OIIE Use Case 12 – RFI and RFI Response for Models Meeting Requirements (Greenfield and Brownfield)

This Use Case describes the process for retrieving Product Models from OEMs that meet specified requirements and (possibly) conform to other provided information. Both Greenfield situations—in which only functional requirements are provided—and Brownfield information remediation situations—in which some information about a serialized asset is known—are represented by this Use Case due to the fundamental similarity of the two situations. Functional requirements and available asset data should be exchanged in a standard format with which OEMs can map and compare to information held in Product Data Management Systems. Depending on the situation, the RFI may originate from an EPC or Owner/Operator.

Background

A common issue in the design, construction, and operation of a complex plant or facility is the need to identify appropriate makes and models of important classes of physical assets to be procured and installed. Traditionally, discovering potential make/models of equipment that can fulfil the requirements is performed by sending a Request for Information, or RFI, document to Manufacturers. The RFI document describes the request and has attached additional information, requirements, etc., also as documents. This makes sending, receiving, and responding to RFIs a document management problem rather than an information sharing problem. Moreover, RFI documents may take many different forms and vary by organization; the same goes for any additional documents and functional requirements. While the requirements may be exchanged as data sheets, they are often modified versions of data sheets originally developed and published by recognized industry bodies or associations. Digitizing and standardizing the RFI and associated data, specifically that of the requirements, facilitates improvements to the make/model matchup process (and possibly later selection processes) to ensure that suggested models fulfill the stated requirements and potentially improving turn-around times on RFI responses.

The RFI is only part of an overall procurement process. Following the response to an RFI, a selection process may occur during which some product model information is required to make a decision. However, before a formal agreement is in place between the EPC or Owner/Operator and the Manufacturer, the Manufacturer may be willing to share only limited product model data. After a model selection has been performed, a Request for Quote (or RFQ) is typically sent to the Manufacturer. Once Procurement has agreed to purchase the equipment from the Manufacturer, additional product model data may be made available by the Manufacturer. The detailed information may then be pulled into Owner/Operator systems in readiness for O&M provisioning. This Use Case only covers the RFI portion of the process, leaving other aspects to be handled by other Use Cases: for example, the population of Owner/Operator systems with product model data is covered by Use Case 4.

There several stages in the plant life-cycle in which product models must be identified. In a Greenfield situation, an RFI is sent during the Capital Project phase, before anything has actually been built. After the detailed engineering design has been developed and the functional requirements of the key equipment locations have been determined (identified by P&ID Tag), an RFI is typically sent to Manufacturers to discover what are the make/model options that best fulfill the functional requirements of the engineering design. This information is used to select appropriate models, possibly revise the design, and later procure equipment for construction.

A second situation occurs when an existing plant/facility has been running for an extended period of time. Over time the different information systems that have been tracking the configuration of physical assets, maintenance activities, structural configuration, engineering design data, requirements, etc., no longer contain the data necessary for the most efficient operation of the plant. The data may not necessarily have been lost but may

never have been transferred to some systems in the first place for a variety of reasons, e.g., the data used by operations differs from that used by maintenance, which may not include all the original data. On the physical assets themselves, important information plates and tags may have worn down, fallen off, or otherwise become lost. Regaining this information is a necessity for improved operational efficiency, particularly to leverage modern analytic capabilities. To reacquire product model data, the Owner/Operator may submit an RFI to the Manufacturer(s) of their key installed assets including as much information that they still have (or are willing to share) in order for the Manufacturer to track down which makes and models match the installed physical assets. The information may include the asset's serial number, functional requirements if they are still known, any available asset properties, and/or product model properties that are recorded across the various O&M systems. Other information that may be useful to the Manufacturer in tracking down possible models may be provided as well, for example, the installation date of asset as it would allow the Manufacturer to exclude any models made available after that date. When the Manufacturer receives such an RFI, they will try to identify the possible models for the asset based on the available information. The best-case scenario for this situation is where the Owner/Operator can provide the serial number and the Manufacturer has maintained accurate tracking of that serial number against its model data over time. Otherwise, the Manufacturer may try any number of matching processes to identify what the model data may be.

A third situation exists, much like the second, in which an installed asset must be replaced but the asset model has been obsolesced and is no longer available. When trying to perform a like-kind replacement of this type, the original requirements and other asset/model information may not be available so the Manufacturer must try to identify possible suitable replacement models based on whatever information is available. The best case in this situation is that the original functional requirements are available, supplemented by new information gathered over time during the operation of plant/asset. If the original model information is known, the Manufacturer may be able to identify a suitable replacement path based on their own records of which models have superseded the original.

Scope

The scope of this Use Case is limited to the transfer of product models conforming to the exchanged requirements and not the transfer of detailed product model data. Moreover, the following are ***out of scope***: the identification of conforming models by the OEM, i.e., the make/model matchup process; the selection of an appropriate model for procurement; and, the agreement on the standard format (such as ISDDs) with which functional requirements and known asset information are exchanged.

While this Use Case may involve the acquisition of some product model data (whatever a Manufacturer may agree to share without a purchase agreement in place), it does not include the population of O&M systems with complete product data—which is covered by Use Case 4.

Preconditions

Depending on the situation the Use Cases on which this is dependent differ. For the situation occurring during the Capital Project, there are no dependencies on another Use Case as this is the logical first step with respect to the currently defined set of Use Cases.

NOTE This will change as the set of Use Cases is expanded to cover additional Capital Project activities.

For the situations occurring during O&M activities, this Use Case is predicated on Use Case 1, Use Case 10 and Use Case 4 occurring prior so that O&M systems are populated with functional location, serialized asset information, and product model data.

Successful End Condition

A set of possible product models have been identified that meet the functional requirements (and conform to other provided data) and the O&M Reference or Execution environment has been populated with product model data such that it is possible to move forward with the model selection and procurement processes.

Actors

Business Actors

- Procurement Officer (situation 1 & 3)
- Operations (situations 2 & 3)
- Manufacturer Engineer (all situations)

System Actors

- Material/Procurement Management System
- O&M Registry (Structure, Asset, and Model)
- OEM Product Management System

Triggers

The primary information flows typically occur: after material take-off from the P&ID has been performed by Engineering (Greenfield); when Operations identifies the need to recover product model information for installed assets (Brownfield); or when Operations needs to perform a like-kind replacement of a physical asset for which an identical replacement of the currently installed is no longer available.

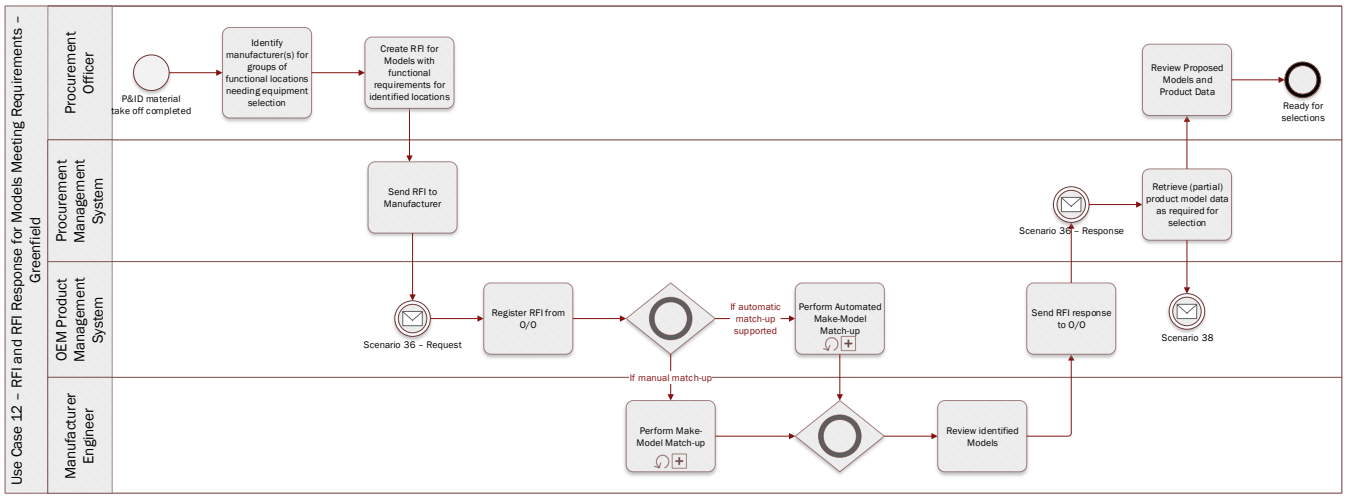
In a Greenfield situation, the selection of equipment models will typically involve requests for a batch of equipment classes and their requirements, while like-kind replacement at a Brownfield site will often occur on an as-needed basis as part of maintenance activities on a particular asset.

The recovery of product model information for installed assets will likely occur as part of a Brownfield Information Remediation project in which batches of physical assets/equipment classes will be requested on a priority basis as determined by the project.

Main Success Scenario

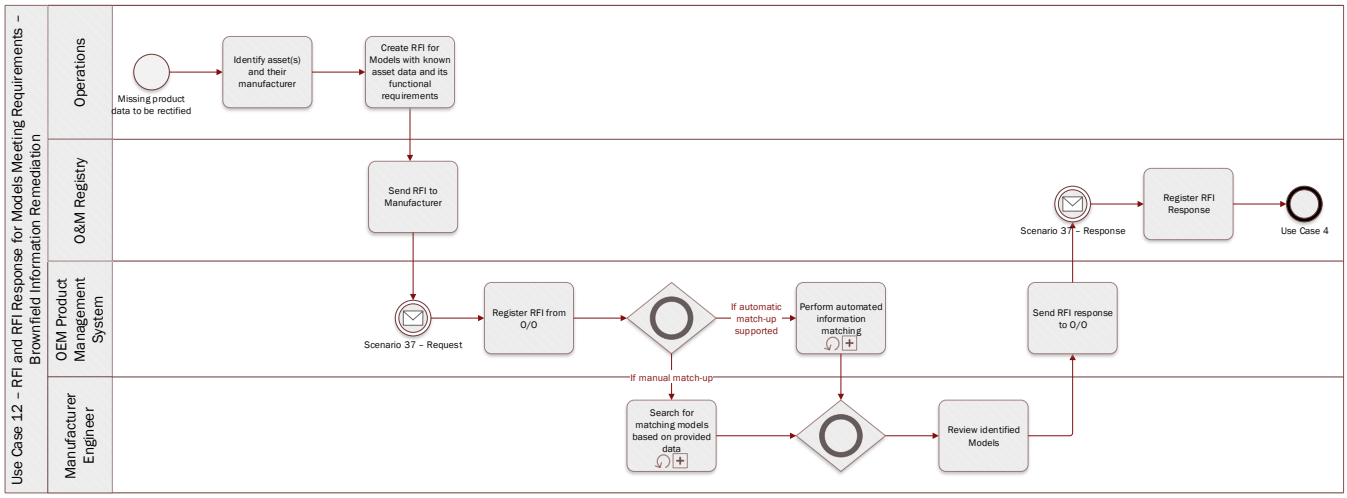
The following is a simplified workflow of requesting product models that meet requirements in the three situations that is intended to indicate the interoperability-based interactions with enterprise and automation systems within a general business process context.

The first workflow illustrates the Greenfield situation of requesting models that meet the functional requirements, following the material take-off from the P&ID.



Identify potential/preferred manufacturer	The Procurement Officer determines possible/preferred Manufacturers for sets of equipment/instruments that need to be procured and installed based on the functional locations and their requirements.
Create RFI for Models	The Procurement Officer puts together an RFI for product models meeting the functional requirements for a set of equipment to be sent to a particular Manufacturer (or Manufacturers). Requirements must be in a standard format.
Send RFI to Manufacturer	The Procurement Management System sends the RFI, including functional requirements for selected P&ID tag locations, to the Manufacturer(s) according to Scenario 36.
Register RFI	The OEM Product Management System registers the RFI, possibly notifying a Manufacturing Engineer that a request has been received and must be addressed.
Optional **Perform Make/Model Match-up**	Depending on the Manufacturer's processes for matching product models to requirements, the Manufacturer Engineer may manually inspect the RFI and search the product catalogue for possible models meeting the requirements.
Optional **Automated Make/Model Match-up**	If the Manufacturer has the capability, the OEM Product Management System may initiate an automated make and model match-up process. The make/model match-up process may also involve a combination of the manual and automated processes.
Review Identified Models	The Manufacturer Engineer reviews the results of the make/model match-up process, regardless of whether the process is performed using automation, manually or some combination of the two.
Send RFI Response	The OEM Product Management System sends a response for the RFI to the Owner/Operator, including possible product models for each set of functional requirements, according to Scenario 36.
Retrieve product data	The Procurement Management System may follow-up the RFI response by requesting product data from the Manufacturer, according to Scenario 38, so that the Owner/Operator can compare the possibilities and make appropriate selections. As there is not yet a purchase agreement in place, the product data that the Manufacturer is willing to share may be incomplete. Product data sheets should be in a standard format.
Review proposed models	The Procurement Officer reviews the response to the RFI, including the partial product data, collates responses from different Manufacturers (if multiple Manufacturers were sent an RFI), and prepares for the selection process.

The second workflow illustrates the Brownfield Information Remediation situation in which Operations attempts to identify the makes and models of installed assets that have been operational for some time.



Identify assets and their manufacturer	Operations identifies assets with missing product model data that needs to be rectified. Importantly, the Manufacturer of the asset(s) must be identified to allow the request to be sent to the appropriate organization.
Create RFI for Models	Operations puts together an RFI including all known/available data for the asset that can be shared and/or may help the Manufacturer identify the correct product model for the asset. The information may include: functional requirements for the P&ID tag location in which the asset is installed, asset serial number, installation date, known operating parameters, etc. Requirements and known asset/product data must be sent in a standard format appropriate to the equipment class.
Send RFI to Manufacturer	The O&M Registry sends the RFI, including associated data, to the Manufacturer according to Scenario 37.
Register RFI	The OEM Product Management System registers the RFI, possibly notifying a Manufacturing Engineer that a request has been received and must be addressed.
Optional **Perform Make/Model Match-up**	Depending on the Manufacturer's processes, the Manufacturer Engineer may manually inspect the RFI and search the product catalogue for possible models meeting the requirements and other data provided. If possible, the Engineer may be able to look up the provided serial number and immediately identify the correct product model.
Optional **Automated Make/Model Match-up**	If the Manufacturer has the capability, the OEM Product Management System may initiate an automated matching process. The process may involve a combination of the manual and automated processes. A simple case would occur when the system can query the provided serial number(s) and immediately identify the correct model for the asset(s).
Review Identified Models	The Manufacturer Engineer reviews the results of the matching process, regardless of whether the process is performed using automation, manually or some combination of the two.
Send RFI Response	The OEM Product Management System sends a response for the RFI to the Owner/Operator, including possible product models for each asset/set of requirements/etc., according to Scenario 37.
Register RFI response	The O&M Registry records the RFI response, possibly notifying Operations of the response. This may trigger Use Case 4.

The third situation is for identifying possible models for a like-kind replacement of an installed asset. This situation incorporates aspects of the first two—it leads to model selection as in the first and utilizes more than simply functional requirements data as in the second—and is not illustrated for brevity.

System Interoperability Scenarios

- Scenario 36 – Push Request for Models Meeting Functional Requirements from MATERIALS/PROCURE to OEM PRODUCT
- Scenario 37 – Push Request for Models Matching Known Engineering and Asset Data from REG to OEM PRODUCT
- Scenario 38 – Pull Partial Product Data from OEM PRODUCT to MATERIALS/PROCURE

Version Applicability/Alignment

Use Cases do not specify generic or specific data requirements; however, they have a lifecycle and can be associated with versions of CCOM and other MIMOSA standards based on when they are introduced, updated, or deprecated. For example, newer Use Cases may not be able to be supported by older versions of CCOM, while older Use Cases may become obsolete as the standards and OIIE evolves over time.

This Use Case is applicable to the following versions of CCOM:

- CCOM 4.1 and above

NOTE Use of 'x' in the version number indicates a variable version. For example, "4.x" indicates applicability to all versions of CCOM with the MAJOR version '4', regardless of MINOR and PATCH versions.

Document Versioning

Version	Date	Major Changes
1.1	2020-06-29	Updated to use OpenO&M template
1.0	2019-01-30	Initial write-up.