Obtaining and Maintaining Accurate Asset Inventories

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Construction Engineering Research Lab
13-Nov-13
Note:

While specific commercial products are listed in this presentation that does not constitute an endorsement of these products by the United States Government.
obtaining
maintaining
“who has the keys?”
janitor’s closet or medicine prep

“I wonder why it smells weird in this room?”
storage room or bioengineering lab

“I wonder why the floor is bouncy corridor?”
office or x-ray film storage
problem
unable

inaccessible
unusable

inaccessible

obsolete

NEVER FORGET
Innovative solutions for a safer, better world
unusable

inaccessible

obsolete

NEVER FORGET

unspecified rqmts
unusable

inaccessible

obsolete

unspecified rqmts
duplicate systems

NEVER FORGET

Innovative solutions for a safer, better world
so what!
• duplicative data collection cost
• duplicative IT system cost
• higher energy cost
• excessive facility inventory cost
• misaligned facility inventory cost
• poor flexibility/resilience
approach
• engage C-level management
• catalog requirements
• translate stovepipes
• identify systems of record
• create standards-based exchanges
• implement exchanges
• engage C-level management
• catalog requirements
• translate stovepipes
• identify systems of record
• create standards-based exchanges
• implement exchanges

User Driven - IT System Portfolio Management
my team’s contribution
• engage C-level management
• catalog requirements
• translate stovepipes
• identify systems of record
• create standards-based exchanges
• implement exchanges

User Driven - IT System Portfolio Management
requirements
Maintenance
- warranties
- spare/replacement parts
- pm tasks
- resources

Operations
- start-up/shut-down procedure
- trouble-shooting procedures

Assets
- space measurement
- fixed or movable property
- space-function capabilities
- occupancy/zoning
Specifiers’ Properties information exchange (SPIe)

technical date

HVACie
Sparkie
Wsie
BAMie

asset transfer

scheduled assets

as-built assets

O&M’s

parts & warranties
standards
COBie is...

a specification for
asset inventory
and O&M info
COBie defines...

allowed formats
(IFC, ifcXML, SpreadsheetML, COBieLite)

and

minimum content
example
### Finish Schedule

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<th>East</th>
<th>South</th>
<th>West</th>
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<th>Height</th>
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Innovative solutions for a safer, better world

BUILDING STRONG®
## Spaces & Attributes

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<th>Category</th>
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<th>UsableHeight</th>
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### Annotation Rules

- **BaseColor**
  - Requirement: Space
  - Value: LA04
  - Color: ROPPE - 40 FAWN - 4" HIGH RUBBER COVE
- **BaseMaterial**
  - Requirement: Space
  - Value: LA04
  - Material: RUBBER BASE
- **CeilingColor**
  - Requirement: Space
  - Value: LA04
  - Color: ARMSTRONG CEILING TILE - CURRUS TEQUILA
- **CeilingMaterial**
  - Requirement: Space
  - Value: LA04
  - Material: ACOUSTICAL CEILING TILE
- **FloorColor**
  - Requirement: Space
  - Value: LA04
  - Color: INTERFACE - CARIBBEAN #3080 ANTIQUA
- **FloorMaterial**
  - Requirement: Space
  - Value: LA04
  - Material: CARPET
- **WallColor-East**
  - Requirement: Space
  - Value: LA04
  - Color: DEVOE #2W18-2 PRARIE BUFF
- **WallColor-North**
  - Requirement: Space
  - Value: LA04
  - Color: DEVOE #2W18-2 PRARIE BUFF
- **WallColor-South**
  - Requirement: Space
  - Value: LA04
  - Color: DEVOE #2W18-2 PRARIE BUFF
- **WallColor-West**
  - Requirement: Space
  - Value: LA04
  - Color: DEVOE #2W18-2 PRARIE BUFF
- **WallMaterial-East**
  - Requirement: Space
  - Value: LA04
  - Material: GYPSUM WALLBOARD WITH PAINT
- **WallMaterial-North**
  - Requirement: Space
  - Value: LA04
  - Material: GYPSUM WALLBOARD WITH PAINT
- **WallMaterial-South**
  - Requirement: Space
  - Value: LA04
  - Material: GYPSUM WALLBOARD WITH PAINT
- **WallMaterial-West**
  - Requirement: Space
  - Value: LA04
  - Material: GYPSUM WALLBOARD WITH PAINT
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<tr>
<th>UNIT NO.</th>
<th>LOCATION</th>
<th>TOTAL CFM</th>
<th>INTERLOCK WITH</th>
<th>TYPE</th>
<th>MAX RPM</th>
<th>START CFM</th>
<th>DESIGN MOTOR</th>
<th>SERIES</th>
<th>VOLT</th>
<th>PH</th>
<th>CYC</th>
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* FILTER LOCK, SLOW-SPEED MOTOR, SELF-CONTAINED FAN, DEPT. SHUT-OFF, BONNAN FAN
### Equipment & Attributes

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#### Fan Schedule

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**Centrifugal Fan - Roof Mounted**

**Centrifugal Fan - In Line**
many ways to view COBie data!
COBie resources?
Construction Operations Building Information Exchange (COBie)

by E. William Coel, PE, PhD
Engineer Research and Development Center, U.S. Army, Corps of Engineers
Last updated 04-22-2013

INTRODUCTION

Today, most contracts require the handover of paper documents containing equipment lists, product data sheets, warranties, spare part lists, preventive maintenance schedules, and other information. This information is essential to support the operations, maintenance, and the management of the facilities assets by the owner and/or property manager.

Gathering this information at the end of the job, today’s standard practice, is expensive, since most of the information has to be extracted from information created earlier. COBie simplifies the work required to capture and record project handover data.

The COBie approach is to enter the data as it is created during design, construction, and commissioning. See Figure 1. Designers provide floor, space, and equipment layouts. Contractors provide make, model, and serial numbers of installed equipment. Much of the data provided by contractors comes directly from product manufacturers who can also participate in COBie. Please see Project Delivery Teams for more information.

Normally it take 3 years to get an building after the financial closeout of a project. Now can get a pre-built equipment list before the building ever breaks ground? Outstanding! 

— Deputy Director, Department of Public Works

Fig. 1. COBie Process Overview
buildingSMART alliance information exchanges: Means and Methods
by E. Wilkin East, PhD, P.E. - Engineer Research and Development Center, U.S. Army, Corps of Engineers

How To Use This Page
This page answers the following questions:

- Can my commercial software deliver b3a information exchanges?
- What free software directly supports b3a information exchanges?
- How do alternative file formats support the associated IFC Model Viewers?
- Who can help me implement b3a standards?

Commercial Software
Delivering and using buildingSMART alliance information exchange standards may be accomplished with existing software used for planning, design, construction, and facility management and operations activities. The list below has worked directly with the buildingSMART alliance, through a public process to test and demonstrate their capabilities.
The links below provide you with the most recent assessment of each product's performance. Configuration guides and user manuals are also provided, based on the software at the time of testing. You may also compare the results of testing these tools by opening each tool in a new tab and viewing their results side-by-side in separate browser windows.

Software for Planning
Planning software can now share information using a new b3a format developed through the Building Planning Information Exchange (BPIe) project. An overview of this project from the 2013 BPIe Demo may be seen here. The software below has demonstrated their ability to produce BPIe information. Their most recent presentations and example files are provided here for your review.

Software for Design

<table>
<thead>
<tr>
<th>Company</th>
<th>Product (name for demo)</th>
<th>Event (name for contact)</th>
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</thead>
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<tr>
<td>Dassl</td>
<td>d3fas (5.5 per)</td>
<td>2013 BPIe Demo</td>
</tr>
<tr>
<td>Onuma</td>
<td>Onuma Systems (50pp)</td>
<td>2013 BPIe Demo</td>
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</table>

nibs.org/?page=bsa_cobiemm
Common Building Information Model Files and Tools
by E. William East, P.E., Engineer Research and Development Center, U.S. Army, Corps of Engineers

How To Use This Page
The information on this page can assist you to:
- Download "information exchange" example files in different file formats
- See how model data from different disciplines is organized
- Compare files to see model content for different demands
- See how exchanges, such as COBie, change over time
- Use these common files to evaluate your software's import or export functions
- Use these common files to teach building information modeling
- Extend these common files for new information exchanges and research
- Find and use free tools to help you work with these files

Project 1. Duplex Apartment
The duplex apartment model was originally created by a student who developed this building as part of a design competition. This model was first used at the Dec 2009 COBie Challenge event.

COBie
2012-03-23-Duplex-01-Programming
2012-03-23-Duplex-02-Design
2012-03-23-Duplex-03-ProductSelect
2012-03-23-Duplex-04-ProductInstall
2012-03-23-Duplex-05-Handoff
## COBie Calculator

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<th>Information Attributes</th>
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<tbody>
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<td>Current process cost:</td>
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<td>Owner</td>
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<tr>
<td>Architect</td>
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<tr>
<td>Contractor</td>
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<tr>
<td>Difference:</td>
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<td>Process Cost Difference:</td>
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<td>Expected process cost:</td>
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<tr>
<td>Owner</td>
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<tr>
<td>Architect</td>
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<td>Contractor</td>
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<td>Difference:</td>
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<td>Process Cost Difference:</td>
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### Process

Reference Chapters 2 Appendix for Process Map

Prepare Shop Drawings

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<th>Current Process</th>
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<tr>
<td>180.01 Identify Submittal Basis on Submittal Register</td>
</tr>
<tr>
<td>180.02 Receive Submittal Information from Sub-Contractors and Vendors</td>
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</tbody>
</table>

### Expected Process

180.01 Identify Submittal Basis on Submittal Register

180.02 Receive Submittal Information from Sub-Contractors and Vendors

<table>
<thead>
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<th>Handling/Electrical</th>
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<tr>
<td>180.02.15 Log Receipt of Submittal Package from Sub-Contractors and Vendors</td>
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<tr>
<td>180.02.16 Total Items Received from Sub-Contractors and Vendors</td>
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Sub-Total $8,645.19

Sub-Total $10.00

[http://acwc.sdp.sirsi.net/client/search/asset/1030580](http://acwc.sdp.sirsi.net/client/search/asset/1030580)
COBie pathway
COBie on new facilities

COBie updates during operations, maintenance, and renovations

updated agency contracts (to do)

identified asset properties (to do)

integrated IT systems (to do)

updated business processes (to do)
COBie is part of NBIMS-US

http://www.nibs.org/?page=bsa_infoexchange
Architectural Model
Coordination Model View Definition

http://www.nibs.org/?page=bsa_commonbimfiles
Planning & Architectural Model
BPie & Coordination Model View Definition

Asset Information
COBie
Planning & Architectural Model
BPie & Coordination Model View Definition
Asset Information
COBie
HVACie
Planning & Architectural Model
BPie & Coordination Model View Definition
Asset Information
COBie
HVACie
WSie
WSie
the owner’s choice?
Building Innovation 2014: The National Institute of Building Sciences second annual Conference & Expo, scheduled for January 6-10, 2014, in Washington, D.C., will explore Advancing Life-Cycle Performance. During the Conference, the Institute will look back on its 40 years of leadership and advocacy and present an informative agenda that highlights its activities and programs for developing innovative solutions for the built environment.

The Institute’s councils will offer symposia that focus on different aspects of the Conference theme. During the Plenary Symposium, the Institute’s programs will provide an overview of their activities and discuss how connecting across programs can help achieve whole building life-cycle performance. Popular events, including the buildingSMART alliance™ Symposium, the Building Enclosure Technology and Environment Council (BETEC) Symposium, and FEDCon® – The Annual Market Outlook on Federal Construction, as well as innovative technology demonstrations, such as the Construction Operations Building information exchange (COBie) and related projects, will be part of this event. In addition, Institute councils and committees will hold annual meetings to reveal their project activities to the entire industry.

Witness the Institute’s impact on the industry, interact with industry experts and innovators, gain a wealth of information through educational programs, earn continuing education units (CEUs), share their expertise and experiences, and participate in solutions toward Advancing Life-Cycle Performance.

Building Innovation 2014 is a gathering place for building community leaders to convene for five impactful days of information sharing, networking and a content-rich conference and educational program, offering sponsors and exhibitors a great opportunity to support the institute’s efforts, reach their target audience, showcase their products and services, and gain valuable exposure and recognition for their contribution to the built environment.

View the Preliminary Schedule.

http://www.nibs.org/?page=conference2014
Obtaining and Maintaining Accurate Asset Inventories

Thank you!

bill.east@us.army.mil
wbrodt@nasa.gov