

Life Cycle information exchange (LCie): Product Program

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BACKGROUND

The product program defines the products needed to be provided in a given room to meet the needs of the work to be accomplished in that room. These products may include service ports such as numbers and types of electrical outlets, specific requirements for lighting or furniture, and specific equipment needed for a given room.

BUSINESS CASE

The use of product program as a separate managed set of information beyond the architectural program is needed in many high-tech facilities particularly where owner-furnished equipment is to be installed. Hospitals and laboratories are particularly good examples of facilities that must explicitly manage the mix of contractor and owner provided equipment (and associated requirements for that equipment) to be installed.

EXAMPLE CONTRACT CLAUSE

The delivery of a common format for the identification of products and equipment should be specified as part of the documentation required for the go/no-go decision package for the project. Many large owners have common form database of the types of equipment that is required to be installed in different types of spaces. The production of this common set of information, tailored to the requirements for a specific facility under consideration, should be included in contracts and/or standard operating procedures.

ORGANIZATION

The buildingSMART international Information Delivery Manual process identifies information exchanges according to the table shown below. Use this table to determine if this information exchange applies to your area of responsibility for a given project.

Code	Phase	Used
0	Portfolio requirements	
1	Conception of need	
2	Outline feasibility	
3	Substantive feasibility	
4	Outline conceptual design	✓
5	Full conceptual design	
6	Coordinated design and procurement	
7	Production information	
8	Construction	
9	Operation and maintenance	
10	Disposal	

The buildingSMART alliance classifies information exchanges according to a number of different classification tables, called OmniClass, provided by the Construction Specification Institute. In addition to OmniClass references to the subject exchange, the buildingSMART alliance provides an overall business activity diagram node referenced in the table below.

LCie Worksheet	OmniClass Table 31	OmniClass Table 34	OmniClass Table 32	Activity Node Tree
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	Phase	Actors	Services	
Programmed Equipment	31-10 14 21 Project Programming Phase	34-21 17 00 Planner	32-11 14 24 Programming	3.41 Perform Systems Development and Layouts

EXCHANGES

The sections below describe the inputs required to apply this information exchange. The processing that is accomplished to process these inputs, and the resulting outputs that should be expected as a result of performing this information exchange. This information exchange can be characterized as a “batch” update of the as-built construction building model. A general description of the requirements for batch exchanges is found in the LCie Overview (URL).

Inputs

Product Program requires the user authentication and project authorization wrappers described in the LCie Overview (URL). In addition, the information below is the minimum data set that will be processed; however, additional worksheets may be provided by the creator of the COBie file. Please note that additional worksheets may be needed to produce a proper ifc file.

- Type Worksheet
 - The following required COBie fields must be present in this file:
 - Type name
 - Category
 - Description
 - Asset type
 - Who created the entry and when
 - The following required COBie fields may not be present in this file:
 - Manufacturer
 - Model number
 - Warranty guarantor-parts
 - Warranty duration-parts
 - Warranty guarantor-labor
 - Warranty duration-labor
 - Warranty duration unit
 - Replacement cost
 - Expected life and it’s duration unit
 - Warranty description
- Attribute worksheet.

The following table summarizes the expected content in the COBie file. Referenced rows are for informational purposes and should not be changed. New rows require the addition of new row items to the designated worksheet. Updated rows require the addition of information to an existing row item. It may also be appropriate to add a new row item to a worksheet as part of an update. Optional rows are not required but will be processed if provided.

Key: Referenced Rows= Y or – (not reqd.)

New Rows= Y or – (not reqd.)

Updated Rows = Y or – (not reqd.)

Optional Rows = Y or – (not reqd.)

Worksheet	Referenced Rows	New Rows	Updated Rows	Optional Rows
Facility	Y	-	-	-
Floor	-	-	-	-
Space	-	-	-	-
Zone	-	-	-	-
Type	-	Y	-	-
Component	-	-	-	-
System	-	-	-	-
Spare	-	-	-	-
Resource	-	-	-	-
Job	-	-	-	-
Document	-	-	-	-
Attribute	-	Y	-	-
Connection	-	-	-	-
Coordinate	-	-	-	-
Issue	-	-	-	-

Processing

All processing of batch deliverables begins with the receipt of the deliverable by its contractually required recipient. Transmission of the batch file to the intended recipient is expected to occur through appropriate secure large file exchange tool provided for the project by the owner. Once received, the deliverable is checked to ensure that the format of the information is correct, after that the new batch file becomes the current building model.

Batch building information processing

The processing stage for batch files checks the new file to ensure it is correct then moves the current building model to a backup folder. A series of checks against the previous model are then completed. The specific checks depend on the specific type of information exchange.

Output

The outputs of this transaction are files that demonstrate proper processing of the submitted information. The following reports would be expected:

- Incoming file compliance with COBie
- Incoming file compliance with information exchange requirements (identification of optional data)
- Verification of mapping to target model
- Results of completing the transactions
- Comparison of prior and current model states.

Follow On

The following processes are expected to occur after or concurrently with this process:

- Early Design

EXAMPLES

The LCie project has two example projects, a duplex apartment and a medical clinic. For each example project, a product program COBie file has been created. The type and attribute worksheets in each product program file have been completed in accordance with the COBie instruction worksheet. The product program files for both example projects can be found below.

Duplex Apartment

- Example 1:
 - Input:
 - Prior building model (DuplexApartment_ProductProgram_before)
 - Exported template for Product Inspection (URL)
 - Completed template for Product Inspection (DuplexApartment_ProductProgram)
 - Output:
 - Incoming file compliance with COBie
 - Incoming file compliance with exchange requirements (identification of optional data)
 - Verification of mapping to target model
 - Results of completing the transactions
 - Comparison of prior and current model states.

Medical Clinic

- Example 1:
 - Input:
 - Prior building model (MedicalClinic_ProductProgram_before)
 - Exported template for Product Inspection (URL)
 - Completed template for Product Inspection (MedicalClinic_ProductProgram)
 - Output:
 - Incoming file compliance with COBie
 - Incoming file compliance with exchange requirements (identification of optional data)
 - Verification of mapping to target model
 - Results of completing the transactions
 - Comparison of prior and current model states.

Software Implementation Guidance

SCRIPTED PROCESS

To recreate the example files identified in this information exchange documentation the bimServices engine was used based on information from two projects a Duplex Apartment building and a Clinic building. The following batch file was used to process the appropriate files through the bimServices engine.