EVALUATION OF AAS IMPLEMENTATION METHODS

1. Document Information

Version	Owner	Changes
V1	Ajay Menon	Creation

a. Purpose of the Document

The goal of the document is to evaluate all the possible AAS implementation methods. The results of this document will be leveraged for architecture selection of Robot Use case and Building Demonstrator.

2. Comparison of Open Source AAS Implementation

The following table compares Open Source AAS Implementations.

Table 1.1: Comparison Results [1]

	AASX Server	**Eclipse BaSyx**	**FA³ST Service**	**NOVAAS**
Organizational and Usability Metrics				
Contributing Organizations	Fraunhofer, Festo SE & Co.	Fraunhofer IESE	Fraunhofer IOSB	NOVA School of Science and Technology
License	Apache v2.0	MIT	Apache v2.0	EUPL v1.2
Programming Language	C#	Java	Java	JavaScript
Usage				
Command Line Interface	Yes	Yes	Yes	No
Docker Container	Yes	Yes	Yes	Yes
Embedded Library	No	Yes	Yes	No
Implementation Metrices				
AAS Metamodel Version	v2/v3	v2/v3	v3	v2
Supported Protocols				
AASX	Yes	Yes	Yes	Yes
JSON	Yes	Yes	Yes	Yes
XML	Yes	Yes	Yes	No
RDF	No	No	Yes	No
API Support				
AAS Repository	Yes	Yes	Yes	Yes
AAS	Yes	Yes	Yes	Yes

Software Management Repository	Yes	No	Yes	Yes
Continuous Delivery Repository	Yes	No	Yes	No
AAS Serialization	Yes	No	Yes	No
AAS Basic Discovery	Yes	No	Yes	No
AASX File Server	Yes	No	No	No
API Protocol				
HTTP	Yes	Yes	Yes	Yes
OPC UA	Yes	Yes	Yes	No
Compatibility Metrices				
Asset Synchronization				
HTTP				
Read	Yes	Yes	Yes	Yes
Write	Yes	Yes	Yes	No
Execute	Yes	Yes	Yes	No
OPC UA				
Read	Yes	Yes	Yes	Yes
Write	No	Yes	Yes	No
Execute	No	Yes	Yes	No
Subscribe	Yes	Yes	Yes	No
MQTT				
Write	No	Yes	Yes	No
Subscribe	No	Yes	Yes	No
Data Persistence				
In-Memory	Yes	Yes	Yes	Yes
File	No	Yes	Yes	No
Database	No	Yes	No	No
Security	Yes	Yes	No	Yes
Flexibility Metrices				
Client Library	Yes	Yes	No	No

AAS Editor	Yes	No	No	No
AAS Registry	Yes	Yes	No	No
Visualization	Yes	Yes	No	Yes
Add Ons				
EDC Connector Integration	Yes	Yes	Yes	Yes
Key Cloak Support	Yes	Yes	Yes	Yes

3. Literature

[1] Jacoby, M.; Baumann, M.; Bischoff, T.; Mees, H.; Müller, J.; Stojanovic, L.; Volz, F. Open-Source Implementations of the Reactive Asset Administration Shell: A Survey. Sensors 2023, 23, 5229. https://doi.org/10.3390/s23115229