construction operations building information exchange (cobie)

E. William East, PE, PhD
buildingSMART Alliance Project Coordinator
o&m costs

- Additional payments for items already under warranty
- Increased costs of replacement parts ordering
- Increased down time due to missing system information

<table>
<thead>
<tr>
<th>Plan</th>
<th>Design</th>
<th>Build</th>
<th>Operate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2% of the total facility life-cycle cost</td>
<td>6% of the total facility life-cycle cost</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
asset management cost

- Inappropriate utilization resulting in decreased performance or unneeded new construction
- Space underutilization resulting in over-building or higher energy costs
- Inability to optimize alternative facility use
- Inability to simulate contingency operations

92% of the total facility life-cycle cost

Plan Design Build Operate Use
reduce handover waste

• facility managers receives boxes full of paper

• questionable data accuracy

• owners currently paying for this data two or three times

• full-time transcribers needed
wide stakeholder participation

project invitation sent 01-Nov-2005
efforts to date

- NAVFAC Operations & Maintenance System Information (OMSI)
  e-paper submission of O&M documents
- U.S. Army, Department of Public Works, Fort Lewis, WA
  Pockets of local, proprietary information exchange & expertise
- Electronic construction submittal register
  Construction Criteria Base, federal UFGS and UFC’s. SpecsIntact software.

- International Alliance for Interoperability (IAI)
  FM Project has been proposed using Industry Foundation Classes (IFC)
- FIATECH Automated Equipment information eXchange (AEX)
  Exchange of supply chains information among tiered stakeholders

- Machinery Information Management Open Systems Alliance (MIMOSA)
  Exchange standard for equipment telemetry
- Open Standards Consortium for Real Estate (OSCRE)
  Asset management and valuation exchange
- National Institute of Science and Technology (NIST)
findings

- research results documented in technical report (wbdg.org)
- maintenance information
  - warranties
  - spare/replacement parts
  - pm tasks
  - resources
- operations
  - start-up/shut-down procedure
  - trouble shooting procedures
- asset management
  - space measurement
  - fixed or movable property
  - space-function capabilities
cobie object model

Requirements for information exchange directly match IFC model.

difficulties?

• specification for information delivery

• insuring consistent nomenclature across domains

• implementation of cobie model view definition in commercial software
findings

• different software types provide/use different sets/subsets

• ultimately need “file > save-as cobie” and “file > import cobie” wherever needed but...

• spreadsheet provides common-ground until software companies in each sector provide routines
  – widely useful by all
  – IFC / spreadsheet translation rules provided free of charge
  – can be created by hand, CADD, BIM, and other software
  – extend value of BIM ideas to widest possible stakeholders
**designers’ data**

<table>
<thead>
<tr>
<th>Facility</th>
<th>Identification of facilities referenced in a file</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>Description of vertical levels</td>
</tr>
<tr>
<td>Space</td>
<td>Spaces referenced in a project</td>
</tr>
<tr>
<td>System</td>
<td>Systems referenced in a project</td>
</tr>
<tr>
<td>Register</td>
<td>Material/equipment/etc. catalog (submittal register)</td>
</tr>
<tr>
<td>Component</td>
<td>Individually named materials and equipment</td>
</tr>
</tbody>
</table>
### builders’ data

<table>
<thead>
<tr>
<th>Department</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>Location and serial no. of installed components</td>
</tr>
<tr>
<td>Manual</td>
<td>Instruction manuals for sets of/or components</td>
</tr>
<tr>
<td>Warranty</td>
<td>Warranty information for sets of/or components</td>
</tr>
<tr>
<td>Spare</td>
<td>Spare/parts reordering info for sets of/or components</td>
</tr>
<tr>
<td>Instruction</td>
<td>Installation/operating instructions</td>
</tr>
<tr>
<td>Test</td>
<td>System/component test results</td>
</tr>
<tr>
<td>Certification</td>
<td>Installation certifications</td>
</tr>
</tbody>
</table>
commissioning agents’ data

<table>
<thead>
<tr>
<th>PM</th>
<th>Identifies specific PM tasks and frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Identifies required safety tasks</td>
</tr>
<tr>
<td>Trouble</td>
<td>Maintenance trouble shooting procedures</td>
</tr>
<tr>
<td>Start-Up</td>
<td>Start-up procedures</td>
</tr>
<tr>
<td>Shut-Down</td>
<td>Shut-down procedures</td>
</tr>
<tr>
<td>Emergency</td>
<td>Emergency operating procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th>Special materials needed for a given Job Plan Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool</td>
<td>Special tools needed for a given Job Plan Task</td>
</tr>
<tr>
<td>Training</td>
<td>Special training needed for a given Job Plan Task</td>
</tr>
</tbody>
</table>
findings – asset management

• research results documented in technical report (wbdg.org)

• maintenance information
  – warranties
  – spare/replacement parts
  – pm tasks
  – resources

• operations
  – start-up/shut-down procedure
  – trouble shooting procedures

• asset management
  – space measurement
  – fixed or movable property
  – space-function capabilities
link to portfolio via. owner’s facility id

(ref: buildingSMART Alliance briefing)

* structural systems
HVAC systems
utility systems
space capabilities

OmniClass Table 13 “Spaces by Function”

(Ref: Reprt tp ASTM Subcommitee E-6.25, by Subcommitee E06.25 Whole Buildings and Facilities, used by permission of Gerald Davis, Chair)
space measurement

IFMA and BOMA requirements for spatial measurement have been harmonized as represented in:
ASTM E 1836-01 Standard Practice for Building Floor Area Measurements for Facility Management and
ANSI standard being updated

Point of Contact: davis-gerald@icf-cebe.com

Interior Gross Area

Comprehensive measurement rules

Interior Gross Area

(ref: Re[pert tp ASTM Subcommittee E-6.25, by Subcommittee E06.25 Whole Buildings and Facilities, used by permission of Gerald Davis, Chair )
draft cobie specification

specifications must follow existing facility delivery process

performance-based specifications should allow any team to create the needed data

specifications must reflect real cost to owners of failure to receive this data

designer submits “pre-built” cobie information

builder submits “as-built” cobie information
please help my friend lyle...
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