

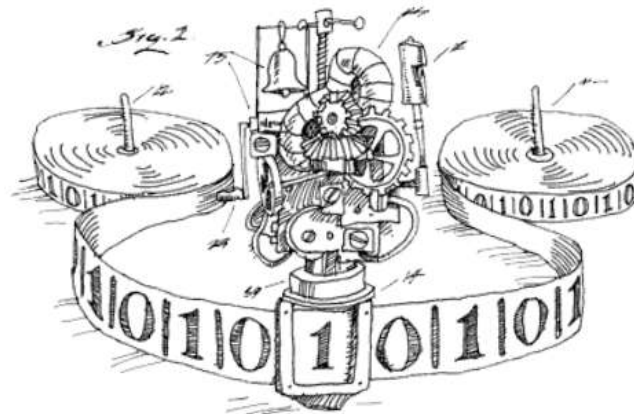
# STRATEGIE INFORMATICHE PER LA VALUTAZIONE DELL'ACCESSIBILITA'

OWL, CAD, BIM, IFC, MC

**Giovanni Bellomo**

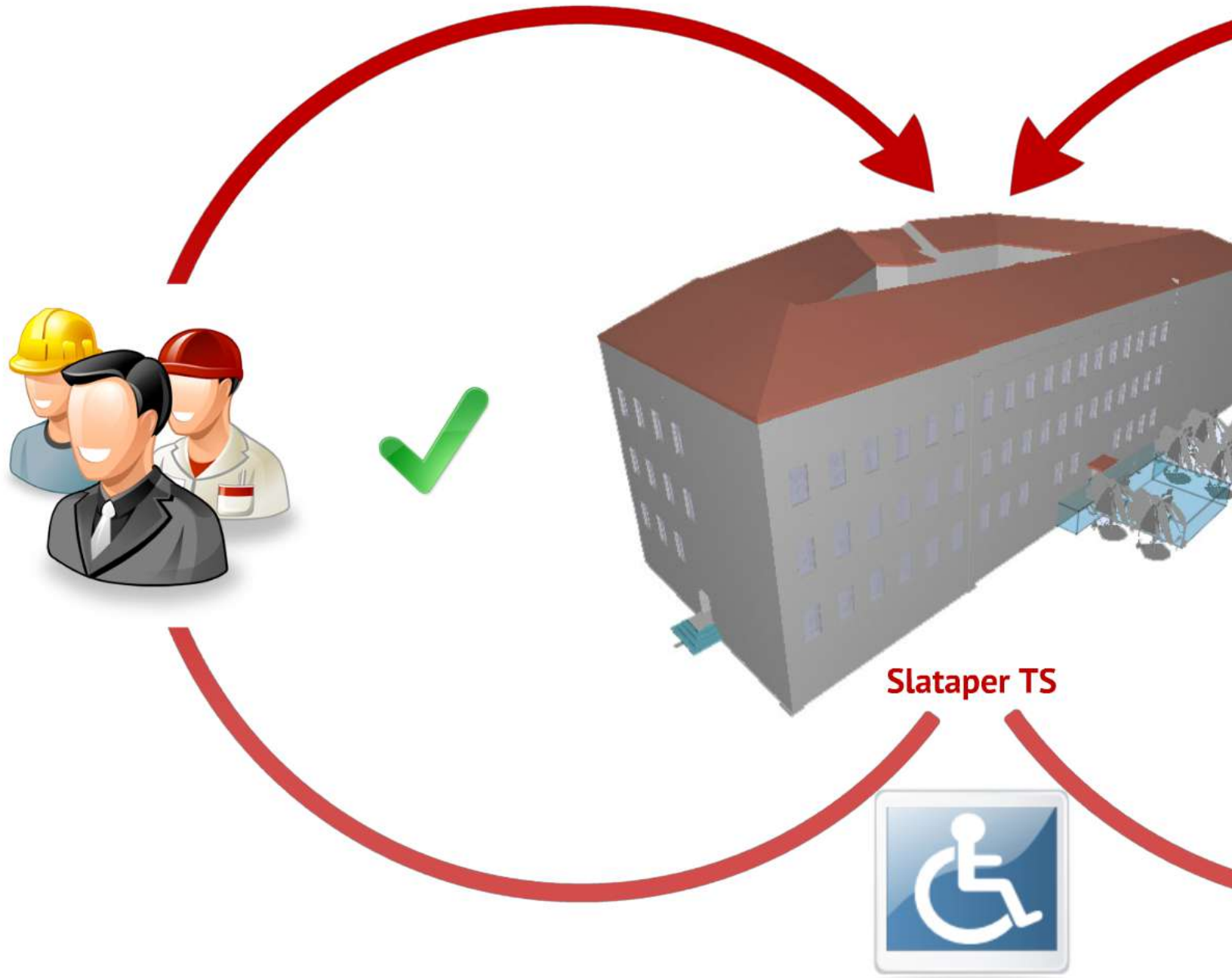
[giovanni.bellomo@welfare.fvg.it](mailto:giovanni.bellomo@welfare.fvg.it)

# E' possibile effettuare la valutazione dell'accessibilità fisica e sensoriale di un edificio in modo "automatico"?

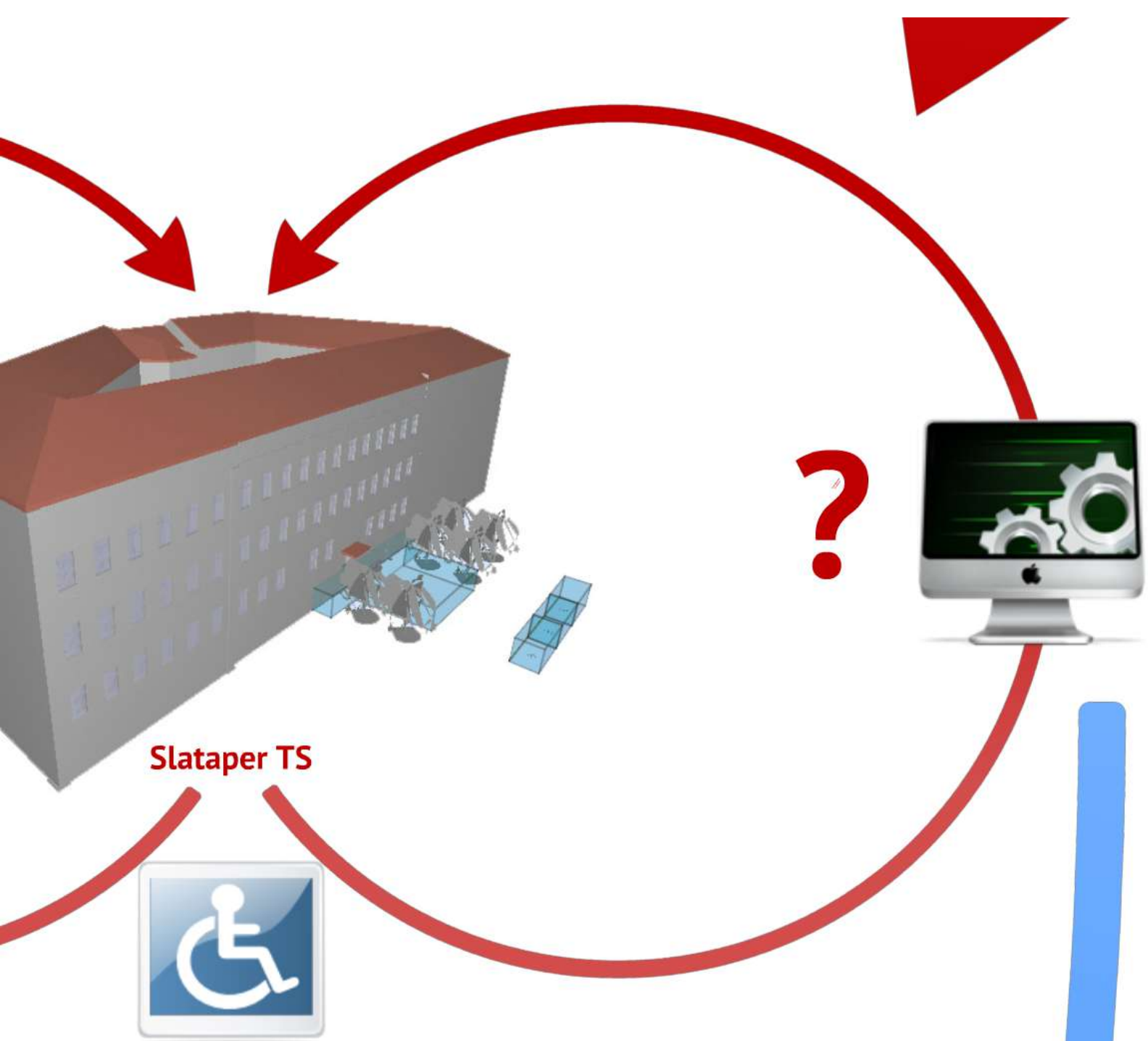




- ✓ Visualizzazione dei risultati è intuitiva
- ✓ Comunicazione dei risultati soddisfacente
- ✓ Informazioni facilmente utilizzabili





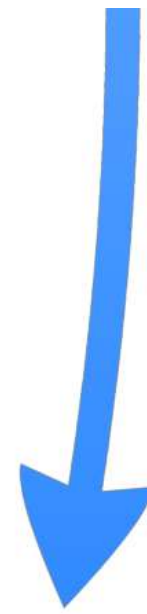


Slataper TS



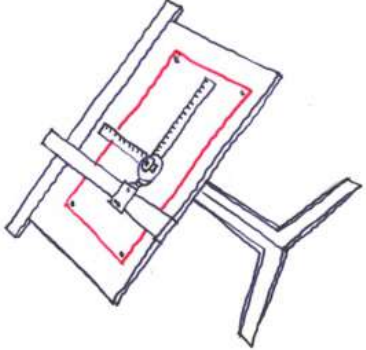
**E' possibile farlo  
al computer?**





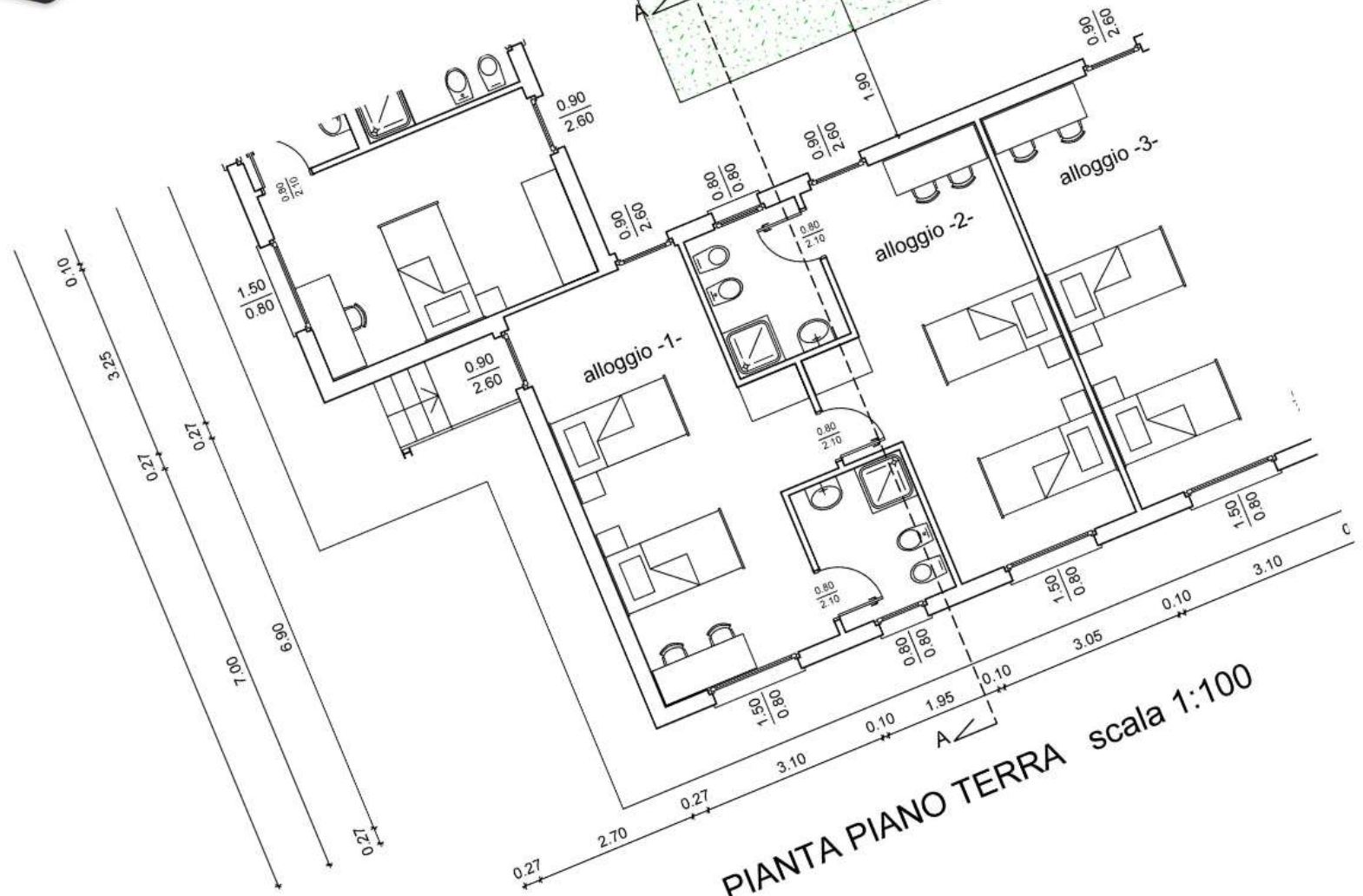
**Prima del 1982**







**1982 - XX sec**



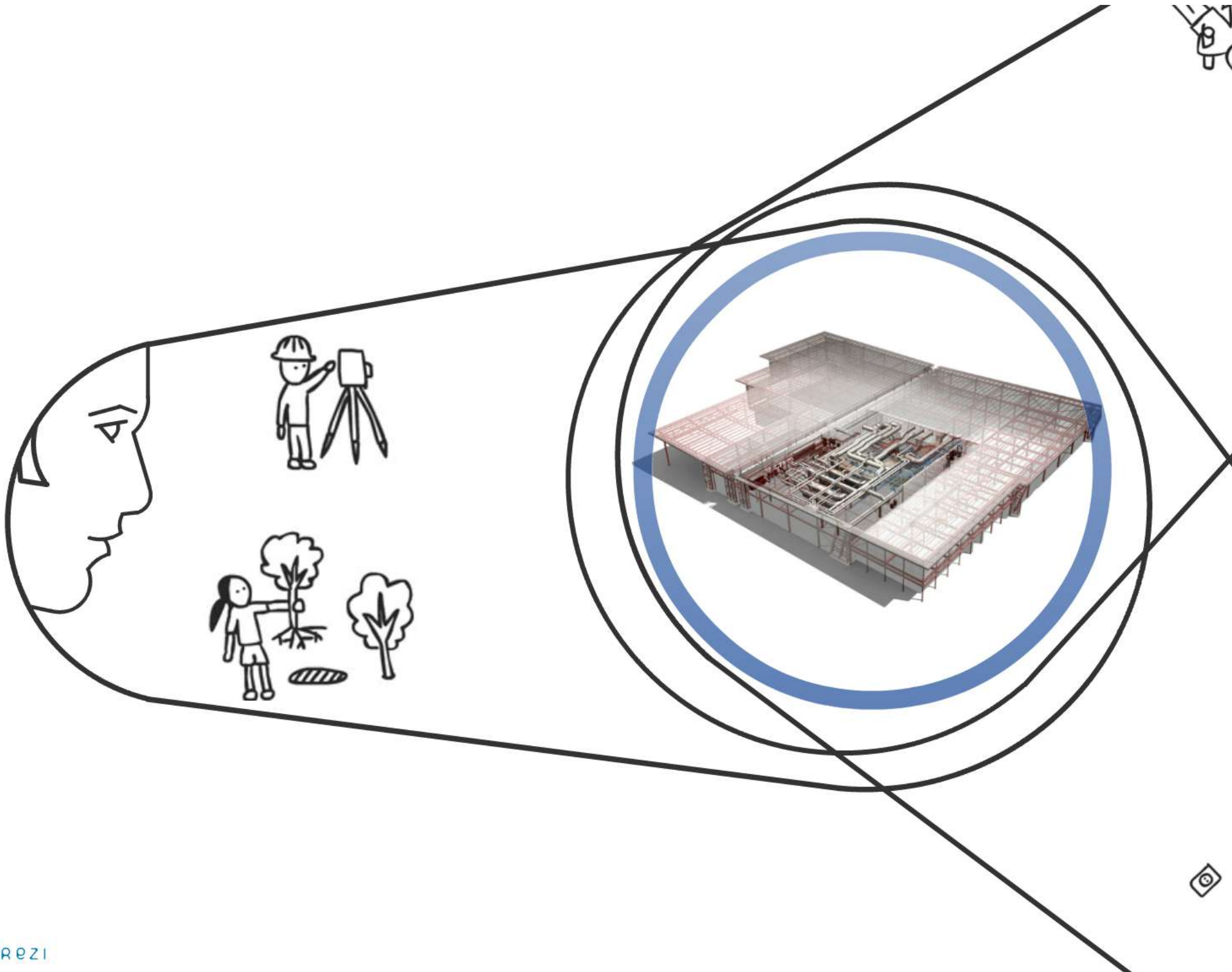
PIANTA PIANO TERRA scala 1:100

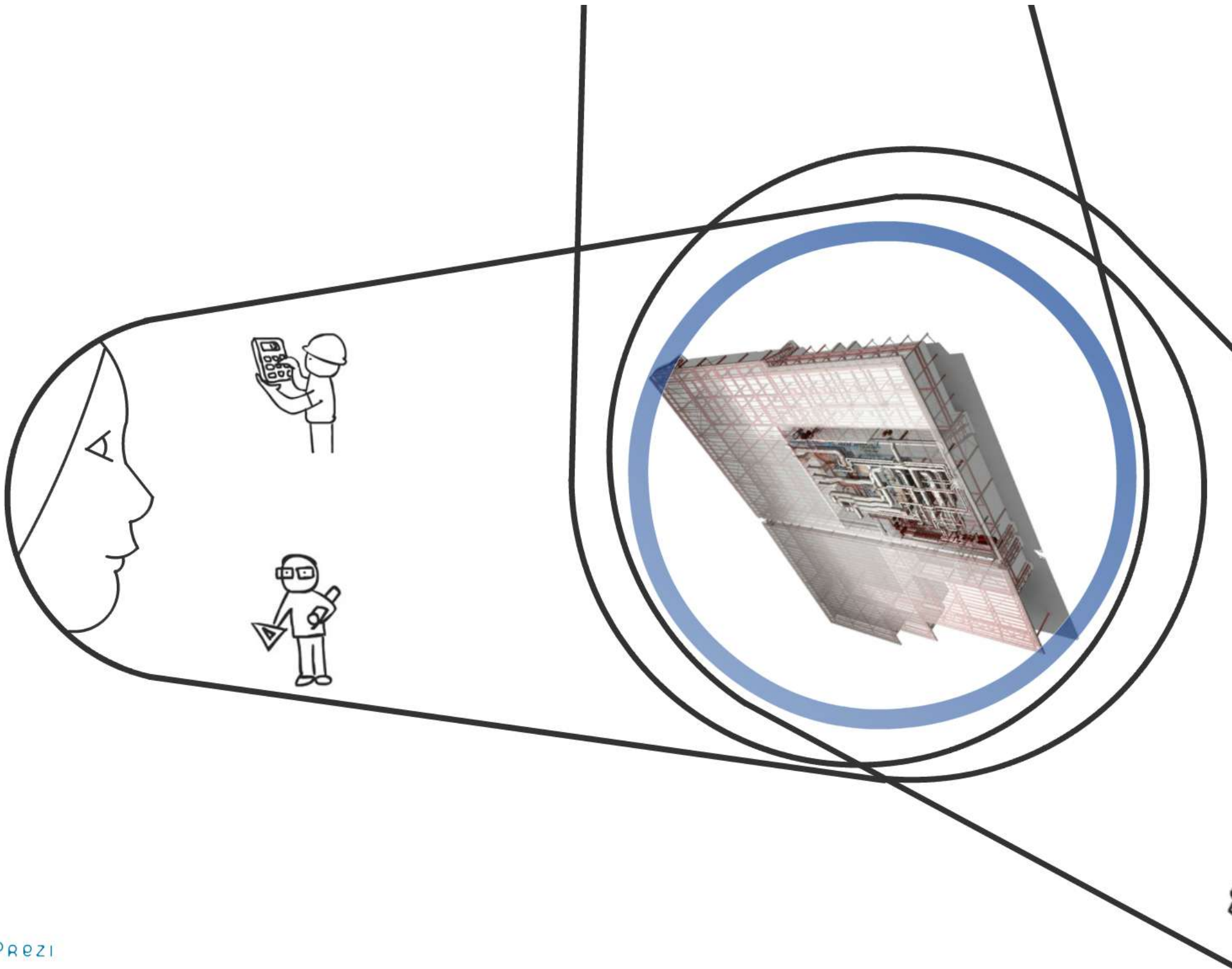


Molti punti di vista

**XX sec < CAD**

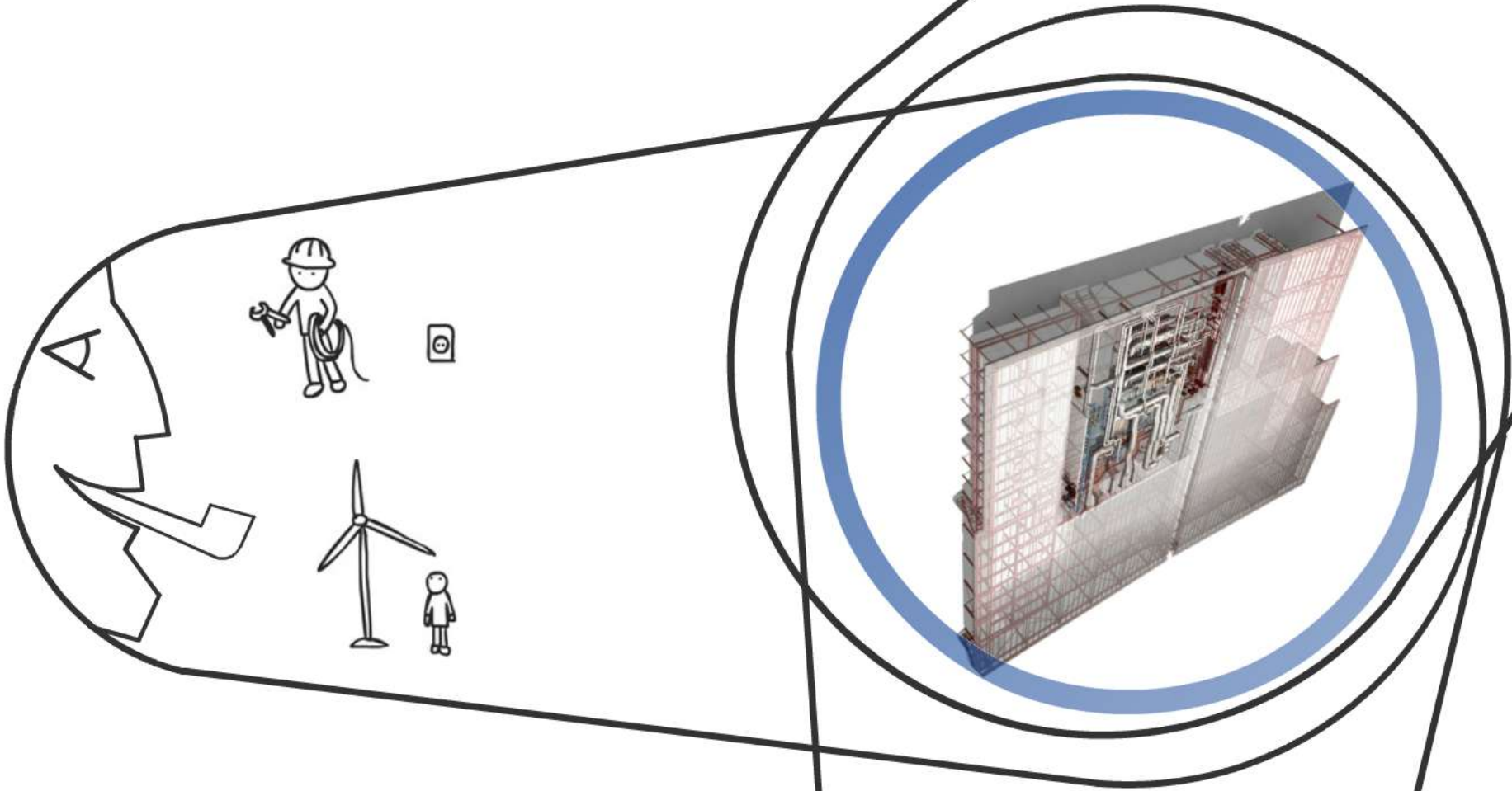




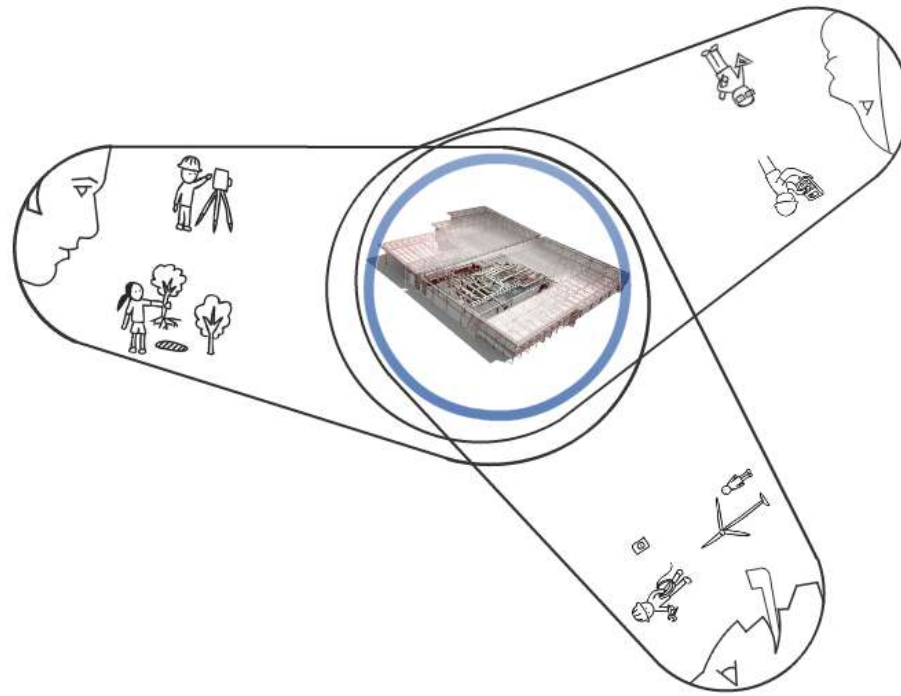




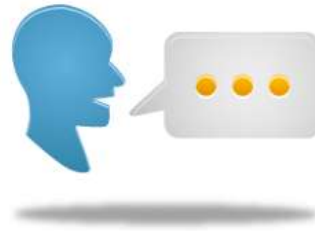
!!!



Hand-drawn signature or scribble at the bottom center.



**Molti punti di vista**



# Linguaggio condiviso

# Ontologia

per l'accessibilità



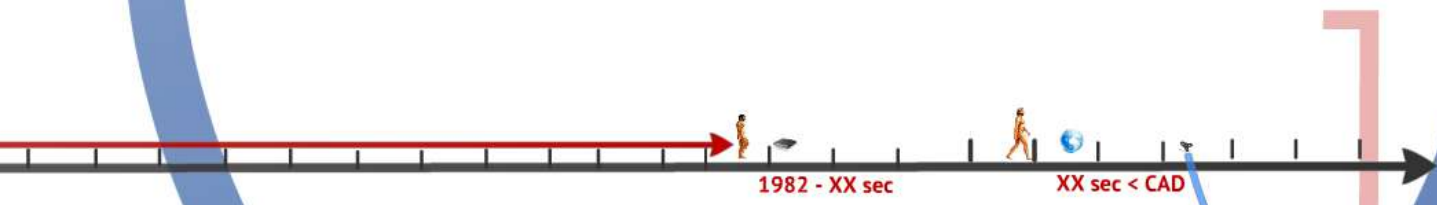
# OWL

Ontology Web Language



# CAD

Computer Aided Design



# OWL

Ontology Web Language



Software





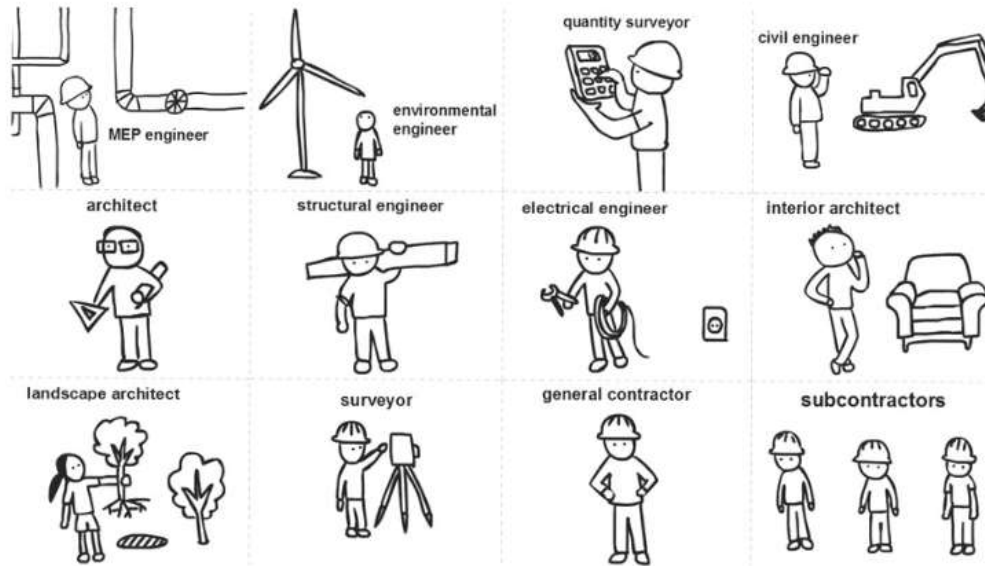
Modello 3D



Collezione di Dati



Processo



NOODS

# BIM

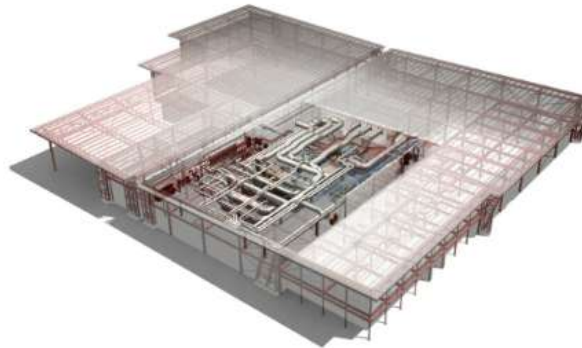
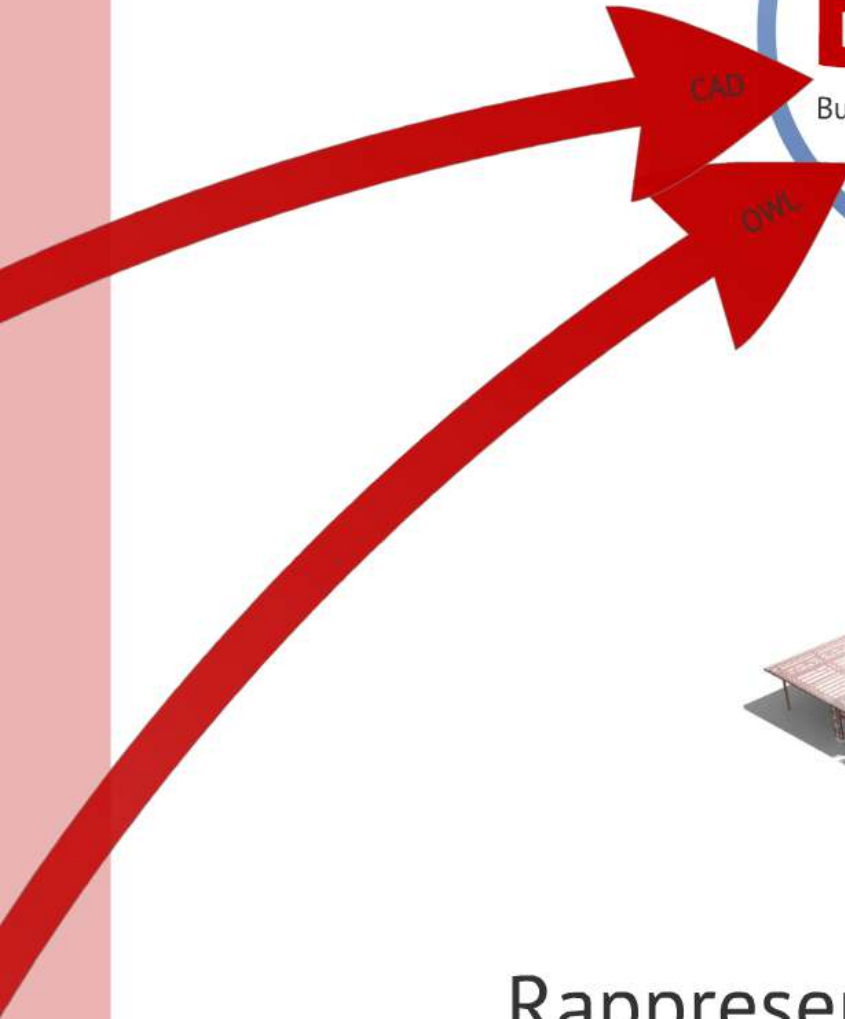
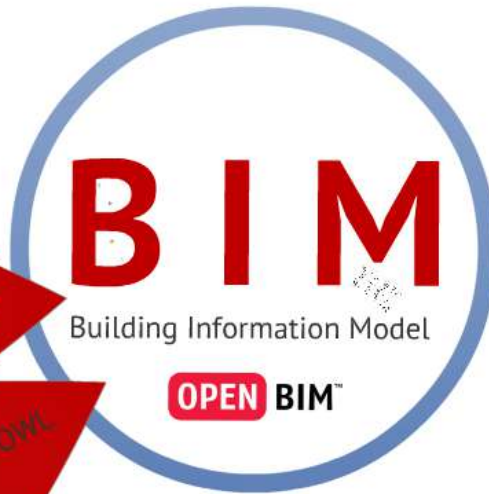
Building Information Model

**OPEN** BIM™

CAD

OWL

Prezi  
2014/04/23  
14:15:15



## Rappresentazione VIRTUALE di un Edificio

# CAD

Computer Aided Design



## OWL

Ontology Web Language

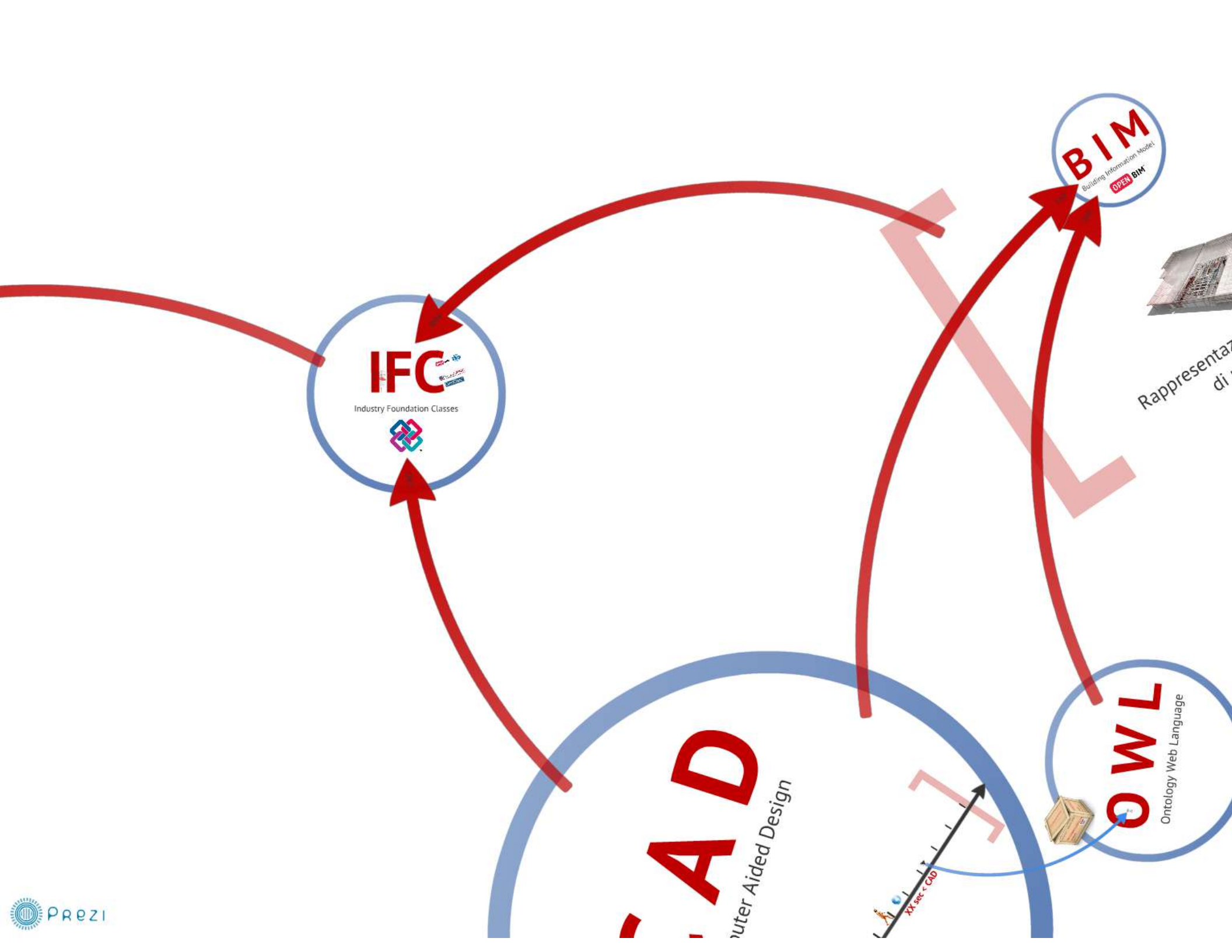
## BIM

Building Information Model  
OPEN BIM

Rappresentazione VIRTUALE  
di un Edificio







**IFC**

Industry Foundation Classes



**BIM**

Building Information Model  
OPEN BIM

Rappresenta  
di

**CAD**

Computer Aided Design

**OWL**

Ontology Web Language



BIM

# IFC



## Industry Foundation Classes



CAD

# IFC

OPEN BIM™ ISO

IFD LIBRARY  
for buildingSMART

buildingSMART®  
International home of openBIM

OmniClass™  
A ST

Foundati:

U1);  
#44603=IFCPROPERTYSET('1Pa\_PaOKn87OWafG1waFjJ',#33,'PSet\_Revit\_Altro',\$(#44583));  
#44604=IFCRELDEFINESBYPROPERTIES('2Xh9wcKRjADwzim6oTk4kT',#33,\$,\$,(#44571),#44603);  
#44605=IFCPROPERTYSET('2bRgK8Q9P5ouT9GFMXyGPo',#33,'PSet\_Revit\_Dati  
identit\X\E0',\$(#44584));  
#44606=IFCRELDEFINESBYPROPERTIES('2mCl9jSifAC97dcFORI8Ww',#33,\$,\$,(#44571),#44605);  
#44607=IFCPROPERTYSET('2\$ZE47eKX07BYZw7\$\$UqEg',#33,'PSet\_Revit\_Fasi',\$(#44585));  
#44608=IFCRELDEFINESBYPROPERTIES('0koMU2hfX4Ywj39ODNyc2p',#33,\$,\$,(#44571),#44607);  
#44609=IFCPROPERTYSET('1wJKC2PTbCfw4odJlOgH\$B',#33,'PSet\_Revit\_Type\_Dimensioni',\$(#44586,#44588,#44589,#44590));  
#44610=IFCPROPERTYSET('3LBsEsI2LEuRL60BRP6igi',#33,'PSet\_Revit\_Type\_Altro',\$(#44587,#44591,#44592,#44593));  
#44611=IFCPROPERTYSET('3B\_RVMSGT43uV3Ct8\$6UGa',#33,'PSet\_Revit\_Type\_Costruzione',\$(#6918,#6922));  
#44612=IFCPROPERTYSET('0bcEeWTbrCtQWfD\$gYeosq',#33,'PSet\_Revit\_Type\_Dati  
identit\X\E0',\$(#44594,#44595,#44596,#44597,#44598));  
#44613=IFCCARTESIANPOINT((749.7885621382677,649.7919814774486,0.));  
#44614=IFCDIRECTION((0.9997489045879824,0.02240820776254289,0.));  
#44615=IFCAXIS2PLACEMENT3D(#44613,#9,#44614);  
#44617=IFCCARTESIANPOINT((16.21231419975593,-28.50000000009687,100.));  
#44618=IFCCARTESIANPOINT((16.17824002604499,-28.50000000009687,100.2588190451025));  
#44619=IFCCARTESIANPOINT((16.07833960354036,-28.50000000009687,100.5));  
#44620=IFCCARTESIANPOINT((15.91942098094247,-28.50000000009687,100.7071067811865));  
#44621=IFCCARTESIANPOINT((15.71231419975592,-28.50000000009687,100.8660254037844));  
#44622=IFCCARTESIANPOINT((15.47113324485844,-28.50000000009687,100.9650250262001));



RE(198.),\$); #44583=IFCPROPERTY SINGLEVALUE('Altezza estremità',IFCLENGTHMEASURE(198.),\$); #44583=IFCPR  
getto'),\$); #44584=IFCPROPERTY SINGLEVALUE('Contrassegno',IFCLABEL('26'),\$); #44584=IFCPR  
999999859) #44585=IFCPROPERTY SINGLEVALUE('Fase di creazione',IFCLABEL('Stato di Progetto'),\$); #44585=IFCPR  
#44586=IFCPROPERTY SINGLEVALUE('Spessore',IFCLENGTHMEASURE(2.999999999999859) #44586=IFCPR  
,\$); #44587=IFCPROPERTY SINGLEVALUE('Opening strength',IFCREAL(1.),\$); #44587=IFCPR  
#44588=IFCPROPERTY SINGLEVALUE('HANDLE DEPTH',IFCLENGTHMEASURE(10.21231419975628),\$); #44588=IFCPR  
#44589=IFCPROPERTY SINGLEVALUE('PANEL THICKNESS',IFCLENGTHMEASURE(2.999999999999811),\$); #44589=IFCPR  
#44590=IFCPROPERTY SINGLEVALUE('HANDLE MOUNTING HEIGHT',IFCLENGTHMEASURE(100.),\$); #44590=IFCPR  
RE(2.5),\$); #44591=IFCPROPERTY SINGLEVALUE('Proiezione telaio est.',IFCLENGTHMEASURE(2.5),\$); #44591=IFCPR  
RE(2.5),\$); #44592=IFCPROPERTY SINGLEVALUE('Proiezione telaio int.',IFCLENGTHMEASURE(2.5),\$); #44592=IFCPR  
#44593=IFCPROPERTY SINGLEVALUE('COLOR CONTRAST',IFCREAL(0.1),\$); #44593=IFCPR  
#44594=IFCPROPERTY SINGLEVALUE('Descrizione assieme',IFCLABEL(''),\$); #44594=IFCPR  
#44595=IFCPROPERTY SINGLEVALUE('Codice assieme',IFCLABEL(''),\$); #44595=IFCPR  
#44596=IFCPROPERTY SINGLEVALUE('Contrassegno tipo',IFCLABEL('42'),\$); #44596=IFCPR  
0),\$); #44597=IFCPROPERTY SINGLEVALUE('Numero OmniClass',IFCLABEL('23.30.10.00'),\$); #44597=IFCPR  
ni',\$(#4457 #44598=IFCPROPERTY SINGLEVALUE('Titolo OmniClass',IFCLABEL('Doors'),\$); #44598=IFCPR  
6,#44577,#44578,#44579,#44580,#44581)); #44599=IFCPROPERTY SET('2SZFn16tH5qOQp1TiSutL4',#33,'PSet\_Revit\_Dimensioni',\$(#4457 #44599=IFCPR  
571),#4459 6,#44577,#44578,#44579,#44580,#44581)); #44600=IFCRELDEFINESBYPROPERTIES('35t33vqBP9qxac7kq6ZCvv',#33,\$,\$,(#44571),#4459 #44600=IFCREL  
9); 9); #44601=IFCPROPERTY SET('3r1sftR5n17AU57jZNE4zt',#33,'PSet\_Revit\_Vincoli',\$(#44582,#69 #44601=IFCPR  
#44582,#69 08)); #44602=IFCRELDEFINESBYPROPERTIES('1QM499b358iepsO3DPn1fY',#33,\$,\$,(#44571),#446 #44602=IFCREL  
4571),#446 01); #44603=IFCPROPERTY SET('1Pa\_PaOKn87OWafG1waFjJ',#33,'PSet\_Revit\_Altro',\$(#44583)); #44603=IFCPR  
#44583)); #44604=IFCRELDEFINESBYPROPERTIES('2Xh9wcKRjADwzim6oTk4kT',#33,\$,\$,(#44571),#446 #44604=IFCREL  
03); 03);

BIM

# IFC



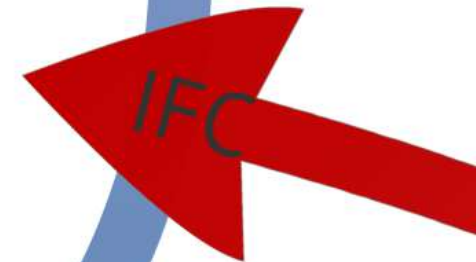
## Industry Foundation Classes



CAD



# Model Checker

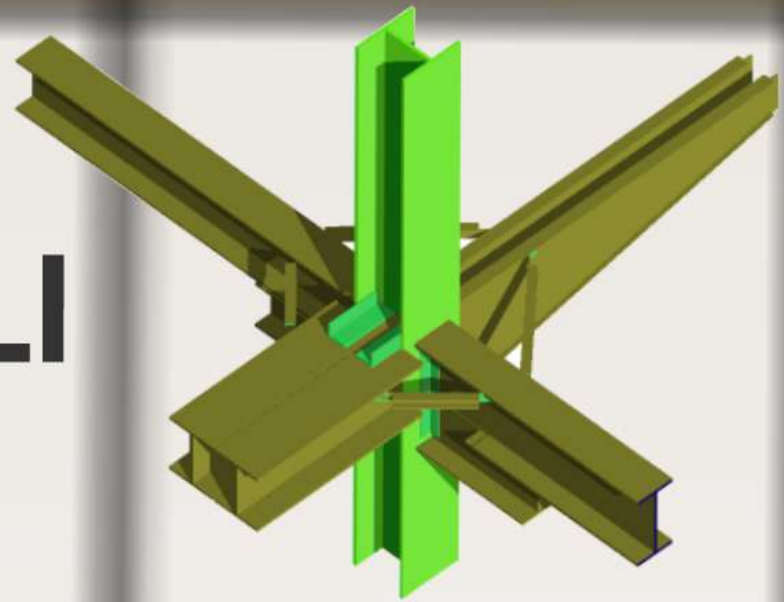




# Regole

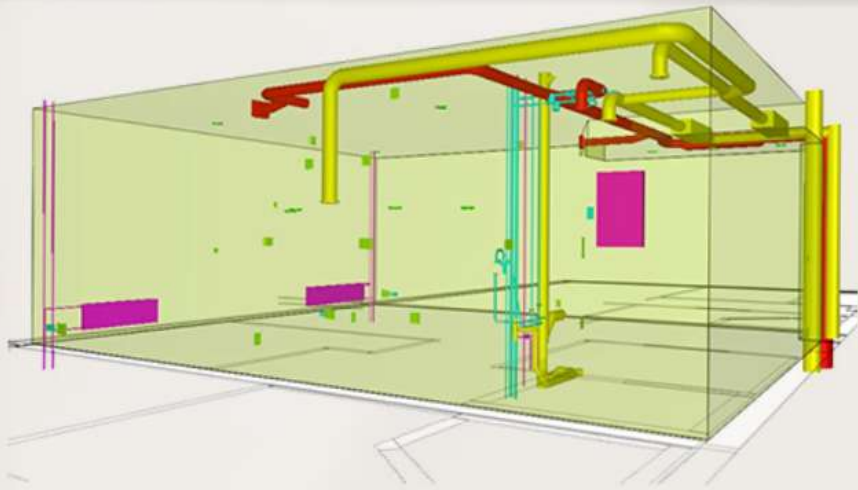


# STRUTTURALI



# ISTISTICHE

**STRUTTURA**



**IMPIANTISTICHE**

**ACCESSIBILE**

# STATISTICHE

## ACCESSIBILITA'





# REGOLE ACCESSIBILITA'

Porte

Terminali Impianti

Finestre

Servizi Igenici

Spazi di Manovra

Rampe

Scale

Parcheeggi





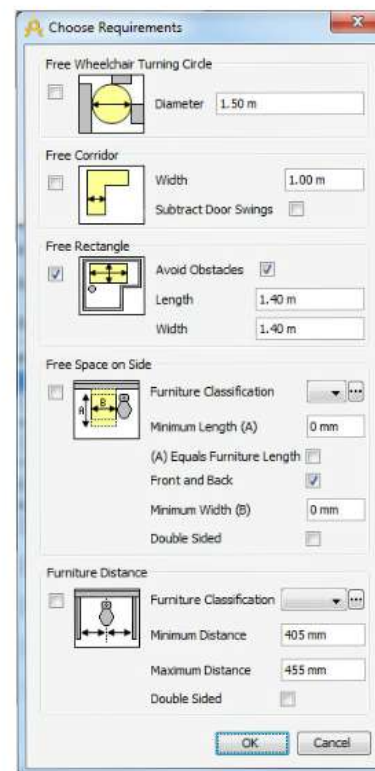
# REGOLE ACCESSIBILITA'



- 8.1.6 Servizi igienici
  - WC - Accostamento Laterale
  - WC - Distanza laterale dalla parete
  - WC - Distanza dalla parete Posteriore (WIP)
  - WC - Altezza seduta
  - Maniglione - Presenza
  - Maniglione - Altezza da terra
  - Maniglione - Distanza MIN da WC
  - Maniglione - Distanza MAX da WC
  - Lavabo - Altezza prospetto da terra
  - Spazio di manovra
  - Vasca - Accostamento laterale (WIP)



- 8.1.11 Rampe
  - Larghezza - transito 1 persona su sedia a ruote
  - Larghezza - incrocio 2 persone
  - Pendenza
  - Materiali
  - Ripiano orizzontale - Inizio, Intermedio, Fine
  - Cordolo - Presenza di un cordolo







## REGOLE ACCESSIBILITA'

Spazi di Manovra

Parcheggi

Finestre

Scale

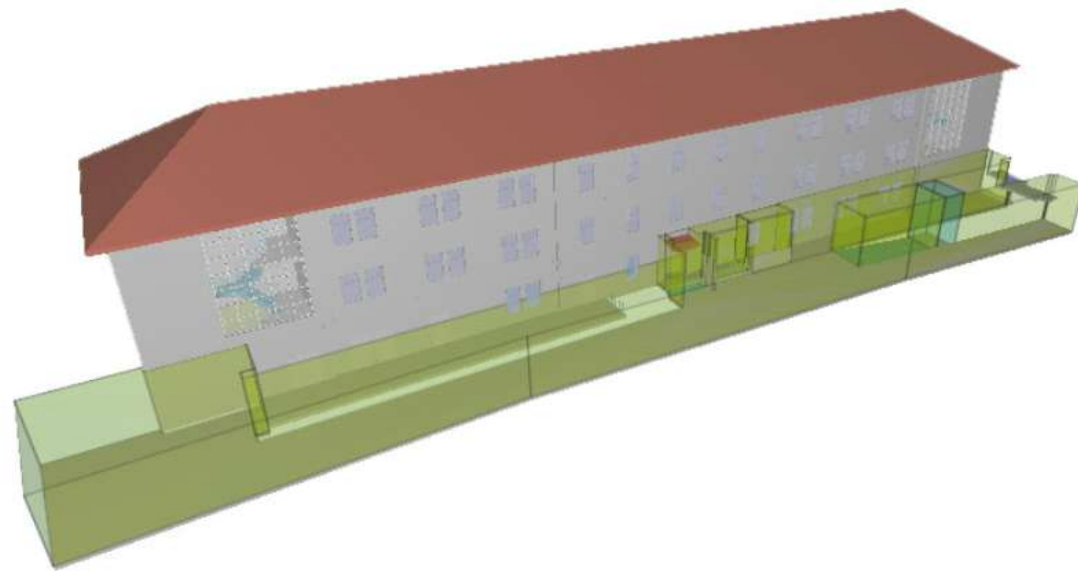
Porte

Rampe

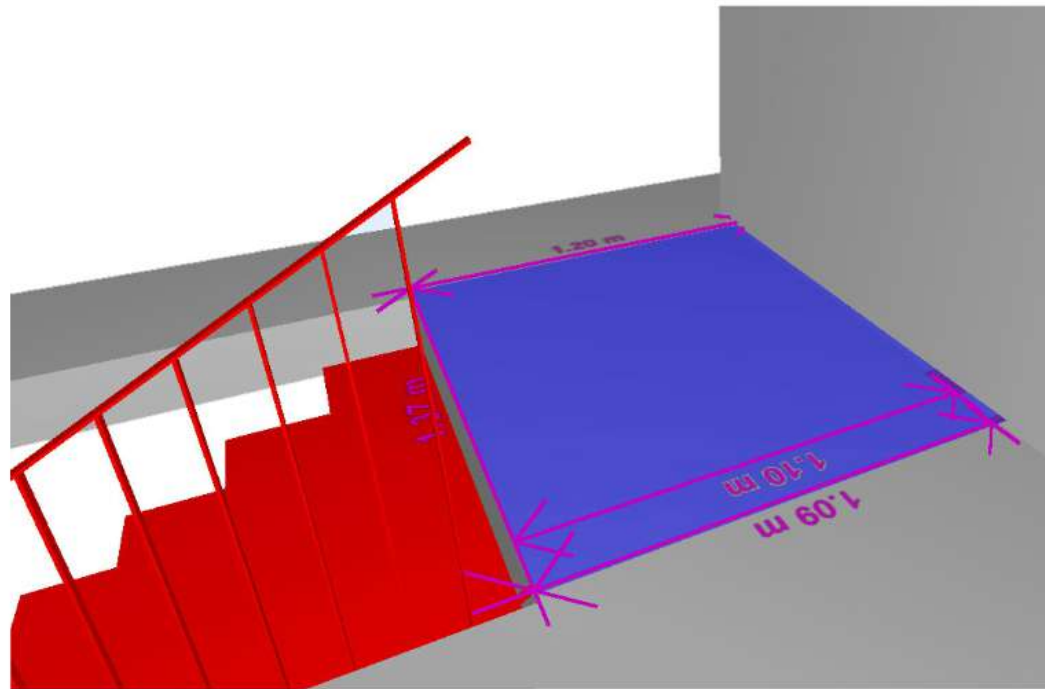
Servizi Igenici

Terminali Impianti

**80+**



# Visualizzazione



**Verifica**



# Comunicazione

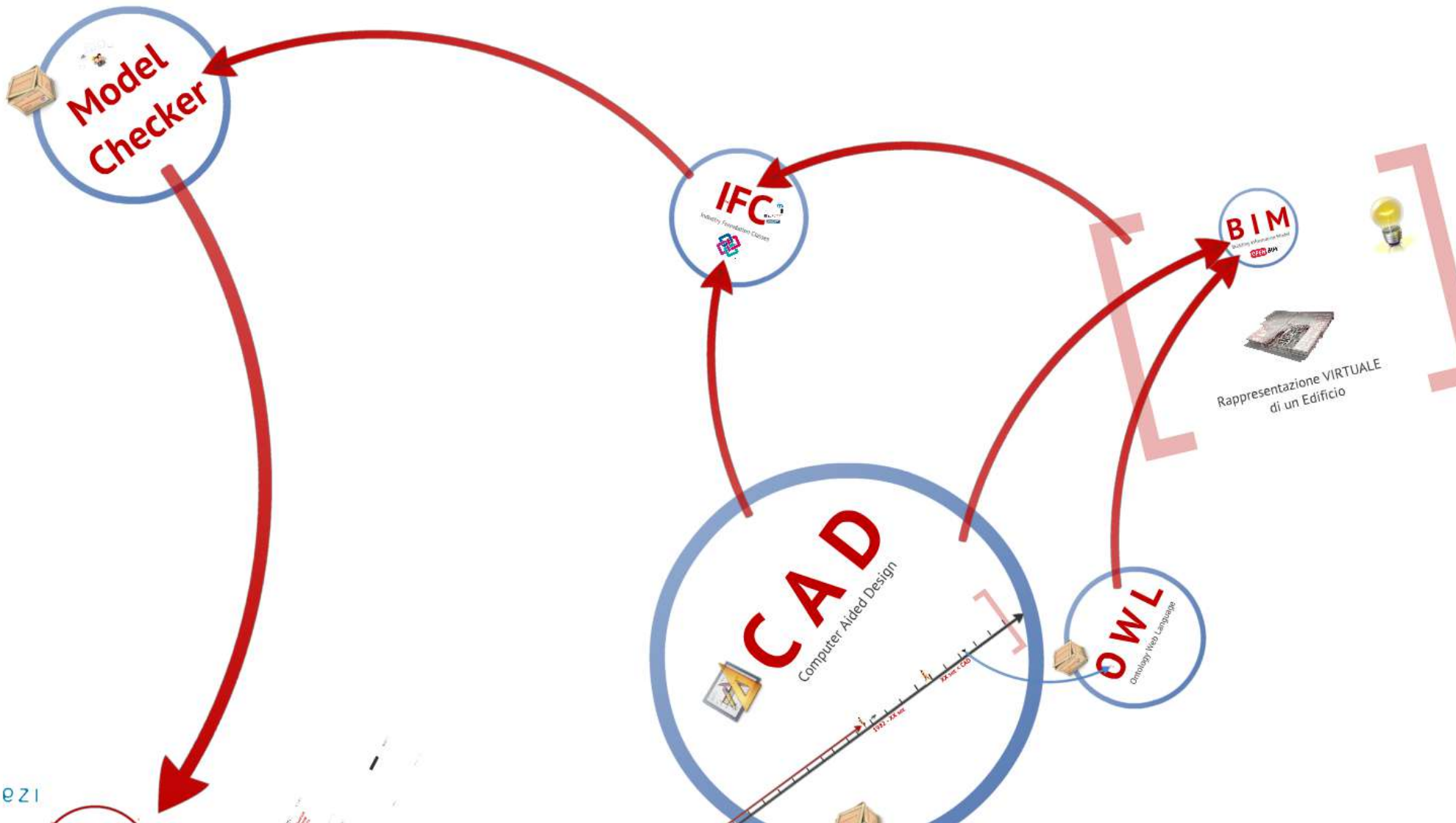


Stair.2.1

Identification	Location	Quantities	Relations	Classification	Hyperlinks	PSet_Revit_Dimensioni
Property	Value					
Building	Building.b.1					
Floor	0 - Piano Terra					
Top Elevation	5.12 m					
Bottom Elevation	0 mm					
Distance to Next Floor	-869 mm					
Global Top Elevation	5.92 m					
Global Bottom Elevation	800 mm					
Global X	0 mm					
Global Y	5.11 m					

# Informazione

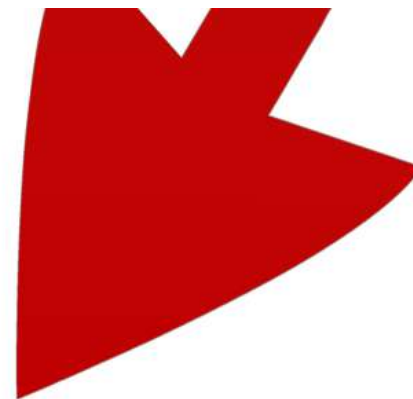
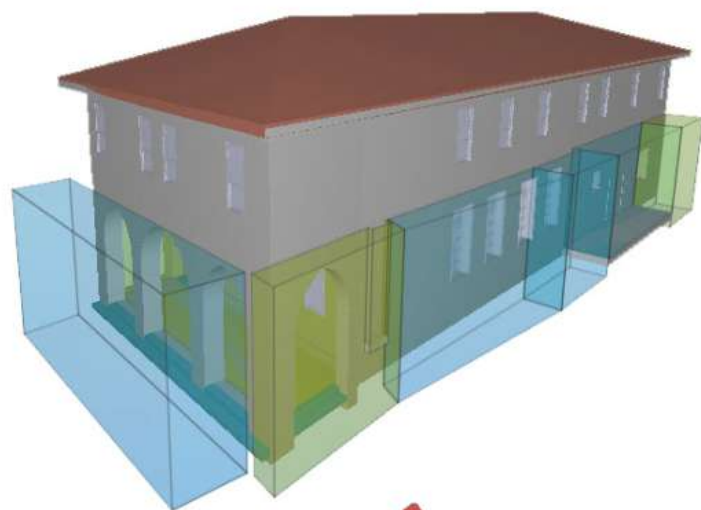




Rappresentazione VIRTUALE  
di un Edificio



**Ex Pretura  
Sacile**



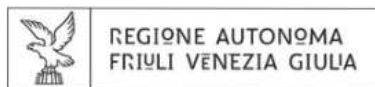
# Profili ICF

Aspetti: "Fisici" e "Sensoriali"



# Pomeriggio

Dimostrazione Interattiva



**AREA WELFARE DI COMUNITÀ**  
TEL. +39 0432.933130  
<http://www.welfare.fvg.it>  
Borgo Aquileia 2, 33057 Palmanova (Ud) - Italy

**Giovanni Bellomo**

[giovanni.bellomo@welfare.fvg.it](mailto:giovanni.bellomo@welfare.fvg.it)



*That's all Folks!*



**Riguarda presentazione**



**AREA WELFARE DI COMUNITÀ**  
TEL. +39 0432.933130  
<http://www.welfare.fvg.it>  
Borgo Aquileia 2, 33057 Palmanova (Ud) - Italy

**Giovanni Bellomo**  
[giovanni.bellomo@welfare.fvg.it](mailto:giovanni.bellomo@welfare.fvg.it)

<http://goo.gl/nfYLY>