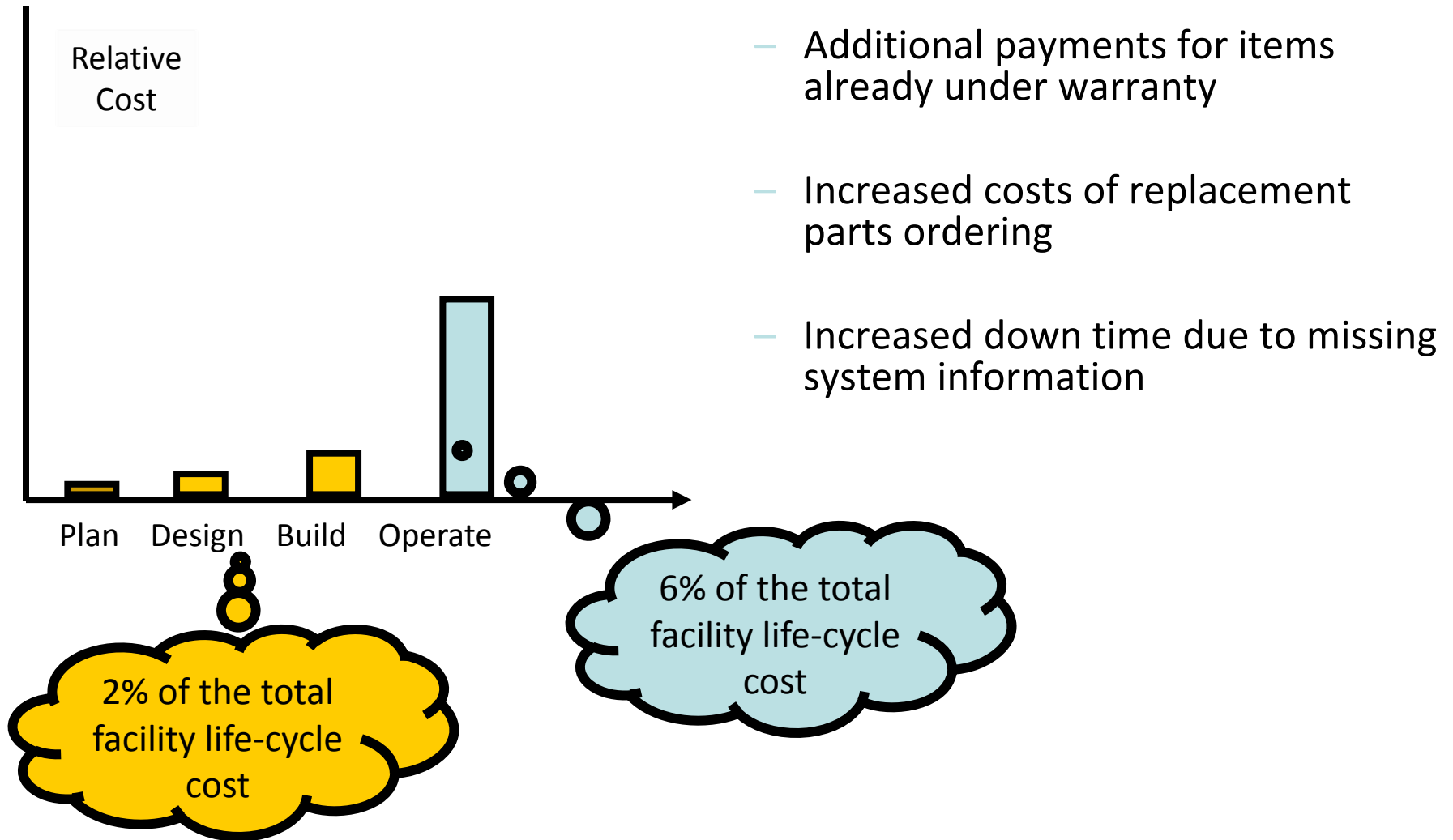


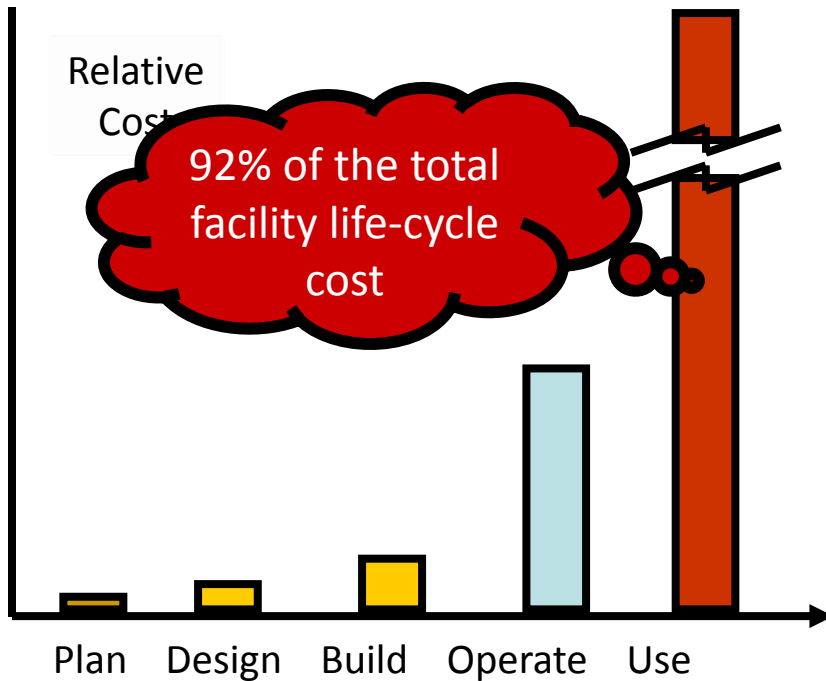
# construction operations building information exchange (cobie)

E. William East, PE, PhD  
buildingSMART Alliance Project Coordinator

# o&m costs



# 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

# 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



National Institute of Building Sciences  
Facilities Information Council  
National BIM Standard



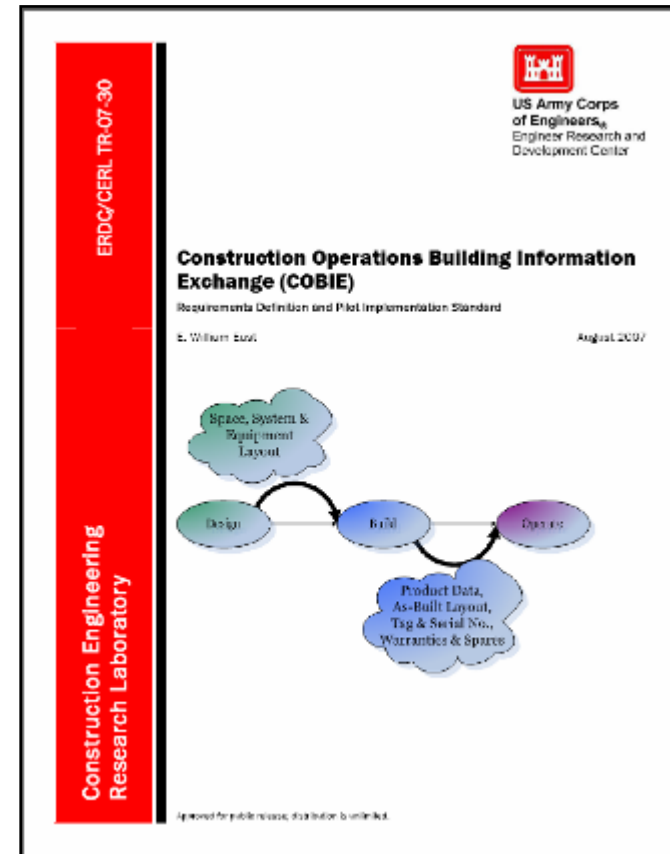
*project invitation sent 01-Nov-2005*

# 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)**  
Capital Facilities "Handover" Guide (Jan 2006) General Building Guide (2007)

# 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



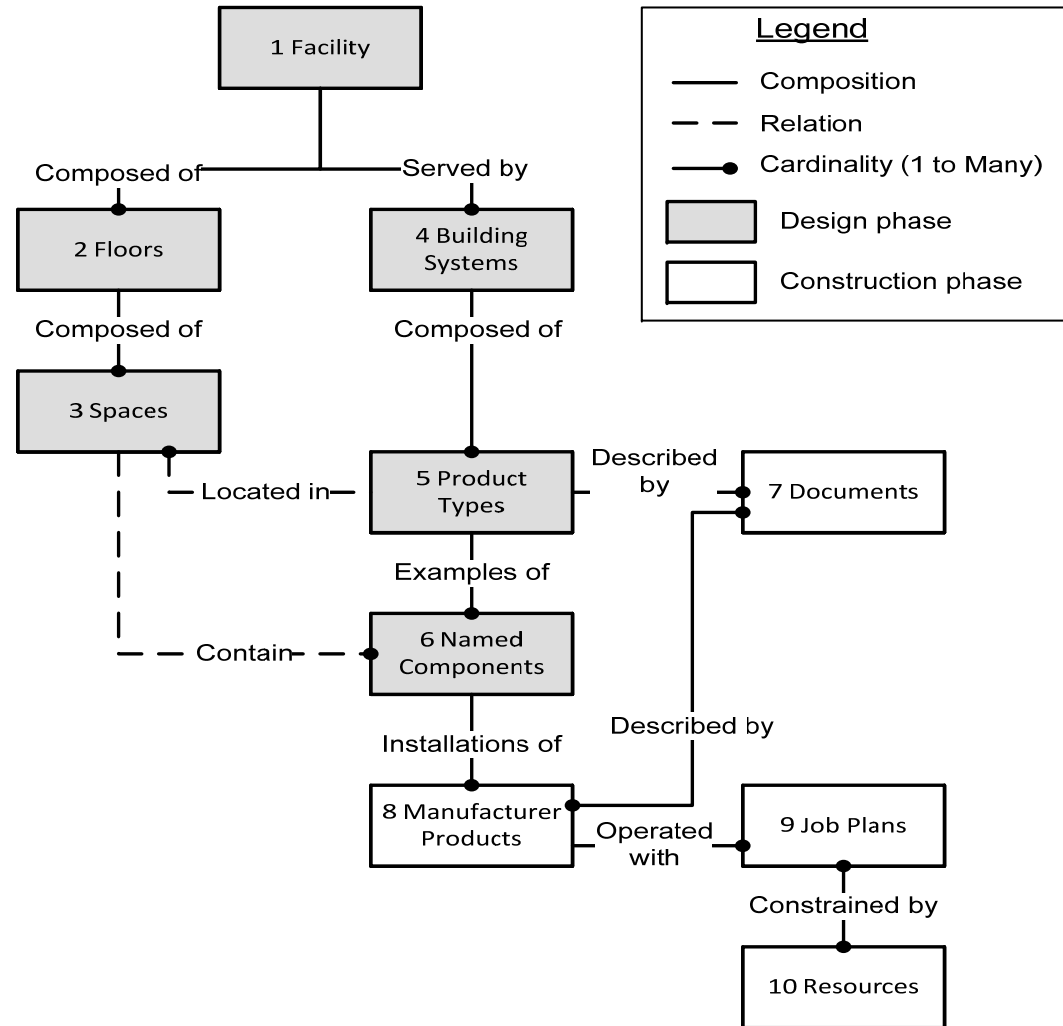
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# cobie object model

Requirements for information exchange directly match IFC model.

difficulties?

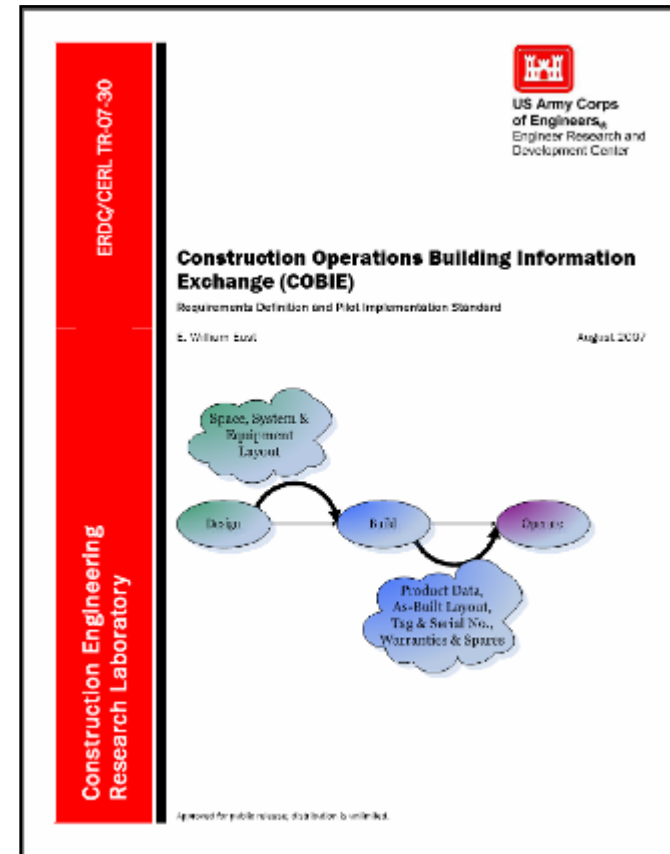
- specification for information delivery
- insuring consistent nomenclature across domains
- implementation of cobie model view definition in commercial software





# 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



August 2007

# designers' data

Facility	Identification of facilities referenced in a file
Floor	Description of vertical levels
Space	Spaces referenced in a project
System	Systems referenced in a project
Register	Material/equipment/etc. catalog (submittal register)
Component	Individually named materials and equipment

# builders' data

Installation	Location and serial no. of installed components
Manual	Instruction manuals for sets of/or components
Warranty	Warranty information for sets of/or components
Spare	Spare/parts reordering info for sets of/or components

Instruction	Installation/operating instructions
Test	System/component test results
Certification	Installation certifications

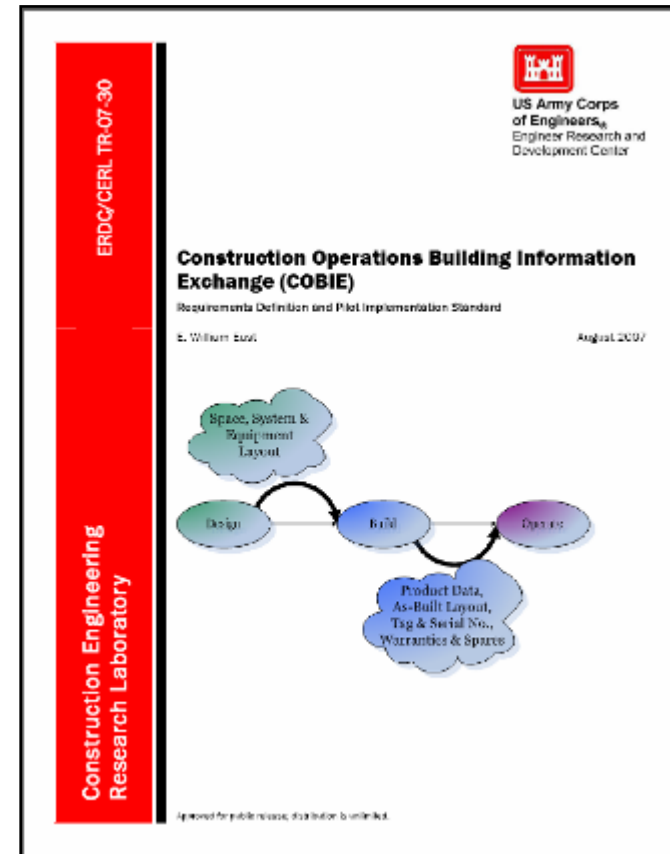
# commissioning agents' data

PM	Identifies specific PM tasks and frequency
Safety	Identifies required safety tasks
Trouble	Maintenance trouble shooting procedures
Start-Up	Start-up procedures
Shut-Down	Shut-down procedures
Emergency	Emergency operating procedures

Material	Special materials needed for a given Job Plan Task
Tool	Special tools needed for a given Job Plan Task
Training	Special training needed for a given Job Plan Task

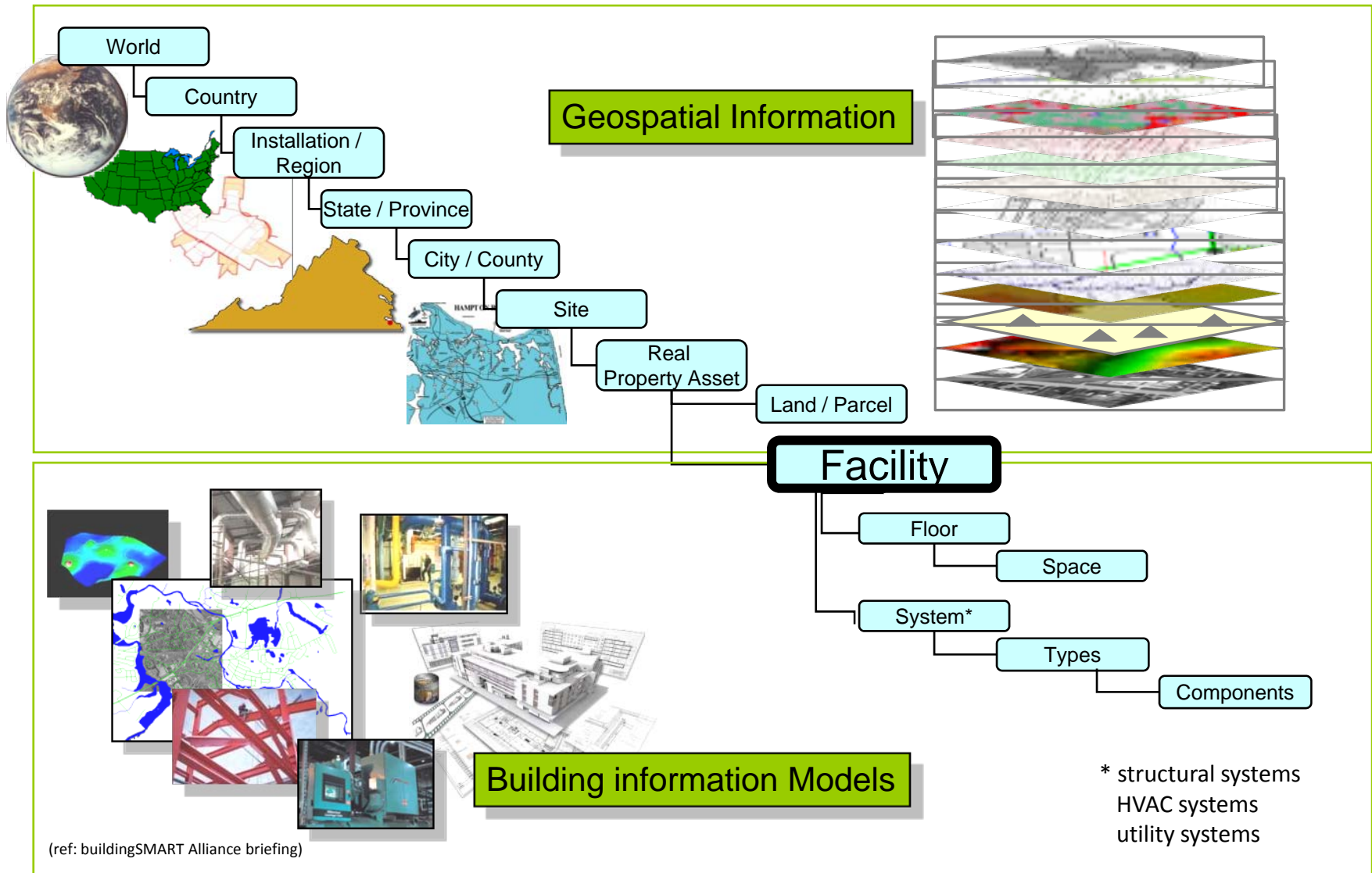
# findings – asset management

- 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



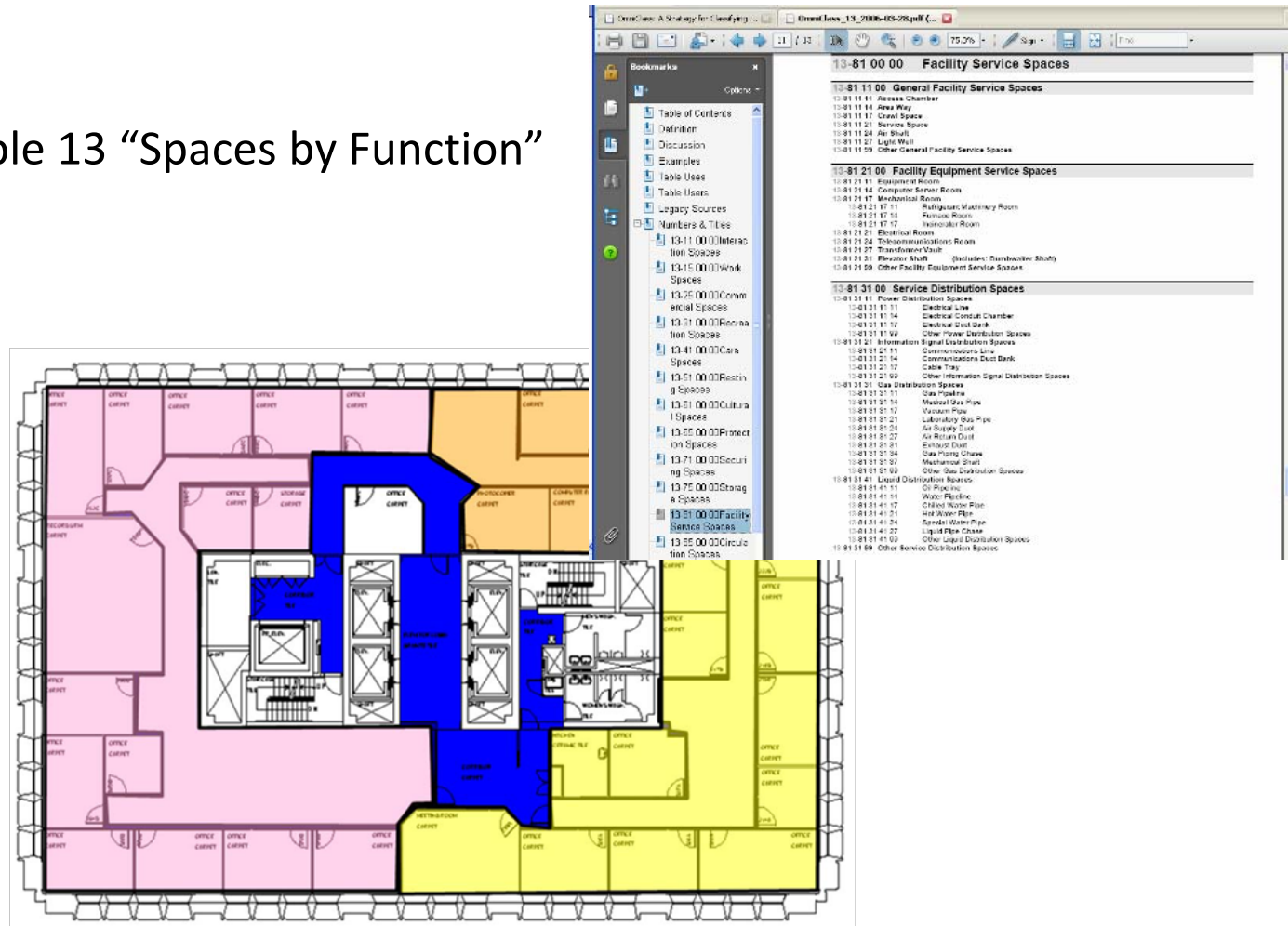
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# link to portfolio via. owner's facility id



# space capabilities

## OmniClass Table 13 “Spaces by Function”



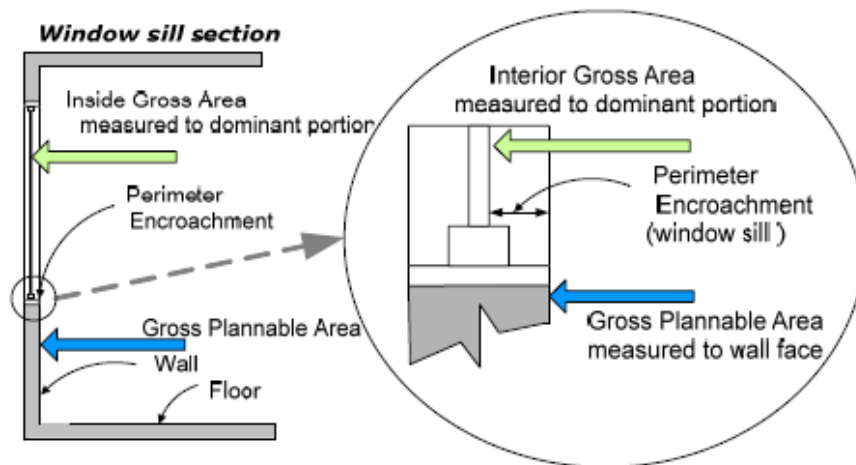
(ref: Re[p]rt tp ASTM Subcommittee E-6.25, by Subcommittee E06.25 Whole Buildings and Facilities, used by permission of Gerald Davis, Chair )

# 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](mailto:davis-gerald@icf-cebe.com)

## Interior Gross Area



## Comprehensive measurement rules

Key to Measurement Rules for Facility Management				Interior Gross Area											
D1 = Defined boundary - Dominant Portion D2 = Defined Boundary - Perimeter Encroachment and Plannable Gross Area C = Measure area to the centre line of its enclosing walls W = Measure area and include its enclosing walls F = Measure area to the face of the finished surface of the adjacent area OPT = Optional (Measurements needed for the ANSI BOMA Standard Z65.1) N/A = Not applicable				Plannable Gross Area											
				Plannable Area											
				Dominant Portion	Perimeter Encroachment	Major Vertical Penetrator	Void Area	Service Area	Primary Circulation	Restricted Area	Interior Encroachment	Occupant Void Area	Assignable Area	Unassignable Area	Secondary Circulation
				D1	D2	C	W	F	W	C	W	C	W	C	W
Interior Gross Area	Dominant Portion	OPT	OPT	D1	D1	D1	D1	D1	N/A	D1	D1	D1	D1		
	Perimeter Encroachment	OPT	OPT	D1	D1	D1	D1	D2	D2	D2	D2	D2	D2		
	Major Vertical Penetration	D1	D1	C	W	W	W	W	W	W	W	W	W		
	Void Area	D1	D1	F	C	W	W	W	W	W	W	W	W		
	Service Area	D1	D1	F	F	C	W	W	W	W	W	W	W		
	Primary Circulation	D1	D1	F	F	F	C	W	W	W	W	W	W		
	Restricted Area	D1	D2	F	F	F	F	C	W	W	W	W	W		
	Interior Encroachment	N/A	D2	F	F	F	F	F	C	W	W	W	W		
	Occupant Void Area	D1	D2	F	F	F	F	F	F	C	W	W	W		
	Assignable Area	D1	D2	F	F	F	F	F	F	F	C	W	W		
Plannable Area	Unassignable Area	D1	D2	F	F	F	F	F	F	F	F	C	W		
	Secondary Circulation	D1	D2	F	F	F	F	F	F	F	F	F	C		

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



# draft cobie specification

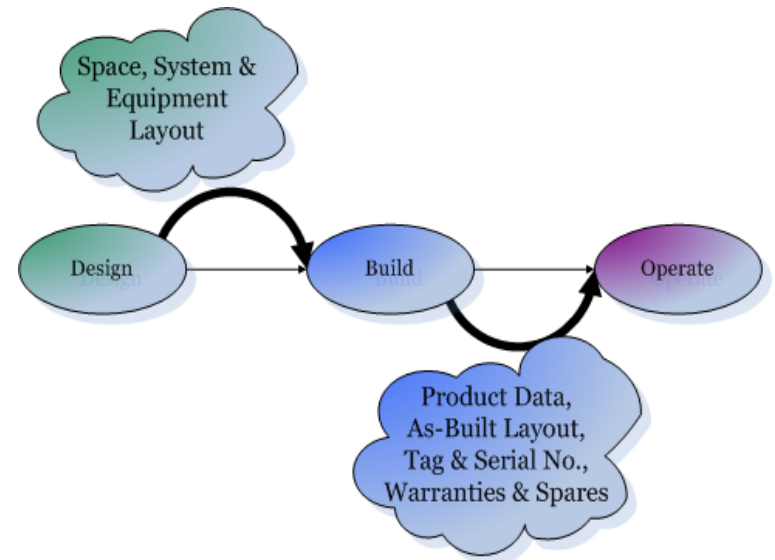
specifications must follow existing facility delivery process

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...



# construction operations building information exchange (cobie)

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