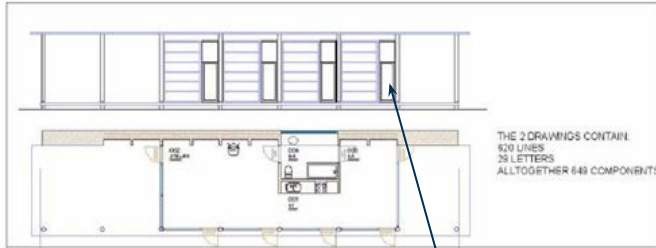


BIM:

Human readable documents



Drawings are graphics (appearance important)



THE 2 DRAWINGS CONTAIN:
420 LINES
25 LETTERS
ALL TOGETHER 648 COMPONENTS

Window



to Machine readable DATA



BIM Digital information consists of objects that may contain geometry and/or attributes (structure important) i.e. IFC

```
ISO-10303-212
HEADER;
FILE_DESCRIPTION(('ViewDefinition [PresentationView, QuantityTakeOffAddonView]', '2.1');
FILE_NAME('c:\\\\teklastructures\\\\IFCtemp\\\\KONGRESSHALLEN-UTKRAGNING.ifc', '2011-05-25T13:07:53', ('SKANSKA/ShiltaghSa'));
FILE_SCHEMA(('IFC2X3'));
ENDSEC;

DATA;
#1= IFCPERSON('SKANSKA/ShiltaghSa', 'Undefined', $, $, $, $, $);
#3= IFCORGANIZATION($, 'Tekla Corporation', $, $, $);
#7= IFCPERSONANDORGANIZATION(#1, #3, $);
#8= IFCAPPLICATION(#3, '16.1', 'Tekla Structures', 'Multi mate');
#9= IFCOWNERHISTORY(#7, #8, $, .NOCHANGE., $, $, 1306321673);
#10= IFCARTESIANPOINT((0, 0, 0));
#14= IFCDIRECTION((1, 0, 0));
#18= IFCDIRECTION((0, 1, 0));
#22= IFCDIRECTION((0, 0, 1));
#26= IFCAXISPLACEMENT3D(#10, #22, #14);
#29= IFCGEOMETRICREPRESENTATIONCONTEXT('Body', 'Model', 3, 1, 0);
#32= IFCGEOMETRICREPRESENTATIONCONTEXT('BoundingBox', 'Model');
#35= IFCSLUNIT(*, .LENGTHUNIT., .MILLI., .METRE.);
#36= IFCSLUNIT(*, .AREAUNIT., ., .SQUARE_METRE.);
#37= IFCSLUNIT(*, .VOLUMEUNIT., ., .CUBIC_METRE.);
#38= IFCSLUNIT(*, .MASSUNIT., .KILO., .GRAM.);
#39= IFCSLUNIT(*, .TIMEUNIT., ., .SECOND.);
#40= IFCSLUNIT(*, .PLANEANGLEUNIT., ., .RADIAN.);
#41= IFCSLUNIT(*, .SOLIDANGLEUNIT., ., .STERADIAN.);
#42= IFCSLUNIT(*, .THERMODYNAMICTEMPERATUREUNIT., ., .DEGREE_CELSIUS.);
#43= IFCSLUNIT(*, .LUMINOUSINTENSITYUNIT., ., .LUMEN.);
```



Window:

Type: Fenestra A206
Size: 1200x600
Glass: opaque
Open: left
...

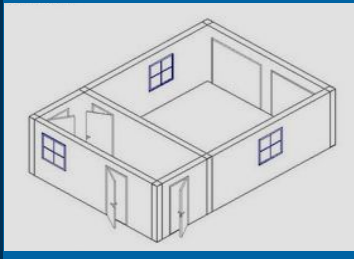


No such thing as "THE model"

Different viewpoints and use cases → different objects (representations) for the same physical phenomena

Objects describing building

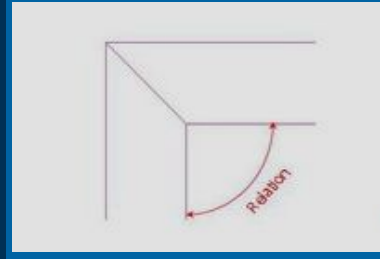
Functional objects



Physical objects



Logical objects



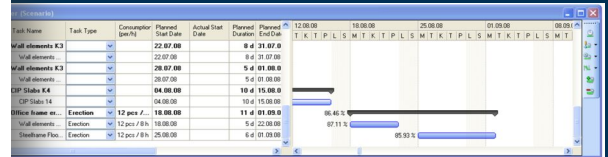
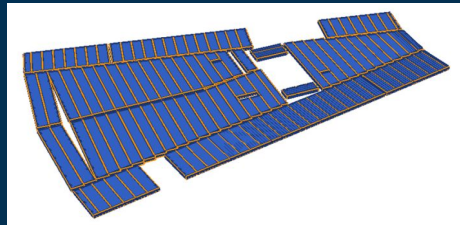
Abstract objects



Objects describing progress

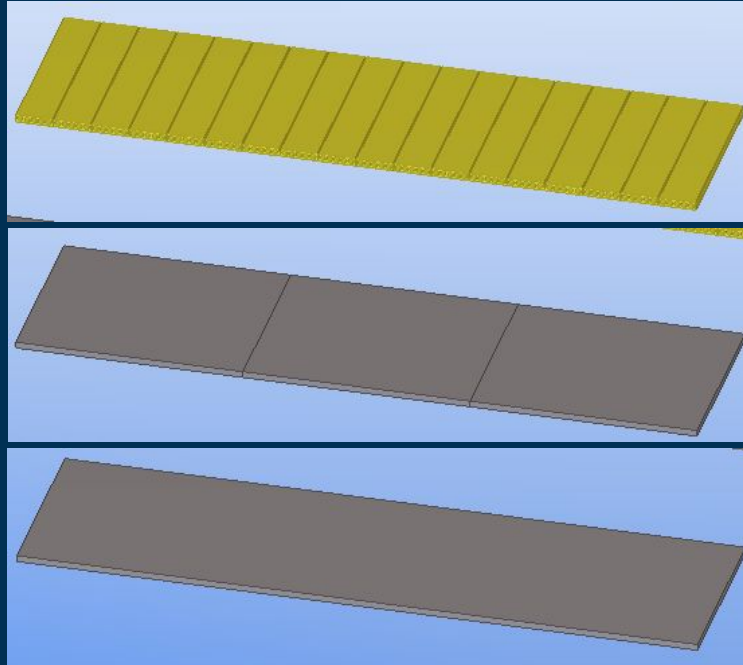
- Schedules
- Resources
- Costs
- Quality assurance
- Tasks

- Work
- Approvals
- RFI's
- Submittals
- ...



| Task Name | Task Type | Consumer (per/h) | Planned Start Date | Actual Start Date | Planned Duration | Planned End Date | 12.08.00 | 18.08.00 | 25.08.00 | 01.09.00 | 08.09.00 |
|-------------------|-----------|------------------|--------------------|-------------------|------------------|------------------|----------|----------|----------|----------|----------|
| Wall elements K3 | nr | | 22.07.00 | | 8 d | 31.07.00 | | | | | |
| Wall elements K3 | nr | | 22.07.00 | | 8 d | 31.07.00 | | | | | |
| Wall elements K3 | nr | | 28.07.00 | | 5 d | 01.08.00 | | | | | |
| Wall elements K3 | nr | | 28.07.00 | | 5 d | 01.08.00 | | | | | |
| GP Slab 9.4 | nr | | 04.08.00 | | 10 d | 15.08.00 | | | | | |
| GP Slab 14 | nr | | 04.08.00 | | 10 d | 15.08.00 | | | | | |
| Office Room ex... | Execution | 12 pers / 8h | 18.08.00 | | 11 d | 01.09.00 | | | | | |
| Office Room ex... | Execution | 12 pers / 8h | 18.08.00 | | 5 d | 23.08.00 | | | | | |
| Staircase Floo... | Execution | 12 pers / 8h | 25.08.00 | | 6 d | 01.09.00 | | | | | |

Different tasks and phases need different representations of reality for the same thing



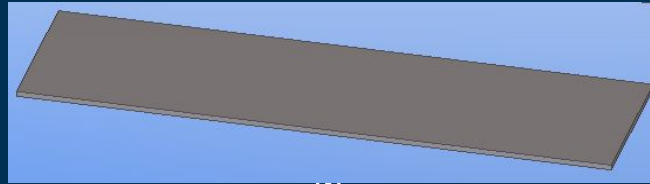
Detailing

Engineering

Architectural

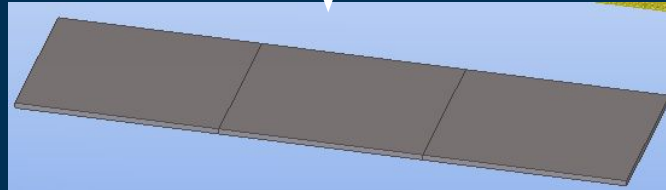
Intra/inter discipline workflow

Design automation

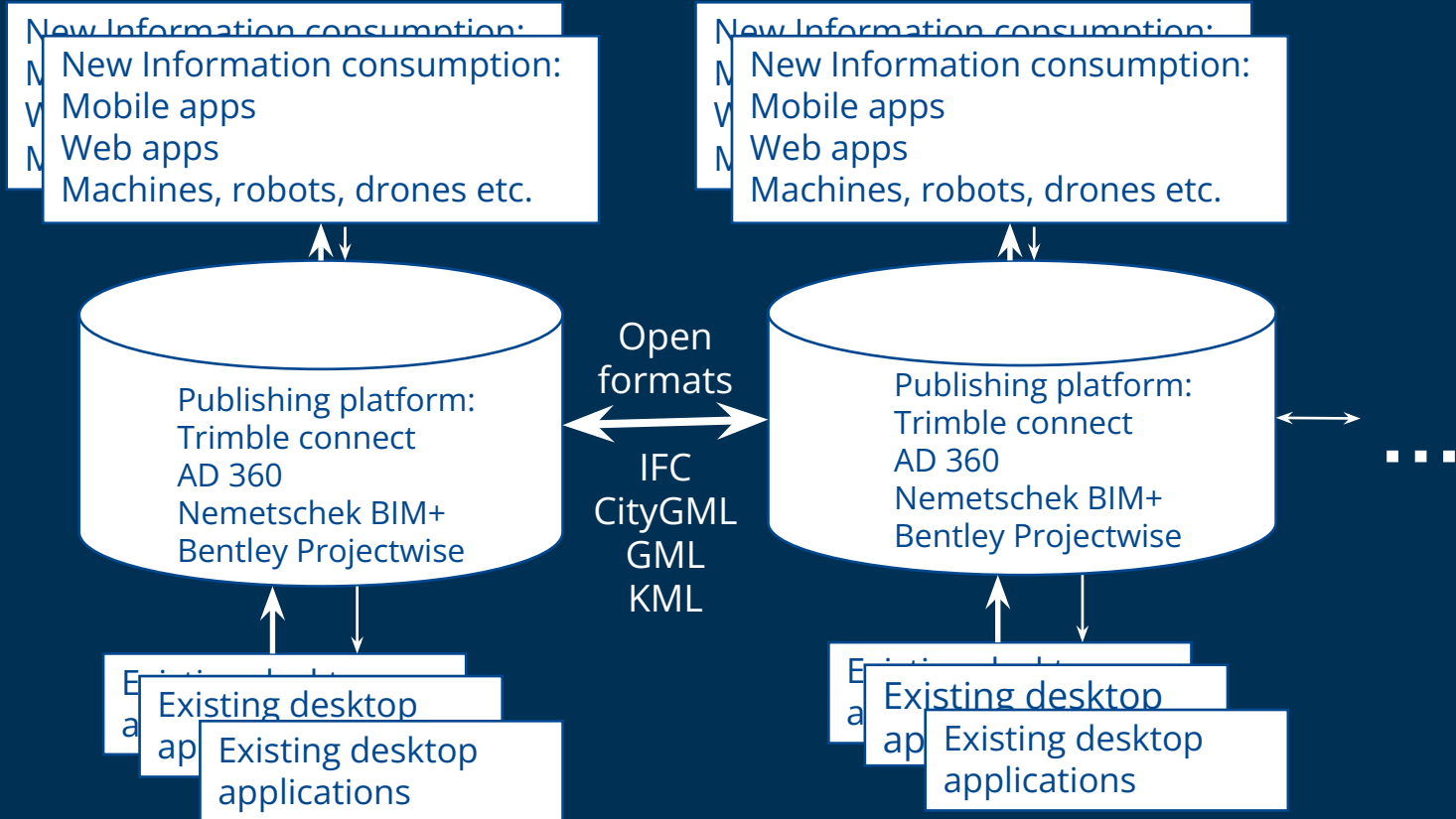


Application functionality

- business logic
- create relationships



System architecture diagram



Future software directions



Currently software mainly driven by human user, incoming data as support



Needs to be mainly driven by incoming data, automated or user as support



My mission and vision:

Leverage role of open standards so that the bulk of data consumption happens in open standard schemas

