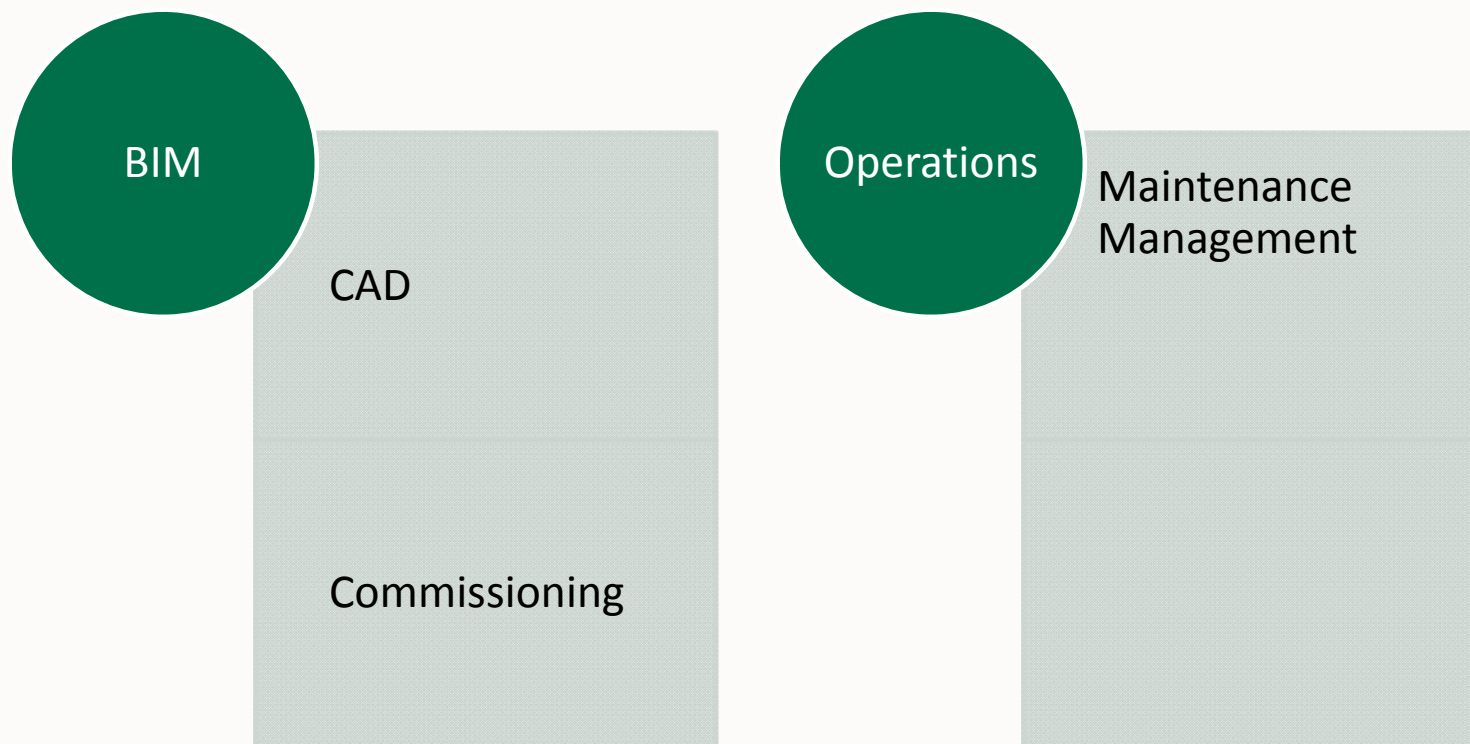




COBIE & Slim BIM Configuration and Alignment

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COBIE defines the path from Construction BIM to Operations



Other business applications in facility still can't share information with Maintenance



COBIE-X

**Today's COBIE addresses only some
traditional needs**



A tighter COBIE Specification would better meet today's use

- Loose definition means many instances are not interoperable
- No standard for automatic validation
 - Structure
 - Completeness
- No Expectation that COBIE can be round tripped.



Round Trip COBIE enhances value and reduces cost of Commissioning and retro-Commissioning

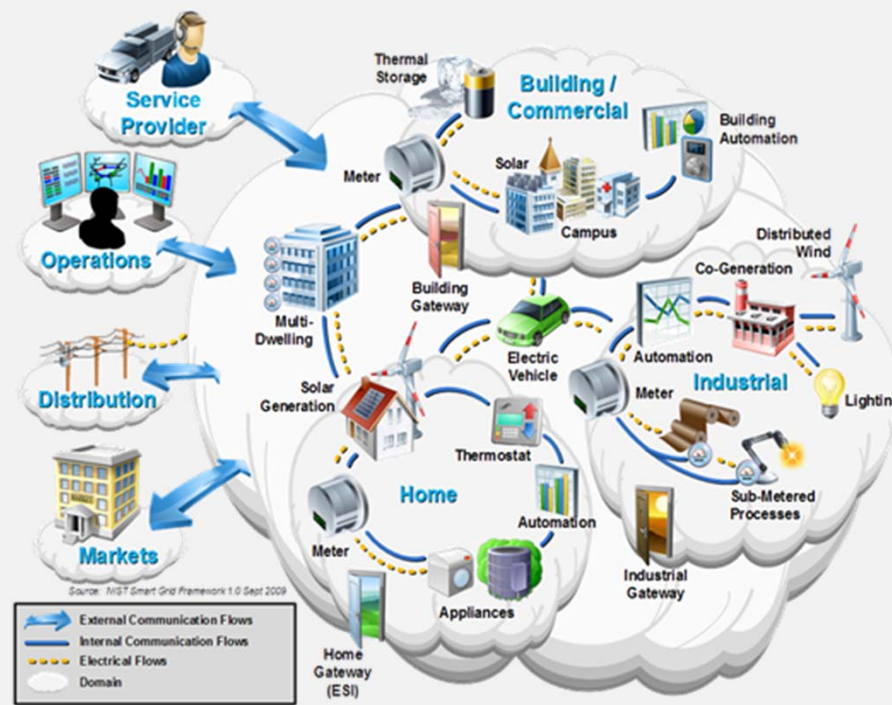
- Applications export COBIE to produce commissioning data set
- Standards-based Commissioning to edit and validate COBIE data sets
 - Merge
 - Compare
 - Edit
- Standards-based Commissioning to edit and validate COBIE data sets
 - Merge
 - Compare
 - Edit
- Standards-based Commissioning exports COBIE
- Applications import COBIE
 - Collision Detection



Many operations applications could benefit from two-way COBIE

- Capital Renewal / Facility Assessment
- Tenant Management
- Space Management
- Registrar
- Enterprise Scheduling
- Emergency Response
- Energy Management



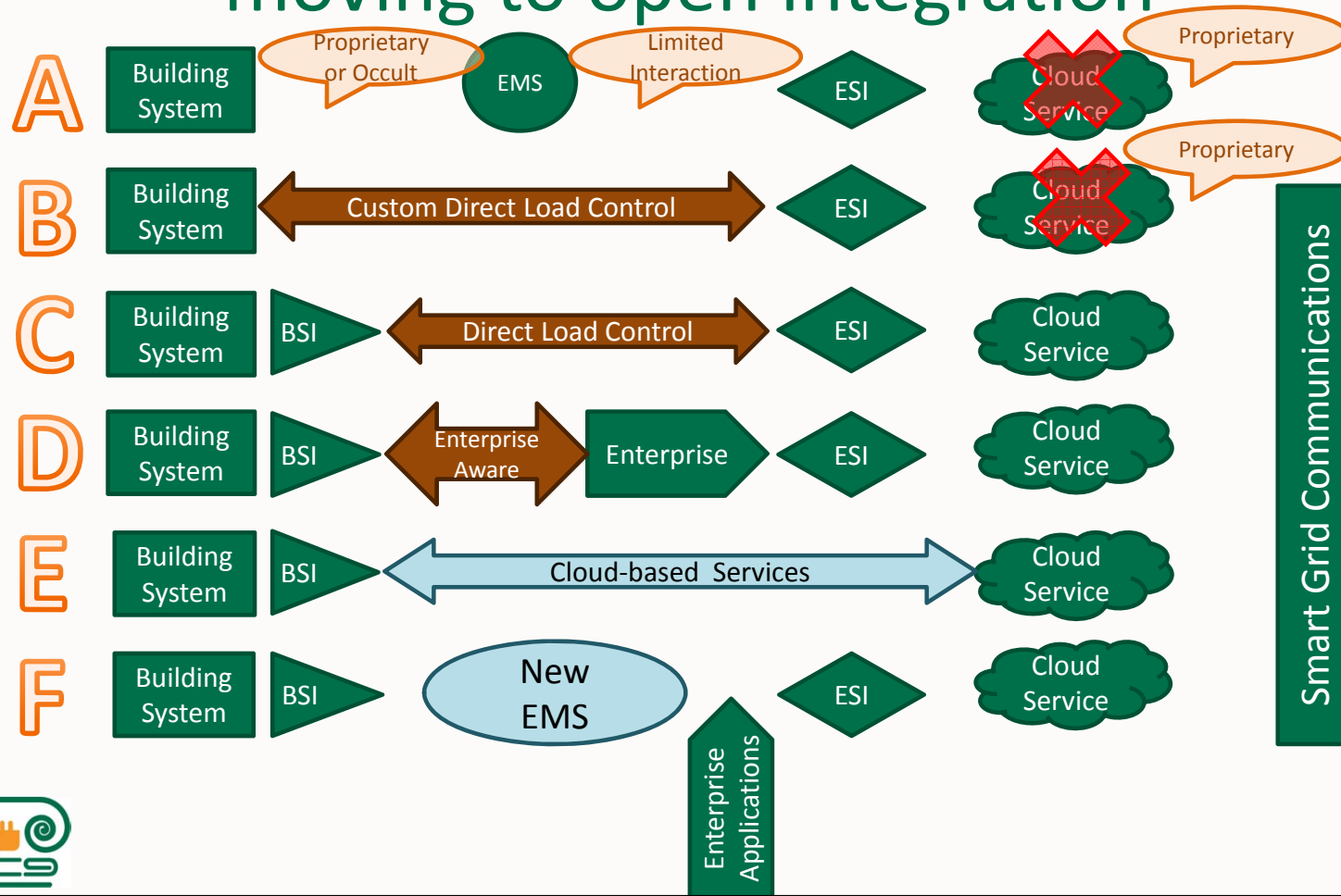


Conceptual Reference Diagram for the Customer Domain (Source: NIST Framework, V2)

Smart Energy and Microgrids broaden opportunities for COBIE-integration



Grid-Integrated Energy Management is moving to open integration



Common configuration of Services, Space, and Systems across applications
Ontologies of purpose
Slim BIM and COBIE-X

**Slim BIM can provide semantic
framework for Policy-based energy**



Use Slim BIM for common configuration of systems

- Energy management is equipment based
- People and services are space-based
 - Ontologies of purpose
- Slim BIM links equipment to Space
- Slim BIM alligns space across applications



What are the candidates for Slim BIM?

- GBXML
- BIMXML
- COBIE

Specifications readily available at no cost
Each available on web
Each already in use



Candidate: COBIE

- Based on IFCs
- Already well-known to CMMS world
- Supported by NIBS
- Multiple sources including software from Autodesk, Bentley
- No Formal Schema
- Data sets often incomplete or inconsistent



Candidate GBXML

- Based on IFCs
- De facto standard for exchange of lightweight engineering information
- Base for many Energy Models
- Supported by 501C3 organization
- Multiple sources including software from Autodesk, Bentley
- Formal Schema supports tooling
- Overlaps COBIE with common semantics
Lacks equipment, maintenance information



Candidate BIMXML

- Optimized for web services
- Informally derived from IFCs
- No SDO or Organizational support
- Mashed up with COBIE data in more than 5000 buildings
- Single vendor
- Substantial overlap with GBXML



COBIE-X

- Fix COBIE
 - Formal Schema
 - Define conformance for two-way transfer
- Align information elements from GBXML
 - Core semantics
 - Landscape and Energy Models
- Define formal profiles for each use.
- Incorporate CERL WS-Calendar approaches



COBIE-X

**Formalize COBIE to provide semantic
configuration for all operational areas**



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Questions

