).
* Customized classifier that can be generated by an application to support a specific detection function such as visual recognition.
 |
| Use case #5.Autonomous operations using automated machine learning | The oneM2M System shall be able to *distinguish the data set that will be trained and has already been trained*. |
| The oneM2M System shall be able to provide *automated machine learning* under certain conditions, e.g., building a model every week or when the number of datasets reaches 100. |
| Use case #6.IoT device calibration using ML | The oneM2M System shall be able to manage calibration information and training datasets for ML to eliminate or minimize measurement errors from IoT sensors**.**  |
| The oneM2M System shall be able to *perform ML using training datasets* from reference IoT devices and notify calibration results to a target sensor that requires calibration. |

The potential requirements can be further classified into four issues, i.e., (1) managing training data for AI/ML, (2) managing AI/ML input data, (3) creation of AI/ML model, and (4) managing AI/ML model (see Figure 8.1-1). Each key issue covers detailed items to be resolved as follows:

1. Managing training data for AI/ML
* Data augmentation
* Training dataset
* Reuse training data
1. Managing AI/ML input data
* Structured and unstructured data
* Calibration data
1. Creation of AI/ML model
* Trained model
* Predefined and customized classifiers
1. Managing AI/ML model
* Distributed training model
* Continuous learning
* AI/ML model on Edge/Fog



Figure 8.1-x. Classify potential requirements to identify key issues

## 8.2 Key Issue 1

*Editor’s Note: This section describes a.key issue that the oneM2M system does not provide.*

## 8.3 Key Issue n

### -----------------------End of change 1-------------------------------------------