

Life Cycle information exchange (LCie): Project Definition

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BACKGROUND

The decision to move forward with a design and construction project, the owner must produce a set of information about the proposed building that is to be built. The procedure for the production project definition information exchange products depends largely on the size and sophistication of the owner. In some cases the building designer is brought in to assist the owner, in other cases the owner has standard types of buildings (or components), for very high visibility projects design competitions are used to help define the project within very broad brief. Regardless of the method used to define the facility, there is a set of information that is developed that identifies types of activities to be supported by the spaces within the facility. Given this information justifications for go/no-go decisions can be made.

In the case of the U.S. Federal Government agencies projects over legally specific dollar thresholds must provide individual justifications for inclusion in federal government budgets. In the U.S. Department of Defense this project funding request form is called the DD1391.

BUSINESS CASE

The business case for this information exchange cannot be generally evaluated outside the specific context in which go/no-go decisions are made. In the context of many large owners who have internal standards for the types of buildings they create, the automated production of open standard information from these internal standards can yield significant benefit. The most important of these benefits is that the Project Definition file can form the basis for evaluation of all design and construction phase solutions. During operations the Project Definition file can provide the information about the requirements that drove the decisions to build the building. In the transition between planning and design, providing an interoperable format to the design team will assist the design (and later the construction) team to provide designs with naming and coding standards required for that specific owner. Finally, the production of standard reports such as the DD 1391 form may be the most immediate and obvious benefit from standardizing the Project Definition information exchange.

EXAMPLE CONTRACT CLAUSE

Given the variation in possible producers and consumers of the Project Definition information exchange, sample contract language is not provided. Suggested language would require that those developing the specific building program, following the go/no go solution would be required to directly use the approved Project Definition and compare the proposed space and product program with the Project Definition information exchange.

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 Phase	OmniClass Table 34 Actors	OmniClass Table 32 Services	Activity Node Tree
Project Identification	31-10 11 14 Project Description Phase	34-21 14 00 Owner	32-11 11 15 Concept Development	2.5 Develop Project Execution Plan

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” exchange of the as-built construction building model. A general description of the requirements for batch exchanges is found in the LCie Overview (URL).

Inputs

Project Definition 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.

- Facility worksheet
- (Optional) Floor 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	-	-	-	Y
Spare	-	-	-	-
Zone	-	-	-	-

Type	-	-	-	-
Component	-	-	-	-
System	-	-	-	-
Spare	-	-	-	-
Resource	-	-	-	-
Job	-	-	-	-
Document	-	-	-	-
Attribute	-	-	-	-
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

There are two types of outputs created with this transaction. The first is the creation of the project definition form. This output may be shown on a screen as part of an information system or may be produced as a standalone template file, as is accomplished with the bimServices engine.

The second outputs 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:

- Design Schematic

EXAMPLES

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

Duplex Apartment

Files for this example building information exchange may be found here:

- Example 1:
 - Input:
 - Exported template for Project Definition (URL)
 - Completed template for Project Definition (DuplexApartment_ProjectDefinition)
 - 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

Medical Clinic

Files for this example building information exchange may be found here:

- Example 1:
 - Input:
 - Exported template for Project Definition (URL)
 - Completed template for Project Definition (MedicalClinic_ProjectDefinition)
 - 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

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.

```
echo off
set a0=ProjectDefinition
rem Replace %1 with MedicalClinic or DuplexApartment
set a1=%1
call goCl      %a1% %a0%
call goReplace1 %a1% %a0%
call goIC     %a1% %a0%
time /t
```

Figure 1 doProjectDefinition batch file