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

buildingSMART
International home of openBIM

buildingSMART today

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

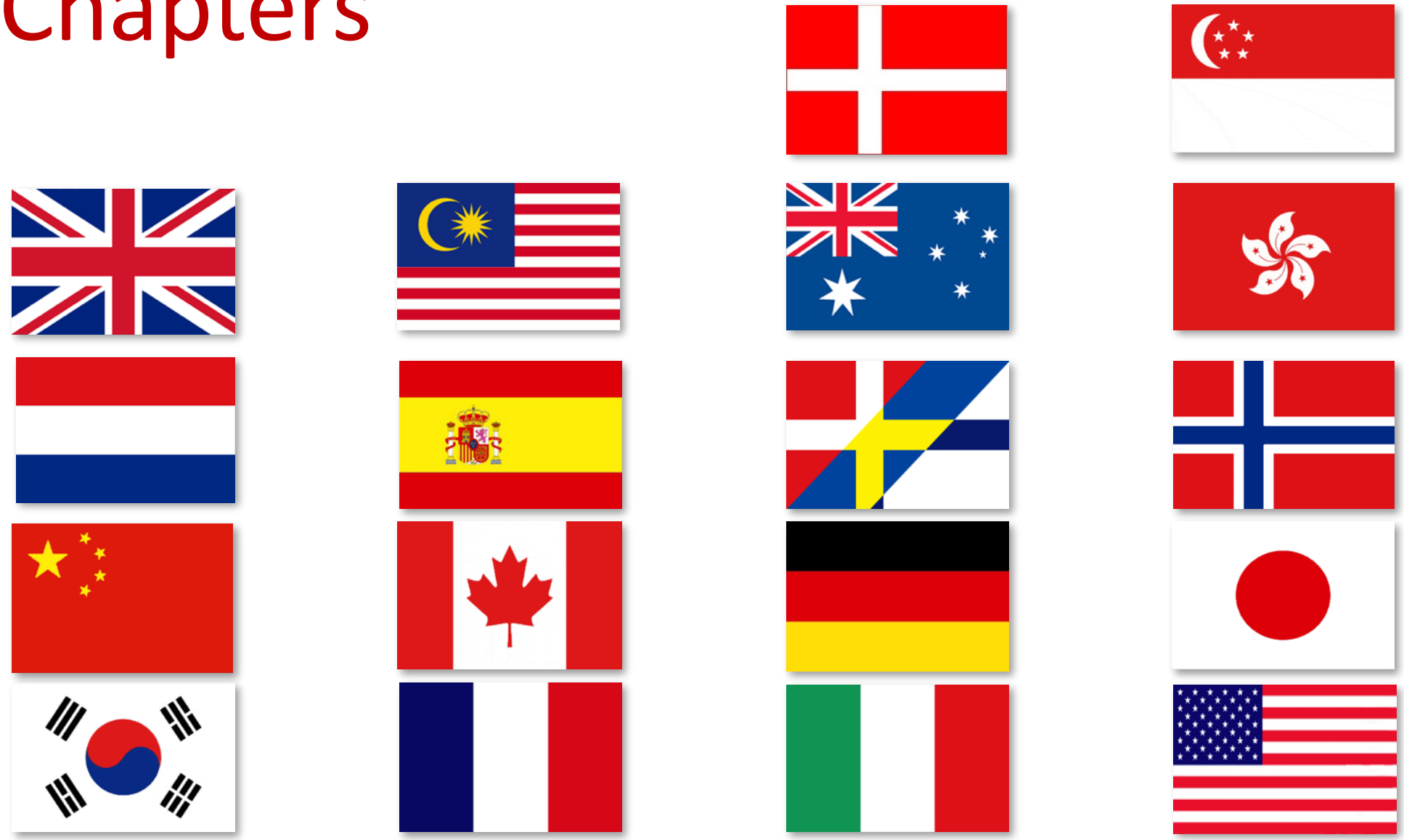
Richard Petrie
Chief Executive

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



bSI Members

ARUP

h+k

鹿島
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

National Programs

Plan Transition Numérique dans le Bâtiment

planen bauen 4.0

Digital Built Britain

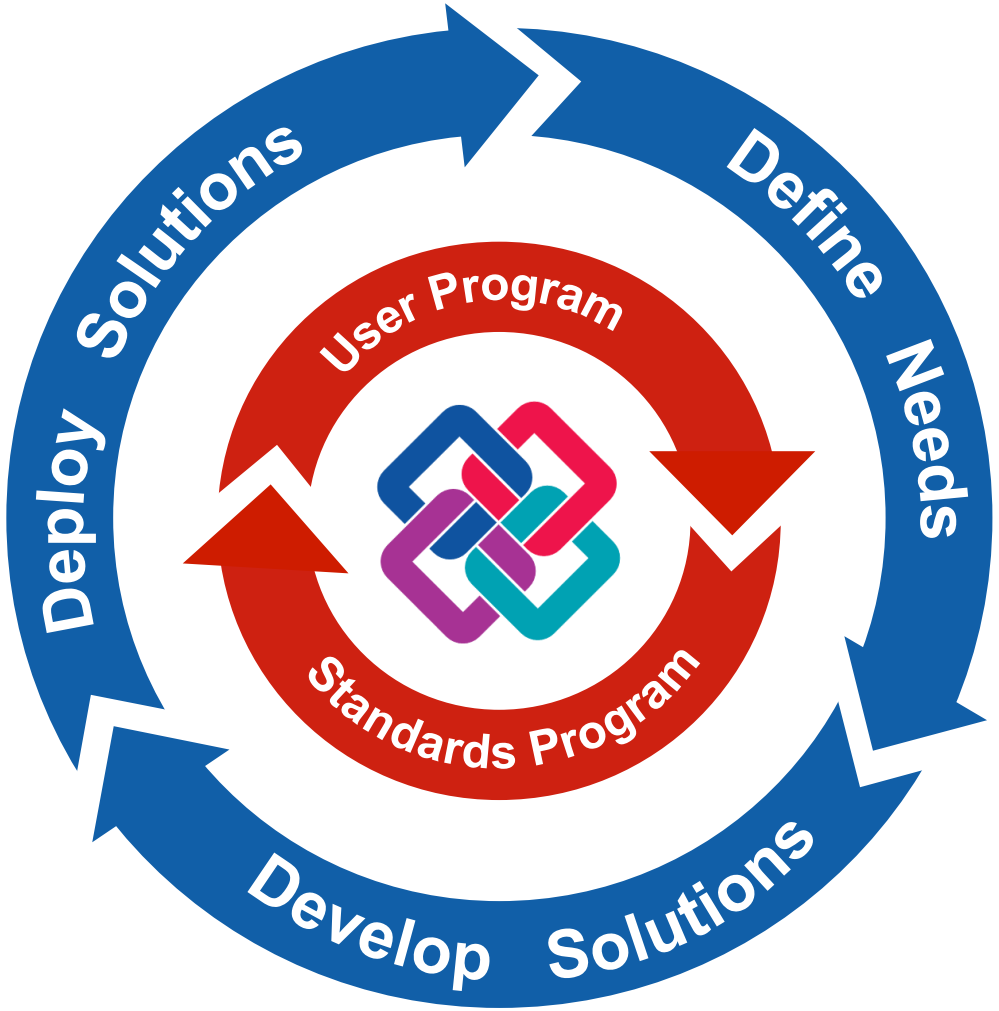
BIM Loket

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

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Enable a single method of providing product information

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

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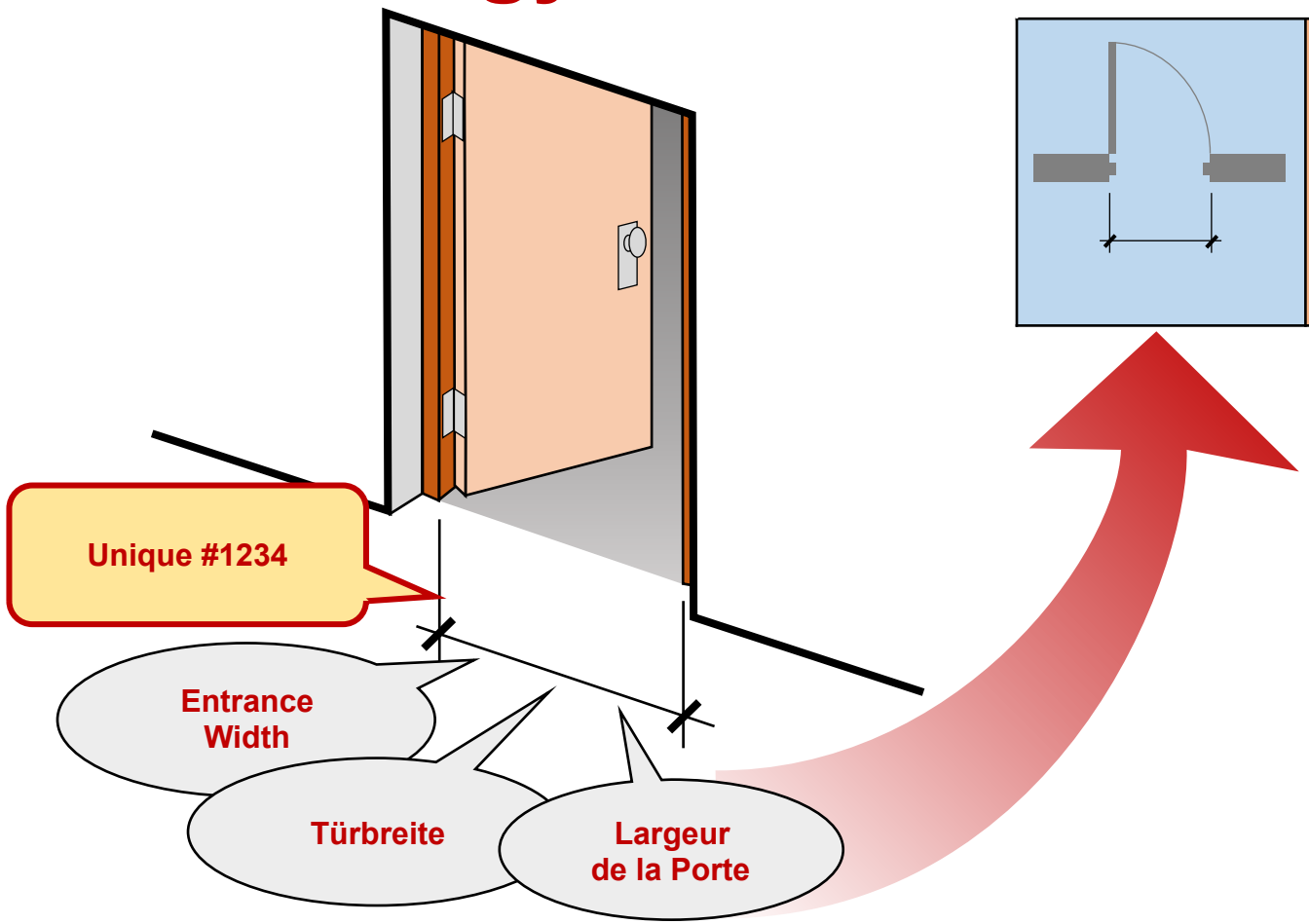
Scope for an independent accreditation method

The bSDD Opportunity

What is the grand vision, what can it do?

Common Object Library

the Strategy



Element	Unique #	English	Deutsch	Français
	IFD#1234	Entrance Width	Türbreite	Largeur de la Porte

Concept by: Professor Rasso Steinmann, IABI

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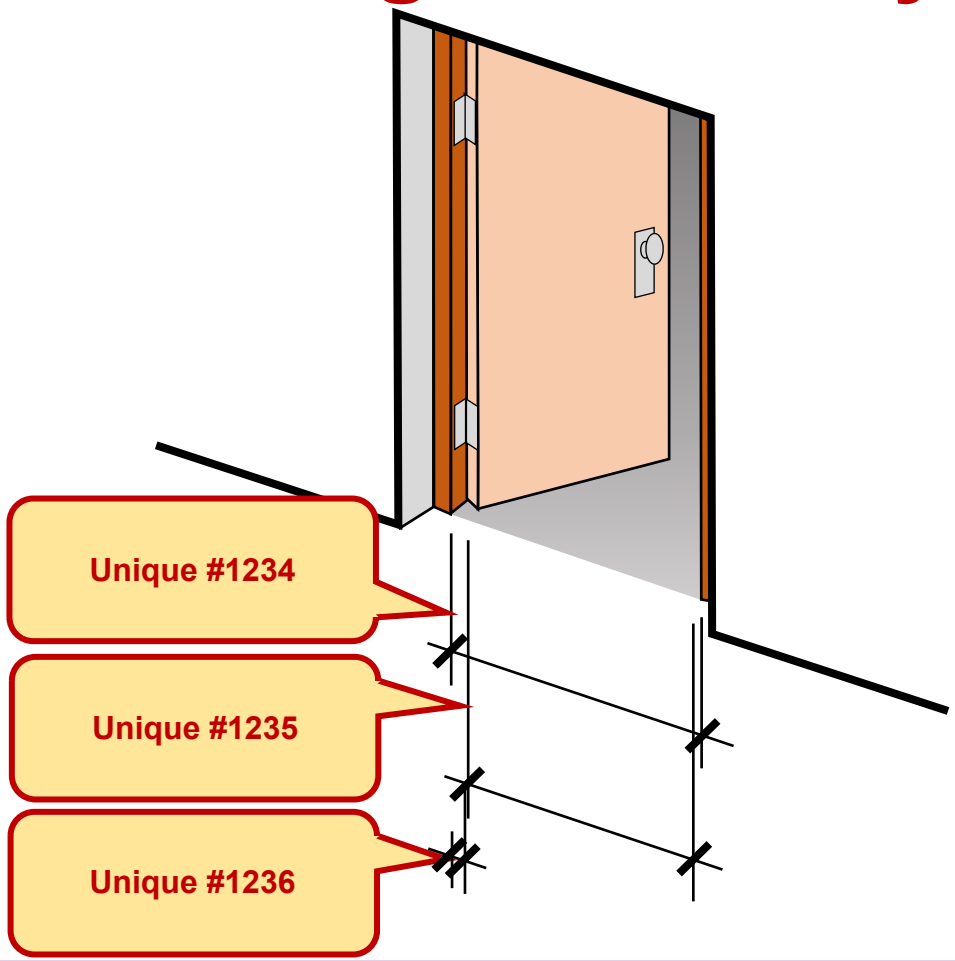
Common Object Library

Building the Library



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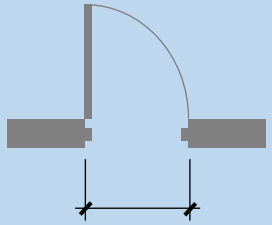
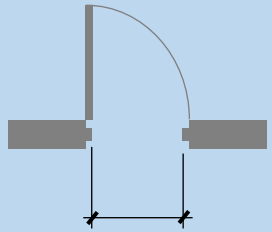
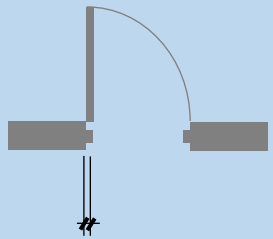
	IFD#1234	Entrance Width	Türbreite	Largeur de la Porte
	IFD #1235	.....	.....	.....
	IFD #1236	.....	.....	.....

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Common Object Library

to the Cloud

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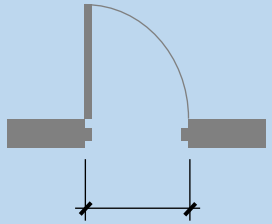
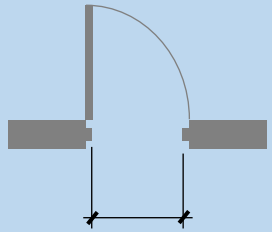
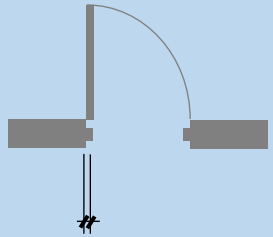
	IFD#1234	Entrance Width	Türbreite	Largeur de la Porte
	IFD #1235	.....	.....	.....
	IFD #1236	.....	.....	.....

Common Object Library

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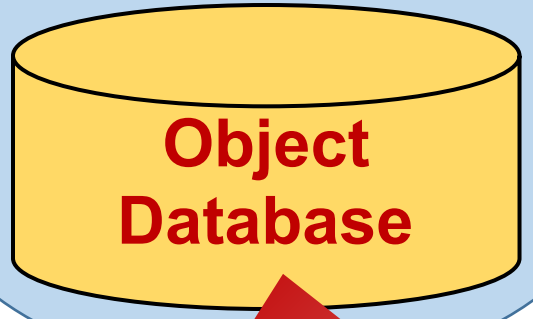

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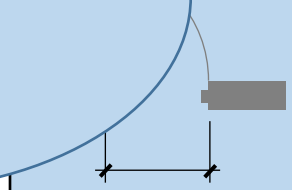
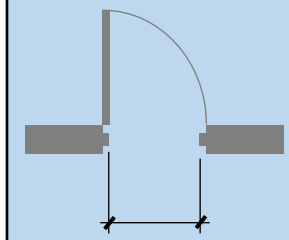
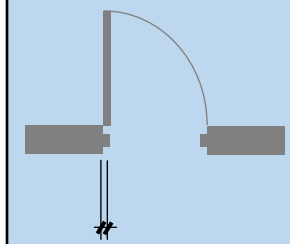
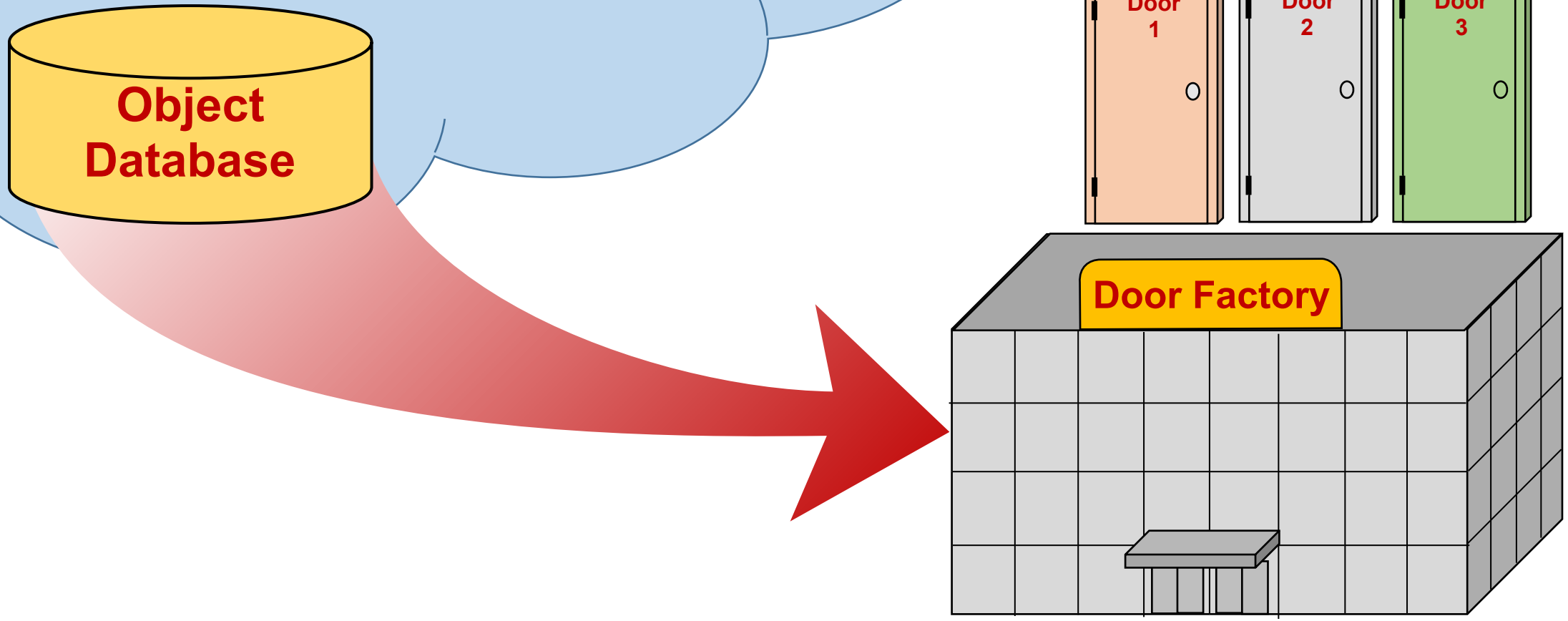
	IFD#1234	Entrance Width	Türbreite	Largeur de la Porte
	IFD #1235	.....	.....	.....
	IFD #1236	.....	.....	.....

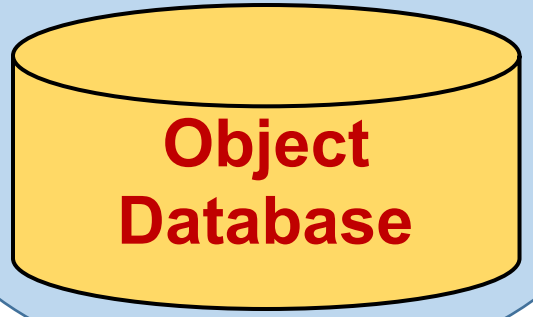
Common Object Library

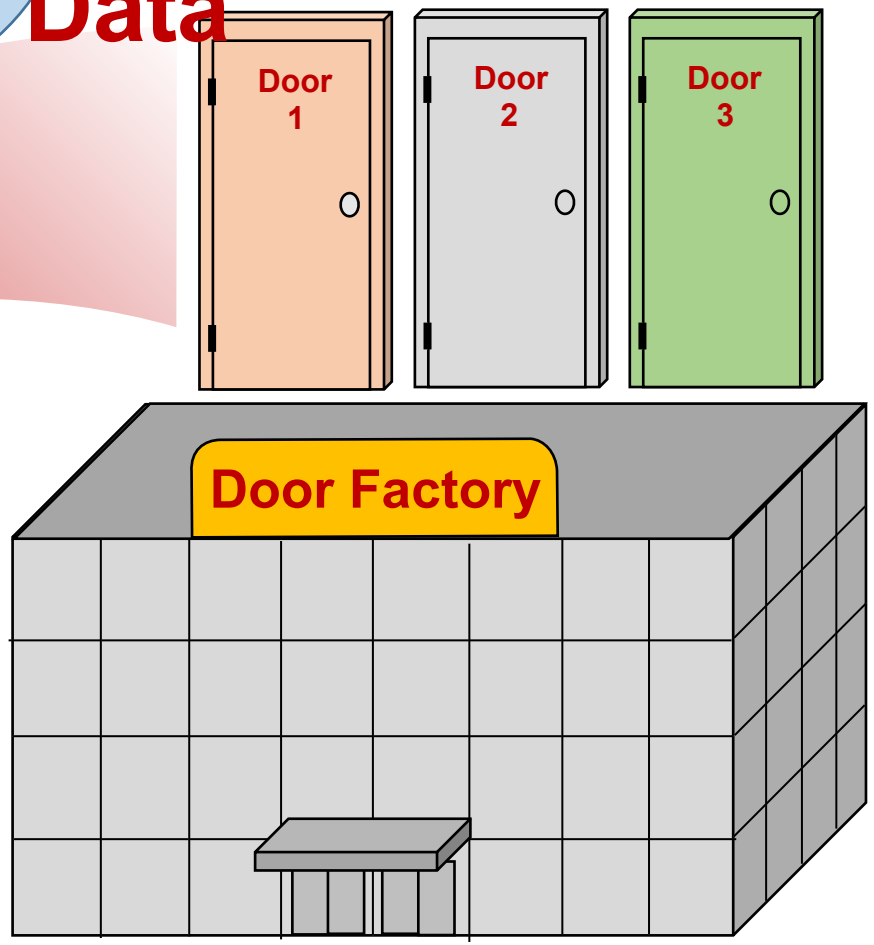
Object Data to Door Factory



Common Object Library

Merge Object Data into Product Data

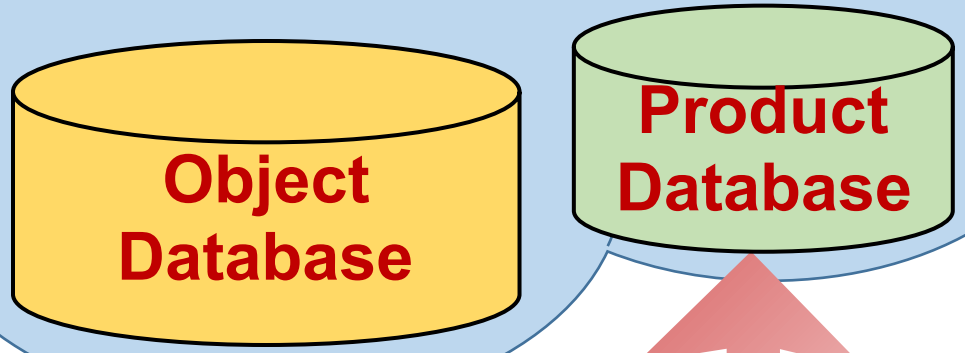




Door	Unique #	M	Unique #	M
1	IFD #1234	0.9	IFD #1235	..
2	IFD #1234	1.0	IFD #1235	..
3	IFD #1234	1.1	IFD #1235	..

Common Object Library

Product Database to Cloud



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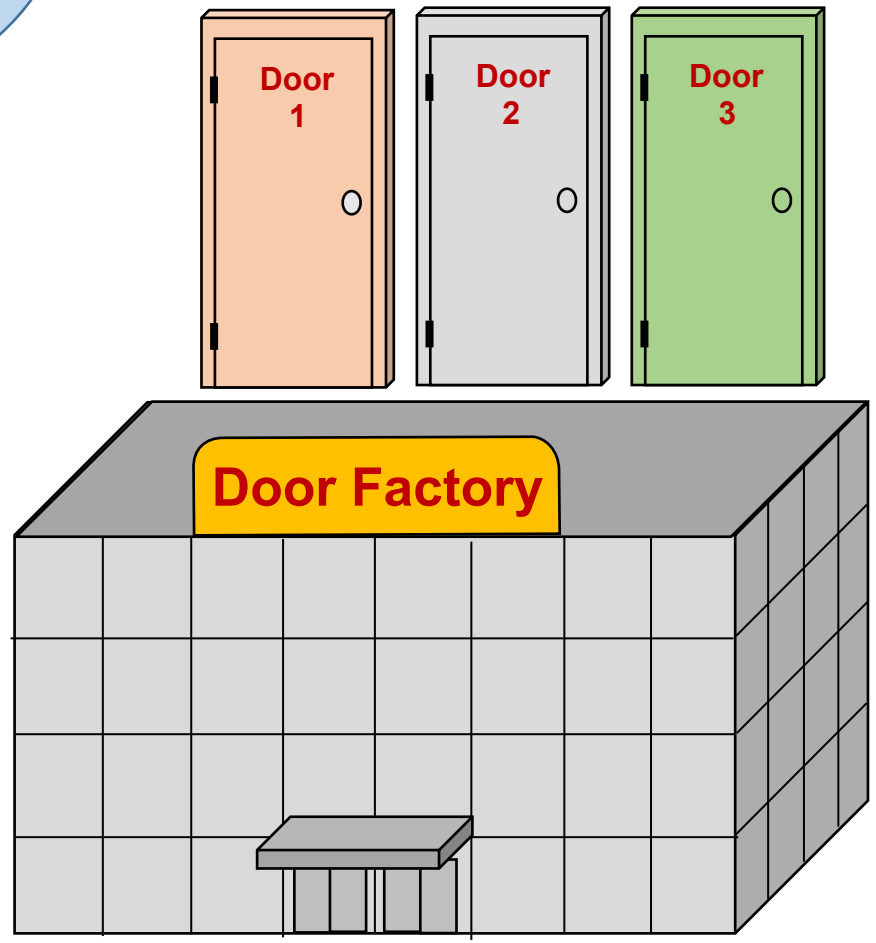
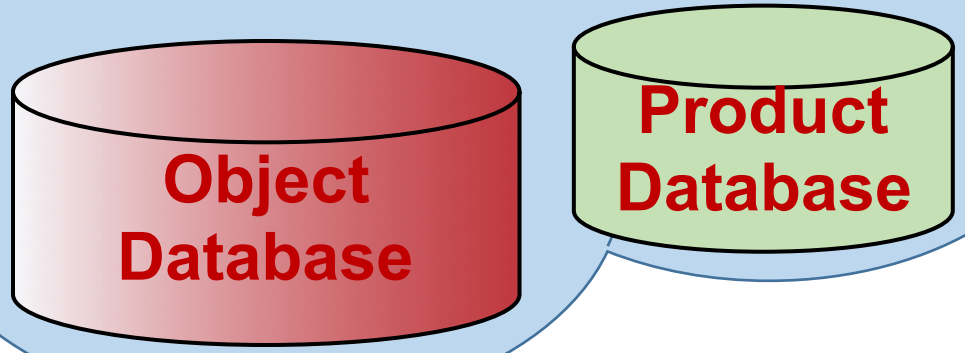


Common Object Library

Architect Needs a Door



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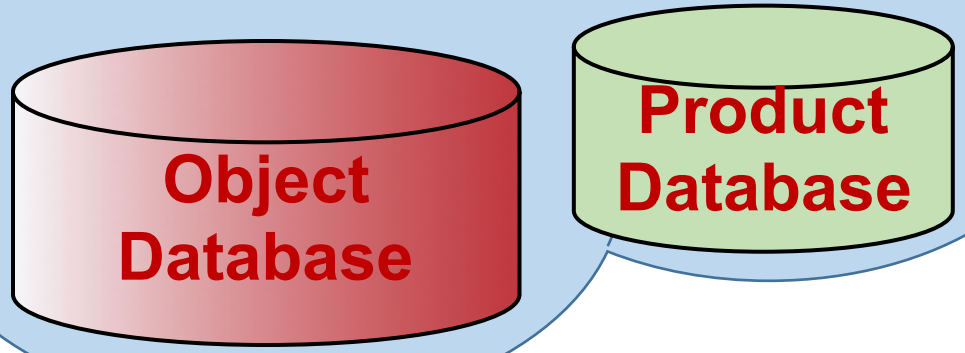
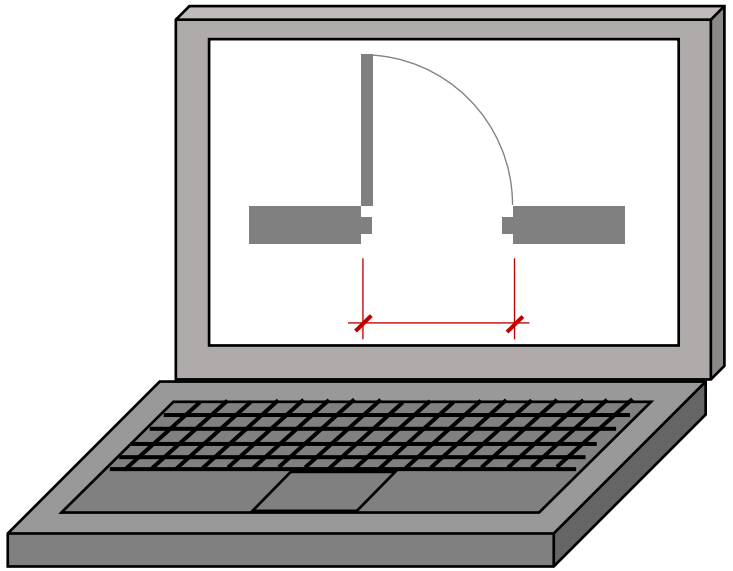


Architect
CAD-BIM Program



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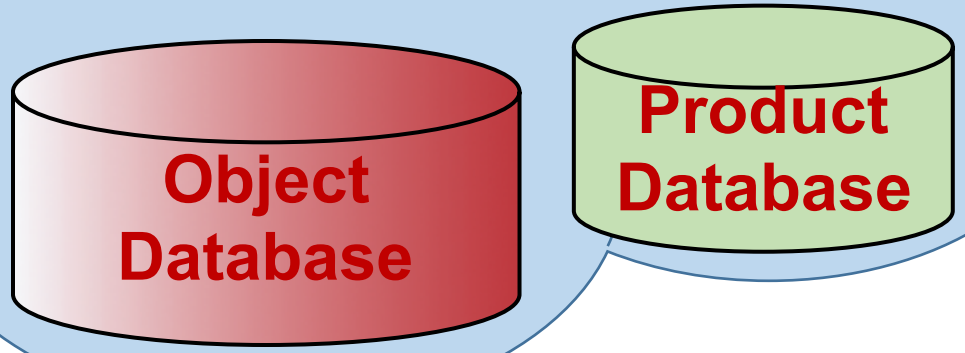

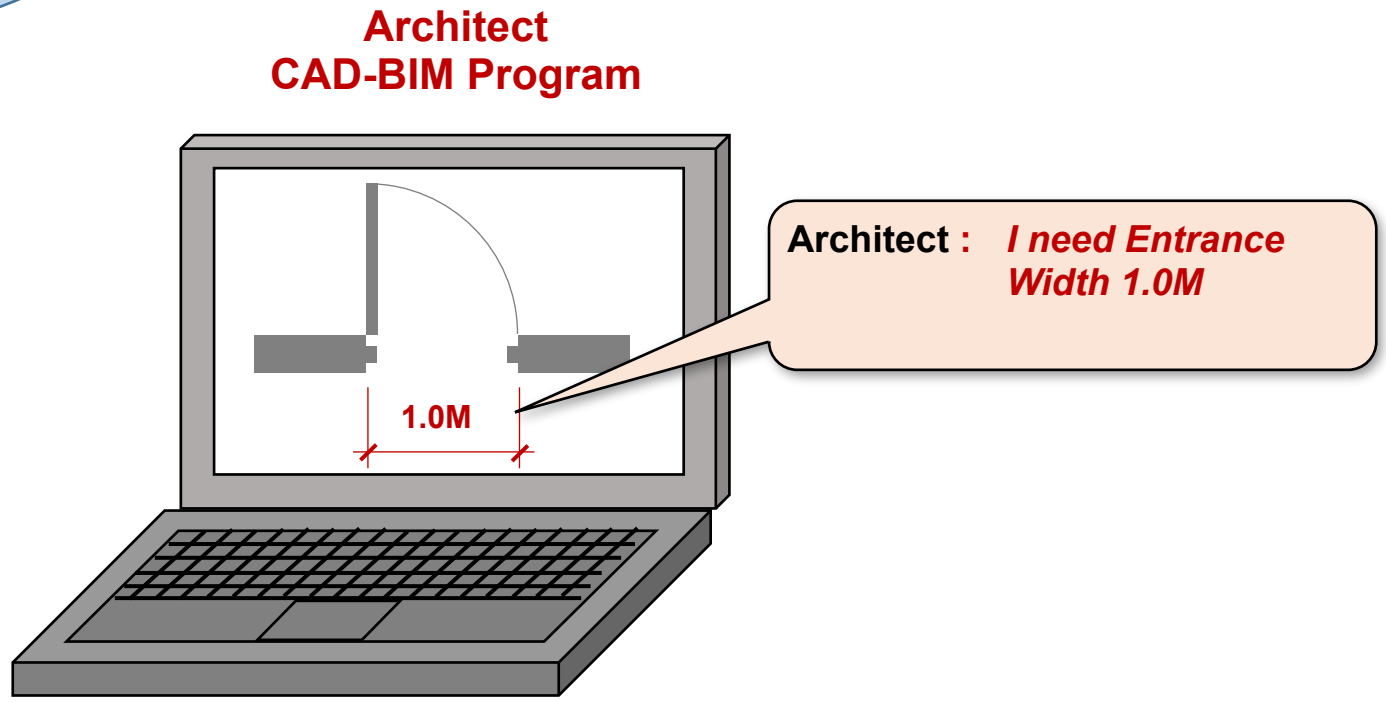

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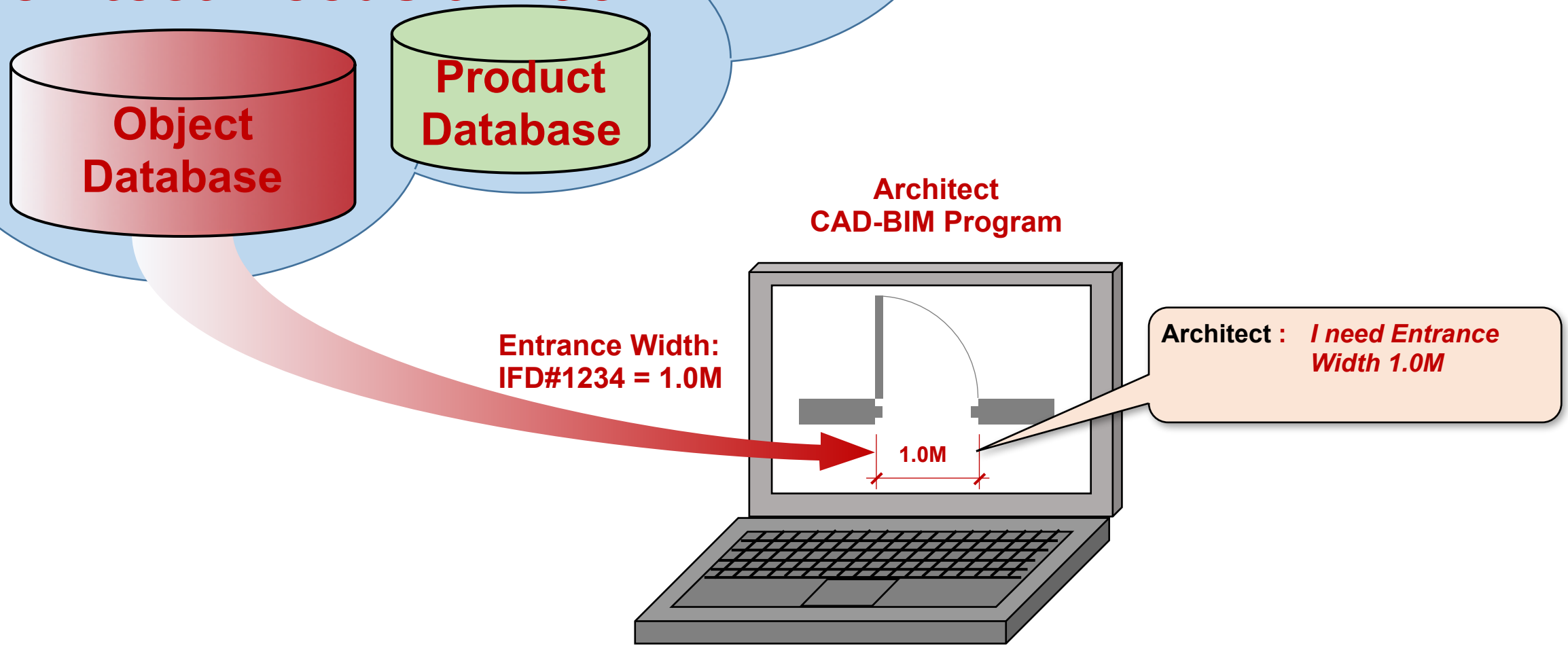
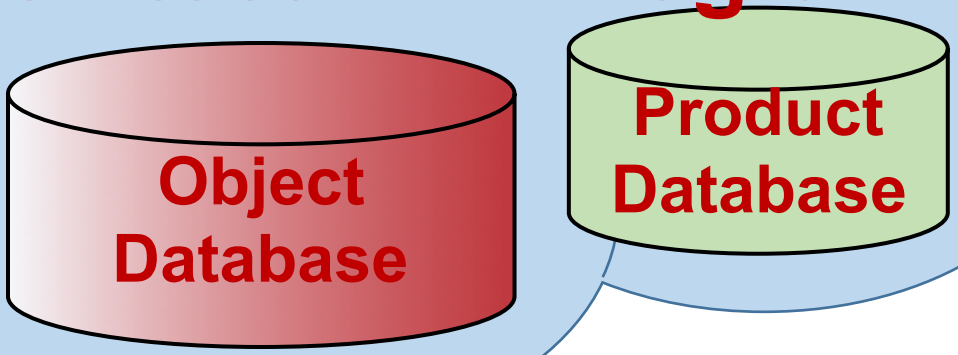
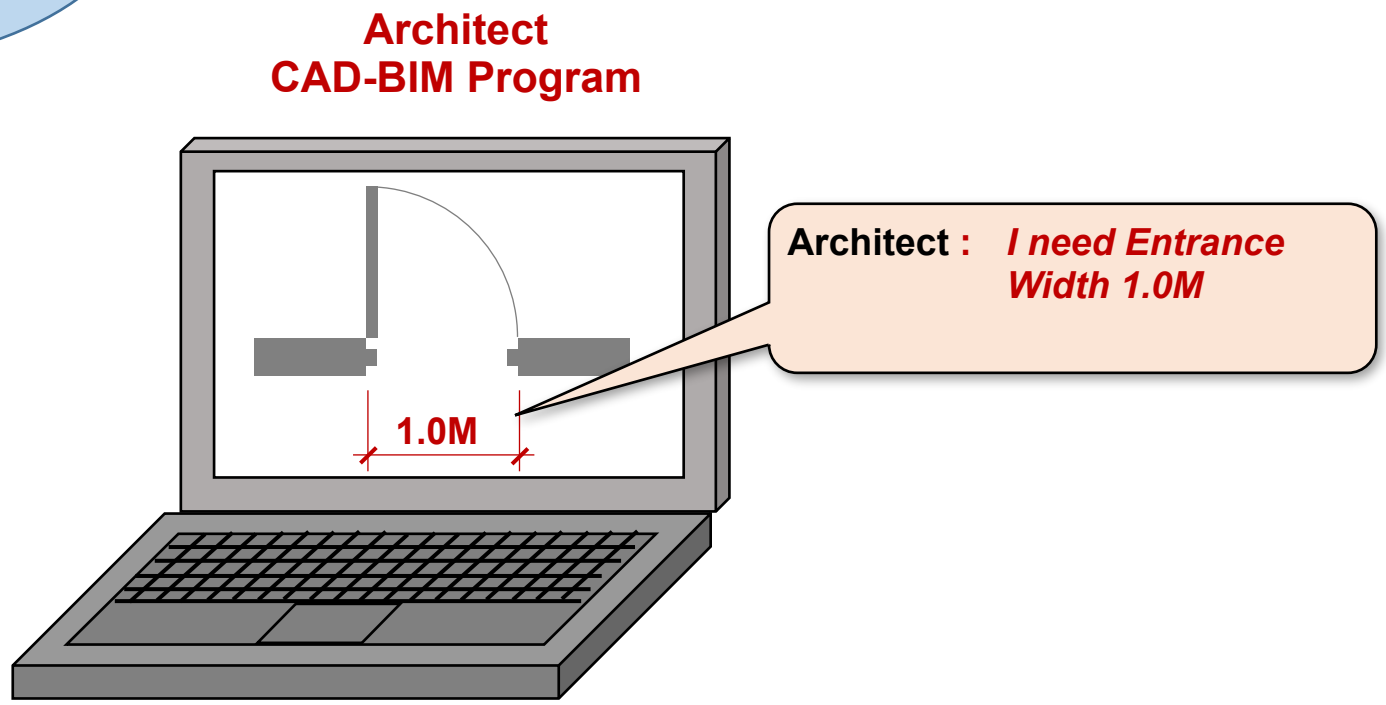


Common Object Library

Architect BIM Program Search





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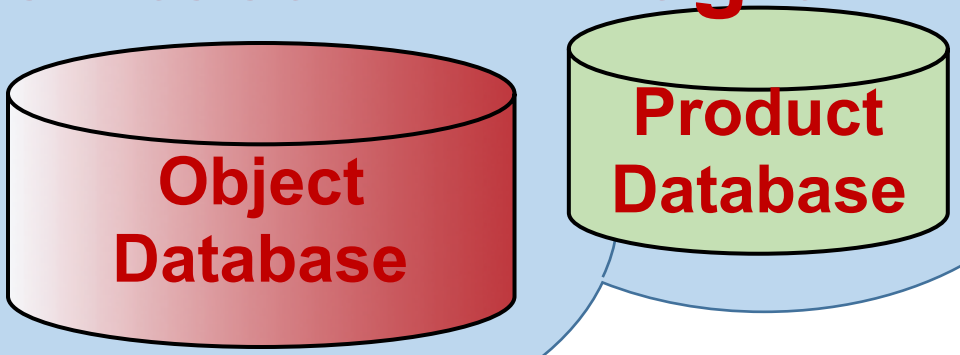
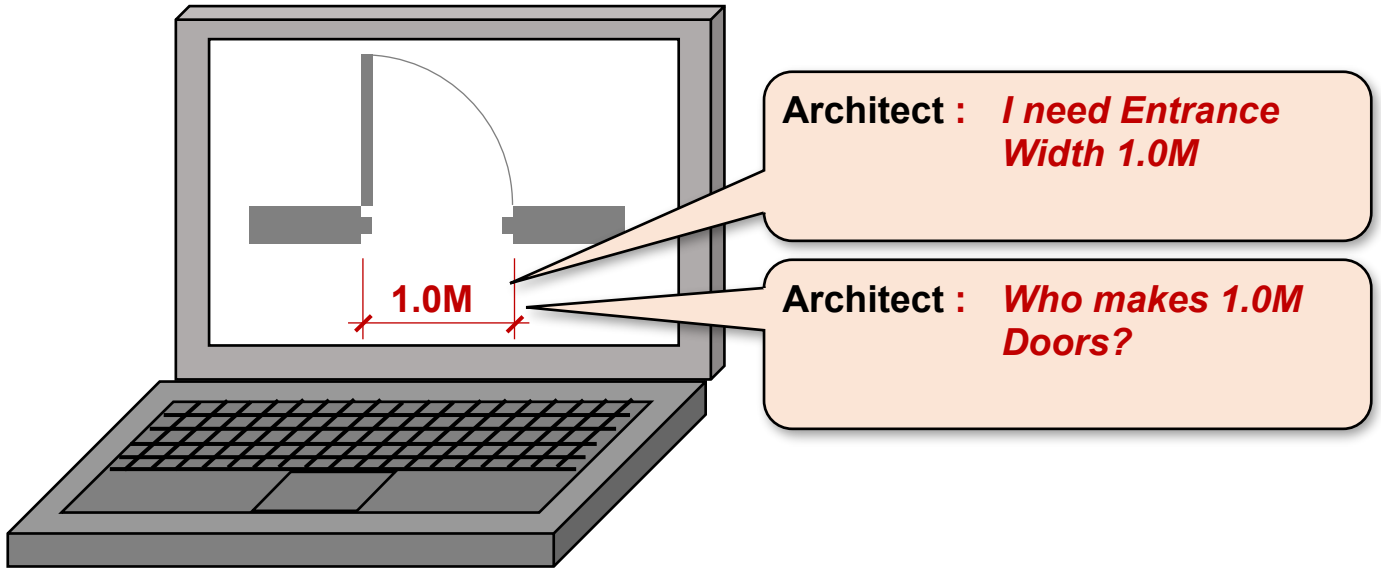
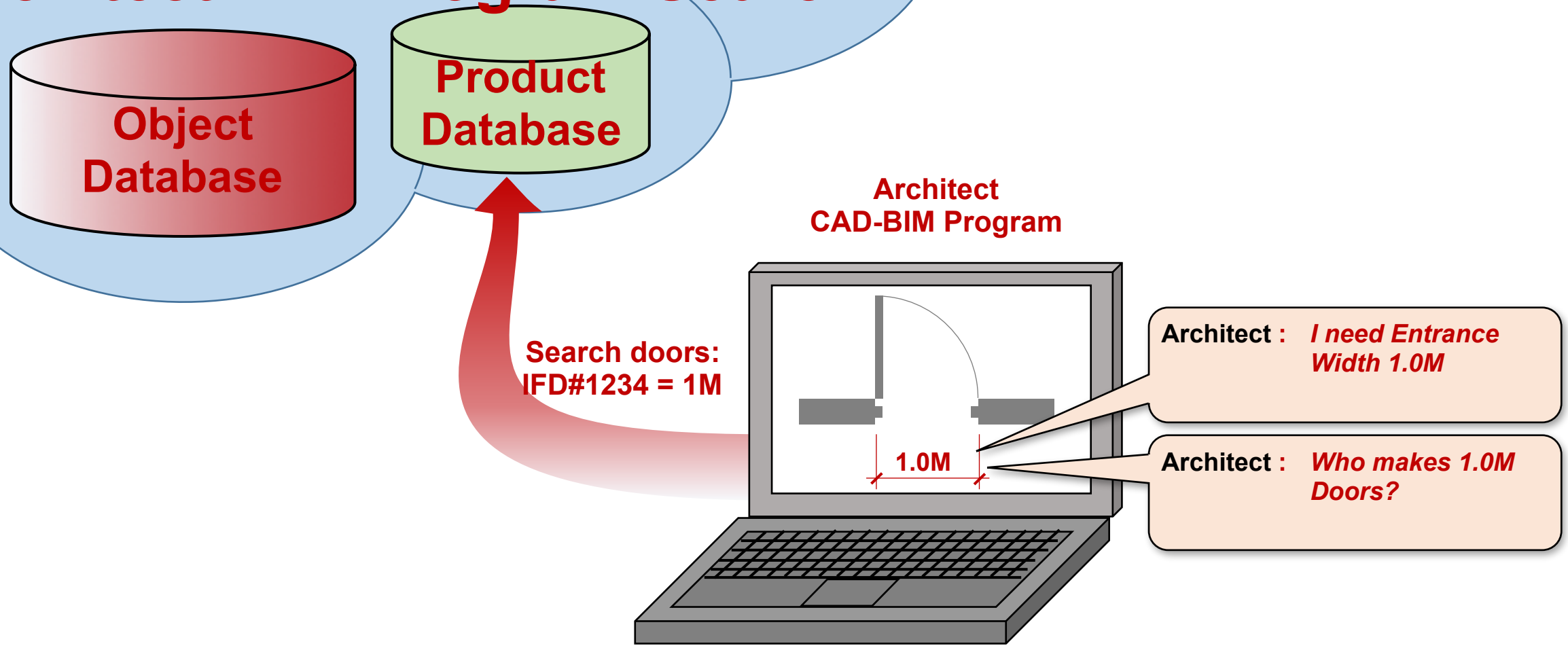


Architect
CAD-BIM Program



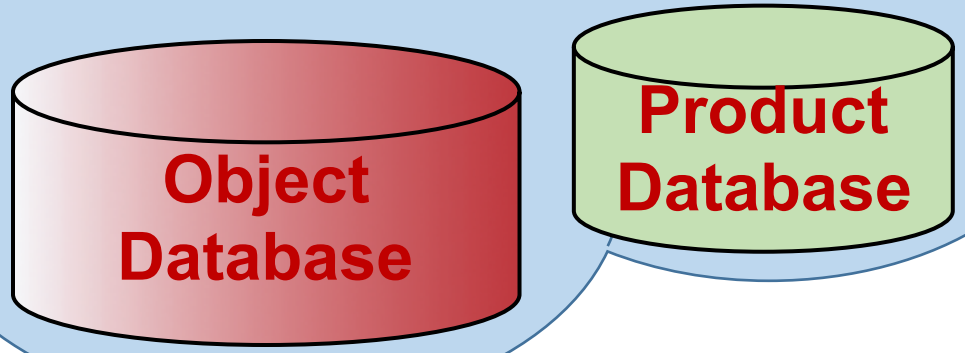
Common Object Library

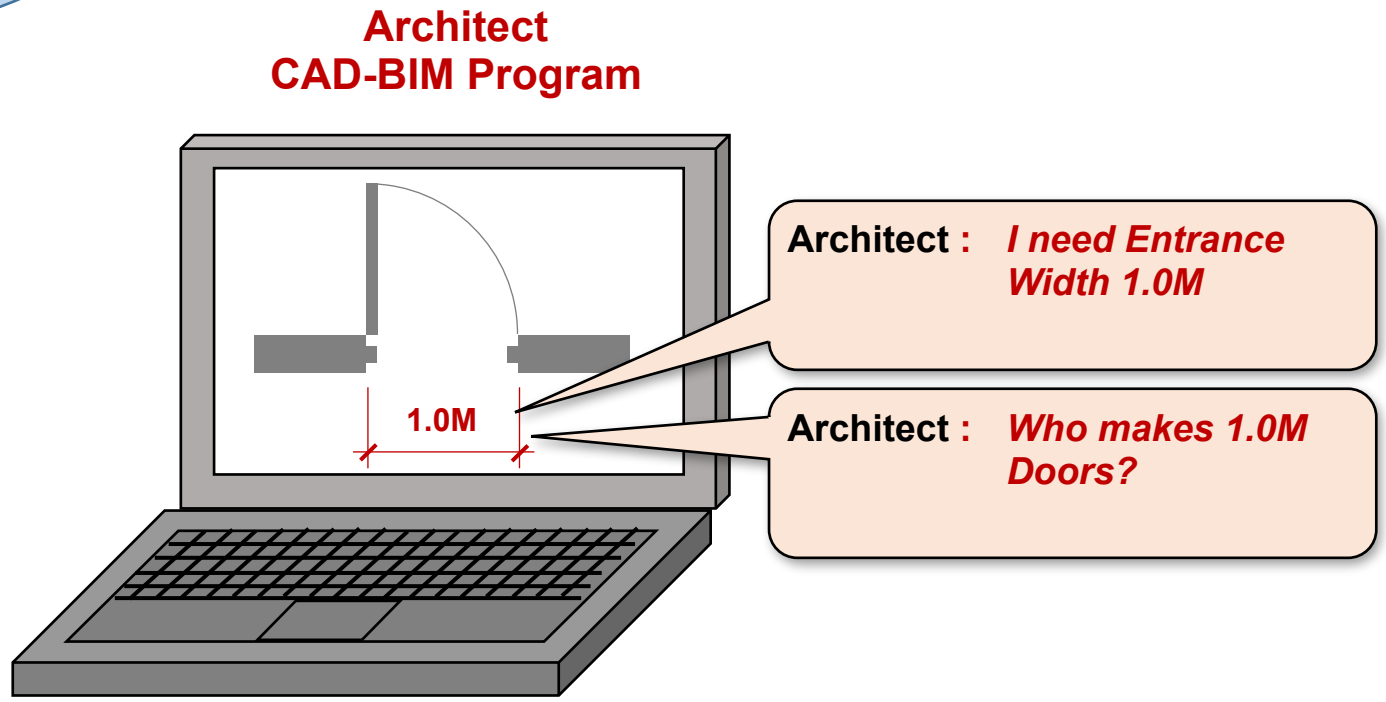
Architect BIM Program Search



Common Object Library

Successful Search!





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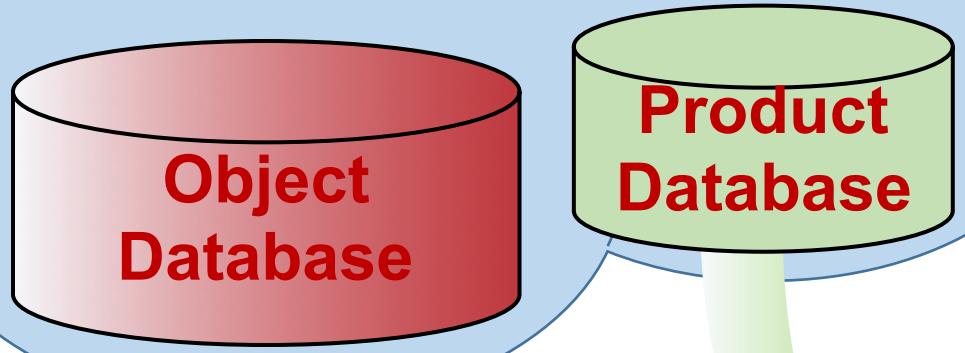
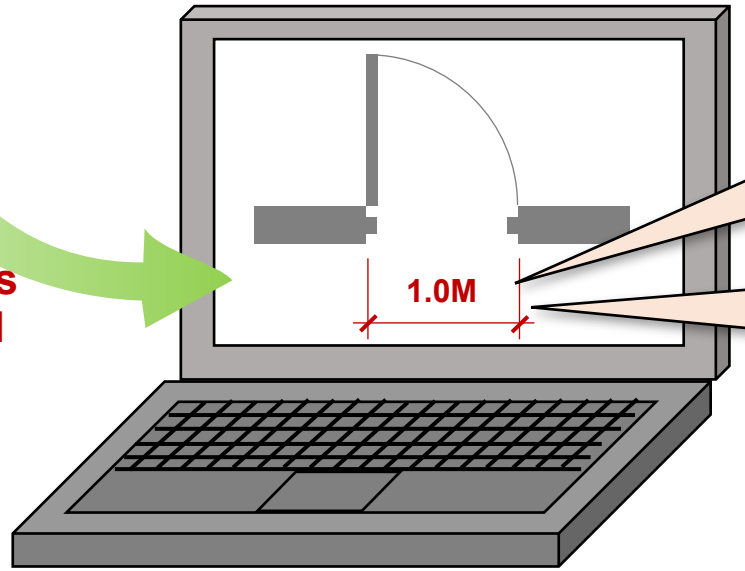


Architect
CAD-BIM Program

We make *great* doors
with IFD #1234 = 1M

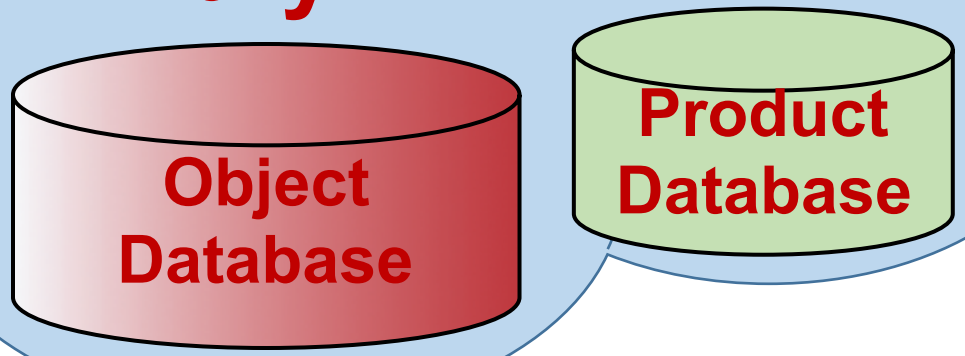


Architect : *I need Entrance Width 1.0M*

Architect : *Who makes 1.0M Doors?*

Common Object Library

Summary



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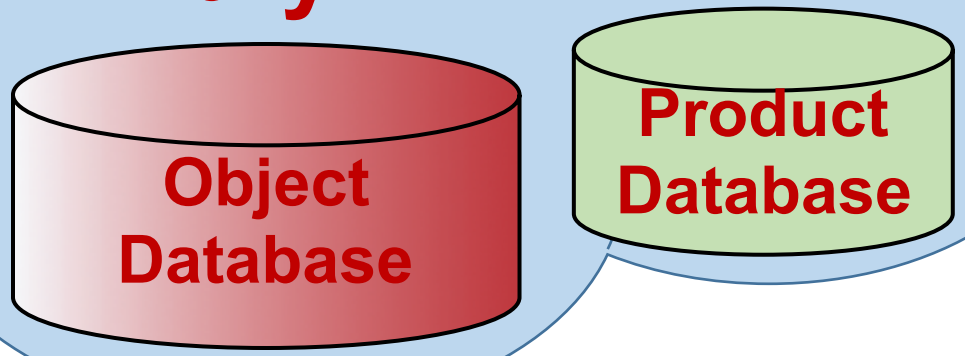
Common Object Library

Summary



Agreement on Common Terms

Multilingual Translations

Assigning each property a unique #

Helping to *find* Building Products

Helping to *sell* Building Products

Common Object Platform

How does the Concept work in practice?

Common Object Platform

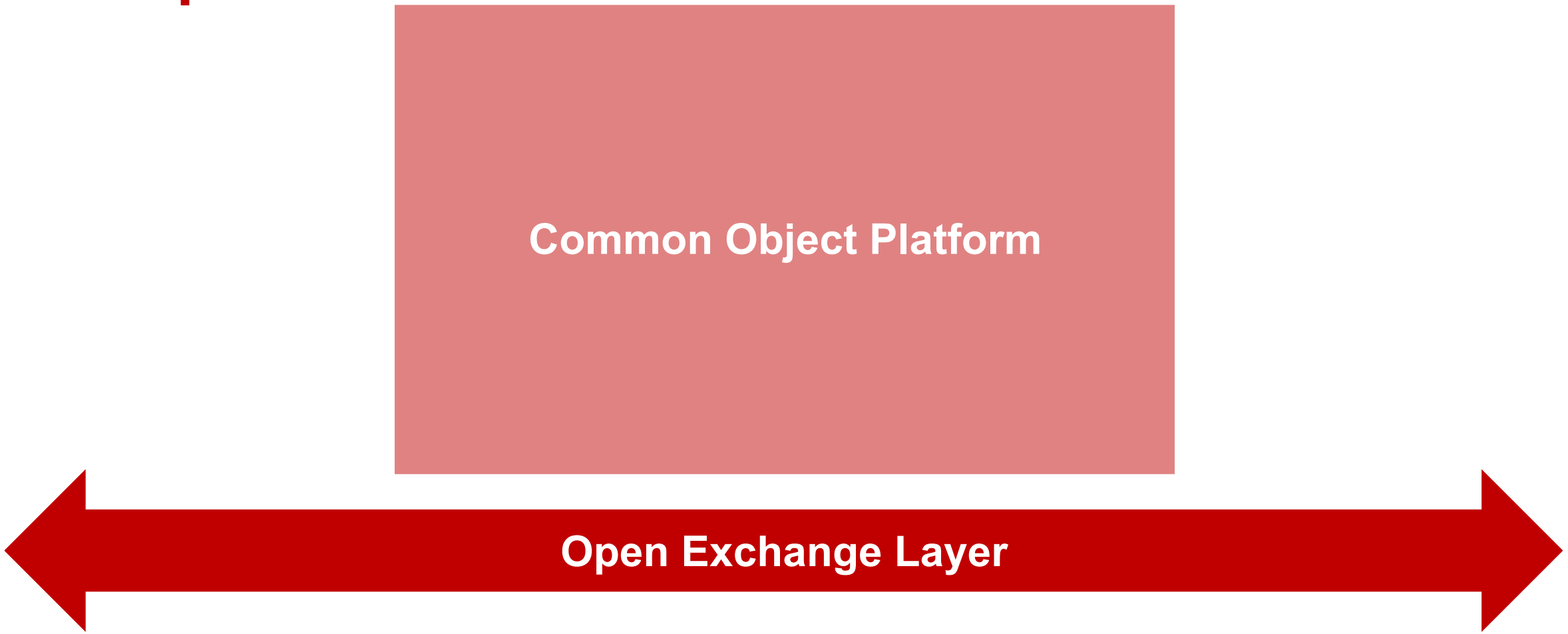
Concept

Common Object Platform

Concept

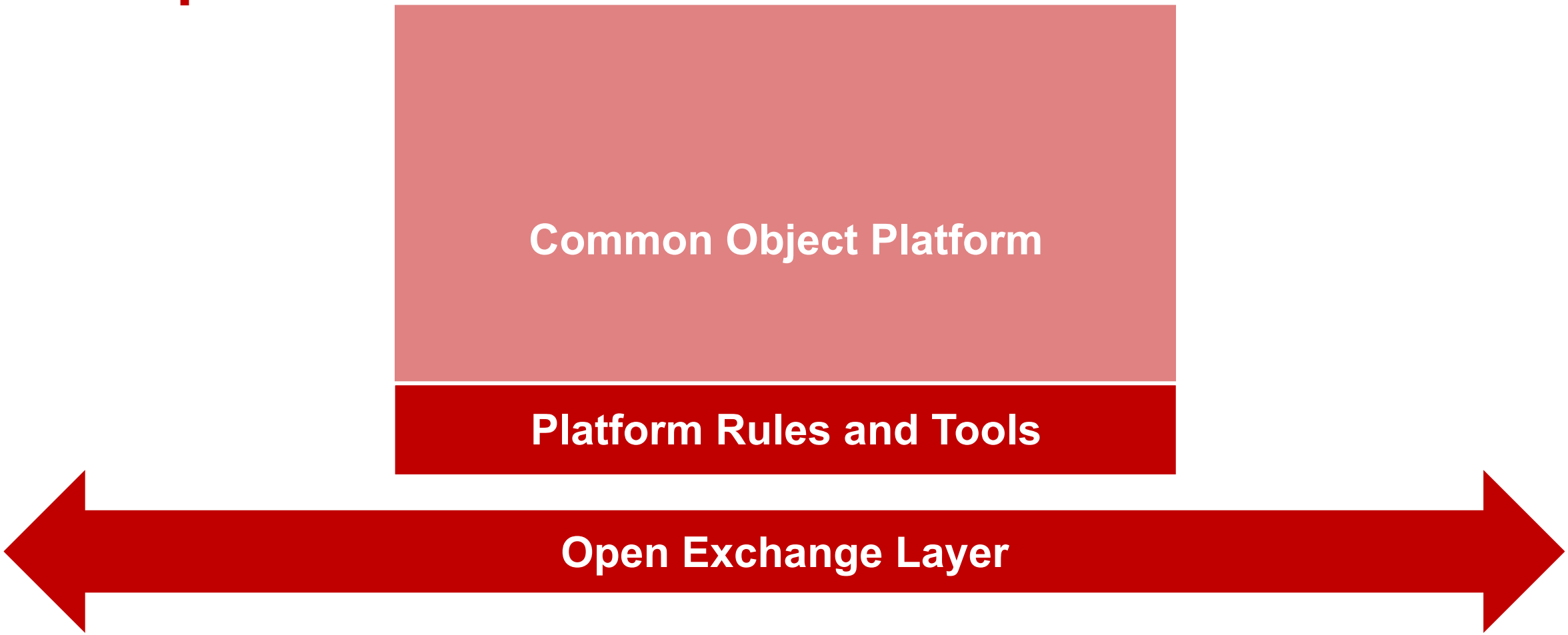
Common Object Platform

Concept



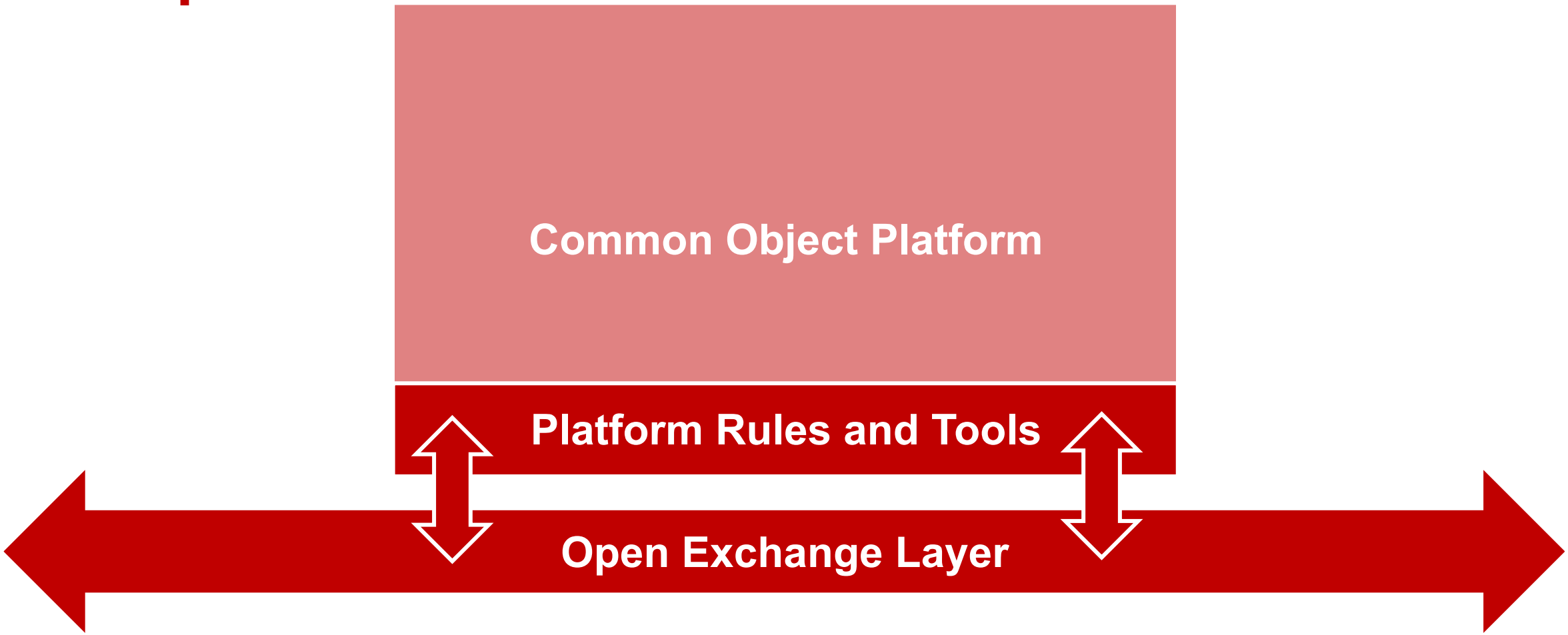
Common Object Platform

Concept



Common Object Platform

Concept



Common Object Platform

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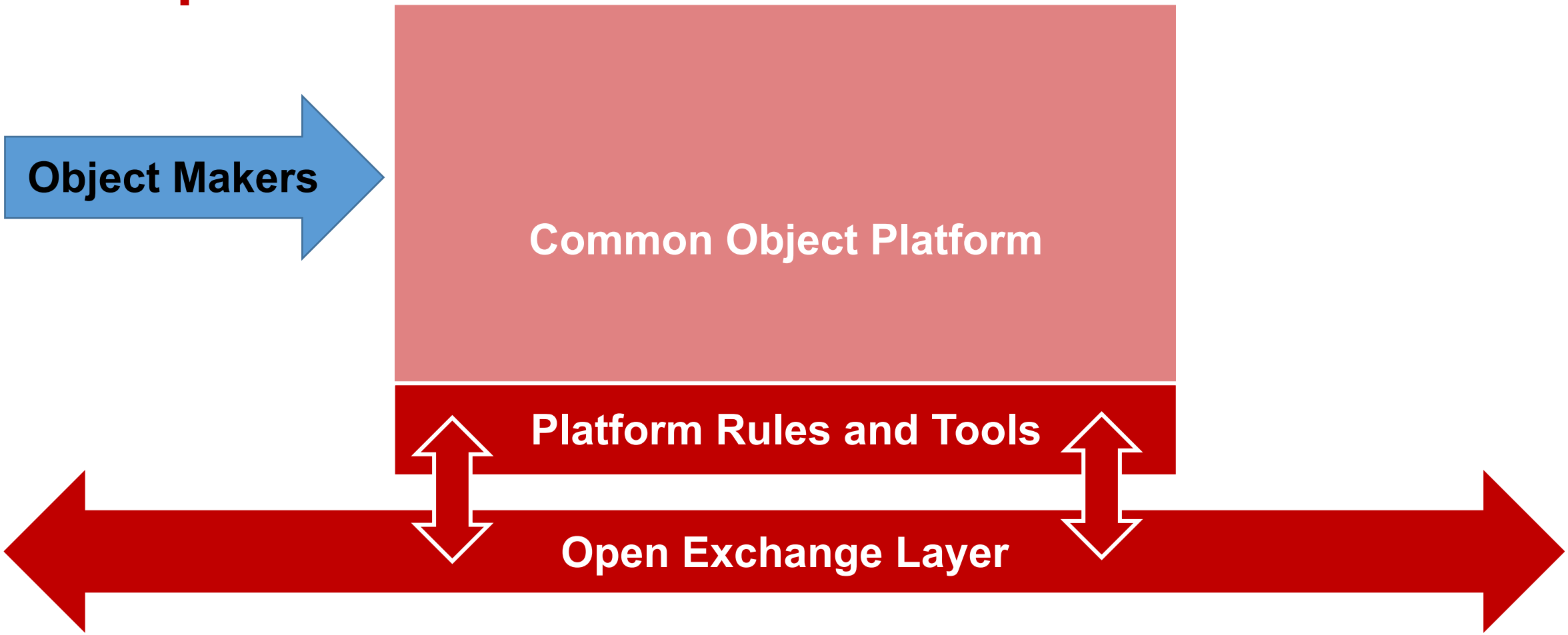

Common Object Platform

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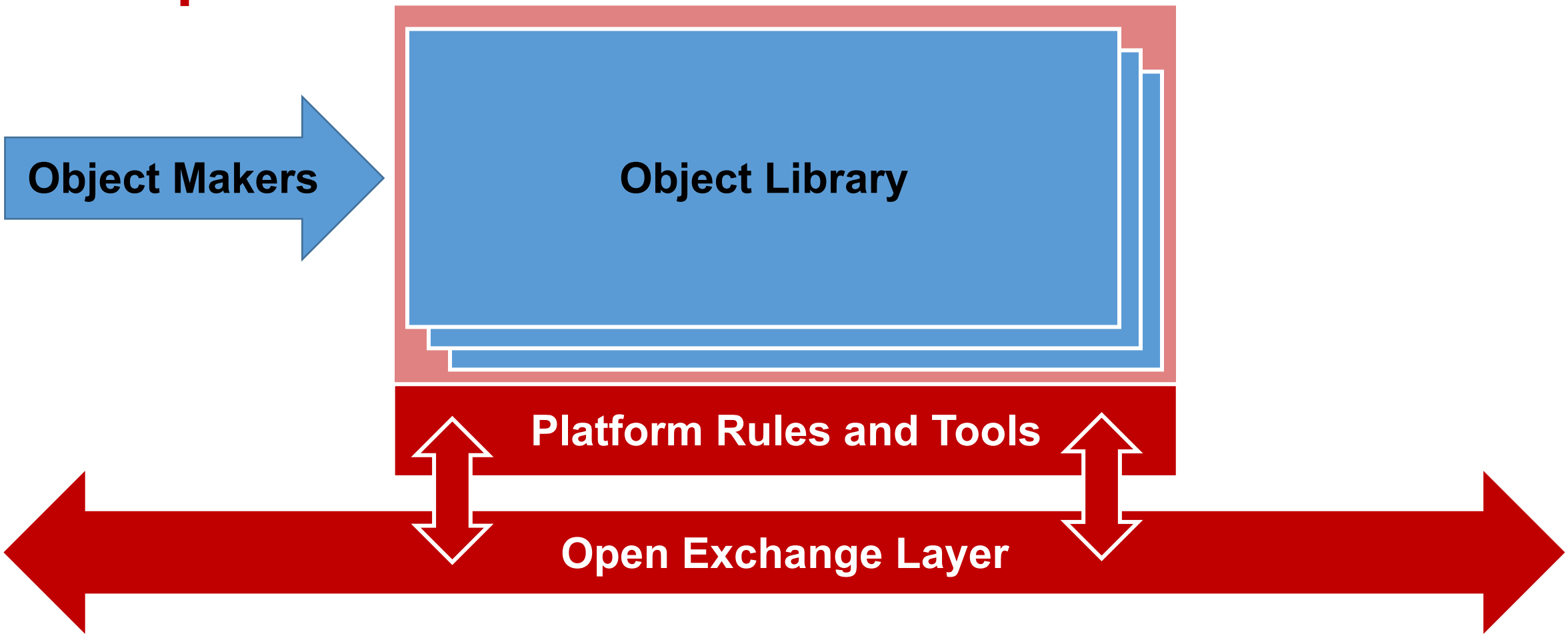

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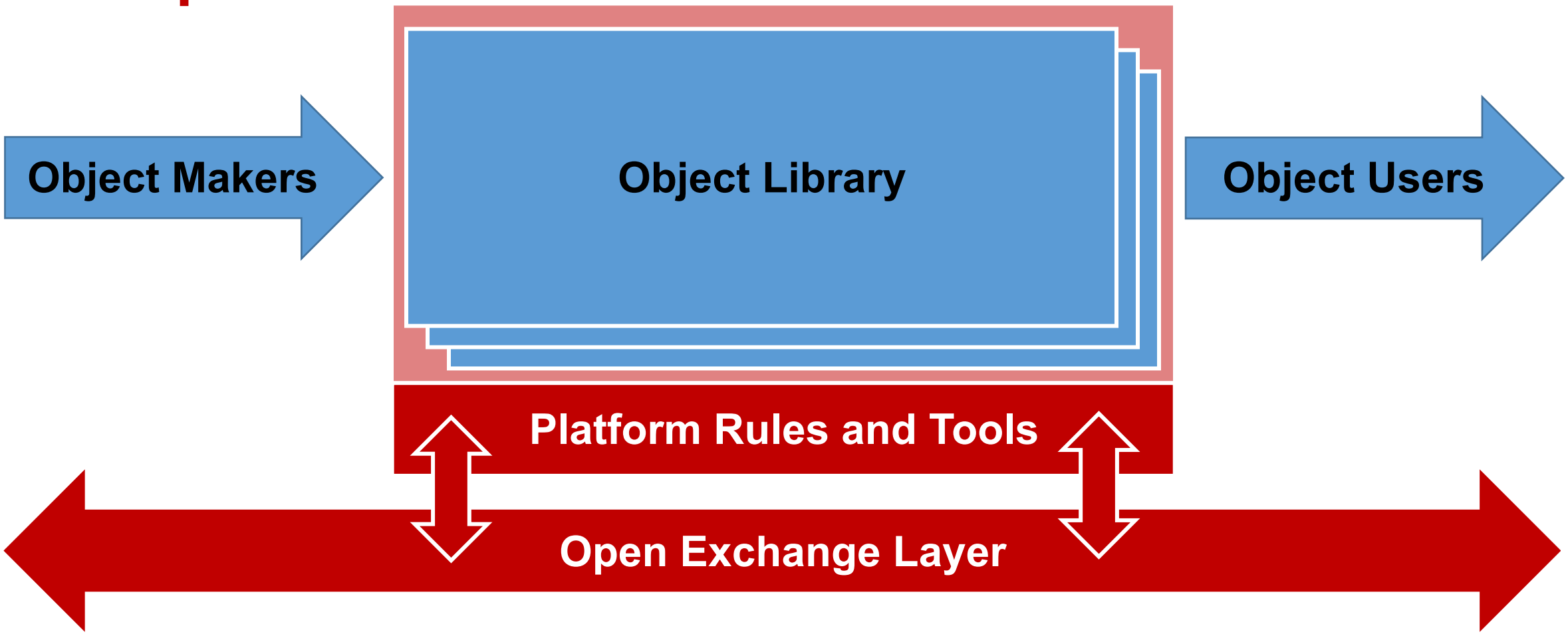
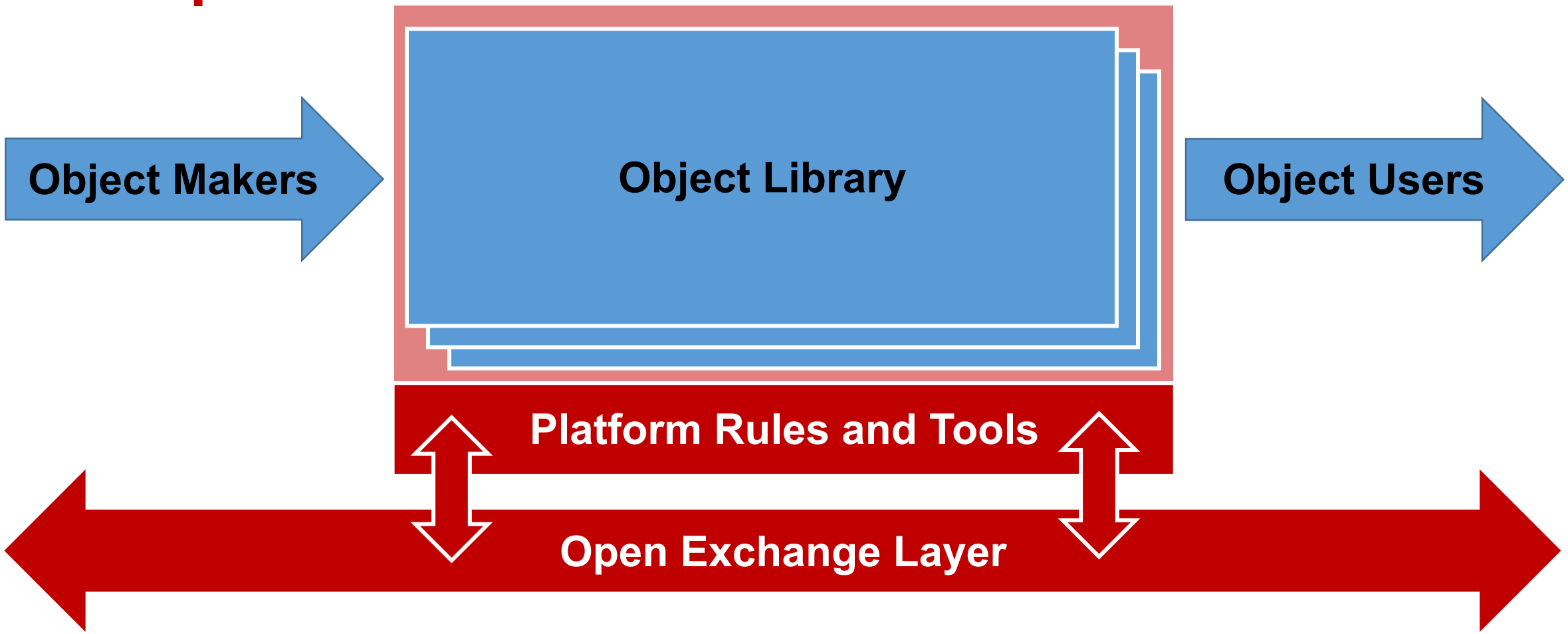


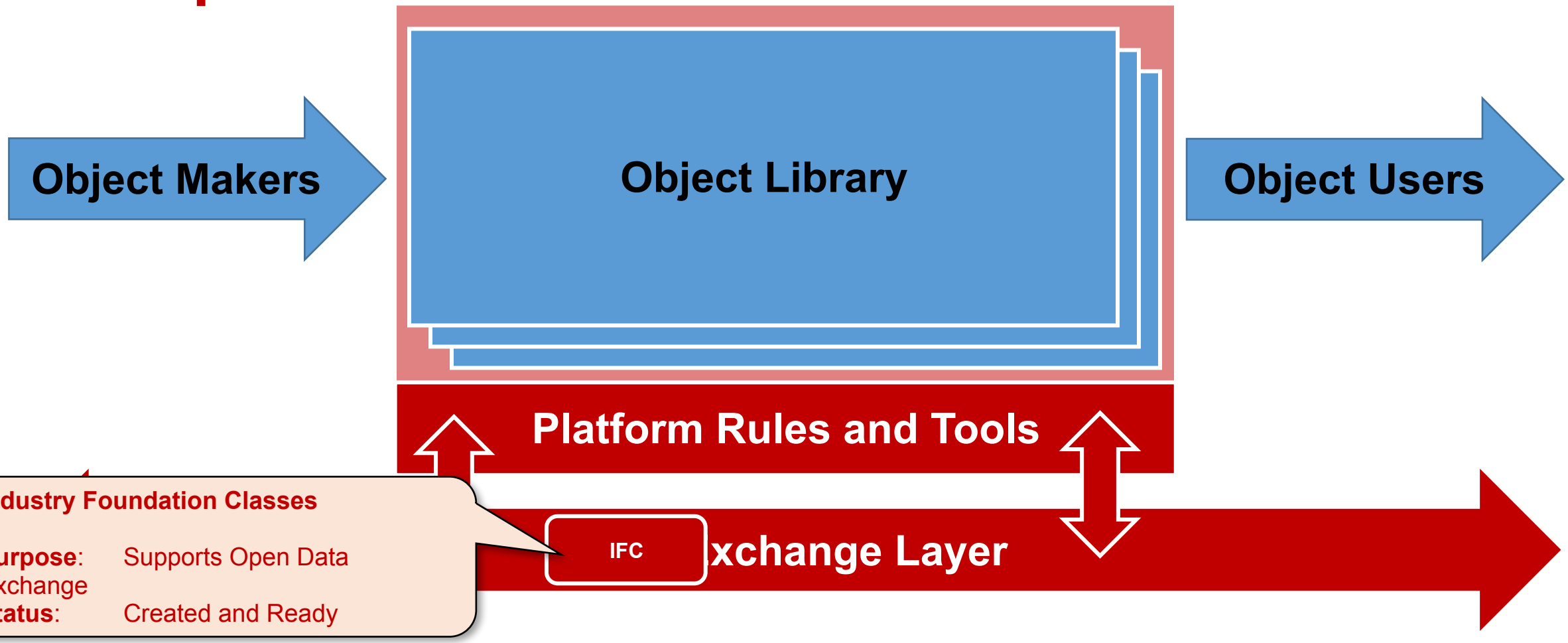
Common Object Platform

Development



Common Object Platform

Development

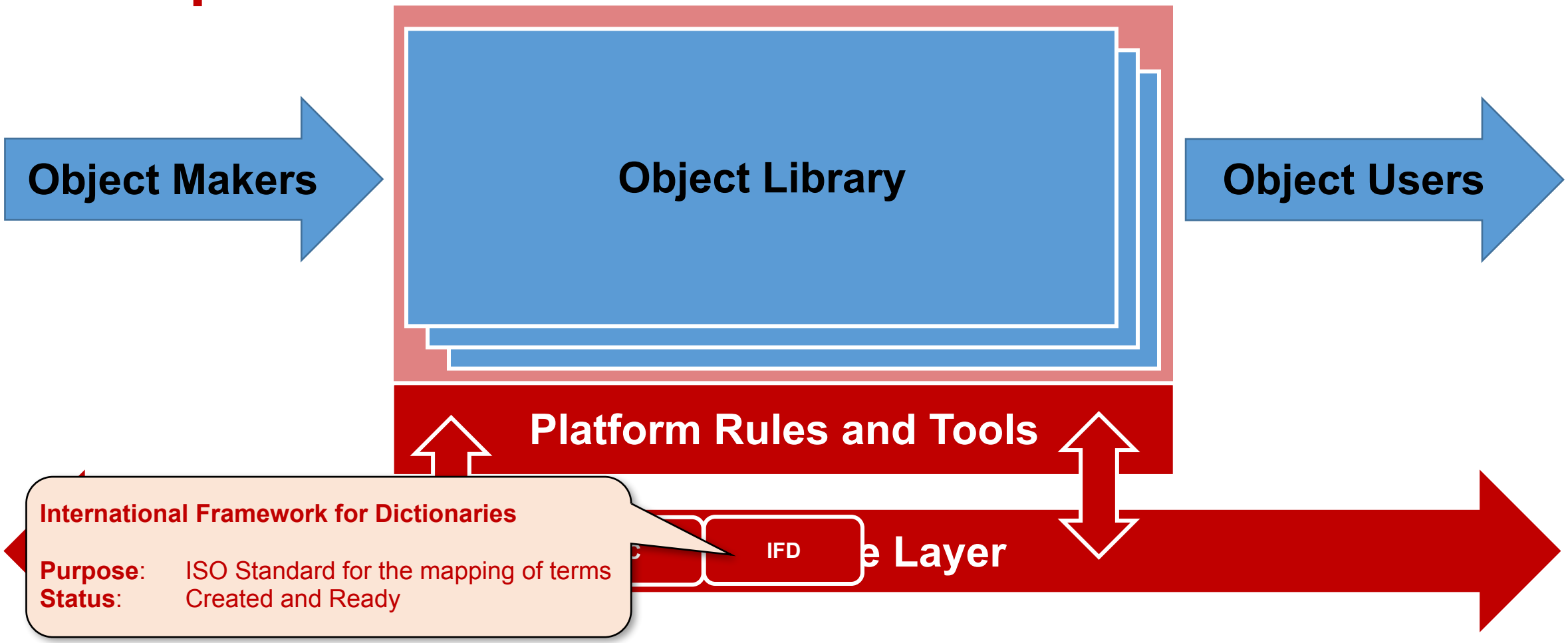


Industry Foundation Classes

Purpose: Supports Open Data Exchange
Status: Created and Ready

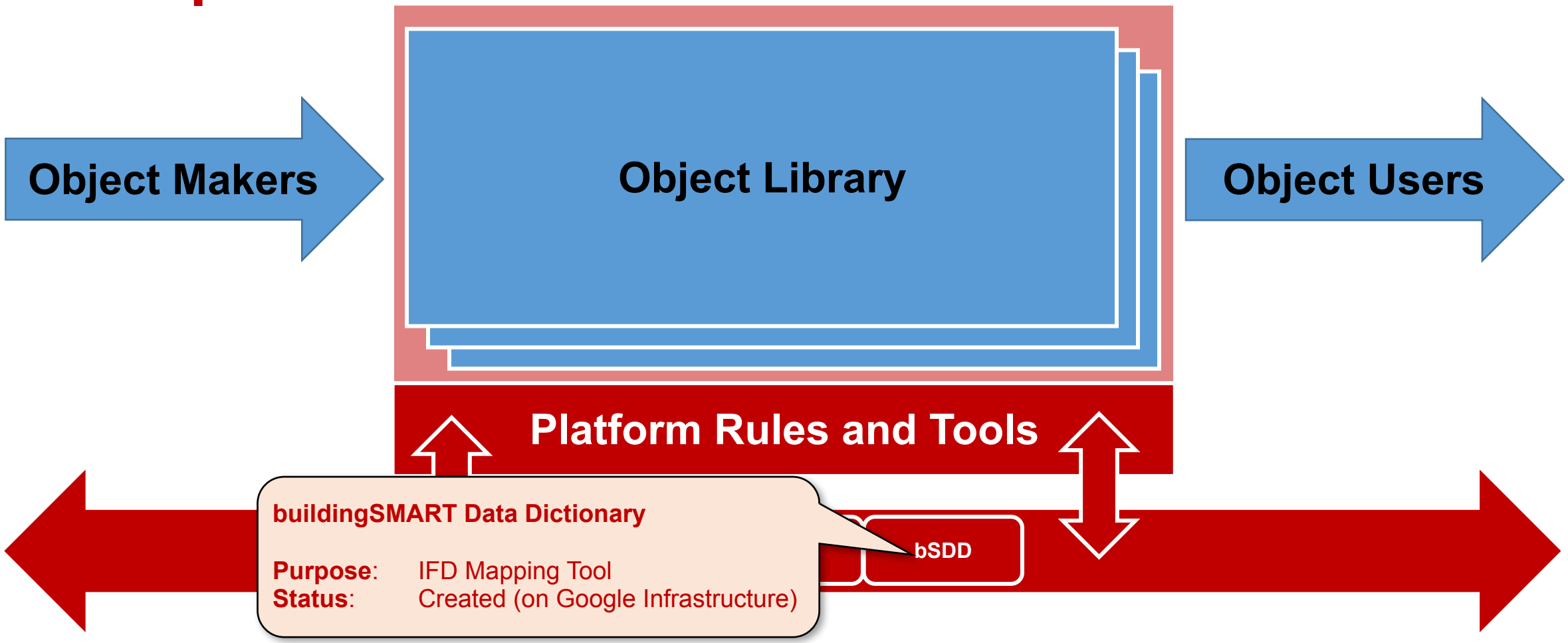
Common Object Platform

Development



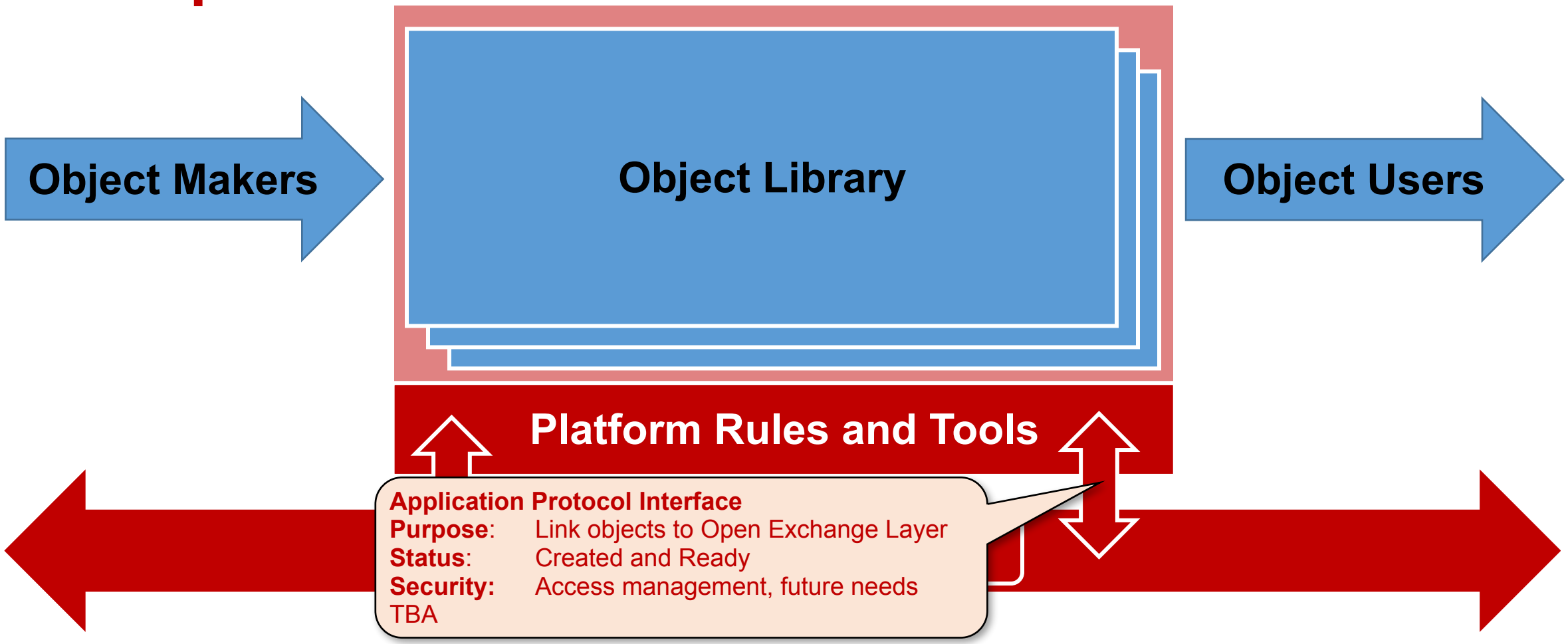
Common Object Platform

Development



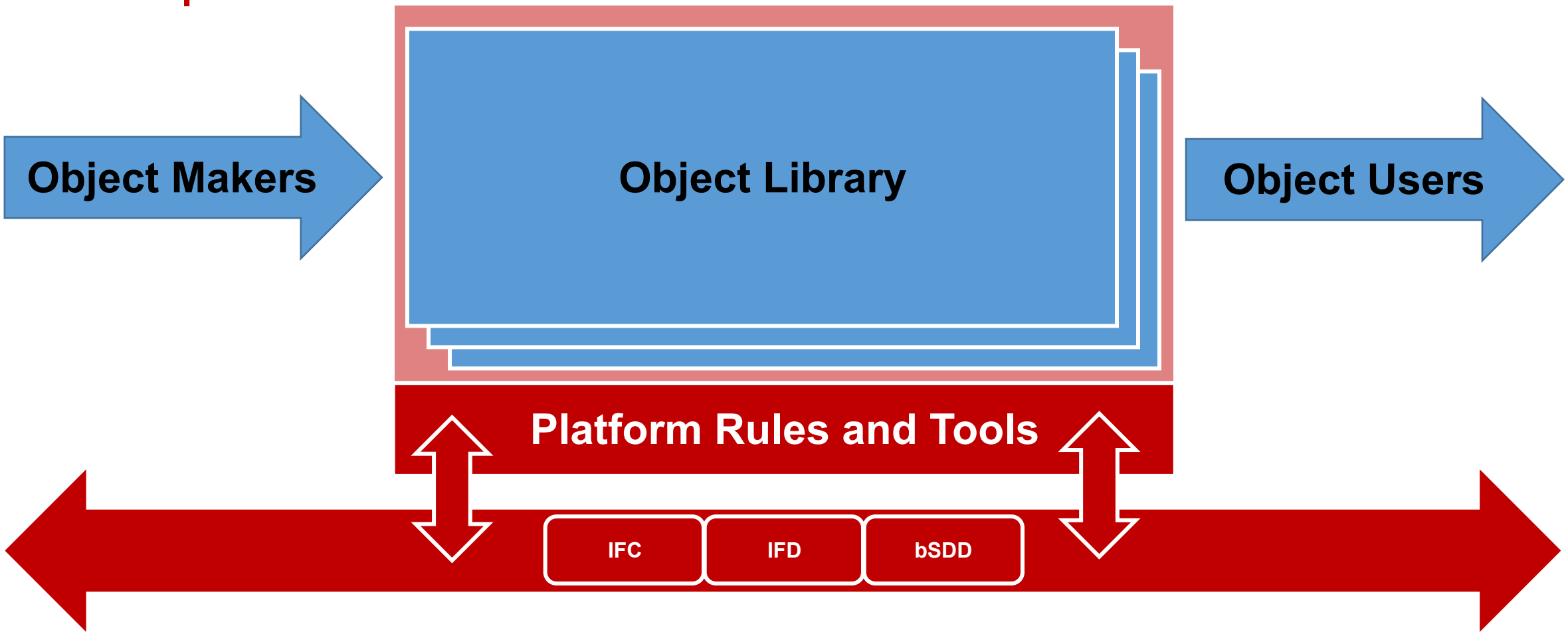
Common Object Platform

Development



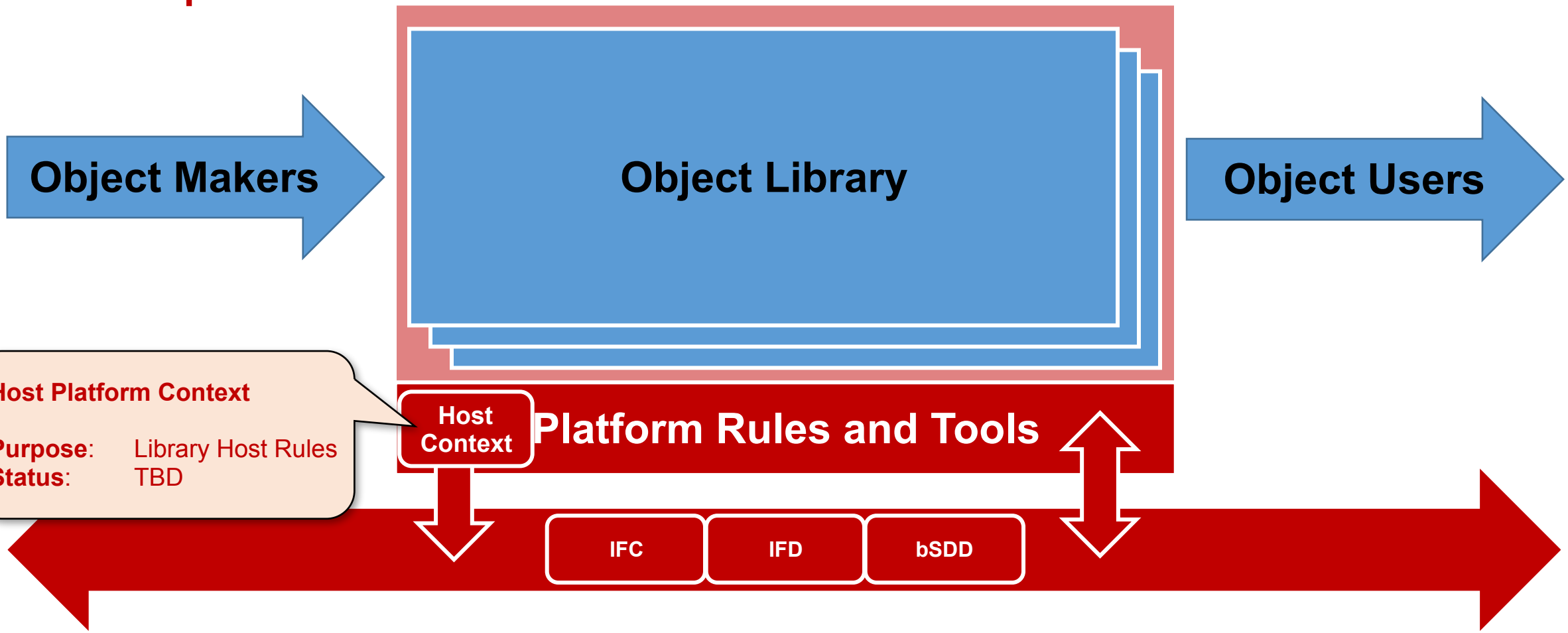
Common Object Platform

Development



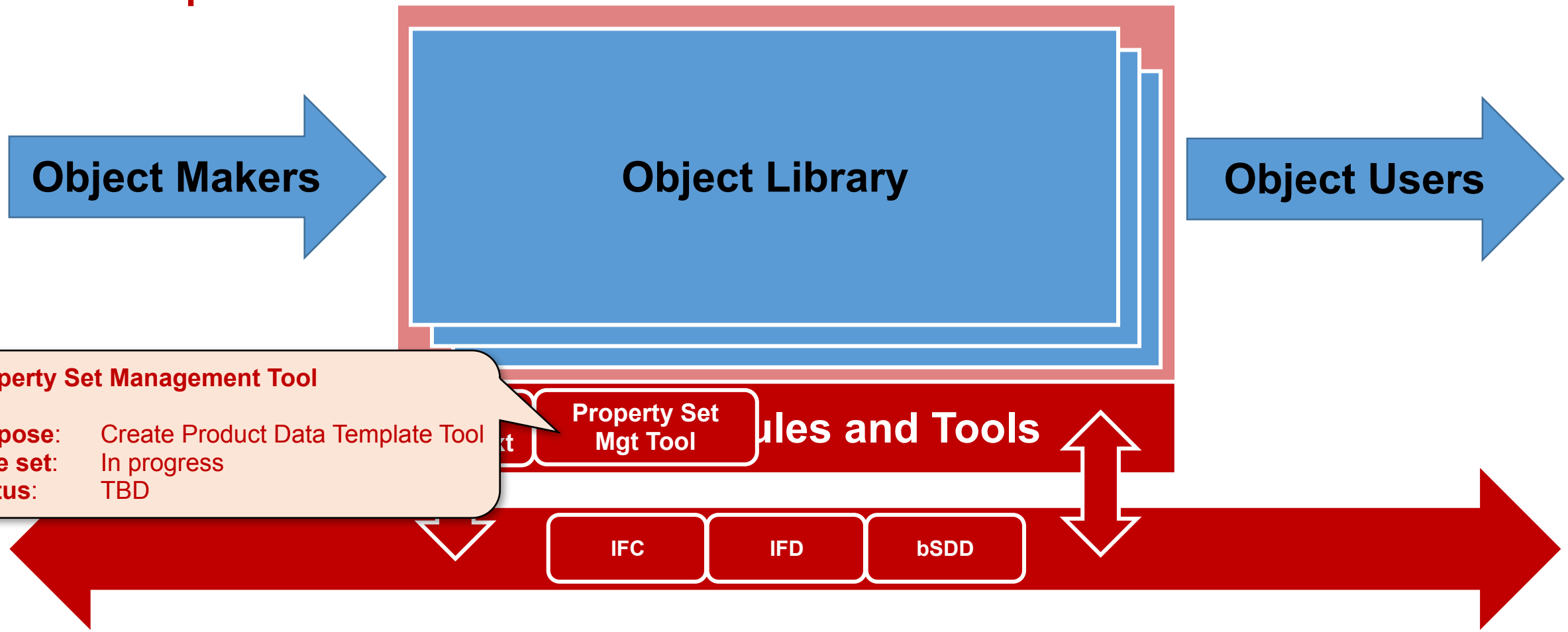
Common Object Platform

Development



Common Object Platform

Development

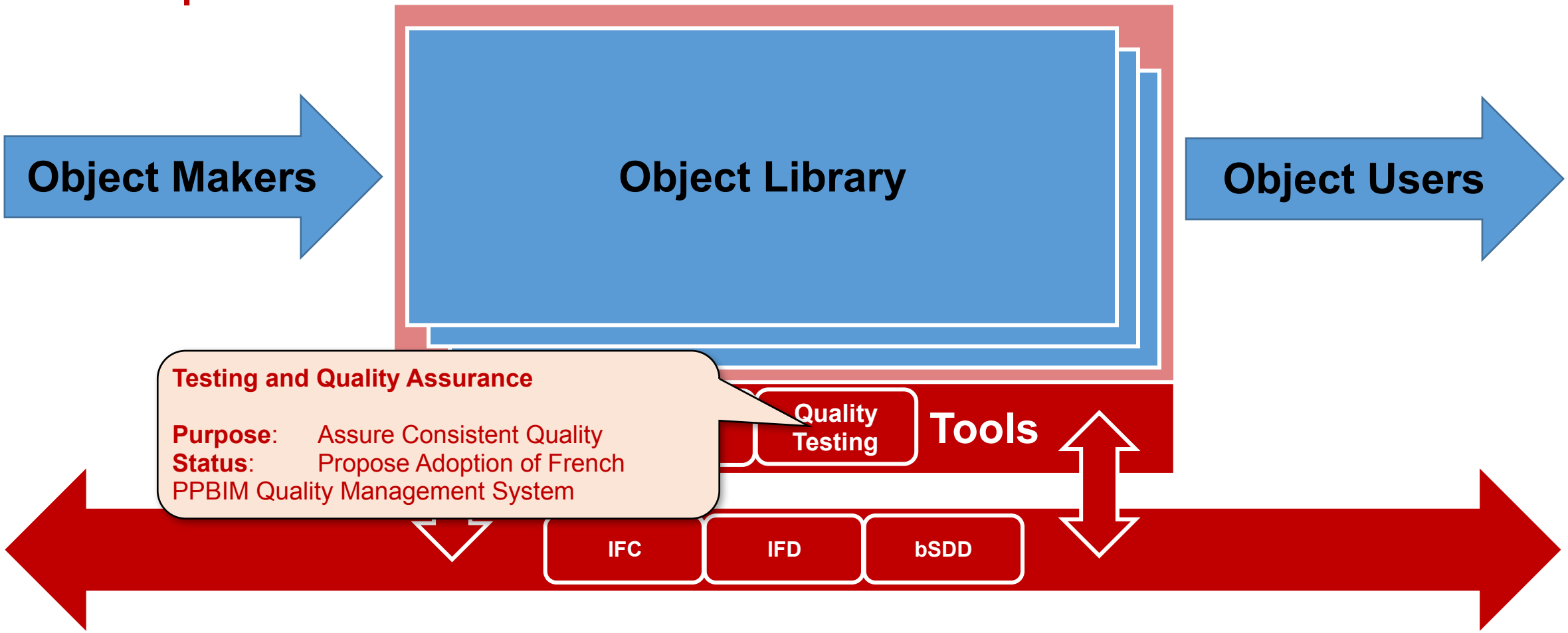


Property Set Management Tool

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

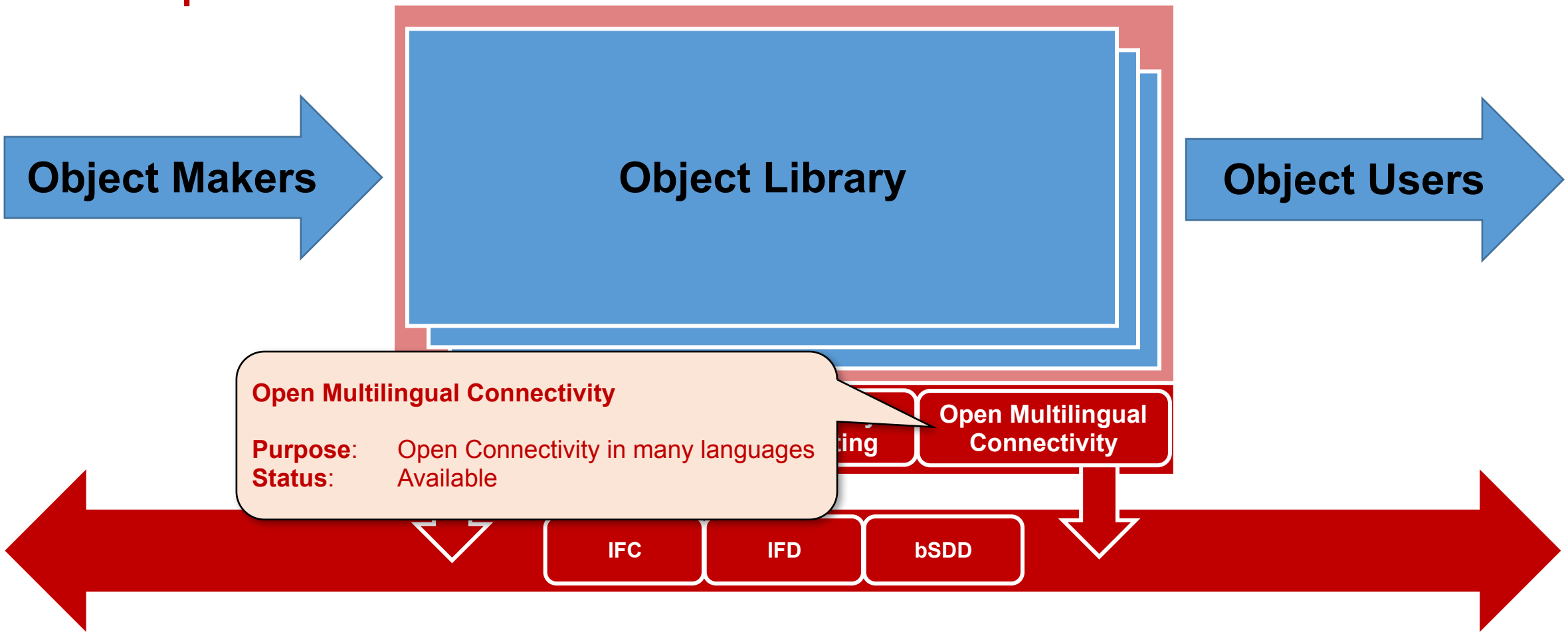
Common Object Platform

Development

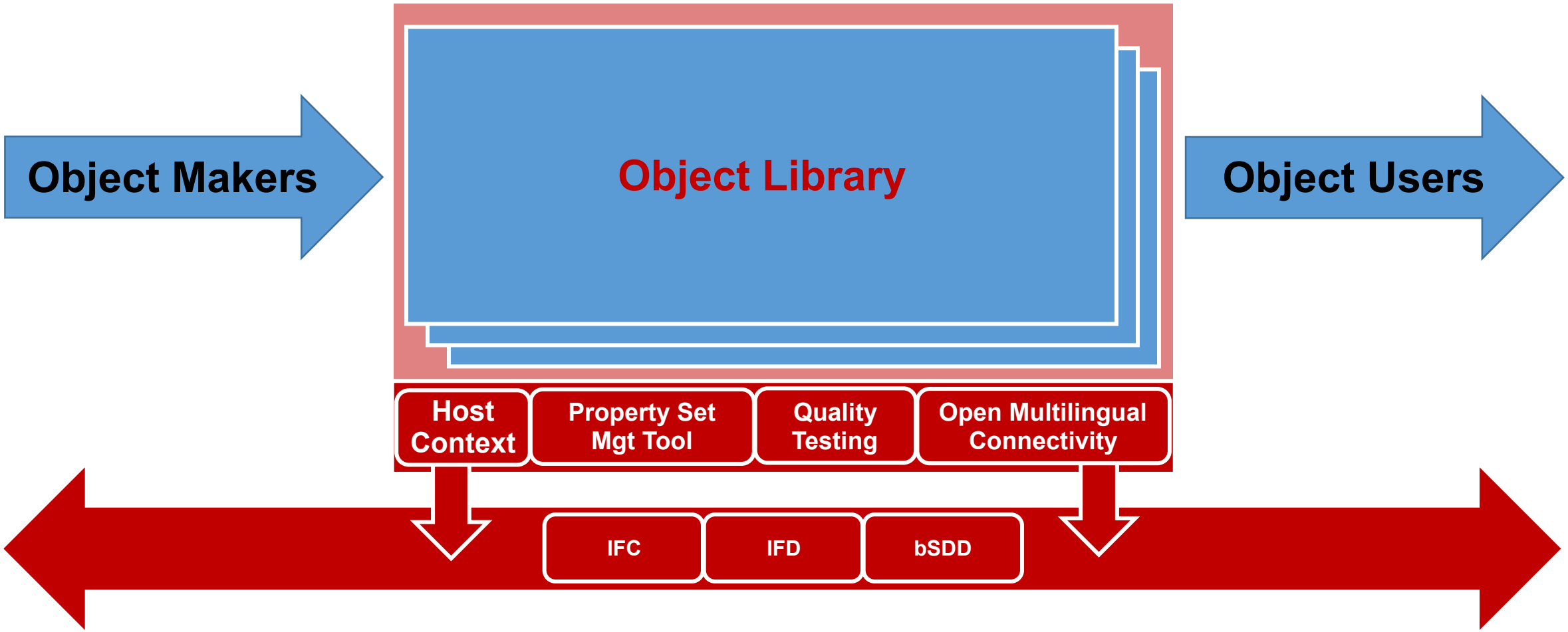


Common Object Platform

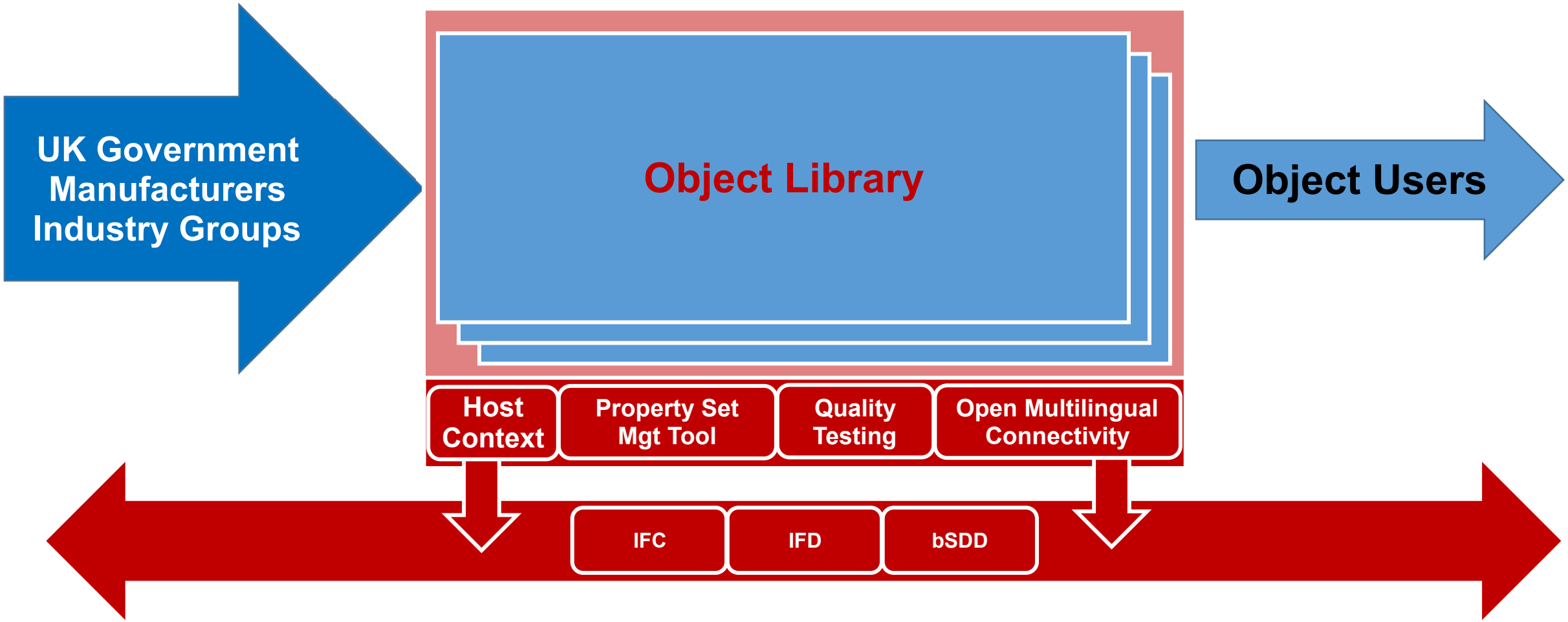
Development



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
Object Users
Host Context
Property Set Mgt Tool
Quality Testing
Open Multilingual Connectivity
IFC
IFD
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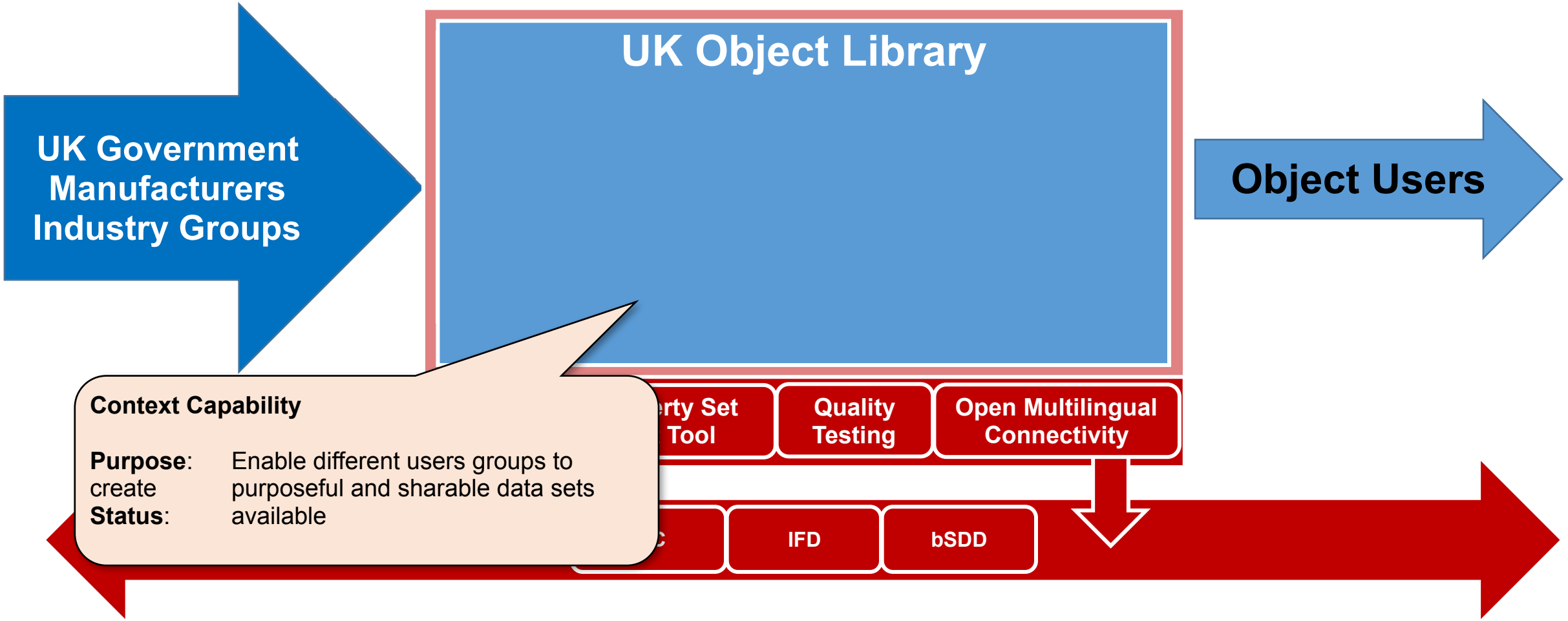
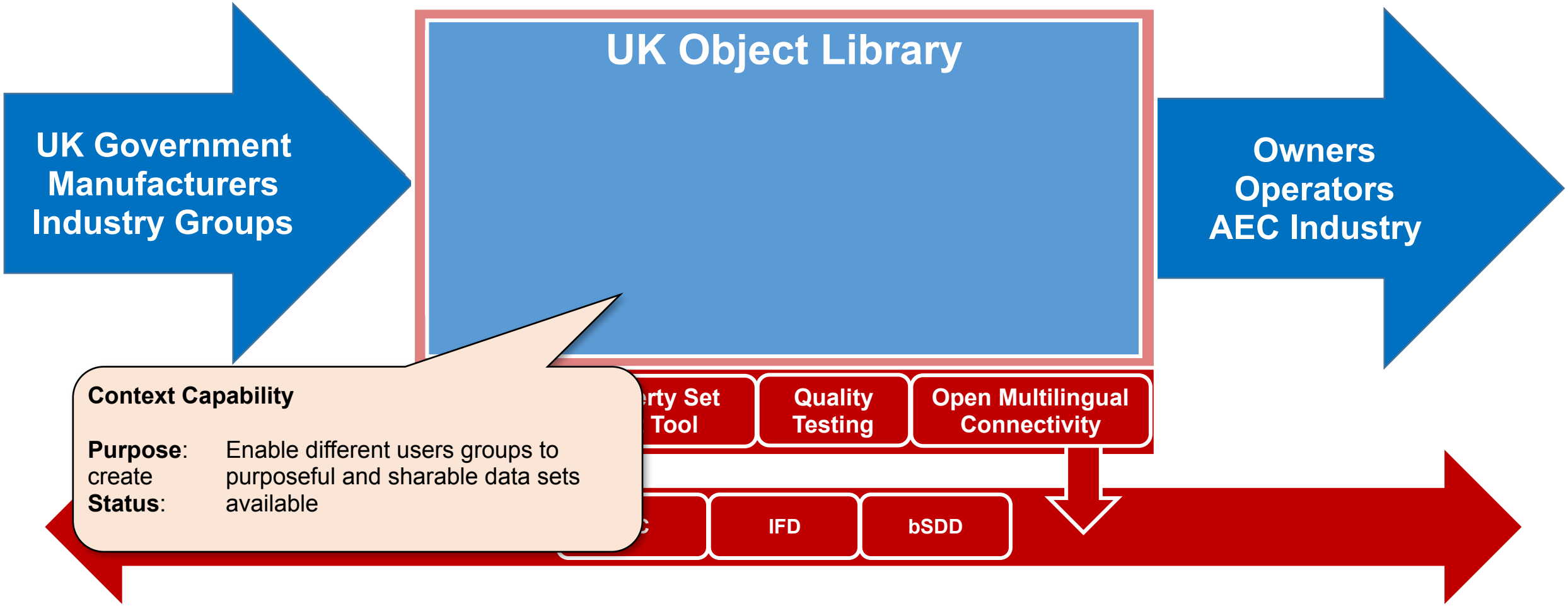
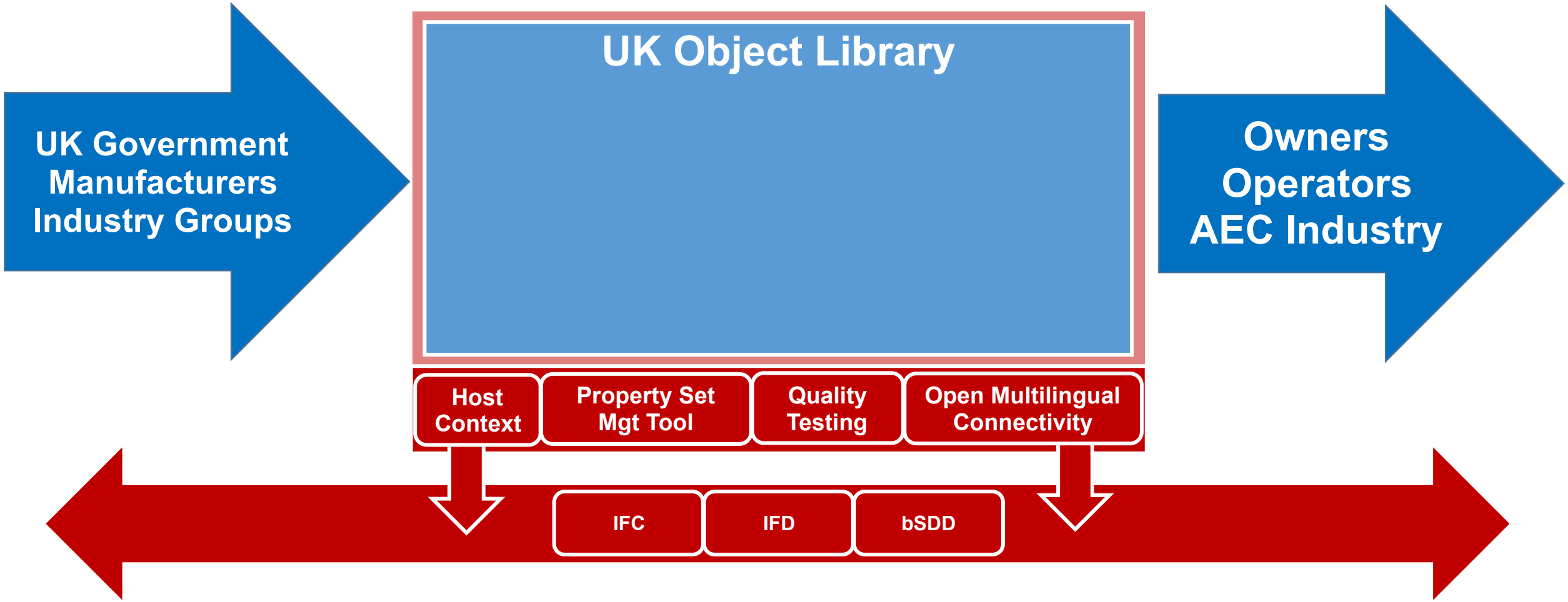
UK Example


UK Government
Manufacturers
Industry Groups
UK Object Library
Object Users
Context Capability
Purpose: Enable different users groups to create purposeful and sharable data sets
Status: available
rty Set Tool
Quality Testing
Open Multilingual Connectivity
IFD
bSDD

UK Example


UK Government
Manufacturers
Industry Groups
UK Object Library
Owners
Operators
AEC Industry
Context Capability
Purpose: Enable different users groups to create purposeful and sharable data sets
Status: available
erty Set Tool
Quality Testing
Open Multilingual Connectivity
IFD
bSDD

UK Example


UK Government
Manufacturers
Industry Groups
UK Object Library
Owners
Operators
AEC Industry
Host Context
Property Set Mgt Tool
Quality Testing
Open Multilingual Connectivity
IFC
IFD
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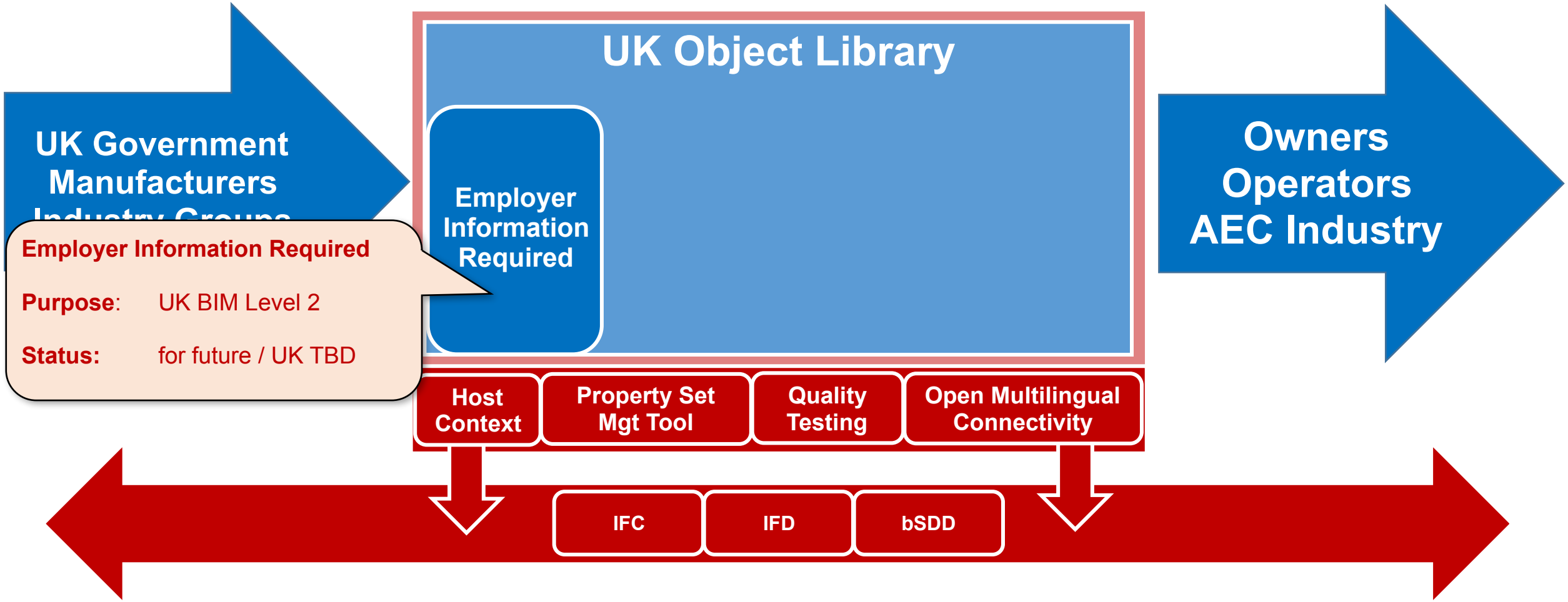
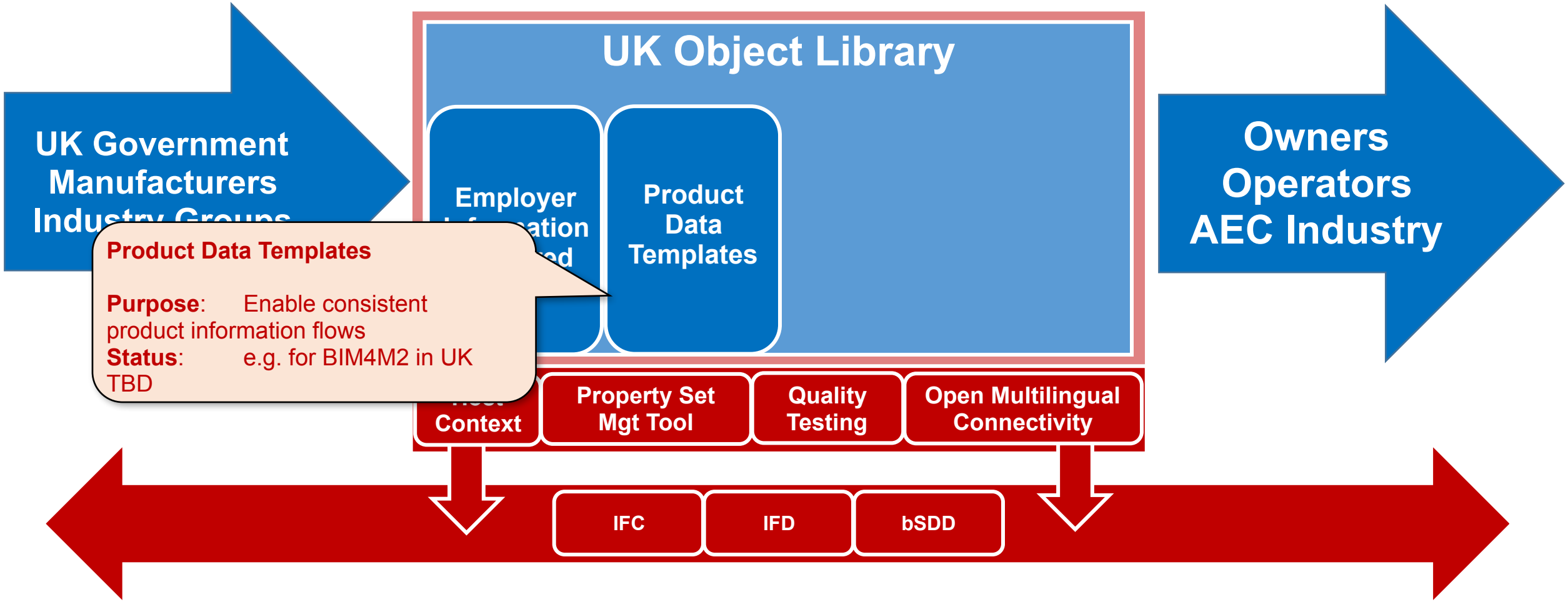
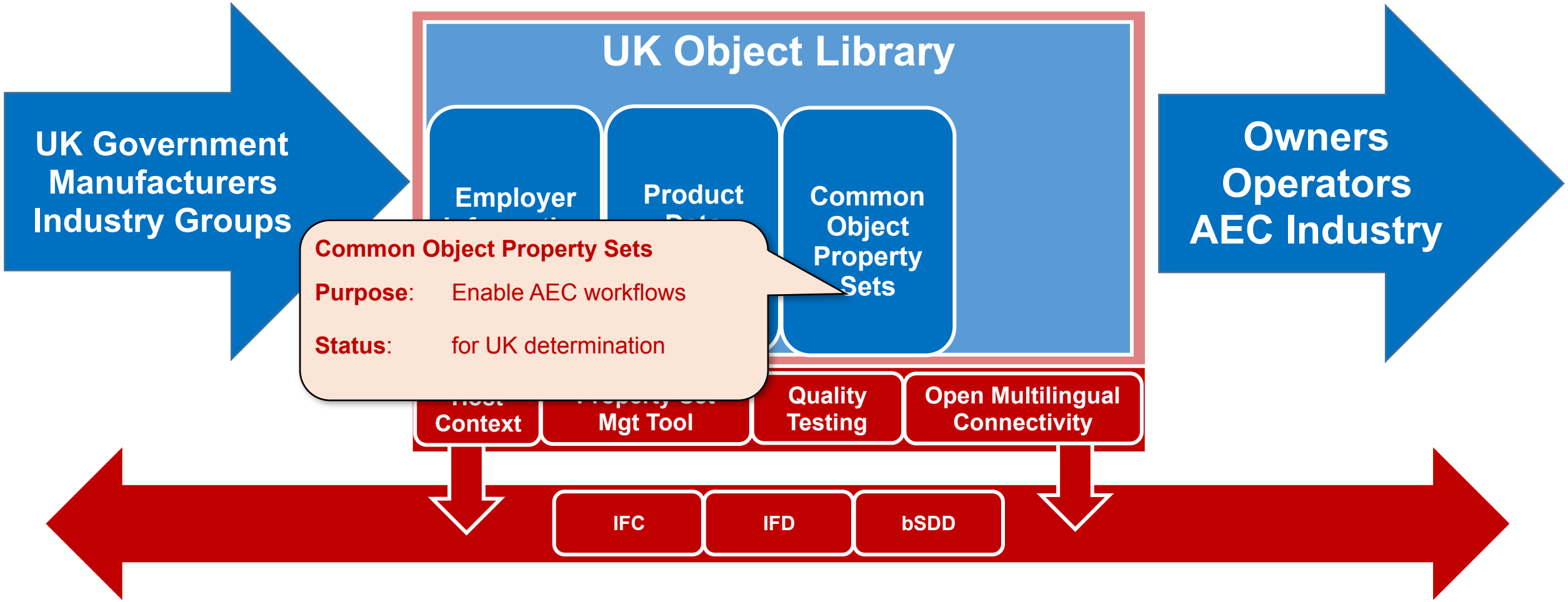
UK Example


UK Government
Manufacturers
Employer Information Required
Purpose: UK BIM Level 2
Status: for future / UK TBD
UK Object Library
Employer Information Required
Host Context
Property Set Mgt Tool
Quality Testing
Open Multilingual Connectivity
IFC
IFD
bSDD
Owners
Operators
AEC Industry

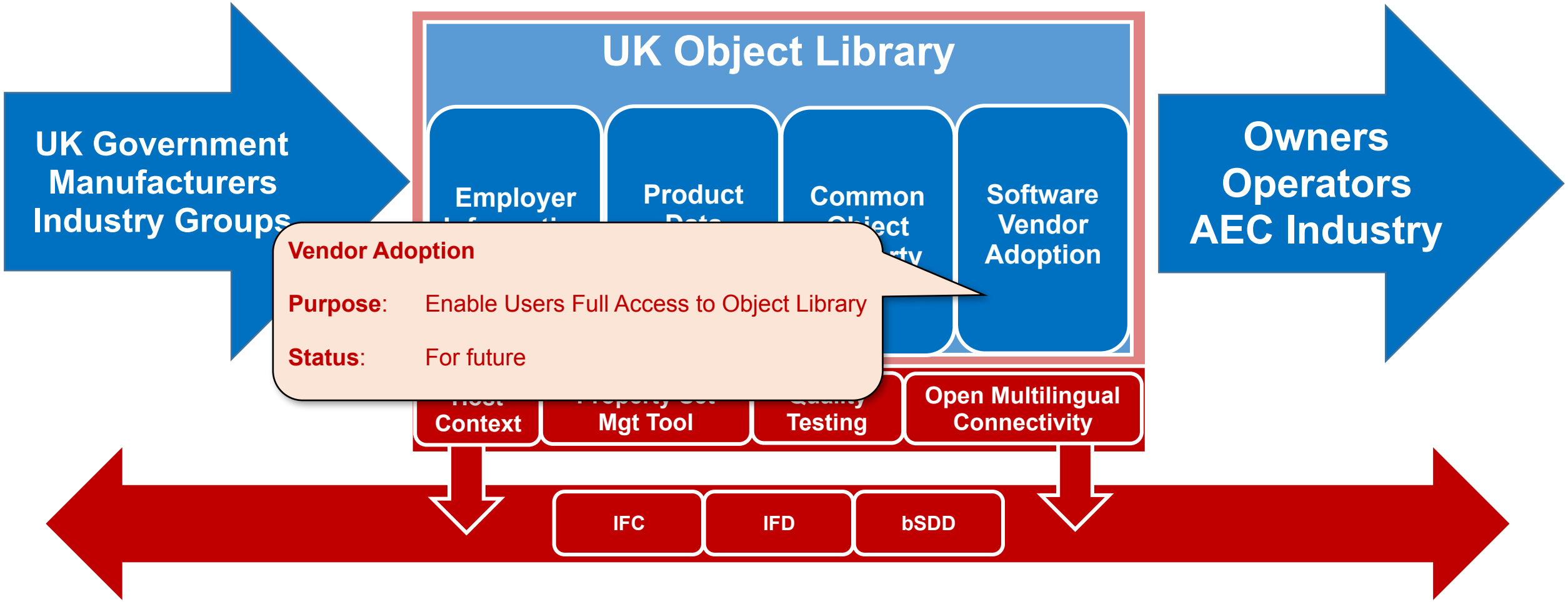
UK Example


UK Government
Manufacturers
Industry Groups
UK Object Library
Employer
Product
Data
Templates
Owners
Operators
AEC Industry
Product Data Templates
Purpose: Enable consistent product information flows
Status: e.g. for BIM4M2 in UK TBD
Context
Property Set Mgt Tool
Quality Testing
Open Multilingual Connectivity
IFC
IFD
bSDD

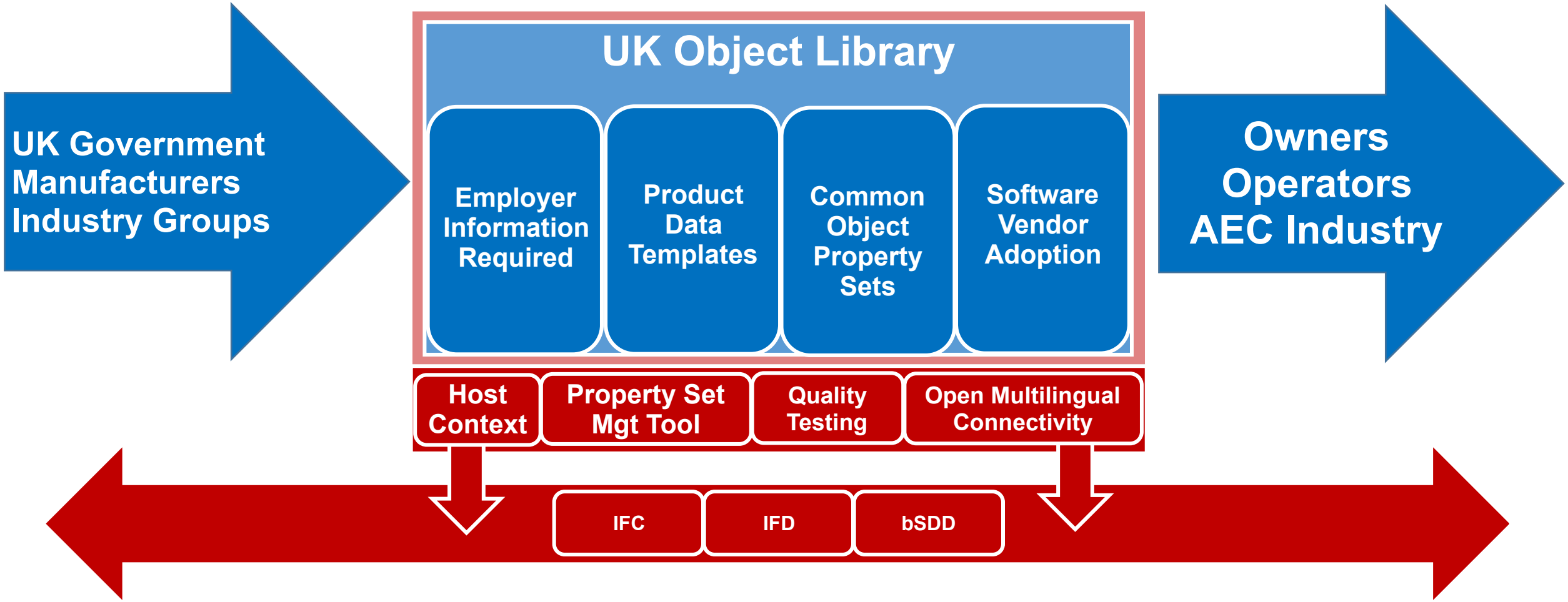
UK Example


UK Government
Manufacturers
Industry Groups
UK Object Library
Employer
Product
Common Object Property Sets
Common Object Property Sets
Purpose: Enable AEC workflows
Status: for UK determination
Context
Mgt Tool
Quality Testing
Open Multilingual Connectivity
IFC
IFD
bSDD
Owners
Operators
AEC Industry

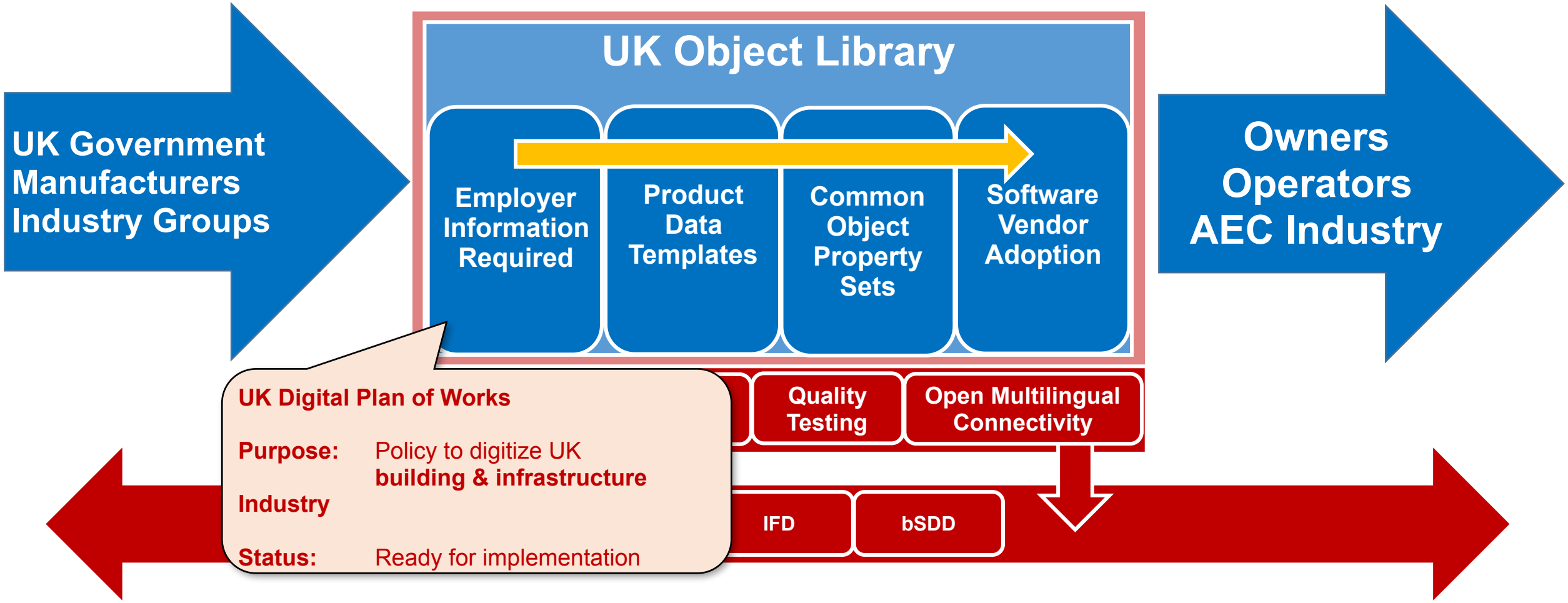
UK Example


UK Government
Manufacturers
Industry Groups
UK Object Library
Employer
Product
Common
Software
Vendor
Adoption
Vendor Adoption
Purpose: Enable Users Full Access to Object Library
Status: For future
Context
Mgt Tool
Testing
Open Multilingual
Connectivity
IFC
IFD
bSDD
Owners
Operators
AEC Industry

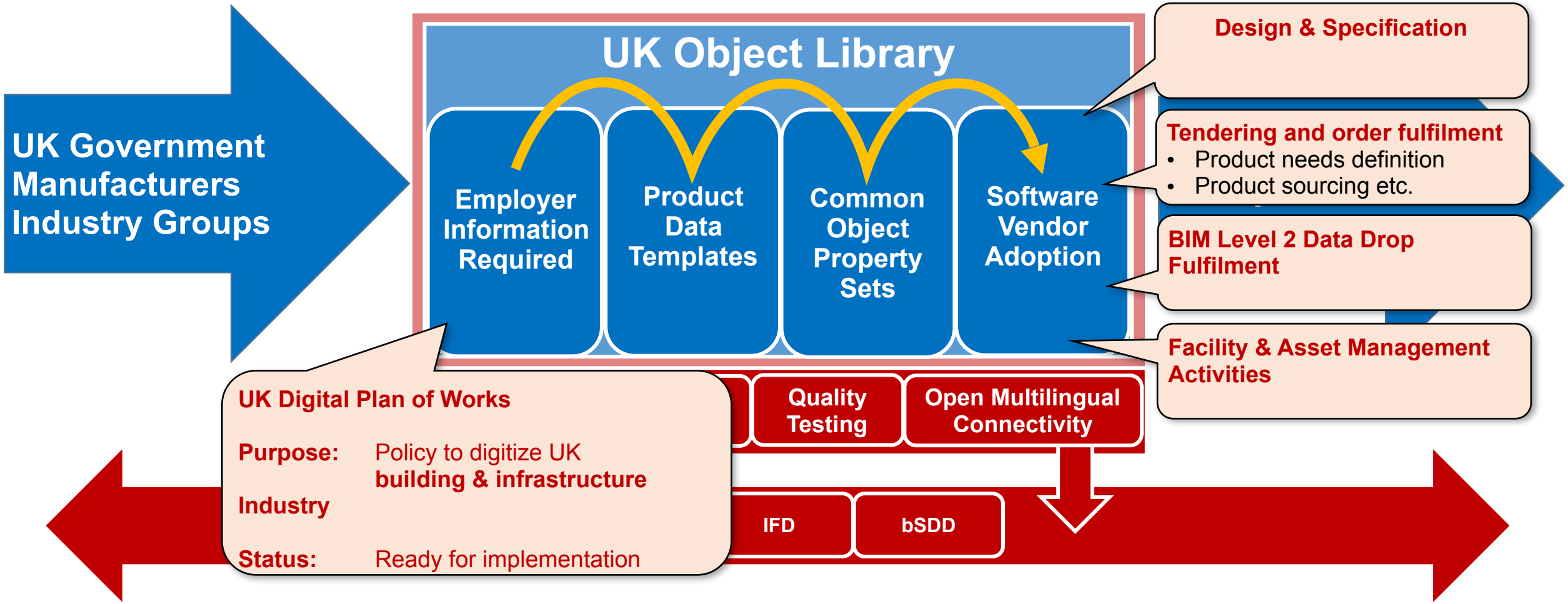
Workflow Support



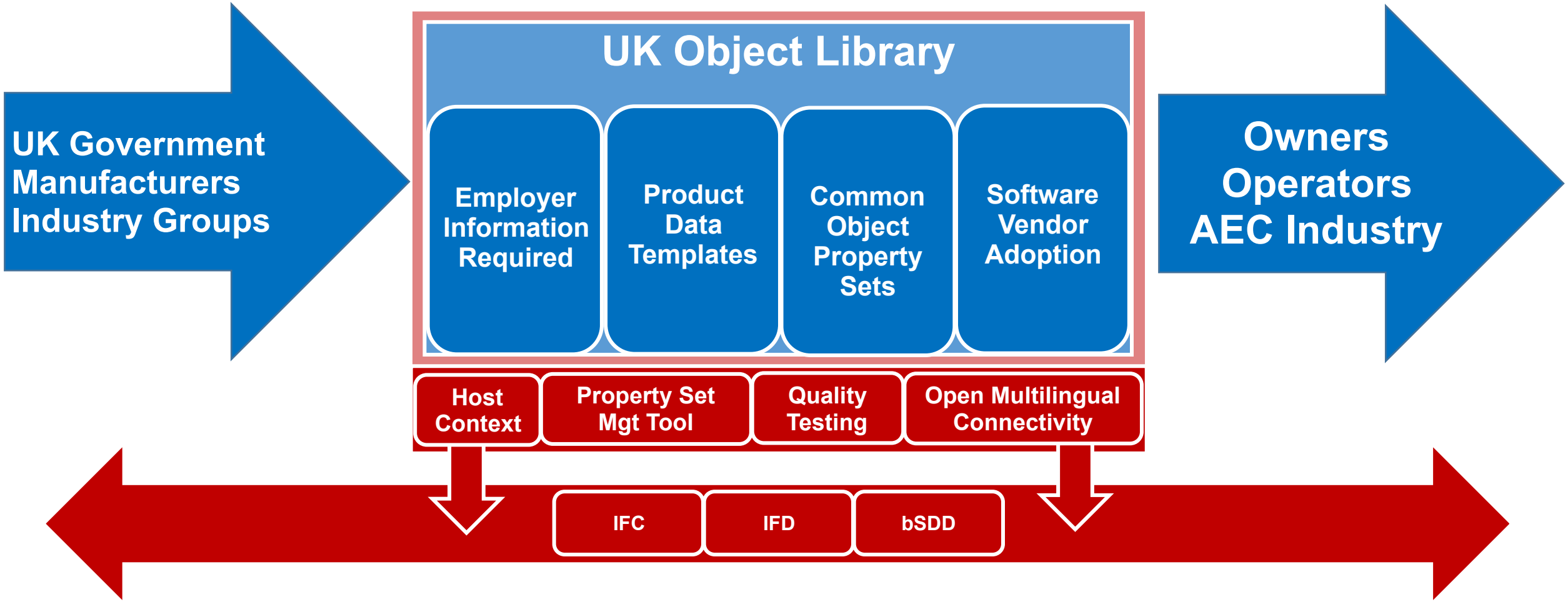
Workflow Support



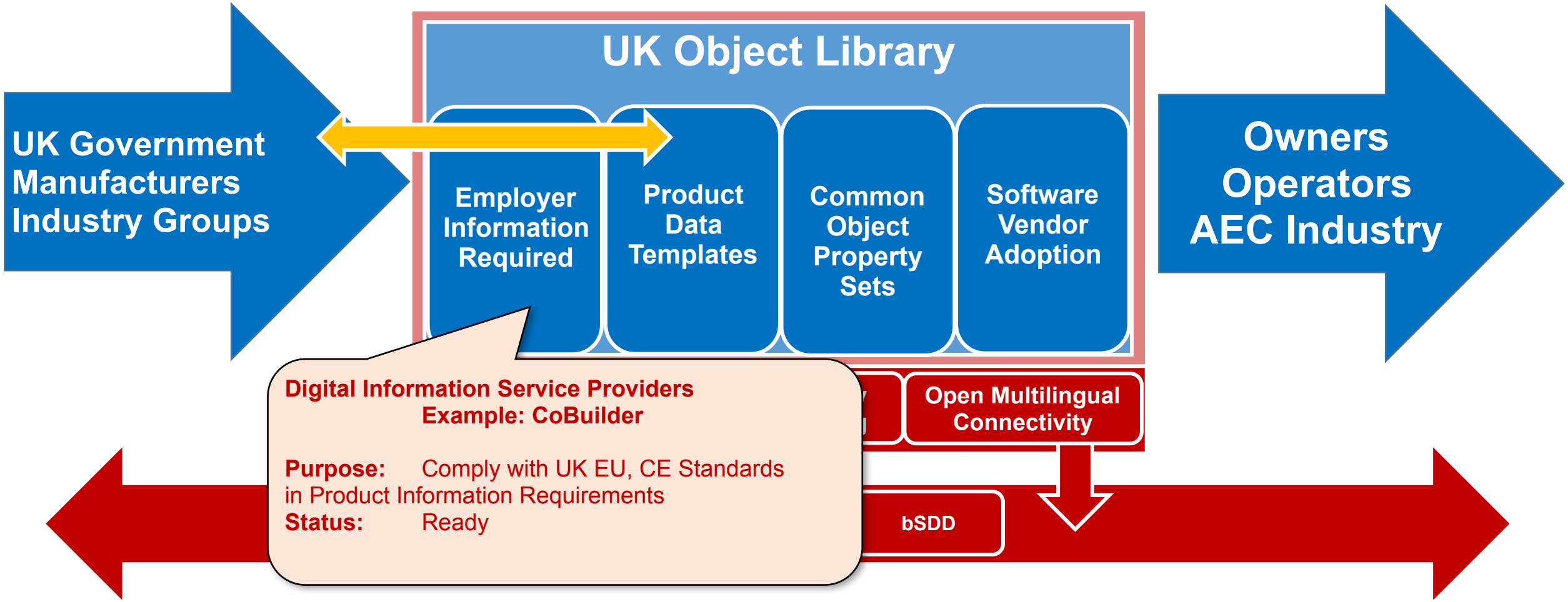
Workflow Support



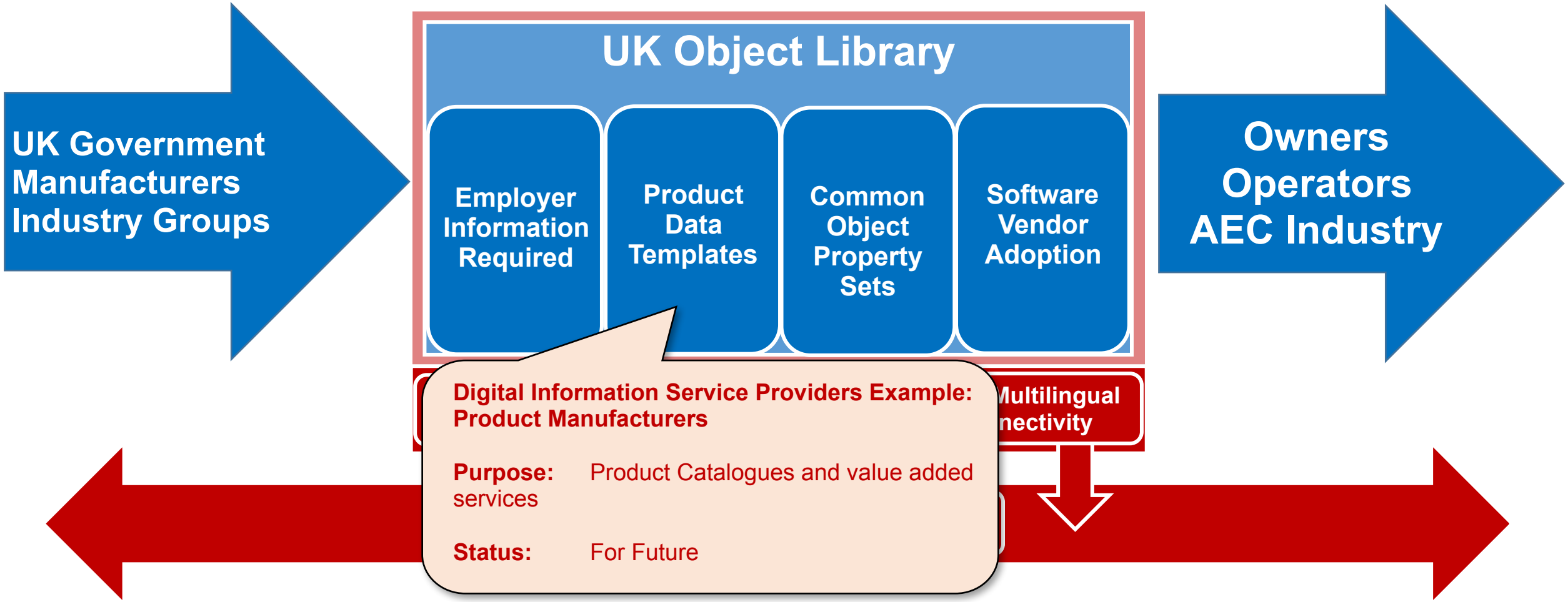
Value Add Services - coBuilder



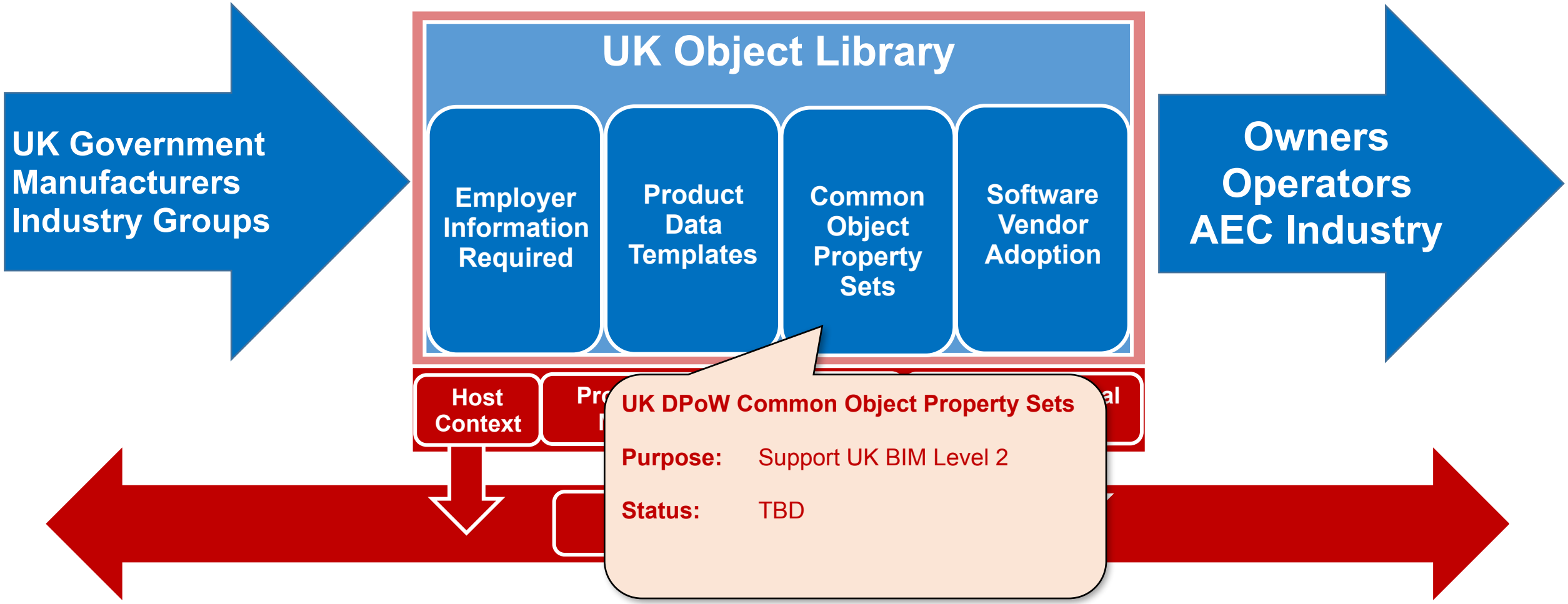
Value Add Services - coBuilder



Value Add Services - coBuilder



Value Add Services - coBuilder



URBAN Modelling

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

LOW CARBON LIVING CRC Brookfield MULTIPLEX BM UNSW AUSTRALIA aurecon AECOM buildingSMART AUSTRALASIA

URBAN Modelling

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

multiple vs single buildings

cadastre & terrain (the link between GIS & buildings)

utilities & services

infrastructure - roads bridges, tunnels etc

statistical & social geo-located data

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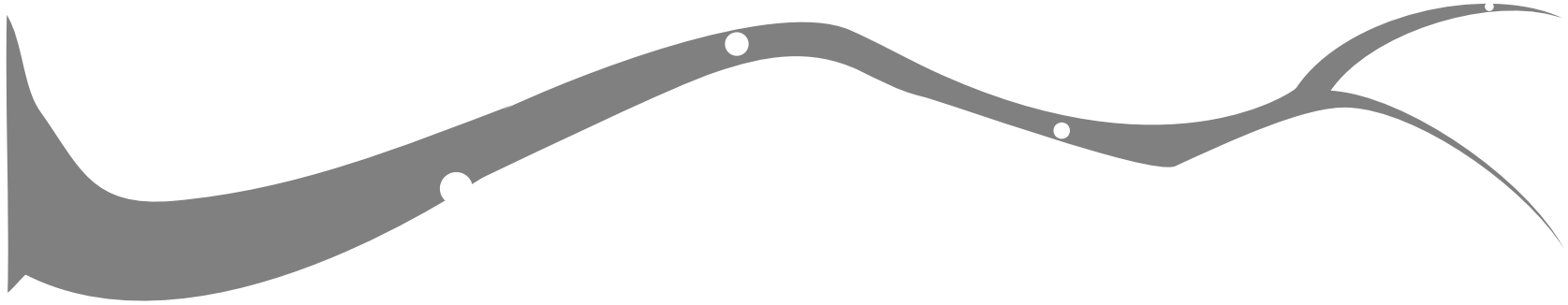
PIM for Low Carbon Management



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Brookfield MULTIPLEX | BM

UNSW AUSTRALIA

aurecon

AECOM

buildingSMART AUSTRALASIA

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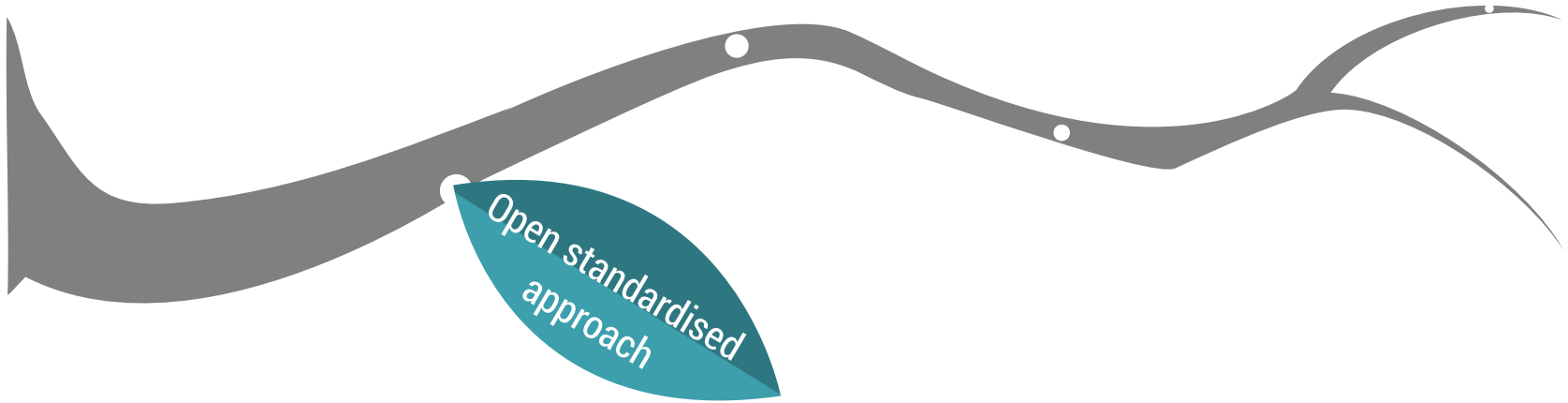

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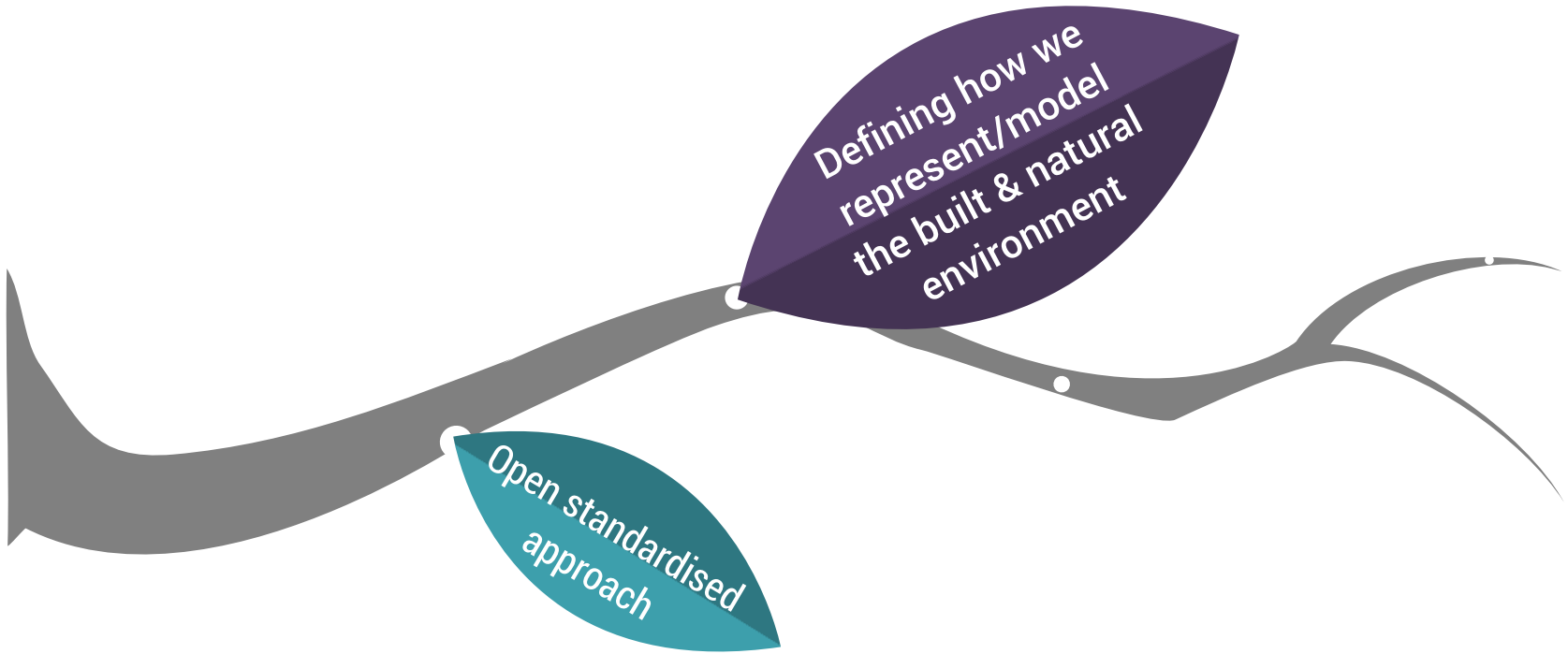

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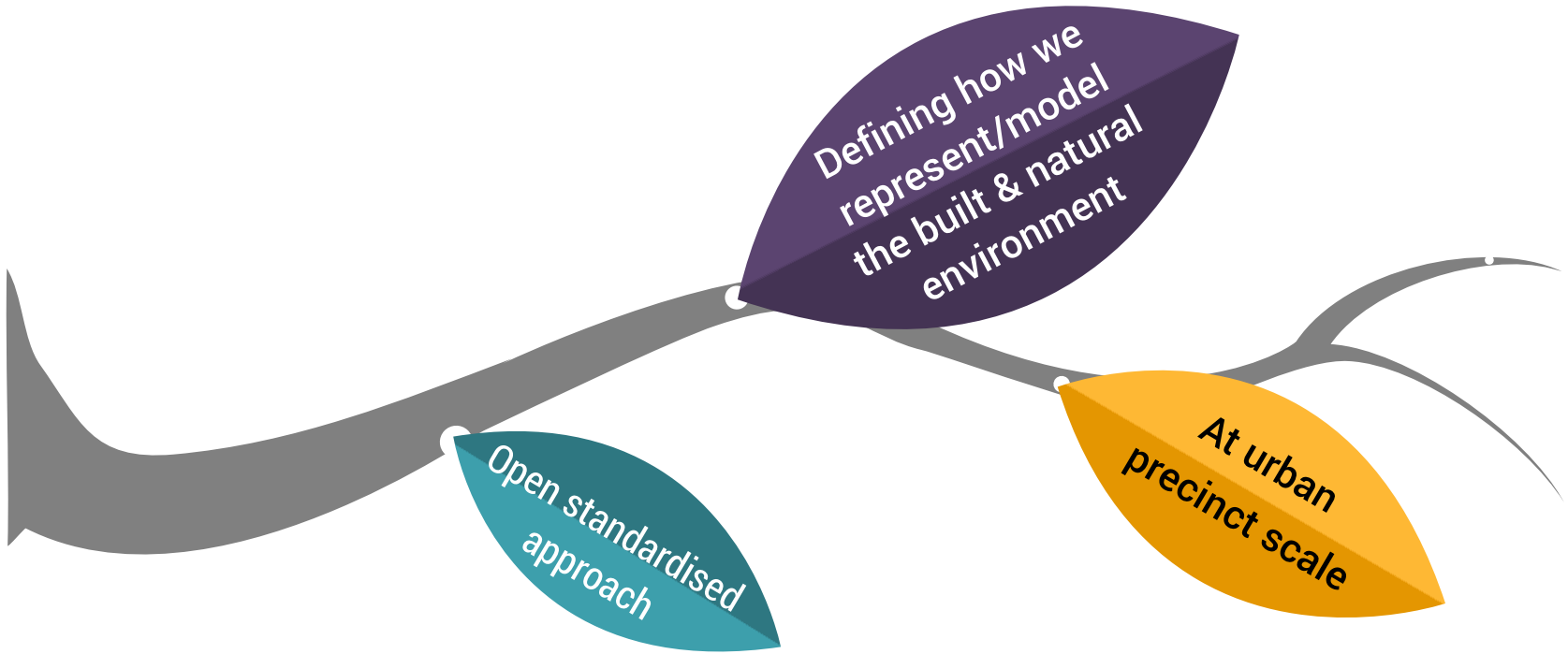

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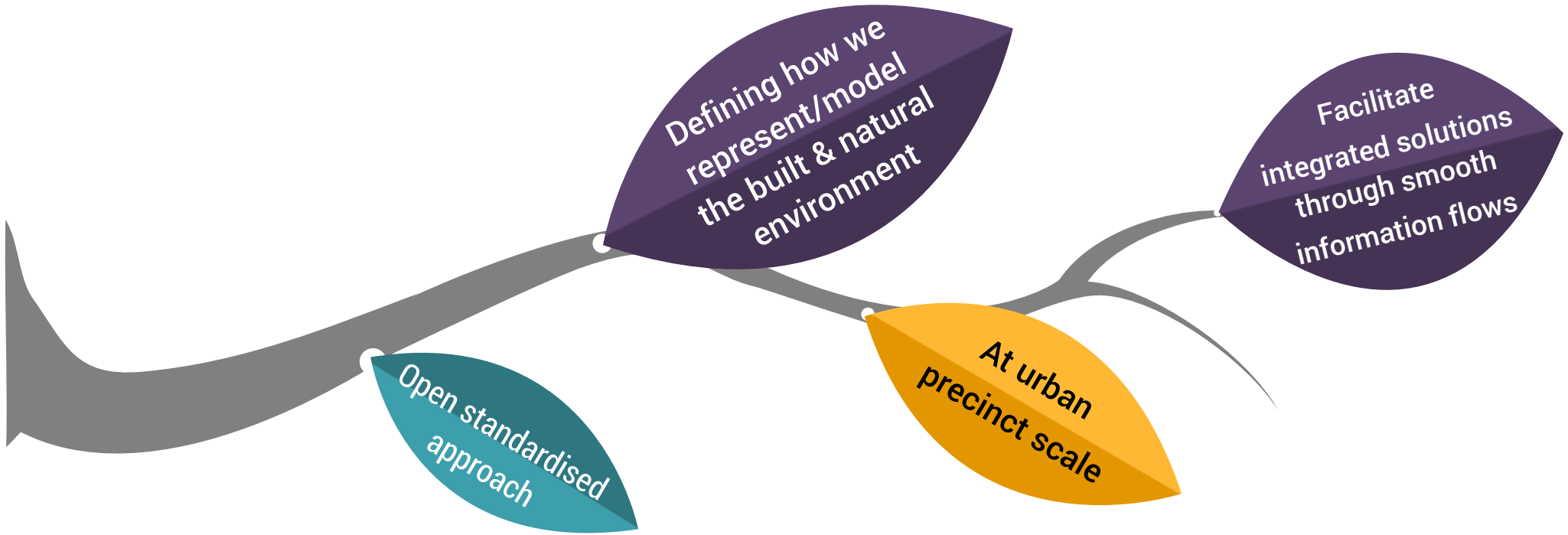

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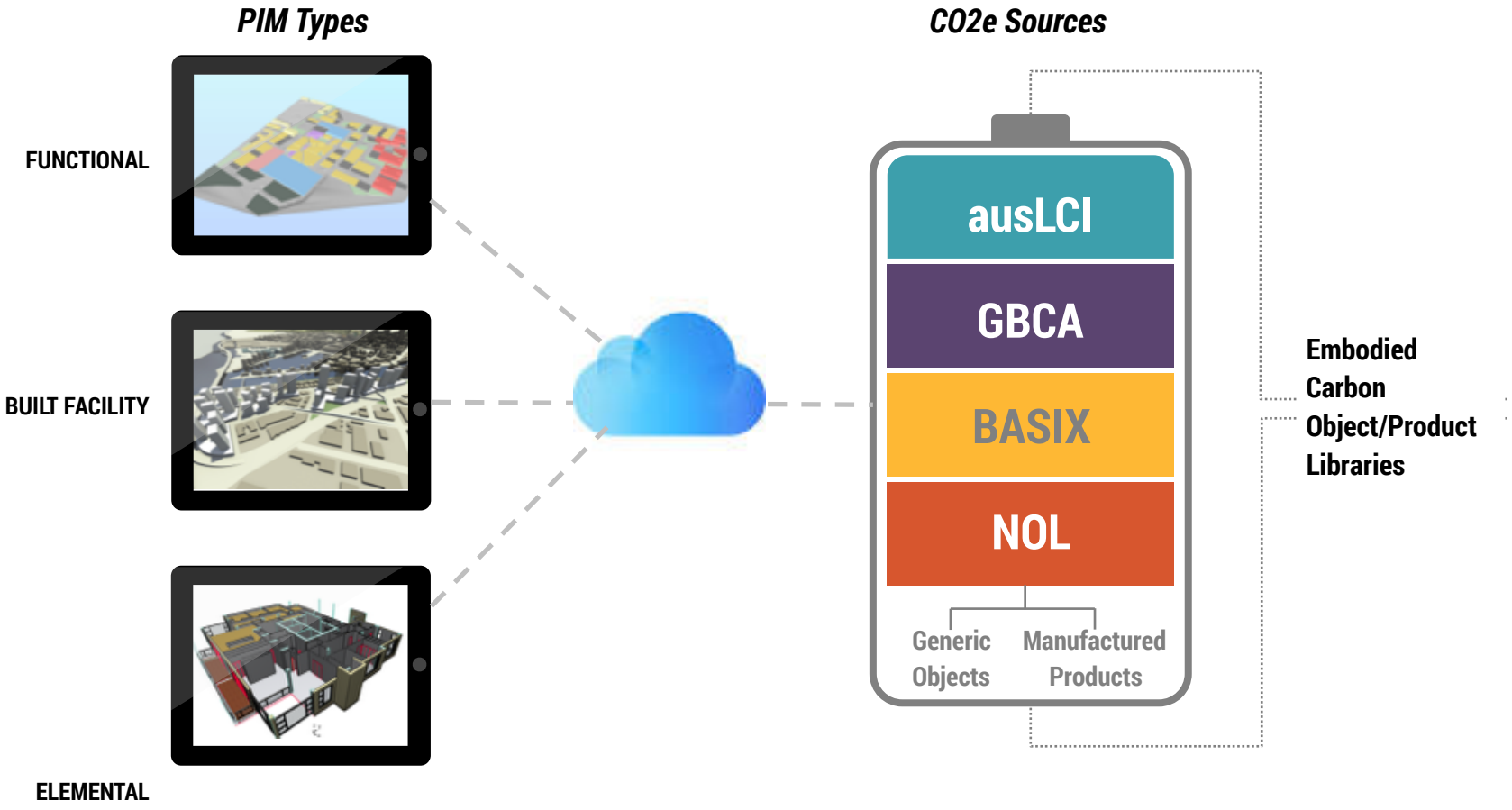
PIM Project - Embodied Carbon Data

Accessing LCI data repositories



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UNSW AUSTRALIA
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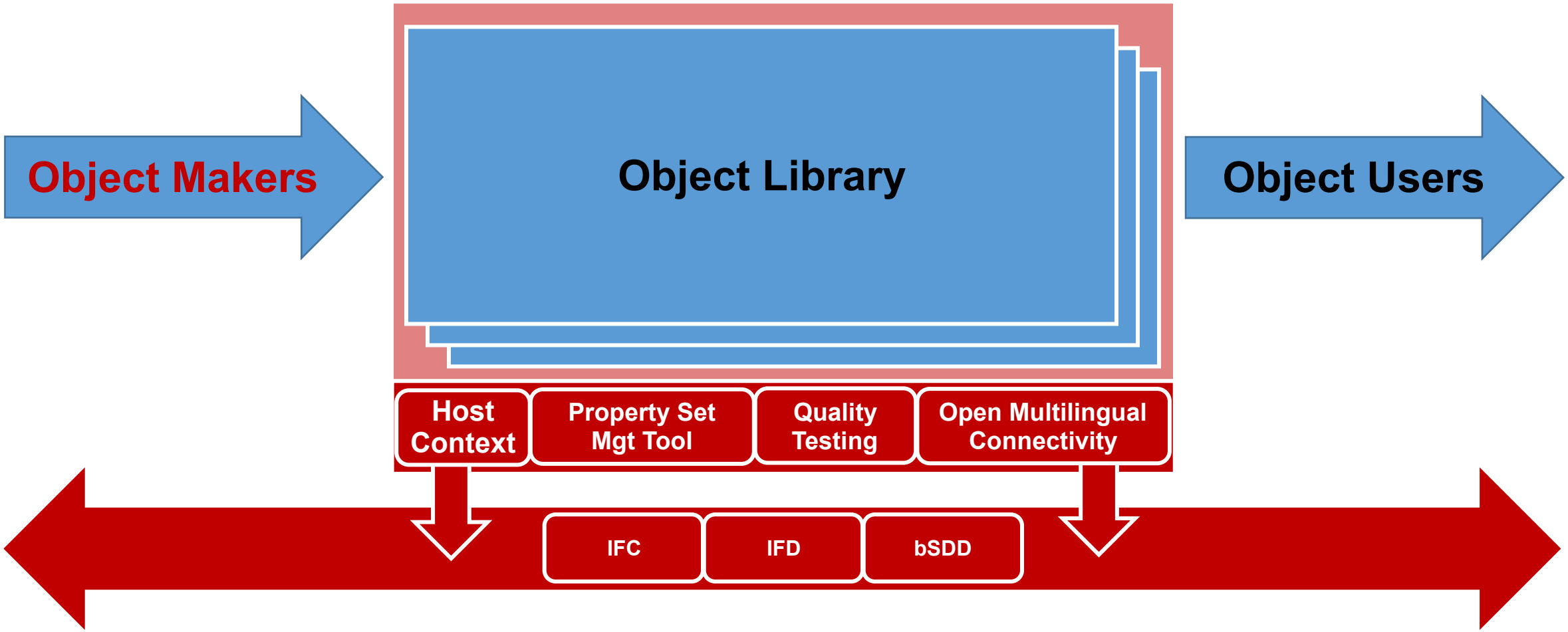
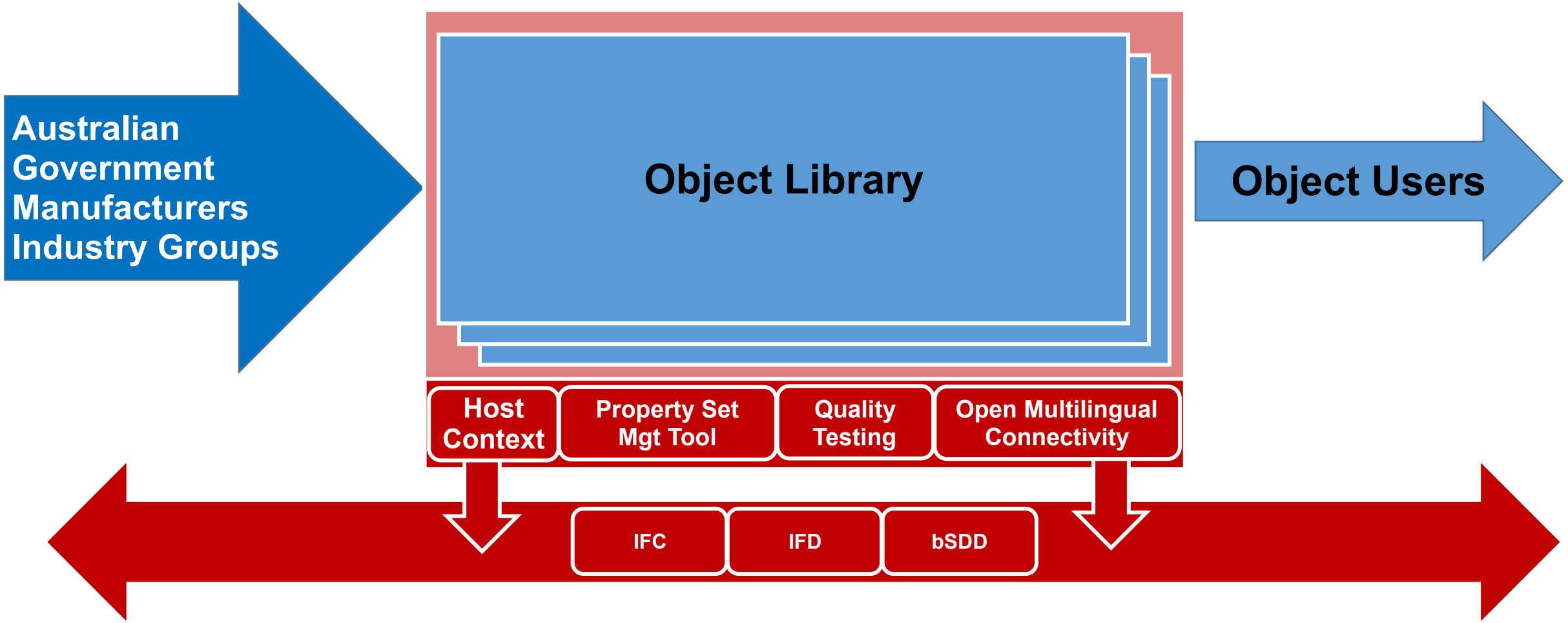
CRCfLCL - PIM at Broadway, Sydney



CRCfLCL - PIM at Broadway, Sydney



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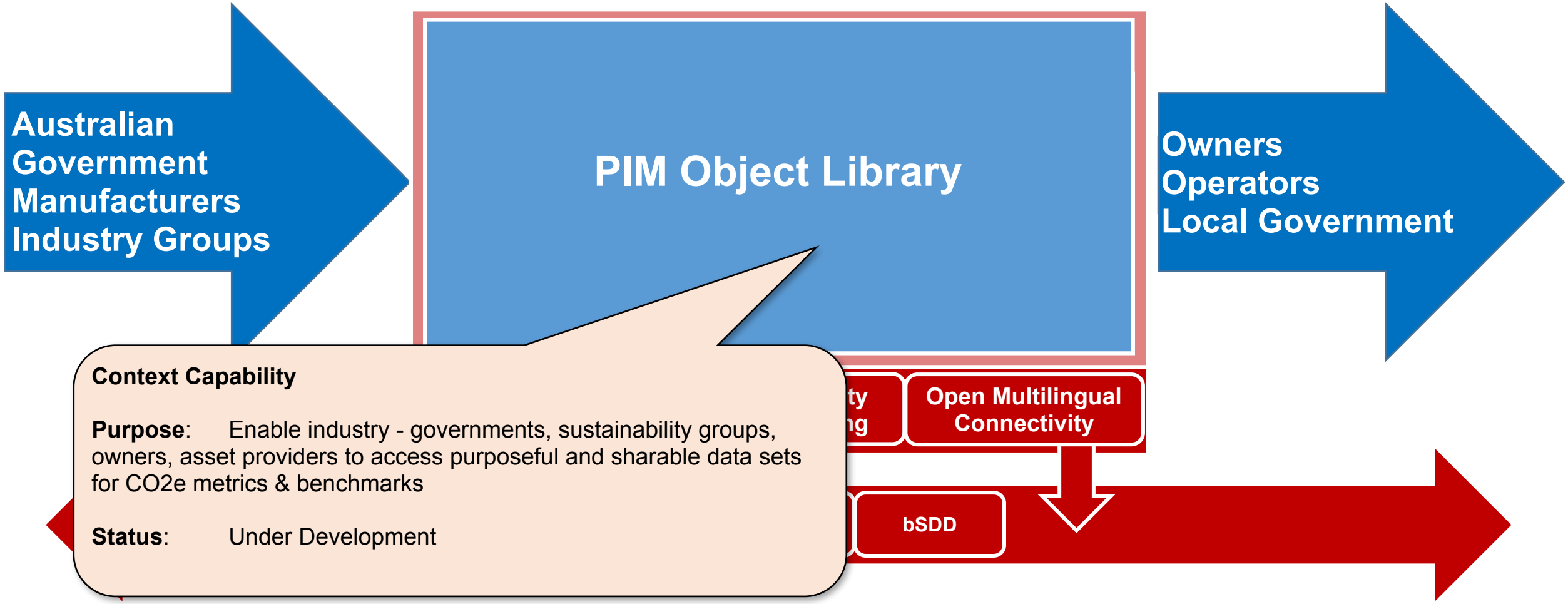

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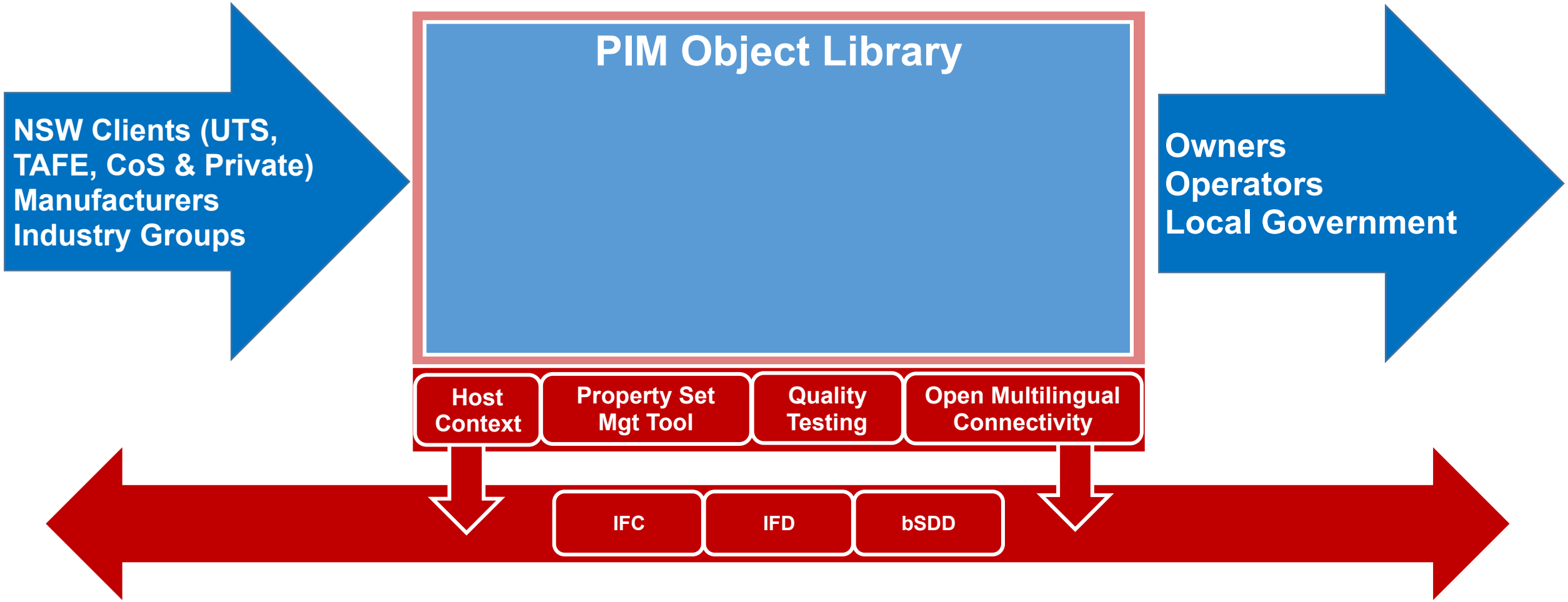

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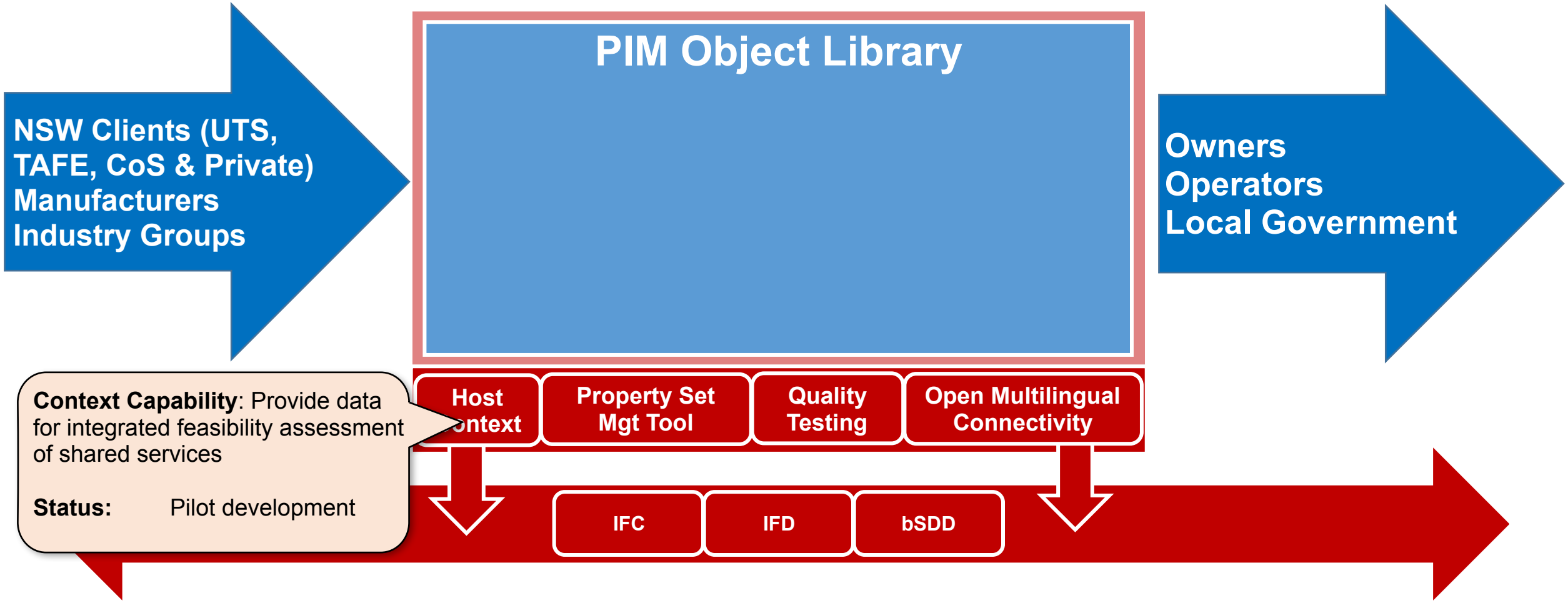

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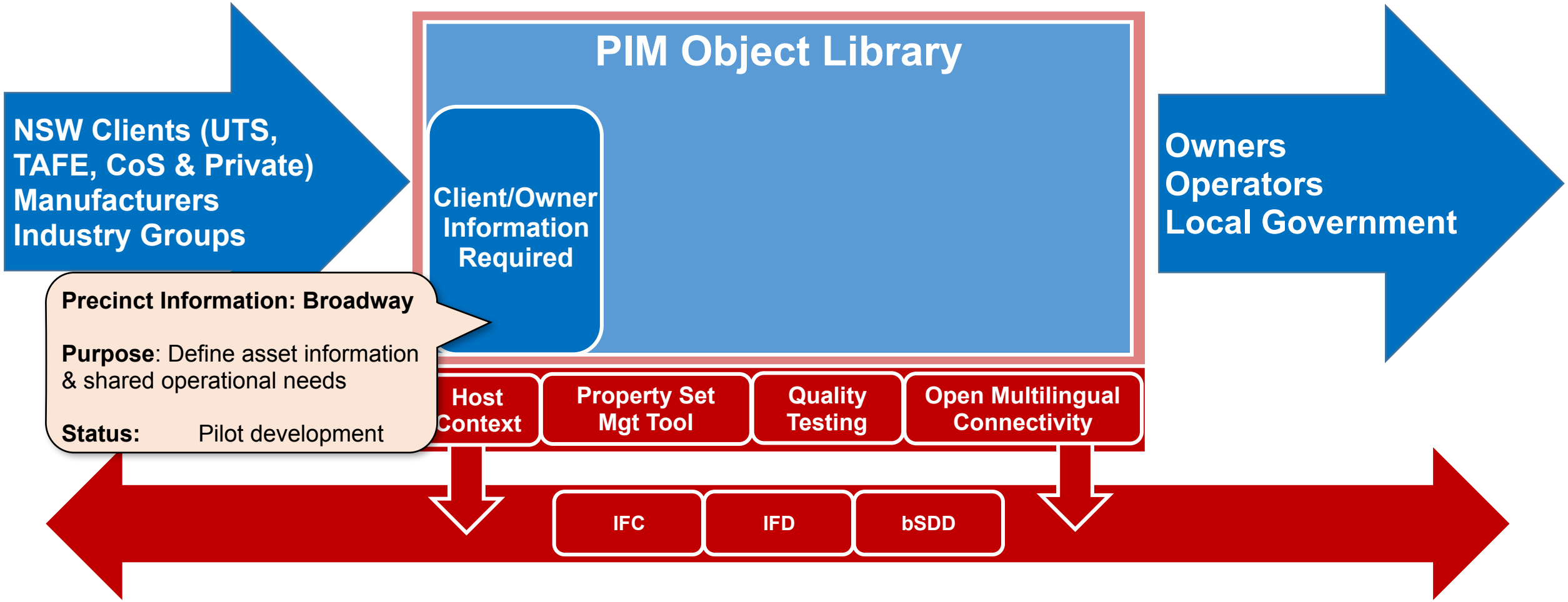

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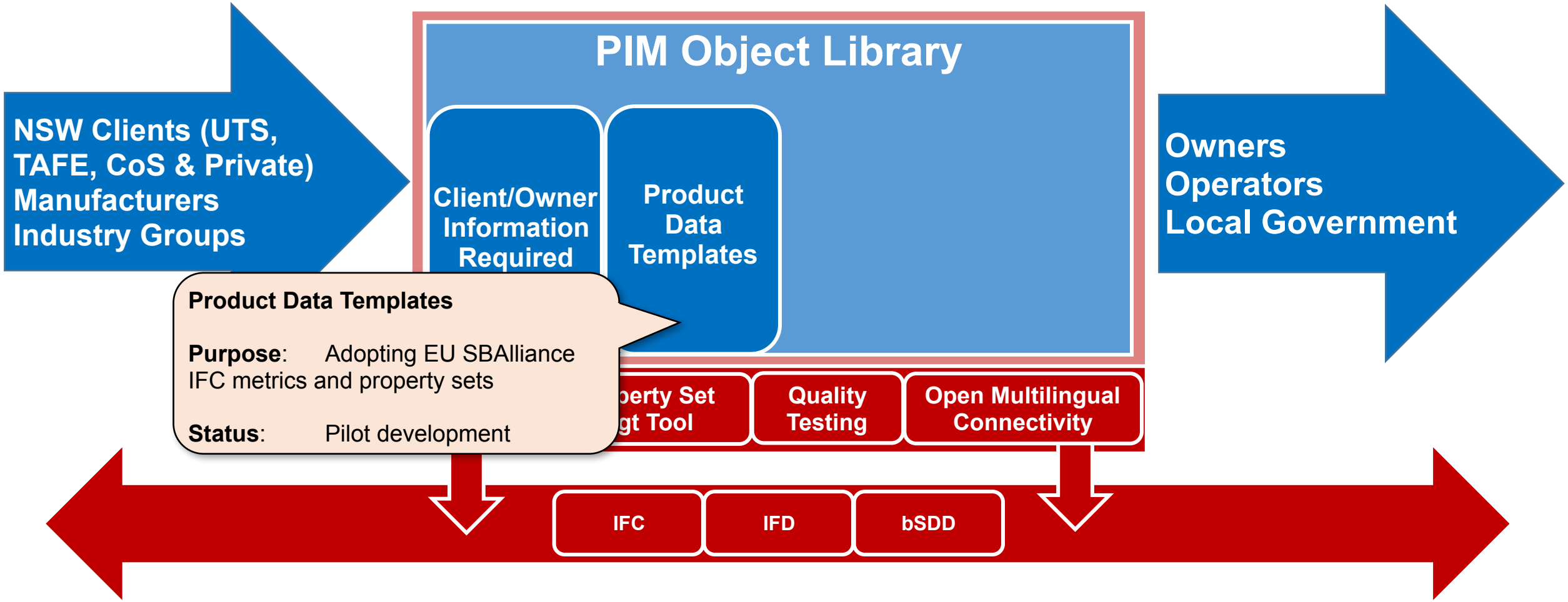

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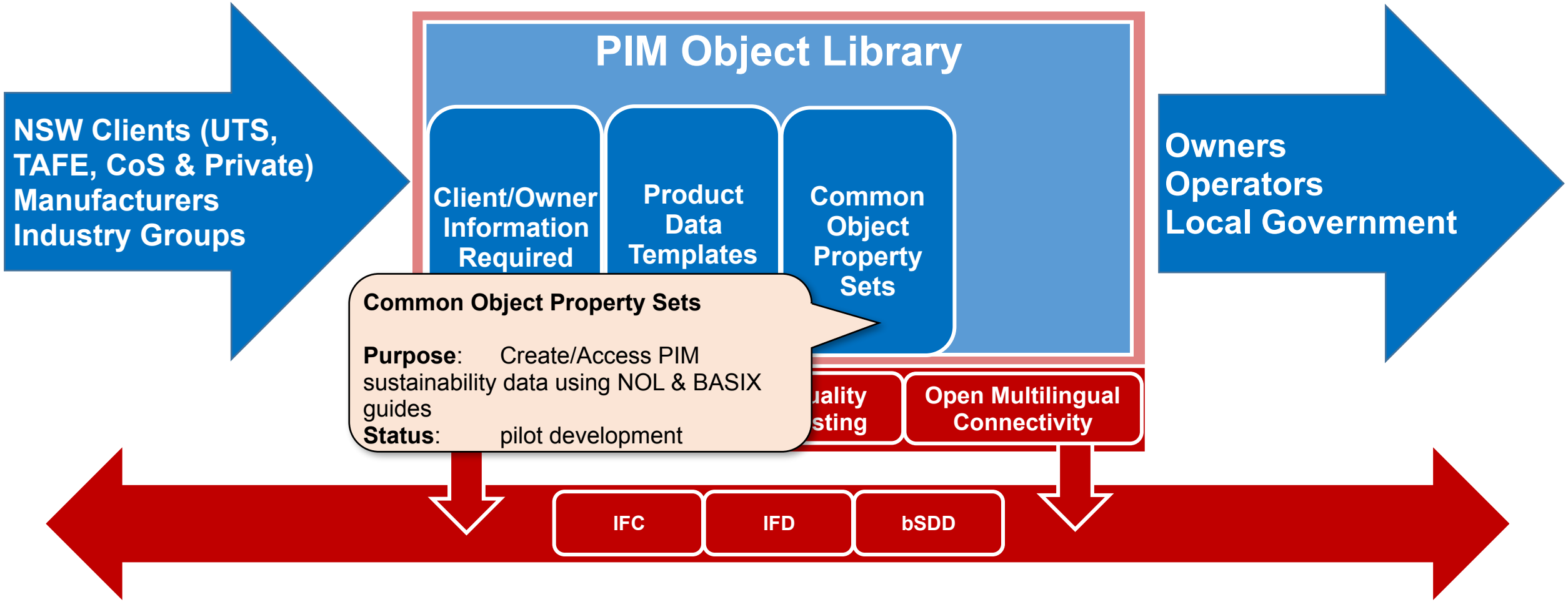

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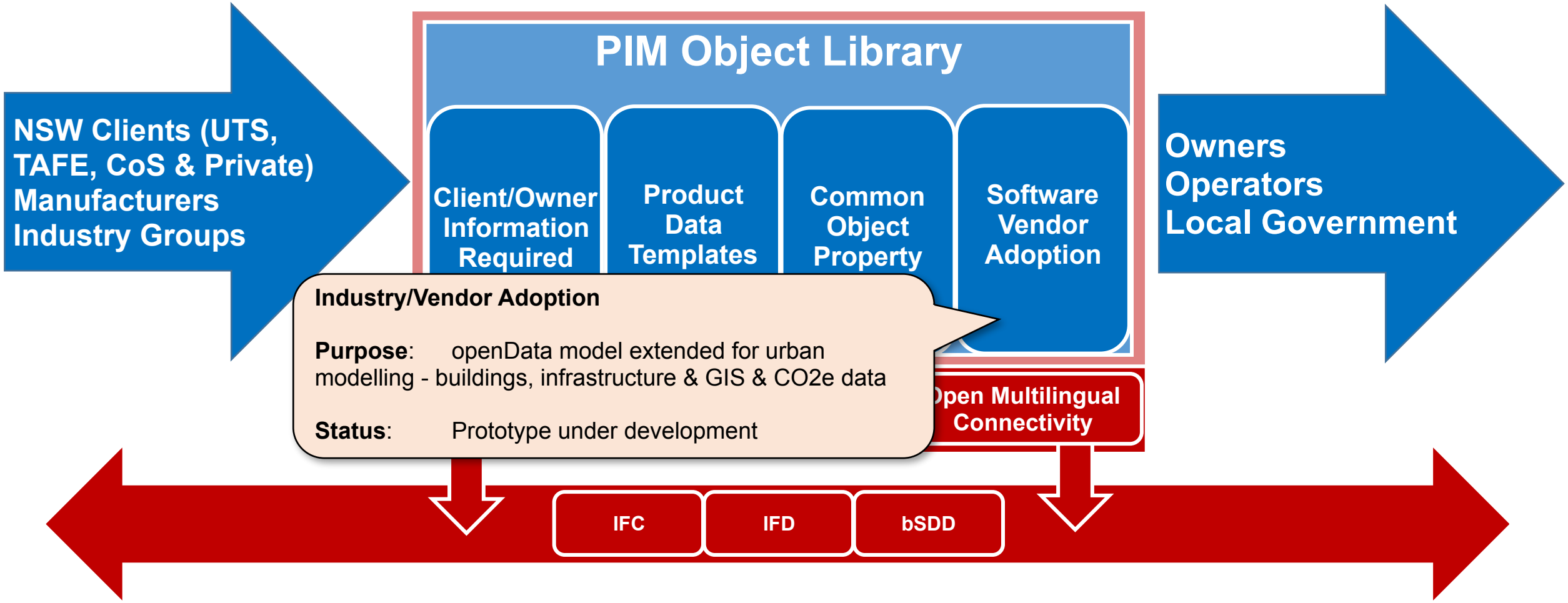

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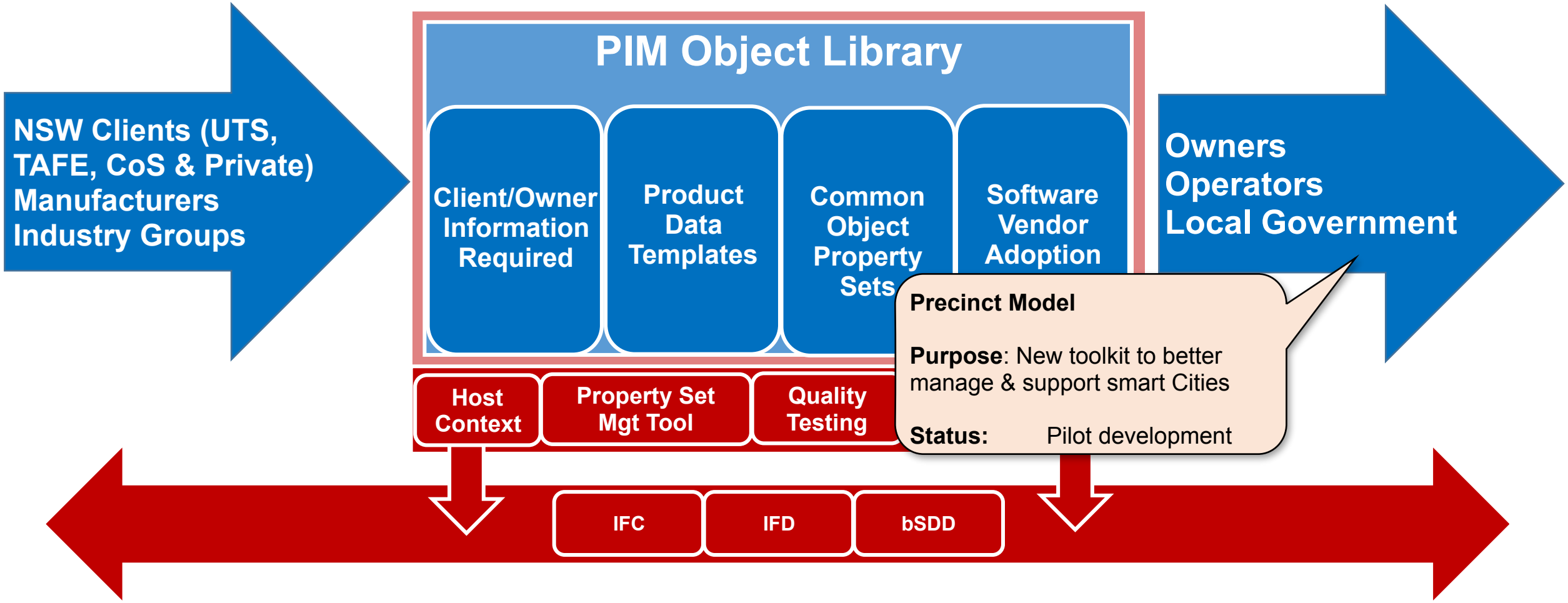
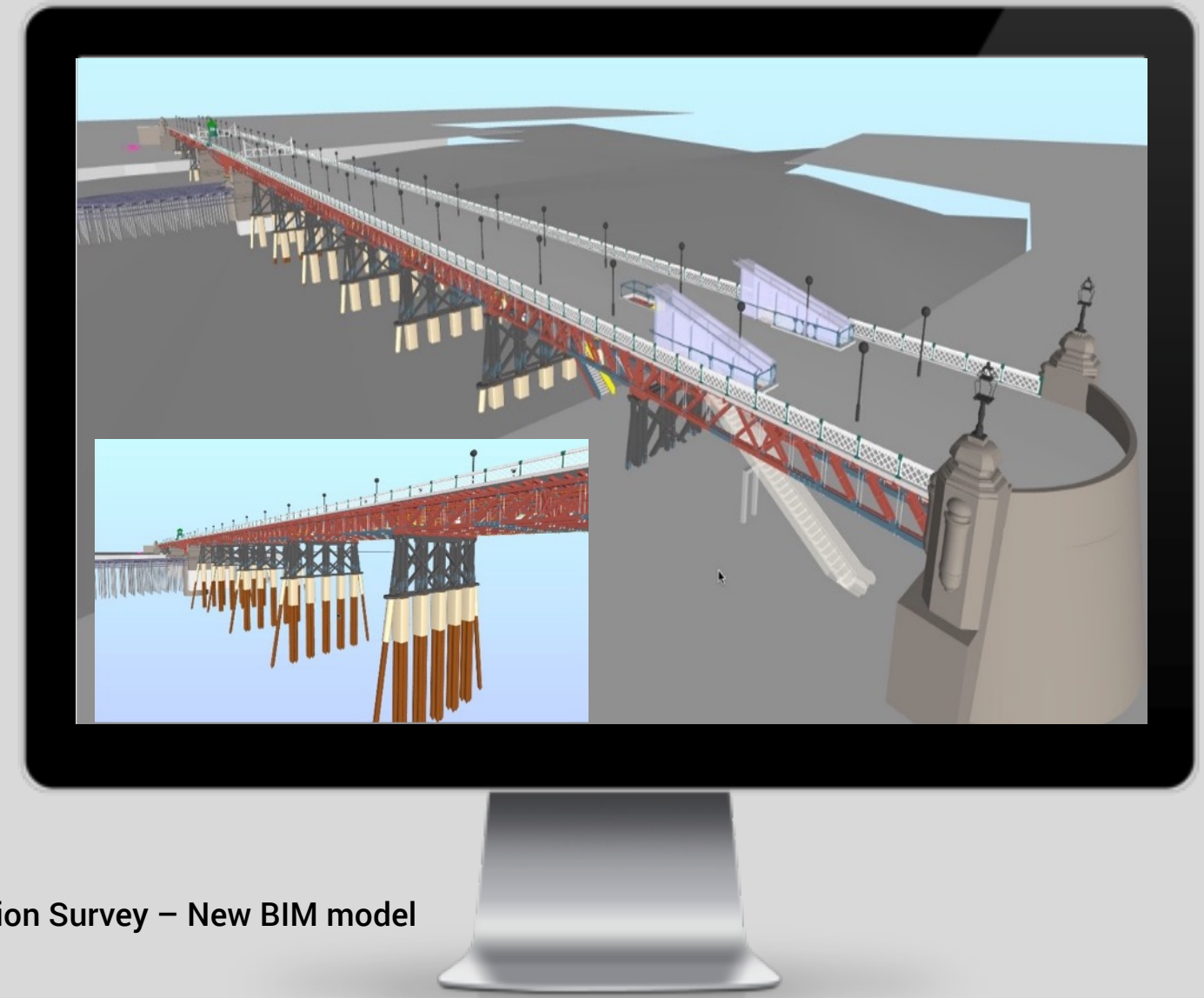
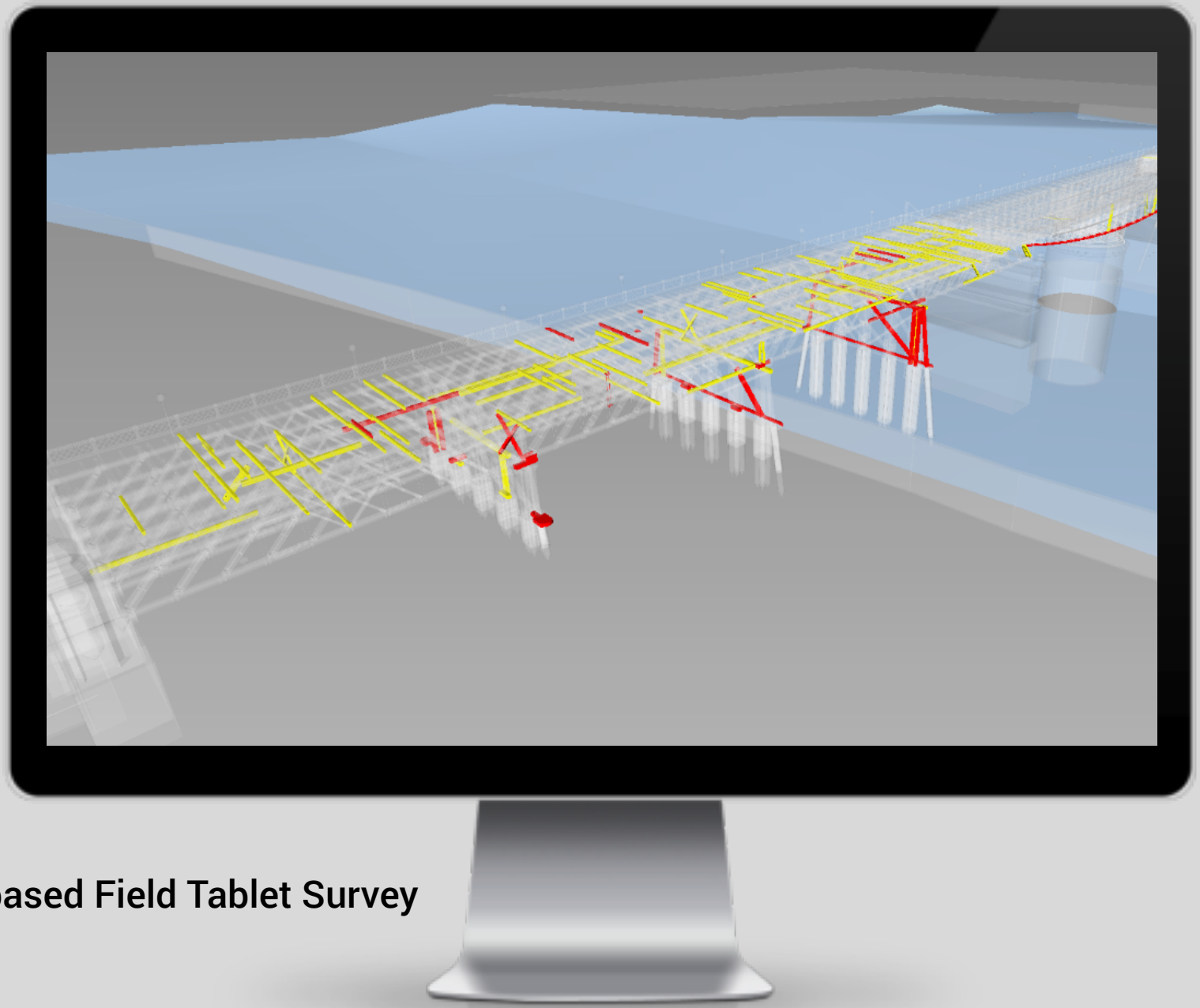


Pyrmont Bridge, Darling Harbour, Sydney

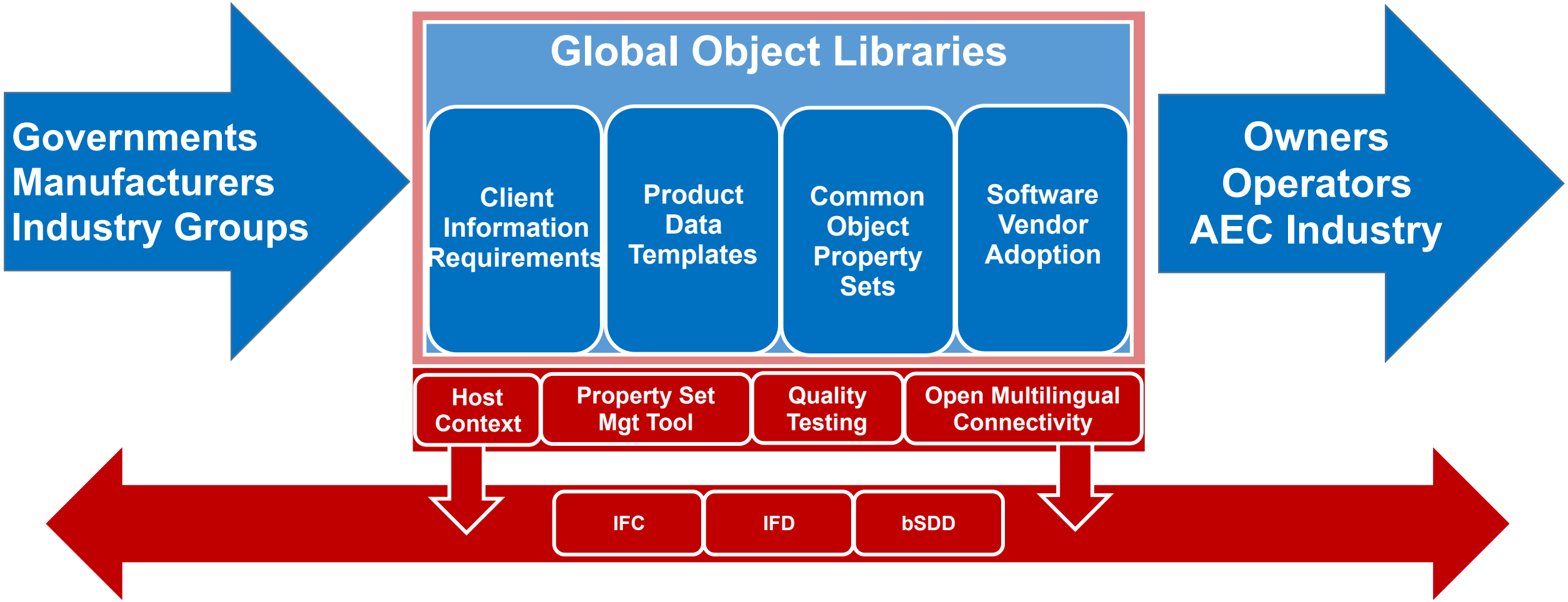


Heritage Bridge requiring Condition Survey – New BIM model



Condition Audit from BIM based Field Tablet Survey

Common Object Platform



Commercial Issues

Implementation + operating costs and the neutrality challenge.

Commercial Issues

Service Propositions

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

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!

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- API & tools are capable of smart implementation

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  - excellent use-cases such as Muigg tool, coBuilder

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- Designer & builders wants clever product data solutions for model building and facility construction

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  - excellent use-cases such as Muigg tool, coBuilder
- Designer & builders wants clever product data solutions for model building and facility construction
  - smart supply chains

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