

OpenBIM per l'approvazione digitale dei progetti. A che punto siamo?

Anna Moreno

Franco Coin

16 Luglio 2020

Agenda

- Building Smart Italy e le rooms – il progetto
- Building Smart International Regulatory Room
- Cosa potrebbe essere/fare la regulatory room Italy

A.Moreno

F.Coin

Workshop

Regulatory Room

Franco Coin

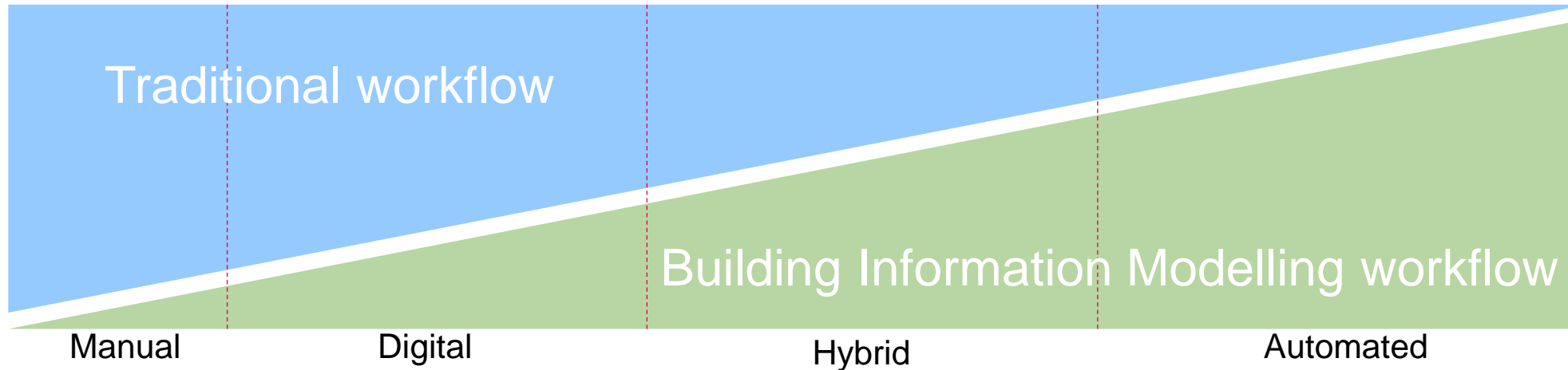


Vision

Automated Regulatory Processes

Strategy

Support gradual change in workflow from manual to automated to safeguard the legal perspective



Objective

The road map have a practical approach using use cases. In a generic regulatory use case all the information is in digital format. The subject of the application is model based and is delivered in international, open standard format. This can be an integrated BIM/GIS model based on IFC, GML or both or other relevant standards. All application data that exist in registries and databases is filled in automatically.

One specific regulatory process is planning and building approval.

Political

- **Regulatory Room roadmap**
 - led by Tomi Henttinen
- **Regulatory Room message**
 - led by Franco Coin

What are the next steps?

Commercial

- **E-submission guideline report**
 - led by Masaki Muto
- **Business case for automated regulatory compliance report**
 - led by Tamir El-Diraby

What are the next steps?

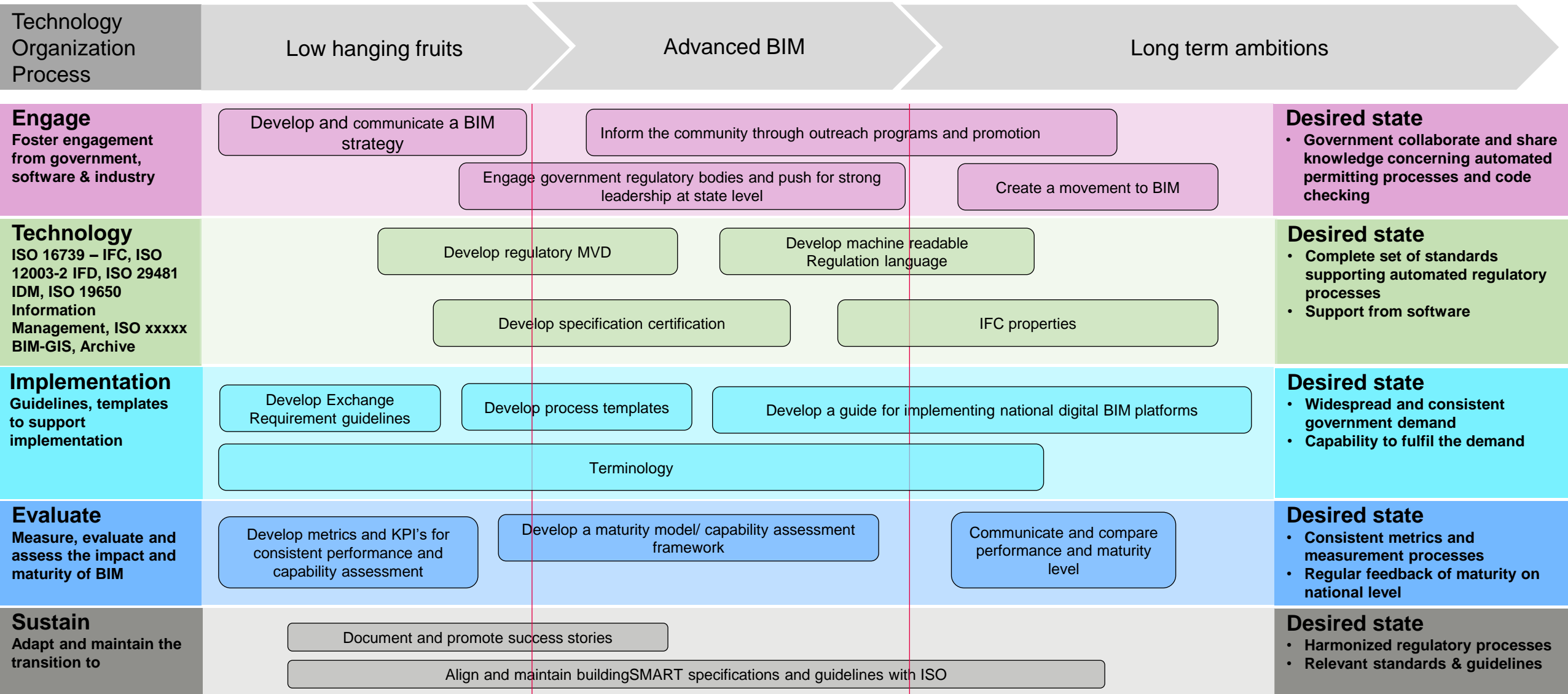
Technology

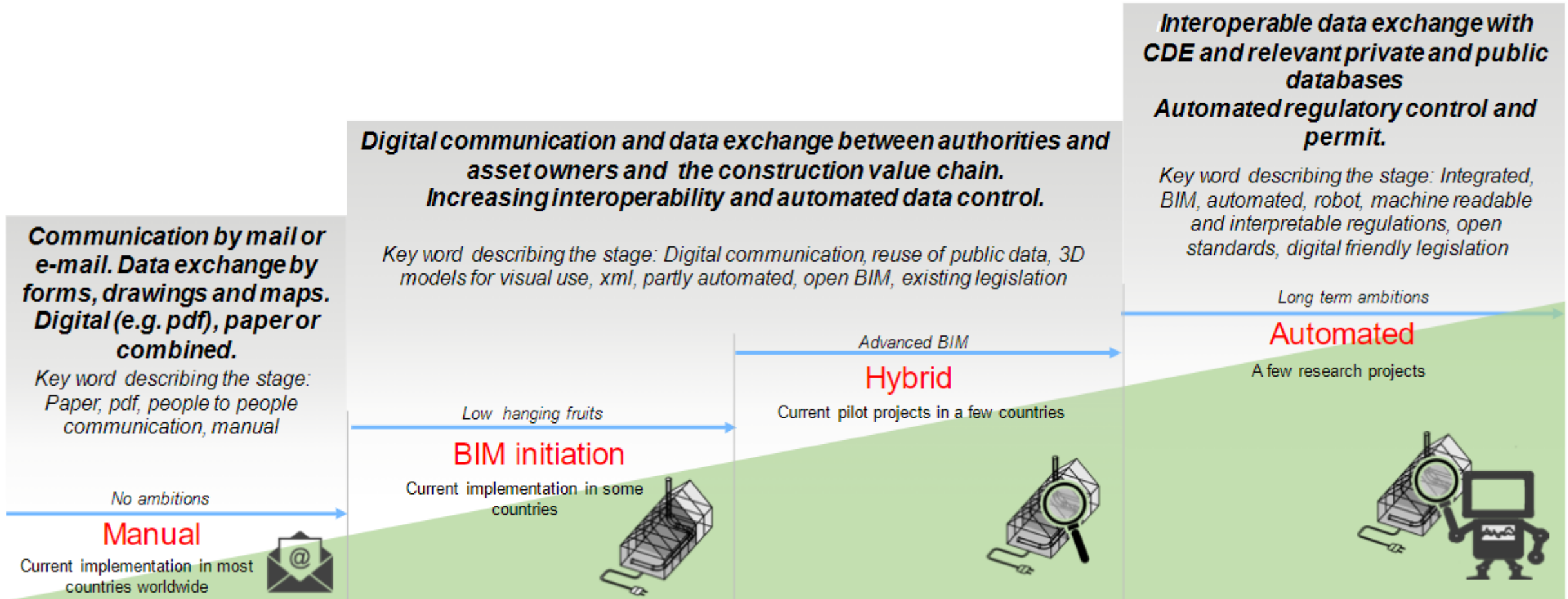
- **Rule Interoperability report**
 - Led by Nicholas Nisbet
- **Application Forms report**
 - led by Nicholas Nisbet

What are the next steps?

Roadmap to automated regulatory processes in construction through BIM

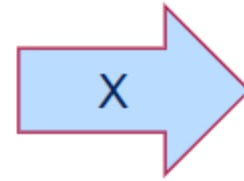
Inspired by buildingSMART Canada Roadmap





Terms and Definitions

Project	Name of the Project
Presenter	Name and organization of the presenter
Event	Event where the project was presented
AME rating	Combination of evaluation of the Matrix Cube
Open BIM	Level 3 = fully integrated Level 2 = extensive, Level 1 = some, Level 0 = none,



Implemented

Solution that is in every-day use or widely shared and can be used without external guidance.

Pilot

Project that is in testing phase or close to implementation.

Research

Proof of Concept, research or a study project.



Code Checking

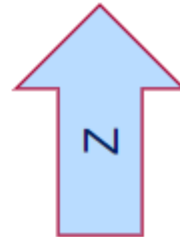
This is the level of auto code checking by computer, the value of BIM property is used for holistic code checking.

Information flow

This is the intermediate level between Visualized and Automated Code Checking, the value of BIM property is actively used for specific code checking.

Visual Use

This is the level of the jury expects the function of Visualize of BIM model, the value of BIM property is not actively used.



Long Term Ambitions

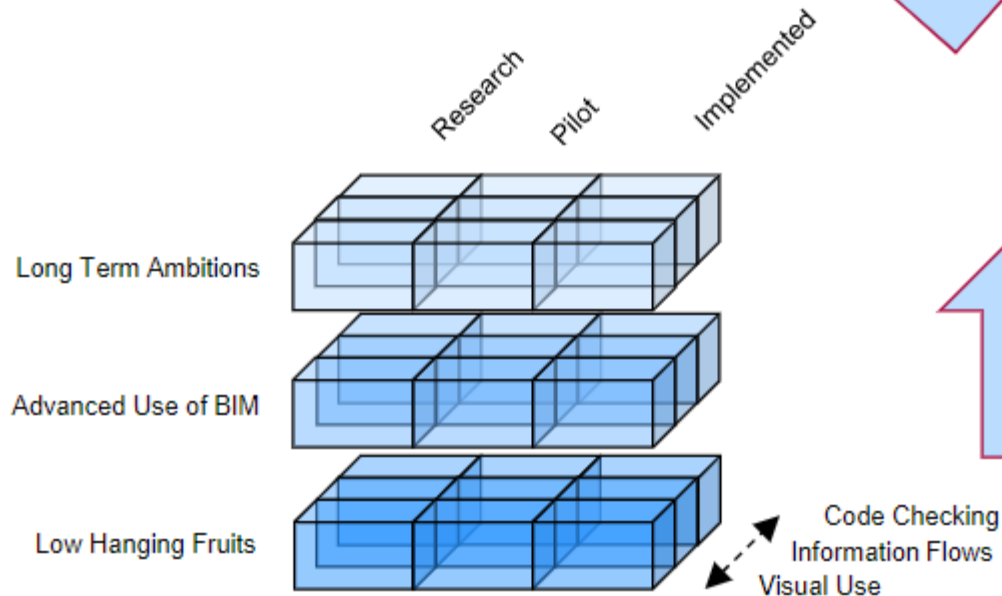
the information exchange between the applicant and the Building Authority is automated and manual procedures are completely eliminated. Therefore, machine-readable laws, integration of information necessary for review into BIM models, and Open Standard that does not depend on the software environment must be prepared.

Advanced Use of BIM

The scope of information exchange at this stage is not necessarily holistic, and manual procedures may be present in some procedures. In that sense, the use of BIM is advancing more than BIM initiation level.

Low Hanging Fruits

The use of BIM at this stage can be limited to necessary parts and it can be said that it is a stage where solution can be easily solved for practical implementation



Message to regulator

session exercise in Beijing

WHY

Reliability

Avoid legal issues

Better Services

Harmonize

Society Game Changer

Fast

Enhance participation

Transparency

Improve Reputation

**OPEN BIM is the language to talk with citizens
+ OPEN RULES**

HOW

Use cases

Creating consensus

NOrms

WHAT

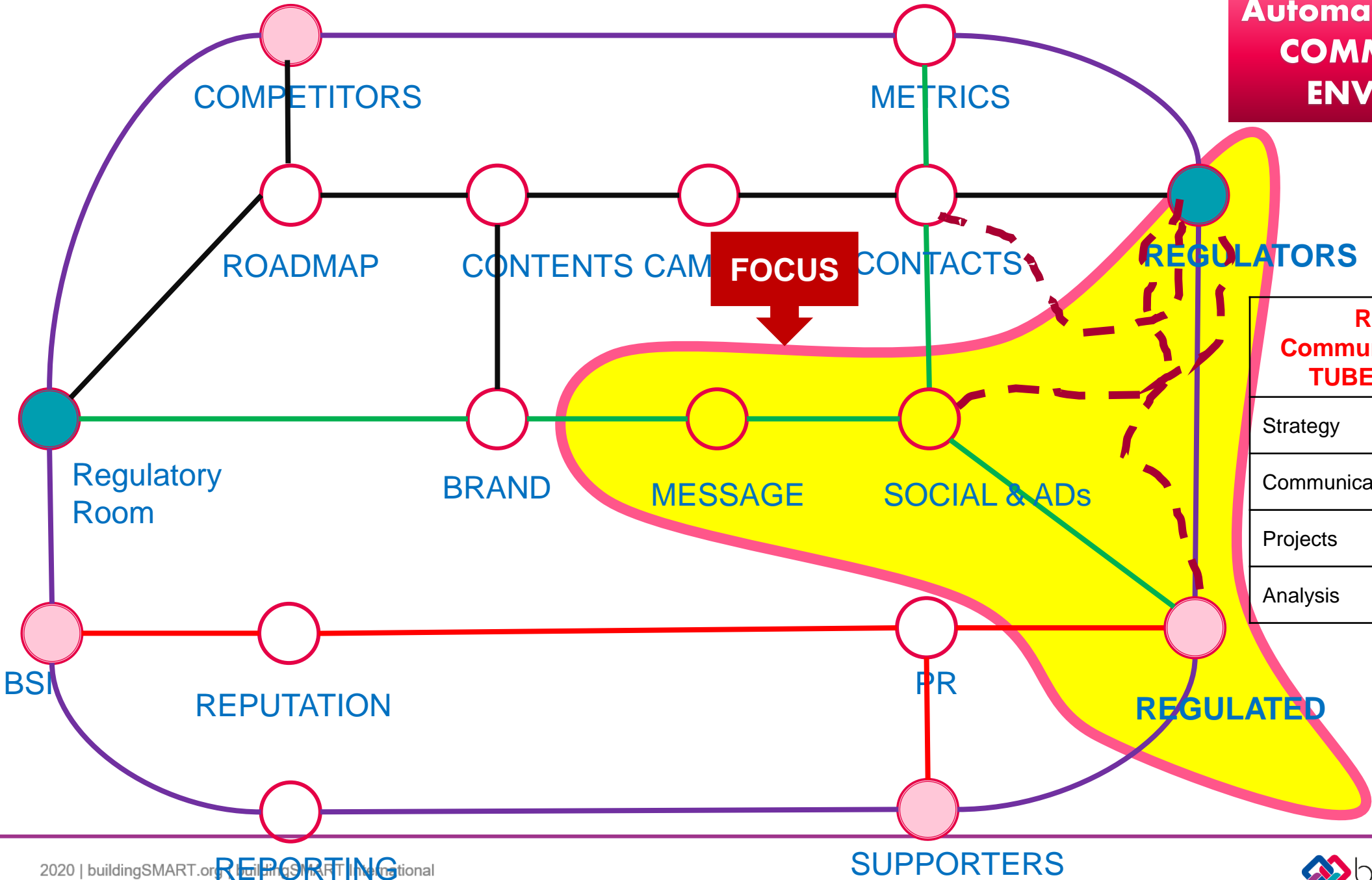
Faster digitalization

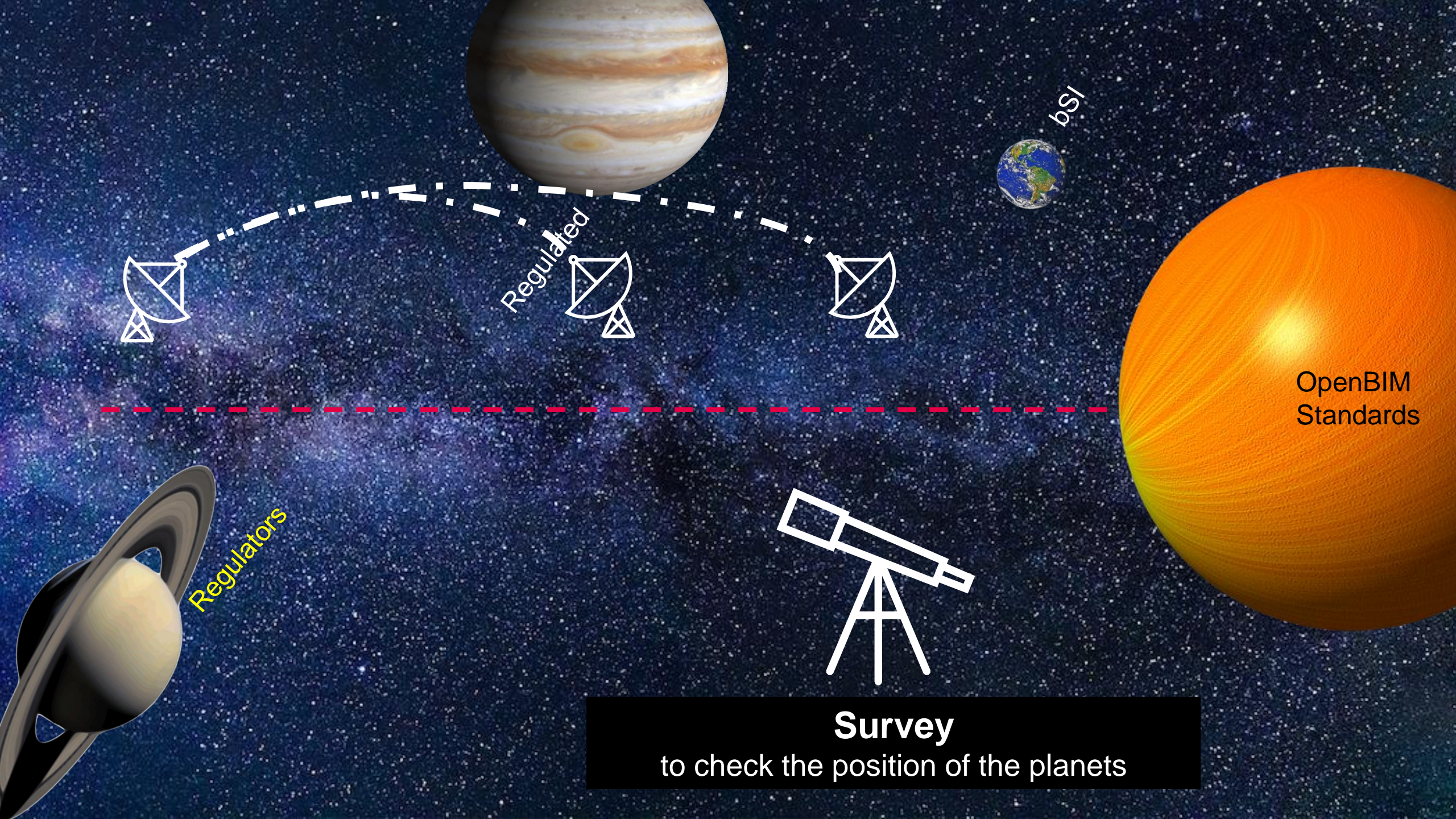
Control

Efficiency

Accuracy

Automated regulatory
**COMMUNICATION
ENVIRONMENT**





Regulated

bSI

OpenBIM
Standards

Regulators

Survey
to check the position of the planets

WEB Survey

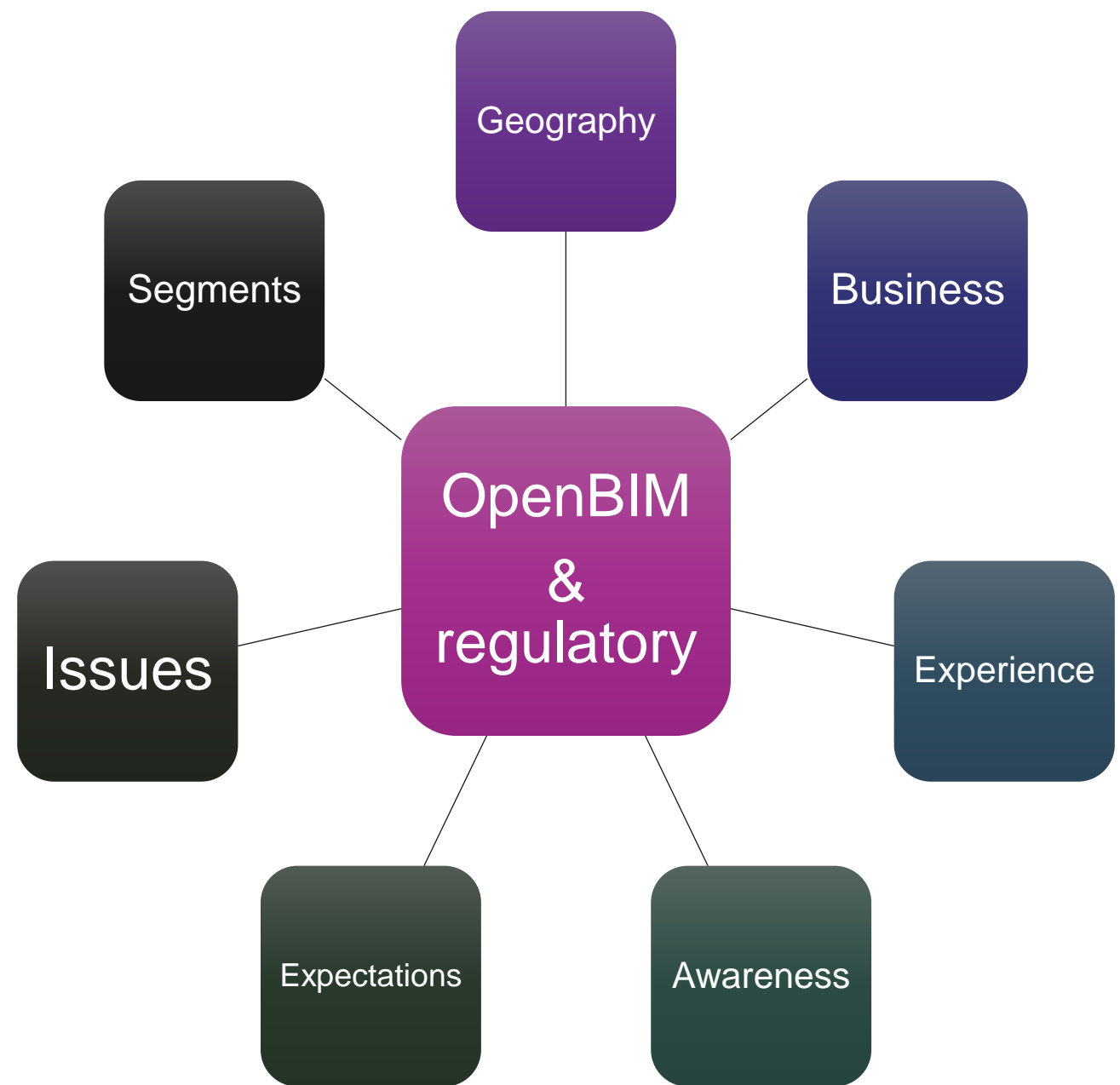
The role of Open BIM in the regulatory process

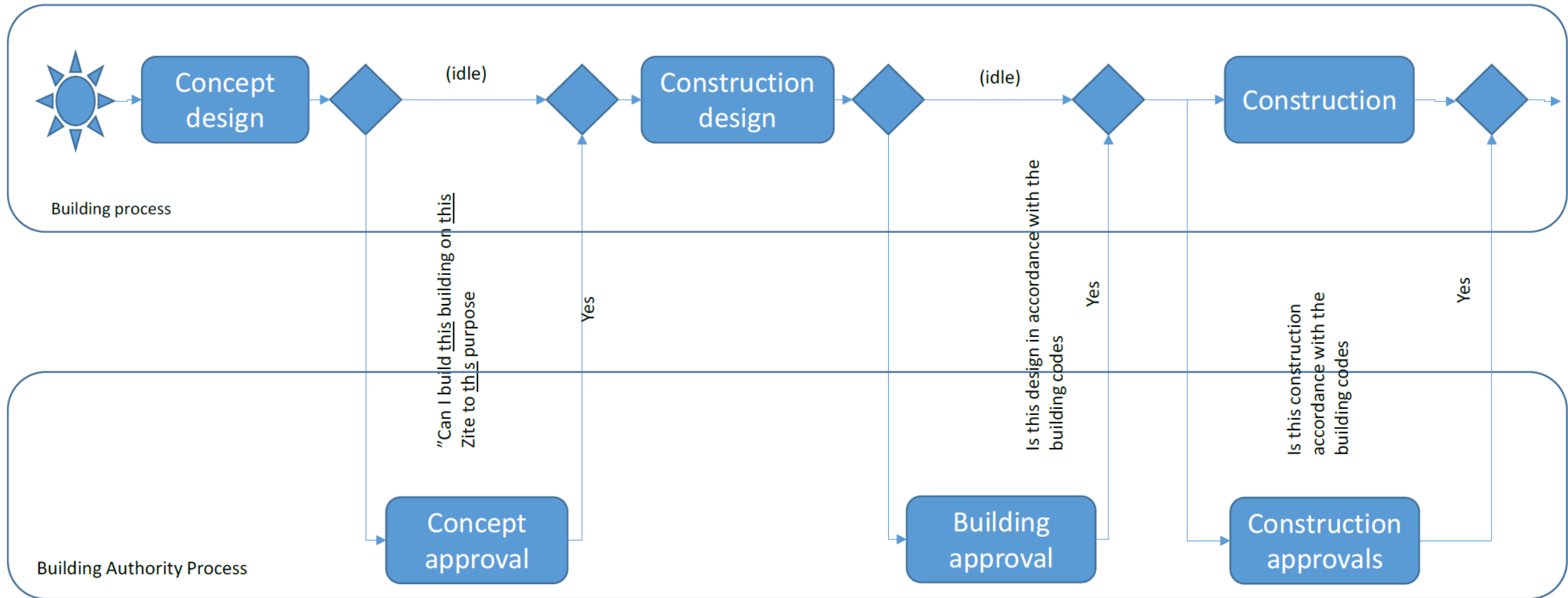
17 questions to BSI members

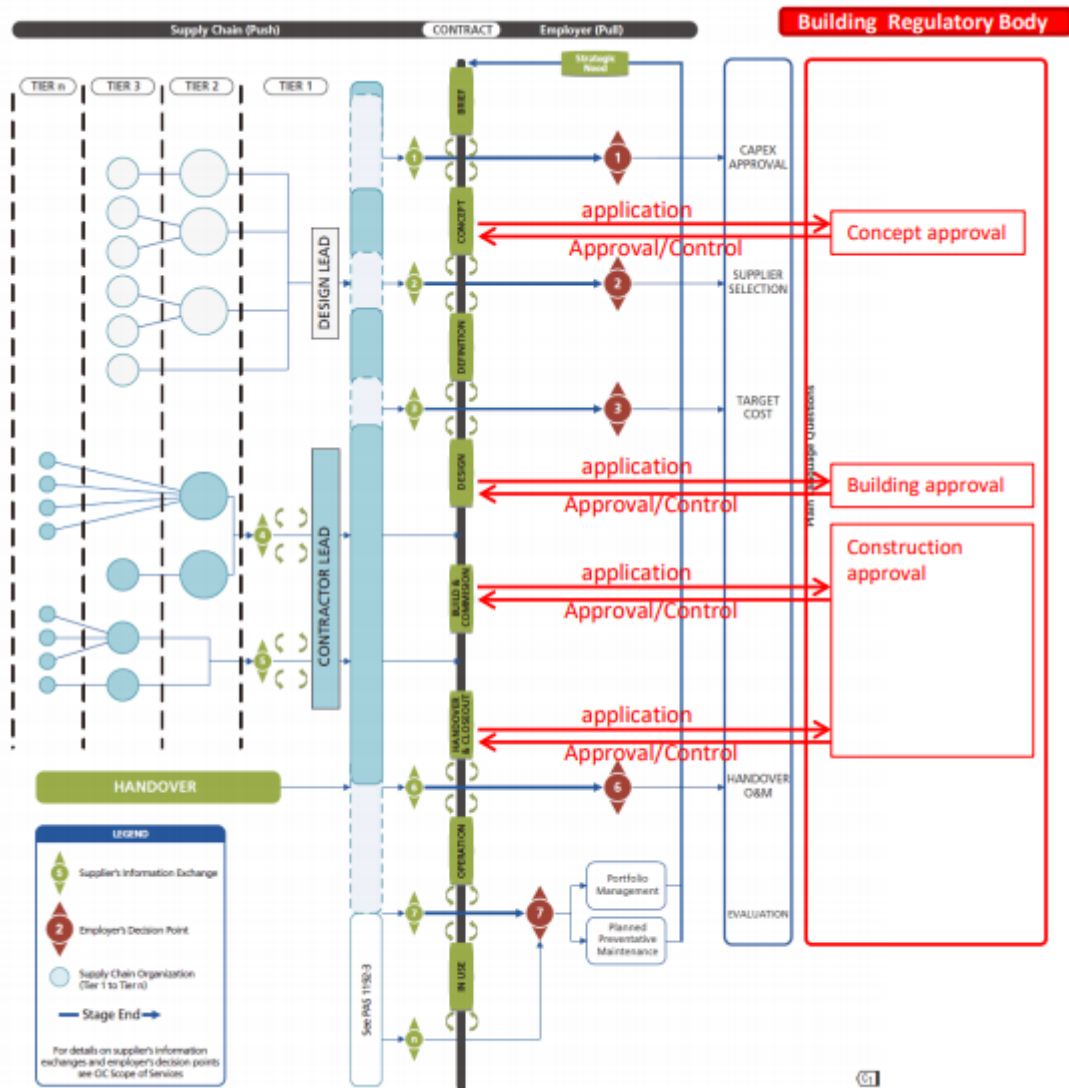
Collecting data from regulators and regulated

Data Analytics

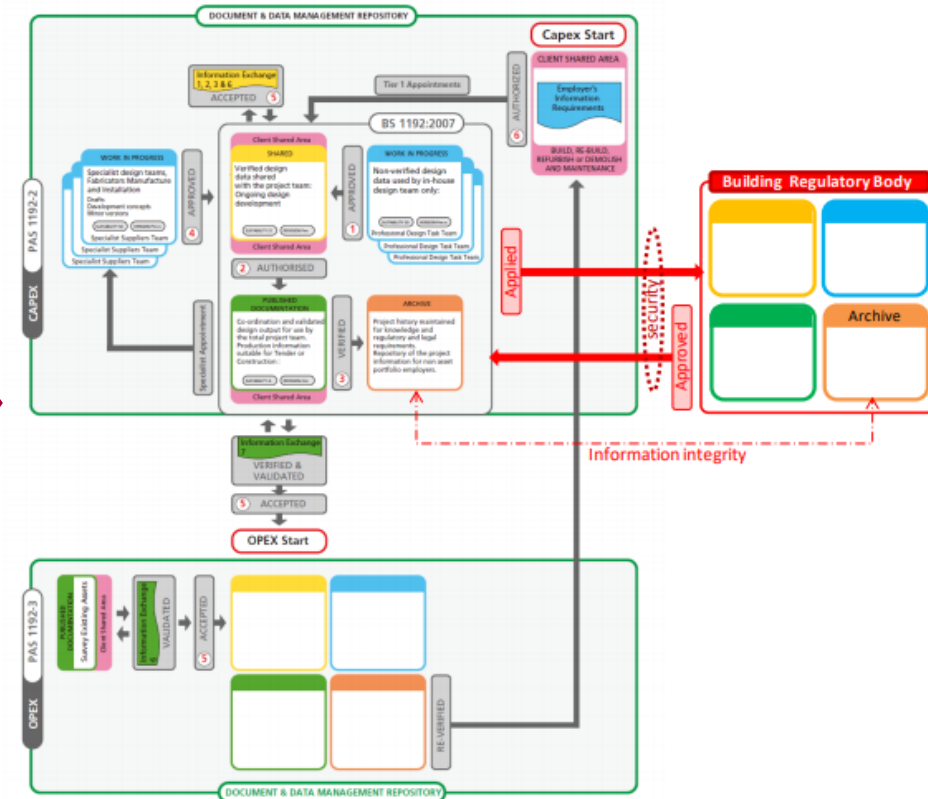
- Metrics have been designed to measure attitudes and perceptions for OpenBIM in the regulatory .
- Dimensions will be used to compare and report collected data (→)







CDE Extension



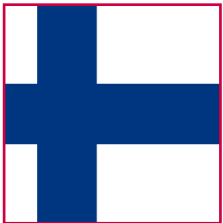
NOTE Copyright is claimed in this illustration. Reproduction of this illustration and making products from it might infringe that copyright. Details of the copyright owners can be found in the Foreword.

E-submission Platforms



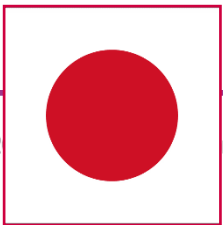
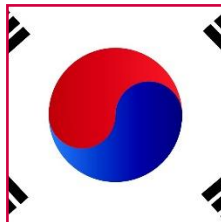
Singapore :
CORENET
(2000-)/e

Planchek (2004-)
Norway :
ByggSøk (2003-)



Finland : Tekra-
GIS Lupapiste.fi
(2012? -)

Korea :
SEUMTER
(2002? -)



Japan : for small
wooden houses
(2015-)

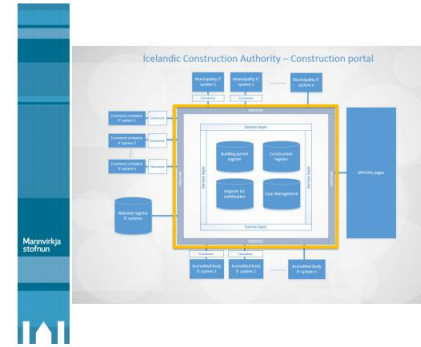


Fig. 7 case of Iceland



Governmental mandate

Boverket

- Digital first
- Prerequisite for digital detailed development plan



Fig. 8 case of Sweden



New workflow management of building paperwork

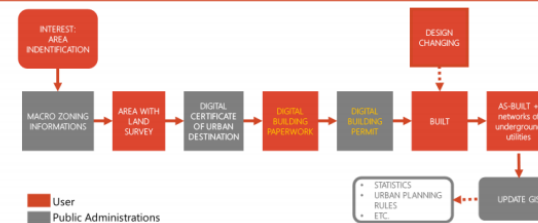
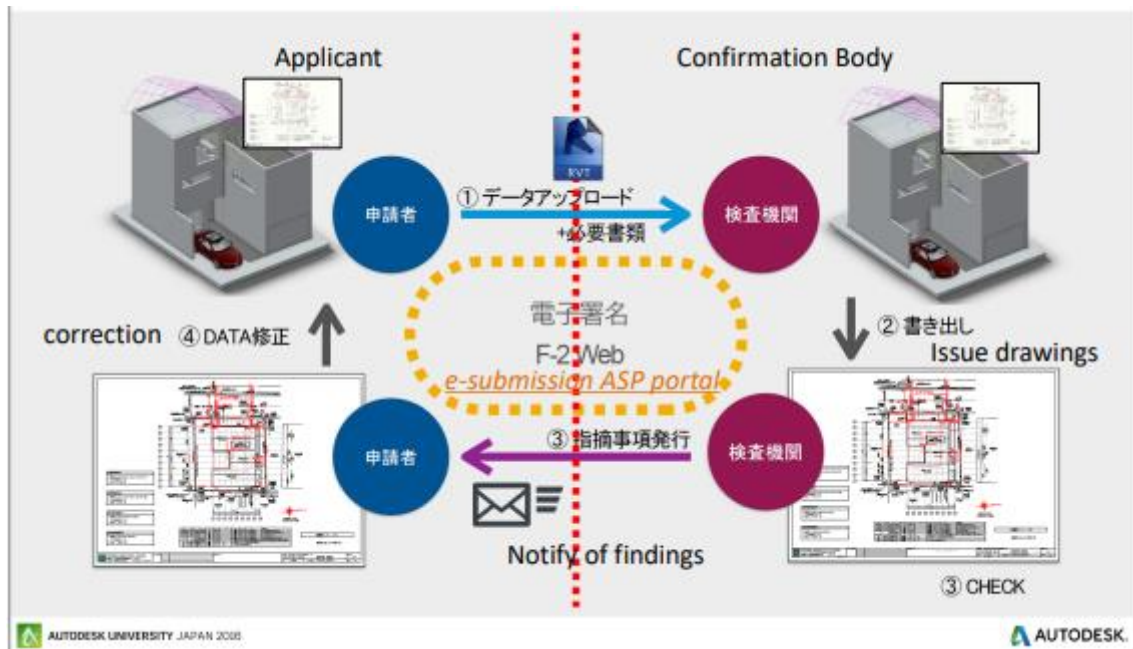


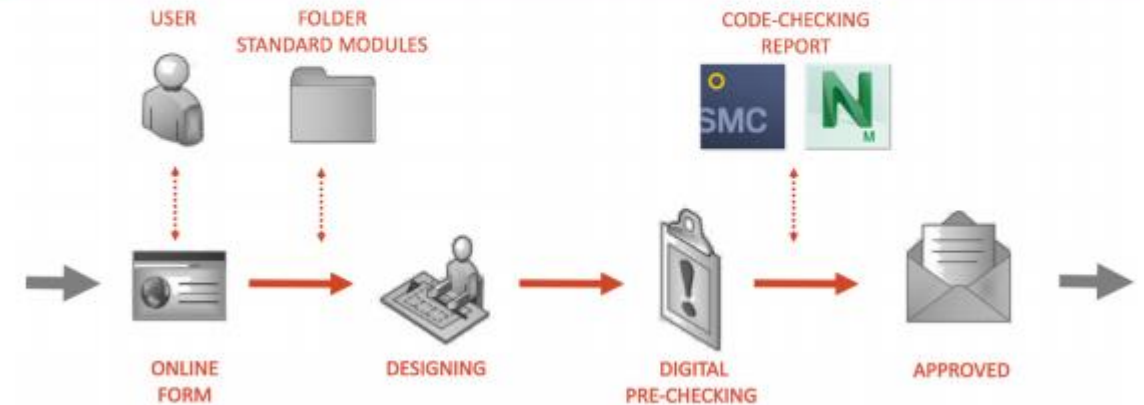
Fig. 9 case of Milan, Italy



Initiation of BIM to paperless process as trial



New workflow for building paperwork pre-checking



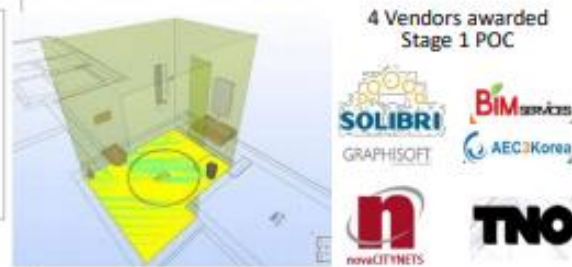
Adaptation of guideline of preparing BIM model for submission

REGULATORY BIM

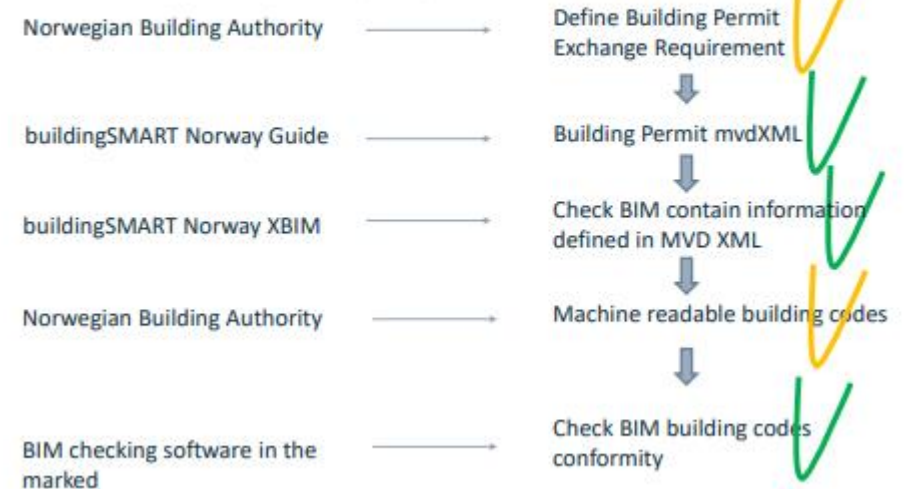
Launched Code of Practice for BIM e-Submission



Supporting BPM's effort in iGrant Call for Automated Code Compliance Check



Exchange requirement for building application



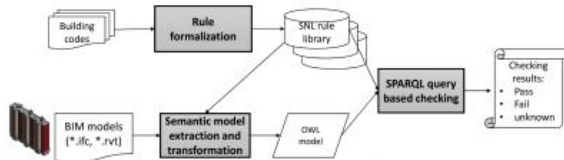
Automated Code Checking (ACC)

(studies)

1. Introduction of BimChecker

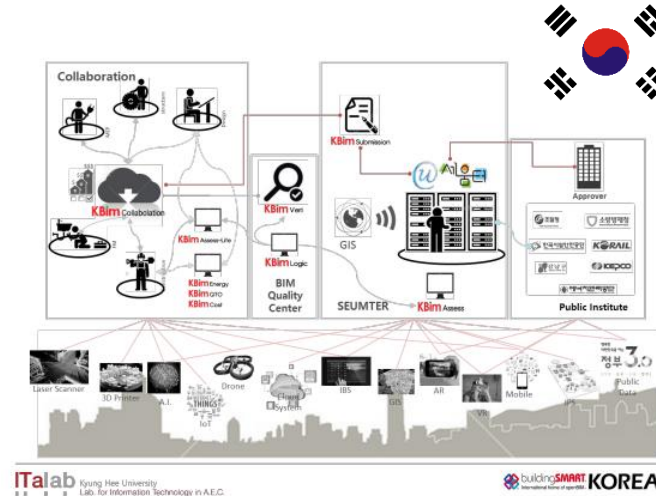


- Rule based automatic BIM checking tool

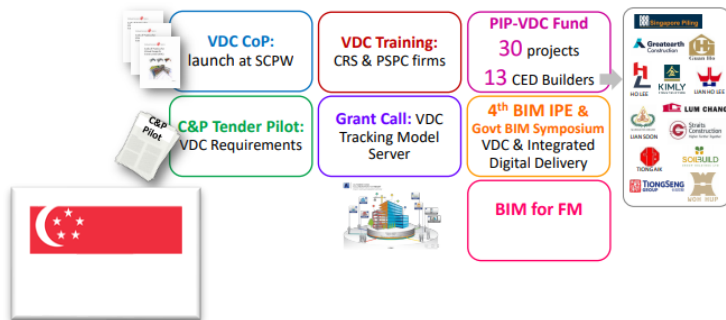


■ Code description language: SNL

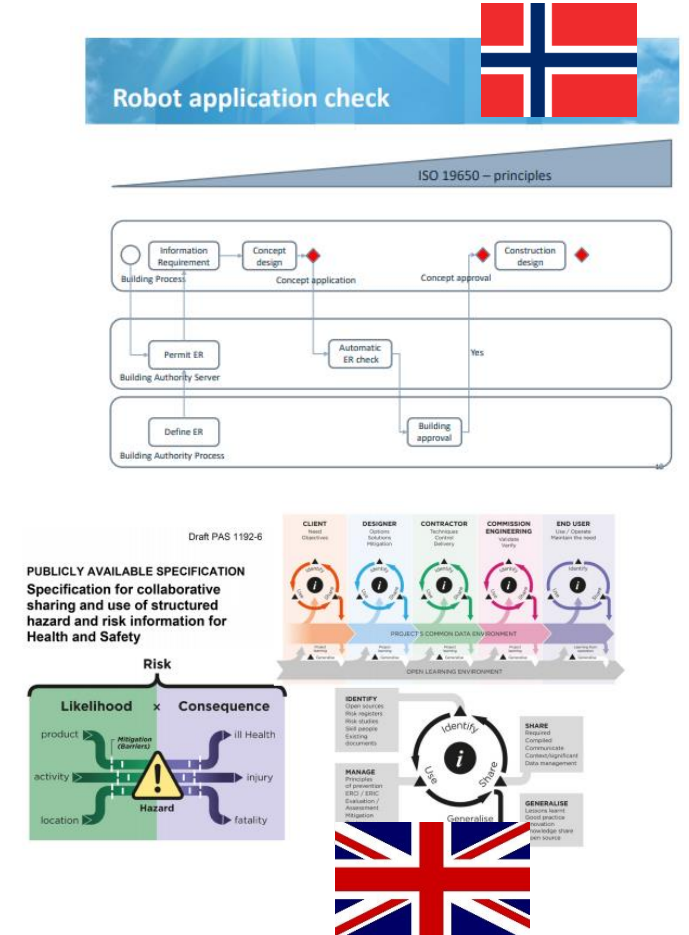
- 1 **Every** Bedroom Has Window.
2 **Every** LivingRoom *its* area ≥ 10



WIDENING BIM/VDC IMPLEMENTATION in FY17



Regulatory Room discovery activity



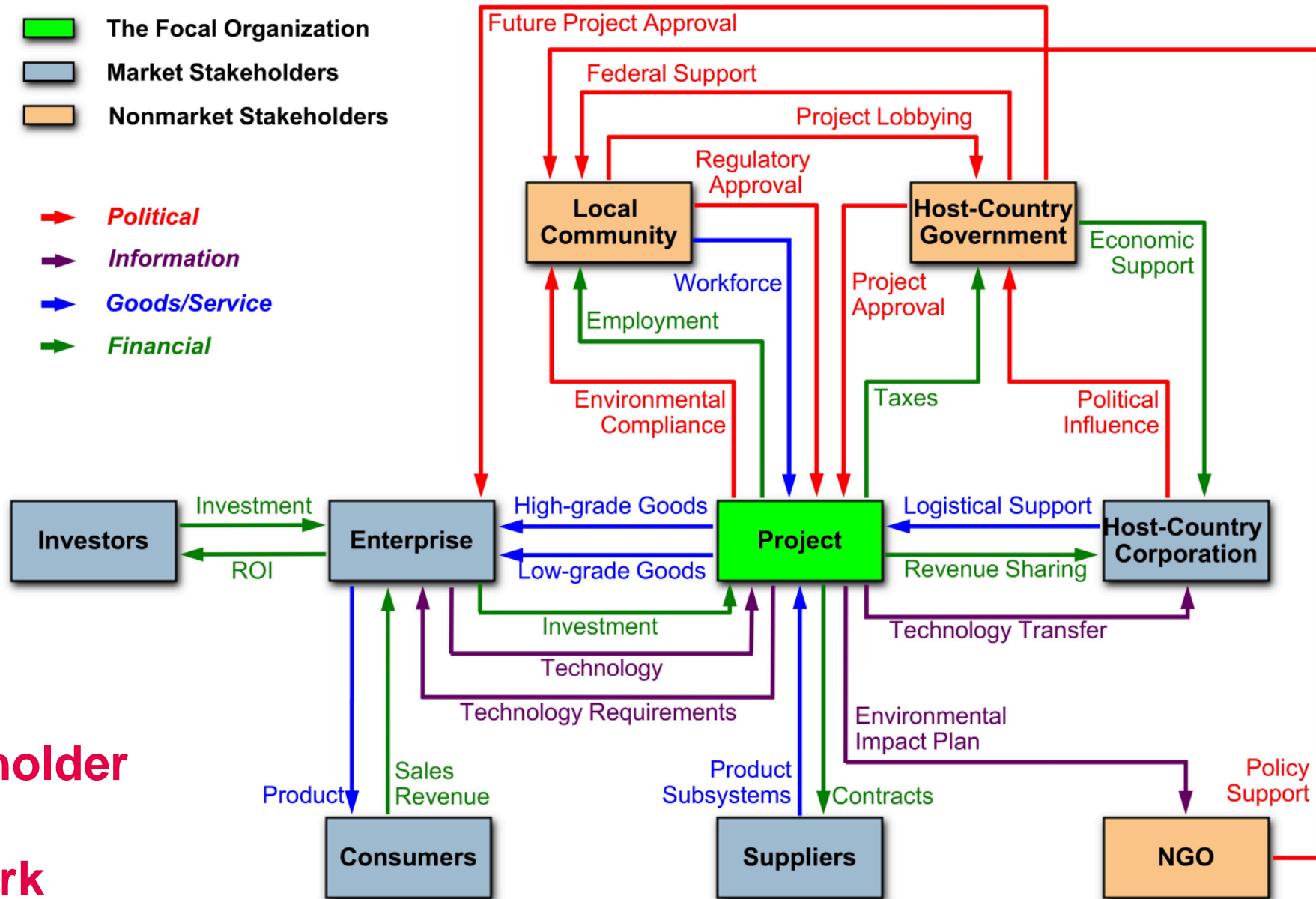
Digitalize Regulatory Expectations

Regulations	Social
Requirements	Economic
Recommendations	Environmental

Nick Nisbet proposed a name change → Expectations Room

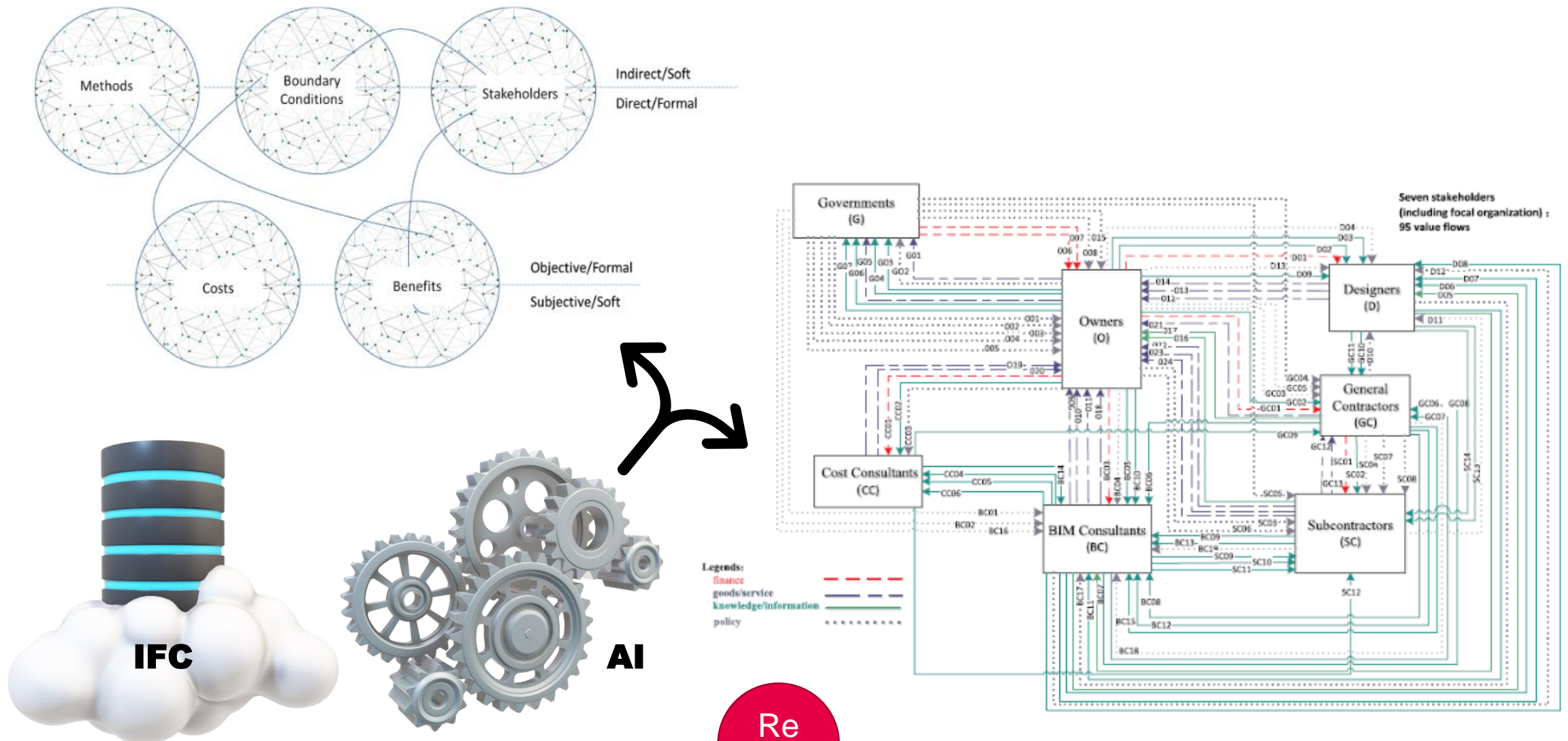
- The Focal Organization**
- Market Stakeholders**
- Nonmarket Stakeholders**

- ➔ **Political**
- ➔ **Information**
- ➔ **Goods/Service**
- ➔ **Financial**



Stakeholder Value Network

Automated Rule Checking (ARC) & AI



Situation Models

Site (existing/intended)

- **Name and other identifiers**
- **Description**
- **Classification**
 - Address
 - Geolocation
 - Administrative region(s)
 - Planning zone(s)
 - Ecological zone(s)
- **Zones (areas)**
 - *Name*
 - *Description*
 - *Classification*
 - Parking
 - Soft Landscaped
 - Hard
 - Facility/Building
 - Activities
 - Jobs
 - Occupants
 - Usage hours
 - Waste generation
 - * above/below ground

Project (change process)

- **Name and other identifiers**
- **Description**
- **Classification**
 - Renovation
 - Restoration
 - Conservation
 - Consolidation
 - New
 - Temporary/permanent
- **Timing**
 - Start date
 - finish dates
 - Expected duration
 - Usage hours
- **Construction Logistics**
 - Access
 - Cranes and temporary works
 - Work outside curtilage
 - Waste generated

Facility/Building (existing/intended)

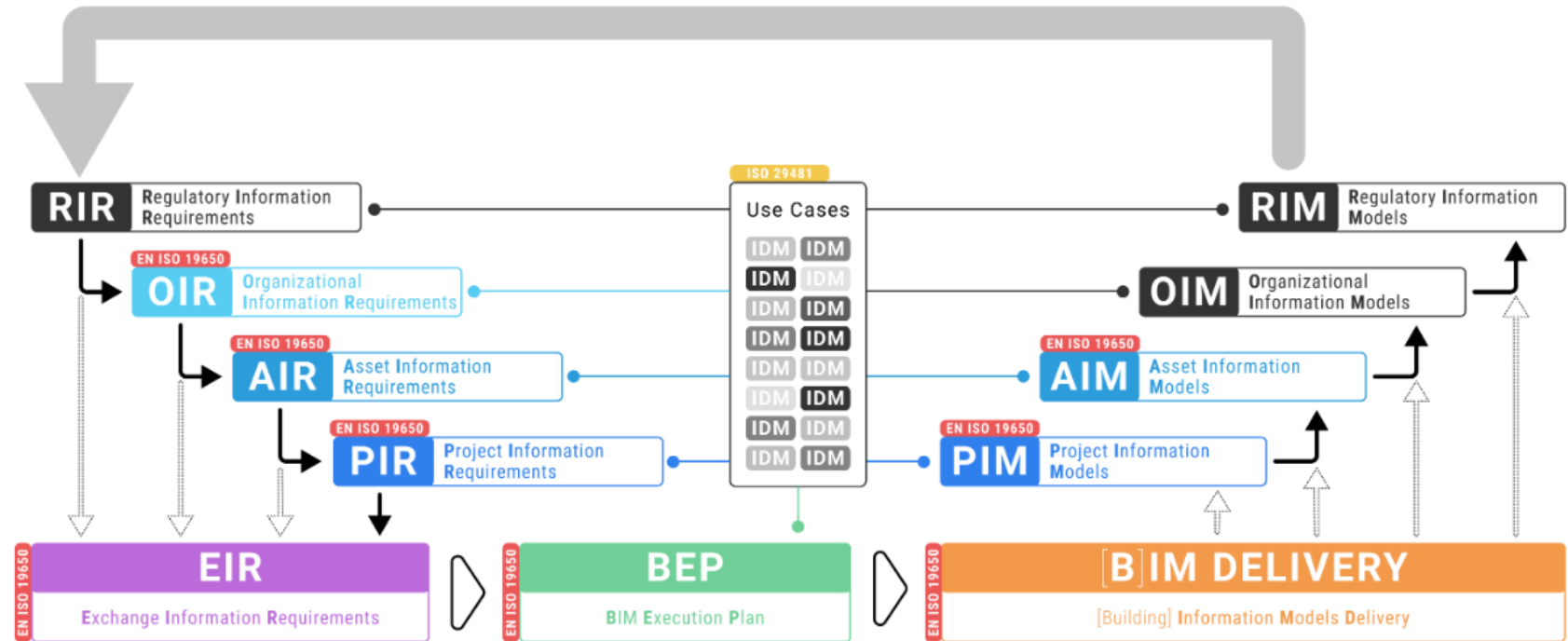
- **Name and other identifiers**
- **Description**
- **Classification**
 - Use
 - Historic protection
 - Fire
- **Systems**
 - **Name**
 - **Description**
 - **Classification**
 - Dominant materials
 - Energy consumption

Standardization Approach

Collate forms from various locales. either as PDF, web or XML forms.

Classify the contents under the three headings (applicant, approval type, BIM information).

Identify the appropriate IFC objects, property sets and properties to constitute a MVD for the initiation of regulatory compliance processes.



Application Forms Collection

Countries	
AT	Austria
BE	Belgium
CA	Canada
CN	China
DE	Germany
ES	Spain
FI	Finland
FR	France
IT	Italy
JP	Japan
KR	South Korea
NL	Nederland
NO	Norway
SE	Sweden
UK	United Kingdom

Table of contents (draft)

Forwards / Summary

1. Purposes for collating application forms

- 1.1 Comparison of information requirements
- 1.2 Standardisation of common information requirements

2. Common information requirements

- 2.1 Application Purpose and Details of the receiving body
- 2.2 Applicant details
- 2.3 Actual and Intended situation models

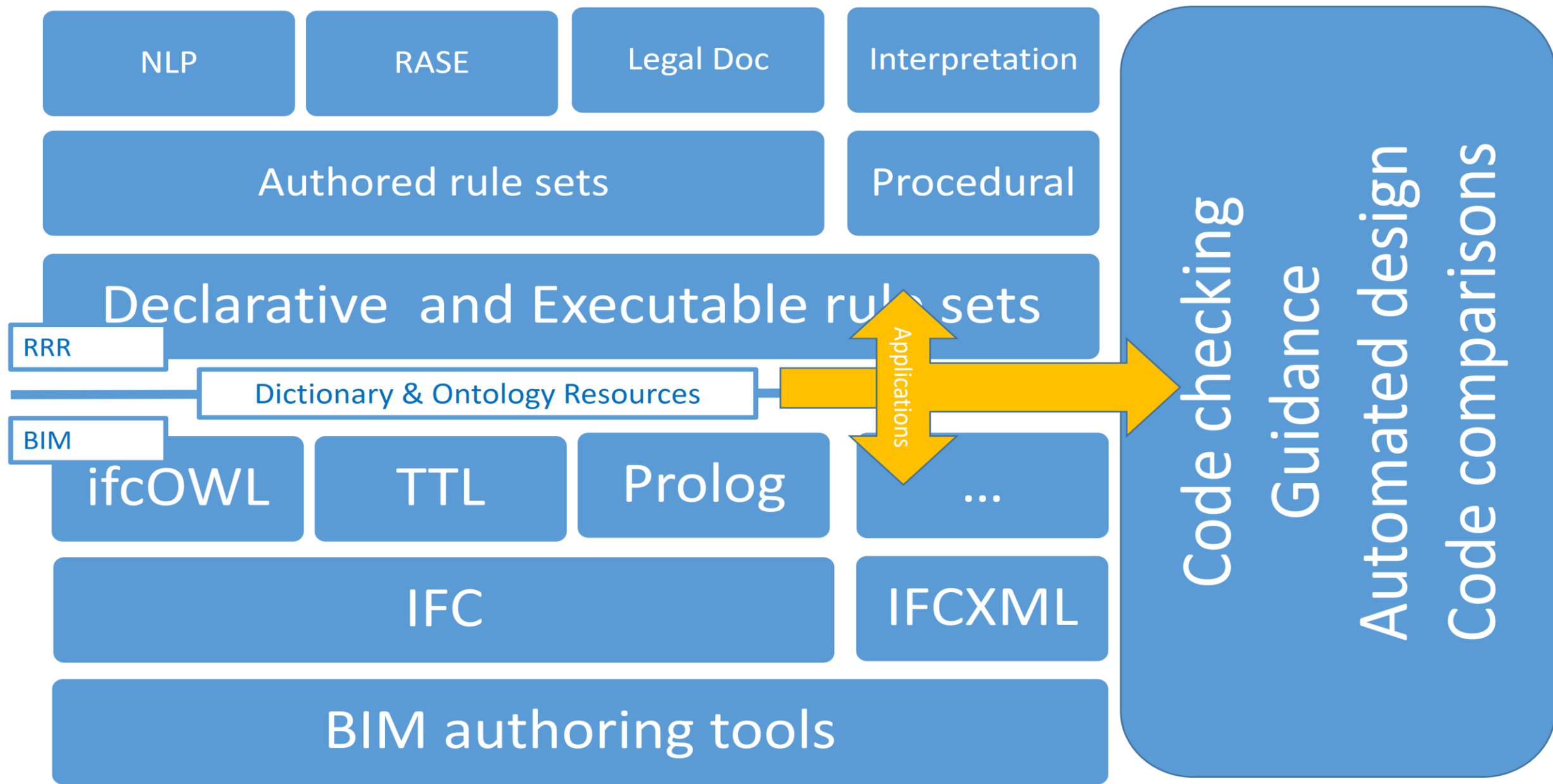
3. Situation models

- 3.1 Common requirements
- 3.2 Specific information requirements

4. Recommendations

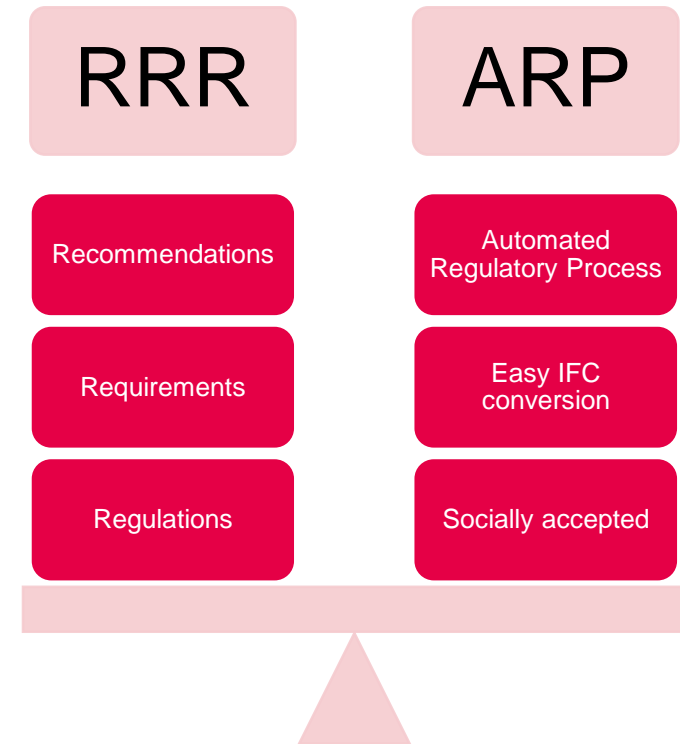
- 3.1 Common forms
- 3.2 Common property sets and object usage

5. Conclusions

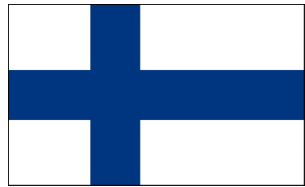


MUST

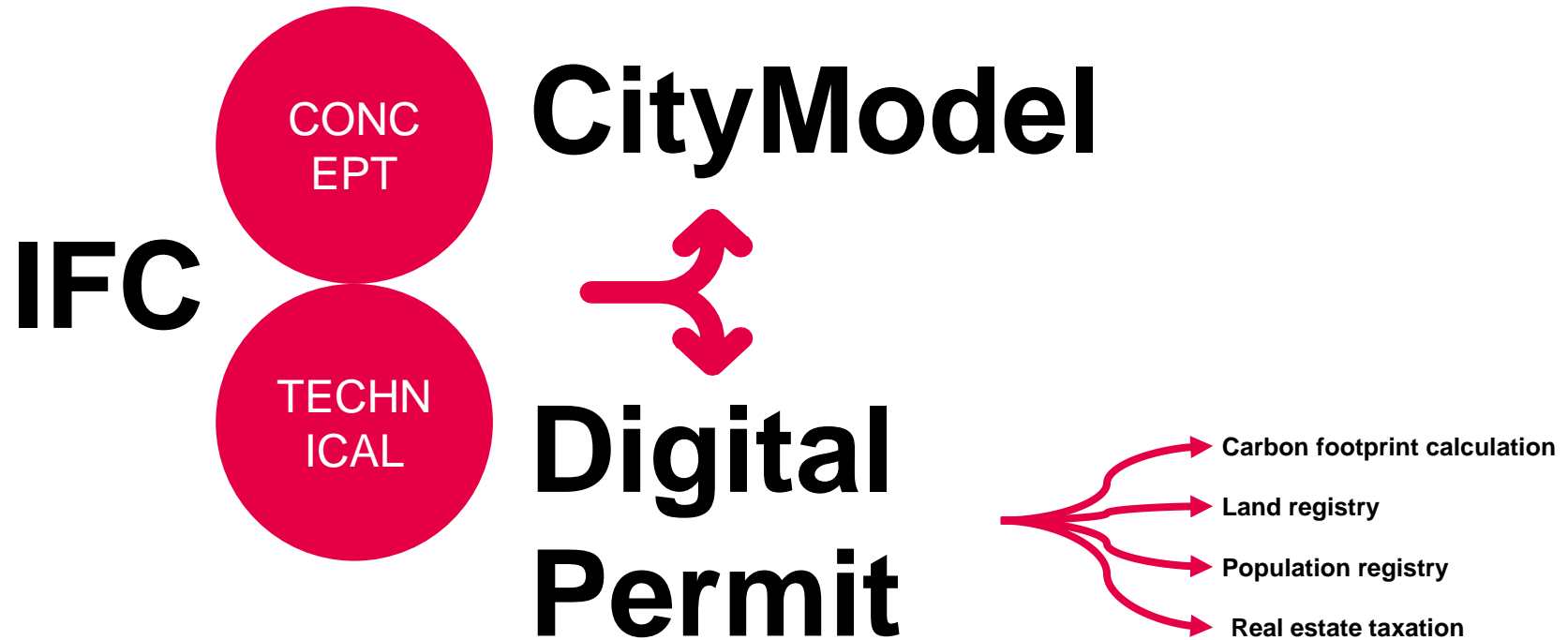
Digital first Institutions



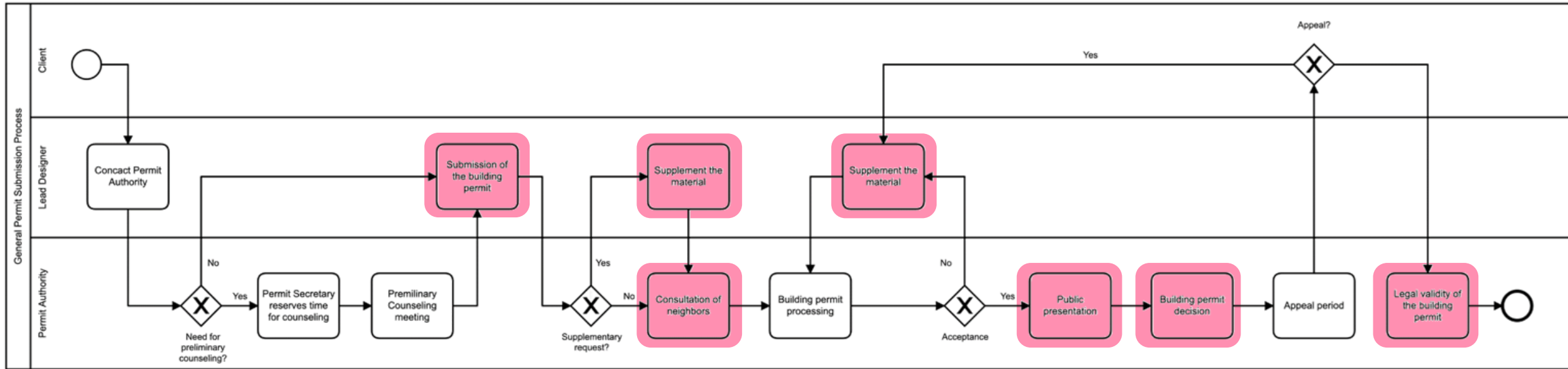
Digital Permit Processing (project)



IFC First
institutions

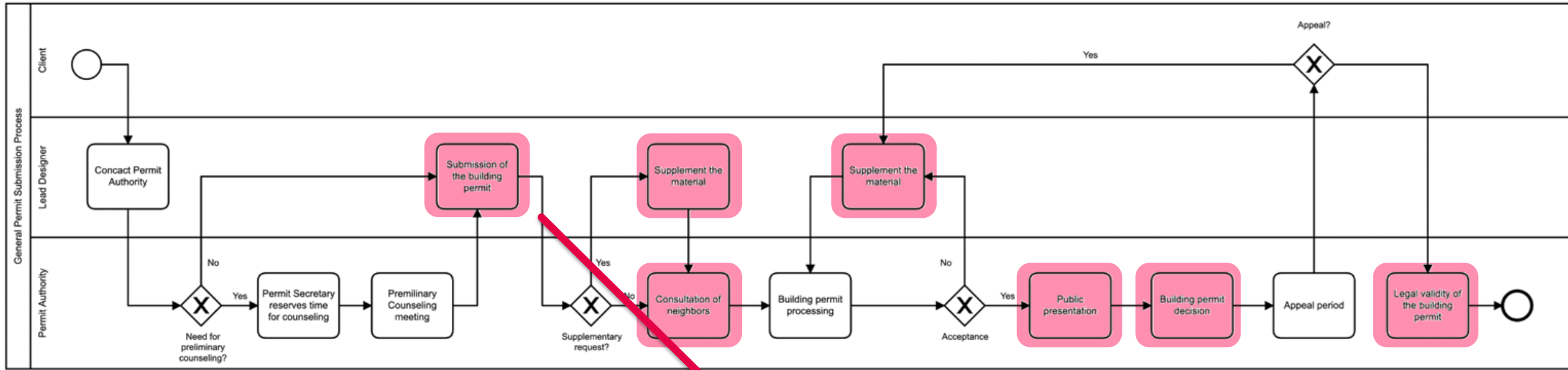


General Process Example

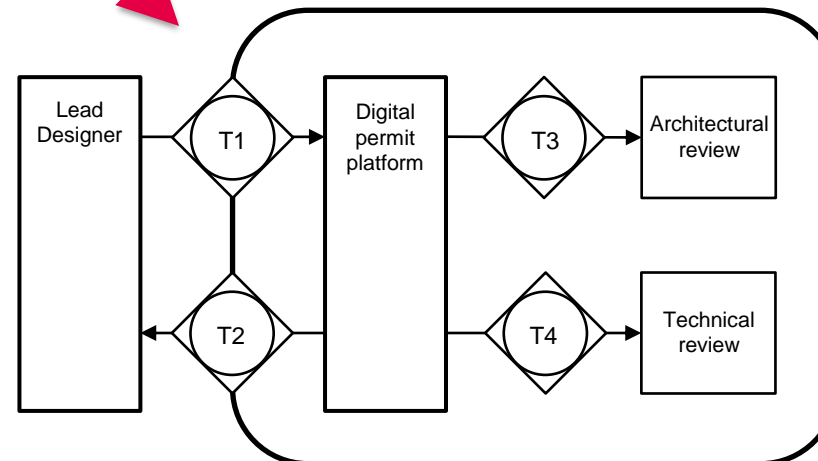


1. Identify the data exchange points

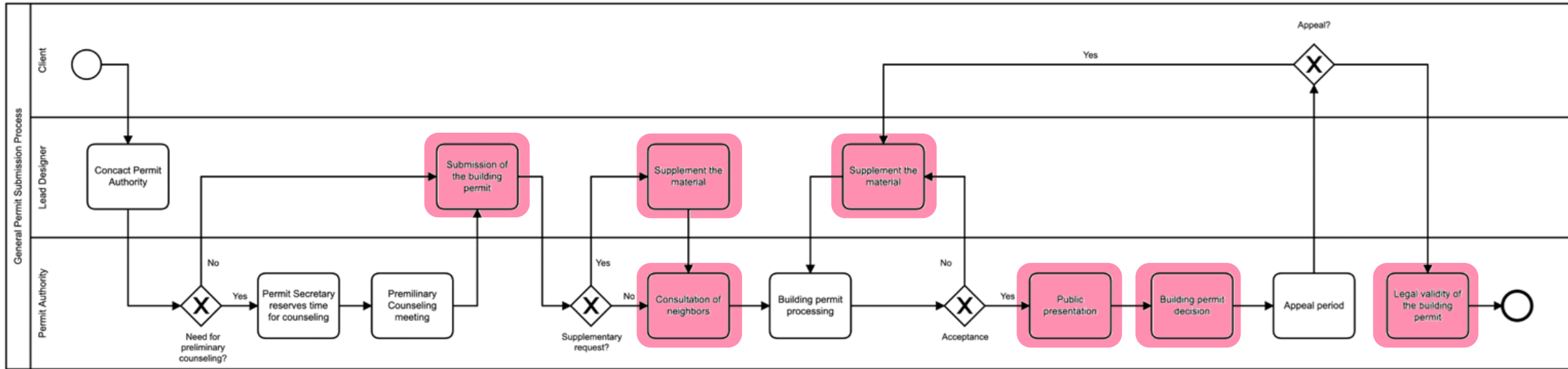
General Process Example



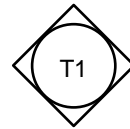
1. Identify the data exchange points
2. Create interaction maps



General Process Example



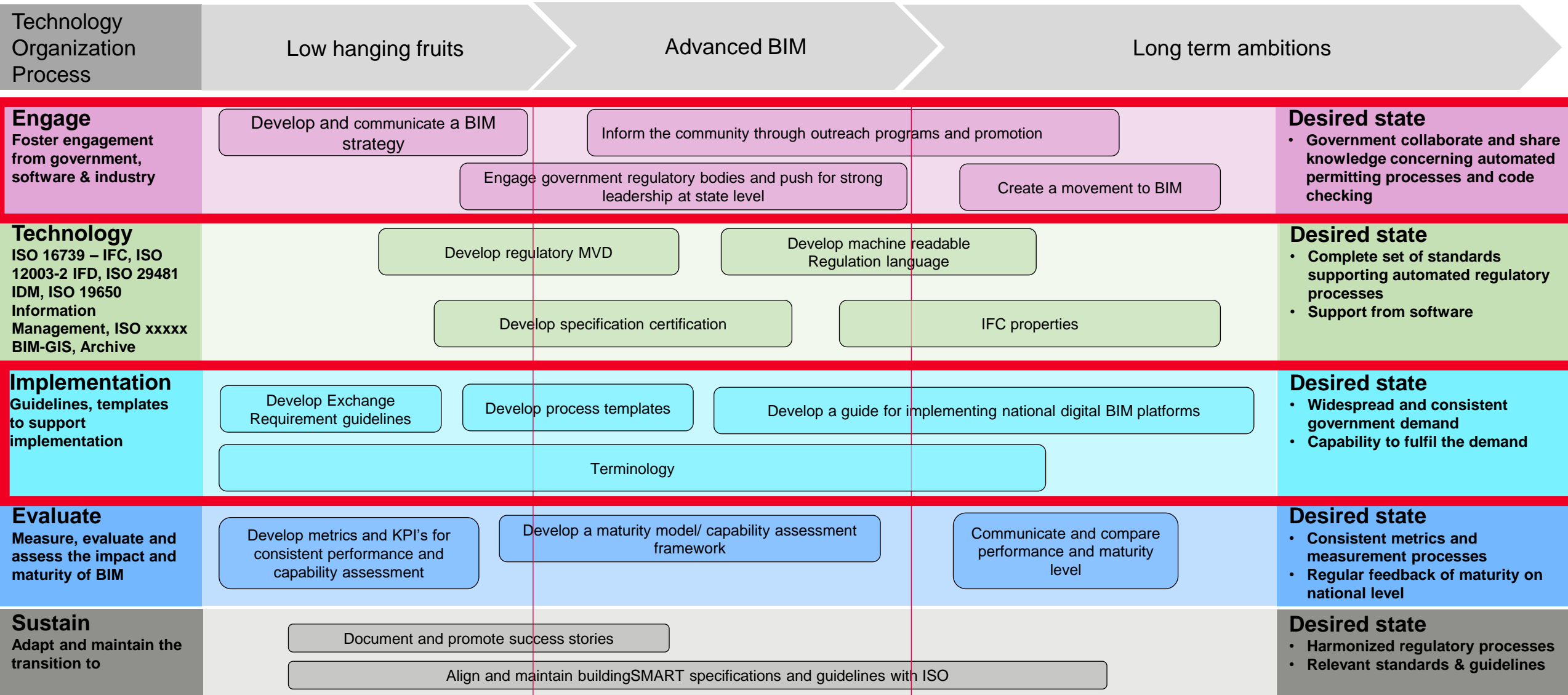
1. Identify the data exchange points
2. Create interaction maps
3. Specify Exchange Requirements for each transaction



Object	IFC definition	Sample Value	Unit	Data Type
Beam	IfcBeam			
Geometrical Information				
Detail		Simplified volume		
Dimensionality	IfcGeometricRepresentationContext	3D		
Location	IfcLocalPlacement; IfcGridPlacement	Absolute (position & rotation from origin)		
Appearance	IfcStyledRepresentation	Realistic with texture of material concrete		
Parametric Behaviour	IfcExtrudedAreaSolid + IfcShapeProfileDef/IfcRectangleProfileDef/...	Partial (using explicit geometry)		
Alphanumerical Information				
Identification	Name			String
Information content				
Description	Description			IfcText
Construction Method	Pset_ConcreteElementGeneral.ConstructionMethod	Precast		IfcLabel
Length	Qto_BeamBaseQuantities.Length	4800	mm	IfcLengthMeasure
Wight	Qto_BeamBaseQuantities.GrossWeight	1830	kg	IfcMassMeasure
Fire Rating	Pset_BeamCommon.FireRating	EI120		IfcLabel
Rebar Total Weight	PsetFIN_StructuralElementCommon.RebarTotalWeight	95	kg	IfcMassMeasure
Rebar Estimate Weight	PsetFIN_StructuralElementCommon.RebarEstimateWeight	100	kg	IfcMassMeasure
Documentation				
Set of documents				
		Formwork Drawing		
		Reinforcement Drawing		
		Structural Analysis Report		

Regulatory Room Recap

Inspired by buildingSMART Canada Roadmap



Nick
Nisbett -
UK



Tomi
Hentinnen
- SF



Masaki
Muto -
JPN



Tamer el
Diraby -
CDN



Franco
Coin - IT



Kirill
Mikhalkin -
RUS



OpenBIM per l'approvazione digitale dei progetti.
A che punto siamo?



Grazie

Ci sono domande?

Franco Coin

franco.coin@dbalab.it



Vi ricordo l'indagine WEB

<https://bsicommunications.typeform.com/to/O33IHgd3>