Open Standards for
Physical Asset Management

OIIE Purchasing Use Case Overview

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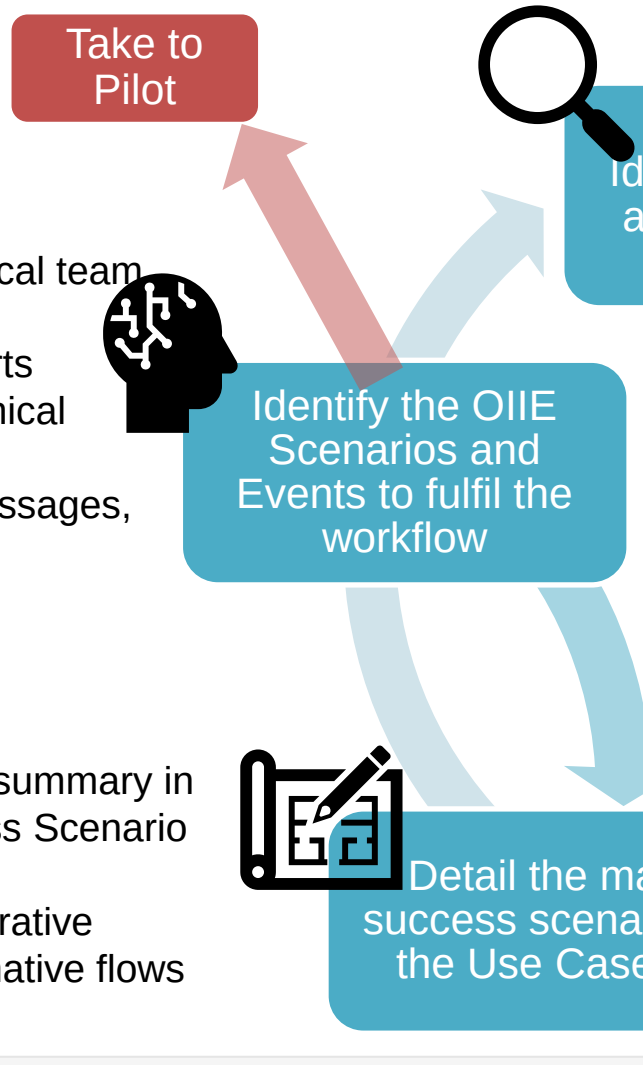
OIIE Use Case Development Process



- Brainstorm or known industry issue
- Industry, Technology trends
- Maturity Models

- What are the business functions to be executed?
- Who, what, when, where, why?
- Elicit through **User Stories**
- Methodologies
- Use Case Library
- Business Value Opportunity

- Draft Background context.
- Scope, success criteria, triggers, and preconditions of the Use Case
- Allocate business functions, interactions to Use Cases within bounded scope
- Use Cases and Workflows
- Business Value Impact Assessment

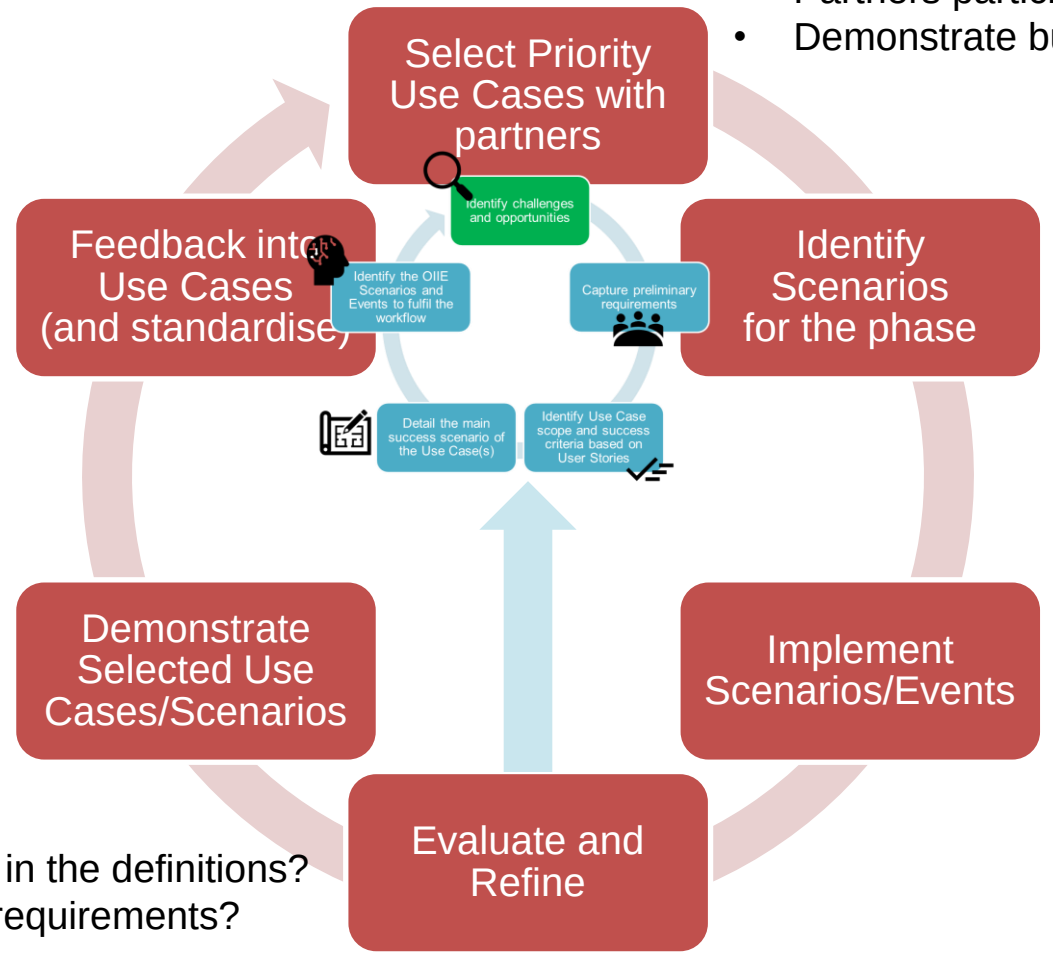
- Capture user story summary in formal Main Success Scenario (BPMN)
- Write up textual narrative
- Identify major alternative flows

- Performed by technical team in parallel
- IT and domain experts
- Begin detailing technical requirements
- Standards, data, messages, protocols, mappings

OIIE Use Case Piloting Process

- Partners participate in pilot
- Demonstrate business and industry value

- Gap Analysis
- Identify Future Priorities
- ISO 18101



- Choose specific scenarios for implementation and demonstration given:
- Time, scope, resource constraints

- Participants execute Use Cases
- Live @ Conferences and/or Published Recording
- Build awareness of capability

May include any or all of:

- Data set creation
- Data mappings
- Message mappings
- Adapter Implementation
- Message Flows and triggering
- Partner/Business Specific Processing
- Infrastructure Configuration, a.k.a. Ecosystem Administration

- Are there issues in the definitions?
- Is it fulfilling the requirements?

OIIE Purchasing Use Case

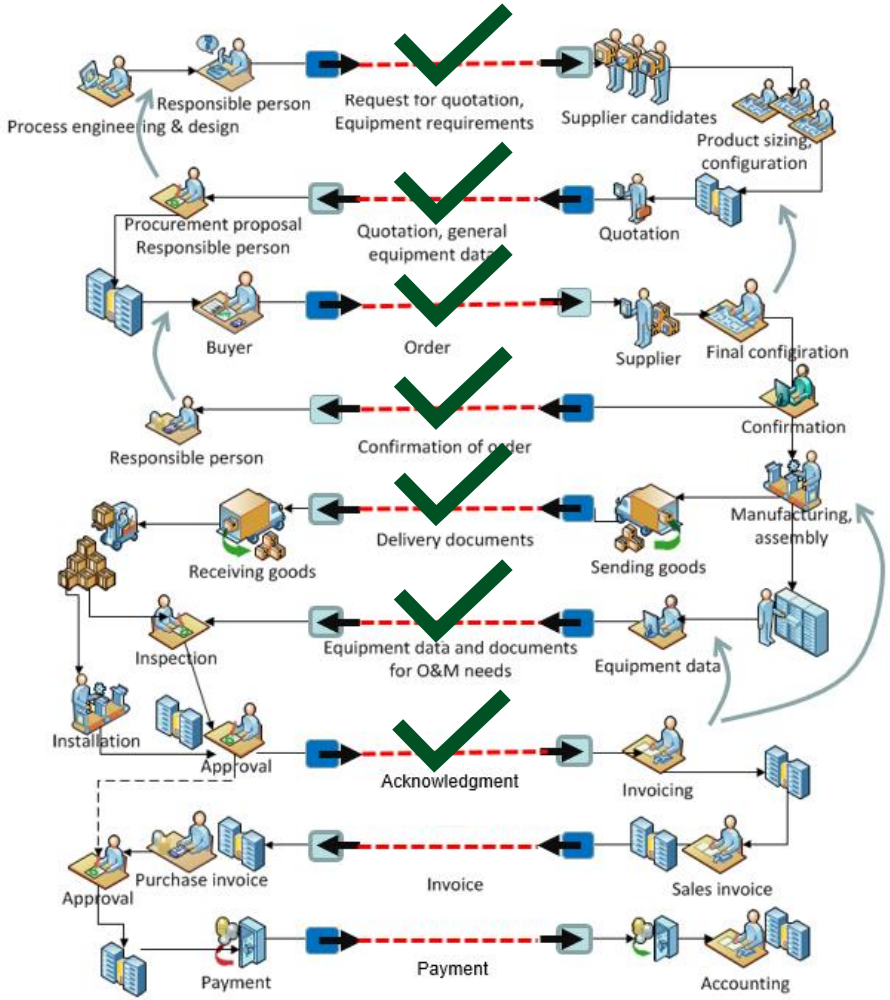
In Scope

- ✓ Purchaser sends RFQ to multiple Suppliers
  - ✓ Including documents (Datasheet, Information Requirements Sheet)
- ✓ Supplier sends RFQ Responses
  - ✓ Including documents (Updated Datasheet, Updated Information Requirements, Other documents)
- ✓ Purchaser sends Purchase Order
  - ✓ Leverages the data gathered/exchanged as part of RFI/RFQ process in creation of Purchase Order
  - ✓ Attach due dates to documents required to be supplied before/with/after the delivery
- ✓ Supplier sends ACK of Purchase Order containing estimated shipment date etc.

Out of Scope

- × Make/model matchup process
- × Logistics aspect of Purchasing
- × Receiving process
- × Inspection processing
- × Cost estimation(Pricing) aspect of Purchasing
  - × RFP/RFP response
- × Payment processing
- × Change(s) in Purchase Order
- × Evaluation and Selection of quote
  - × After receiving RFQ Responses
- × Supplier Management
  - × Managing list of preferred suppliers etc.

TIE use case and OIIE Purchasing Use Case



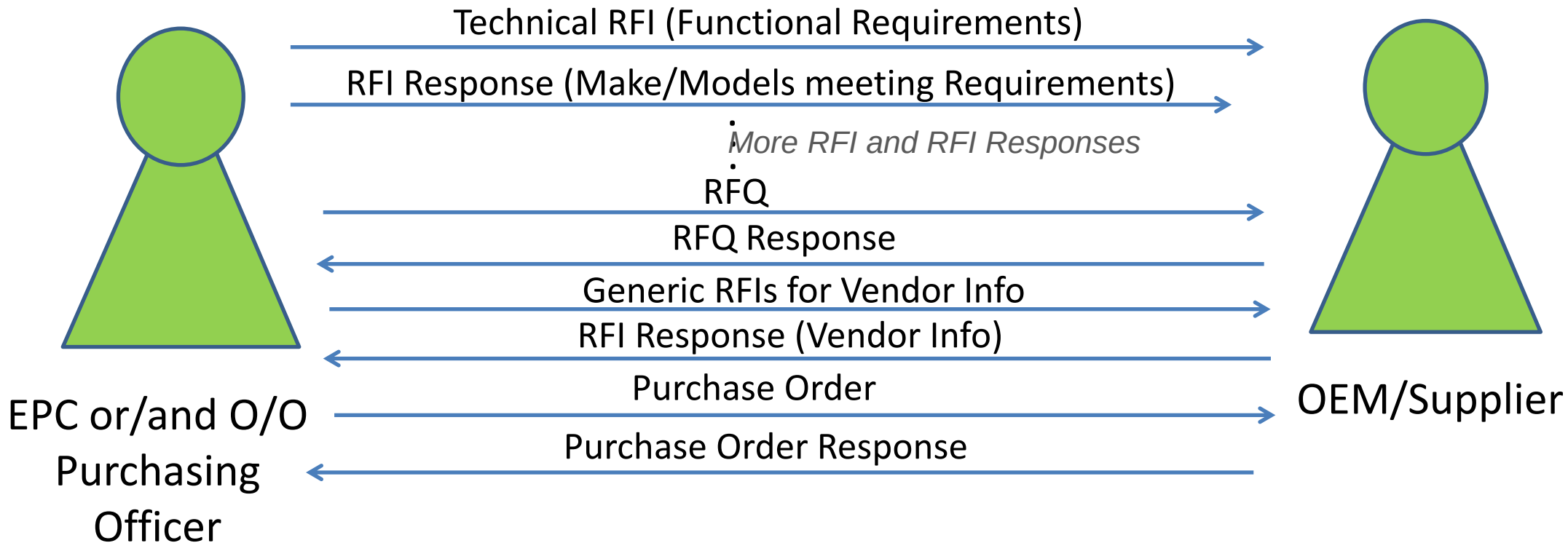
Source: https://www.ththry.org/projects/Technical-information-exchange-in-digital-business-ecosystem/

OIIE Purchasing Use Case

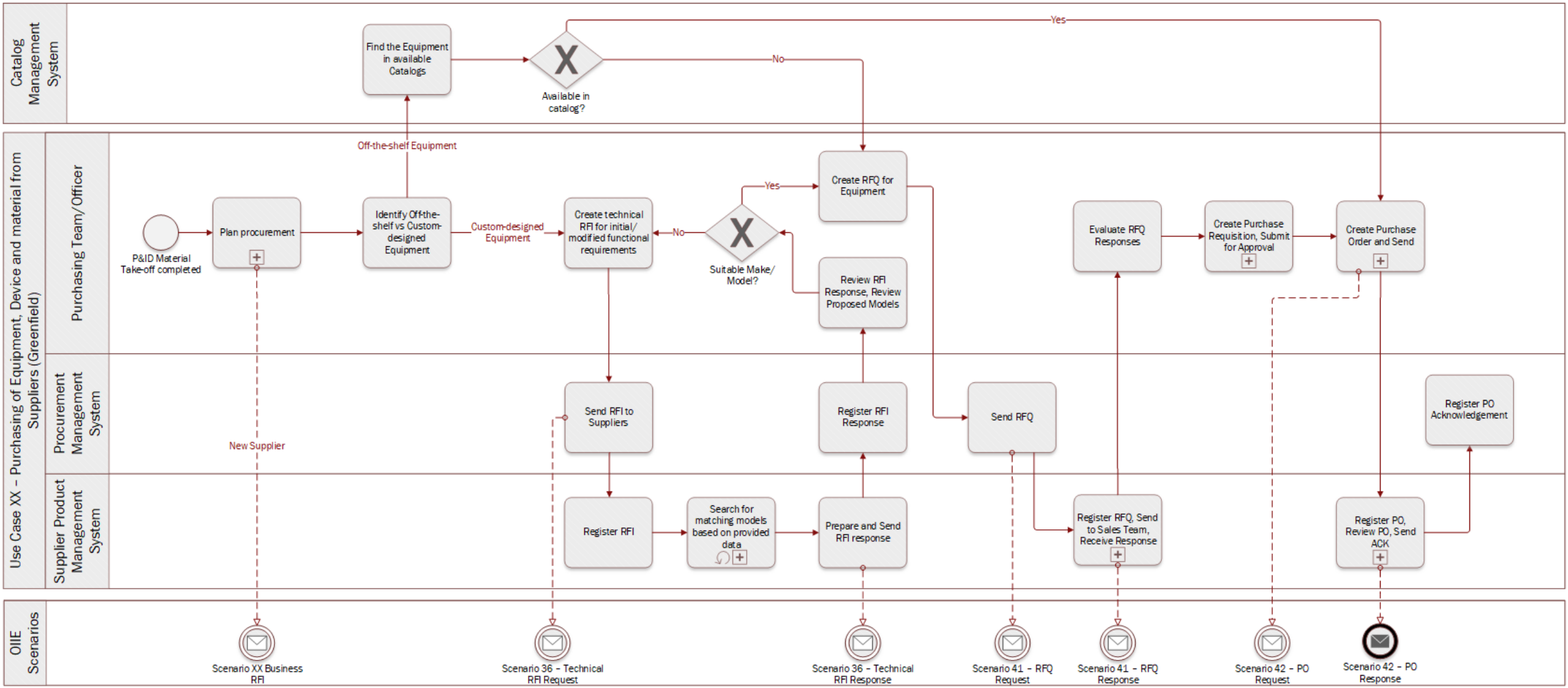
	OEM already a preferred/qualified Supplier	OEM NOT already a preferred/qualified Supplier
Purchasing Off the Shelf or from a Catalogue	Scenario 1 Option 1	Scenario 1 Option 2
Purchasing Custom Designed Equipment	Scenario 2 Option 1	Scenario 2 Option 2

OIIE Purchasing Use Case Scenarios (s2 o2)

- Scenario 2 – Purchasing Customisable Catalogue Item
  - Option 2 – *OEM **NOT** already a preferred/qualified Supplier*



OIIE Purchasing Use Case – Process Diagram



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RFQ and RFQ Response – Data Contents

RFQ Header

- Project Details
- Note
- Issue Date
- Due Date
- Validity Period
- Billing Address
- Delivery Address
- Delivery Terms (Incoterms)
- Payment Terms
- Currency Code (ISO 4217)
- Destination Country (ISO 3166)
- Partial Shipment Allowed Indicator
- Tax Exempted
- Catalogue Reference
- Contract Reference
- Document Reference(s)
- Total Amount
- Signature
- Line Count

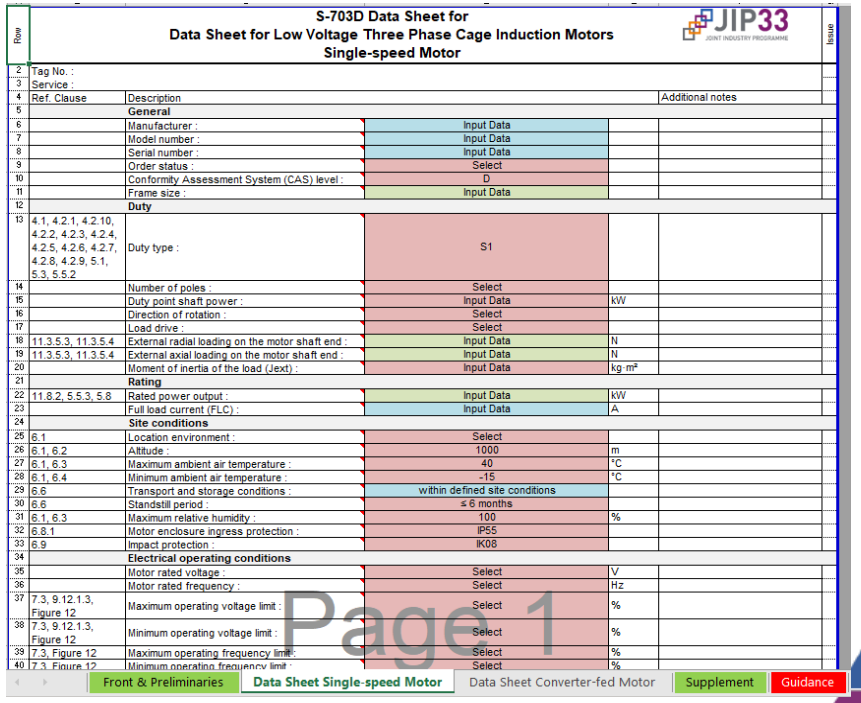
RFQ Line

- Item Number
- Tag Number
- Size/Measurements/Dimensions
- Quantity
- UoM
- Lead Time (ISO 8601)
- Unit Price
- Total Price
- Required Delivery Date
- Partial Shipment Allowed Indicator
- Delivery Address
- Optional Item
- Transportation Terms
- License Information
- Catalogue Reference
- Item Details

Subset of

UBL (ISO/IEC 19845)
+
OAGIS 10 RFQ

Using IOGP JIP 33 Procurement Specifications



S-703D Data Sheet for
Data Sheet for Low Voltage Three Phase Cage Induction Motors
Single-speed Motor

JIP33 JOINT INDUSTRY PROGRAMME

Row	Ref. Clause	Description			Additional notes
2	Tag No. :				
3	Service :				
4	Ref. Clause	Description			Additional notes
5		**General**			
6		Manufacturer :	Input Data		
7		Model number :	Input Data		
8		Serial number :	Input Data		
9		Order status :	Select		
10		Conformity Assessment System (CAS) level :	D		
11		Frame size :	Input Data		
12		**Duty**			
13	4.1, 4.2.1, 4.2.10, 4.2.2, 4.2.3, 4.2.4, 4.2.5, 4.2.6, 4.2.7, 4.2.8, 4.2.9, 5.1, 5.3, 5.5.2	Duty type :	S1		
14		Number of poles :	Select		
15		Duty point shaft power :	Input Data	kW	
16		Direction of rotation :	Select		
17		Load drive :	Select		
18	11.3.5.3, 11.3.5.4	External radial loading on the motor shaft end :	Input Data	N	
19	11.3.5.3, 11.3.5.4	External axial loading on the motor shaft end :	Input Data	N	
20		Moment of inertia of the load (Jext) :	Input Data	kg·m²	
21		**Rating**			
22	11.8.2, 5.5.3, 5.8	Rated power output :	Input Data	kW	
23		Full load current (FLC) :	Input Data	A	
24		**Site conditions**			
25	6.1	Location environment :	Select		
26	6.1, 6.2	Altitude :	1000	m	
27	6.1, 6.3	Maximum ambient air temperature :	40	°C	
28	6.1, 6.4	Minimum ambient air temperature :	-15	°C	
29	6.6	Transport and storage conditions :	within defined site conditions		
30	6.6	Standstill period :	≤ 6 months		
31	6.1, 6.3	Maximum relative humidity :	100	%	
32	6.8.1	Motor enclosure ingress protection :	IP55		
33	6.9	Impact protection :	IK08		
34		**Electrical operating conditions**			
35		Motor rated voltage :	Select	V	
36		Motor rated frequency :	Select	Hz	
37	7.3, 9.12.1.3, Figure 12	Maximum operating voltage limit :	Select	%	
38	7.3, 9.12.1.3, Figure 12	Minimum operating voltage limit :	Select	%	
39	7.3, Figure 12	Maximum operating frequency limit :	Select	%	
40	7.3, Figure 12	Minimum operating frequency limit :	Select	%	

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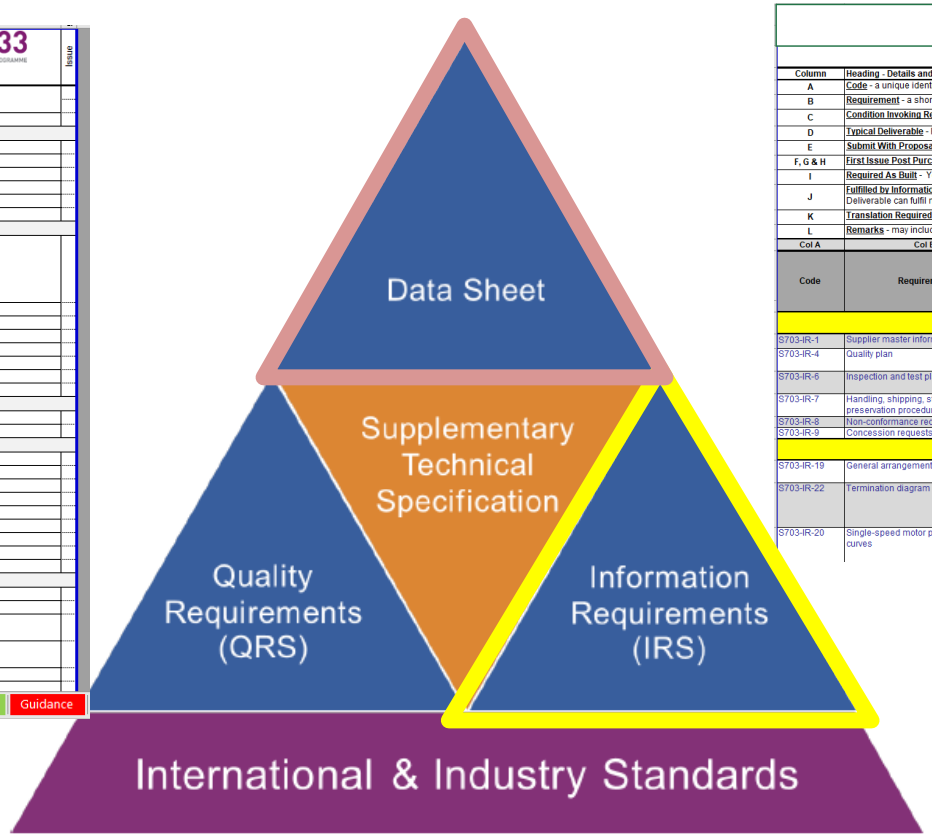
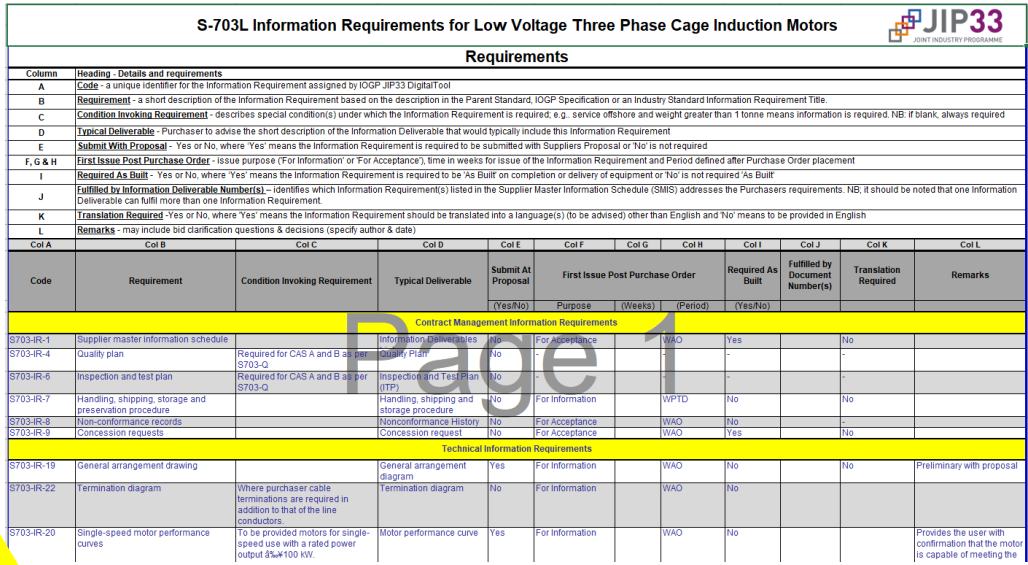
Front & Preliminaries | Data Sheet Single-speed Motor | Data Sheet Converter-fed Motor | Supplement | Guidance



JIP33 Specification for Procurement Documents
Supplementary Technical Specification



S-703L Information Requirements for Low Voltage Three Phase Cage Induction Motors

JIP33 JOINT INDUSTRY PROGRAMME

Requirements

Column	Heading - Details and requirements
A	**Code** - a unique identifier for the Information Requirement assigned by IOGP JIP33 DigitalTool
B	**Requirement** - a short description of the Information Requirement based on the description in the Parent Standard, IOGP Specification or an Industry Standard Information Requirement Title.
C	**Condition Invoking Requirement** - describes special condition(s) under which the Information Requirement is required; e.g., service offshore and weight greater than 1 tonne means information is required. NB: if blank, always required
D	**Typical Deliverable** - Purchaser to advise the short description of the Information Deliverable that would typically include this Information Requirement
E	**Submit With Proposal** - Yes or No, where 'Yes' means the Information Requirement is required to be submitted with Suppliers Proposal or 'No' is not required
F, G & H	**First Issue Post Purchase Order** - issue purpose ('For Information' or 'For Acceptance'), time in weeks for issue of the Information Requirement and Period defined after Purchase Order placement
I	**Required As Built** - Yes or No, where 'Yes' means the Information Requirement is required to be 'As Built' on completion or delivery of equipment or 'No' is not required 'As Built'
J	**Fulfilled by Information Deliverable Number(s)** – identifies which Information Requirement(s) listed in the Supplier Master Information Schedule (SMIS) addresses the Purchasers requirements. NB; it should be noted that one Information Deliverable can fulfil more than one Information Requirement.
K	**Translation Required** -Yes or No, where 'Yes' means the Information Requirement should be translated into a language(s) (to be advised) other than English and 'No' means to be provided in English
L	**Remarks** - may include bid clarification questions & decisions (specify author & date)

Col A	Col B	Col C	Col D	Col E	Col F	Col G	Col H	Col I	Col J	Col K	Col L
Code	Requirement	Condition Invoking Requirement	Typical Deliverable	Submit At Proposal	First Issue Post Purchase Order			Required As Built	Fulfilled by Document Number(s)	Translation Required	Remarks
				(Yes/No)	Purpose	(Weeks)	(Period)	(Yes/No)			
Contract Management Information Requirements											
S703-IR-1	Supplier master information schedule		Information Deliverables	No	For Acceptance		WAO	Yes		No	
S703-IR-4	Quality plan	Required for CAS A and B as per S703-Q	Quality Plan	No	-		-	-		-	
S703-IR-6	Inspection and test plan	Required for CAS A and B as per S703-Q	Inspection and Test Plan (ITP)	No	-		-	-		-	
S703-IR-7	Handling, shipping, storage and preservation procedure		Handling, shipping and storage procedure	No	For Information		WPTD	No		No	
S703-IR-8	Non-conformance records		Nonconformance History	No	For Acceptance		WAO	No		-	
S703-IR-9	Concession requests		Concession request	No	For Acceptance		WAO	Yes		No	
Technical Information Requirements											
S703-IR-19	General arrangement drawing		General arrangement diagram	Yes	For Information		WAO	No		No	Preliminary with proposal
S703-IR-22	Termination diagram	Where purchaser cable terminations are required in addition to that of the line conductors.	Termination diagram	No	For Information		WAO	No			
S703-IR-20	Single-speed motor performance curves	To be provided motors for single-speed use with a rated power output 3¾-100 kW.	Motor performance curve	Yes	For Information		WAO	No			Provides the user with confirmation that the motor is capable of meeting the

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Summary of TIE results so far

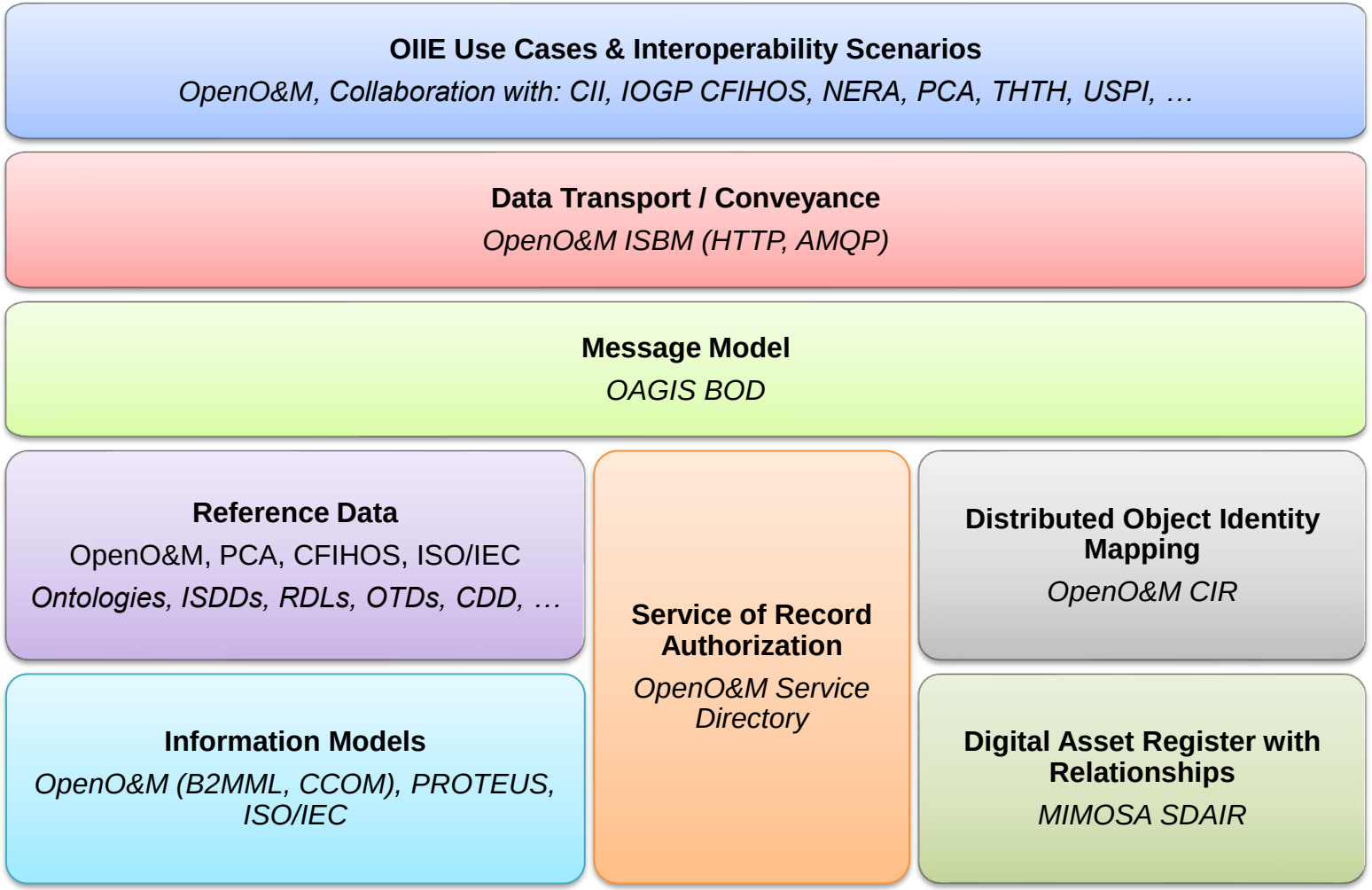
1. Standardization infrastructure for technical information
   - National standardization collaboration enhanced (PSK)
   - TIE connected with the international standardization networks → better view to standards' landscape
   - Evaluation work with existing example classes resulted
     → a general approach for all classes (requires further development)
     → Pulp & Paper specific classes and attributes missing in existing reference standards → to be adde
     Swedish collaboration
2. Inter-enterprise use-case examples
   - Lean digital business processes for the ecosystem and companies accepted for the example use-case
   - UBL2.3 is well suited for information exchange in the process industry procurement process → strong potential for a general concept!
   - Waiting for the pilot implementations, more use cases and more experience
3. Network infrastructure
   - Standardization network infrastructure (connected digital reference standard data libraries) developm
   - Concrete business network infrastructure (network rulebook, principles, ...) discussions to be started
4. Interface integration
   - We didn't reach pilot implementations for network interfaces/APIs →

OIIE Use Cases

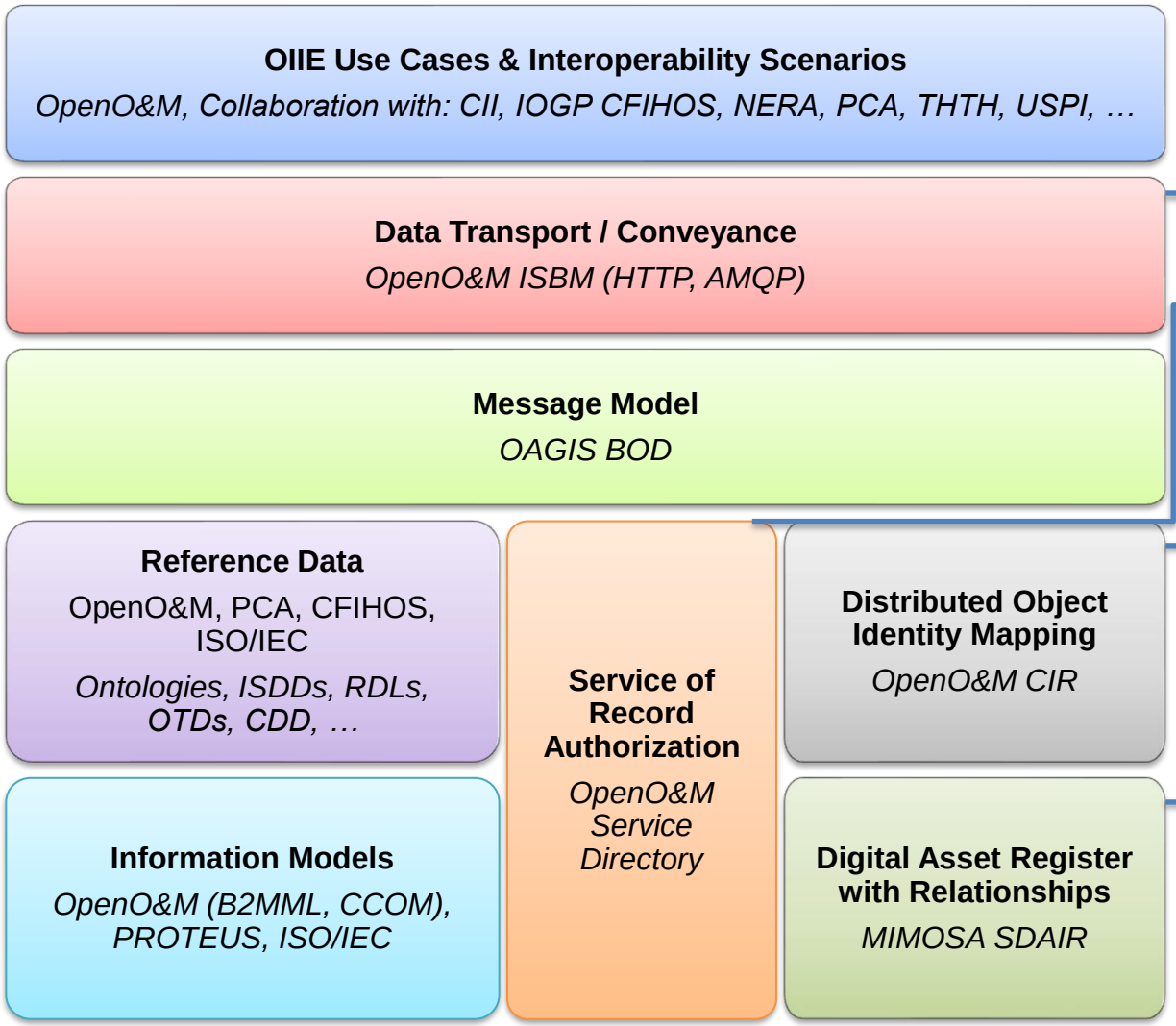
OIIE Primary Component Specifications

Slide from THTH Autumn webinar 11.11.2021 presented by Arto Marttinen, THTH

OIIE Primary Components



OIIE Interoperability Laboratory, UniSA



OIIE Instances

The OIIE Interoperability Laboratory provides several OIIE instances for research and industry purposes. Each instance will comprise core infrastructure conforming to OIIE Specifications, including the:

- ISBM: providing the core communications and connectivity infrastructure using a common set of interfaces (REST and SOAP) for both intra- and inter-enterprise connectivity conforming to ISA-95/IEC 62264 Part 6 Messaging Service Model; adaptors allow existing and novel systems or applications to communicate in an interoperable manner using publish/subscribe and request/response messaging modalities
- Service Directory: sitting atop the ISBM, a Service Directory provides configuration management of the ecosystem, including available services, capabilities, and the data flows of the ecosystem; essentially providing a vendor-neutral "App Store" for OIIE instances
- Common Interoperability Registry (CIR): handling the registration, mapping, and translation of object identifiers from diverse systems; it allows disparate systems to exchange information about objects they share but identify differently due to viewing the objects from different contexts or perspectives
- SDAIR (Structured Digital Asset Interoperability Registry): providing the federation capabilities of such a diverse environment and supporting event-driven Management of Change and synchronisation across the ecosystem; provenance information and other object meta-data references back to each object's System of Record (or "source of truth") while facilitating the incorporation of additional data from other systems that have a different view of the objects

The University of South Australia, partners, and participants will be able to provide services over this core, standards-based, vendor-neutral infrastructure, together developing an ever growing ecosystem to meet industry needs.

There are currently two OIIE instances available that will be scaled up over time. These include:

1. The core OIIE Interoperability Lab instance, which is where research, development, and testing will take place. This instance will likely evolve rapidly as it will support the trialling of new technologies from the University of South Australia, its partners, and OIIE participants.
2. The OIIE Australian Working Group instance will provide a more stable environment for moving tested technologies from Australian SMEs through staging and into production, supporting them to provide unique value-add services to projects.

Source: https://www.unisa.edu.au/research/industrial-ai/our-research/the-australian-oiie-interoperability-laboratory/

OIIE Specification - ISBM

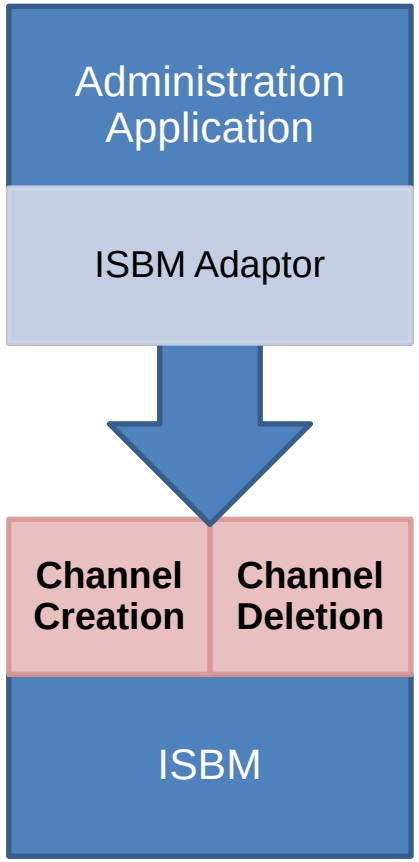
ISBM

- Common Communication and Message Exchange Interfaces

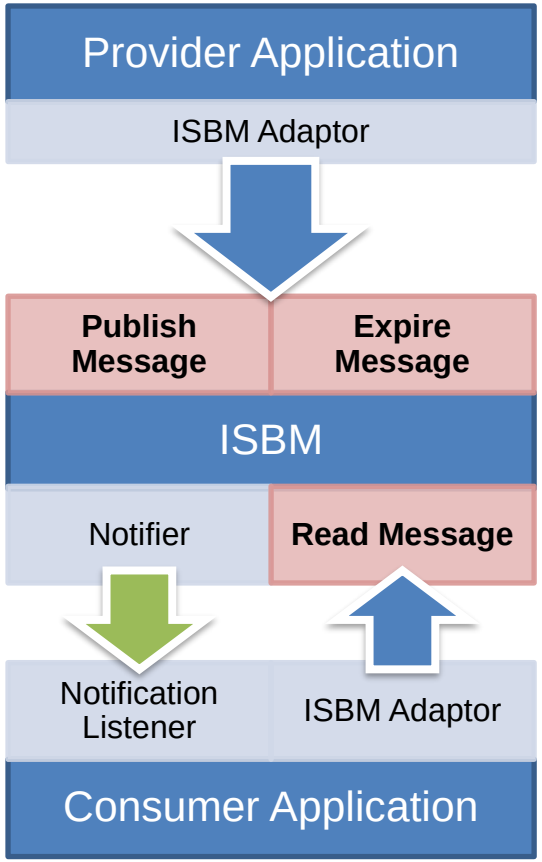
- **Standard API - Connectivity Backbone of OIIE**
- Bi-directional alignment with ISA-95/IEC 62264 Part 6 MSM
- Implementation specification that provides additional detail to support separate implementations of MSM to interoperate
- Defined as a subset of interfaces for ESBs to allow vendor neutral interfaces
- Service definitions support **publish-subscribe**, **request-response**, and push **notifications**
- **ISBM v2.0 SOAP and REST/JSON interfaces**

Primary ISBM Service Interfaces

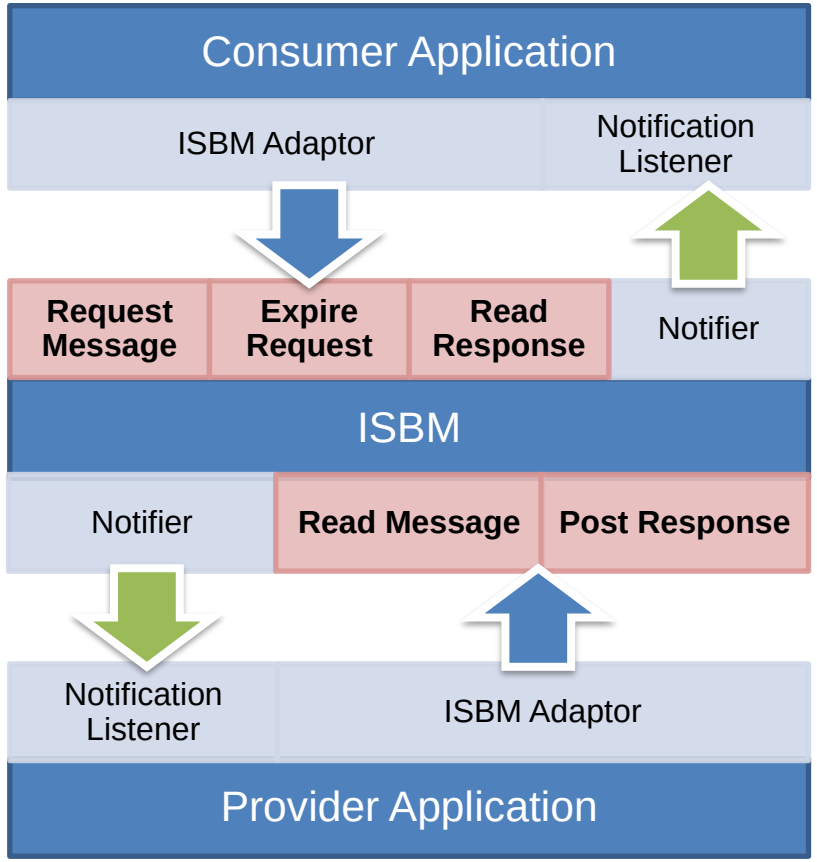
Channel Management



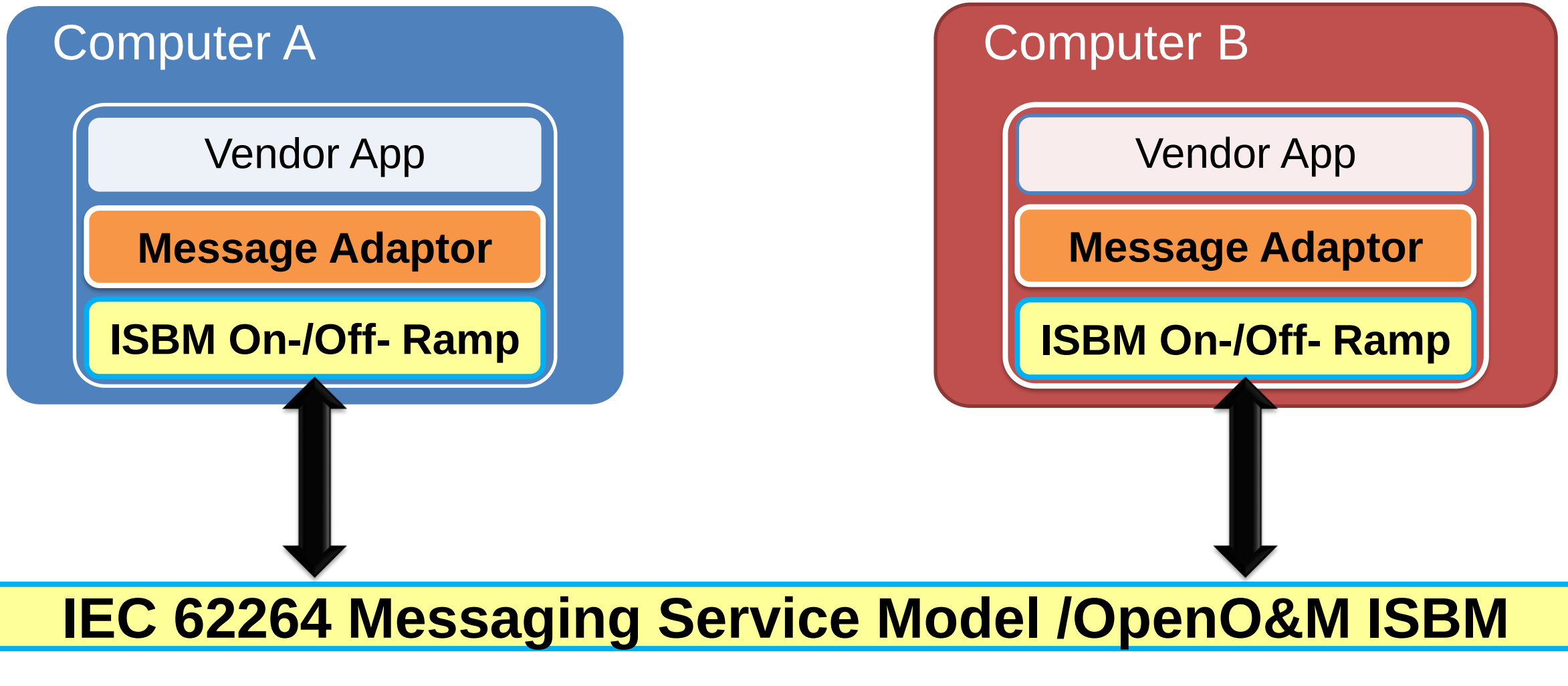
Publish/Subscribe
(Notification optional)



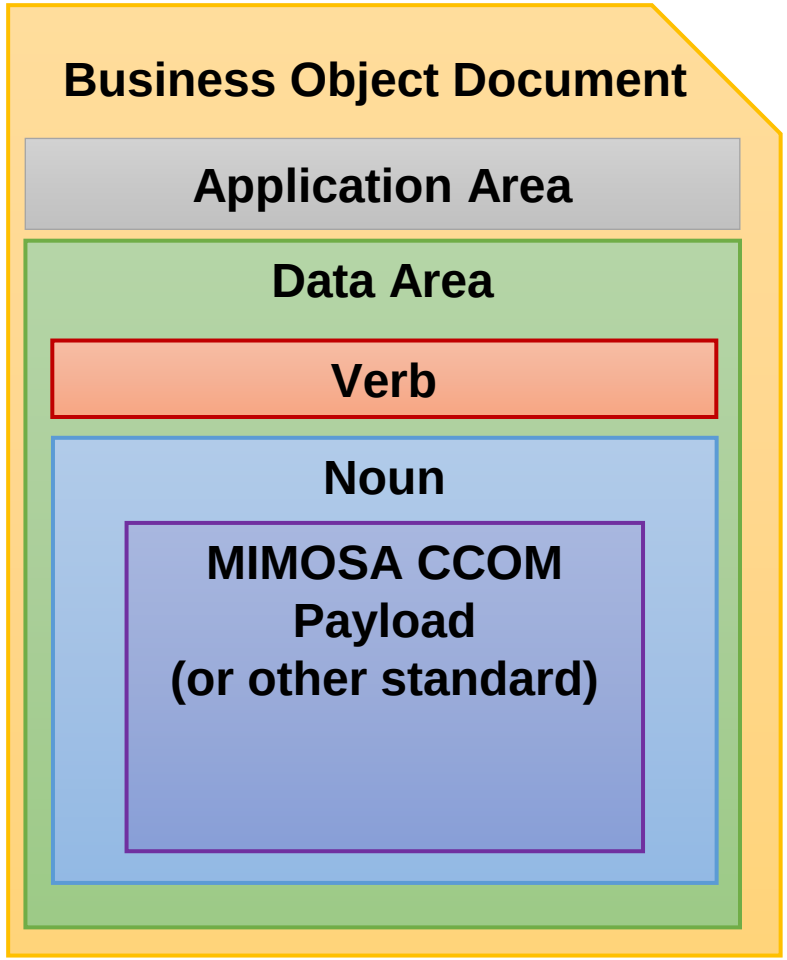
Request/Response
(Notification optional)



OIIE Adaptors

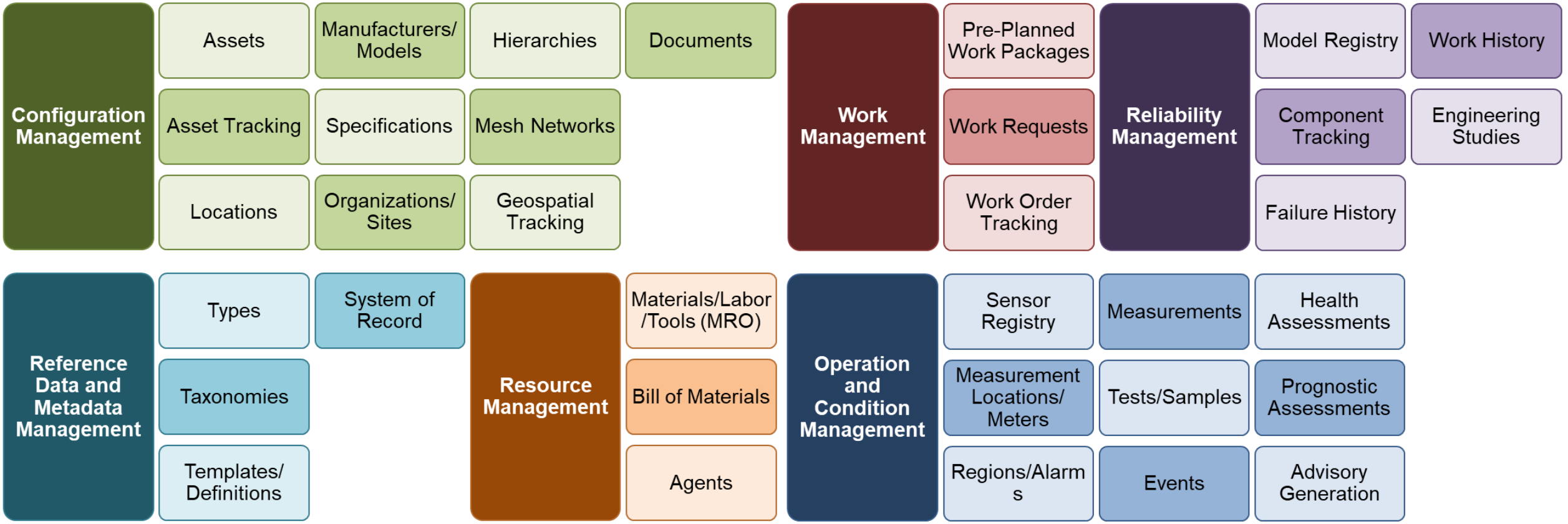


Message Model



- OAGIS Business Object Document (BOD)
- Consistent structure and metadata regardless of data format or protocol
- BOD schemas specify criteria on message content
  - implement OIIE Events
- Verbs:
  - Get, Show, *Sync*, Process, Acknowledge, Change, Confirm
  - Map to *pub/sub* or request/response

MIMOSA CCOM Information Model Scope



OIIE Ties with TIE Project

- ✓ Focus on digital inter-enterprise information exchange leveraging existing standards and specifications (IOGP JIP33, UBL)
- ✓ Simple workflow for commercial and technical information exchange in procurement
- ✓ Lean digital business processes for ecosystem
- ✓ Upcoming TIE pilot can leverage OIIE primary component specifications and possibly, reference implementations provided through OIIE Interoperability Lab hosted at UniSA
  - ✓ Specifically the OpenO&M ISBM specification

Contact us for more details

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