OIIE Use Cases Catalogue

Use Cases, Scenarios, and Systems

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This document provides a catalogue of the currently defined OIIE Use Cases and provides an overview of the system interactions, i.e., the Scenarios, included in those Use Cases through the Systems Landscape Dataflow Diagram. A description of each system is provided to aid the understanding of the landscape. In addition, the Scenarios referenced by the defined Use Cases are listed, both fully defined Scenarios and placeholders, along with a mapping matrix between Use Cases and Scenarios for quick reference. All defined Use Cases and Scenarios are fully linked to assist navigation between the documents describing the components.

Version 1.4

Contents

Glossary

OGI Pilot
Oil and Gas Interoperability Pilot

OIIE
Open Industrial Interoperability Ecosystem

Document Versioning

Version	Date	Major Changes
1.4	2021-02-02	Released version 1.0.2 of OIIE Use Case Package, includes Events corresponding to Scenarios 29,30,31,32
1.3	2021-01-19	Document updated with hyperlinks to Scenarios 29,30,31,32 Released version 1.0.1 of OIIE Use Case Package, includes Scenarios 29,30,31,32
1.2	2020-12-16	Updated with new Use Cases for OIIE/OGI Pilot Phase 3.1 Added Use Case/Scenario matrix. Added EDGE systems. Released version 1.0 of OIIE Use Case Package
1.1	2020-06-26	Released version 1.0RC1 of OIIE Use Case Package, includes Use Cases demonstrated in OIIE/OGI Pilot Phase 3.1
1.0	2018-12-22	Initial catalogue, taken from the current MIMOSA website content.

Background

Beginning in 2007, representatives from the Oil & Gas and Petrochemical industries participated in an *OpenO&M* End-User Advisory Group to provide the highest valued Use Cases with interoperability scenarios required for organizations to meet their business objectives. These have been continuously developed and refined through the *OGI Pilot*.

Current Use Cases

- *OIIE Use Case 1 – Information Handover from EPC to O/O*
- OIIE Use Case 2 – Engineering Updates
- OIIE Use Case 3 – Field Changes to Plant/Facility Engineering
- *OIIE Use Case 4 – Online Product Data Library Management*
- *OIIE Use Case 5 – Asset Installation/Removal Updates*
- OIIE Use Case 6 – Preventive Maintenance Triggering
- *OIIE Use Case 7 – Condition-Based Maintenance Triggering*
- OIIE Use Case 8 – Early Warning Notifications
- OIIE Use Case 9 – Incident Management/Accountability
- OIIE Use Case 10 – Information Provisioning of O&M Systems
- OIIE Use Case 11 – Enterprise Reference Data Library Management
- *OIIE Use Case 12 – RFI and RFI Response for Models Meeting Requirements (Greenfield & Brownfield)*
- OIIE Use Case 13 – Lockout-Tagout
- *OIIE Use Case 14 – Condition-Based Maintenance Data Acquisition*
- *OIIE Use Case 15 – Capital Project Asset Installation*

Note The currently defined Use Cases (and Scenarios) are only a subset of those previously given definitions (some only partial). As additional Use Cases (and Scenarios) are updated to conform to the new architecture, they will be linked to from this document.

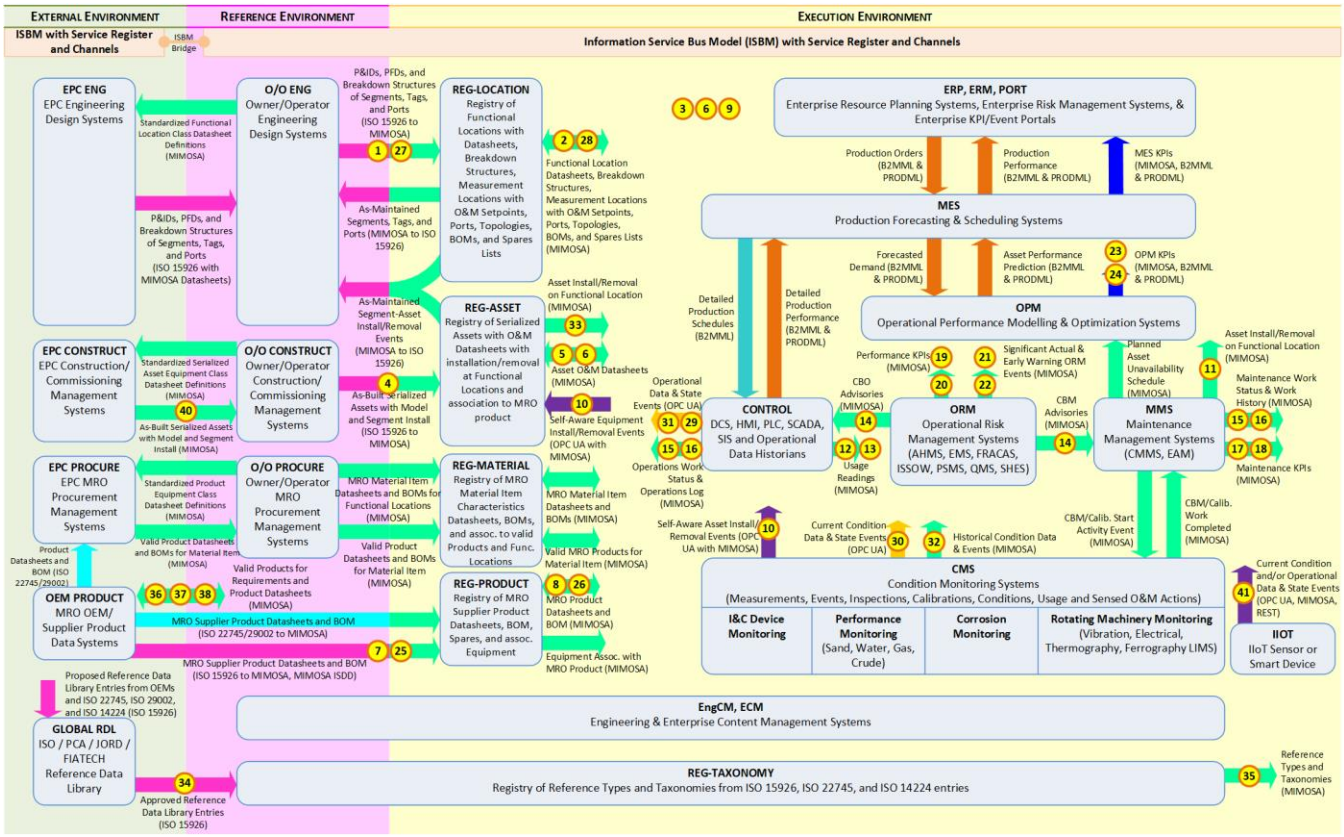
Pending Use Cases

These are use cases in which owner/operators have expressed interest, but detailed analysis work has not yet been completed.

- OIIE Use Case – Asset Configuration Management
- OIIE Use Case – Reference Data Standardization
- OIIE Use Case – Capital Project Tag Generation

Scenarios

Each of the above Use Cases have a number of interoperability scenarios that indicate the source and target systems, information payload and format, triggers and transfer mechanism. The OIIE Systems Landscape Data Flow Diagram below provides a single visual rendering of the scenarios with the relevant system blocks that represent categories of data/information repositories, and arrows that represent the standardized information data flow scenarios between the system blocks.



No.	Method	Data	From System/s	To System/s
1	Publish	As-Designed/As-Built Engineering Network/Segment/Tag	ENG	REG-LOCATION
2	Publish	As-Designed/As-Built Engineering Network/Segment/Tag	REG-LOCATION	O&M
3	Publish	As-Maintained Engineering Network/Segment/Tag	O&M	O&M
4	Publish	As-Built Engineering Asset	CONSTRUCT	REG-ASSET
5	Publish	As-Built Engineering Asset	REG-ASSET	O&M
6	Publish	As-Maintained Engineering Asset	O&M	O&M
7	Pull	OEM Model	MATERIALS, OEM PDM	REG-PRODUCT
8	Pull	OEM Model	REG-PRODUCT	O&M
9	Publish	OEM Model	O&M	O&M

10	Push	Intelligent Device Removal/Installation	CONTROL/CMS	MMS
11	Publish	Asset Removal/Installation	MMS	O&M
12	Pull	Usage Readings	HIST	MMS, ORM
13	Publish	Usage Readings	HIST	MMS, ORM
14	Push	CBO/CBM Advisories	ORM	MMS, CONTROL
15	Pull	Work Status/Work History	MMS, CONTROL	O&M
16	Publish	Work Status/Work History	MMS, CONTROL	O&M
17	Pull	Maintenance KPIs	MMS	ERP, ERM, PORT, MES, OPM
18	Publish	Maintenance KPIs	MMS	ERP, ERM, PORT, MES, OPM
19	Pull	Performance KPIs	ORM	ERP, ERM, PORT, OPM
20	Publish	Performance KPIs	ORM	ERP, ERM, PORT, OPM
21	Pull	Significant ORM Events	ORM	ERP, ERM, PORT, OPM
22	Publish	Significant ORM Events	ORM	ERP, ERM, PORT, OPM
23	Pull	OPM KPIs	OPM	ERP, ERM, PORT, MES
24	Publish	OPM KPIs	OPM	ERP, ERM, PORT, MES
25	Publish	Product/Part Engineering Change Advisories	OEM PDM	REG-PRODUCT
26	Publish	Product/Part Engineering Change Advisories	REG-PRODUCT	O&M
27	Publish	Plant/Process Change Advisories	ENG	REG-LOCATION
28	Publish	Plant/Process Change Advisories	REG-LOCATION	O&M
29	Publish	Current Operational Data and State Events	CONTROL	O&M
30	Publish	Current Condition Data and State Events	CMS	O&M
31	Pull	Historical Operational Data and State Events	CONTROL	O&M
32	Pull	Historical Condition Data and State Events	CMS	O&M
33	Pull	Asset Removal/Installation	REG-ASSET	O&M
34	Pull	Reference Data	External RDL	Enterprise RDL
35	Pull	Reference Data	Enterprise RDL	O&M
36	Push	Request for Models Meeting Functional Requirements	MATERIALS/ PROCURE	OEM PRODUCT
37	Push	Request for Models Matching Known Engineering and Asset Data	REG (ASSET, LOCATION, PRODUCT)	OEM PRODUCT
38	Pull	Partial Product Data	OEM PRODUCT	MATERIALS/PROCURE
39	Pull	Work Installation Packages	RDL, OEM	CONSTRUCT
40	Publish	Asset/Package Installation Events	CONSTRUCT	CONSTRUCT, O&M
41	Publish	Current Operational/Condition Data and State Events (Edge/IIoT)	EDGE/IIOT	O&M
42	Pull	Operational/Condition Data and State Events (Edge/IIoT)	EDGE/IIOT	O&M

NOTE When mapping Publish, Push and Pull actions to ISBM services, Publish uses the Publish-Subscribe services, while Push and Pull actions use Request-Response services.

NOTE When mapping Publish, Push and Pull actions to OAGIS BOD Verbs, Publish may use the Sync verb, while Push and Pull actions may use Process-Acknowledge and Get-Show verbs respectively.

Systems Requiring Interoperability

The following identify and describe various aspects of functionality required by the systems/applications that may participate in an OIIE. The acronyms are used in the Scenario definitions to indicate the source and target systems of an interaction. Many of these systems are generalized and abstract definitions of required functionality that may be realized by one or more actual systems or applications in the real-world.

AHMS
Asset Health Management System

CMMS
Computerized Maintenance Management System

CMS
Condition Monitoring System

CONSTRUCT
Construction Management System

DCS
Distributed Control System

ECM
Enterprise Content Management

EAM
Enterprise Asset Management System

EDGE
System or application providing computing services near to the requestor of those services

NOTE An EDGE system may provide functionality similar or related to almost any other functional block. Typically, an EDGE system will not provide the complete functionality of the related functional block.

NOTE While an (I)IoT device may be referred to as an “edge” device or system, our use of EDGE includes a level of aggregation above a basic IIoT device and may overlap with “fog” computing.

Example A system at the shop-floor providing a fast, first stage aggregation and analytics functionality for Condition-Based Maintenance based on local data, which may publish the original data to other systems in batches as well as publishing the results of its local analytics. An ORM may incorporate the results from the EDGE along with a broader set of data to perform another level of analytics at a slower rate.

EMS
Environmental Management System

ENG
Engineering Design System

ERM
Enterprise Risk Management System

ERP
Enterprise Resource Planning System

FRACAS
Failure Reporting, Analysis and Corrective Action System

HMI
Human-Machine Interface (Operator Console) System

I&C Device Monitoring System
Instrumentation and Control Device Monitoring System

IIOT
(Industrial) Internet of Things Sensor/Device, or Smart Device

ISBM
Information Service Bus Model

ISSOW
Integrated Safe System Of Work

LIMS
Lab Information Management System

MATERIALS
Material/Procurement Management System

MES
Manufacturing Execution System

OPM
Operational Performance Modelling & Optimization System

ORM
Operational Risk Management System

PRODUCT
Product Data Management System

PLC
Programmable Logic Controller

PORT
Enterprise KPI/Event Portal

PSMS
Process Safety Management System

QMS
Quality Management System

RDL
Reference Data Library

REG
O&M Structure (i.e., breakdown structure and functional locations), Asset, Model & Index Registry(ies) with Standardized Data Dictionary/Taxonomy

NOTE When referring to an individual Registry component by itself REG-*component* is used.

Example The Asset Registry component may be referred to as REG-ASSET.

SCADA
Supervisory Control and Data Acquisition

SHES
Safety, Health, and Environmental System

SIS
Safety Instrumented System

Use Case/Scenario Matrix

The following matrix maps scenarios to their use cases, providing a simple overview with links for direct access to the Use Cases and Scenarios.

	Use Case No.														
Scenario No.	1	*2*	*3*	4	5	*6*	7	*8*	*9*	*10*	*11*	12	*13*	14	15
1	x														
2															
3															
4	x														
5															
6															
7				x											
8				x											
9				x											
10					x										
11					x										
12															
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14							x								
15							x								
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21															
22															
23															
24															
25				x											
26				x											
27															
28															
29														x	
30														x	
31														x	
32														x	

	Use Case No.														
Scenario No.	1	*2*	*3*	4	5	*6*	7	*8*	*9*	*10*	*11*	12	*13*	14	15
33															
34															
35															
36												x			
37												x			
38												x			
39															x
40															x
41														x	
42														x	