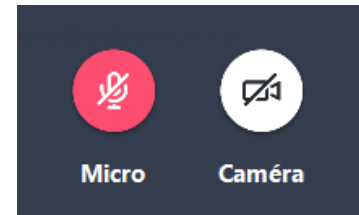


Modalités de la visio-conférence

Début des conférences à 12h

- Merci d'inscrire vos **noms et prénoms** en tant que participant afin de valider que vous êtes bien inscrit
- Merci de garder vos **micros en mute** et vos **caméras éteintes** tout le long de la conférence
- Si vous avez des **questions à poser aux conférenciers**, veuillez les inscrire dans l'espace réservé aux conversations, en cliquant sur
- En cas de problèmes, veuillez envoyer un mail à info@bimquebec.org



La transformation numérique pour assurer une pérennité en entreprise



Rencontre du
11 novembre 2020

Inscrivez-vous
pour la saison 2020

building Smart Canada Affilié



POUR UN
ENVIRONNEMENT
BÂTI NUMÉRIQUE
AU QUÉBEC

Programme de la conférence



12h10 – 12h40

Améliorer la Qualité des Modèles BIM pour les opérations

- Romain Leygonie, M.Sc.A., Intégrateur BIM/VDC – Spécialiste FM chez Pomerleau



12h45 – 13h15

How to use real-time data for safe return to the office (conférence en anglais)

- Tomi Teikko, Founder and Head of Empathic Building, Haltian Inc

PARTENAIRES
OR



PARTENAIRES
RÉGULIERS



PARTENAIRES
OR



PARTENAIRES
RÉGULIERS





Partenaires académiques
Encourageons la relève vers la transition numérique

*Société québécoise
des infrastructures*

Québec



Partenaire public



POUR UN
ENVIRONNEMENT
BÂTI NUMÉRIQUE
AU QUÉBEC

Nouvelles du Groupe BIM du Québec

Il reste encore
quelques places!

Constructionnumerique.ca

**J'ACCÉLÈRE
MON VIRAGE
NUMÉRIQUE!**

Inscris ton
entreprise:
constructionnumerique.ca

I Q C
4.0 INITIATIVE
QUÉBÉCOISE POUR
LA CONSTRUCTION 4.0

 **BIM**
Québec

Avec le soutien de :

 Institut
de gouvernance
numérique

Québec 

Lancement guide

INTRODUCTION
À LA GESTION
DES ACTIFS
FACILITÉE PAR
LA MODÉLISATION
DES DONNÉES DU
BÂTIMENT (BIM)

MERCREDI 18 NOVEMBRE 2020
DE 12H À 13H

INVITÉS

Ali Motamedi, PhD, Professeur agrégé

Mathieu Robitaille, DESS Gestion, B.Sc.Arch., CAPM

Erik A. Poirier, PhD, M.Eng., B.Sc.Arch., Professeur agrégé

Daniel Forgues, PhD, Professeur titulaire

ÉVÈNEMENT
EN LIGNE,
GRATUIT
ET OUVERT
À TOUS

GRIDD

GRUPE DE RECHERCHE
EN INTÉGRATION ET DÉVELOPPEMENT DURABLE
EN ENVIRONNEMENT BÂTI

EN
PARTENARIAT

ÉTS
Le génie pour l'industrie

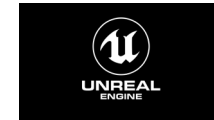
CERACQ
Centre d'études et de recherches
pour l'avancement de la construction au Québec

BIM
Québec
POUR UN
ENVIRONNEMENT
BÂTI NUMÉRIQUE
AU QUÉBEC

PARTENAIRE
PUBLIC



PARTENAIRES
OR



PARTENAIRES
ACADÉMIQUES



PARTENAIRES
RÉGULIERS



Améliorer la qualité des modèles BIM pour les opérations

-
- **Romain Leygonie, M.Sc.A.**
 - Intégrateur VDC – Spécialiste FM

POMERLEAU



Plan

- Introduction
- Etat de l'Art
- Méthode Développée
- Implémentation de la Méthode
- Etudes de Cas
- Directions Futures

Introduction

Le BIM pour les opérations – Problèmes avec l’information des actifs - Développer le BIM pour les opérations

Le BIM pour les opérations

- Base de données de l'information des actifs
- Visualisation 3D du bâtiment
- Locations des actifs et relations entre eux
- Historique de la maintenance
- Intégration avec d'autres technologies



Problèmes avec l'information des actifs

Manque d'information

Information incorrecte, imprécise, mal définie

Dépassement de coûts, délais dans la résolution des requêtes

Excès d'information

Information désorganisée, format non-standardisés, données inutilisées

Base de données saturées, efficacité réduite

Problèmes avec l'information des actifs



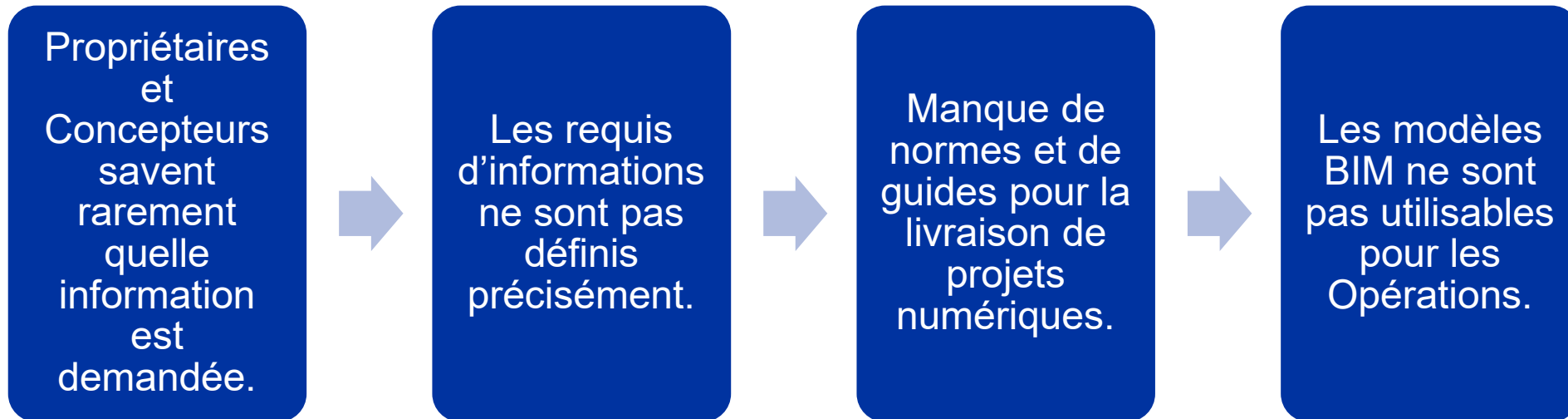
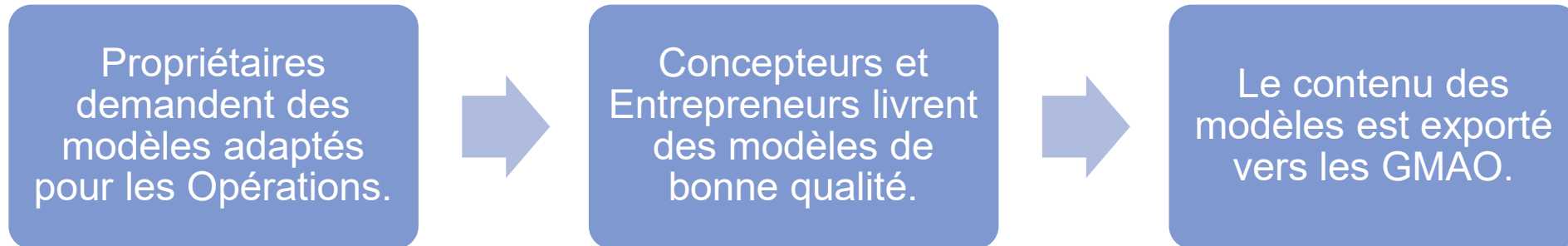
Papier, CAD, PDF...

VS

Structure BIM :

- Données des actifs centralisées
- Population des GMAO
- Utilisation pour la maintenance
- Structure rigoureuse

Développer le BIM pour les opérations



Développer le BIM pour les opérations

Most attention
given...

... most attention
required !

Planning (0.20\$) **Design (0.90)** **Construction (8.70)** **Activation (3.20)** **Operations (87.00)**



Credits: [AECNext](#) 2019

État de l'art

Perspective académique – Perspective industrielle

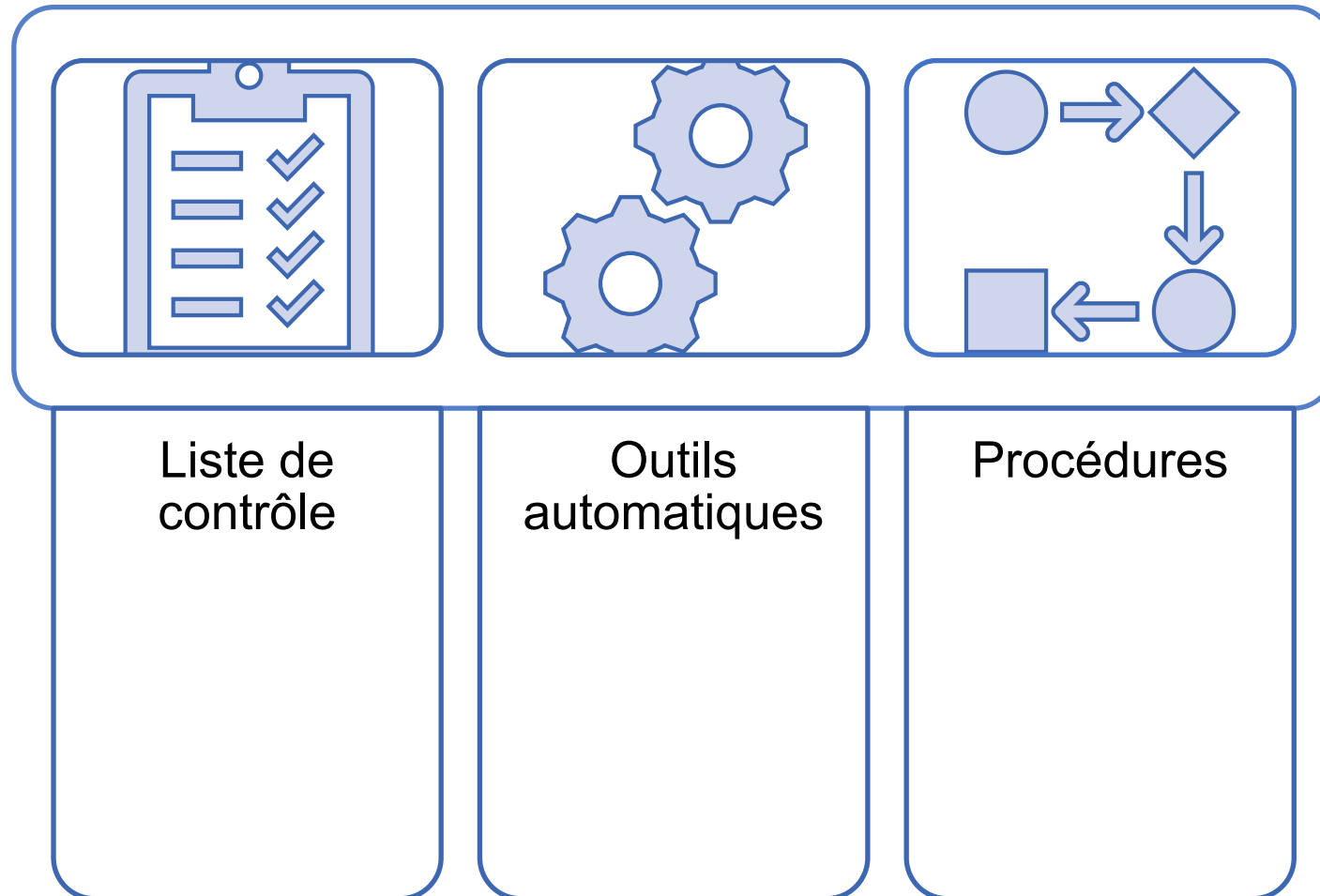
Perspective académique



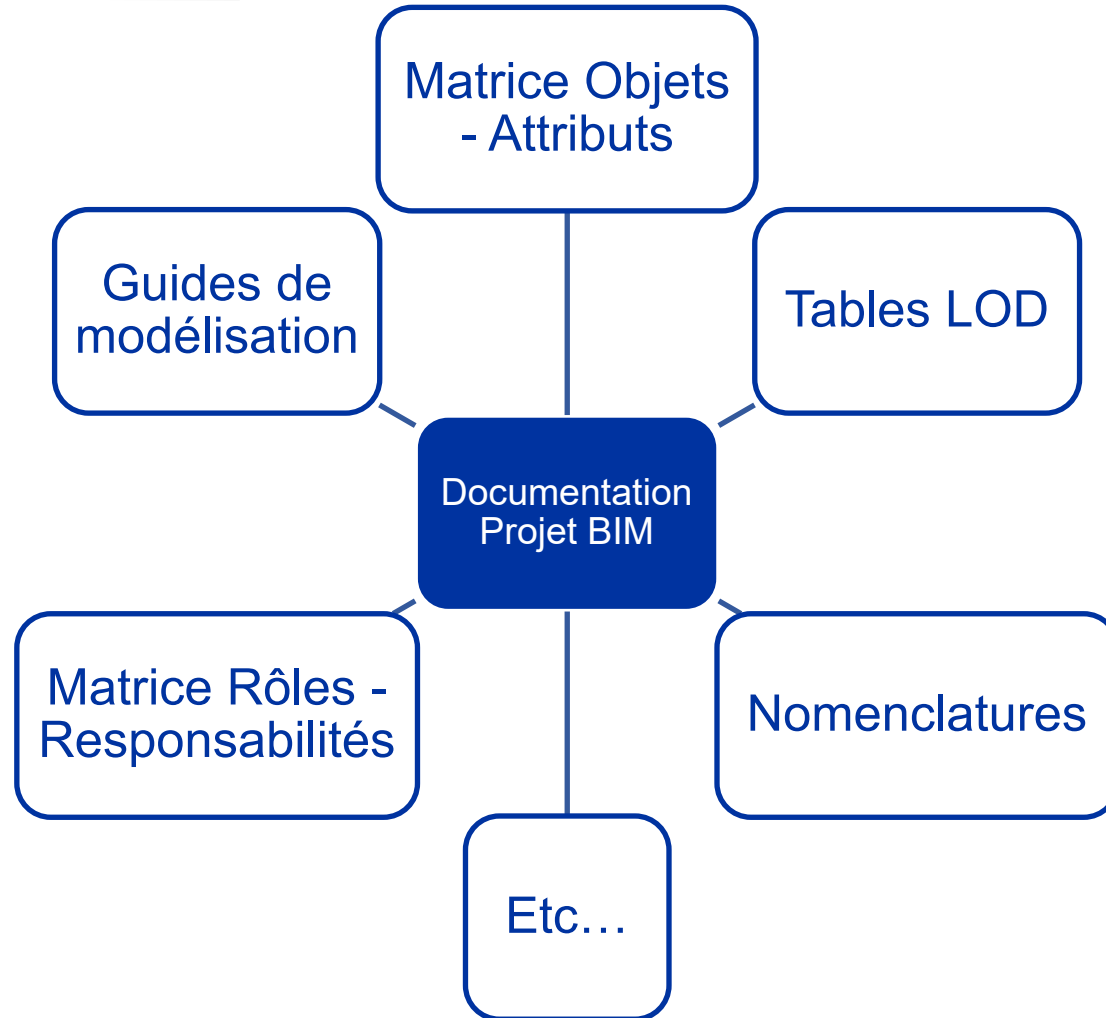
(Zadeh et al., 2015; Ramesh, 2016)

Qu'est ce qu'un
modèle cohérent ?
Pertinent ?
Etc...

Perspective académique

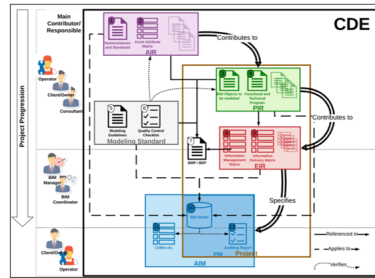


Perspective industrielle

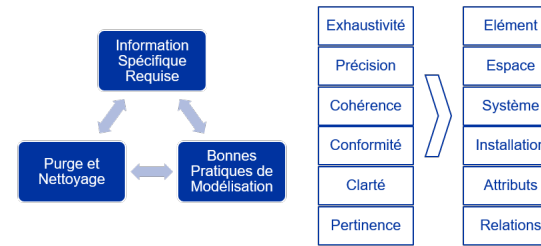


- **Qui ?**
- **Quoi ?**
- **Quand ?**
- **Comment ?**

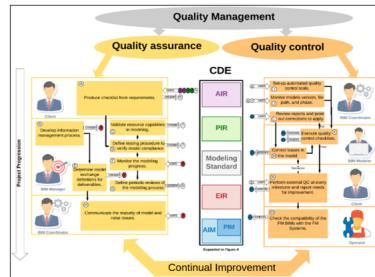
Relations entre requis d'Information et documents de projet BIM



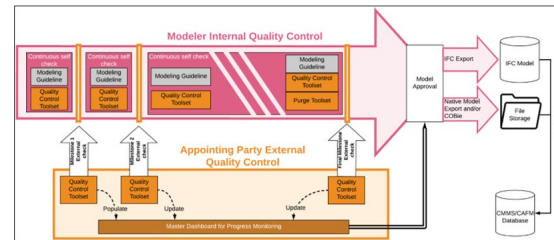
Listes de contrôle qualité



Procédure d'assurance et contrôle qualité



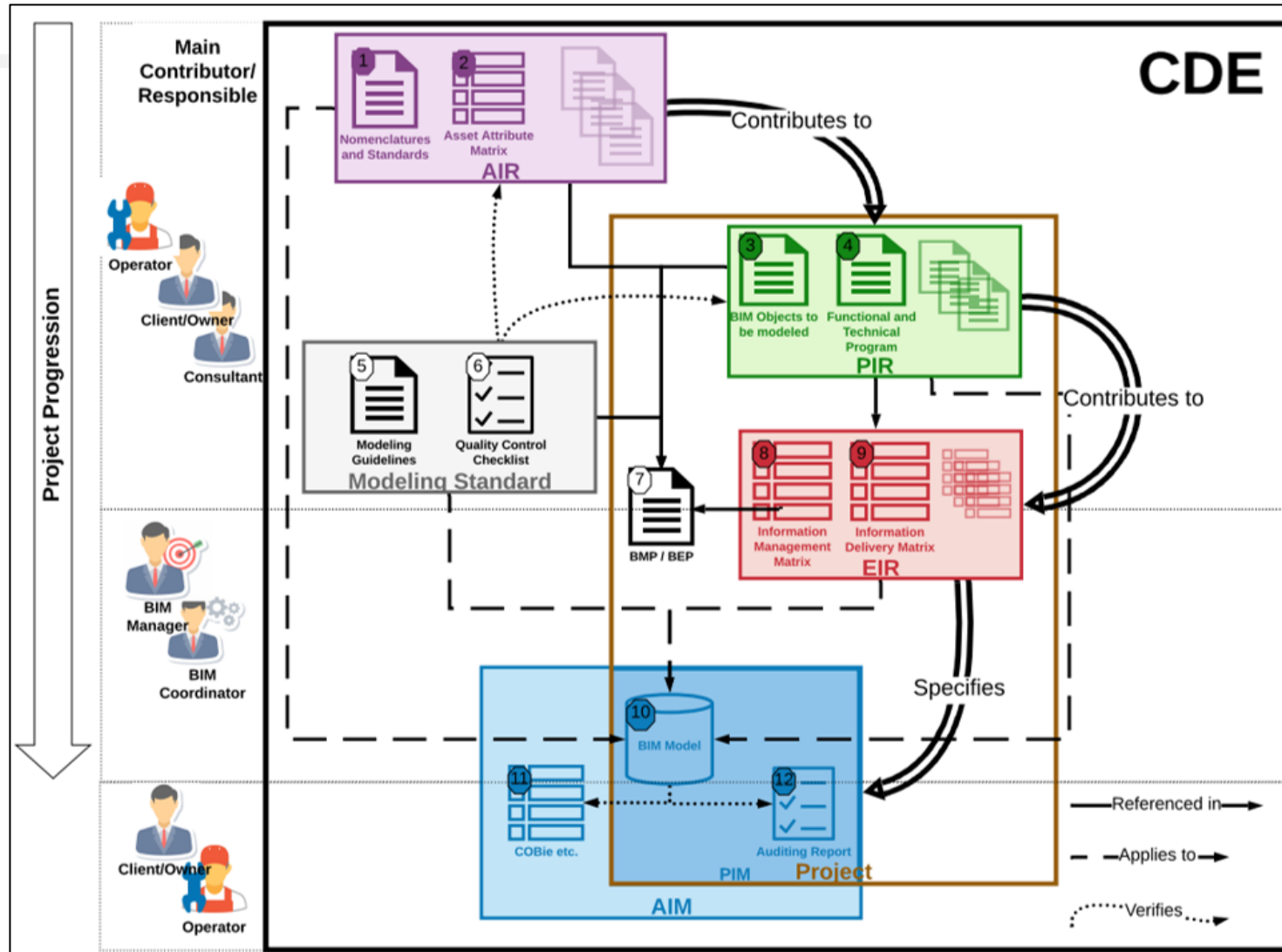
Processus de contrôle qualité



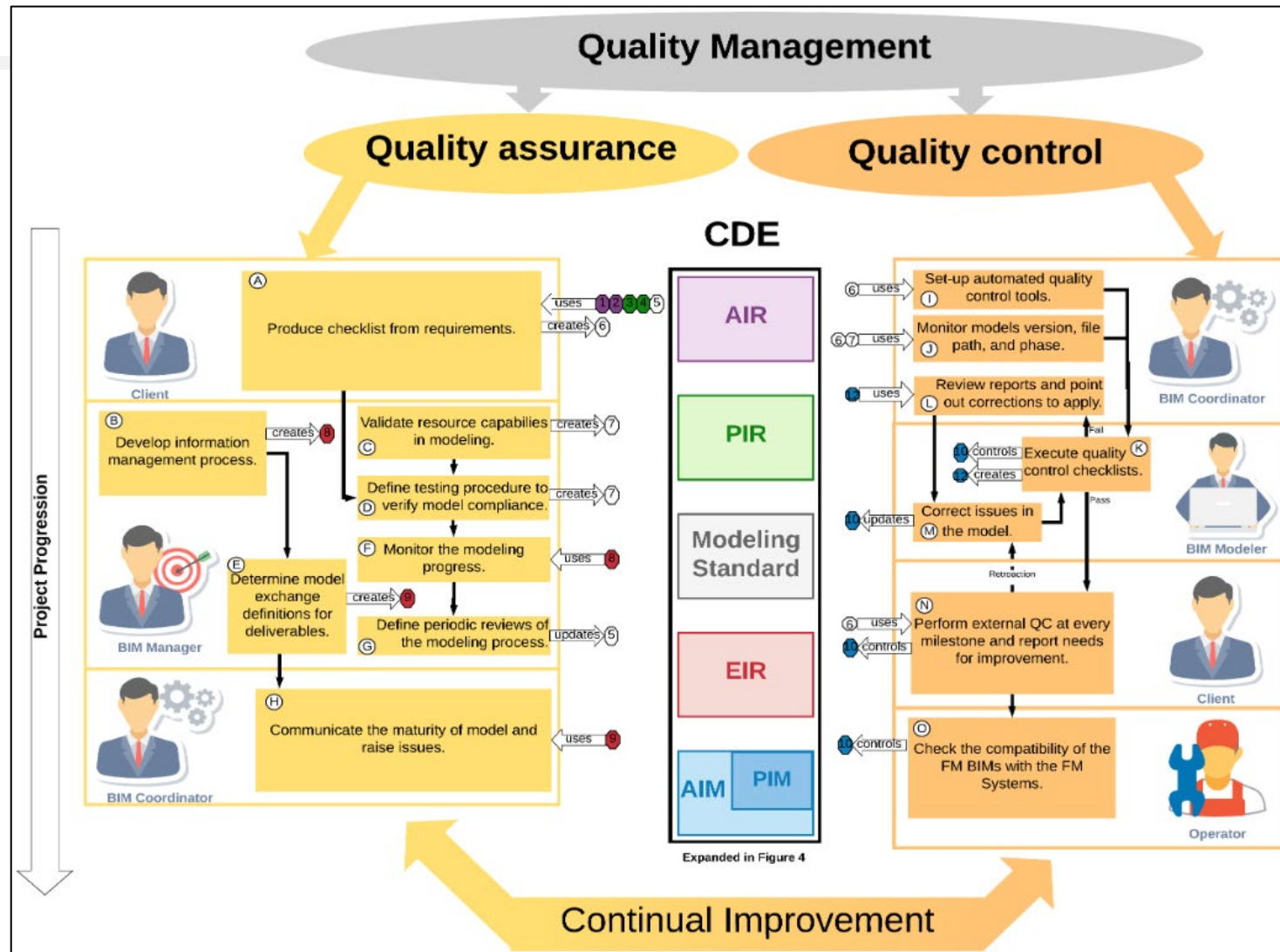
Méthode développée

Cadre de travail pour assurer la qualité des modèles BIM pour les opérations

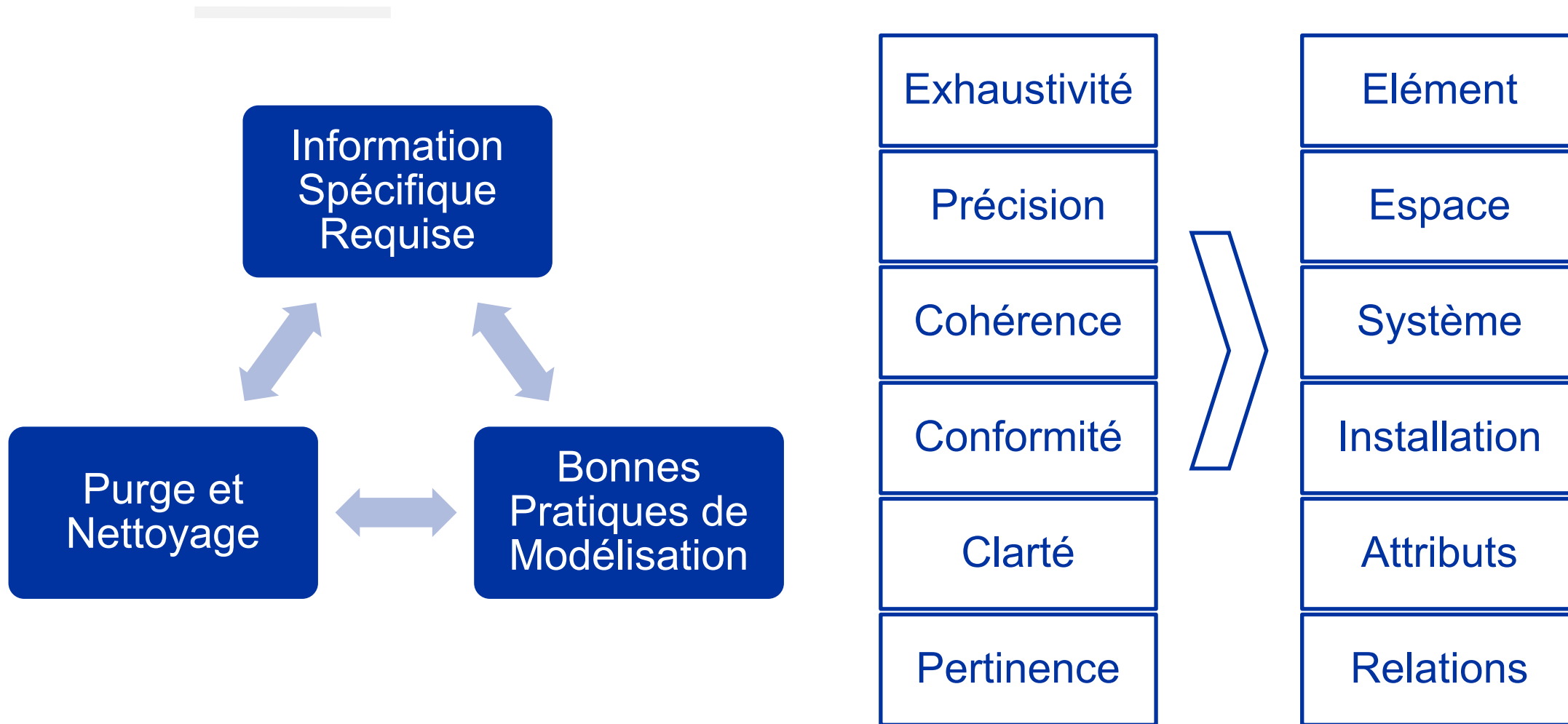
Relations entre requis d'Information et documents de projet BIM



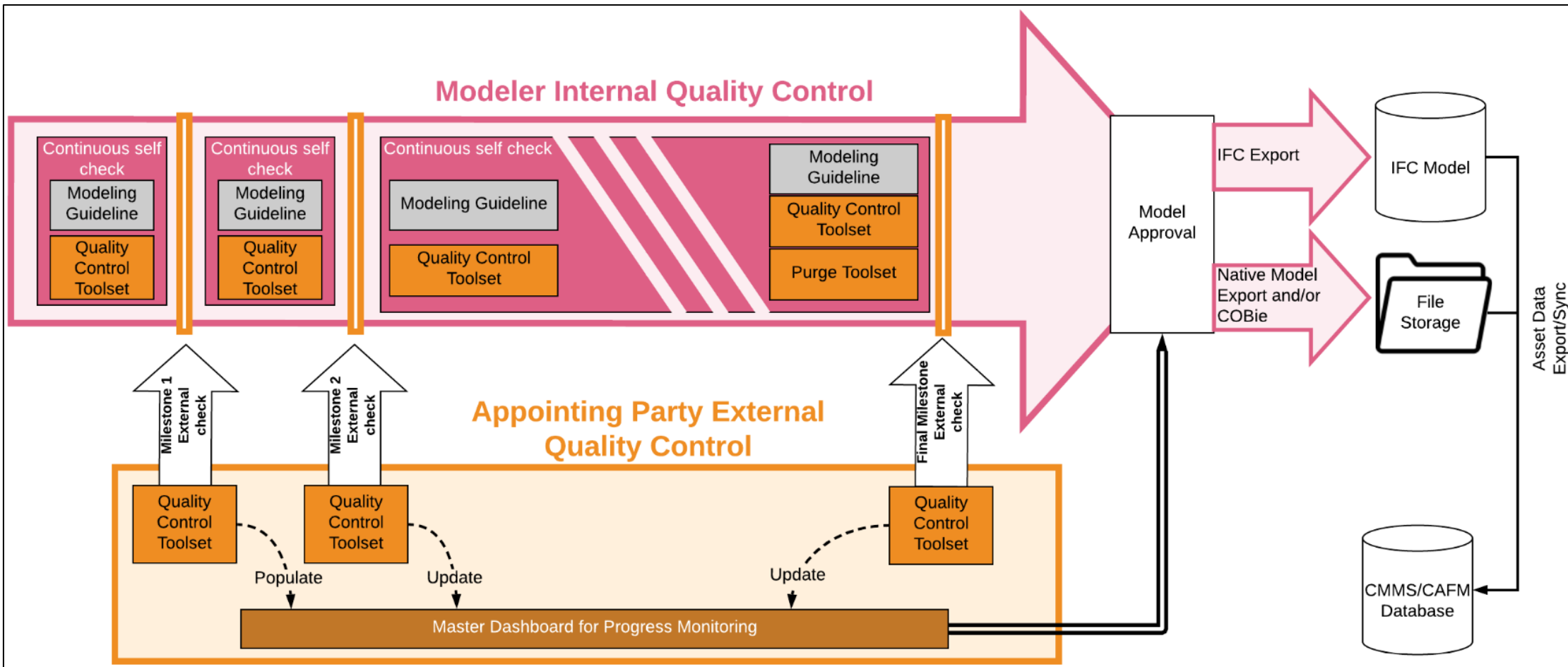
Procédure d'assurance et contrôle qualité



Listes de contrôle qualité



Processus de contrôle qualité



Implémentation de la méthode

Développement d'outils pour automatiser l'exécution de la méthode

Utilisation d'outils automatiques

Filters


Add Filter...

	Operator	Criteria	Property	Condition	Value	
⋮		Category	OST_MEPSpaces	Include	Code: True	✘
⋮	And	Type or Instan	Is Element Type	=	Code: False	✘
⋮	And	Parameter	IC_ROOM_NAME	Does N	Code: ROOM_NAME	✘
⋮	Or	Category	OST_MEPSpaces	Include	Code: True	✘
⋮	And	Parameter	ROOM_NUMBER	Does N	Code: ROOM_NUMBER	✘

Preview (Category OST_MEPSpacesIncluded True AND Type or Instance Is Element Type= False AND Parameter SPACE_ASSOC_ROOM_NAME Does Not Match Parameter ROOM_NAME) OR (Category OST_MEPSpacesIncluded True AND Parameter SPACE_ASSOC_ROOM_NUMBER Does Not Match Parameter ROOM_NUMBER)

Autodesk BIM Interoperability Tools | Model Checker

AUTODESK MODEL CHECKER FOR REVIT

 **Title** Element Checks Organized by UniFormat

Date Friday, June 29, 2018

Author Autodesk

Description Collection of Pass/Fail checks on individual elements based on the UniFormat number

CADD University Kepler.rvt

Check Summary 222 Checks, 146 (66%) Pass, 76 Fail

Report Date Thursday, August 23, 2018 - 7:45:48 PM

Revit Filepath CADD University Kepler.rvt

Checkset File <http://www.biminteroperabilitytools.com/modelchecker/hostedchecks/checks-uniformat.xml>

66%

- ▲ A1010 - Standard Foundations 10 Checks, 9 (90%) Pass, 1 Fail
 - ▲ A1010.10 - Wall Foundations 5 Checks, 4 (80%) Pass, 1 Fail
 - ✓ Placed Checks for wall foundations placed in the model.
 - ✓ Mark

Copy HTML Excel Close



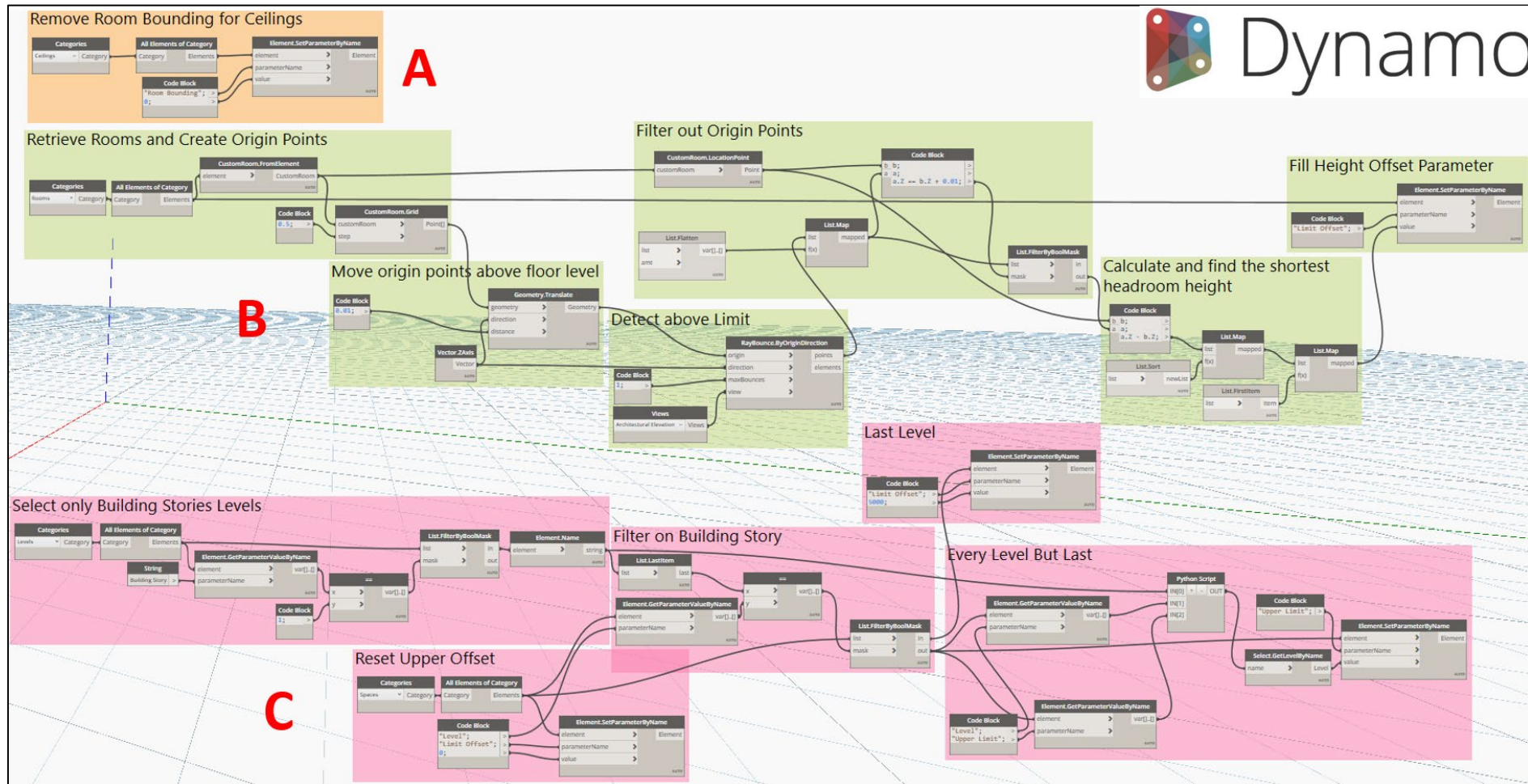
Autodesk Model Checker for Revit



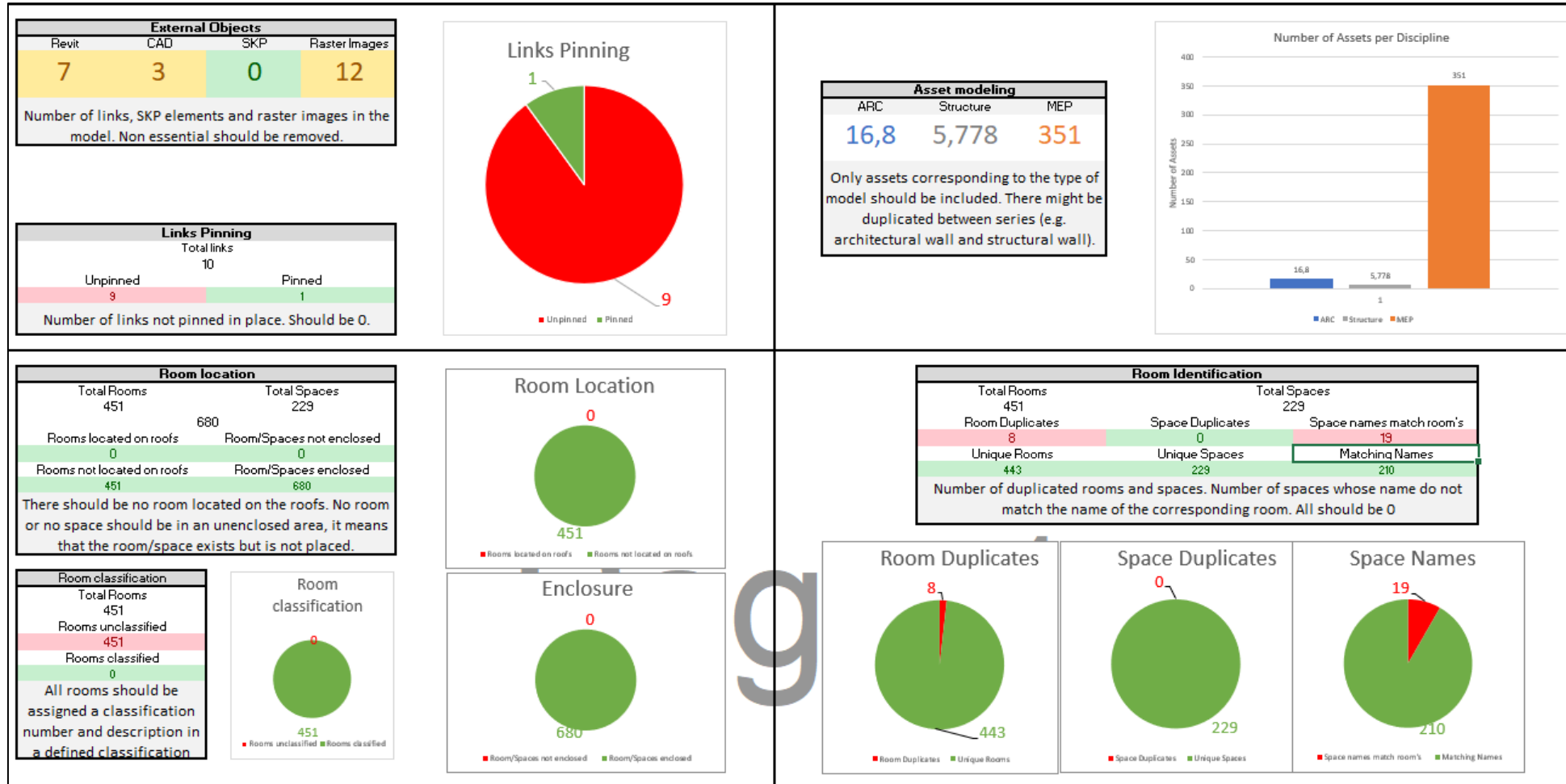
Autodesk Model Checker Configurator for Revit



Scripts pour Items Spécifiques



Suivi de la qualité avec tableaux de bord

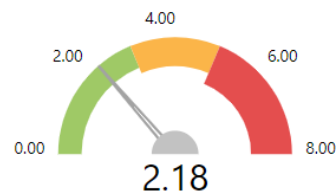


Suivi de la qualité avec tableaux de bord

Project X
Model Health Latest Dashboard

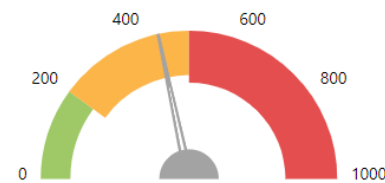
Last run report
Monday, June 24, 2019

Warnings Per MB



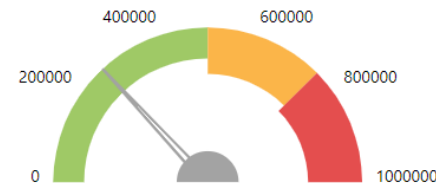
944

Total Warnings



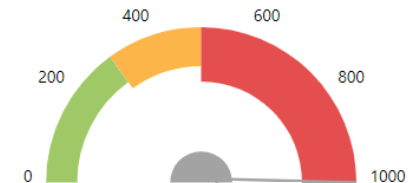
433

File Size in MB



262K

Total Elements



1693

Purgable Elements

Elements Performance

511

Model Groups

12K

Detail Groups

555

In-Place Families

173

Duplicates

Imports

101

CAD Imports

0

SKP Imports

1482

Custom Obj Styles

95

Raster Images

Views

2493

Total Views

1871

w/Hidden Elemen...

722

Not On Sheets

318

Sheets

Links

15

Revit Links

19

CAD Links

Worksets and Options

13

Worksets

10

Options

AUTODESK.



Etudes de cas

Pavillon Universitaire

En cours de livraison

Partenariat avec le client



Le génie pour l'industrie



Centre de santé

En cours de construction

Partenariat avec l'entrepreneur

POMERLEAU

Effacité des outils automatiques

Item de la liste de contrôle qualité	Temps		# de problèmes	
	Man.	Aut.	Man.	Aut.
Géolocalisation	03:30	00:15	0	0
Alignement des modèles	03:05	00:10	2	2
Liens épinglés	14:38	00:30	5	44
Délimitation de pièces désactivées pour les plafonds	04:45	00:06	6	234
Pièces et espaces placés	03:31	00:03	25	28
Pièces et espaces fermés et sans chevauchement	02:00	00:03	0	2
Objets dans le modèle correspondant	23:27	00:28	11731	16520
Objets définis dans une pièce ou un espace	18:00	00:14	17960	18136
Pas d'objet caché, filtré, annoté	39:13	01:12	434	860
Modèles génériques	06:06	00:22	1700	1705
Volumes	04:37	00:19	6	12
Composants de détails	04:19	00:16	21962	22017
Groupes à dissocier	20:15	00:16	67	2985
Vues sur aucune feuille	05:12	00:16	210	209

Problèmes de qualité dans les modèles

A	B	E	F
COBie	NAME	CATEGORY	DESCRIPTION
<input checked="" type="checkbox"/>	Chilled Water Return_CWR 2	Missing Classification Values	Missing Description Values
<input checked="" type="checkbox"/>	Chilled Water Return_CWR 3		
<input checked="" type="checkbox"/>	Chilled Water Return_CWR 4		
<input checked="" type="checkbox"/>	Chilled Water Supply_CWS 1		
<input checked="" type="checkbox"/>	Chilled Water Supply_CWS 2		
<input checked="" type="checkbox"/>	Chilled Water Supply_CWS 3		
<input checked="" type="checkbox"/>	Chilled Water Supply_CWS 4		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 2		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 3		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 4		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 5		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 6		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 7		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 8		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 9		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 10		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 11		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 12		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 13		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 14		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 15		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 16		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 17		
<input checked="" type="checkbox"/>	CNDWR_CNDWR 18		

Non explicit and redundant names

A	B	E	F	G	H	I	J	K
COBie	NAME	CATEGORY	DESCRIPTION	ASSETTYPE	MANUFACTURER	MODELNUMBER	WARRANTYGUARA	WARRANTYDURATI
<input checked="" type="checkbox"/>	Windows - Window Wall - Mechanical Louver_3D_Frame Depth 142mm	n/a	n/a					
<input checked="" type="checkbox"/>	Windows - Window Wall - Awning_3D_Operable Insert	n/a	n/a					
<input checked="" type="checkbox"/>	Windows - Scupper_3D_Overflow	n/a	n/a					
<input checked="" type="checkbox"/>	Windows - Mechanical Louvre_3D_1500x1000_Frame Depth 102mm	n/a	n/a					
<input checked="" type="checkbox"/>	WH3740BAR_WH3740BAR	n/a	Whitehall ADA Compl	Acom Engineering	WH3740BAR			
<input checked="" type="checkbox"/>	Washroom - Basin Door - Barn - Typical Bedroom Washroom	n/a	n/a					
<input checked="" type="checkbox"/>	SLDING - SLDING - SLDING	n/a	n/a					
<input checked="" type="checkbox"/>	SLDING - SLDING - SLDING	n/a	n/a					
<input checked="" type="checkbox"/>	Radiant Panel_Radiant Panel 2825AFF	n/a	n/a					
<input checked="" type="checkbox"/>	Radiant Panel_Radiant Panel	n/a	n/a					
<input checked="" type="checkbox"/>	PotLight - Cing Based - 3D_Type	n/a	n/a					
<input checked="" type="checkbox"/>	Plumbing - Urinal - Wall Mount - Commercial_30_Base	n/a	n/a					
<input checked="" type="checkbox"/>	Plumbing - Toilet - Wall Mount - Commercial_30_Base	n/a	n/a					
<input checked="" type="checkbox"/>	Plumbing - Drain_3D_Floor Drain 2	n/a	n/a					
<input checked="" type="checkbox"/>	Plumbing - Drain_3D_Floor Drain	n/a	n/a					
<input checked="" type="checkbox"/>	Plumbing - Drain_2D_Shower Drain - 100mm DIA	n/a	n/a					
<input checked="" type="checkbox"/>	Medicine Wheel Do - Typical Bed Room	n/a	n/a					
<input checked="" type="checkbox"/>	Mechanical - Gas Valve - Typical	n/a	n/a					
<input checked="" type="checkbox"/>	M_Roof Drain_380 mm Strainer - 75 mm Drain	n/a	n/a					
<input checked="" type="checkbox"/>	M_Roof Drain_380 mm Strainer - 75 mm Drain	n/a	n/a					
<input checked="" type="checkbox"/>	Locker-Spectrum-Two_Tier_2 Tier Locker - 15.375'	E2020200	2 Tier Locker	Spectrum	2 Tier Locker 15.375			
<input checked="" type="checkbox"/>	Light Fixture - Score_200mm	n/a	n/a					
<input checked="" type="checkbox"/>	Light Fixture - Pats_300 mm	n/a	n/a					
<input checked="" type="checkbox"/>	Library Gate 1_Barn 1120mm x 2450mm - Lays 3 Only	n/a	n/a					
<input checked="" type="checkbox"/>	Ladder-Precision_Ladders-Fixed_Ladder_w/_Parapet_Platform_and_Roof-Side_Return_Fixed	n/a	Fixed Ladder	Precision Ladders, LL	FL-06			
<input checked="" type="checkbox"/>	Ladder-Access-O'Keefe-Removable_Standard	n/a	Aluminum Ladder	O'Keefe's, Inc.	Removable			
<input checked="" type="checkbox"/>	Fitness - Weight Rack_2D_Fitness - Weight Rack_2D	n/a	n/a					
<input checked="" type="checkbox"/>	Fitness - Upright Bike_2D_Fitness - Upright Bike_2D	n/a	n/a					
<input checked="" type="checkbox"/>	Fitness - Treadmill_2D_Fitness - Treadmill_2D	n/a	n/a					
<input checked="" type="checkbox"/>	Fire Suppression - Valve Cabinet (Recessed)_3D_865x865x300	n/a	n/a					

Non consistent names

Misplaced objects

Missing Classification, Description, Manufacturer and Warranty Values

A	B	E	F	G	H	I
COBie	NAME	TYPENAME	SPACE	DESCRIPTION	SERIAL NUMBER	INSTALLATIONDAT
<input checked="" type="checkbox"/>	AC PKFY-P12NHMU 1TON_AC PKFY-P12NHMU_AC-114	AC PKFY-P12NHMU 1TON_AC PKFY-P12NHMU	029			
<input checked="" type="checkbox"/>	AC PKFY-P12NHMU 1TON_AC PKFY-P12NHMU_AC-113	AC PKFY-P12NHMU 1TON_AC PKFY-P12NHMU	01-109			
<input checked="" type="checkbox"/>	AC PKFY-P12NHMU 1TON_AC PKFY-P12NHMU_AC-112	AC PKFY-P12NHMU 1TON_AC PKFY-P12NHMU	03-109			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-110	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	029			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-101	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	03-207			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-104	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	058			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-115	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	06-207			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-111	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	01-107			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-108	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	071			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-102	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	058			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-107	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	058			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-109	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	06-207			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-106	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	03-207			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-116	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	071			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-115	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	007			
<input checked="" type="checkbox"/>	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU_AC-116	AC PKFY-P24NKMU 2TON_AC PKFY-P24NKMU	007			
<input checked="" type="checkbox"/>	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1_CU-101	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1				
<input checked="" type="checkbox"/>	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1_CU-102	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1				
<input checked="" type="checkbox"/>	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1_CU-103	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1				
<input checked="" type="checkbox"/>	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1_CU-104	Condensing Unit PUMY - P60NKMU1_Condensing Unit PUMY - P60NKMU1				

Non consistent, incomprehensible and duplicate names

Missing Space, Description, Serial Number, and Installation Values

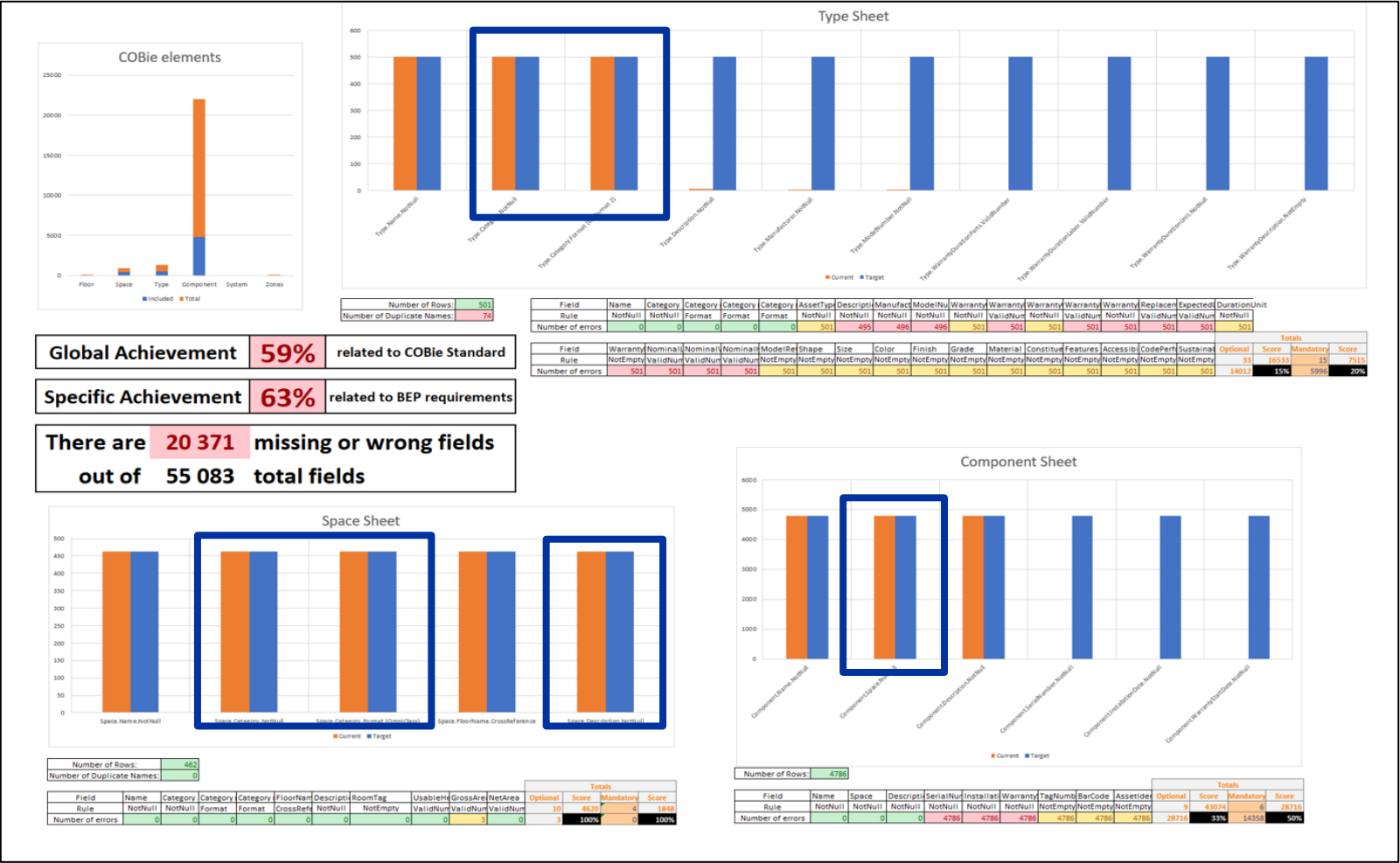
Résultats du contrôle qualité

+ autres items de Model Checker et Dynamo non requis dans la portée d'un projet COBie

	Règles	Erreurs	# d'elements
Space	Name.Unique	4	451
	Category.NotNull	451	
	Category.Format (OmniClass 13)	451	
Type	AComponentForEachType	111	607
	Name.Unique	3	
	Category.NotNull	160	
	Category.Format (Unifomat 2)	500	
	Description.NotNull	481	
	AssetType.NotNull	607	
	Manufacturer.NotNull	488	
	Manufacturer.CrossReference (Contact)	607	
	ModelNumber.NotNull	494	
	WarrantyGuarantorParts.NotNull	607	
	WarrantyGuarantorParts.CrossReference (Contact)	607	
	WarrantyGuarantorLabor.NotNull	607	
	WarrantyGuarantorLabor.CrossReference (Contact)	607	
	WarrantyDurationUnit.NotNull	607	
	DurationUnit.NotNull	607	
Component	Space.NotNull	12168	16678
	Space.CrossReference	12790	
	Description.NotNull	16678	
	SerialNumber.NotNull	16678	
	InstallationDate.NotNull	16678	
	WarrantyStartDate.NotNull	16678	
System	PrimaryKey.Unique (Name, Category, ComponentNames)	3049	75435
	Category.NotNull	75435	
	Category.Format (Unifomat 2)	75435	
	ComponentNames.CrossReference	64907	

Evaluation des résultats

- **Éléments conformes** vs nombre total d'éléments.
- Augmentation notable du score entre avant et après l'intervention.



Directions Futures

Prochaines tâches – Pistes de recherche

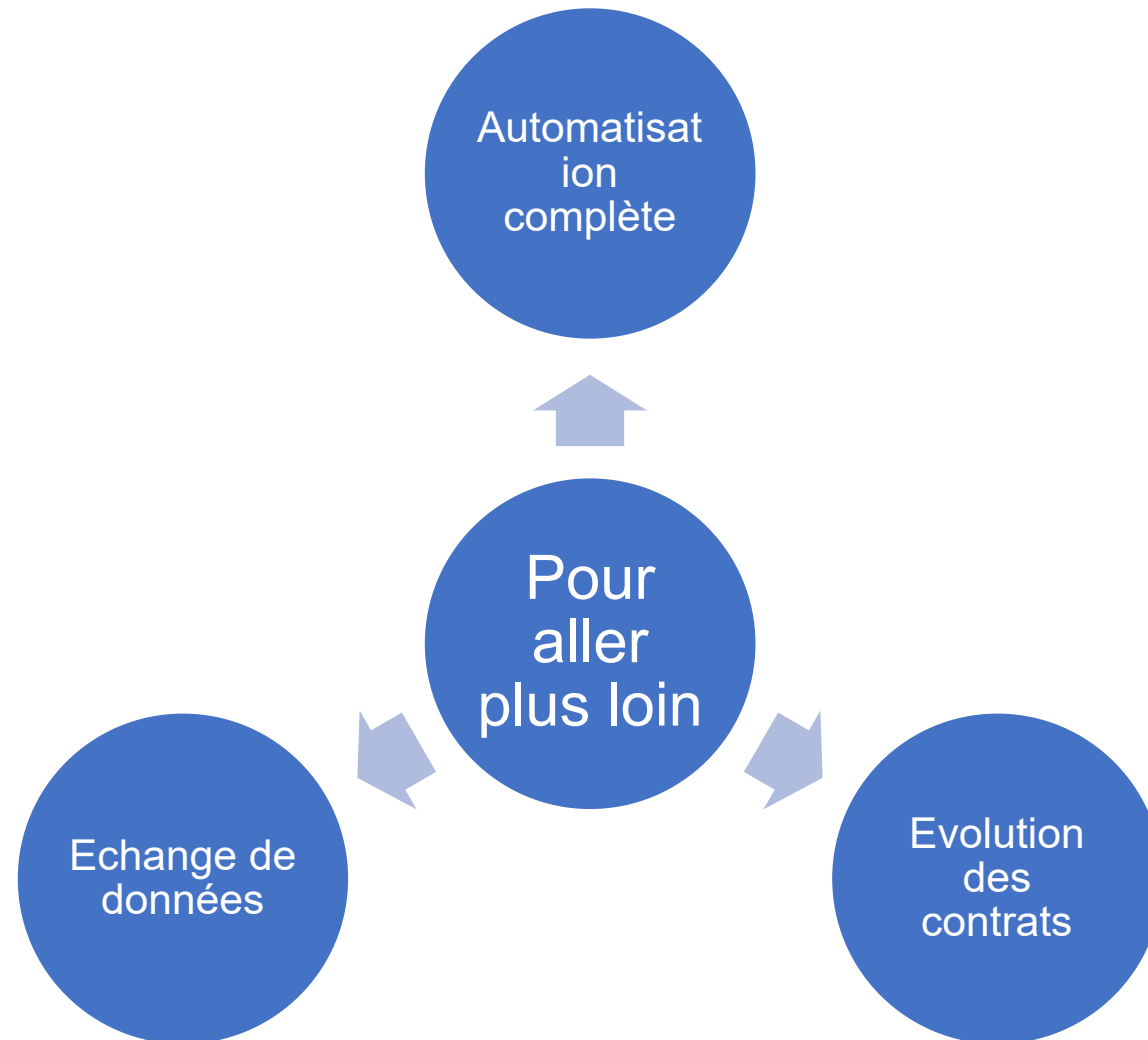
Prochaine tâches

- **Extension de la liste de contrôle qualité pour tous les modèles BIM**
- **Création d'extraits et de gabarits selon les types de projets et les cas d'usage**

- **Automatisation des items manquants de la liste**
- **Développement de gabarits selon les types de projets et les cas d'usage**
- **Mise en place d'analytique plus performante**

- **Transfert efficace des données BIM vers la GMAO**
- **Centralisation dans un modèle intégré et interconnecté (vers le CDE)**

Initiatives de recherches futures

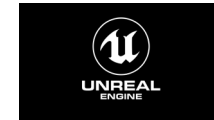


Questions?

PARTENAIRE
PUBLIC



PARTENAIRES
OR



PARTENAIRES
ACADÉMIQUES



PARTENAIRES
RÉGULIERS



How to use real-time data for safe return to the office

- Tomi Teikko
- Founder and Head of Empathic Building, Haltian Inc

△ Haltian



Empathic Building

Safe return to the office

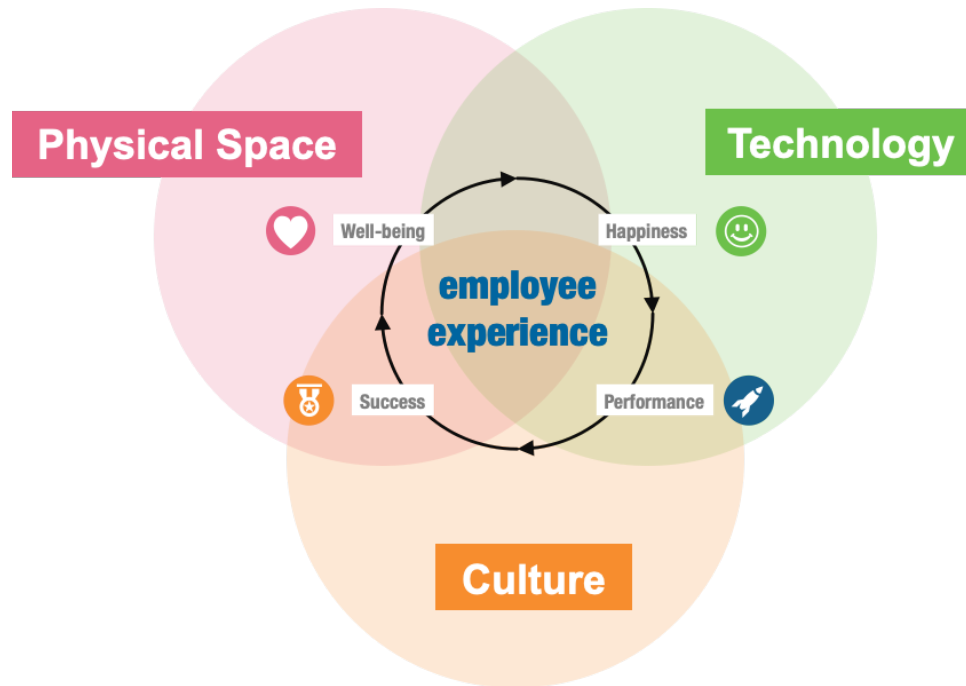


empathic building®

Empathic Building integrates IoT data to customer business success by solving end-user problems in a digital twin.

What kind of building is empathic?

The one that delivers the best employee experience



Empathic Building digital twin

- Focusing on improving employee wellbeing and happiness
- Enables people to find the rights spaces, colleagues and voice their feelings
- Show relevant real-time data to the employees in a digital twin to make fast data-driven decisions
- Easy-to-use browser-based app that can use on info screen, workstations and mobile phone
- Enables safe return to the office



Empathic Building features



empathic building®

Find or book your desk

Feature: Finding safely the right workspace for the work at hand.

Benefit: Finding a desired space instantly with desired equipment and surroundings.

Find people and collaborate

Feature: Finding the right people in the building when needed and getting to know their professional profile, skills and wills.

Benefit: Instant collaboration with no need to search, sync calendars, or do unnecessary emails or calls.

Find your atmosphere

Feature: Finding a workspace based on air quality, noise level or people flow.

Benefit: No more freezing or sweating in unwanted noise or silence.



Visualizing data

Feature: Statistics on space usage & employee satisfaction.

Benefit: Data-driven decisions for optimizing space and improving the environment.



Find your room

Feature: Finding a room for ad-hoc meetings or concentration.

Benefit: No more booking in advance – just walk in and work when room needed.



Share your voice

Feature: Expressing and hearing feedback from employees on both internal and external matters.

Benefit: A real-time SWOT tracking employee satisfaction – when it happens, as it happens.



Create service tickets

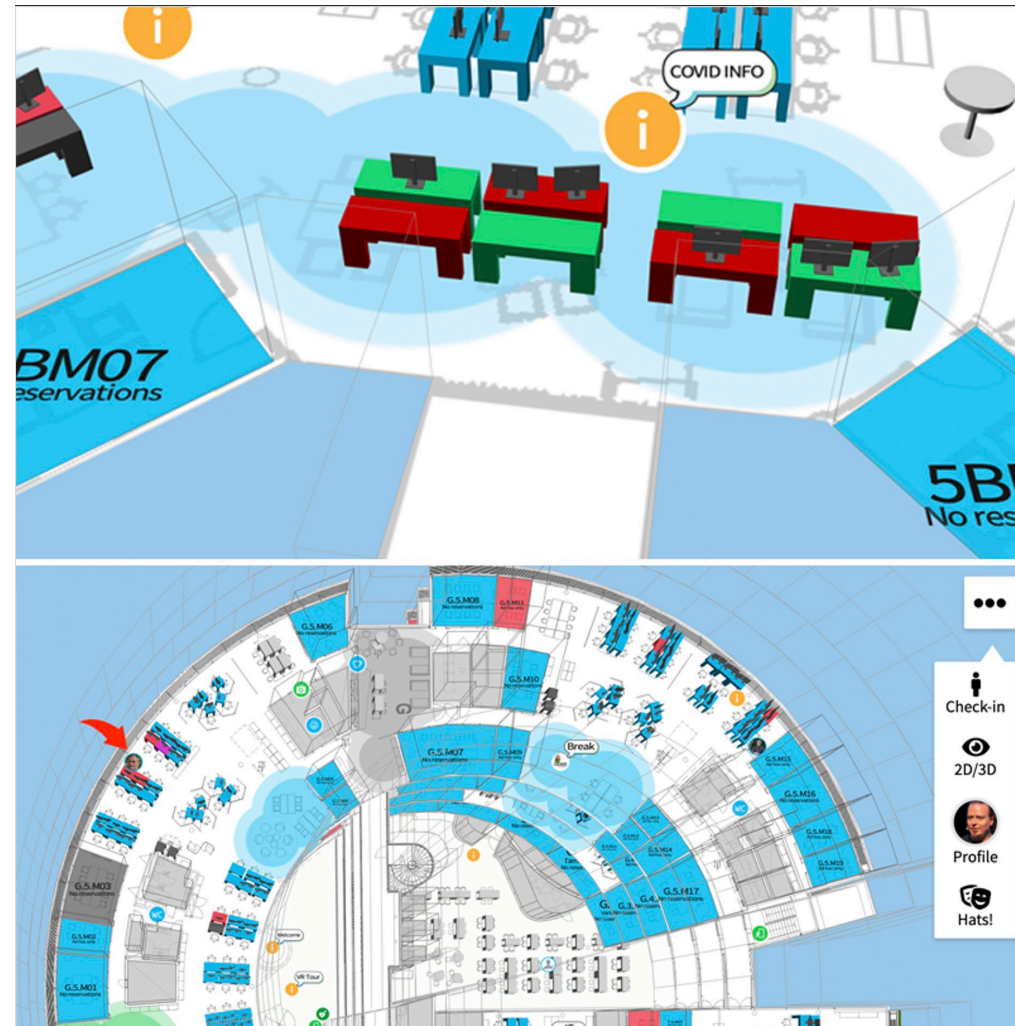
Feature: Mapping & reporting technical and sanitation issues with location data.

Benefit: Savings from scheduled routes to need-based maintenance.

Empathic Building desk digital

Find or book your desk 1/3

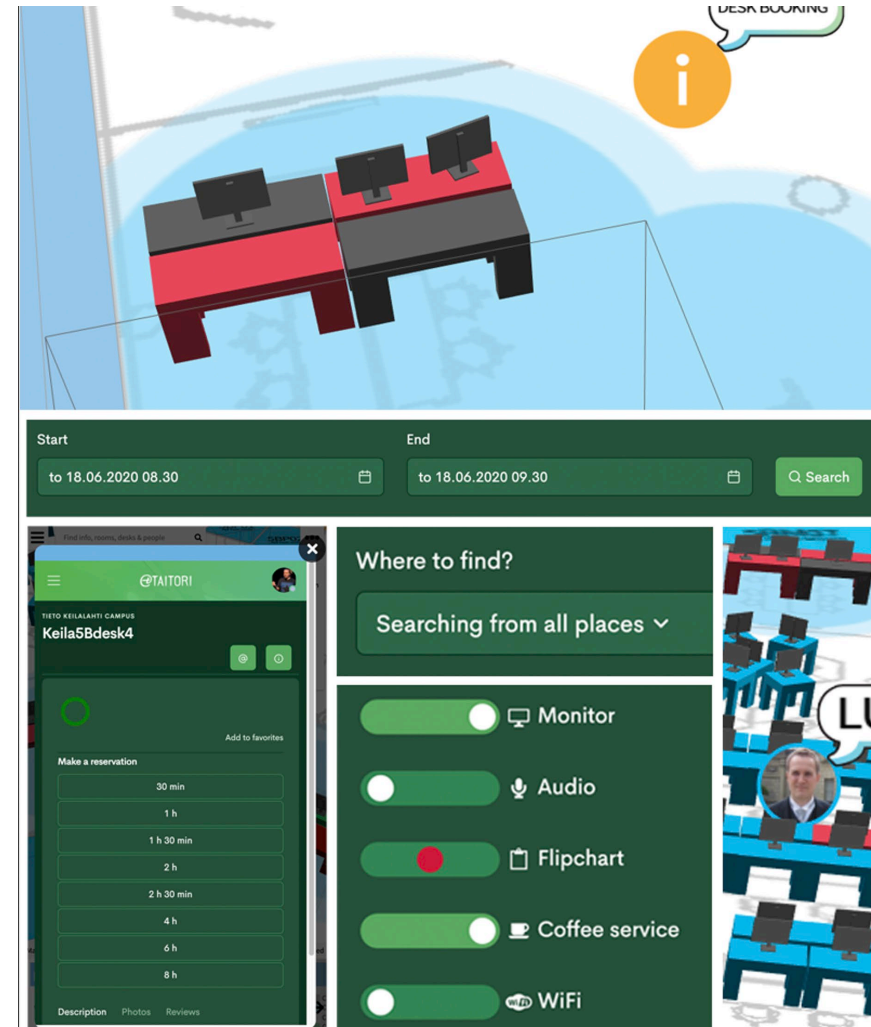
- Digital 3D copy of your workplace
- Visualizing desks that are in use
- Use your own brand colours
- Showing the user instructions
- Possibility to employees to share their own avatar (check-in to the office)
- Bringing building service information visible



Empathic Building desk booking

Find or book your desk 2/3

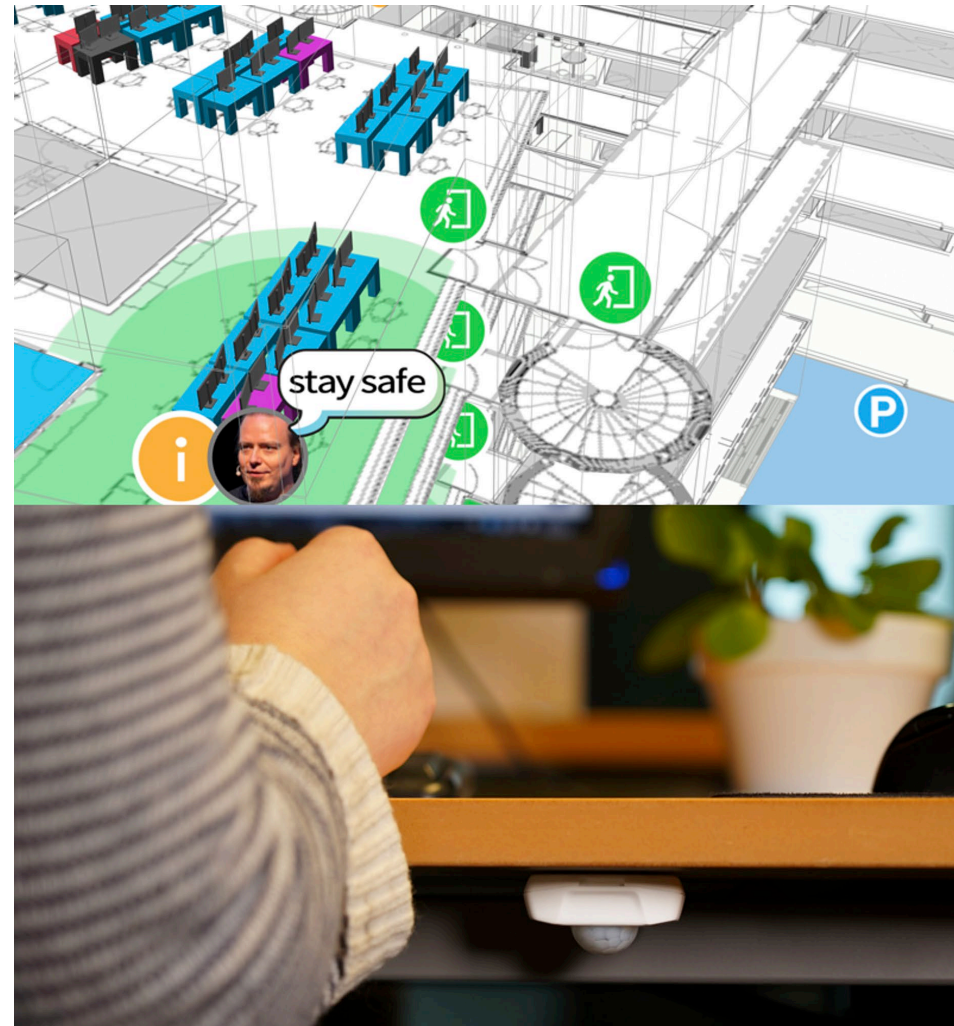
- Enables desk booking for employees or book desk on-behalf
- Good and safe alternative for desk sharing
- Desk can be booked ad-hock or advanced
- Visual and filter tools for desk equipment's (screens, port replicators, ergonomics, lightning, etc.)
- Automated cleaning processes (notifications when desk booking ends)
- Possibility to adjust minimum and maximum booking times



Empathic Building desk sensing

Desk booking automated 3/3

- Desk booking/occupancy fully automated
- Reliable data of desk usage real-time
- Valuable occupancy reporting
- Enables need based maintenance (disinfect only the desk been used)
- Wireless sensors, no access or need for customer network
- Easy to install, no ICT competence needed (plug and play)
- Global data roaming



Subsea 7 opening office safely

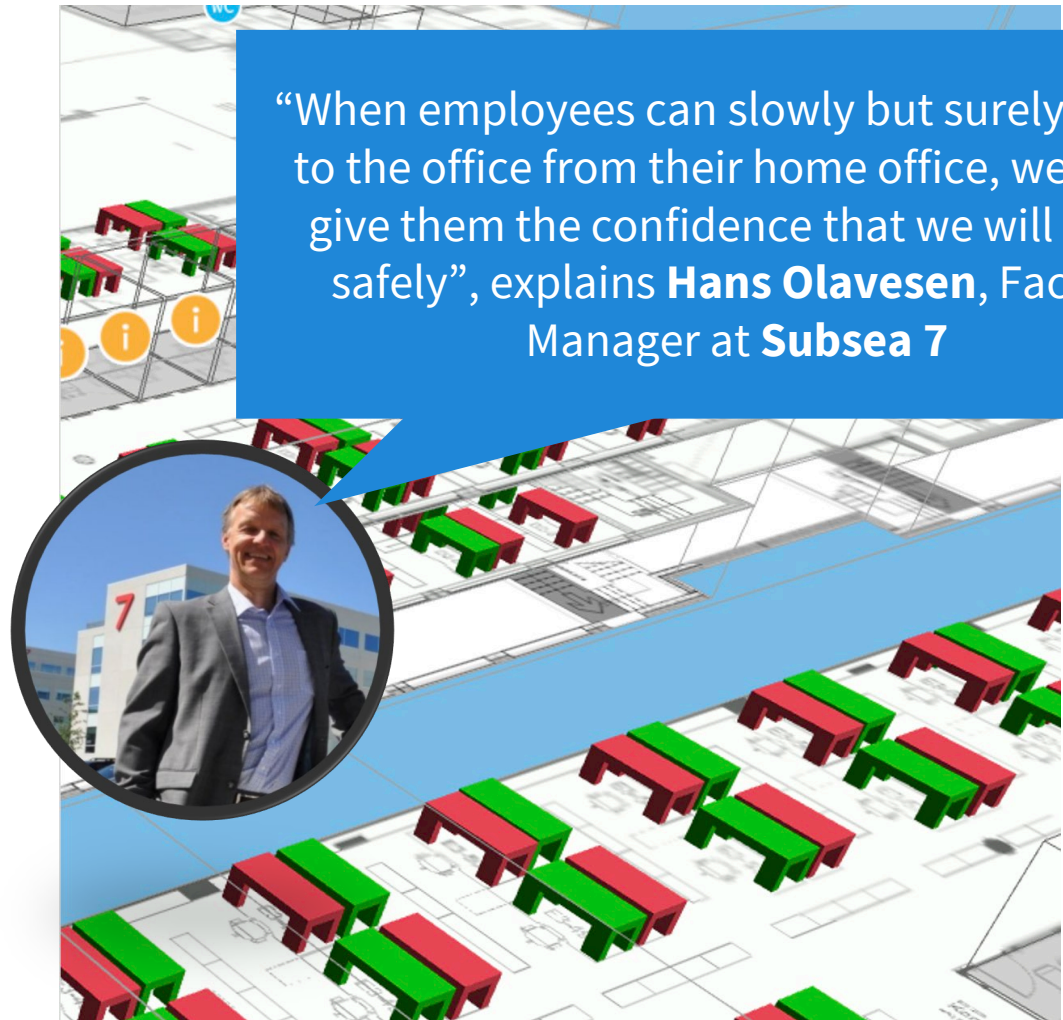
Customer case example

Subsea 7 implemented Empathic Building in their office in Stavanger Norway to enable a safe return to the office

Subsea 7 wanted a solution that made it easy for employees to:

- See where they could work safely
- Choose when to eat lunch
- Implement need-based maintenance for the canteen

Due to the first successful implementation, Subsea 7 is now considering to introduce the service in their offices outside of Norway

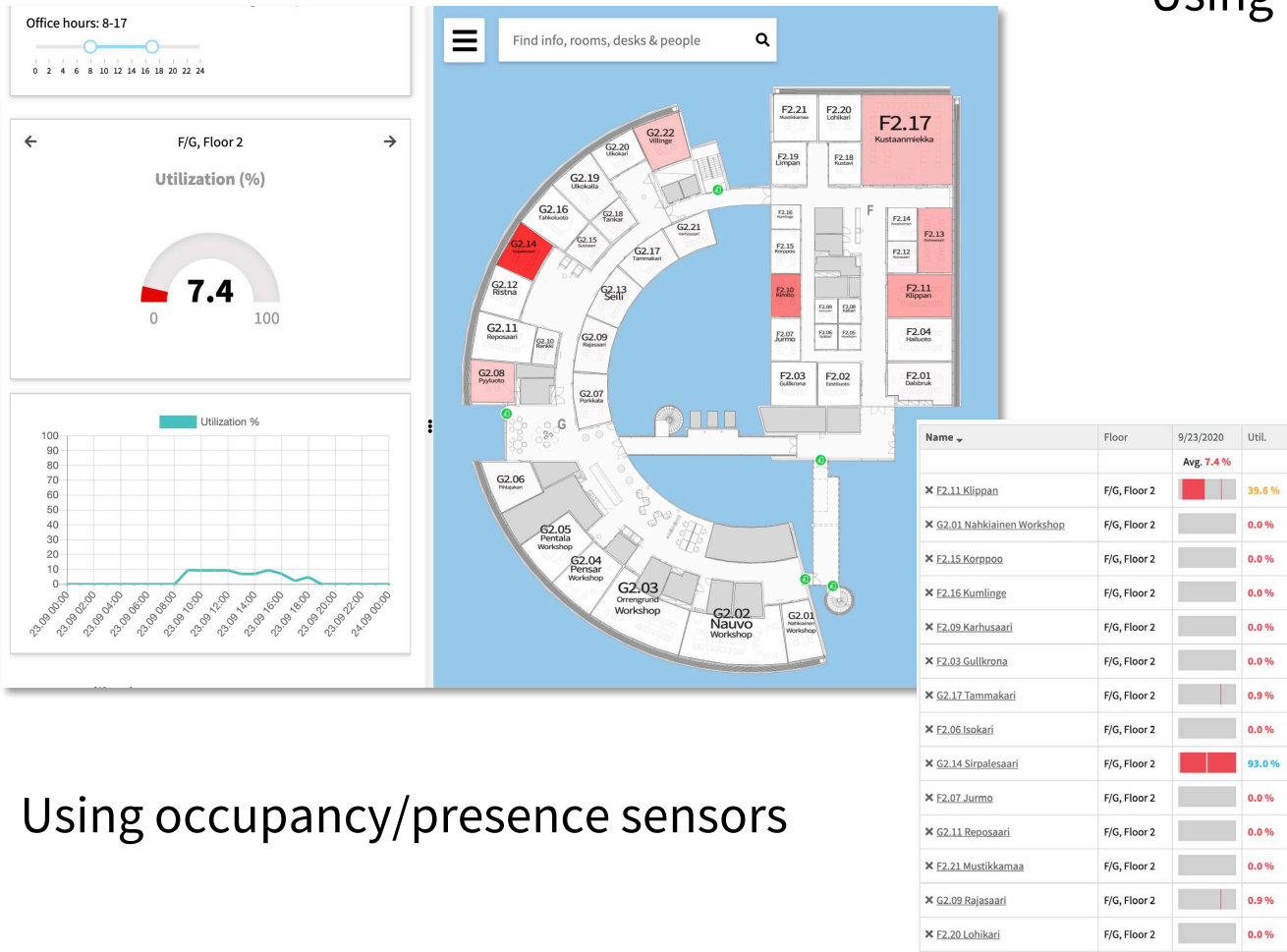


Haltian

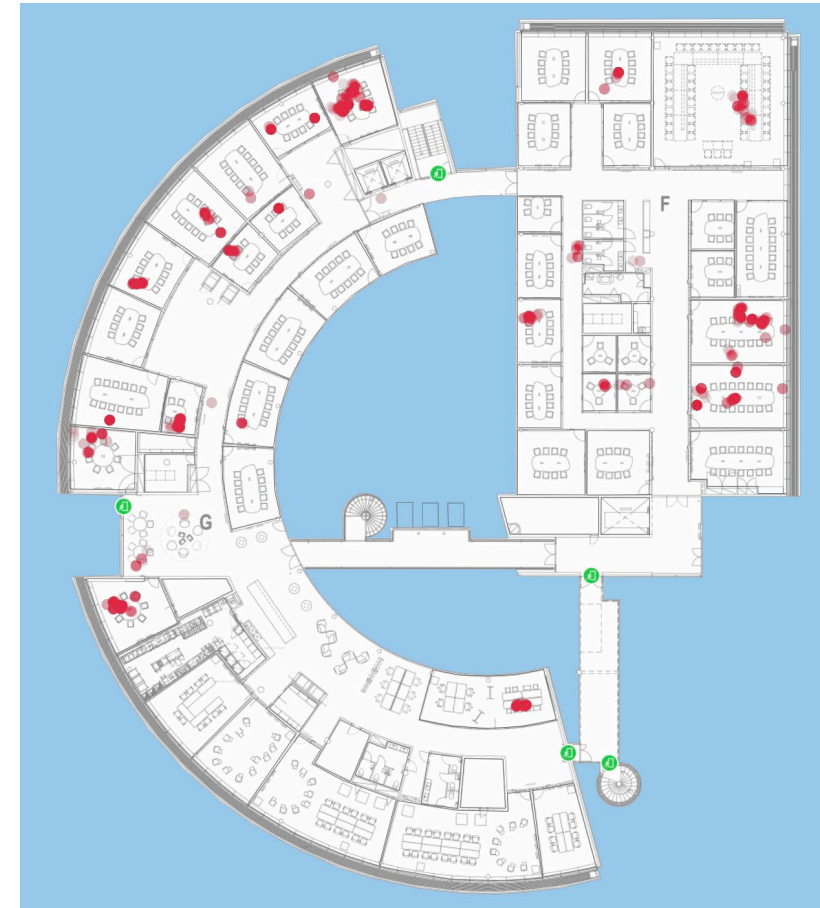
Impossible Thinks Made Easy

Real-time room usage report examples

Using indoor positioning



Using occupancy/presence sensors



Real-time desk usage report examples

Date range
 21/09/2020 - 25/09/2020

Floors
 F/G, Floor 4

Exclude weekends (Sat and Sun)

Generate report

Excluded assets
 Select...

Utilization percentage: 0-100 %
 0 2 4 6 8 10 12 14 16 18 20 22 24

Office hours: 8-17

Case sensitive
 Regular expression

Clean desk policy: 120 mins

F/G, Floor 4
 Utilization (%)
 0 12.0 100



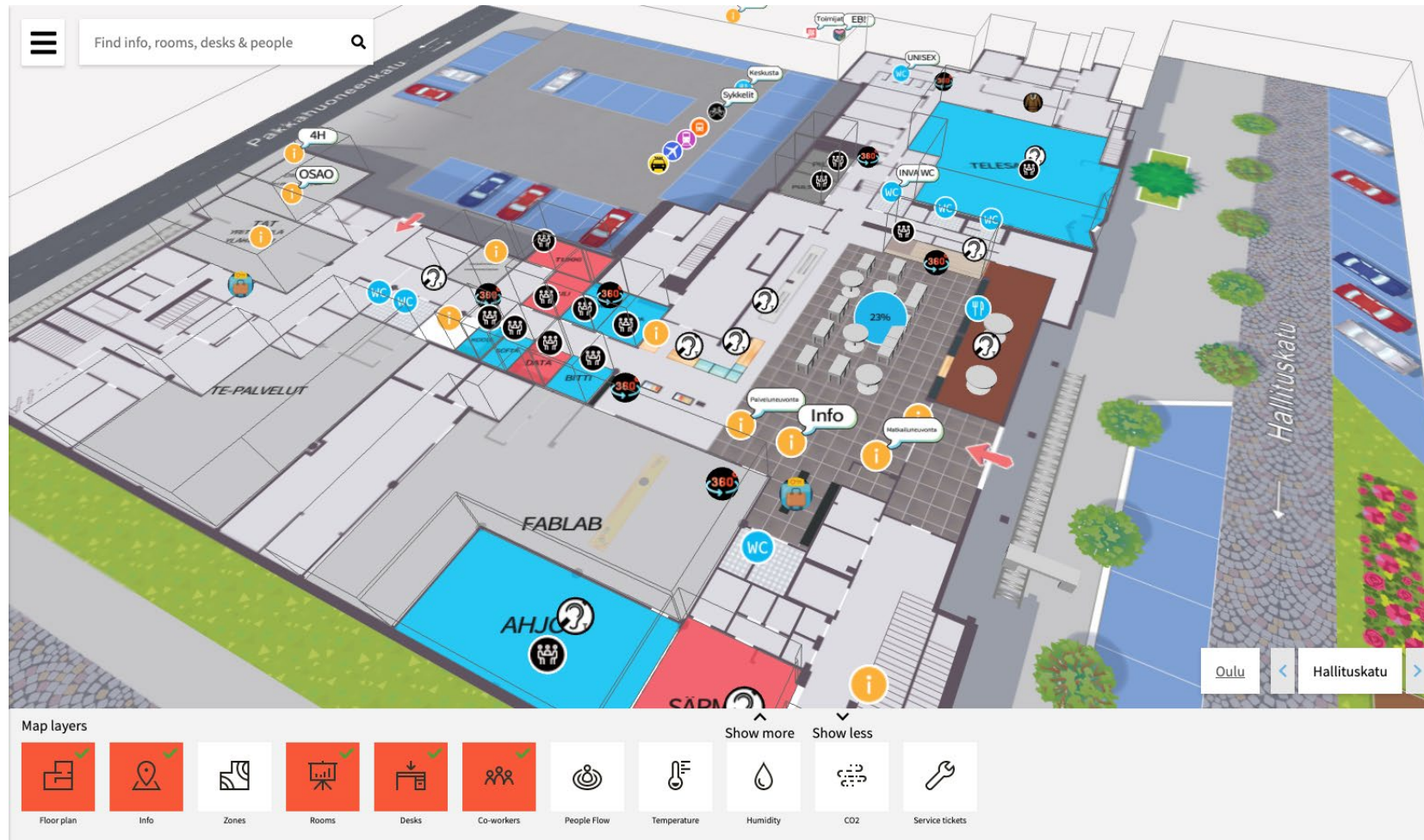
Using indoor positioning

Name	Floor	9/21/2020	9/22/2020	9/23/2020	9/24/2020	9/25/2020	Util.
X 4GW063	F/G, Floor 4						0.0 %
X 4GW017	F/G, Floor 4						10.6 %
X 4GW064	F/G, Floor 4						0.1 %
X 4GW076	F/G, Floor 4						85.1 %
X 4GW011	F/G, Floor 4						18.9 %
X 4GW071	F/G, Floor 4						0.0 %
X 4GW018	F/G, Floor 4						12.8 %
X 4GW065	F/G, Floor 4						0.0 %
X 4FW061	F/G, Floor 4						0.0 %
X 4FW074	F/G, Floor 4						0.0 %
X 4FW081	F/G, Floor 4						49.8 %
X 4GW086	F/G, Floor 4						10.8 %
X 4GPD4	F/G, Floor 4						0.0 %
X 4FW092	F/G, Floor 4						0.0 %
X 4FW005	F/G, Floor 4						0.0 %



Using occupancy/presence sensors

Co-working customer in Oulu, Finland



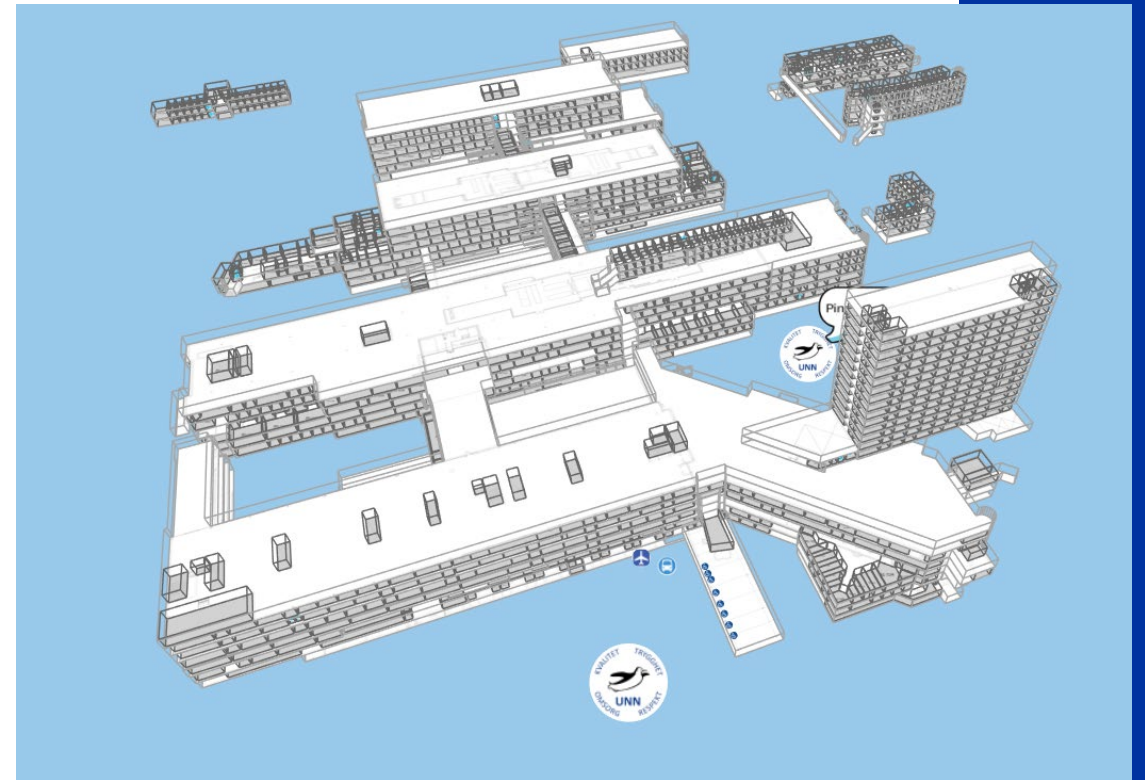
Empathic Building application



University hospital Tromsø Norway

Fully digital twin

130.000 m2 onboarded in 2,5 months

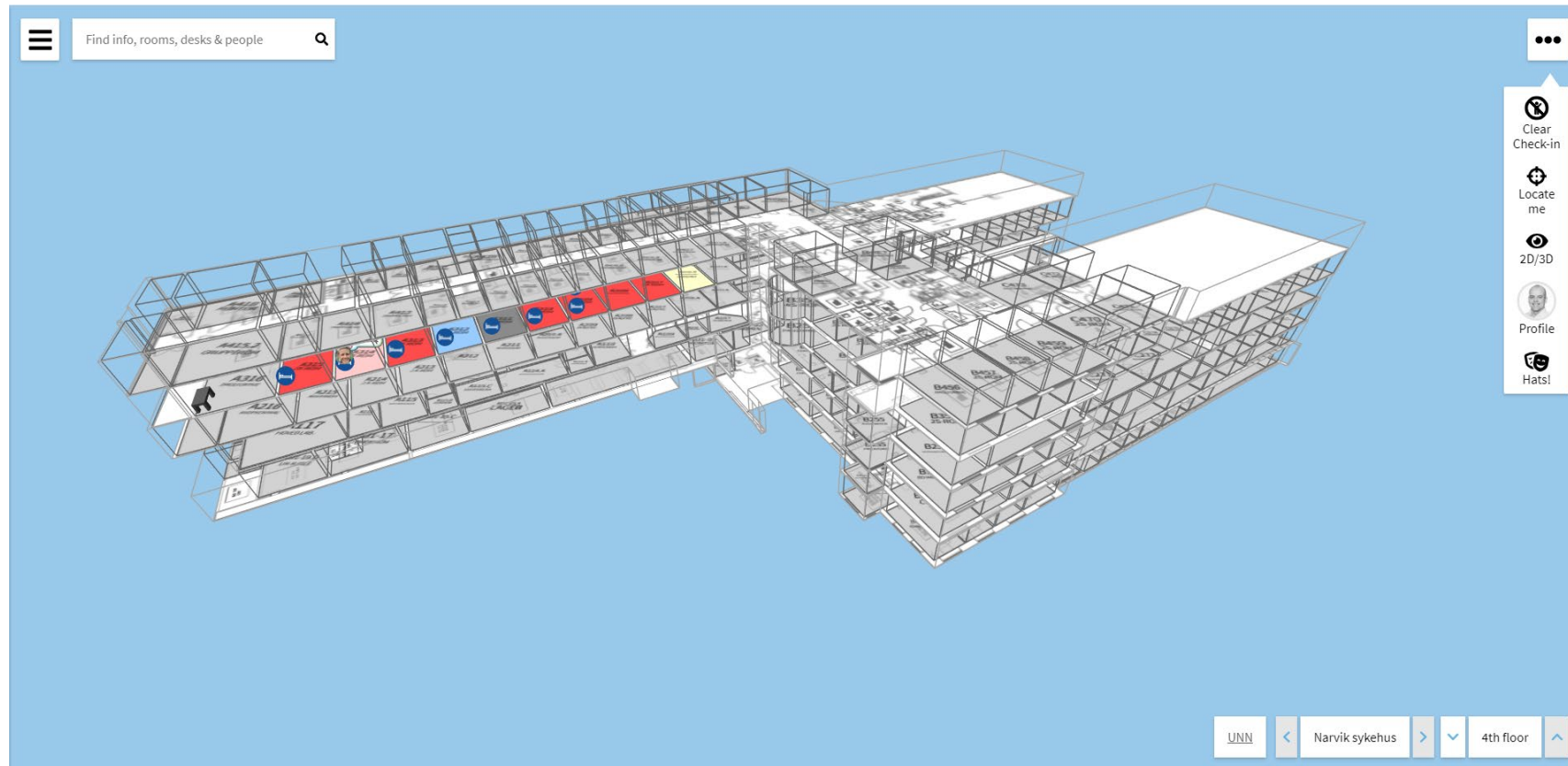


Office customer Espoo, Finland



Empathic Building application

Narvik Hospital – 18.000m2 onboarded in 2 days

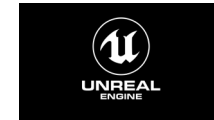


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POUR UN
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