



# AEC3

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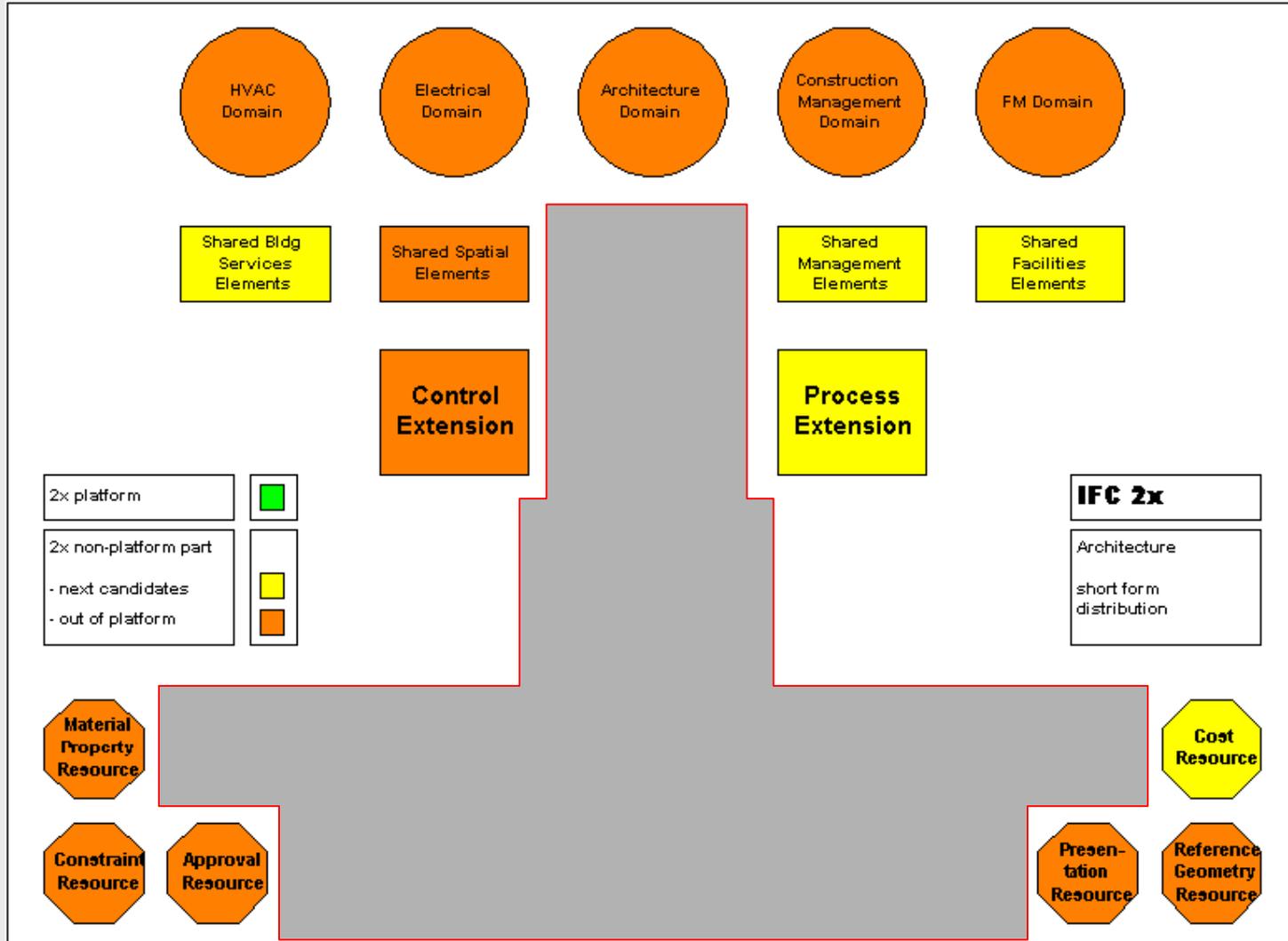
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Fax: +1 415 4192 9499

email: james.forester@aec3.com

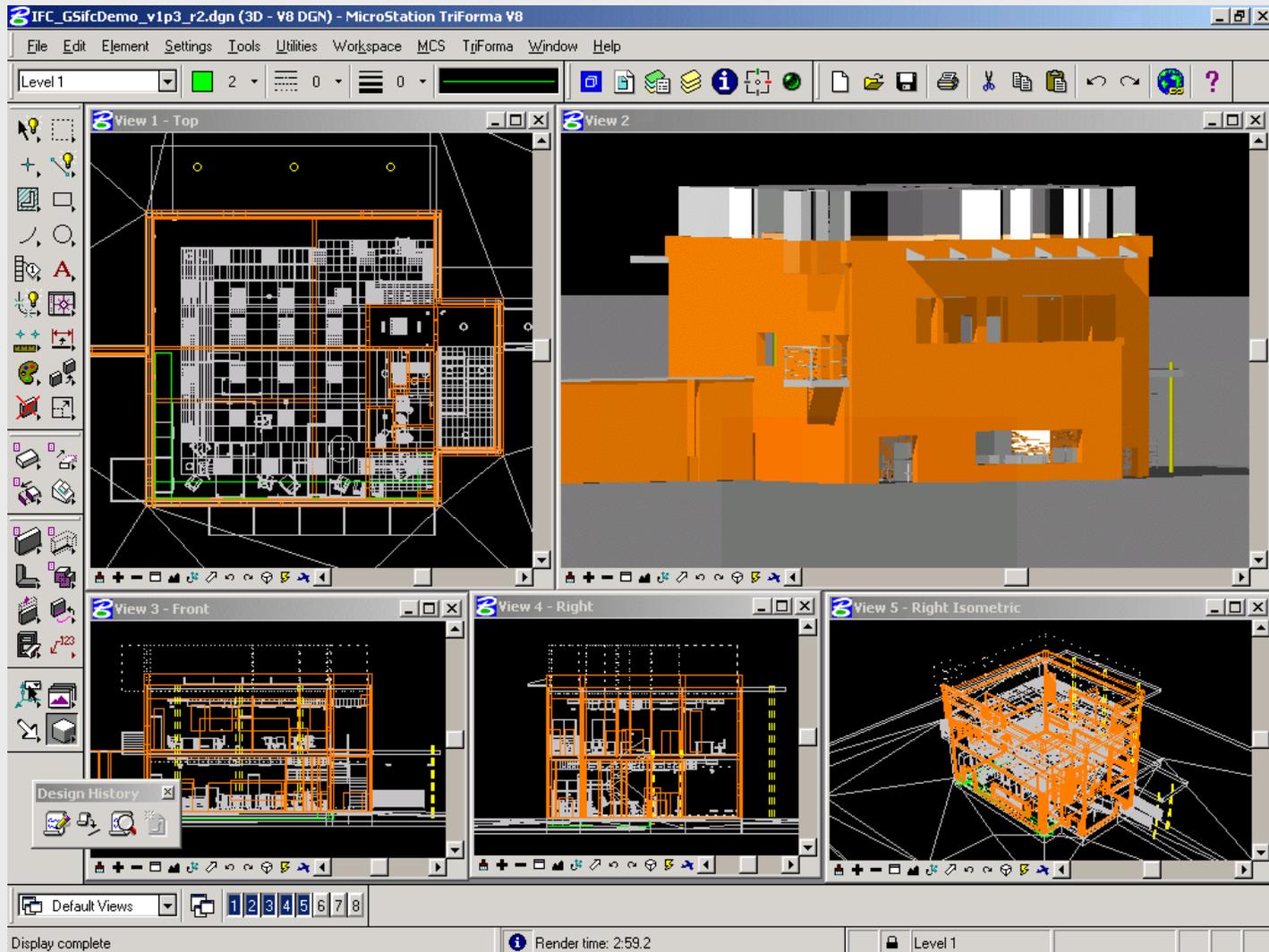
## IFC 2x2 Content (and stuff) Reality, approaching reality and beyo-nD

*Jeffrey Wix*



# IFC 2x Test Building

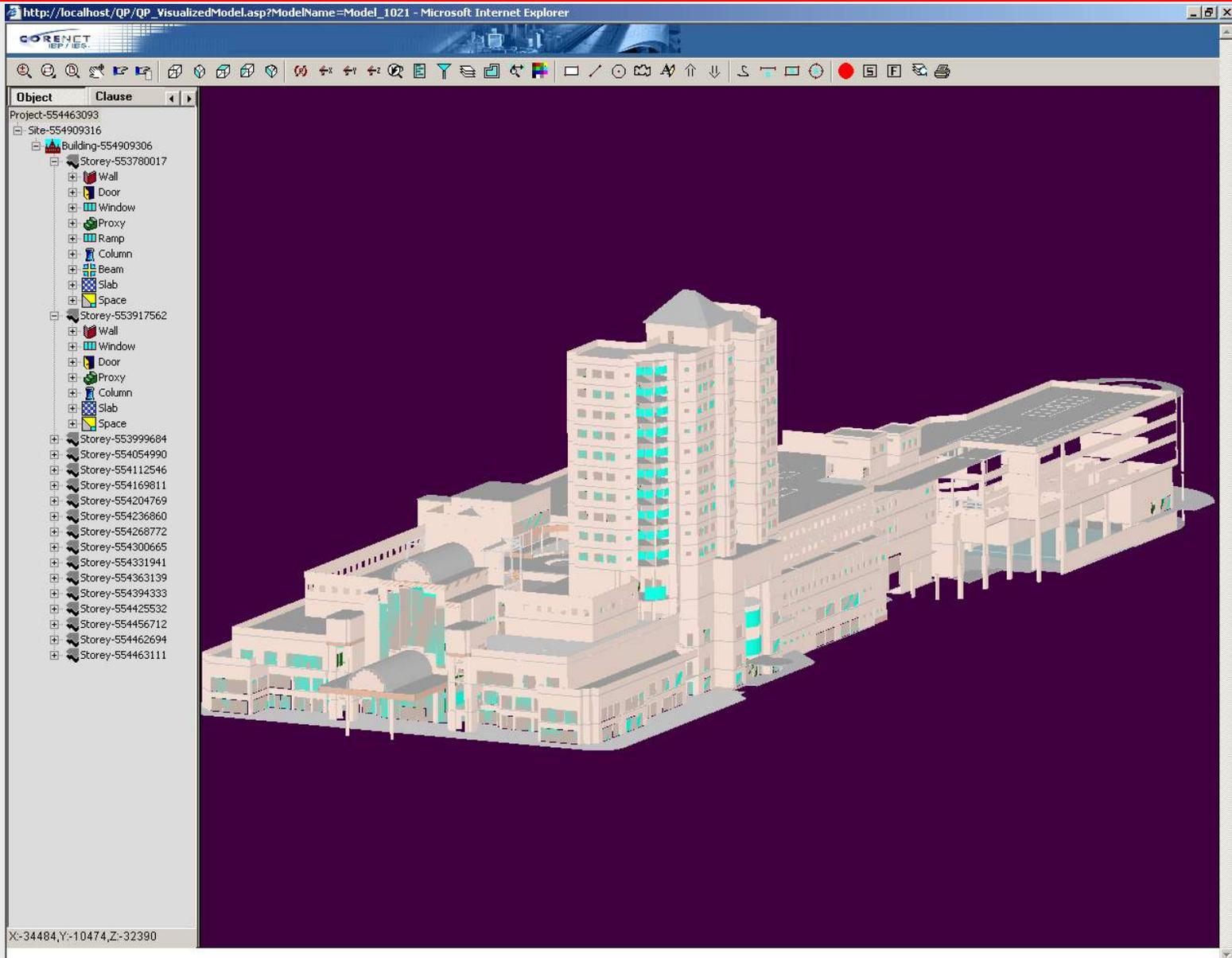
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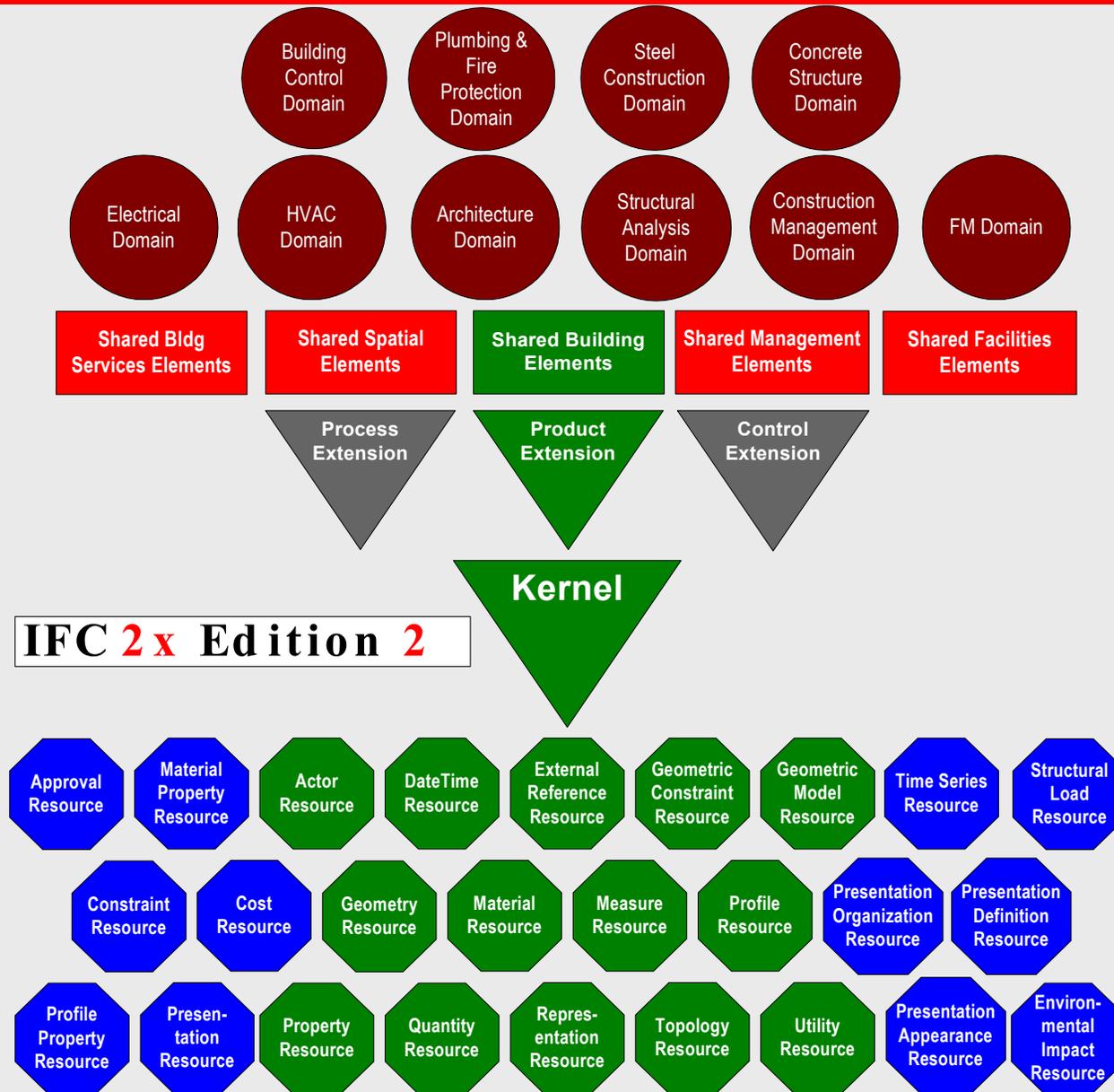


Test building exchanged using IFC 2x from ArchiCAD to MicroStation TriForma

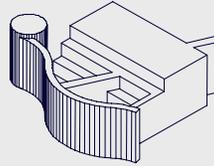
# IFC 2x Plan Checking Test

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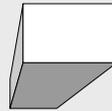


## Shape (explicit)



## Shape (extrusions)

beams, pipes, ducts, walls etc.



## Shape (topology)

line representations for pipe, duct, etc.



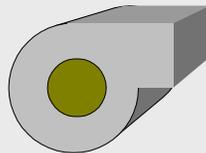
## Building Elements

wall, door, window, roof, stairs, etc.



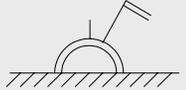
## HVAC Equipment

chillers, fans, pumps, boilers, coils, cooling towers, heaters, heat exchangers, etc..



## Electrical Elements

transformers, motors, generators, switches, protective devices, power and communication outlets panels, cubicles



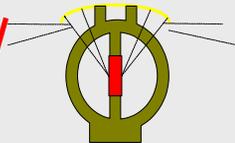
## Sanitary Elements

WC's, urinals, baths, bidets, traps gulleys



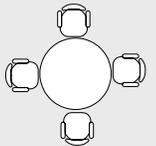
## Fire Protection Elements

sprinklers, hose reels, hydrants, wet/dry rising mains



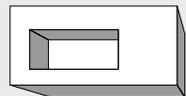
## Furniture

inc. system furniture



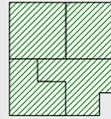
## Relations Between Elements

holes, chases, voids, zones



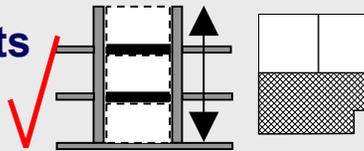
## Spaces, Space Structure

space, storey, part, building, site



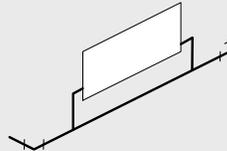
## Zones, Compartments

fire, workstation, rising ducts, shafts



## Systems

pipng, ducting, cable, structural



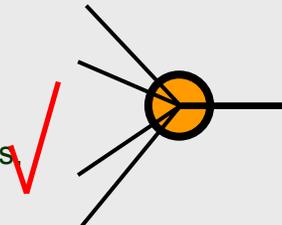
## Lighting

fittings, rendering, photo-accurate lighting



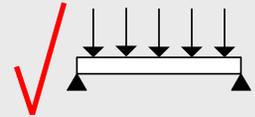
## Manholes

manholes, inspection chambers, access chambers, meter chambers, valve chambers



## Structural analysis:

structural members, boundary conditions, connections, supports, loads, etc.



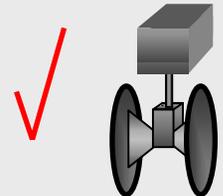
## Structural Elements

members, profiles, rebars, properties, joints, features, surface



## Controls, Instruments

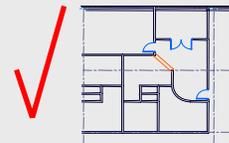
sensor, actuator, controller, gauge, meter



## Grids



## Draughting

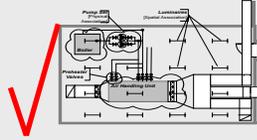


# What IFC 2x2 can do

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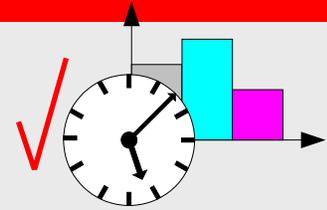
## Asset Management

maintenance history, inventories

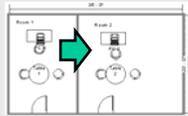


## Time Series

time related events



## Move Management



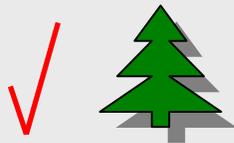
## Constraints

rules, specifications, requirements, trigger conditions



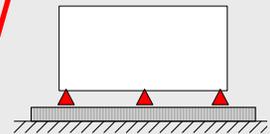
## Environmental Impact

embodied energy, CO<sub>2</sub>



## Holes and Bases

holes, sleeves, packing, framing, upstands, vibration isolation



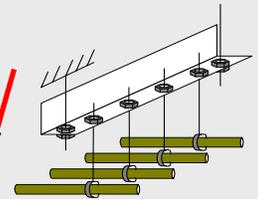
## Help

request, action, permit, warranty, operation



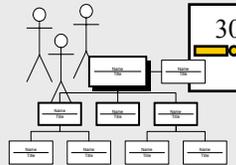
## Brackets and Fasteners

brackets, drop rods, steel sections, bracket assemblies, screws, bolts etc.



## Actors

people, organizations, addresses

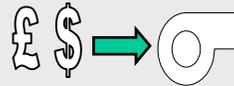


## External Data

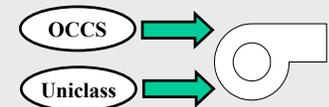


## Costing

cost planning, estimates, budgets, whole life



## Classification

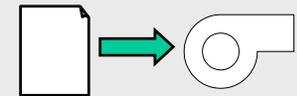


## Work Plans and Schedules

inc. nested schedules, resource allocation



## Associated Documents



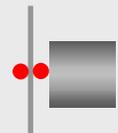
## Orders

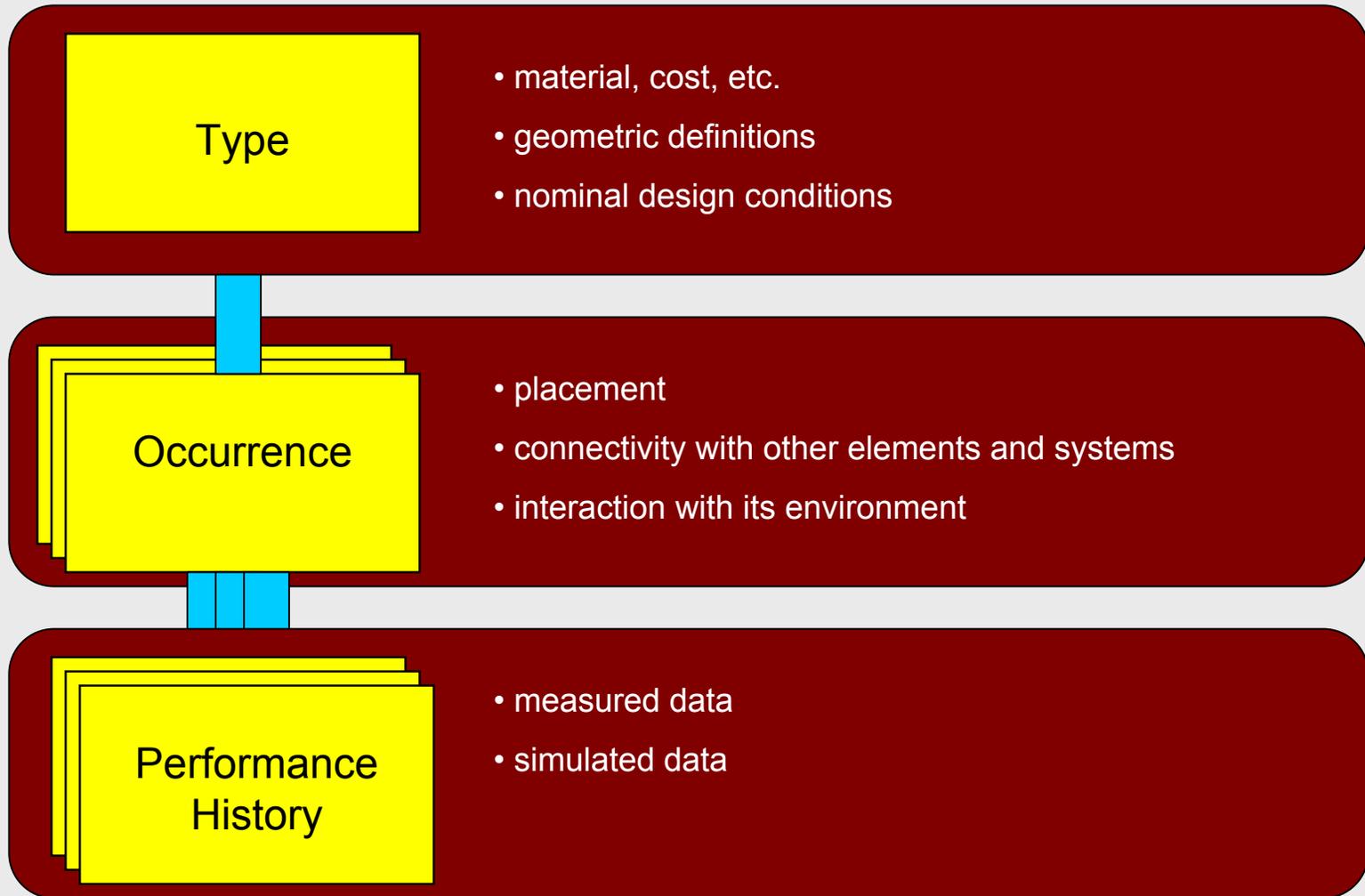
work orders, change orders, purchase orders

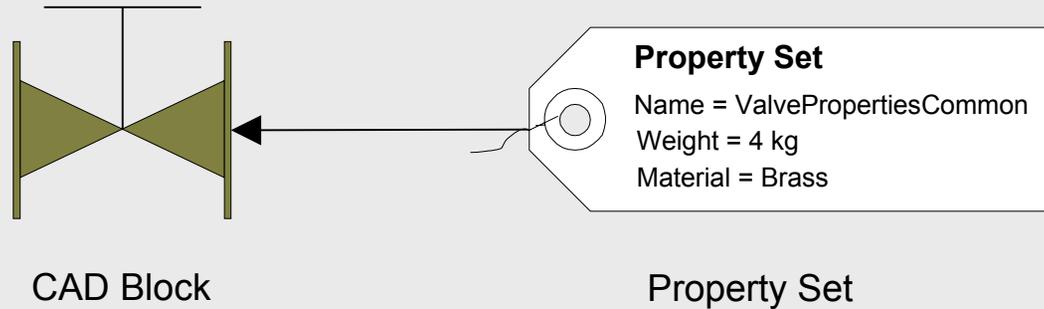


## Connectivity

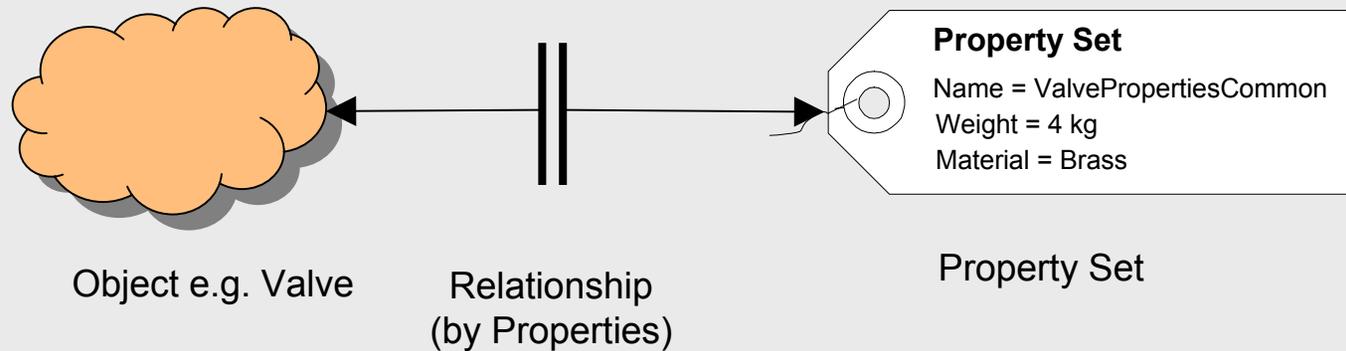
services, structure, building







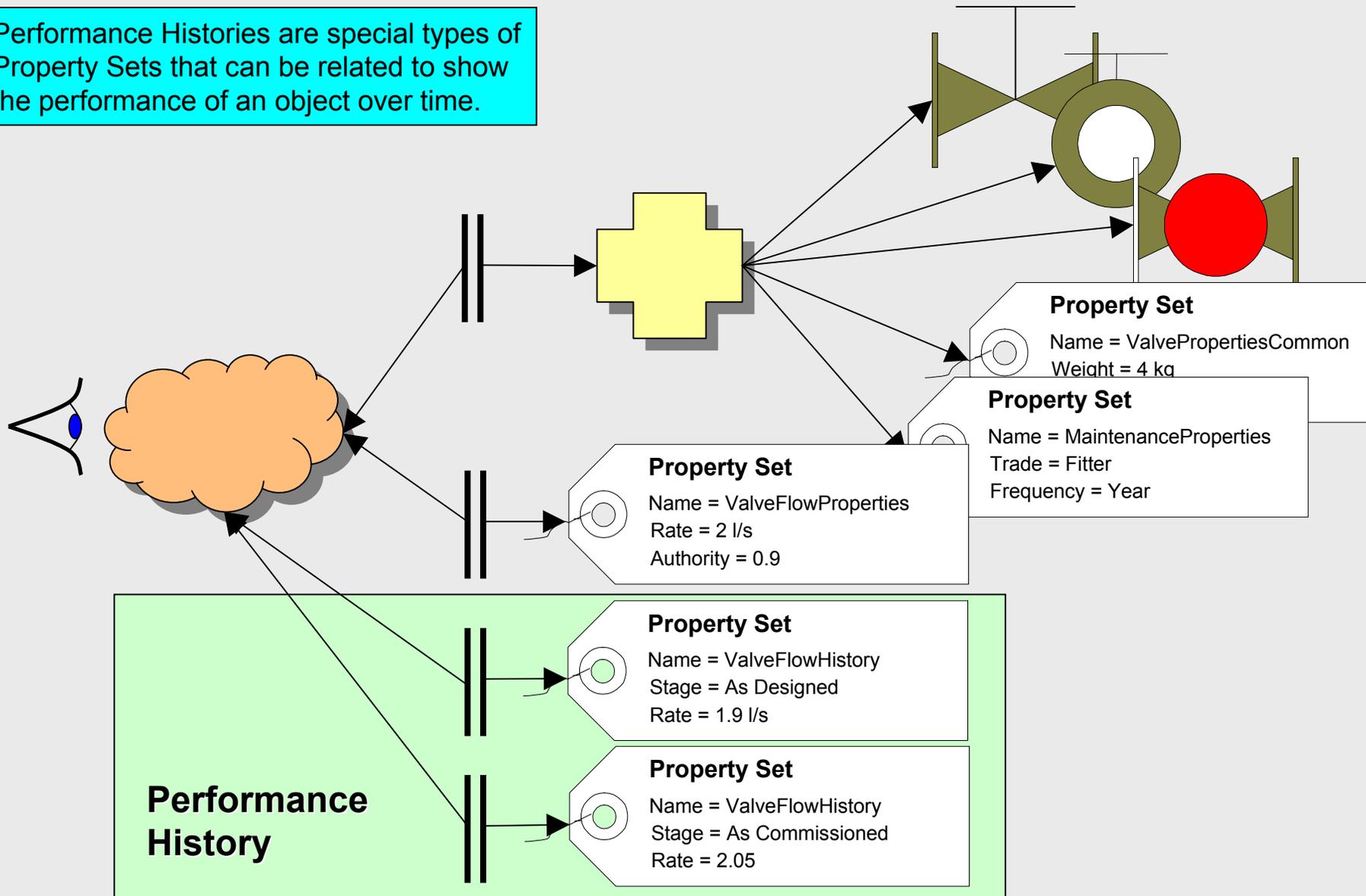
An IFC Property Set can be used to add non-shape data to an entity in conventional CAD



In IFC, a Property Set is 'related to' an object and not directly attached to it as In conventional CAD

# Type, Occurrence and Performance History AEC3

Performance Histories are special types of Property Sets that can be related to show the performance of an object over time.



# Property Set Display (XML)

The screenshot shows a Microsoft Internet Explorer browser window with the title "IFC R2x2 Property Set Definition Reference - Microsoft Internet Explorer". The address bar shows the file path: "C:\Documents and Settings\Jeffrey Wix\My Documents\IFC\_2x2\_Model\_Development\PreIntegration\psets\IfcSharedFacilitiesElements\Pset\_Warranty.xml".

## IFC R2x2 Property Set Definition Reference

**PropertySet Definition:**

<b>PropertySet Name</b>	Pset_Warranty
<b>Typed</b>	False
<b>TypedClass</b>	<a href="#">IfcProduct or IfcSystem</a>
<b>Type Name</b>	
<b>Definition</b>	Definition from IA1: An assurance given by the seller or provider of an artefact that the artefact is without defects and will operate as described for a defined period of time without failure and that if a defect does arise during that time, that it will be corrected by the seller or provider.

**Property Definitions:**

Name	Property Type	Data Type	Definition
WarrantyIdentifier	IfcPropertySingleValue	IfcIdentifier	The identifier assigned to a warranty.
WarrantyStartDate	IfcPropertyReferenceValue	IfcCalendarDate	The date on which the warranty commences.
WarrantyEndDate	IfcPropertyReferenceValue	IfcCalendarDate	The date on which the warranty expires.
IsExtendedWarranty	IfcPropertySingleValue	IfcBoolean	Indication of whether this is an extended warranty whose duration is greater than that normally assigned to an artefact (=TRUE) or not (=FALSE)
WarrantyPeriod	IfcPropertySingleValue	IfcTimeMeasure	The time duration during which a manufacturer or supplier guarantees or warrants the performance of an artefact.
PointOfContact	IfcPropertyReferenceValue	IfcOrganization	The organization that should be contacted for action under the terms of the warranty. Note that the role of the organization (manufacturer, supplier, installer etc.) is determined by the IfcActorRole attribute of IfcOrganization.
WarrantyContent	IfcPropertyReferenceValue	IfcText	The content of the warranty.
Exclusions	IfcPropertySingleValue	IfcText	Items, conditions or actions that may be excluded from the warranty or that may cause the warranty to become void.
Comments	IfcPropertySingleValue	IfcText	Additional comments that may be relevant.

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The taskbar at the bottom shows several open applications: Start, Workshops, IfcSharedFacilitiesElements, Adobe Acrobat - [20010...], 20030128\_5\_User Defin..., Reading the IFC Model, and IFC R2x2 Property Se... The system clock shows 09:31.

# Example: Roof light

IAI-UK PIP4 v2003.01.06 (c)JWC 2002-3

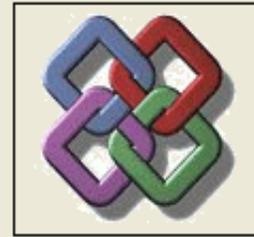
### Property Sets and Properties

#### Properties of Type Product

Product Identifier: IP1000  
Product Description: Ward Rooflight Trapezoidal IP1000 GRP  
Industry Classification: 27.3

#### Properties of Rooflight Product

OverallLength: 2000  
OverallWidth: 1000  
OverallHeight: 95  
Rooflight\_Weight kg/m2: 3.7  
Rooflight\_MaxLoad: 3.5  
Rooflight\_FragilityClassification: B  
Rooflight\_Material: GRP



Upgrade >>

Cancel

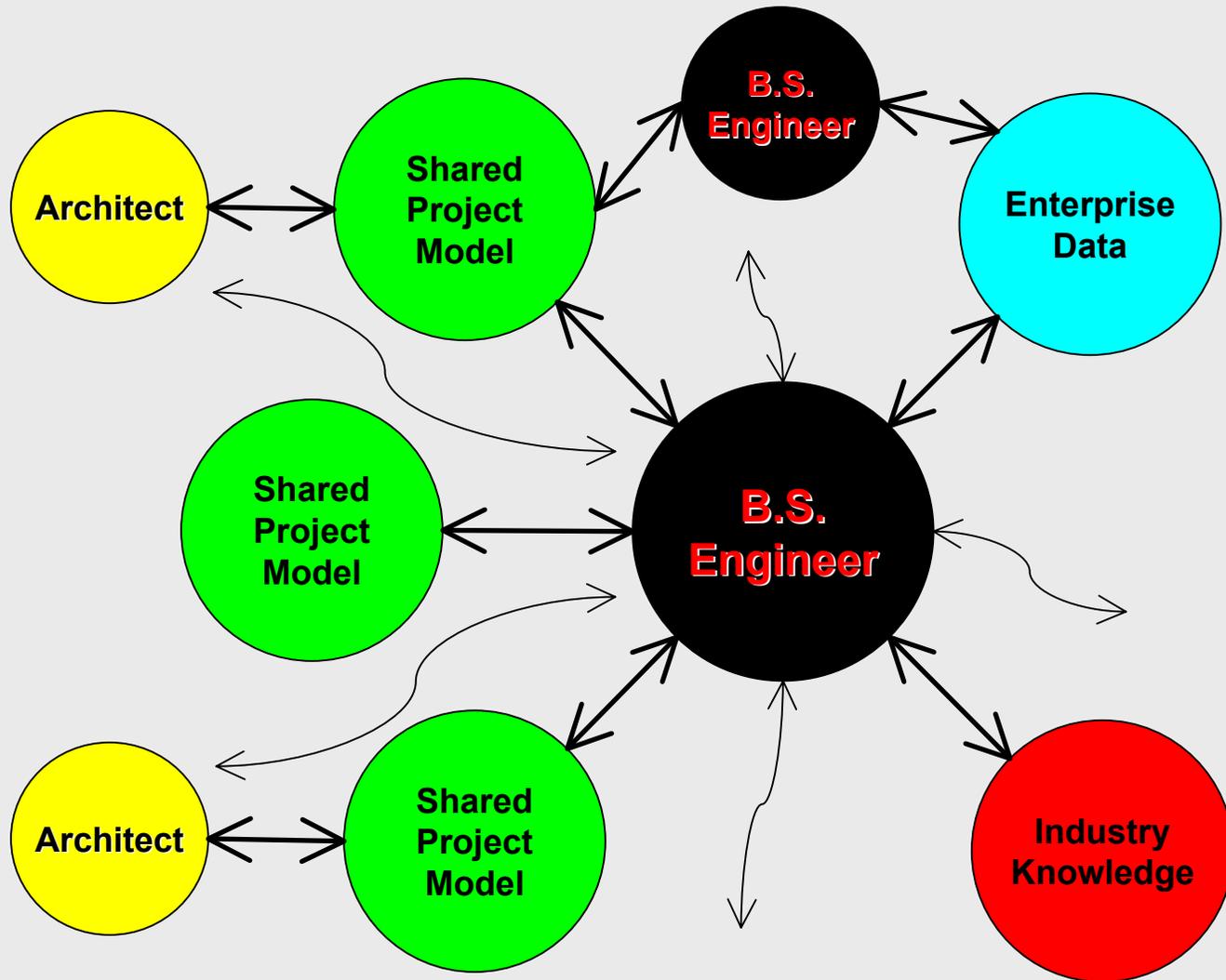
Identifier  
IP1000

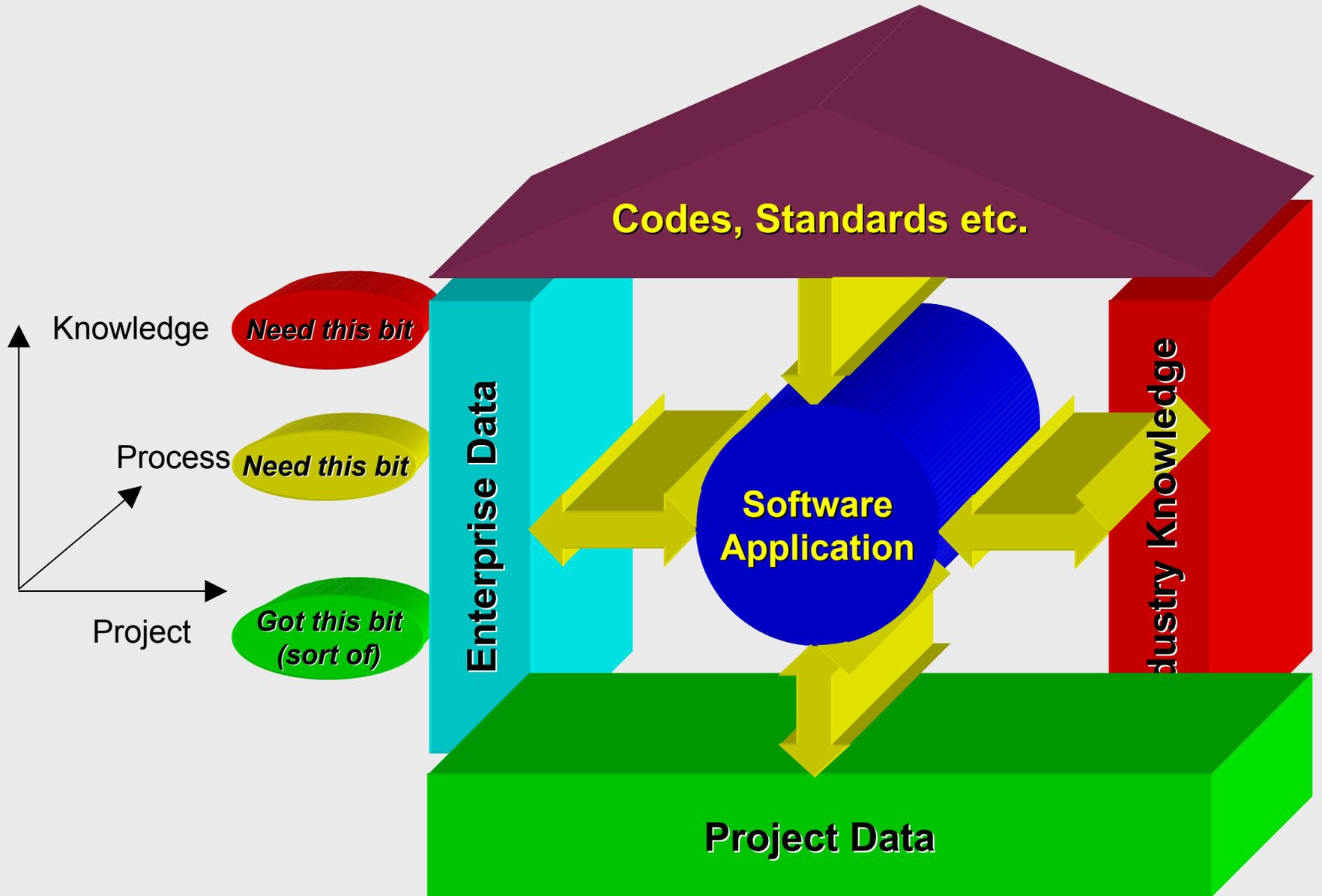
Value  
37

PSet_TypeProduct	Properties for Manufactured Product	Value
OverallLength	Overall Length	2000
OverallDepth	Overall Depth	1000
OverallHeight	Overall Height	95
Weight	Weight kg	3.7
Fragility	Fragility Classification	B
Material	Primary Material	GRP
TypeProduct_Type	Product Type	Plane
DesignLife	Design Life in years	15



PSet_Rooflight	Properties for Rooflight functionality	Value
Rooflight_MaxLoad	Rooflight MaxLoad	3.5
RooflightConstruction_LinerFitting	Liner Installation Process	Prefabricated
Rooflight_HasLiner	Liner Included	true
Rooflight_PermanentProtection	Permanent Protection Method	None





# Concentric Communication

