Interoperability tools and protocols
a progress update from buildingSMART*

ICIS Delegates Meeting & Conference, Auckland March 2016

Richard Petrie, Chief Executive, buildingSMART International
John Mitchell, Chairman, buildingSMART Australasia

* edited by JRM for ICIS Presentation
Values
Open
Neutral
Not-for-profit
International

Goals
Create open BIM standards
Host open BIM forum
Certify software and people
Become a trusted resource
Promote active use

Core Standards Focus
Data
Processes
Dictionaries
BIM Standards

History
1995 Established
2000 IFC2 Release
2012 IFC4 Release
2013 First ISO Standards
2014 IFC Infrastructure

buildingSMART today

buildingSMART is the world wide authority driving the transformation of the built asset economy through creation and adoption of open, international digital standards

Richard Petrie
Chief Executive

Patrick MacLeamy
Chairman

bSI Chapters
Australasia
Benelux
Canada
China
France
Germany
Hong Kong
Italy
Japan
Korea
Malaysia
Nordic
Norway
Singapore
Spain
Switzerland
United Kingdom
USA

bSI Partners
bSI Chapters

Flags of participating countries:
bSI Members

ARUP  A  H+K  KAJIMA CORPORATION  NEMETSCHEK GROUP

cobuilder  DASSAULT SYSTEMES  Trimble

Rijkswaterstaat Ministry of Infrastructure and the Environment  Direktoratet for Byggkvalitet  TRAFIKVERKET

CSC  CSI  FM Global  NORGE  MEDI@CONSTRUCT  universität Innsbruck  CB・NL
Engagement

Partners

- ISO
- CEN
- OGC

National Programs

- Plan Transition Numérique dans le Bâtiment
- Digital Built Britain
- BIM Loket
High Ambitions

Our Goal: Enable full benefits from digital ways of working in the built asset industry

Our Journey: Success will mean
- Standards Body of Reference
- Vibrant Chapters
- Quality Mark in demand
Client Problem

How to manage product data information consistently?
Problem Statement
Problem Statement

Enable a single method of providing product information
Problem Statement

Enable a single method of providing product information
Problem Statement

Enable a single method of providing product information

Consistent flow of information from a manufacturer on an application-agnostic product through to an installed, operational and maintainable product or system
Problem Statement

Enable a single method of providing product information

**Consistent flow of information** from a manufacturer on an application-agnostic product through to an installed, operational and maintainable product or system

Agreed, documented transparent development, approval and management process for industry consensus and peer reviewed product data templates and a consistent plain language dictionary for product parameters
Problem Statement

Enable a single method of providing product information

**Consistent flow of information** from a manufacturer on an application-agnostic product through to an installed, operational and maintainable product or system

Agreed, documented transparent development, approval and **management process for industry consensus and peer reviewed product data templates and a consistent plain language dictionary** for product parameters

Structure to enable plain language **parameters to be exchanged through open standards** including IFC
Enable a single method of providing product information

Consistent flow of information from a manufacturer on an application-agnostic product through to an installed, operational and maintainable product or system

Agreed, documented transparent development, approval and management process for industry consensus and peer reviewed product data templates and a consistent plain language dictionary for product parameters

Structure to enable plain language parameters to be exchanged through open standards including IFC

All necessary product information requirements are met to comply with relevant standards, and to meet both the Employers Information Requirements (EIRs) and those of the supply chain through the whole of the product’s lifecycle
Enable a single method of providing product information

**Consistent flow of information** from a manufacturer on an application-agnostic product through to an installed, operational and maintainable product or system

Agreed, documented transparent development, approval and **management process for industry consensus and peer reviewed product data templates and a consistent plain language dictionary** for product parameters

Structure to enable plain language **parameters to be exchanged through open standards** including IFC

**All necessary product information requirements are met** to comply with relevant standards, and to meet both the Employers Information Requirements (EIRs) and those of the supply chain through the whole of the product’s lifecycle

**Scope for an independent accreditation method**
The bSDD Opportunity

What is the grand vision, what can it do?
Common Object Library
the Strategy

<table>
<thead>
<tr>
<th>Element</th>
<th>Unique #</th>
<th>English</th>
<th>Deutsch</th>
<th>Français</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrance Width</td>
<td>IFD#1234</td>
<td>Entrance Width</td>
<td>Türbreite</td>
<td>Largeur de la Porte</td>
</tr>
</tbody>
</table>

Unique #1234

Concept by: Professor Rasso Steinmann, IABI
## Common Object Library

### Building the Library

<table>
<thead>
<tr>
<th>Element</th>
<th>Unique #</th>
<th>English</th>
<th>Deutsch</th>
<th>Français</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Door Element" /></td>
<td>IFD#1234</td>
<td>Entrance Width</td>
<td>Türbreite</td>
<td>Largeur de la Porte</td>
</tr>
<tr>
<td><img src="image" alt="Door Element" /></td>
<td>IFD #1235</td>
<td>..........</td>
<td>..........</td>
<td>..........</td>
</tr>
<tr>
<td><img src="image" alt="Door Element" /></td>
<td>IFD #1236</td>
<td>..........</td>
<td>..........</td>
<td>..........</td>
</tr>
</tbody>
</table>
# Common Object Library to the Cloud

<table>
<thead>
<tr>
<th>Element</th>
<th>Unique #</th>
<th>English</th>
<th>Deutsch</th>
<th>Français</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Diagram" /></td>
<td>IFD#1234</td>
<td>Entrance Width</td>
<td>Türbreite</td>
<td>Largeur de la Porte</td>
</tr>
<tr>
<td><img src="image2.png" alt="Diagram" /></td>
<td>IFD #1235</td>
<td>.............</td>
<td>.............</td>
<td>.............</td>
</tr>
<tr>
<td><img src="image3.png" alt="Diagram" /></td>
<td>IFD #1236</td>
<td>.............</td>
<td>.............</td>
<td>.............</td>
</tr>
</tbody>
</table>
### Common Object Library to the Cloud

<table>
<thead>
<tr>
<th>ID</th>
<th>English</th>
<th>Deutsch</th>
<th>Français</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFD#1234</td>
<td>Entrance Width</td>
<td>Türbreite</td>
<td>Largeur de la Porte</td>
</tr>
<tr>
<td>IFD#1235</td>
<td>……</td>
<td>……</td>
<td>……</td>
</tr>
<tr>
<td>IFD#1236</td>
<td>……</td>
<td>……</td>
<td>……</td>
</tr>
</tbody>
</table>

Object Database
Common Object Library
Object Data to Door Factory

Object Database

Door Factory
Door 1
Door 2
Door 3
Common Object Library
Merge Object Data into Product Data

<table>
<thead>
<tr>
<th>Door</th>
<th>Unique #</th>
<th>M</th>
<th>Unique #</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IFD #1234</td>
<td>0.9</td>
<td>IFD #1235</td>
<td>..</td>
</tr>
<tr>
<td>2</td>
<td>IFD #1234</td>
<td>1.0</td>
<td>IFD #1235</td>
<td>..</td>
</tr>
<tr>
<td>3</td>
<td>IFD #1234</td>
<td>1.1</td>
<td>IFD #1235</td>
<td>..</td>
</tr>
</tbody>
</table>
Common Object Library
Product Database to Cloud

<table>
<thead>
<tr>
<th>Door</th>
<th>Unique #</th>
<th>M</th>
<th>Unique #</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IFD #1234</td>
<td>0.9</td>
<td>IFD #1235</td>
<td>..</td>
</tr>
<tr>
<td>2</td>
<td>IFD #1234</td>
<td>1.0</td>
<td>IFD #1235</td>
<td>..</td>
</tr>
<tr>
<td>3</td>
<td>IFD #1234</td>
<td>1.1</td>
<td>IFD #1235</td>
<td>..</td>
</tr>
</tbody>
</table>

Door Factory

Door 1
Door 2
Door 3
Common Object Library
Architect Needs a Door

Object Database

Product Database
Common Object Library

Architect Needs a Door

Object Database

Product Database

Architect CAD-BIM Program
Common Object Library
Architect Needs a Door

Object Database
Product Database

Architect: I need Entrance Width 1.0M
Common Object Library

Architect Needs a Door

Object Database

Product Database

Architect CAD-BIM Program

Entrance Width: IFD#1234 = 1.0M

Architect: I need Entrance Width 1.0M
Common Object Library
Architect BIM Program Search

Object Database
Product Database

Architect CAD-BIM Program

Architect: I need Entrance Width 1.0M
Architect: I need Entrance Width 1.0M

Architect: Who makes 1.0M Doors?
Common Object Library
Architect BIM Program Search

Object Database

Product Database

Search doors: IFD#1234 = 1M

Architect CAD-BIM Program

Architect: I need Entrance Width 1.0M

1.0M

Architect: Who makes 1.0M Doors?
Common Object Library
Successful Search!

Object Database
Product Database

Architect CAD-BIM Program

Architect: I need Entrance Width 1.0M
Architect: Who makes 1.0M Doors?
Common Object Library
Successful Search!

Object Database

Product Database

Architect CAD-BIM Program

Architect: I need Entrance Width 1.0M

Architect: Who makes 1.0M Doors?

We make great doors with IFD #1234 = 1M
Common Object Library
Summary

Object Database
Product Database

Concept by: Professor Rasso Steinmann, IABI
Common Object Library Summary

Agreement on Common Terms
Multilingual Translations
Assigning each property a unique #

Helping to *find* Building Products
Helping to *sell* Building Products

Concept by: Professor Rasso Steinmann, IABI
Common Object Platform

How does the Concept work in practice?
Common Object Platform Concept
Common Object Platform Concept
Common Object Platform
Concept

Common Object Platform

Open Exchange Layer
Common Object Platform Concept

Common Object Platform

Platform Rules and Tools

Open Exchange Layer
Common Object Platform
Concept

- Common Object Platform
- Platform Rules and Tools
- Open Exchange Layer
Common Object Platform Concept

Object Makers

Common Object Platform

Platform Rules and Tools

Open Exchange Layer
Common Object Platform Concept

Object Makers

Object Library

Platform Rules and Tools

Open Exchange Layer
Common Object Platform

Concept

Object Makers

Object Library

Object Users

Platform Rules and Tools

Open Exchange Layer
Common Object Platform
Development

Object Makers

Object Users

Object Library

Platform Rules and Tools

Open Exchange Layer
Common Object Platform

Development

Object Makers

Object Library

Platform Rules and Tools

Object Users

Industry Foundation Classes

**Purpose:** Supports Open Data

**Status:** Created and Ready

Exchange Layer

IFC
Common Object Platform
Development

Object Makers → Object Library → Object Users

Platform Rules and Tools

International Framework for Dictionaries
Purpose: ISO Standard for the mapping of terms
Status: Created and Ready
Common Object Platform
Development

Object Makers

Object Library

Platform Rules and Tools

Object Users

buildingSMART Data Dictionary

Purpose: IFD Mapping Tool
Status: Created (on Google Infrastructure)
Common Object Platform Development

Object Makers

Object Library

Platform Rules and Tools

Object Users

Application Protocol Interface
Purpose: Link objects to Open Exchange Layer
Status: Created and Ready
Security: Access management, future needs
TBA
Common Object Platform
Development

Object Makers

Object Library

Platform Rules and Tools

Object Users

IFC
IFD
bSDD
Common Object Platform Development

Object Makers

Object Library

Object Users

Host Platform Context
Purpose: Library Host Rules
Status: TBD

Platform Rules and Tools

IFC
IFD
bSDD
Common Object Platform

Development

Object Makers

Object Library

Property Set Management Tool

Purpose: Create Product Data Template Tool
Rule set: In progress
Status: TBD

Object Users

Property Set
Mgt Tool

Rules and Tools

IFC
IFD
bSDD
Common Object Platform
Development

Object Makers

Object Library

Object Users

Testing and Quality Assurance

**Purpose:** Assure Consistent Quality

**Status:** Propose Adoption of French PPBIM Quality Management System

**Tools:**
- IFC
- IFD
- bSDD
Common Object Platform
Development

Object Makers

Object Library

Object Users

Open Multilingual Connectivity

Purpose: Open Connectivity in many languages
Status: Available

IFC  IFD  bSDD
UK Example

Object Makers

Object Library

Object Users

Host Context
Property Set Mgt Tool
Quality Testing
Open Multilingual Connectivity

IFC
IFD
bSDD
UK Example

UK Government Manufacturers Industry Groups

Object Library

Host Context Property Set Mgt Tool Quality Testing Open Multilingual Connectivity

IFC IFD bSDD

Object Users
UK Example

UK Government Manufacturers Industry Groups

Object Makers

Object Users

UK Object Library

Context Capability

Purpose: Enable different users groups to create purposeful and sharable data sets

Status: available
UK Example

UK Object Library

UK Government Manufacturers Industry Groups

Owners Operators AEC Industry

Context Capability

Purpose: Enable different users groups to create purposeful and sharable data sets
Status: available
UK Example

UK Object Library

UK Government
Manufacturers
Industry Groups

Owners
Operators
AEC Industry

Host
Context
Property Set
Mgt Tool
Quality
Testing
Open Multilingual
Connectivity

IFC
IFD
bSDD
UK Example

- UK Government
- Manufacturers
- Industry Groups

Employer Information Required
Purpose: UK BIM Level 2
Status: for future / UK TBD

UK Object Library

- Host Context
- Property Set Mgt Tool
- Quality Testing
- Open Multilingual Connectivity

- IFC
- IFD
- bSDD

Owners
Operators
AEC Industry
UK Example

Product Data Templates

**Purpose:** Enable consistent product information flows

**Status:** e.g., for BIM4M2 in UK TBD

UK Government Manufacturers Industry Groups

Owners Operators AEC Industry

UK Object Library

- Employer Information Mgt
- Property Set Mgt Tool
- Quality Testing
- Open Multilingual Connectivity

Platform Rules and Tools

IFC, IFD, bSDD

Host Context

Property Set

Mgt Tool

Quality

Testing

Open Multilingual Connectivity

Product Data Templates

Product Data Templates

Purpose: Enable consistent product information flows

Status: e.g., for BIM4M2 in UK TBD

UK Example
UK Example

UK Government Manufacturers Industry Groups

UK Object Library

Owners Operators AEC Industry

Common Object Property Sets

Purpose: Enable AEC workflows

Status: for UK determination

UK Example
UK Example

Vendor Adoption

Purpose: Enable Users Full Access to Object Library
Status: For future
Workflow Support

UK Object Library

- Employer Information Required
- Product Data Templates
- Common Object Property Sets
- Software Vendor Adoption

Host Context
- Property Set Mgt Tool
- Quality Testing
- Open Multilingual Connectivity

IFC
IFD
bSDD

UK Government Manufacturers Industry Groups

Owners Operators AEC Industry
Workflow Support

UK Digital Plan of Works

**Purpose:** Policy to digitize UK building & infrastructure

**Status:** Ready for implementation
UK Government Manufacturers Industry Groups

UK Object Library

Employer Information Required
Product Data Templates
Common Object Property Sets
Software Vendor Adoption

UK Digital Plan of Works
Purpose: Policy to digitize UK building & infrastructure
Status: Ready for implementation

Workflow Support

- Design & Specification
  - Policy framework
  - Information & training

- Tendering and order fulfilment
  - Product needs definition
  - Product sourcing etc.

- BIM Level 2 Data Drop Fulfilment

- Facility & Asset Management Activities

- Quality Testing
- Open Multilingual Connectivity

- IFD
- bSDD

UK Digital Plan of Works

Purpose: Policy to digitize UK building & infrastructure
Status: Ready for implementation

Design & Specification

Tendering and order fulfilment
  - Product needs definition
  - Product sourcing etc.

BIM Level 2 Data Drop Fulfilment

Facility & Asset Management Activities

Quality Testing
Open Multilingual Connectivity

IFD
bSDD
Value Add Services - coBuilder

UK Object Library
- Employer Information Required
- Product Data Templates
- Common Object Property Sets
- Software Vendor Adoption

Host Context
Property Set Mgt Tool
Quality Testing
Open Multilingual Connectivity

IFC
IFD
bSDD

UK Government
Manufacturers
Industry Groups

Owners
Operators
AEC Industry
Value Add Services - coBuilder

Digital Information Service Providers
Example: CoBuilder

Purpose: Comply with UK EU, CE Standards in Product Information Requirements
Status: Ready
Value Add Services - coBuilder

UK Government Manufacturers Industry Groups

UK Object Library

- Employer Information Required
- Product Data Templates
- Common Object Property Sets
- Software Vendor Adoption

Owners Operators AEC Industry

Digital Information Service Providers Example: Product Manufacturers

- **Purpose:** Product Catalogues and value added services
- **Status:** For Future

Open Exchange Layer Platform Rules and Tools

- IFC
- IFD
- bSDD

Host Context Property Set

- Mgt Tool
- Quality
- Testing

Open Multilingual Connectivity

Value Add Services

- coBuilder

Product Data Templates

Software Vendor Adoption

Employer Information Required

Digital Information Required

Manufacturers

Industry Groups

Owners Operators AEC Industry

Value Add Services

Employer Information Required

Product Catalogues and value added services

For Future
Value Add Services - coBuilder

UK Object Library

- Employer Information Required
- Product Data Templates
- Common Object Property Sets
- Software Vendor Adoption

UK Government Manufacturers Industry Groups

Owners Operators AEC Industry

UK DPoW Common Object Property Sets

Purpose: Support UK BIM Level 2
Status: TBD
A convergence is rapidly emerging of the historically independent disciplines in the built environment, particularly with the geo-spatial industries. These disciplines are now digital technologies. A new integration is possible.
A convergence is rapidly emerging of the historically independent disciplines in the built environment, particularly with the geo-spatial industries. These disciplines are now digital technologies, and a new integration is possible.

- Multiple vs single buildings
- Cadastre & terrain (the link between GIS & buildings)
- Utilities & services
- Infrastructure - roads, bridges, tunnels etc
- Statistical & social geo-located data
PIM for Low Carbon Management
PIM for Low Carbon Management
PIM for Low Carbon Management

Defining how we represent/model the built & natural environment

Open standardised approach
PIM for Low Carbon Management

Defining how we represent/model the built & natural environment

At urban precinct scale

Open standardised approach
PIM for Low Carbon Management

Defining how we represent/model the built & natural environment

Open standardised approach

Facilitate integrated solutions through smooth information flows

At urban precinct scale
PIM Project - Embodied Carbon Data
Accessing LCI data repositories

PIM Types
- FUNCTIONAL
- BUILT FACILITY
- ELEMENTAL

CO2e Sources
- ausLCI
- GBCA
- BASIX
- NOL

Generic Objects
Manufactured Products

Embodied Carbon Object/Product Libraries
CRCfLCL - PIM at Broadway, Sydney

Object Makers

Object Library

Object Users

Host Context

Property Set Mgt Tool

Quality Testing

Open Multilingual Connectivity

IFC

IFD

bSDD

Object Library

Object Library

Object Library
CRCfLCL - PIM at Broadway, Sydney

Australian Government Manufacturers Industry Groups

Object Library

- Host Context
- Property Set Mgt Tool
- Quality Testing
- Open Multilingual Connectivity

Object Users

- IFC
- IFD
- bSDD
CRCfLCL - PIM at Broadway, Sydney

Purpose: Enable industry - governments, sustainability groups, owners, asset providers to access purposeful and sharable data sets for CO2e metrics & benchmarks

Status: Under Development

Context Capability

Australian Government Manufacturers Industry Groups

Owner Operators Local Government

PIM Object Library

Open Multilingual Connectivity

Host

Context Capability

Purpose: Enable industry - governments, sustainability groups, owners, asset providers to access purposeful and sharable data sets for CO2e metrics & benchmarks

Status: Under Development
CRCfLCL - PIM at Broadway, Sydney

PIM Object Library

NSW Clients (UTS, TAFE, CoS & Private) Manufacturers Industry Groups

Owners Operators Local Government

Host Context  Property Set Mgt Tool  Quality Testing  Open Multilingual Connectivity

IFC  IFD  bSDD
CRCfLCL - PIM at Broadway, Sydney

PIM Object Library

NSW Clients (UTS, TAFE, CoS & Private) Manufacturers Industry Groups

Owners Operators Local Government

**Context Capability**: Provide data for integrated feasibility assessment of shared services

**Status**: Pilot development
Precinct Information: Broadway

Purpose: Define asset information & shared operational needs

Status: Pilot development

CRCfLCL - PIM at Broadway, Sydney

Precinct Information: Broadway

Purpose: Define asset information & shared operational needs

Status: Pilot development
CRCfLCL - PIM at Broadway, Sydney

Product Data Templates

- **Purpose**: Adopting EU SB Alliance IFC metrics and property sets
- **Status**: Pilot development

**IFC**

**IFD**

**bSDD**

NSW Clients (UTS, TAFE, CoS & Private) Manufacturers Industry Groups

Owners Operators Local Government
Common Object Platform

PIM

Object Library

Client/Owner Information Required
Product Data Templates
Common Object Property Sets

Purpose: Create/Access PIM sustainability data using NOL & BASIX guides
Status: pilot development

NSW Clients (UTS, TAFE, CoS & Private) Manufacturers Industry Groups

Owners Operators Local Government

CRCfLCL - PIM at Broadway, Sydney

Host Context Property Set Mgt Tool Quality Testing Open Multilingual Connectivity

IFC IFD bSDD
CRCfLCL - PIM at Broadway, Sydney

Industry/Vendor Adoption

Purpose: openData model extended for urban modelling - buildings, infrastructure & GIS & CO2e data

Status: Prototype under development
CRCfLCL - PIM at Broadway, Sydney

NSW Clients (UTS, TAFE, CoS & Private) Manufacturers Industry Groups

Owners Operators Local Government

PIM Object Library
- Client/Owner Information Required
- Product Data Templates
- Common Object Property Sets
- Software Vendor Adoption

Host Context Property Set Mgt Tool Quality Testing

IFC IFD bSDD

Precinct Model
Purpose: New toolkit to better manage & support smart Cities
Status: Pilot development
Pyrmont Bridge, Darling Harbour, Sydney

Heritage Bridge requiring Condition Survey – New BIM model
Condition Audit from BIM based Field Tablet Survey
Common Object Platform

Governments
Manufacturers
Industry Groups

Owners
Operators
AEC Industry

Global Object Libraries
- Client Information Requirements
- Product Data Templates
- Common Object Property Sets
- Software Vendor Adoption

Host Context
Property Set Mgt Tool
Quality Testing
Open Multilingual Connectivity

IFC
IFD
bSDD
Commercial Issues

Implementation + operating costs and the neutrality challenge.
# Commercial Issues

## Service Propositions

<table>
<thead>
<tr>
<th>Services</th>
<th>Clients</th>
<th>End Users</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Objects Service</td>
<td>Owners, Government BIM Initiatives</td>
<td>Owners</td>
<td>Free to use, Pay to modify</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facility Managers</td>
<td>IPR protected via license</td>
</tr>
<tr>
<td>Common Objects Service</td>
<td>Product Manufacturers, Software Companies</td>
<td>AEC Industry</td>
<td>License fee</td>
</tr>
<tr>
<td>Data Aggregation Support</td>
<td>Information Publishers, i.e., CoBuilders, etc.</td>
<td></td>
<td>License fee</td>
</tr>
<tr>
<td>Online Dictionary Hosting</td>
<td>Owners, Government BIM Initiatives, Product Manufacturers, Software Companies</td>
<td></td>
<td>Free to use, Pay to modify</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IPR protected via license</td>
</tr>
</tbody>
</table>
Commercial Issues

Industry Led Model

Seek support for investment to develop services from:
- Governments
- Owners
- Vendors
- Product Manufacturers

Cost recovery based on charges for uploading data
Data access is free
Open status enforced through license agreements
Conclusion / Discussion
Solution Summary

Enable a single method of providing product information

- Consistent flow of information
  - buildingSMART Common Object Service is designed for this

- Process for industry consensus, peer reviewed product data templates, consistent plain language dictionary
  - Through Industry Association managed library contexts

- Parameters to be exchanged through open standards
  - The bSDD is based on open standards (IFC and IFD)

- All necessary product information requirements are met
  - Achieve National/Regional Protocols (such as FR Plan de transition numérique bâtiment) using buildingSMART Common Object Service

- Scope for an independent accreditation method
  - buildingSMART International Compliance Program
bsdd is ready!
bsdd is ready!

• API & tools are capable of smart implementation
bsdd is ready!

• API & tools are capable of smart implementation
  ‣ excellent use-cases such as Muigg tool, coBuilder
bsdd is ready!

• API & tools are capable of smart implementation
  ▸ excellent use-cases such as Muigg tool, coBuilder
• Designer & builders wants clever product data solutions for model building and facility construction
bsdd is ready!

• API & tools are capable of smart implementation
  ▸ excellent use-cases such as Muigg tool, coBuilder

• Designer & builders wants clever product data solutions for model building and facility construction
  ▸ smart supply chains
bsdd is ready!

• API & tools are capable of smart implementation
  ▸ excellent use-cases such as Muigg tool, coBuilder

• Designer & builders want clever product data solutions for model building and facility construction
  ▸ smart supply chains

• Clients want outcomes that improve operations & maintenance
bsdd is ready!

• API & tools are capable of smart implementation
  ▸ excellent use-cases such as Muigg tool, coBuilder
• Designer & builders wants clever product data solutions for model building and facility construction
  ▸ smart supply chains
• Clients want outcomes that improve operations & maintenance
  ▸ integrated data for decision making
bsdd is ready!

• API & tools are capable of smart implementation
  ‣ excellent use-cases such as Muigg tool, coBuilder

• Designer & builders wants clever product data solutions for model building and facility construction
  ‣ smart supply chains

• Clients want outcomes that improve operations & maintenance
  ‣ integrated data for decision making

ICIS is in a key position to lead the next developments with product data, the “I” in BIM