

# Life Cycle information exchange (LCie): Product Type Warranty

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## BACKGROUND

The compilation of commissioning information requires the collection of a variety of different types of information from product manufactures. This information includes: product attributes, replacement parts, warranty terms and conditions, and preventative maintenance tasks. Currently such information is provided by manufacturers in documents whose information cannot be effectively compiled during the construction commissioning stage or effectively used by the facility manager during the operations stage of the building.

## BUSINESS CASE

Commissioning agents can directly use commissioning information directly provided by product manufacturers to eliminate the requirement to manually load such information into owner CMMS systems.

Product manufacturers can use the common definition of warranty terms to improve customer relationships and increase repeat specification and replacement of manufacturer product s.

Facility operators use warranty information to reduce the costs of work orders by accessing warranty terms of all materials, products, and equipment in the facility.

## EXAMPLE CONTRACT CLAUSE

Construction Contractors shall provide material, product, equipment and system warranty information required in the contract in electronic format in accordance with the Product Type Warranty specification of the LCie model.

## 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<br>Phase        | OmniClass Table 34<br>Actors  | OmniClass Table 32<br>Services    | Activity Node Tree           |
|-------------------------|------------------------------------|-------------------------------|-----------------------------------|------------------------------|
| Warranty<br>information | 31-40 50 00<br>Commissioning Phase | 34-35 17 00<br>Sub Contractor | 32-21 00 00<br>Execution Services | 4.4 Perform<br>Commissioning |

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

### Inputs

Product Type Warranty 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 information would be expected:
    - Parts guarantor
    - Labor guarantor
    - Warranty duration for parts
    - Warranty duration for labor
  - Data on previously submitted required fields may not be changed.
- Document 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   | - | Y | - | - |
| Attribute  | - | - | - | - |
| Connection | - | - | - | - |
| Coordinate | - | - | - | - |
| Issue      | - | - | - | - |

## Processing

The capture of this transactional information may be seen as a type of building information survey where the appropriate portion of the building information is requested to generate a data entry form, the user completes that form, and the information is returned to update the building information.

### Preparation of building information template

The first stage is the preparation of a template data set from the current building information. Implementation of the template information may be accomplished through specific software solutions using appropriate menus. To create realistic examples, bimServices demonstration scripts automatically create COBie spreadsheets containing the minimum set of information needed to provide the required BIM sub-set.

- Select current project from building information database
- Select specific product type from current project
- Generate product type warranty data entry form
- Provide product type warranty data entry form

### Building information capture

The second stage is the capture of the required new information in the data entry form. As with step one this would be expected to be accomplished within proprietary software solutions. To provide a realistic example the COBie file provided in the first step may be used to:

- Access product type warranty data entry form
- Provide required type data
- Provide required document data

### Building information transmission and processing

The final stage is the transmission and processing of that information by the target information system. For this specific information exchange the following steps are required. To provide a realistic example the completed COBie building information survey form is used as the input artifact that updates the model.

- Access product type warranty data entry form
- Provide user credential information (if needed)
- Provide required type data
- Provide required document data
- Send information to the building information server

Processing information sent to the building information server will require the following steps.

- User authentication
- User authorization
- Checking file compliance with COBie
- Checking file compliance with LCie exchange requirements
- Checking the requested transaction with targeted information
- Backing-up prior building information
- Identification of matching type
- Updating type data

- Updating document data
- Completion of the transaction and reporting

## Output

There are two types of outputs created with this transaction. The first is the creation of the product type warranty 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:

- Other product type warranty reports
- Product type parts
- Product type maintenance

## EXAMPLES

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

### Duplex Apartment

- Example 1:
  - Input:
    - Prior building model  
(DuplexApartment\_ProductTypeWarranty\_SwingingDoor\_0.750\_before)
    - Exported template for Product Type Warranty (URL)
    - Completed template for Product Type Warranty  
(DuplexApartment\_ProductTypeWarranty\_SwingingDoor\_0.750)
  - 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.
- Example 2:
  - Input:
    - Prior building model  
(DuplexApartment\_ProductTypeWarranty\_SwingingDoor\_0.885\_before)
    - Exported template for Product Type Warranty (URL)

- Completed template for Product Type Warranty (DuplexApartment\_ProductTypeWarranty\_SwingingDoor\_0.885)
  - 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\_ProductTypeWarranty\_DoorTypeA\_before)
    - Exported template for Product Type Warranty (URL)
    - Completed template for Product Type Warranty (MedicalClinic\_ProductTypeWarranty\_DoorTypeA)
  - 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.
  
- Example 2:
  - Input:
    - Prior building model (MedicalClinic\_ProductTypeWarranty\_DoorTypeB)
    - Exported template for Product Type Warranty (URL)
    - Completed template for Product Type Warranty (MedicalClinic\_ProductTypeWarranty\_DoorTypeB)
  - 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.

```
echo off
set a0=ProductTypeWarranty
rem Replace %1 with MedicalClinic or DuplexApartment
set a1=%1
rem Replace %2 with appropriate type name
set a2=%2

call goCl      %a1% %a0%_%a2%
call goMerge2  %a1% %a0% %a2%
call goIC      %a1% %a0%_%a2%

time /t
```

Figure 1 doProductTypeWarranty batch file