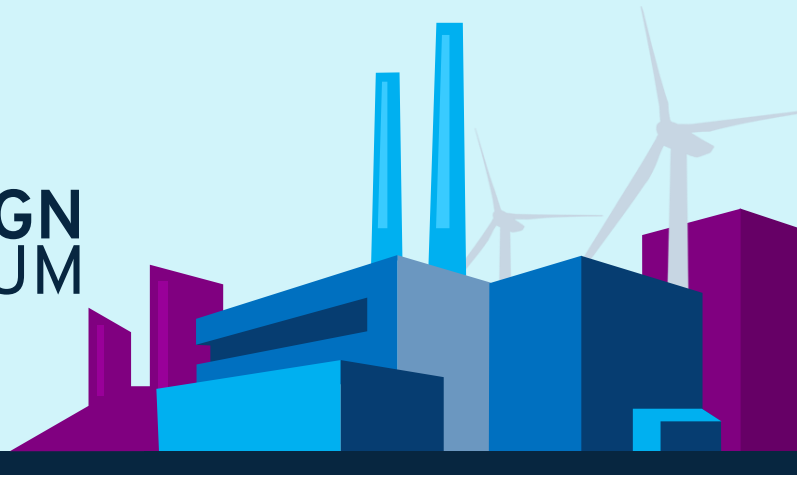
2023 INDUSTRI&DESIGN FORUM



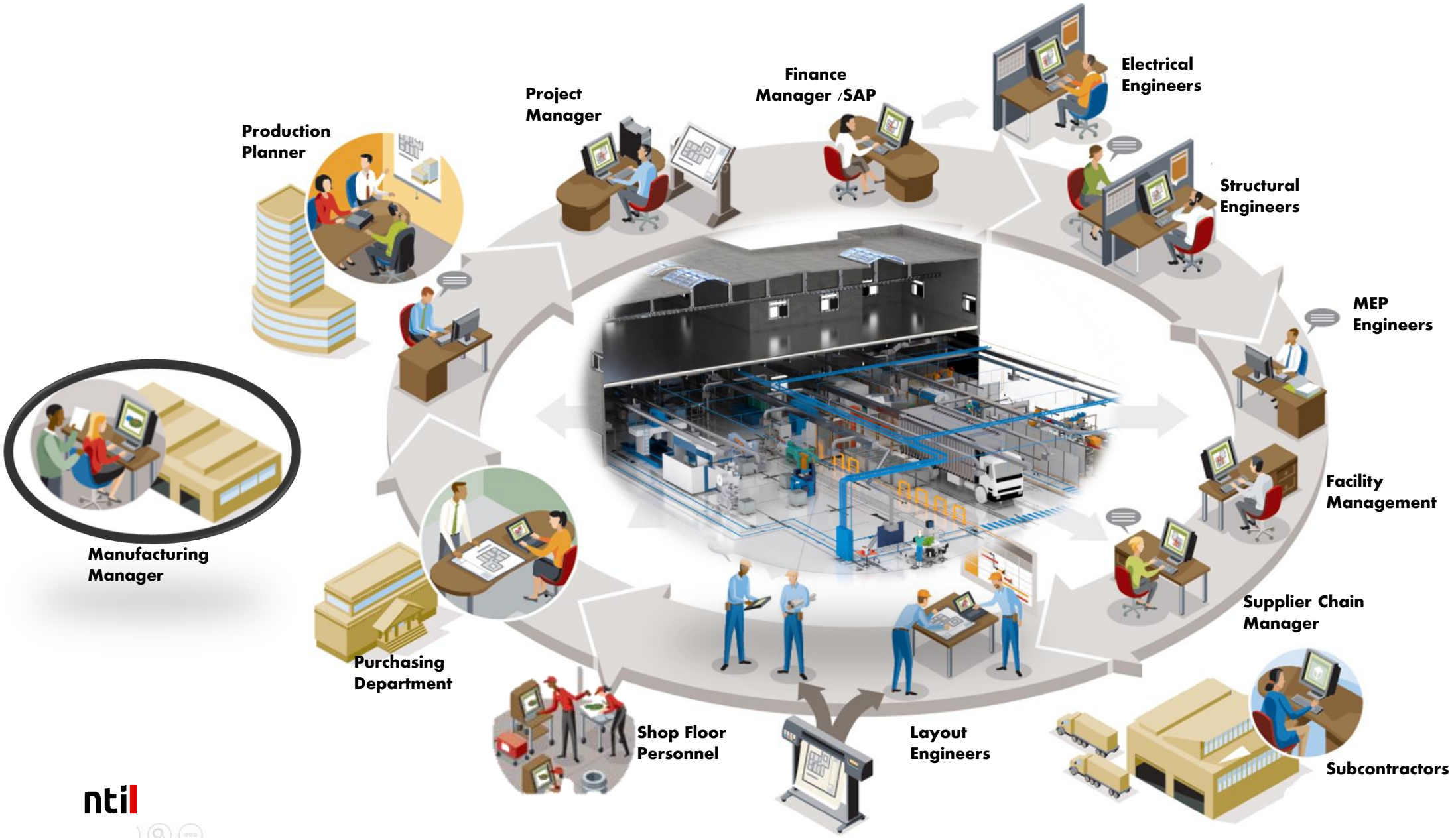
Integreret 3D-modellering

nti

WHO AM I ?!

- Michael Kjærgaard
- 11 år I NTI A/S
- System konsulent, System Arkitekt, Projektleder
- 22 år med Autodesk produkter

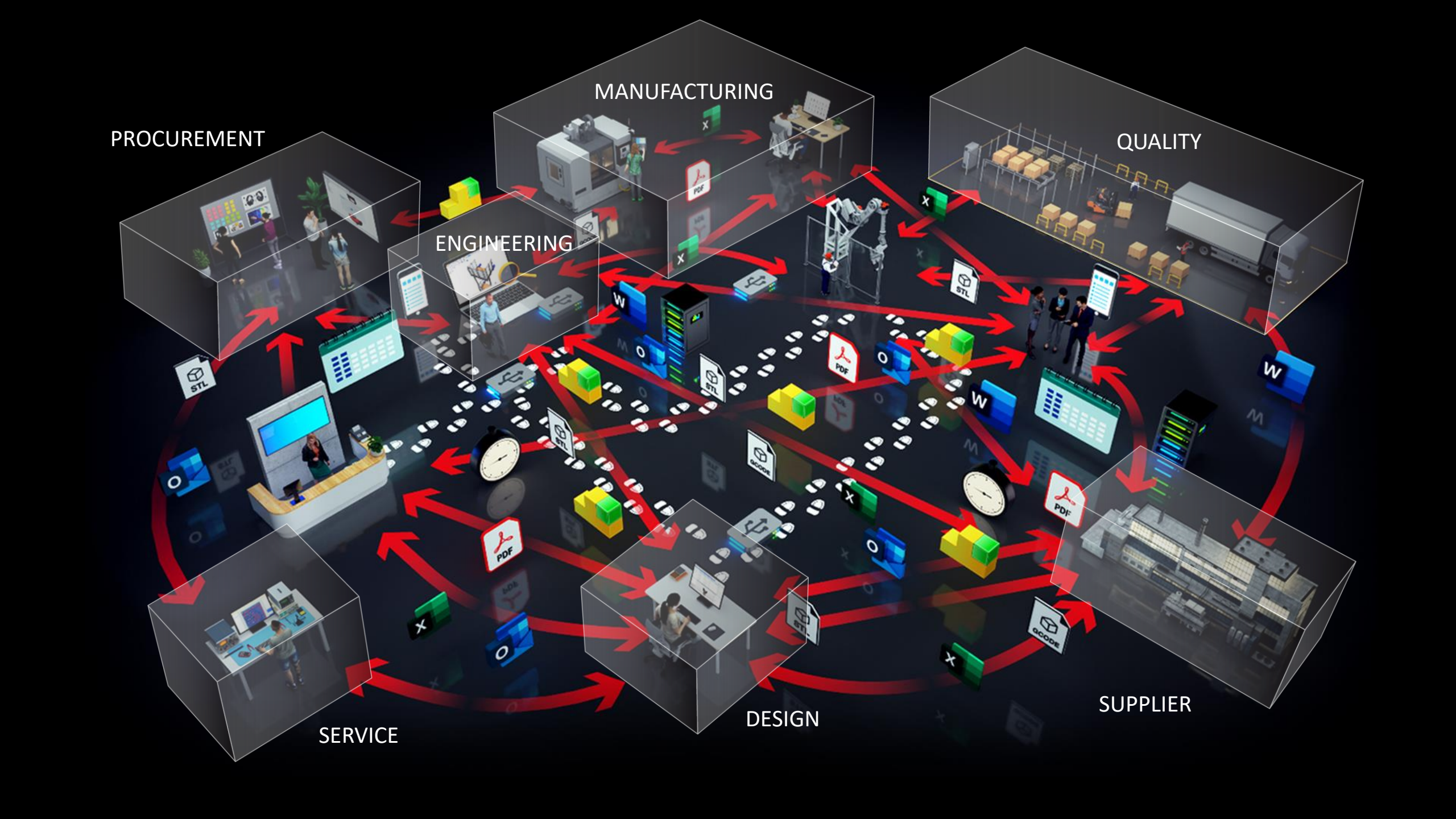
Processes and Information model in center



ntil

AUTODESK


AUTODESK

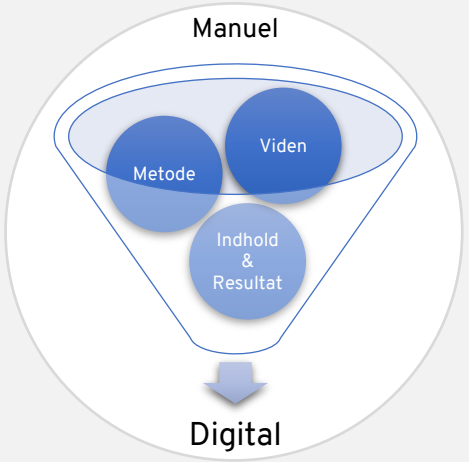

PROCUREMENT
MANUFACTURING
QUALITY
ENGINEERING
SERVICE
DESIGN
SUPPLIER

Digitalisering

Digitalisér

Organisering og standardisering af data/proces/viden digitalt

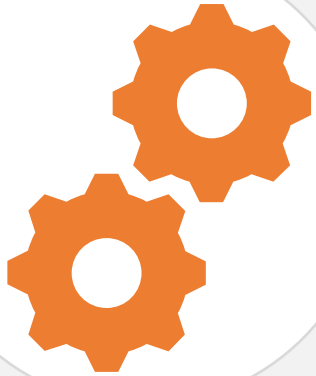
Ofte manuelt håndteret



Automatisér

Sæt strøm til håndteringen af data og metoder

Skabelse, proces, vedligehold …

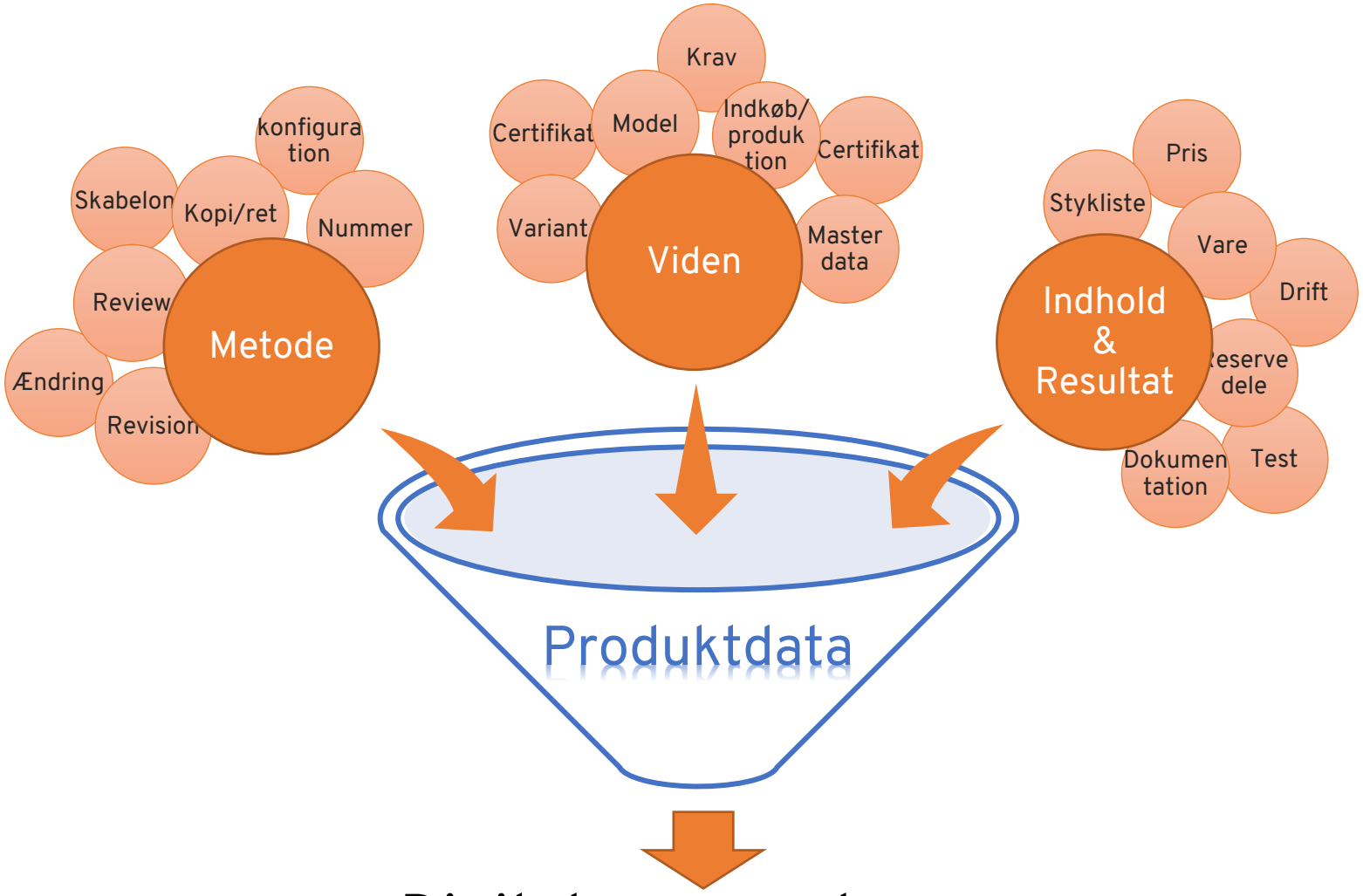


Transformér

Integrér og optimér med nye muligheder

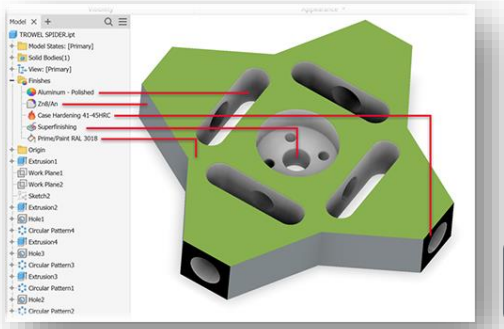
Beslutning om aktivt at udnytte og optimere metoder og forretning ift. digitale muligheder

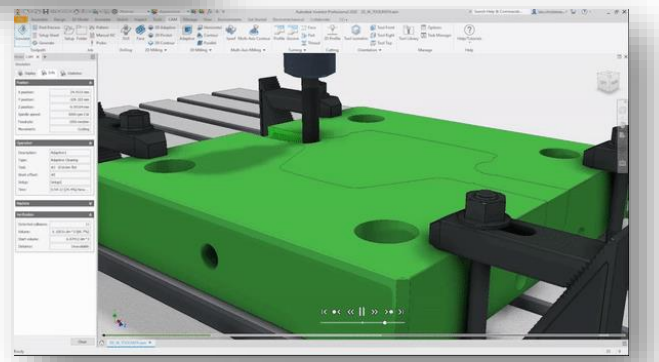
Vigtige trin

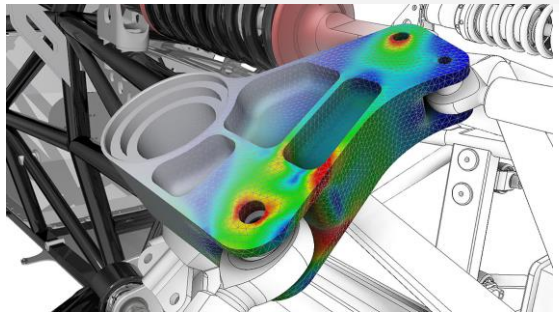


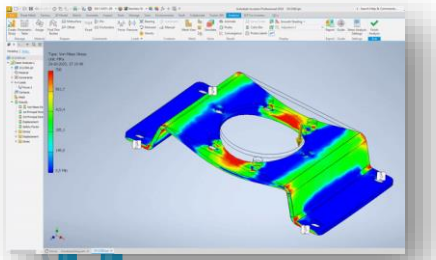
Digital sammenhæng og overblik

Information Model



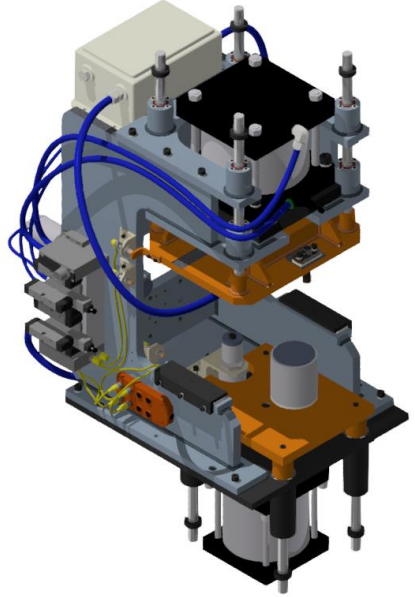


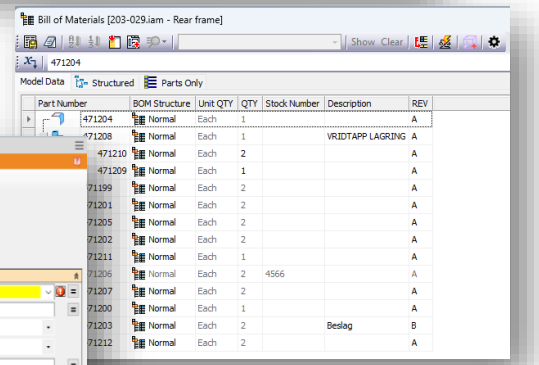


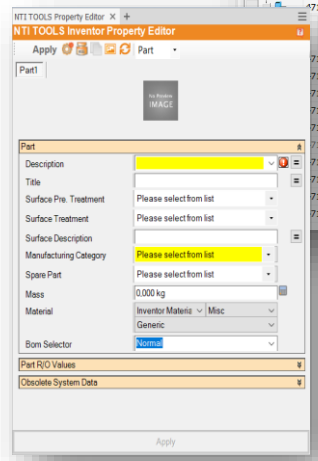


Weight
Simulation
CAM
BOM
Nesting
Material
Sparepart
Quantity
Metadata
Drawing
Piping / Harness
Position
Finish / Process information
Dimensions

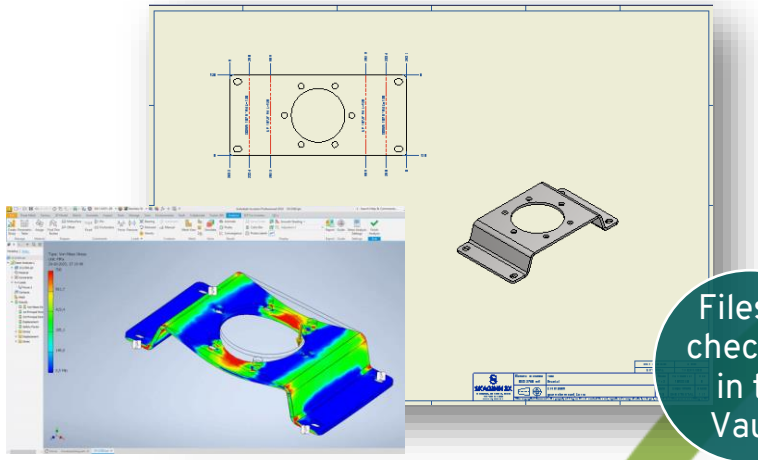
Eksempel på produktdata







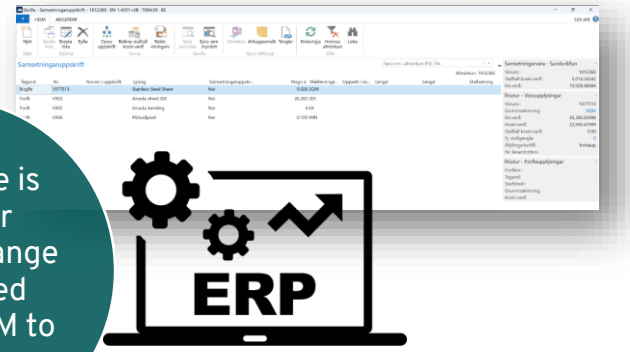
Eksempel: Engineering Workflow



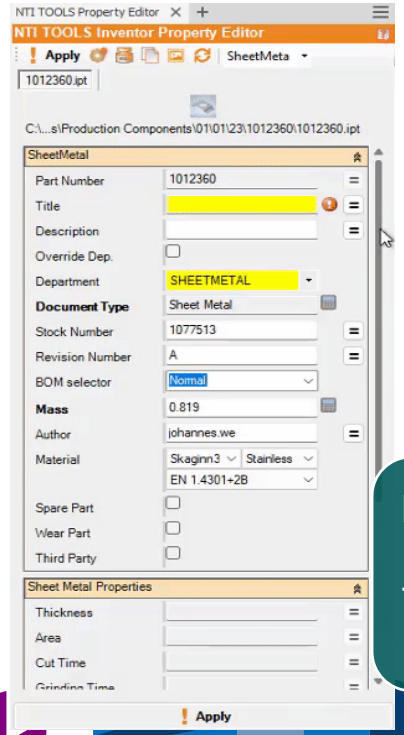
Assign update Item

Change state to Scheduled For Release (Publish documentation)

When State is Ready for Release, change to Released Exports BOM to ERP



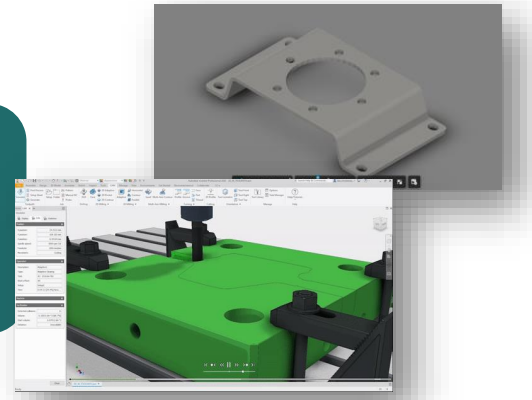
Files is checked in to Vault



SM property like Grinding Time and Cut Time, is automatic saved to the file.

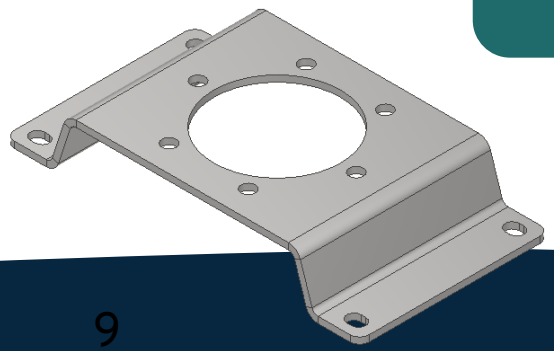
V PRO TL TOOLS

When the Item is Released, it will be visible for production

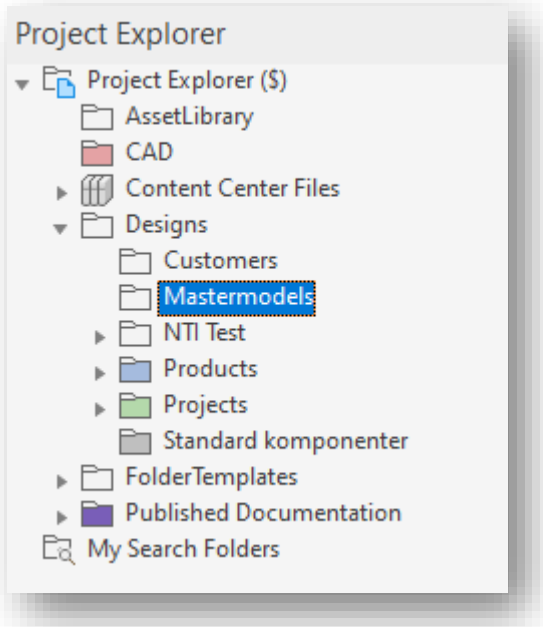


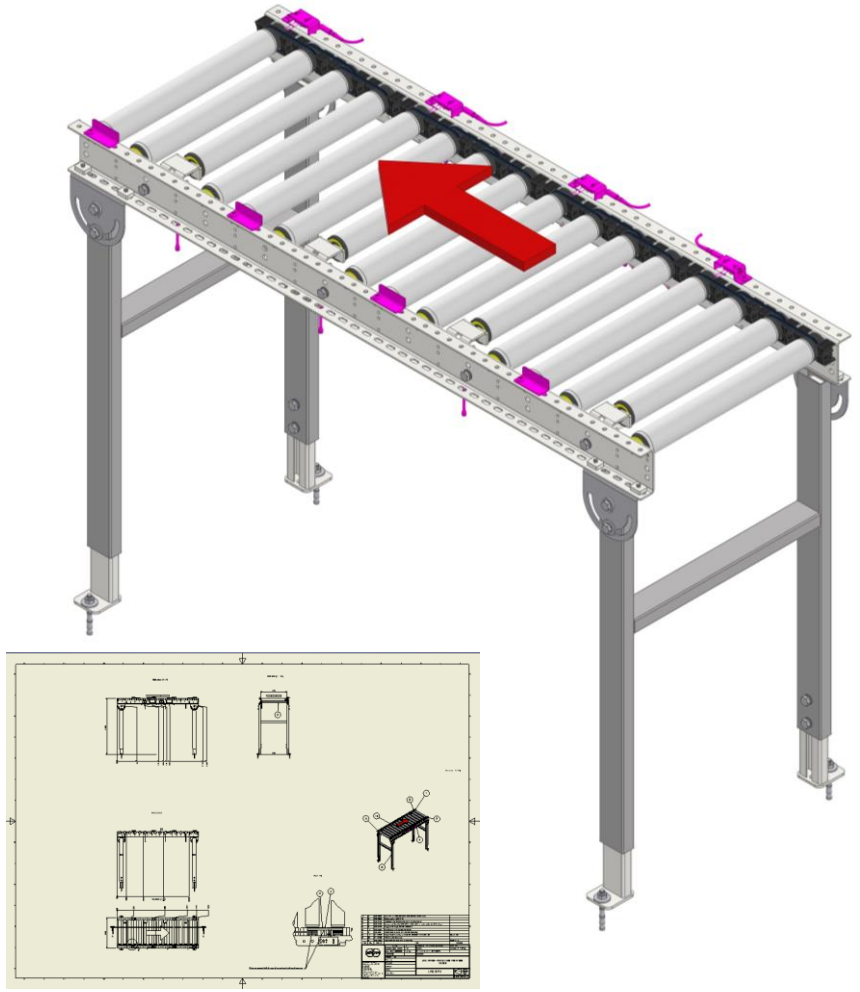
Properties is filled and maintained through NTI Tools Property editor

File is named from the Vault custom number provider



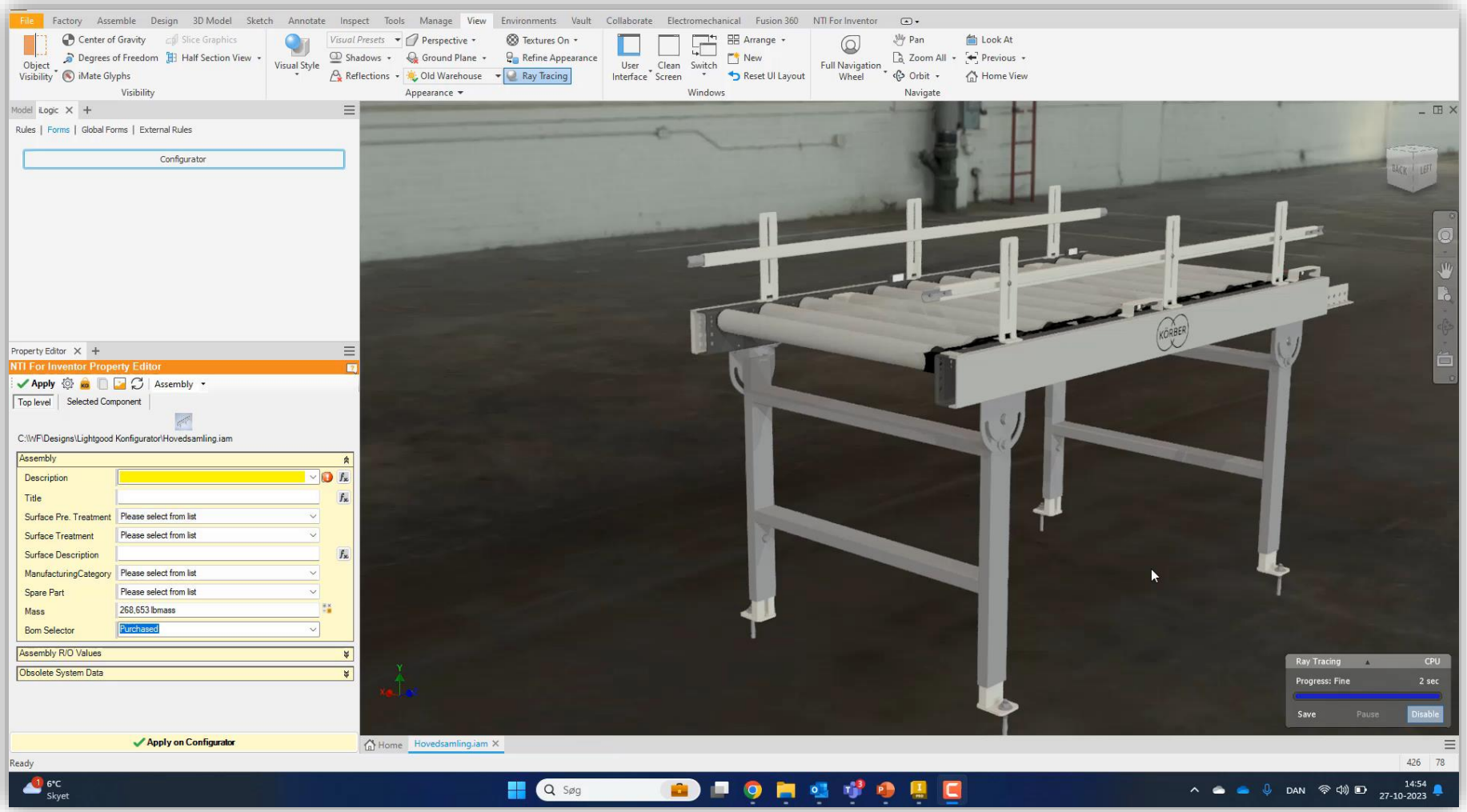
Mastermodeller





- Genbrug af opdaterede data
- Mulighed for automatisering

Varianter


File
Factory
Assemble
Design
3D Model
Sketch
Annotate
Inspect
Tools
Manage
View
Environments
Vault
Collaborate
Electromechanical
Fusion 360
NTI For Inventor
Object Visibility
Center of Gravity
Degrees of Freedom
iMate Glyphs
Slice Graphics
Half Section View
Visibility
Visual Style
Visual Presets
Shadows
Reflections
Perspective
Ground Plane
Old Warehouse
Textures On
Refine Appearance
Ray Tracing
Appearance
User Interface
Clean Screen
Switch
Arrange
New
Reset UI Layout
Windows
Full Navigation Wheel
Pan
Zoom All
Orbit
Look At
Previous
Home View
Navigate
Model
iLogic
Rules | Forms | Global Forms | External Rules
Configurator
Property Editor
NTI For Inventor Property Editor
Apply
Assembly
Top level
Selected Component
C:\WF\Designs\Lightgood Konfigurator\Hovedsamling.iam
Assembly
Description
Title
Surface Pre. Treatment
Surface Treatment
Surface Description
ManufacturingCategory
Spare Part
Mass
268,653 lbmass
Bom Selector
Purchased
Assembly R/O Values
Obsolete System Data
Apply on Configurator
KÖRBER
Ray Tracing
CPU
Progress: Fine
2 sec
Save
Pause
Disable
Home
Hovedsamling.iam
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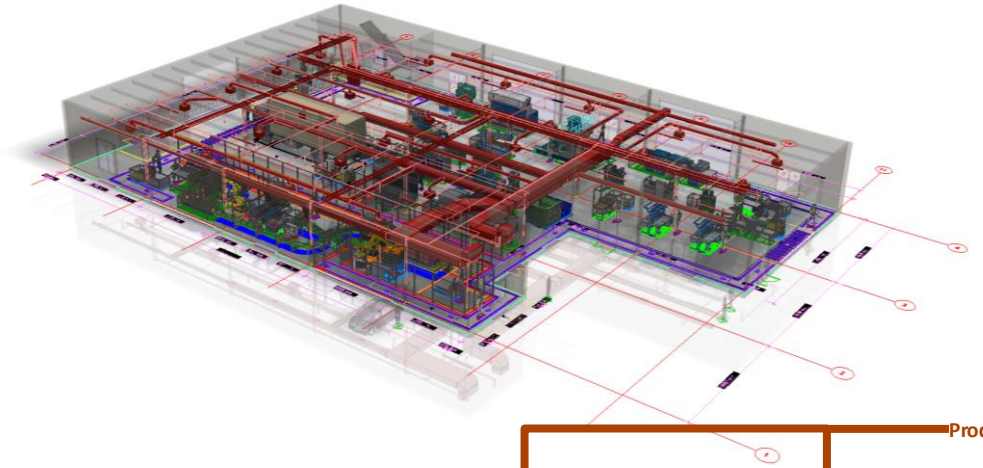
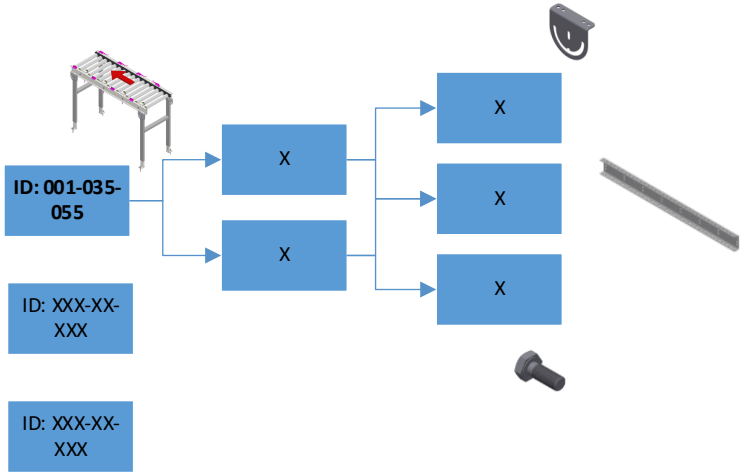
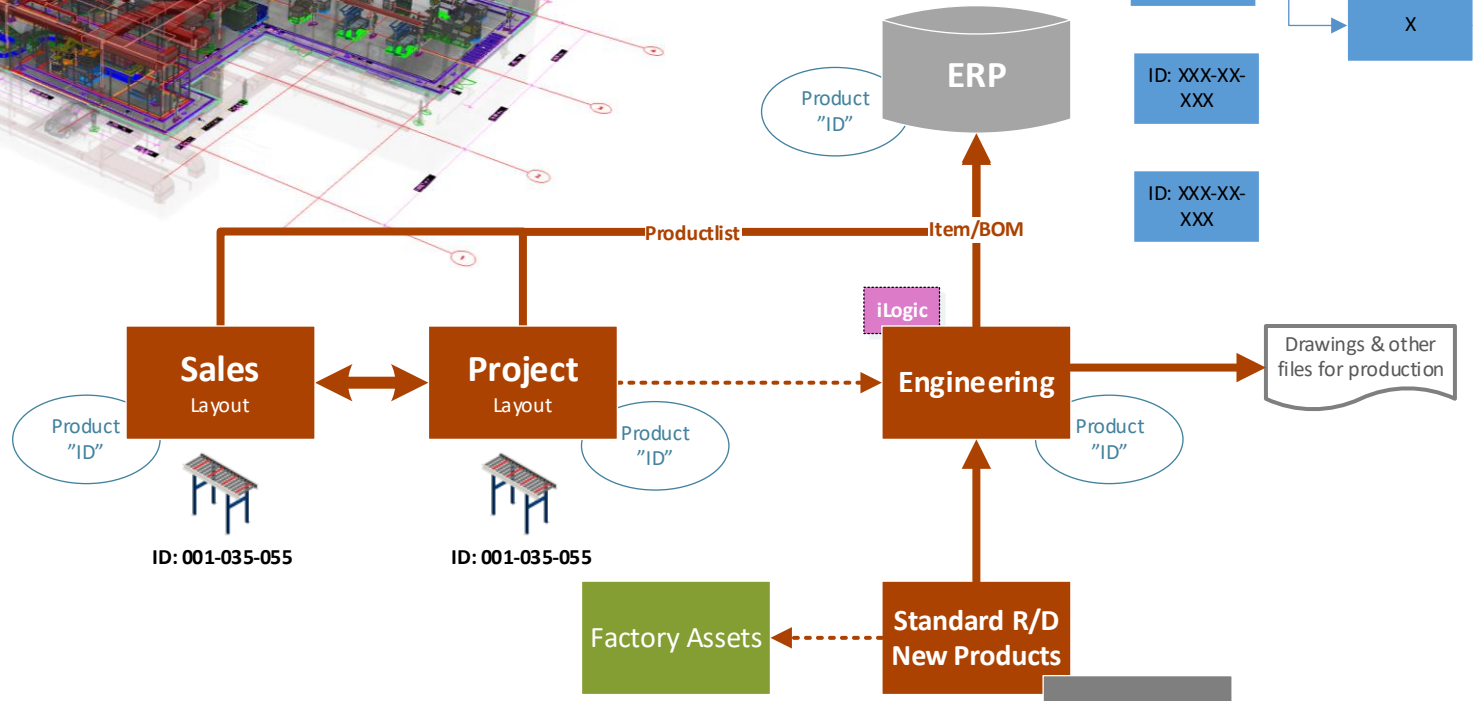
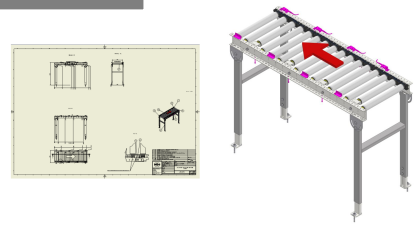
78
6°C
Skyet
Søg
DAN
14:54
27-10-2023





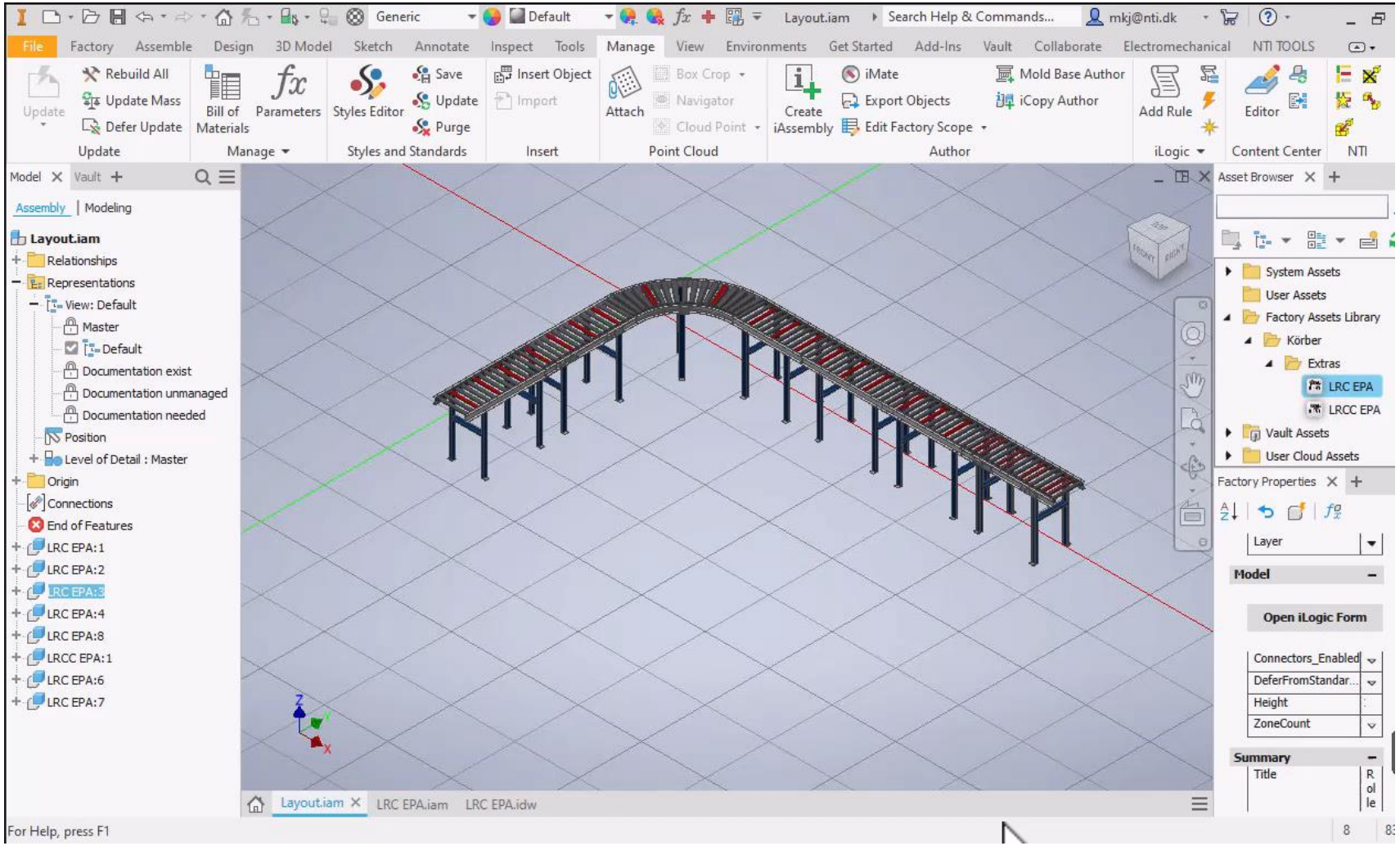




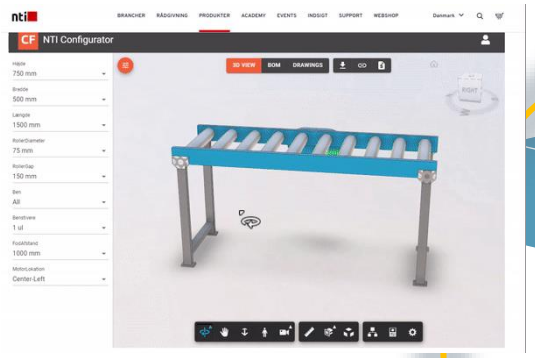
ID: 001-035-055

- Stor tidsbesparelse ift. håndtering af store layouts
- Sammenhæng i data, gennem værdikæden
- Muligt med fulde BOM lister, med skruer, bolte etc.

Automatisering med mastermodels



Eksempel på optimeret designproces



Bla. mulighed for:
- Disponering:

Bla. mulighed for:
- Multi BOM
- Ændringshåndtering

Bla. mulighed for:
- Publisering af dokumentation
- Overførsel af BOM til ERP

Supplier/Service portal

CRM

PLM

ERP

Product "ID"

Product Configuration

Productlist

Item/BOM

Sales Material

2D layout
3D layout
Visualization

TL TOOLS

Sales
Layout

Project
Layout

Engineering

iLogic

Factory Layout

Drawings & other files for production

Scanning & PointClouds

Buildings

Components

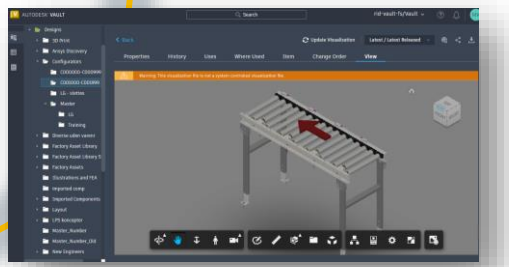
ACA
Revit
ACAD
Microstation

ACAD Blocks
Inventor
ACA objects

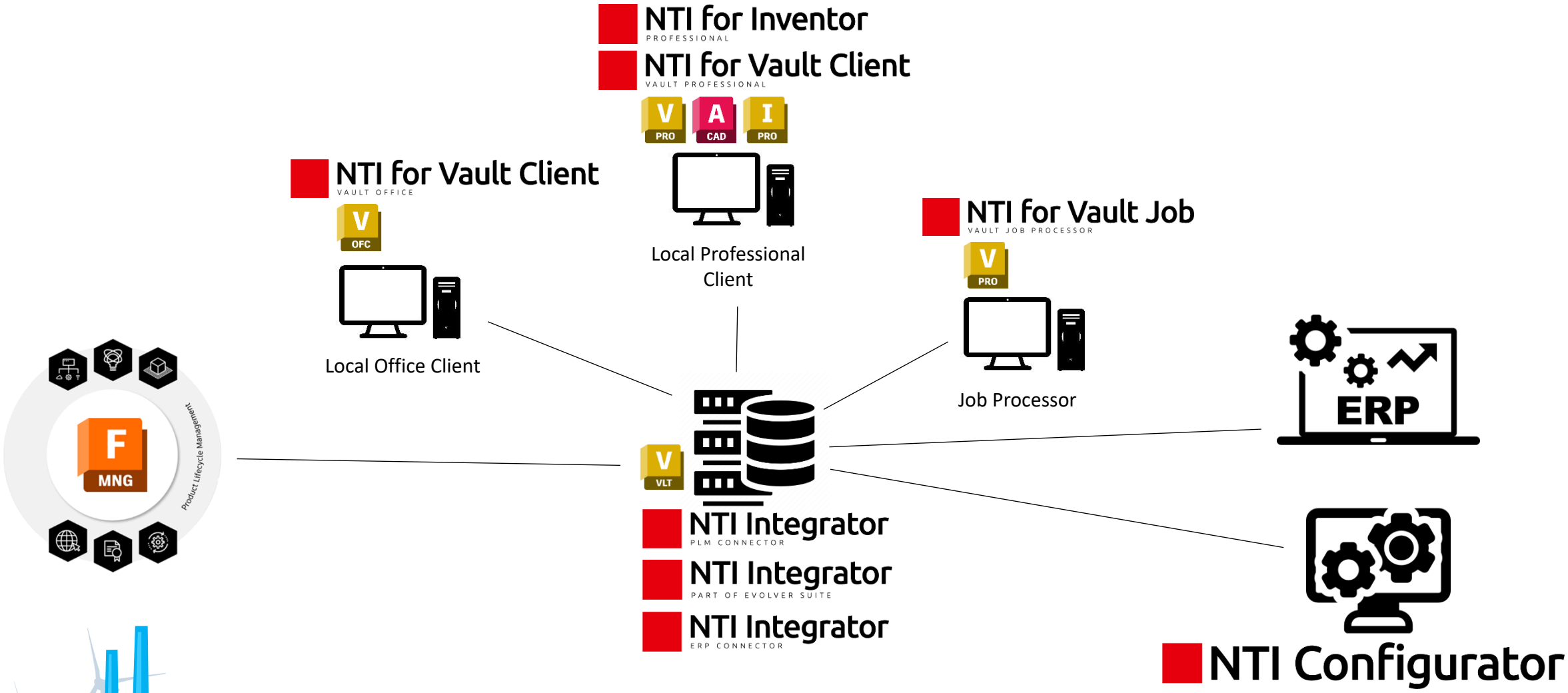
Standardizing

Factory Assets
2D Blocks
3D Blocks

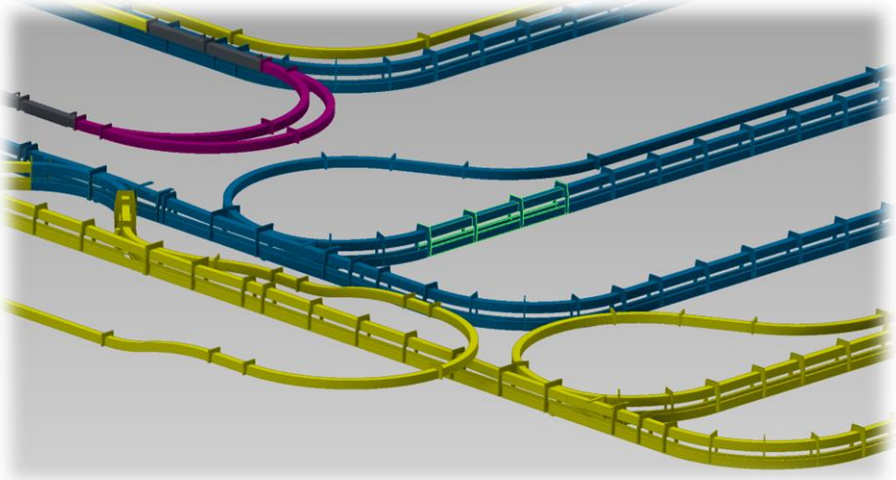
Design/R&D
New Products

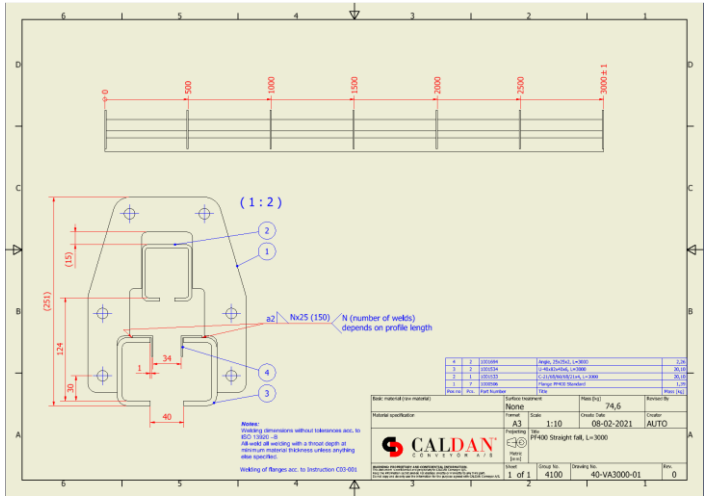


Automatiser



Automatisering med NTI Automation





Layout med assets

NTI TOOLS Automation

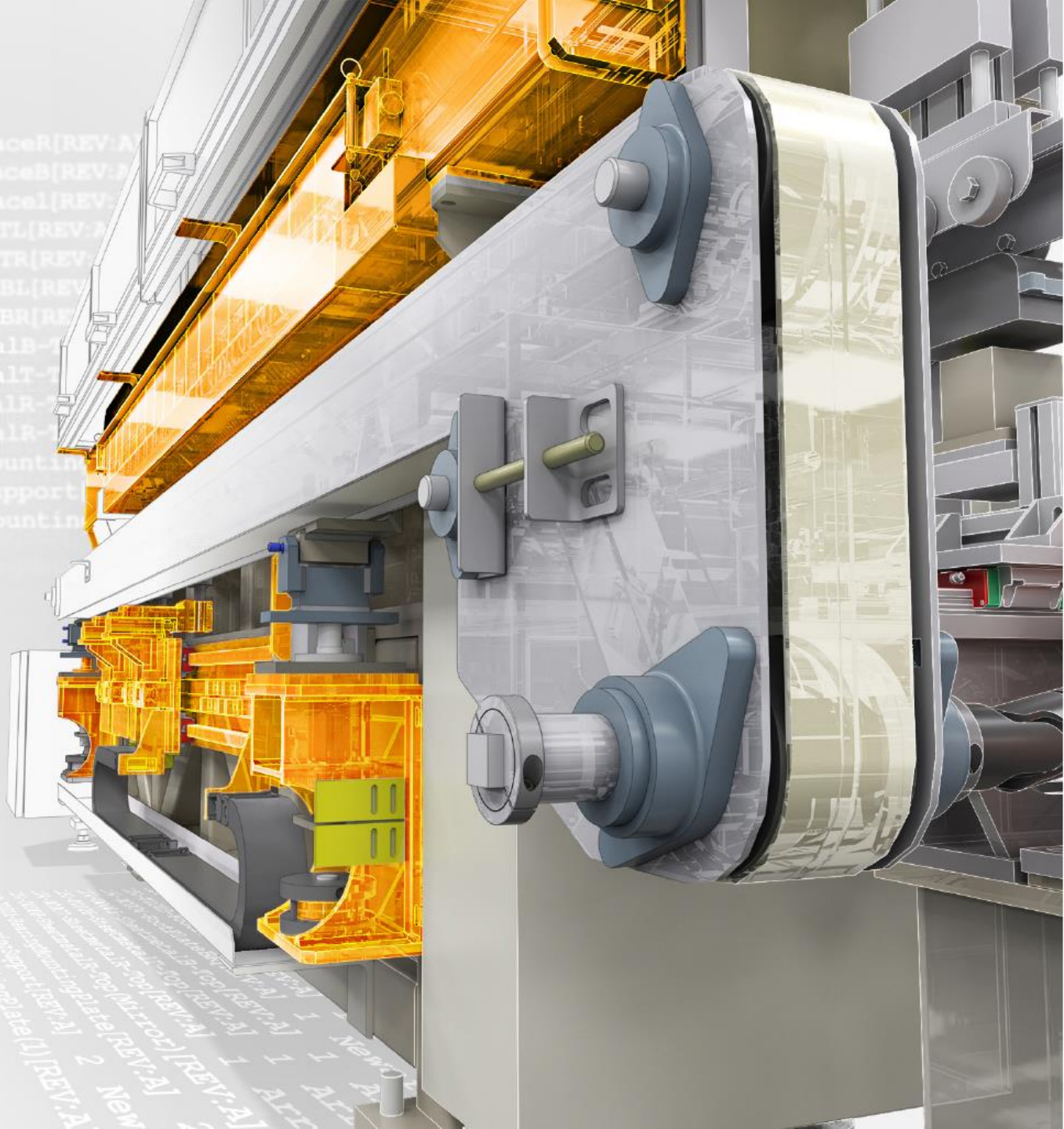
Fuldt produktionsgrundlag, BOM, PDF, DXF, STP, ...

JobServer skaber manglende parter, samlinger og tegninger
Genbruger tidligere skabte dele

AUTODESK

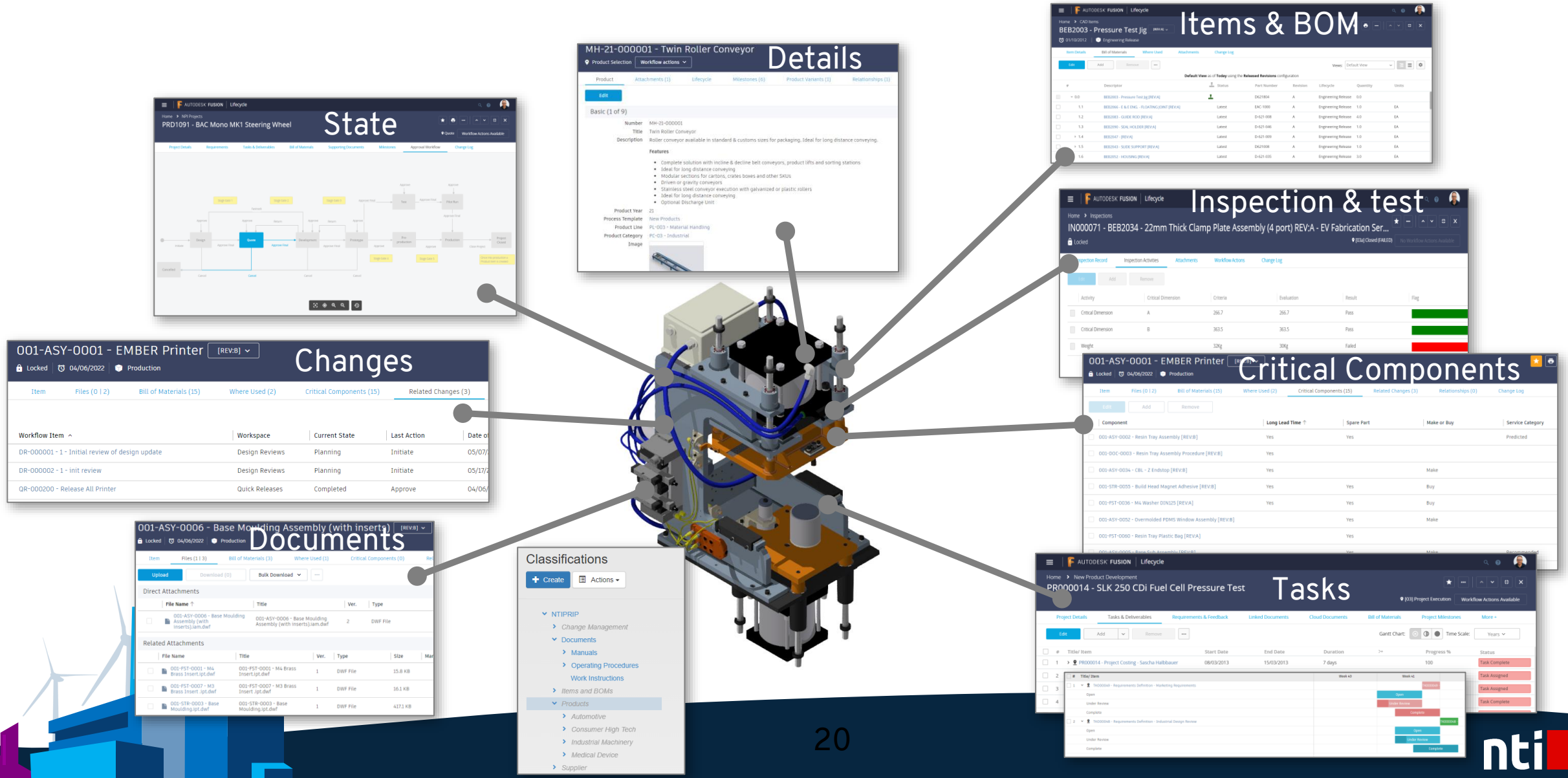
The difference between PDM and PLM (and why you need both)

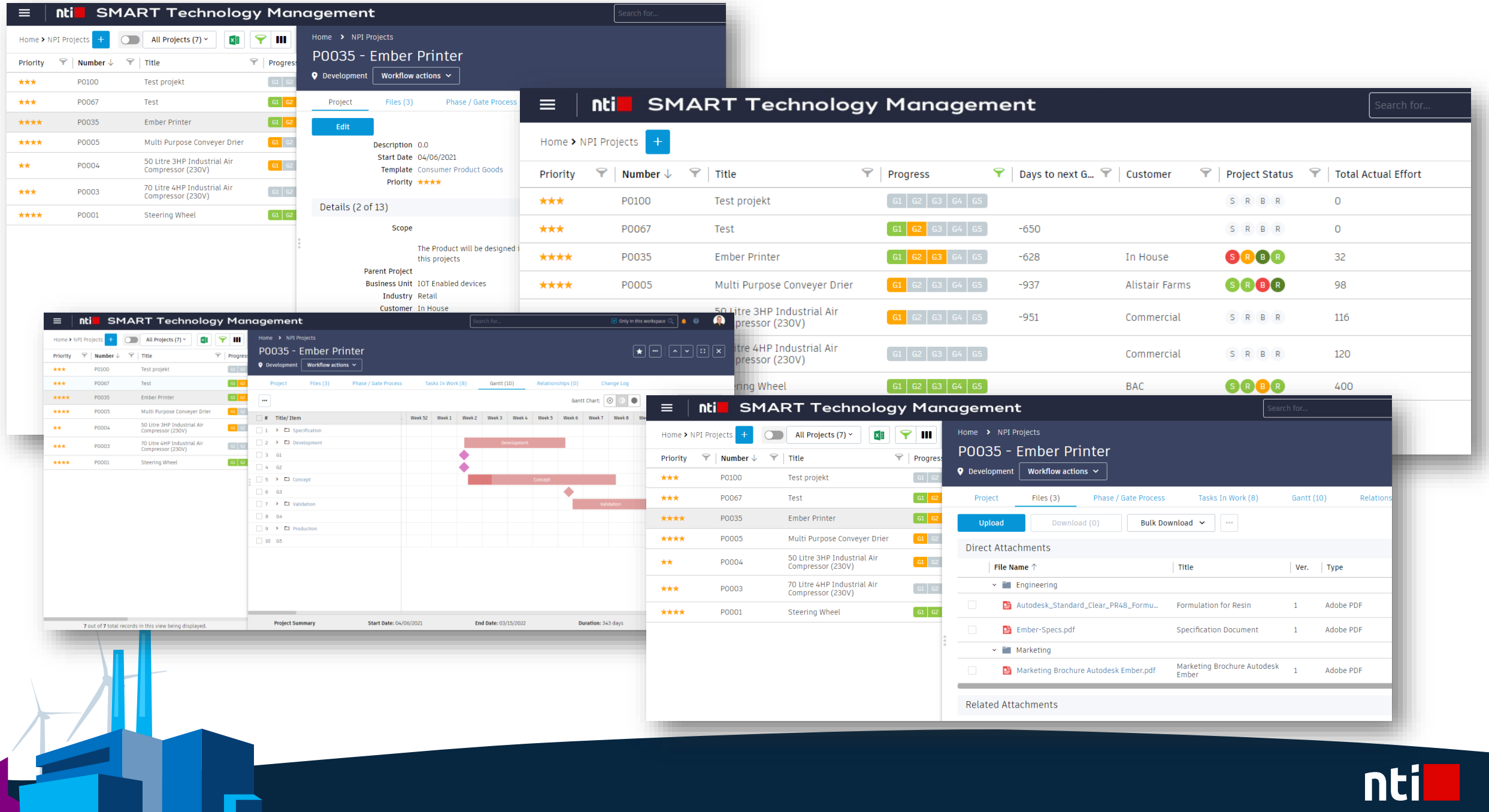
Improve quality, reduce costs, and get your products out to market faster. Realize the benefits of using product lifecycle management with data management.

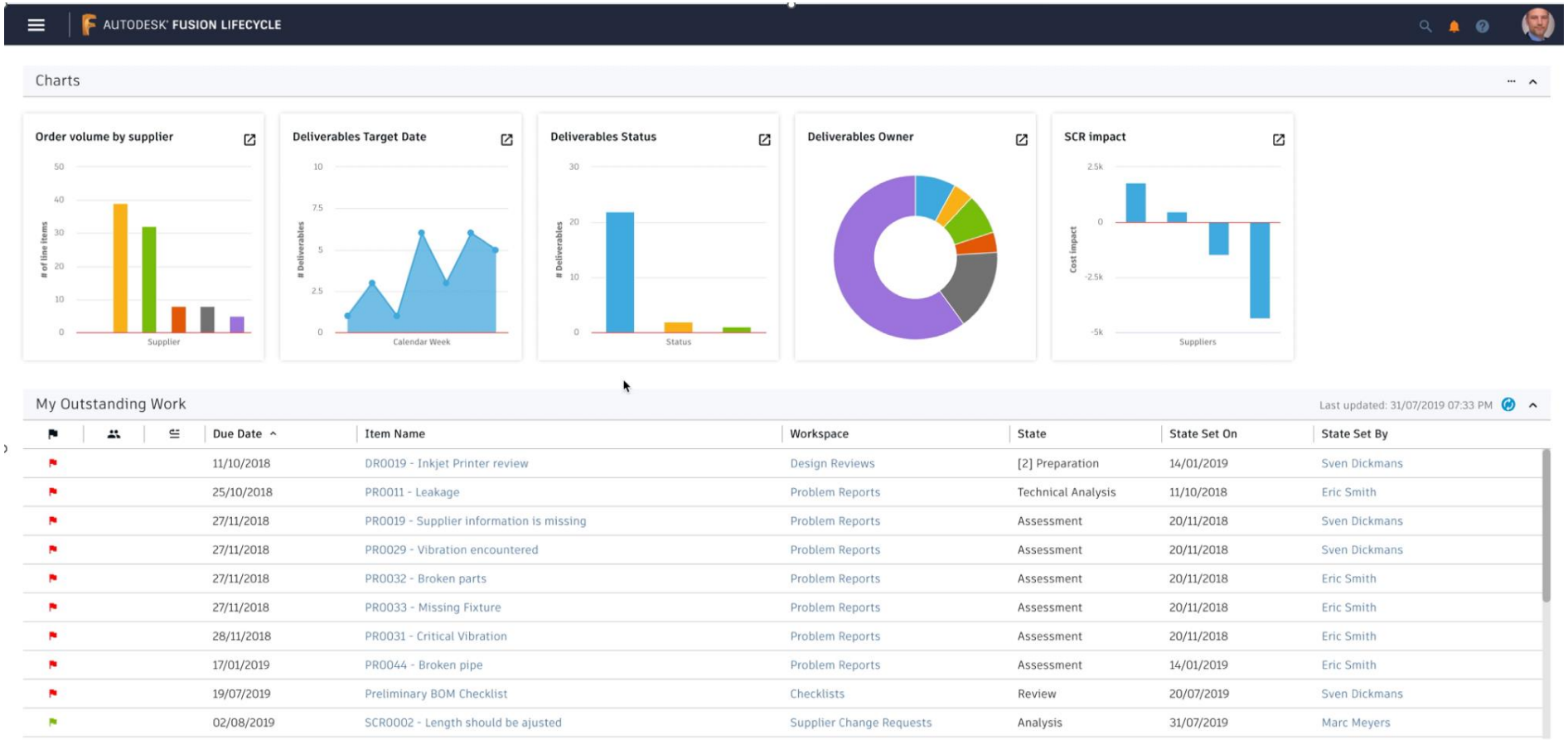


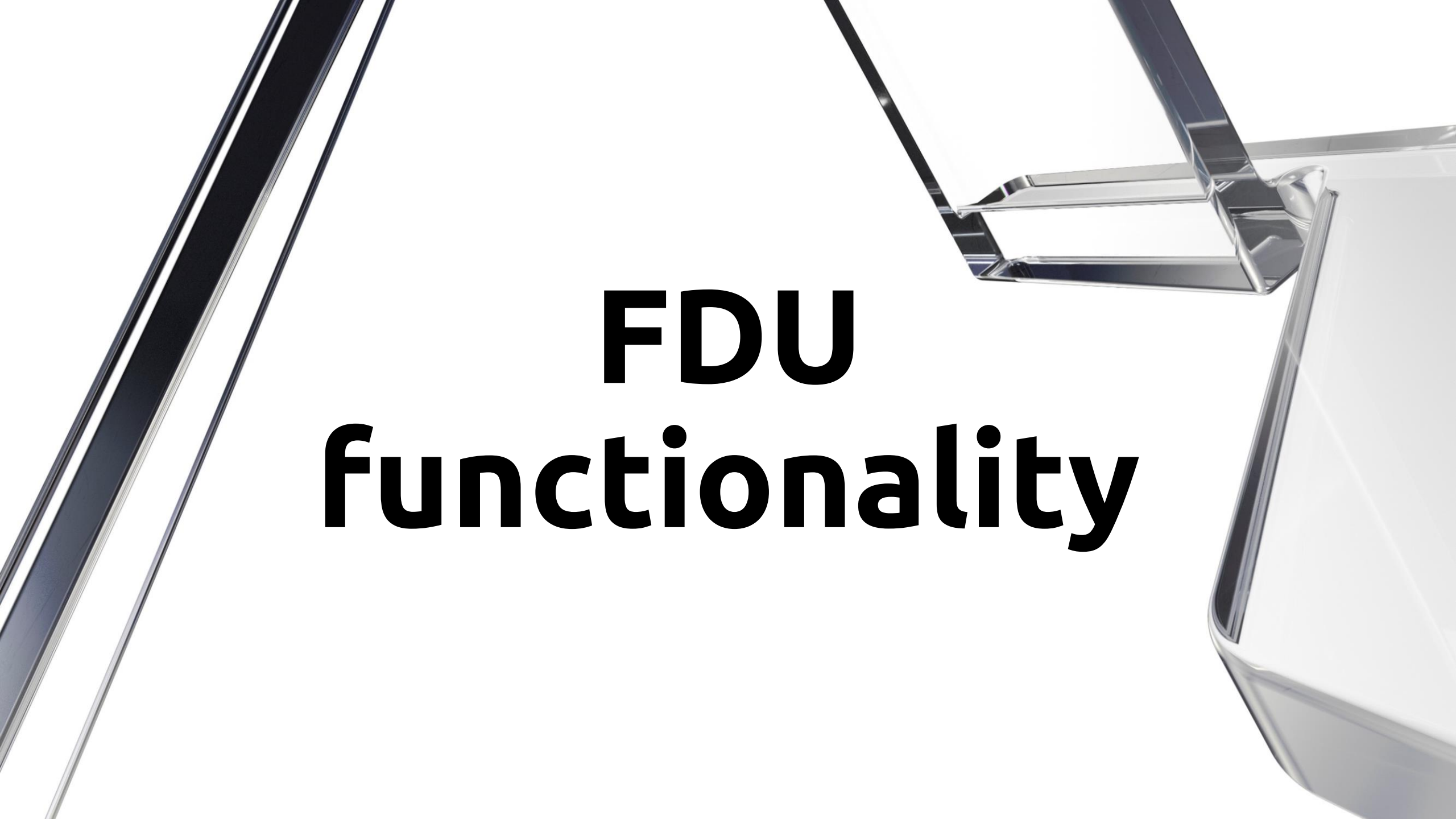
Product in focus

Autodesk Fusion Manage

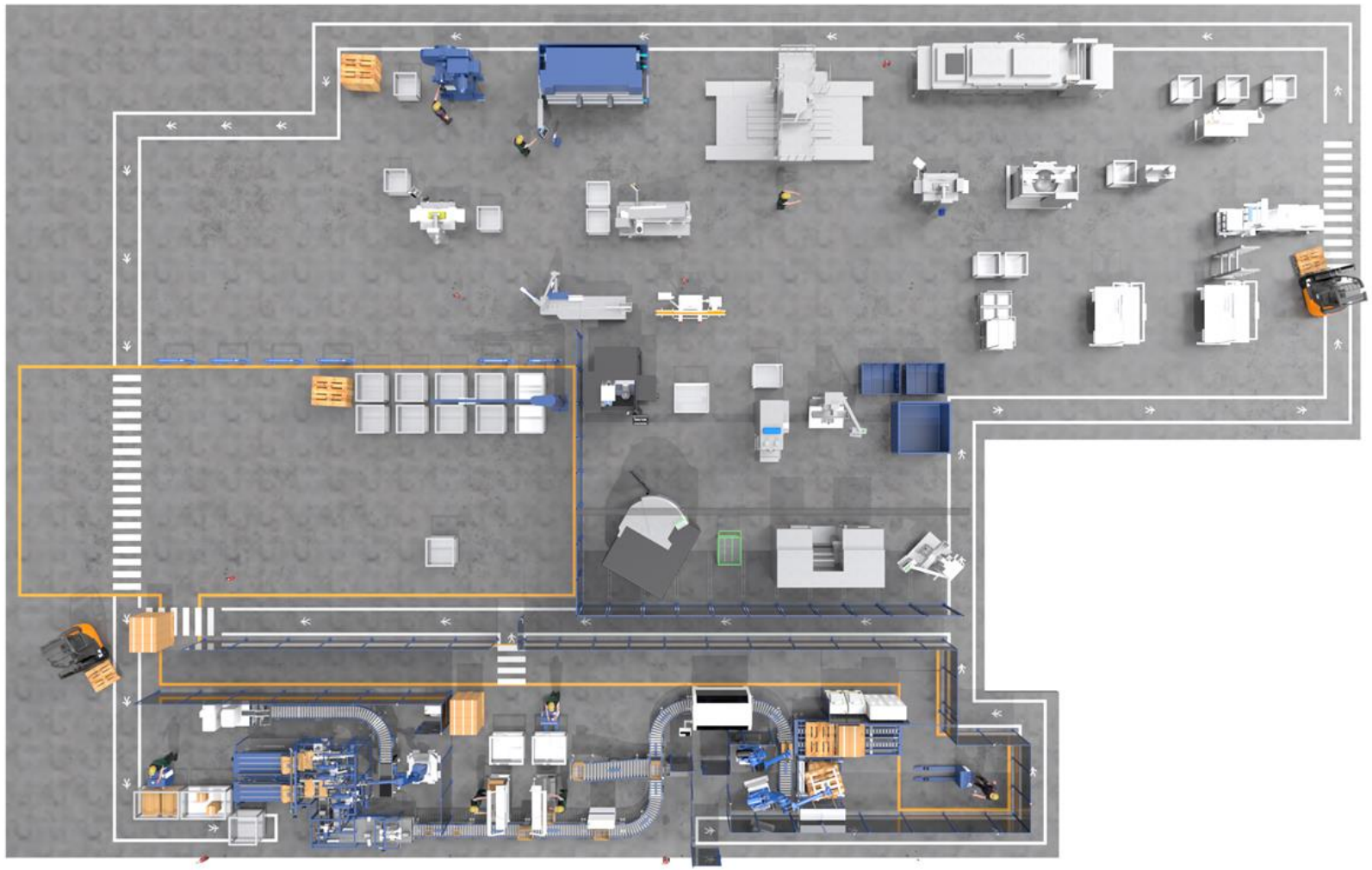



SMART Technology Management
Search for...
Home › NPI Projects
All Projects (7)
Priority
Number
Title
Progress
P0100 Test projekt
P0067 Test
P0035 Ember Printer
P0005 Multi Purpose Conveyer Drier
P0004 50 Litre 3HP Industrial Air Compressor (230V)
P0003 70 Litre 4HP Industrial Air Compressor (230V)
P0001 Steering Wheel
P0035 - Ember Printer
Development
Workflow actions
Project
Files (3)
Phase / Gate Process
Edit
Description 0.0
Start Date 04/06/2021
Template Consumer Product Goods
Priority
Details (2 of 13)
Scope
The Product will be designed i this projects
Parent Project
Business Unit IOT Enabled devices
Industry Retail
Customer In House
Days to next G...
Customer
Project Status
Total Actual Effort
-650
-628
In House
-937
Alistair Farms
-951
Commercial
116
120
BAC
400
Tasks In Work (8)
Gantt (10)
Relationships (0)
Change Log
Gantt Chart:
Title/ Item
Week 52
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Specification
Development
Concept
Validation
Production
Project Summary
Start Date: 04/06/2021
End Date: 03/15/2022
Duration: 343 days
7 out of 7 total records in this view being displayed.
Upload
Download (0)
Bulk Download
Direct Attachments
File Name
Title
Ver.
Type
Engineering
Autodesk_Standard_Clear_PR48_Formu...
Formulation for Resin
Ember-Specs.pdf
Specification Document
Marketing
Marketing Brochure Autodesk Ember.pdf
Marketing Brochure Autodesk Ember
Related Attachments

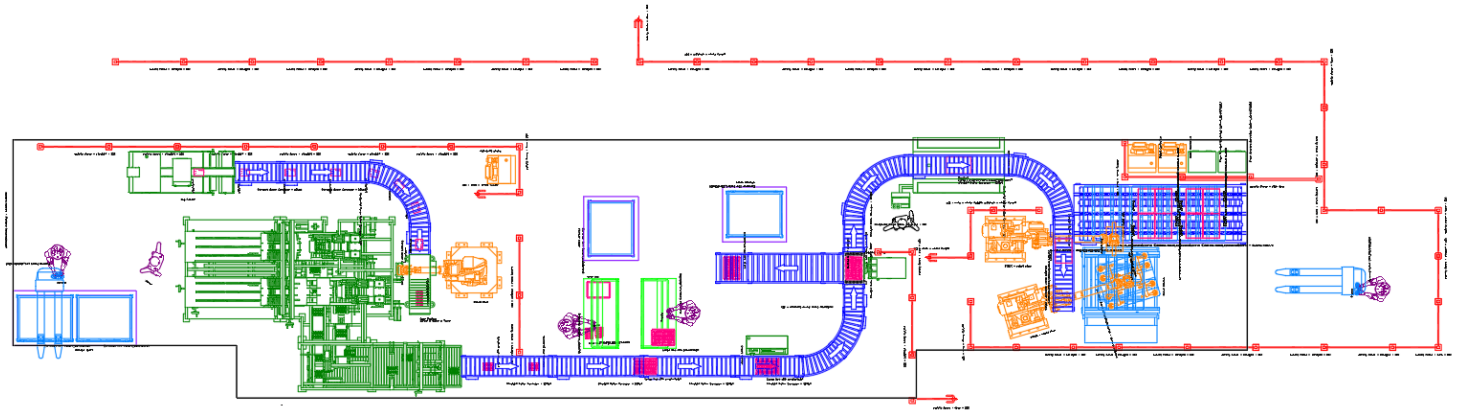

AUTODESK' FUSION LIFECYCLE
Charts
Order volume by supplier
# of line items
Supplier
Deliverables Target Date
Deliverables
Calendar Week
Deliverables Status
Deliverables
Status
Deliverables Owner
SCR impact
Cost impact
Suppliers
My Outstanding Work
Last updated: 31/07/2019 07:33 PM
Due Date
Item Name
Workspace
State
State Set On
State Set By
11/10/2018 DR0019 - Inkjet Printer review Design Reviews [2] Preparation 14/01/2019 Sven Dickmans
25/10/2018 PR0011 - Leakage Problem Reports Technical Analysis 11/10/2018 Eric Smith
27/11/2018 PR0019 - Supplier information is missing Problem Reports Assessment 20/11/2018 Sven Dickmans
27/11/2018 PR0029 - Vibration encountered Problem Reports Assessment 20/11/2018 Sven Dickmans
27/11/2018 PR0032 - Broken parts Problem Reports Assessment 20/11/2018 Eric Smith
27/11/2018 PR0033 - Missing Fixture Problem Reports Assessment 20/11/2018 Eric Smith
28/11/2018 PR0031 - Critical Vibration Problem Reports Assessment 20/11/2018 Eric Smith
17/01/2019 PR0044 - Broken pipe Problem Reports Assessment 14/01/2019 Eric Smith
19/07/2019 Preliminary BOM Checklist Checklists Review 20/07/2019 Sven Dickmans
02/08/2019 SCR0002 - Length should be ajusted Supplier Change Requests Analysis 31/07/2019 Marc Meyers

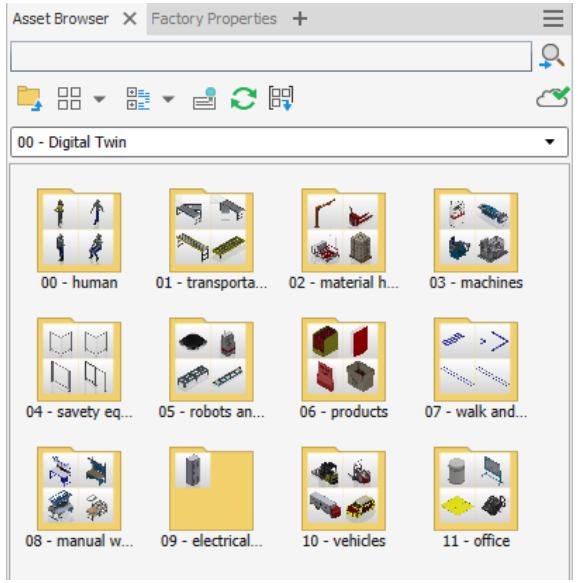


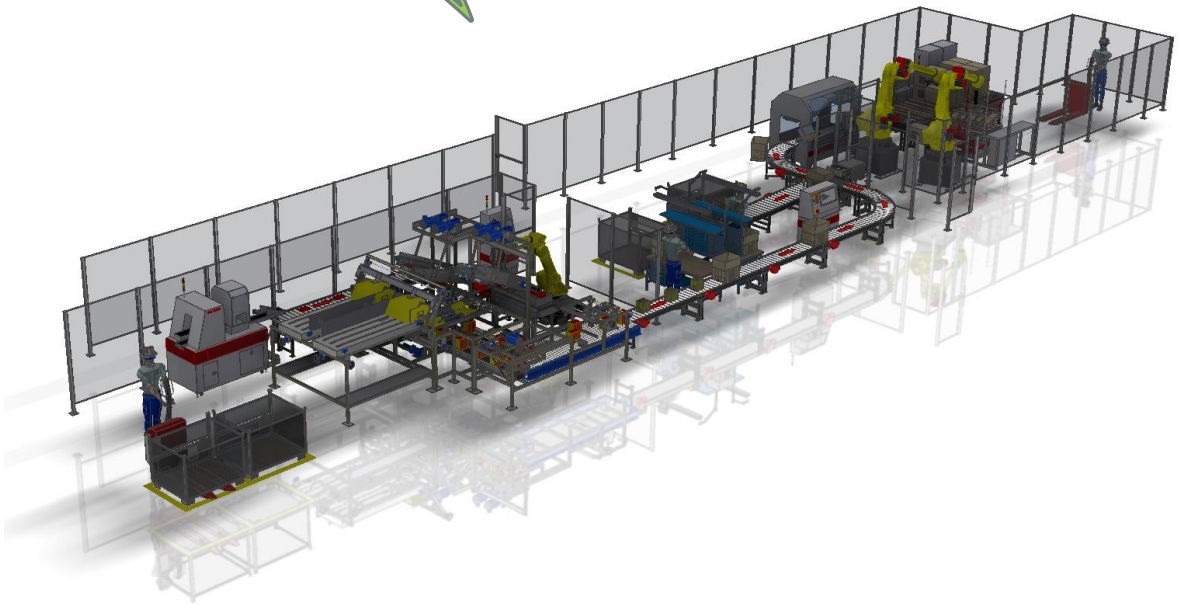
FDU functionality



2D/3D workflow



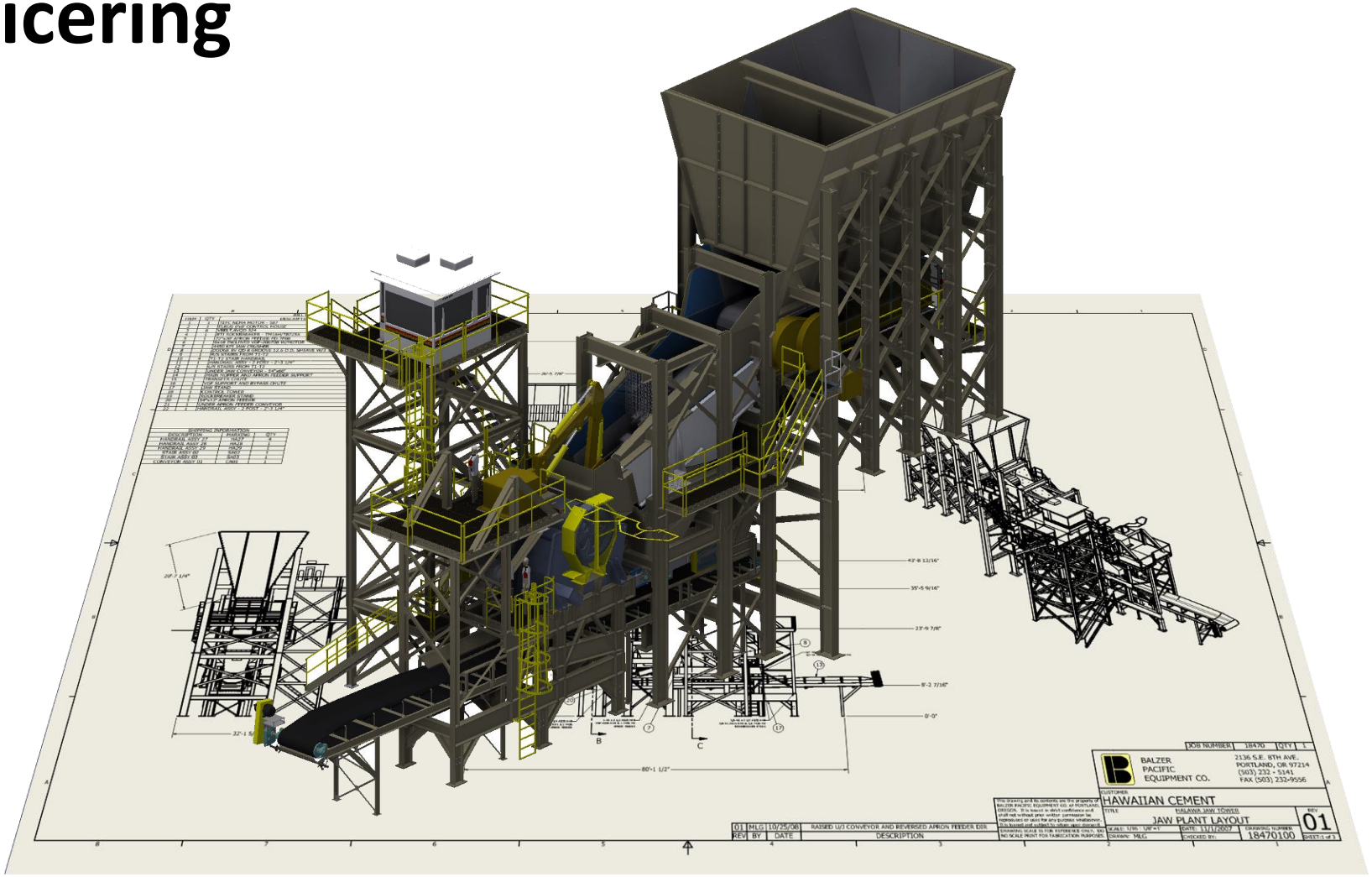


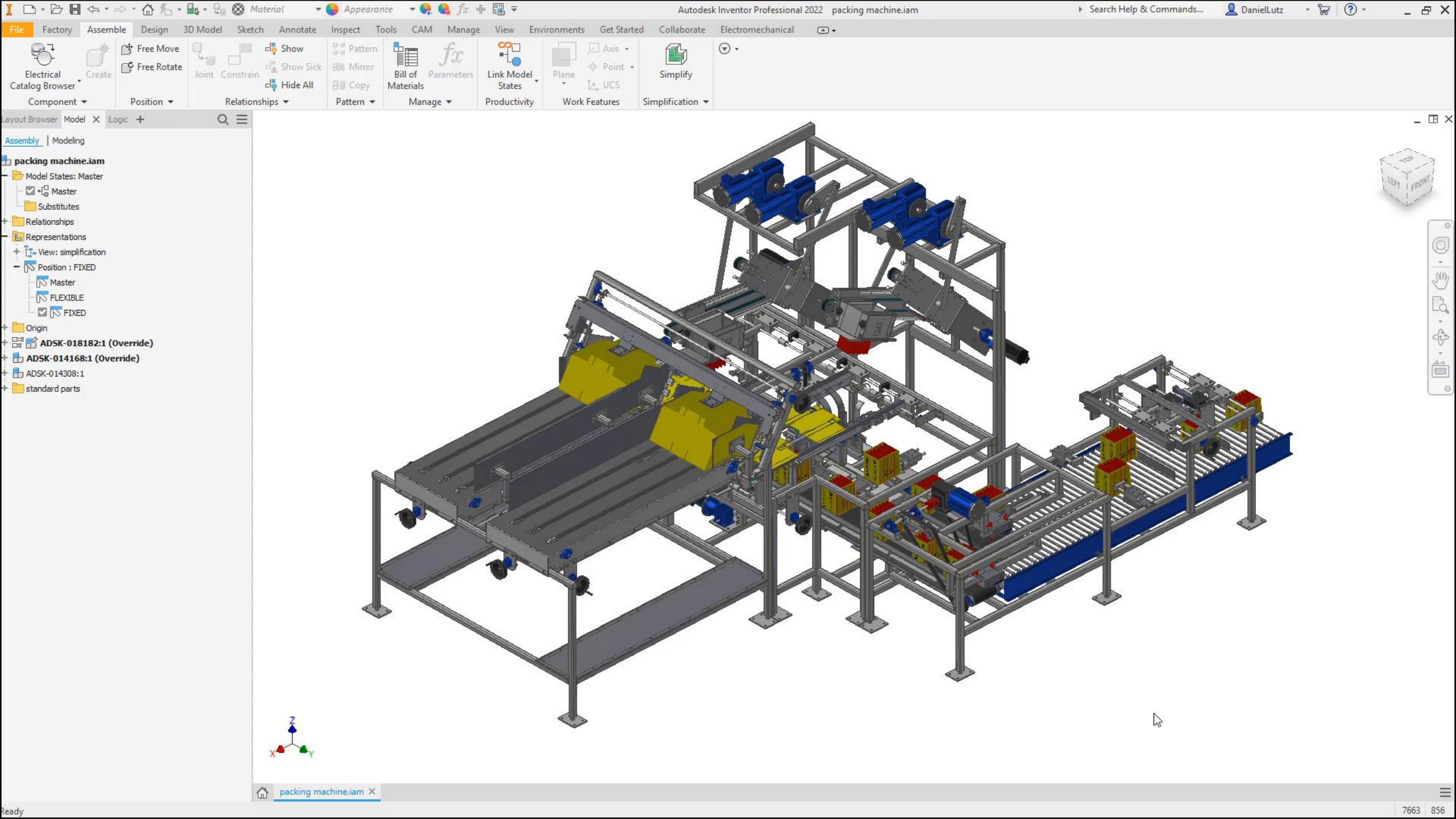


- Common library for 2D and 3D
- The possibility to create a layout in 2D or 3D is unique on the market
- 2D and 3D is always associatively linked

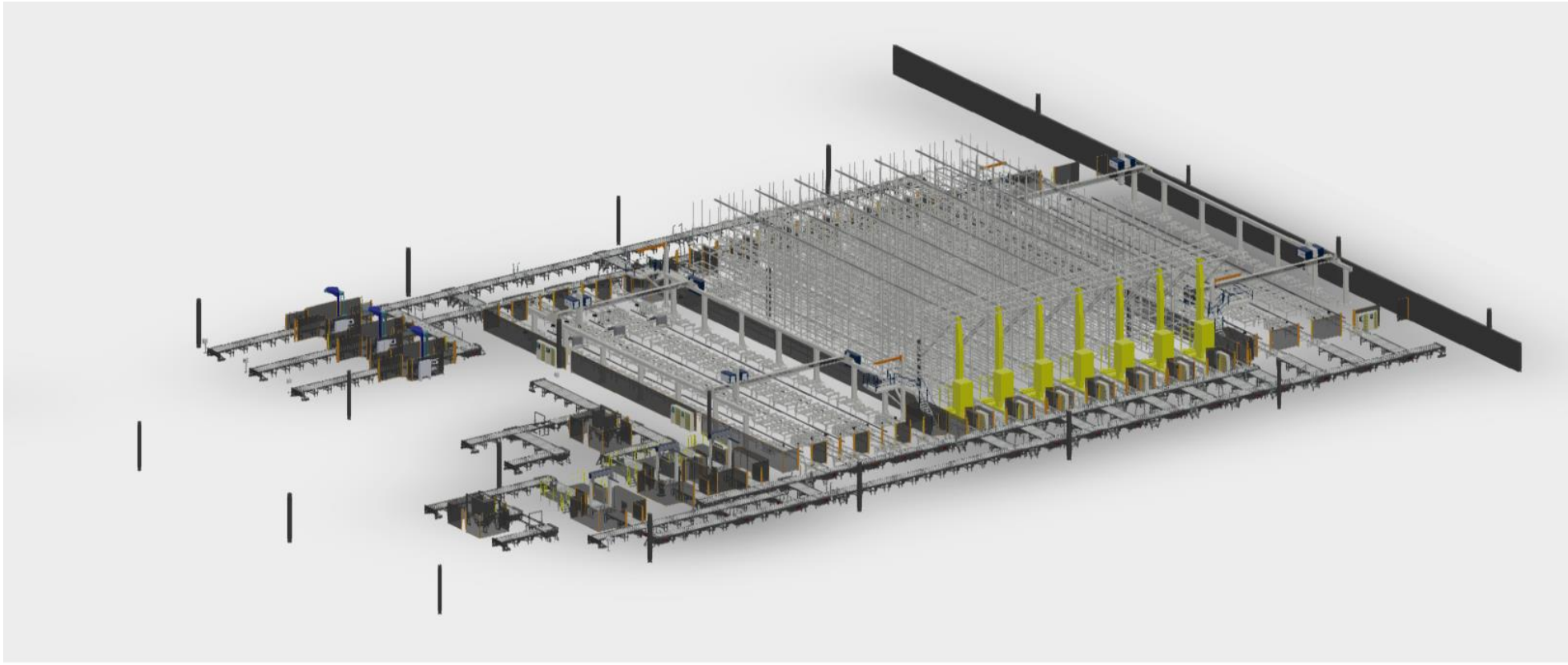
AUTODESK

Simplificering



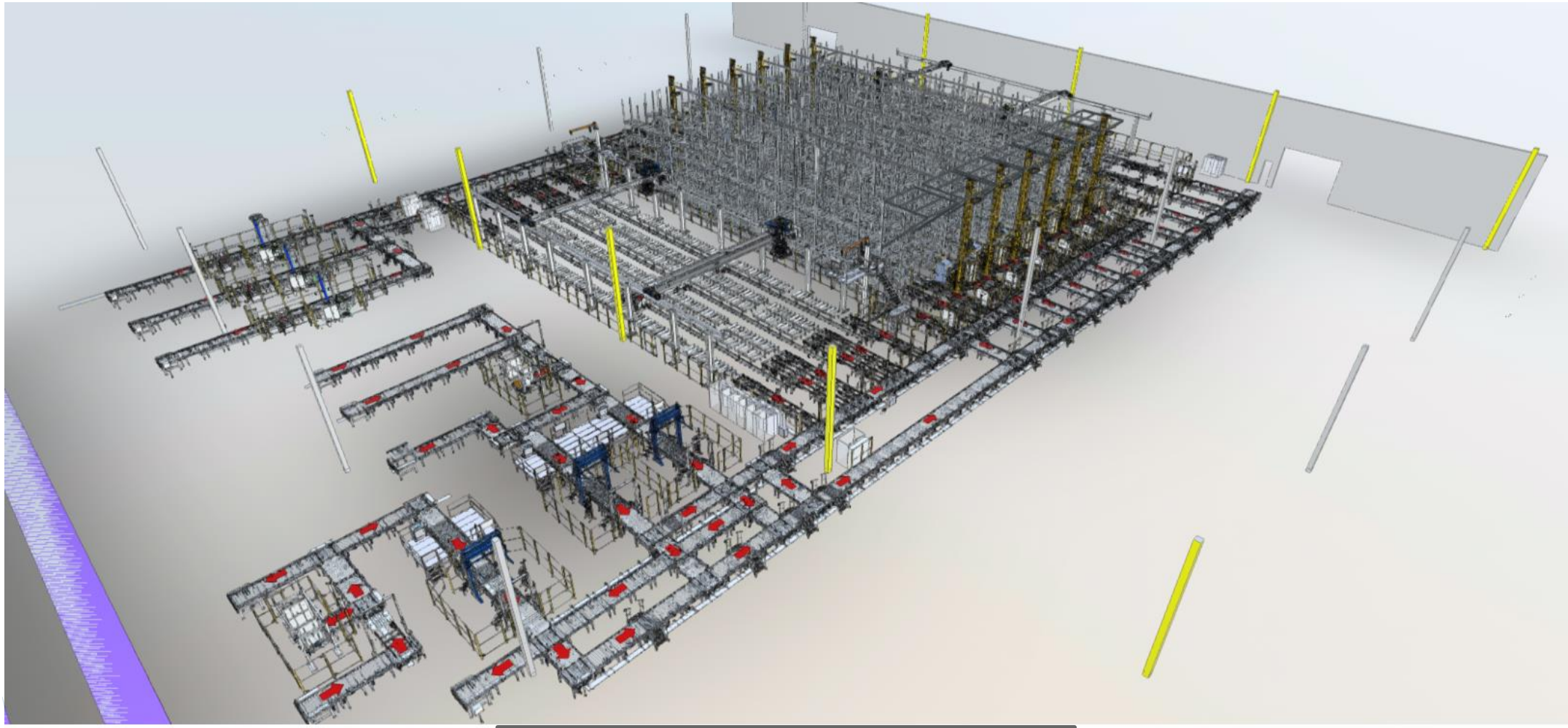

Autodesk Inventor Professional 2022 packing machine.iam
Search Help & Commands...
DanielLutz
File
Factory
Assemble
Design
3D Model
Sketch
Annotate
Inspect
Tools
CAM
Manage
View
Environments
Get Started
Collaborate
Electromechanical
Electrical Catalog Browser
Create
Free Move
Free Rotate
Component
Position
Joint
Constrain
Show
Show Sick
Hide All
Relationships
Pattern
Mirror
Copy
Pattern
Bill of Materials
Parameters
Manage
Link Model States
Productivity
Plane
Axis
Point
UCS
Work Features
Simplify
Simplification
Layout Browser
Model
iLogic
Assembly
Modeling
packing machine.iam
Model States: Master
Master
Substitutes
Relationships
Representations
View: simplification
Position : FIXED
Master
FLEXIBLE
FIXED
Origin
ADSK-018182:1 (Override)
ADSK-014168:1 (Override)
ADSK-014308:1
standard parts
packing machine.iam
Ready
7663
856

Inventor Factory layout, med simplificerede modeller



Åbnes på under 1 minut

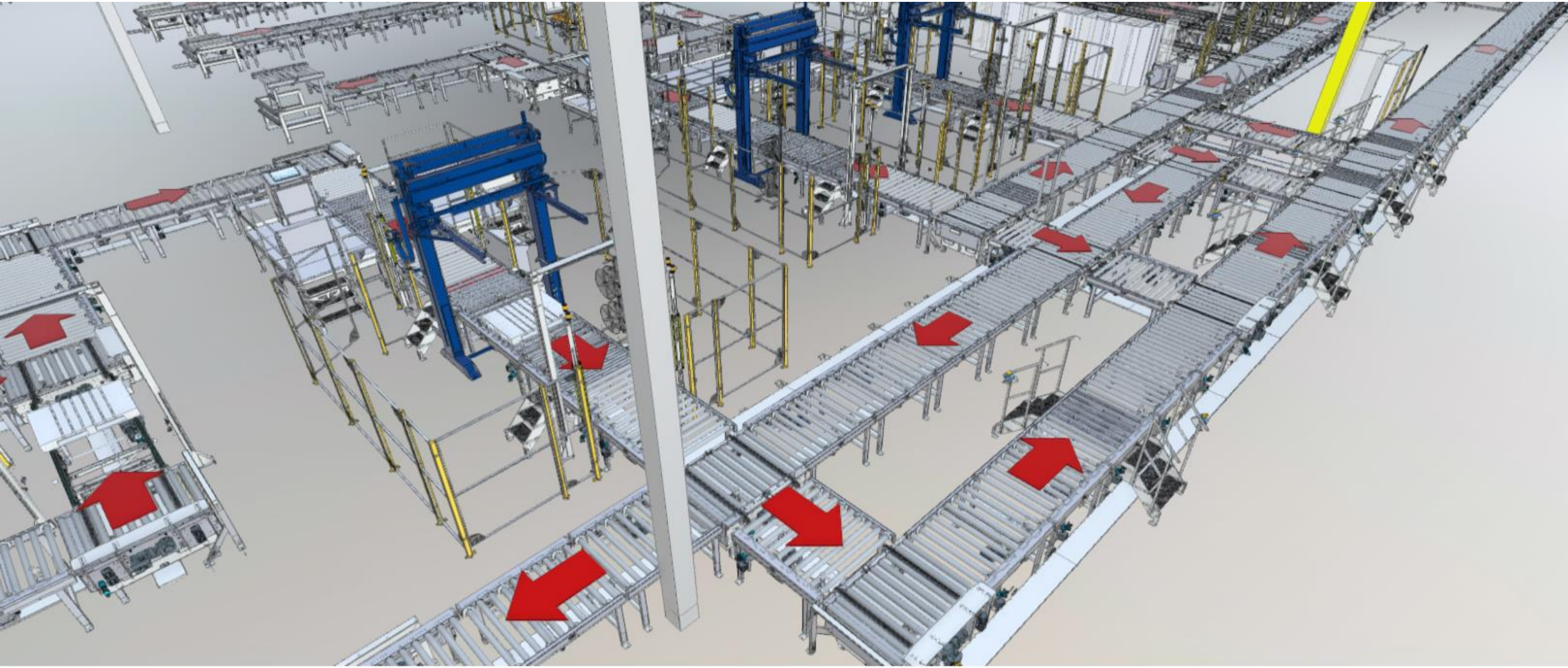
Inventor layout, med fuldt detaljerede modeller



AUTODESK Viewer

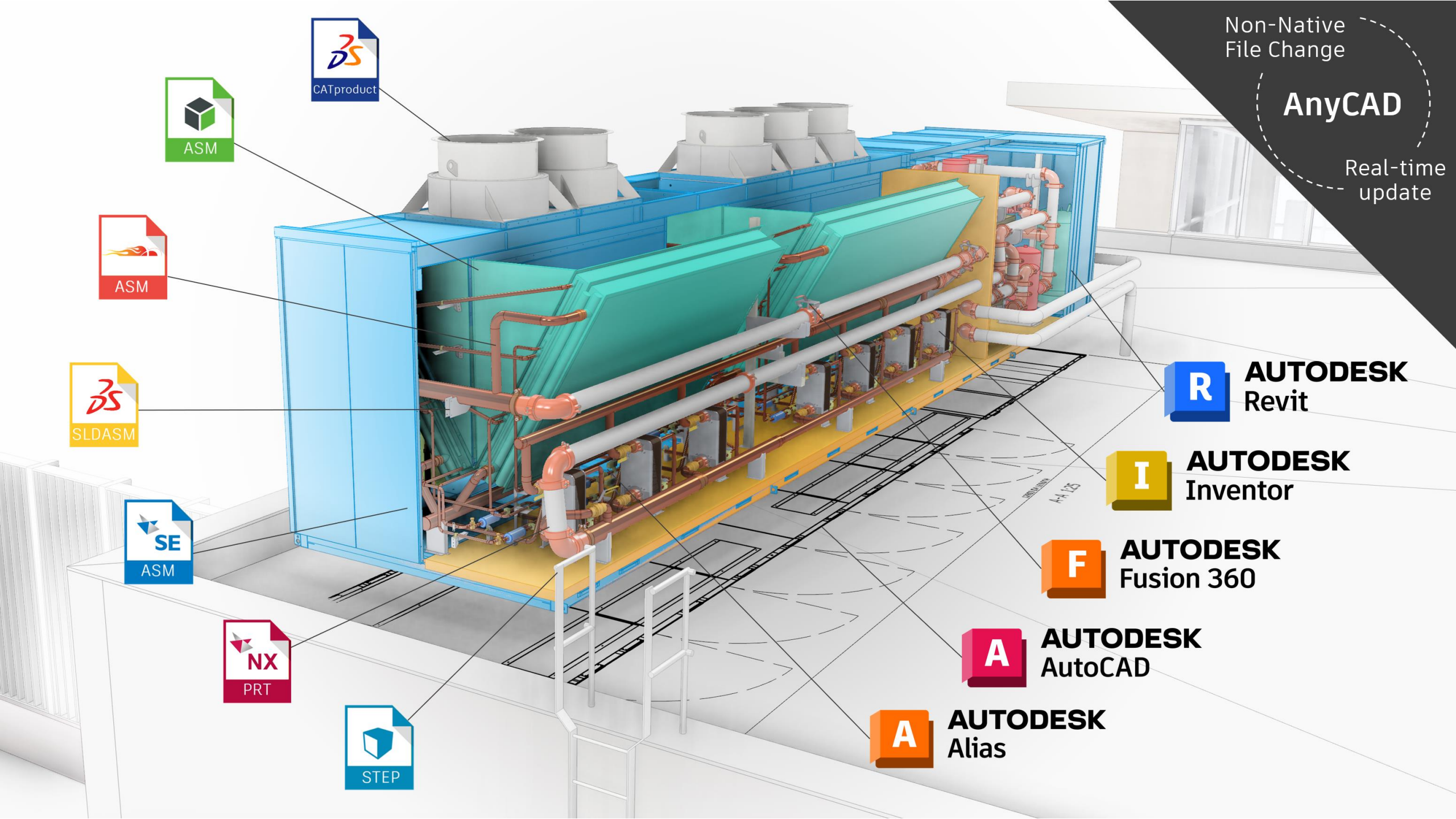
Kan ikke længere åbnes i Inventor

AUTODESK



AUTODESK Viewer

AUTODESK


Non-Native
File Change
AnyCAD
Real-time
update
CATproduct
ASM
ASM
SLDASM
SE
ASM
NX
PRT
STEP
AUTODESK
Revit
AUTODESK
Inventor
AUTODESK
Fusion 360
AUTODESK
AutoCAD
AUTODESK
Alias


Autodesk Navisworks Manage 2023 Factory 2022 - DIGITAL TWIN-FINISH - MS.nwf
Type a keyword or phrase
DanielLutz
Home
Viewpoint
Review
Animation
View
Output
BIM 360 Glue
Render
Vault
Factory
Coordination
Ready
1 of 1
1246 MB

building-integration

Autodesk Revit 2023.1 - Mannheim - Revit.rvt - 3D View: installation space with building

DanielLutz

File | Architecture | Structure | Steel | Precast | Systems | Insert | Annotate | Analyze | Massing & Site | Collaborate | View | Manage | Add-Ins | Quantification | Issues | Vault | BIM Interoperability Tools | Modify

Modify | Wall | Door | Window | Component | Column | Roof | Ceiling | Floor | Curtain System | Curtain Grid | Mullion | Railing | Ramp | Stair | Model Text | Model Line | Model Group | Room | Room Separator | Tag Room | Area | Area Boundary | Tag Area | By Face | Shaft | Wall | Vertical | Dormer | Level | Grid | Set | Show | Ref Plane | Viewer

Select | Build | Circulation | Model | Room & Area | Opening | Datum | Work Plane

Properties

3D View
Vue 3D

3D View: installation space with building | Edit Type

Graphics	
Detail Level	Fine
Parts Visibility	Show Original
Visibility/Graphics Overrides	Edit...
Graphic Display Options	Edit...
Discipline	Architectural
Default Analysis Display Style	None
Show Grids	Edit...
Sun Path	☐
Extents	
Crop View	☐
Crop Region Visible	☐
Far Clip Active	☐
Far Clip Offset	304800.0 mm
Scope Box	None
Section Box	☐

Properties help | Apply

Project Browser - Mannheim - Revit.rvt

- Views (tout)
  - Structural Plans (Plan structurel)
  - Floor Plans (Plan d'étage)
  - Ceiling Plans (Plan du plafond)
  - 3D Views (Vue 3D)
    - 3D Ortho - Coordination
    - 3D Ortho - START
    - 3D View 1
    - 3D View 2
    - 3D View 3
    - Inside
    - installation space
    - **installation space with building**
    - Layout
    - section view
    - {3D}
  - Elevations (Elévation)
  - Sections (Coupe du bâtiment)
- Legends
- Schedules/Quantities (tout)
  - Nomenclature des fenêtres
  - Nomenclature des pièces
  - Nomenclature des portes

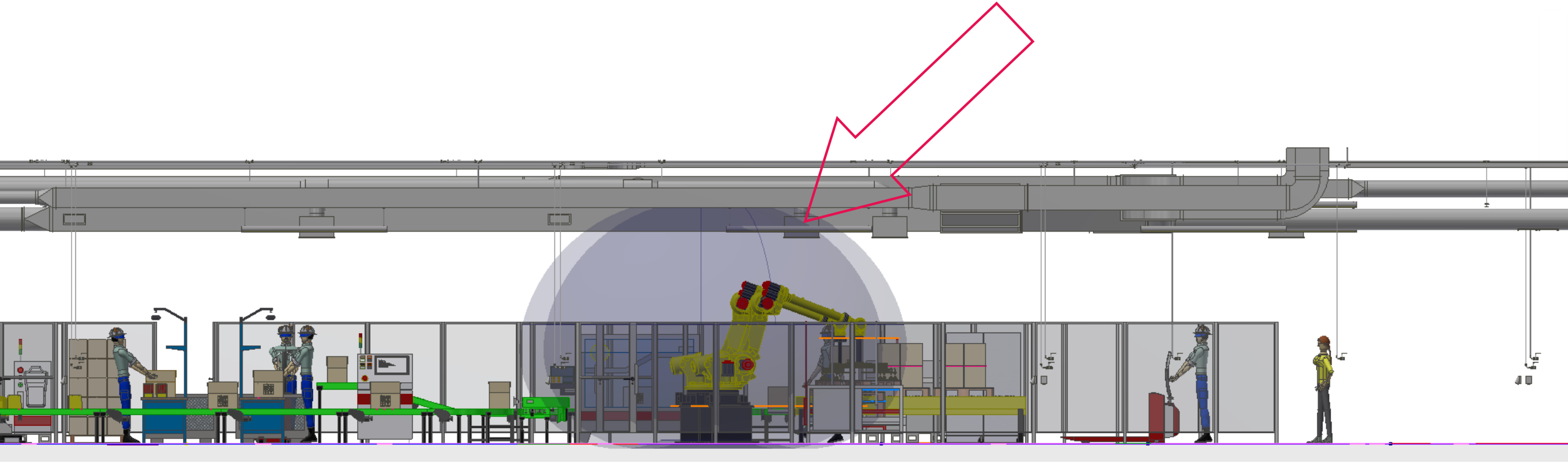
installation space with building | installation space

Perspective

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Main Model

building-integration - collision check



By integrating the Revit construction spaces, collisions with other trades can be detected at an early stage.

AUTODESK

ACC integration

ACC-integration

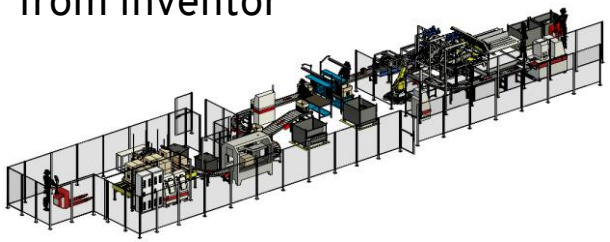
FDU with Inventor

managed in Vault

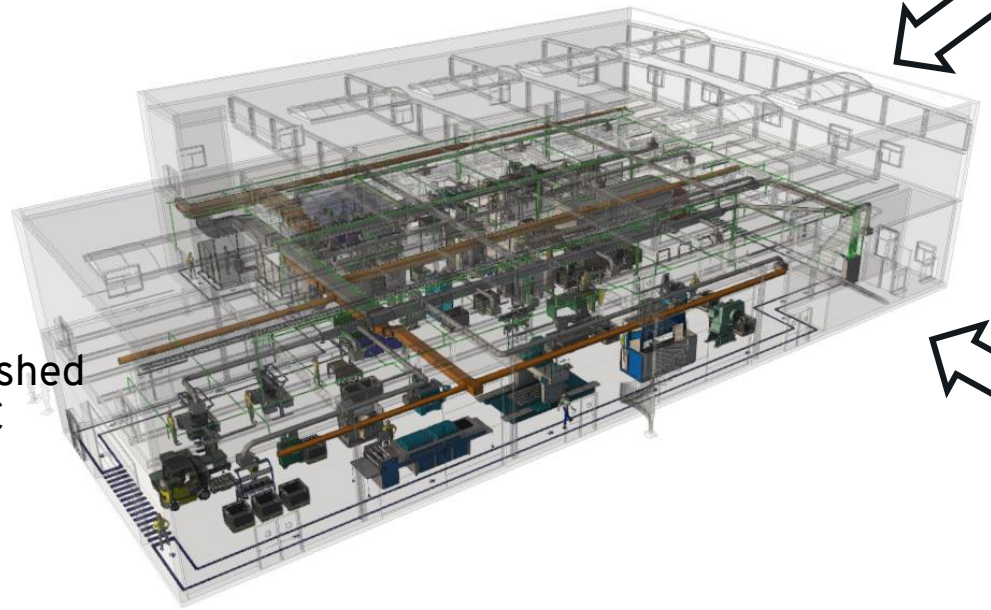
managed in Vault

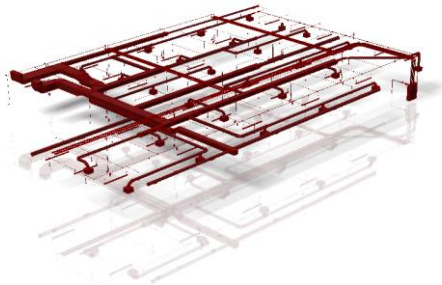
Revit published to ACC

Revit-Export from Inventor

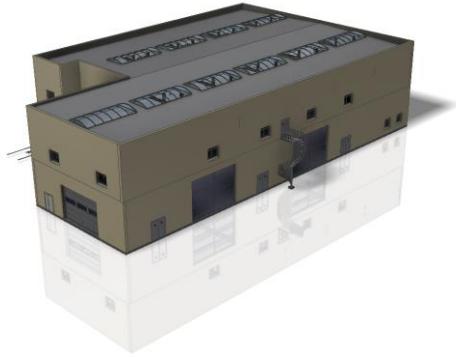


AUTODESK Construction Cloud



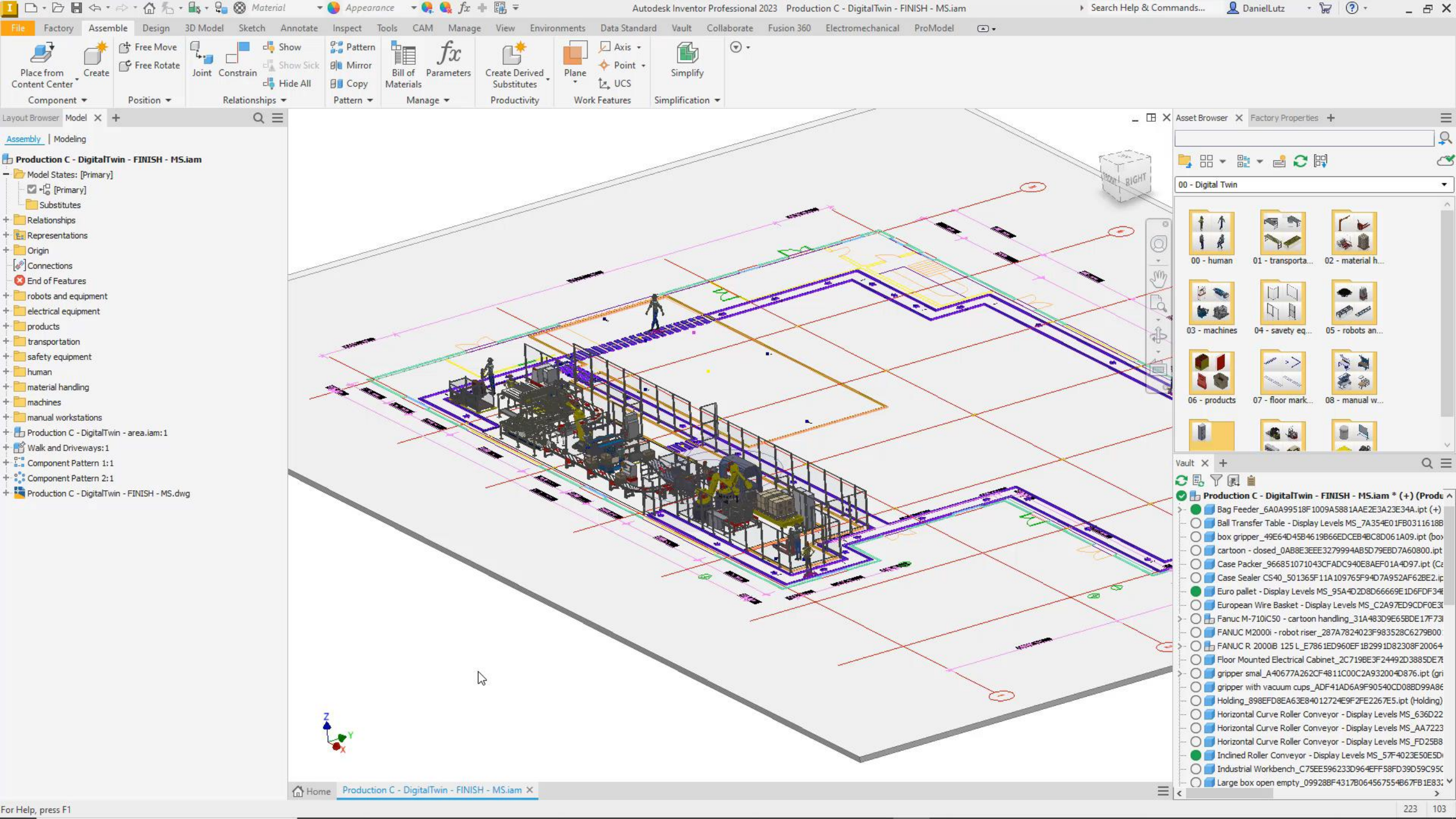


Revit



Revit data from Inventor allow a continuous workflow in ACC

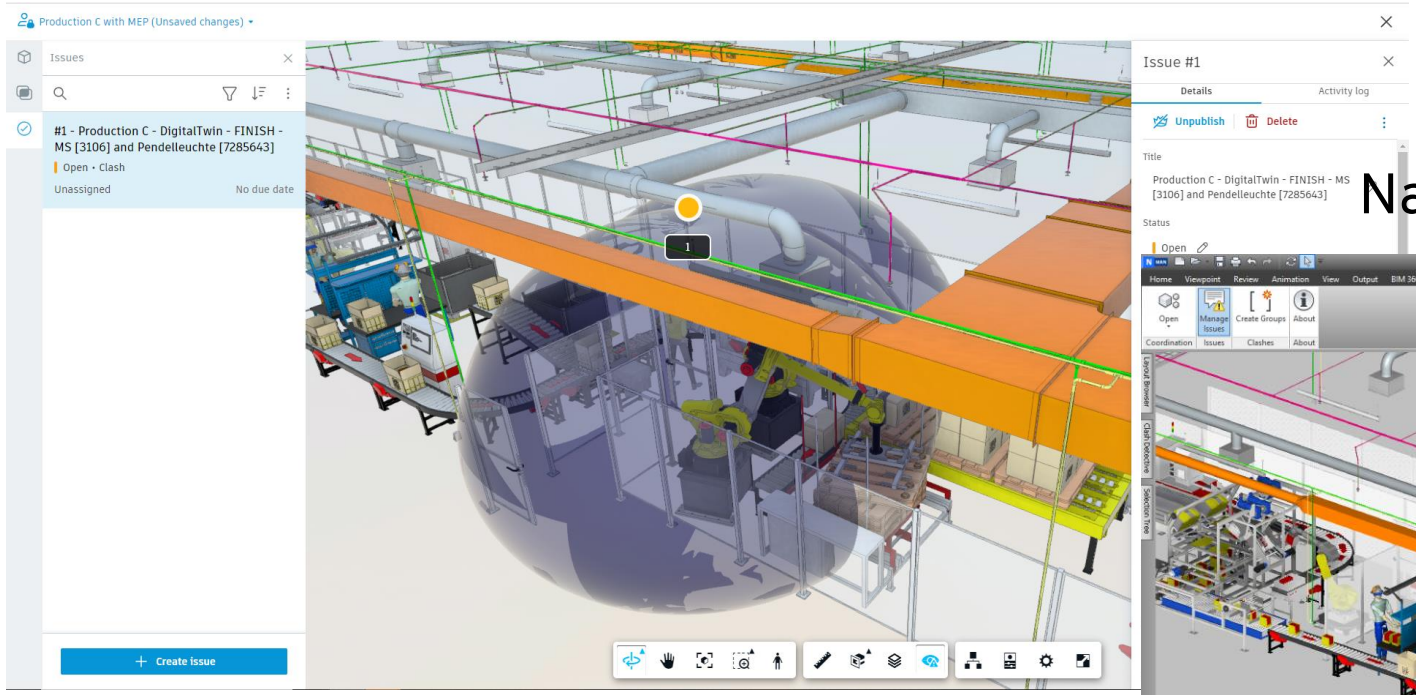
ACC-Integration


Autodesk Inventor Professional 2023 Production C - DigitalTwin - FINISH - MS.iam
File Factory Assemble Design 3D Model Sketch Annotate Inspect Tools CAM Manage View Environments Data Standard Vault Collaborate Fusion 360 Electromechanical ProModel
Place from Content Center Create Free Move Free Rotate Joint Constrain Show Show Sick Hide All Pattern Mirror Copy Bill of Materials Parameters Create Derived Substitutes Plane Axis Point UCS Simplify
Component Position Relationships Pattern Manage Productivity Work Features Simplification
Layout Browser Model
Assembly | Modeling
Production C - DigitalTwin - FINISH - MS.iam
Model States: [Primary]
[Primary]
Substitutes
Relationships
Representations
Origin
Connections
End of Features
robots and equipment
electrical equipment
products
transportation
safety equipment
human
material handling
machines
manual workstations
Production C - DigitalTwin - area.iam:1
Walk and Driveways:1
Component Pattern 1:1
Component Pattern 2:1
Production C - DigitalTwin - FINISH - MS.dwg
Asset Browser
Factory Properties
00 - Digital Twin
00 - human
01 - transporta...
02 - material h...
03 - machines
04 - savety eq...
05 - robots an...
06 - products
07 - floor mark...
08 - manual w...
Vault
Production C - DigitalTwin - FINISH - MS.iam * (+) (Produ
Bag Feeder_6A0A99518F1009A5881AAE2E3A23E34A.ipt (+)
Ball Transfer Table - Display Levels MS_7A354E01FB0311618B
box gripper_49E64D45B4619B66EDCEB4BC8D061A09.ipt (box
cartoon - closed_0AB8E3EEE3279994AB5D79EBD7A60800.ipt
Case Packer_966851071043CFADC940E8AEF01A4D97.ipt (Ca
Case Sealer CS40_501365F11A109765F94D7A952AF62BE2.ip
Euro pallet - Display Levels MS_95A4D2D8D66669E1D6FDF34
European Wire Basket - Display Levels MS_C2A97ED9CDF0E3
Fanuc M-710iC50 - cartoon handling_31A483D9E65BDE17F73
FANUC M2000i - robot riser_287A7824023F983528C6279B00
FANUC R 2000iB 125 L_E7861ED960EF1B2991D82308F20064
Floor Mounted Electrical Cabinet_2C719BE3F24492D3885DE7
gripper smal_A40677A262CF4811C00C2A932004D876.ipt (gri
gripper with vacuum cups_ADF41AD6A9F90540CD08BD99A8
Holding_898EFD8EA63E84012724E9F2FE2267E5.ipt (Holding)
Horizontal Curve Roller Conveyor - Display Levels MS_636D22
Horizontal Curve Roller Conveyor - Display Levels MS_AA7223
Horizontal Curve Roller Conveyor - Display Levels MS_FD25B8
Inclined Roller Conveyor - Display Levels MS_57F4023E50E5D
Industrial Workbench_C75EE596233D964EFF58FD39D59C95C
Large box open empty_09928BF4317B064567554B67FB1E83
Home
Production C - DigitalTwin - FINISH - MS.iam
For Help, press F1
223
103

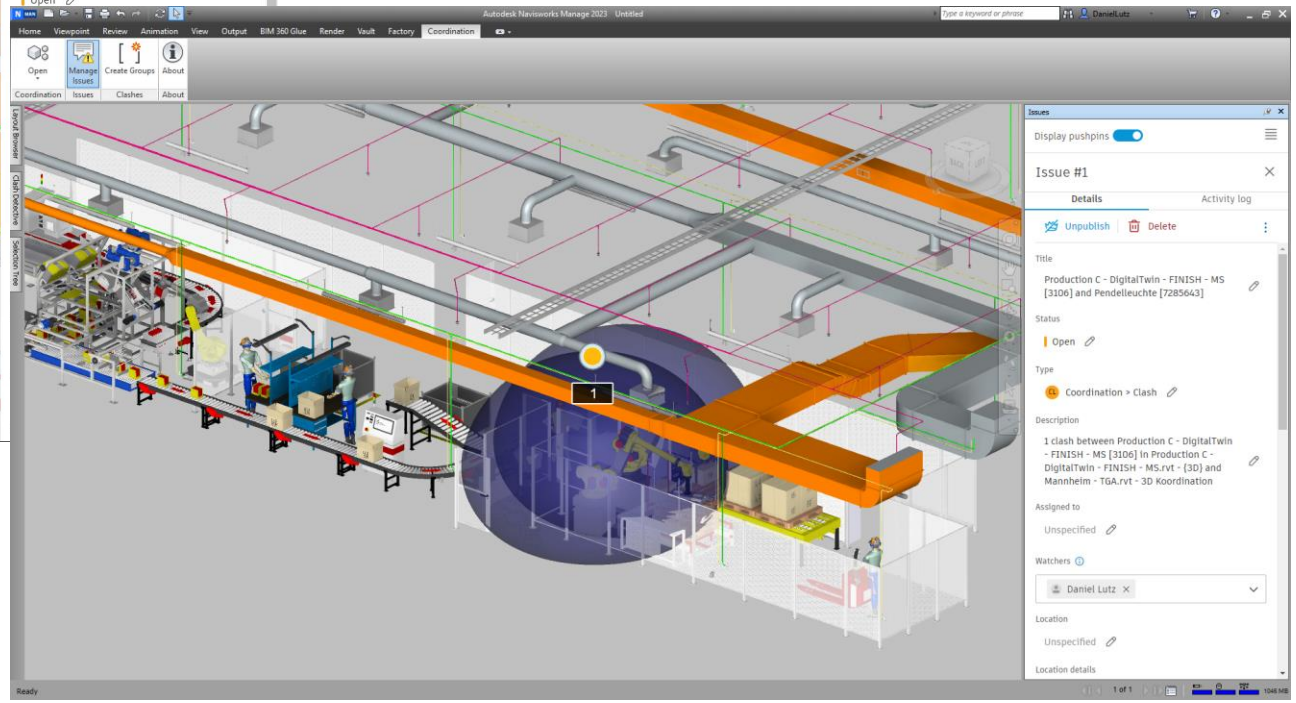
ACC-Integration

Model coordination in the cloud or local

ACC – Model Coordination



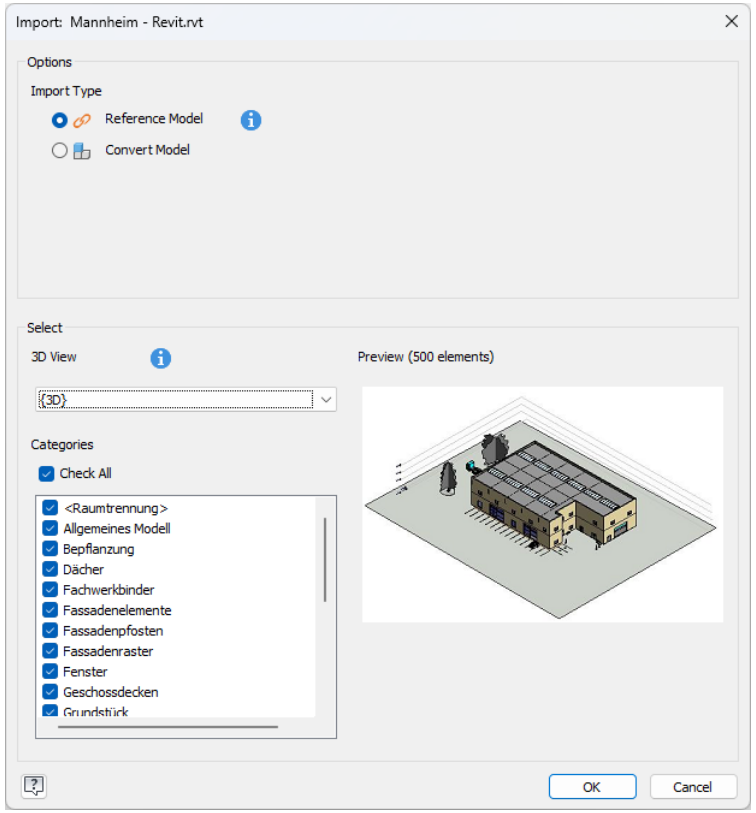
Navisworks – Model Coordination

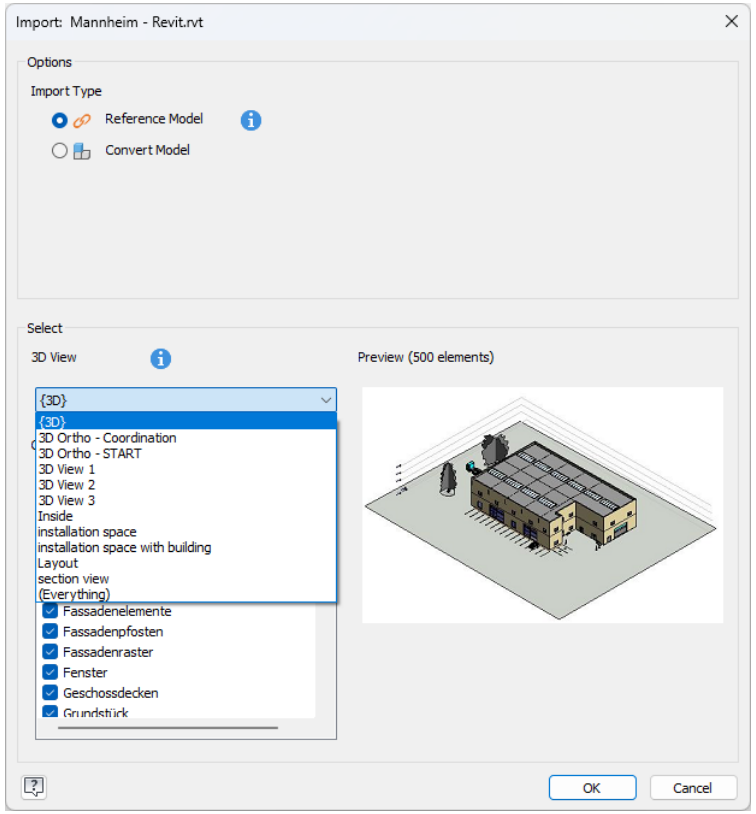


Local access to models and views from Model Coordination

data exchange

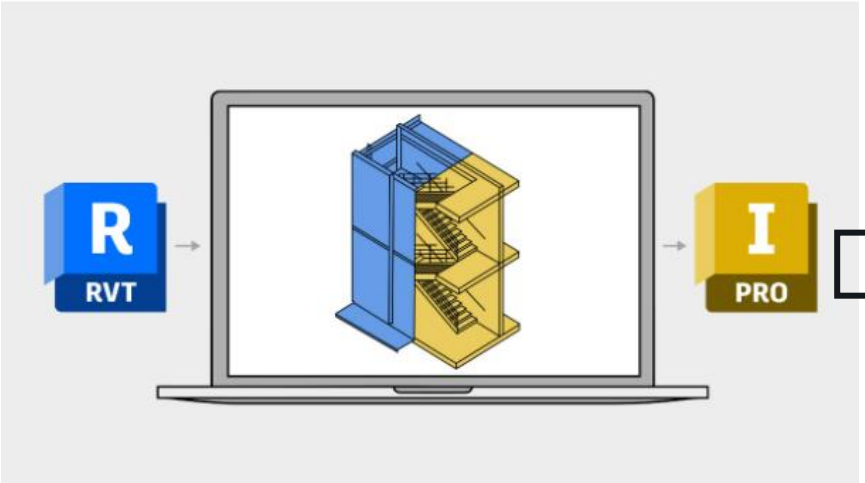
data exchange



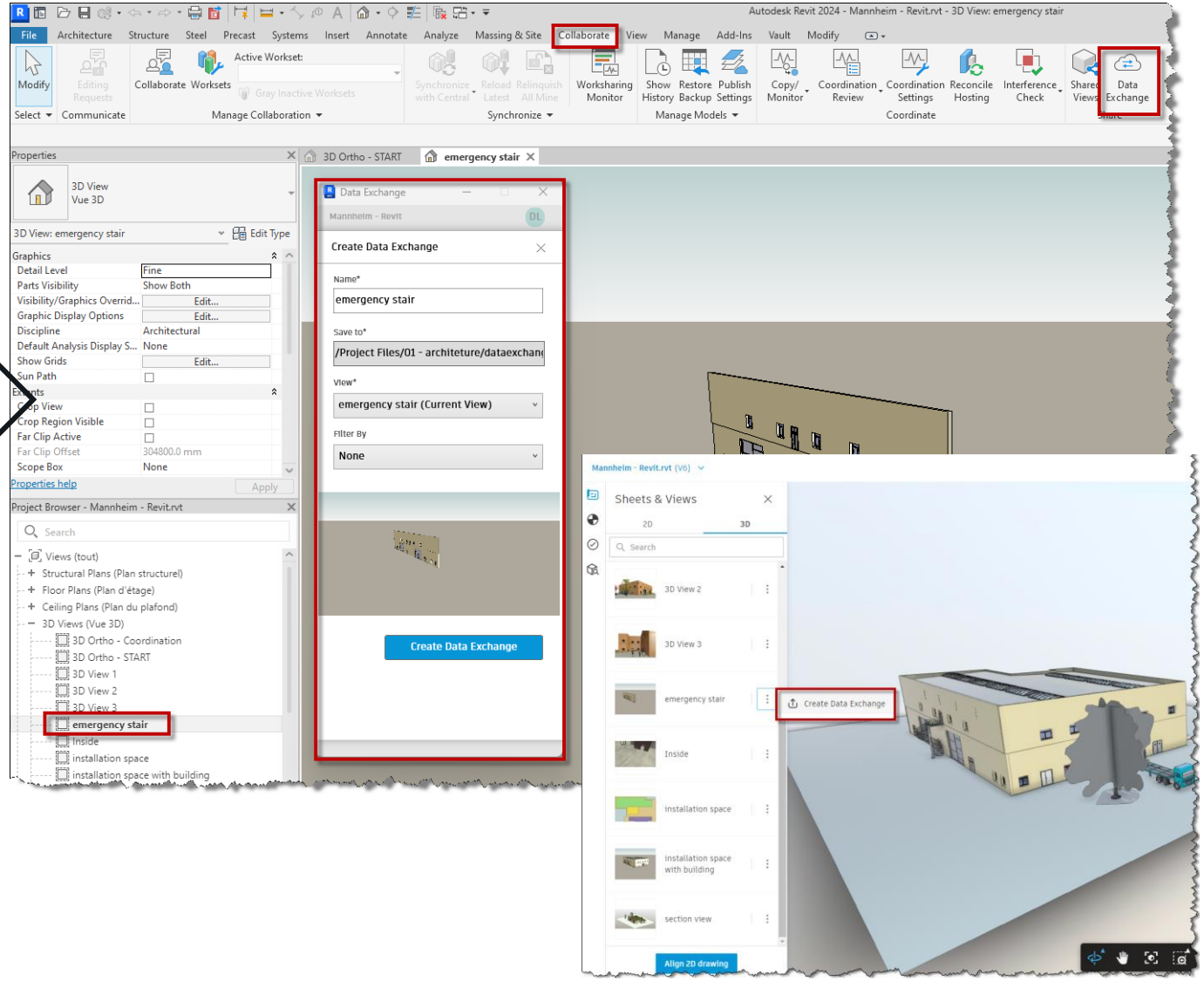


AnyCAD for Revit in Inventor
Possibility of data exchange since Inventor 2021

data exchange

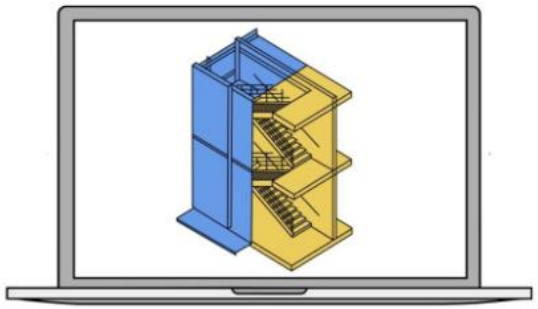


Data exchange
with “Data Exchange” from Revit

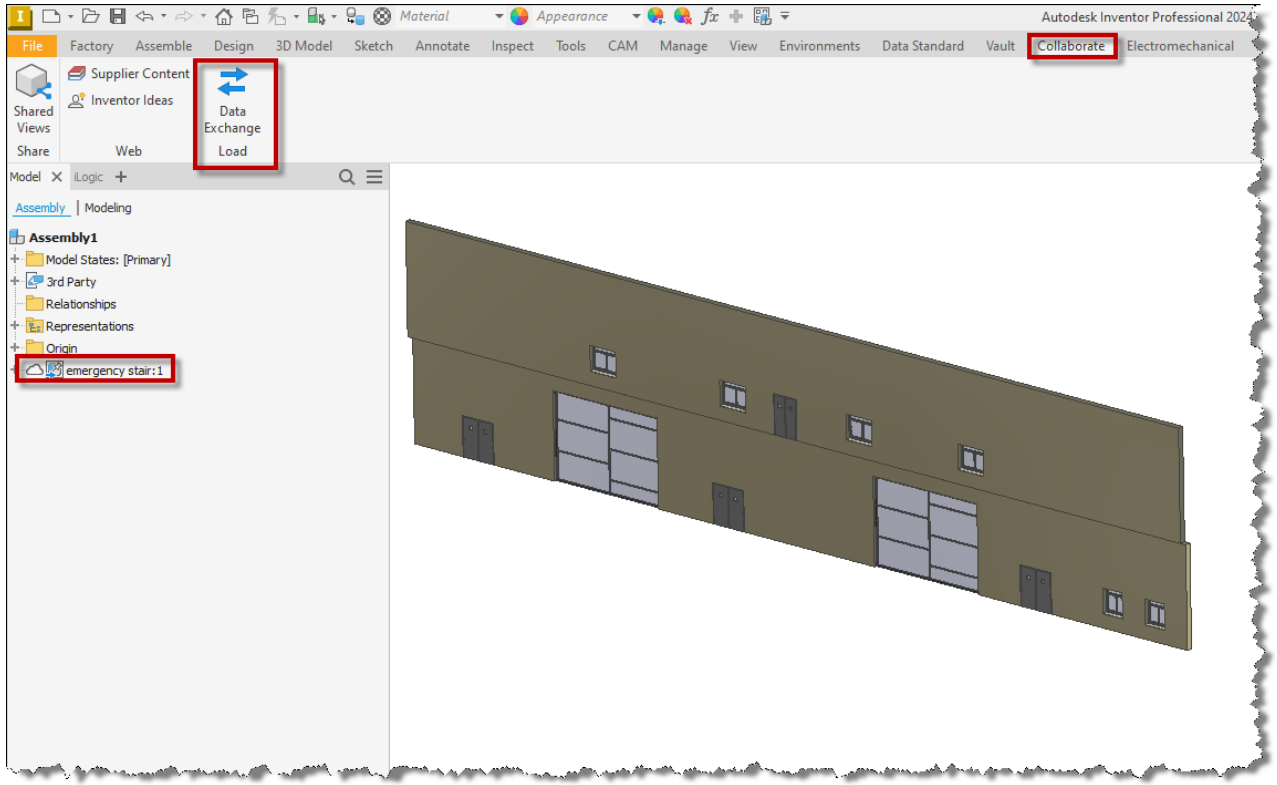


data exchange

Inventor 2023
Data Exchange Connector



Data Exchange
in Inventor



Modify | Editing Requests | Collaborate | Worksets | Active Workset: | Gray Inactive Worksets | Synchronize with Central | Reload Latest | Relinquish All Mine | Worksharing Monitor | Show History | Restore Backup | Publish Settings | Copy/ Monitor | Coordination Review | Coordination Settings | Reconcile Hosting | Interference Check | Shared Views | Data Exchange

Select | Communicate | Manage Collaboration | Synchronize | Manage Models | Coordinate | Share

Properties

3D View
Vue 3D

3D View: 3D Ortho - START | Edit Type

Graphics	
Detail Level	Fine
Parts Visibility	Show Both
Visibility/Graphics Overrid...	Edit...
Graphic Display Options	Edit...
Discipline	Architectural
Default Analysis Display S...	None
Show Grids	Edit...
Sun Path	☐
Extents	
Crop View	☐
Crop Region Visible	☐
Far Clip Active	☐
Far Clip Offset	304800.0 mm
Scope Box	None
Section Box	☐

Properties help | Apply

Project Browser - Mannheim - Revit.rvt

Search

- Views (tout)
  - Structural Plans (Plan structurel)
  - Floor Plans (Plan d'étage)
  - Ceiling Plans (Plan du plafond)
  - 3D Views (Vue 3D)
    - 3D Ortho - Coordination
    - **3D Ortho - START**
    - 3D View 1
    - 3D View 2
    - 3D View 3
    - emergency stair
    - Inside
    - installation space
    - installation space with building
    - Layout
    - section view
    - {3D}
  - Elevations (Elévation)
  - Sections (Coupe du bâtiment)

3D Ortho - START | emergency stair

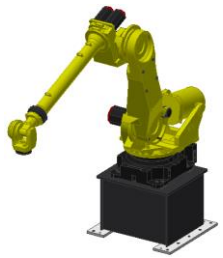
Perspective

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

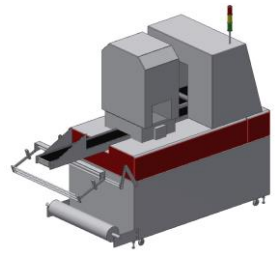
Main Model

Supplier-integration

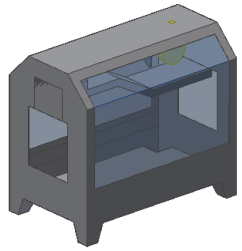
Supplier- integration



Lieferant 1



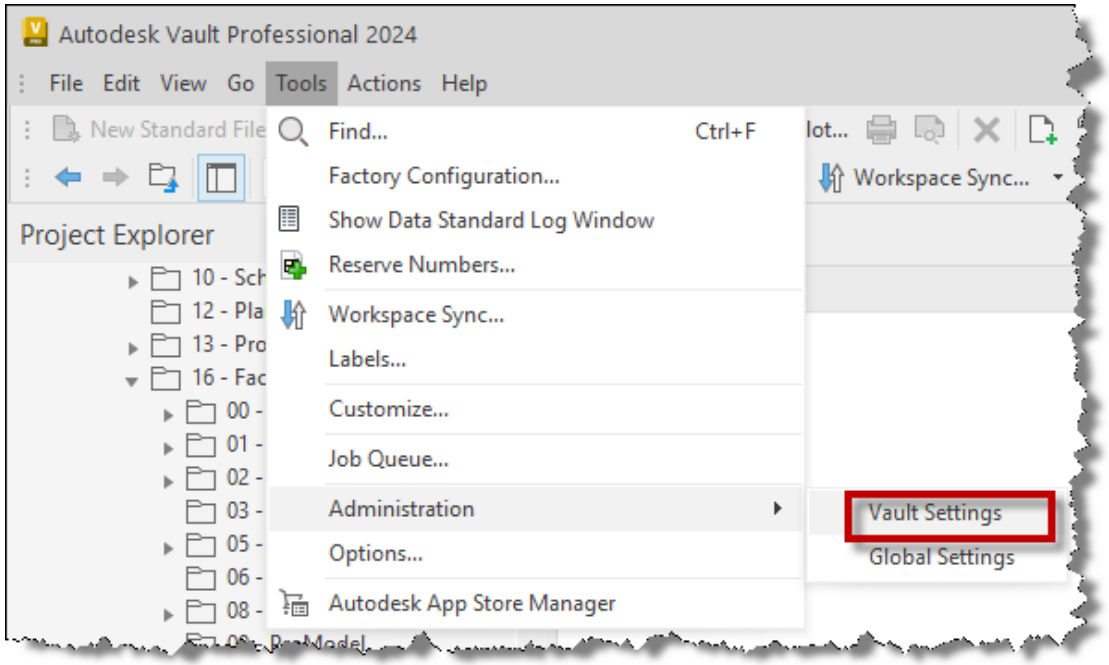
Lieferant 2

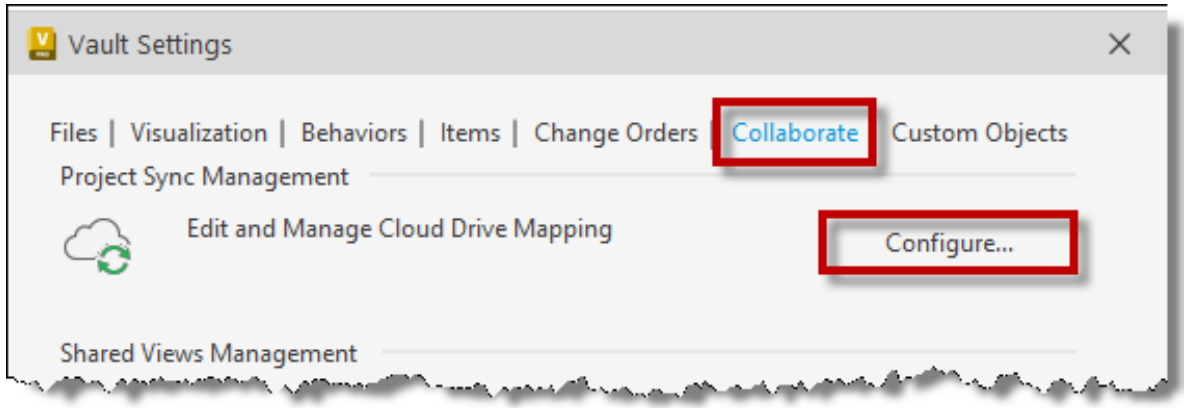


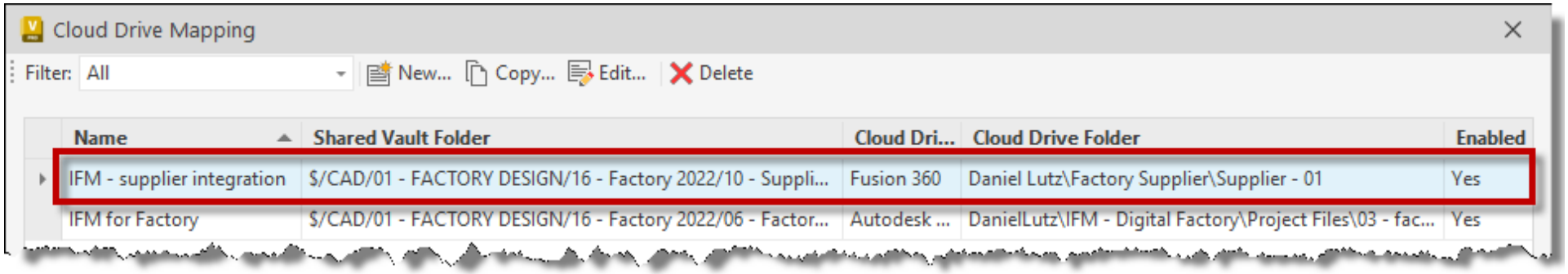
Lieferant 3

with Fusion Team and Vault project synchronization, suppliers can be integrated into the planning process

Definition of the project sync in the Vault-settings



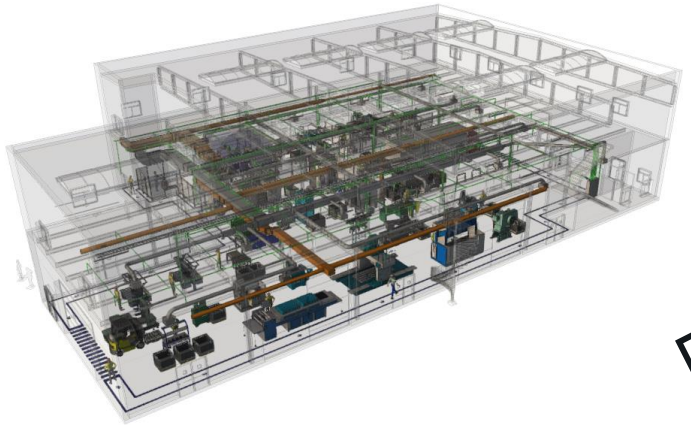




operation

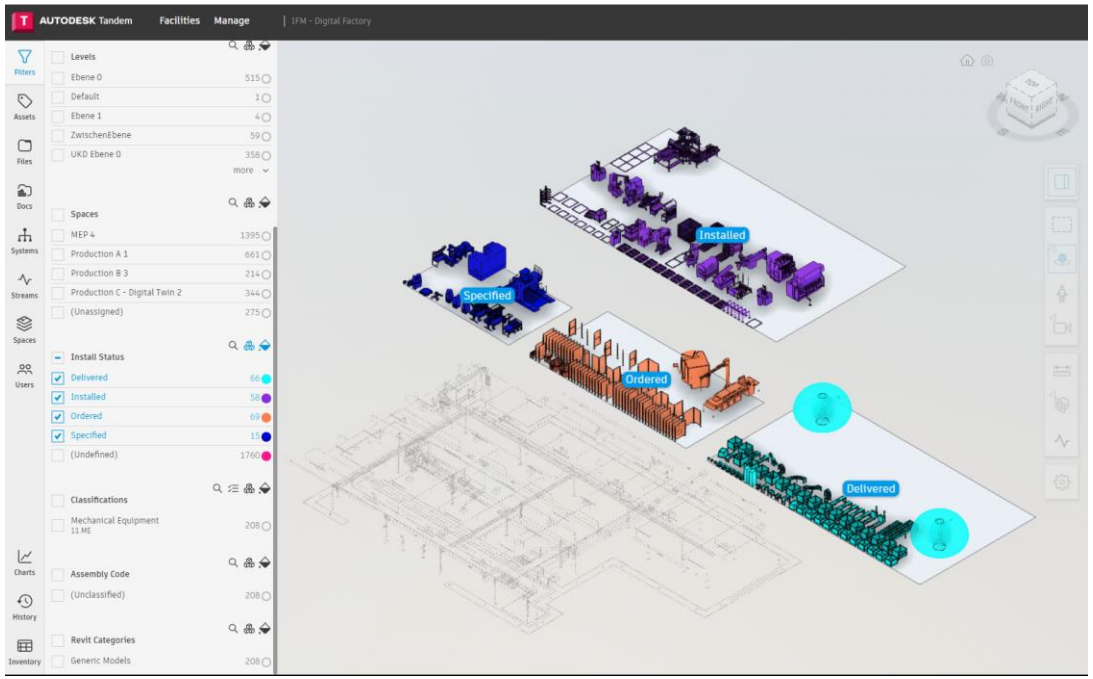
operation

AUTODESK Construction Cloud



Revit IFC

AUTODESK Tandem



Autodesk Tandem is a post-commissioning digital twin solution to monitor factory

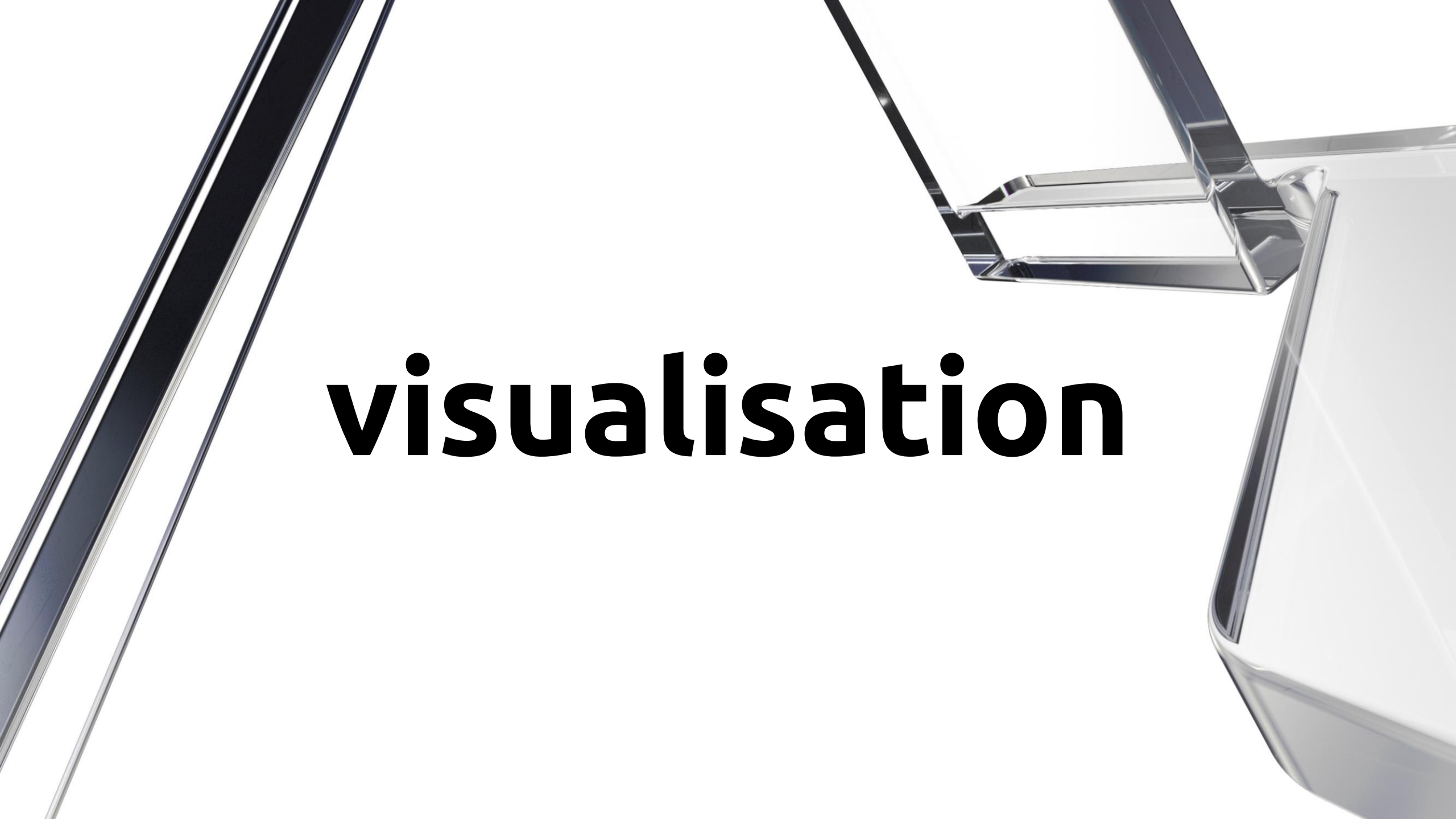
Autodesk Tandem

tandem.autodesk.com/pages/facilities/urn:adsk.dtt:bwEXMw77SKuGuQo7gwNGOg

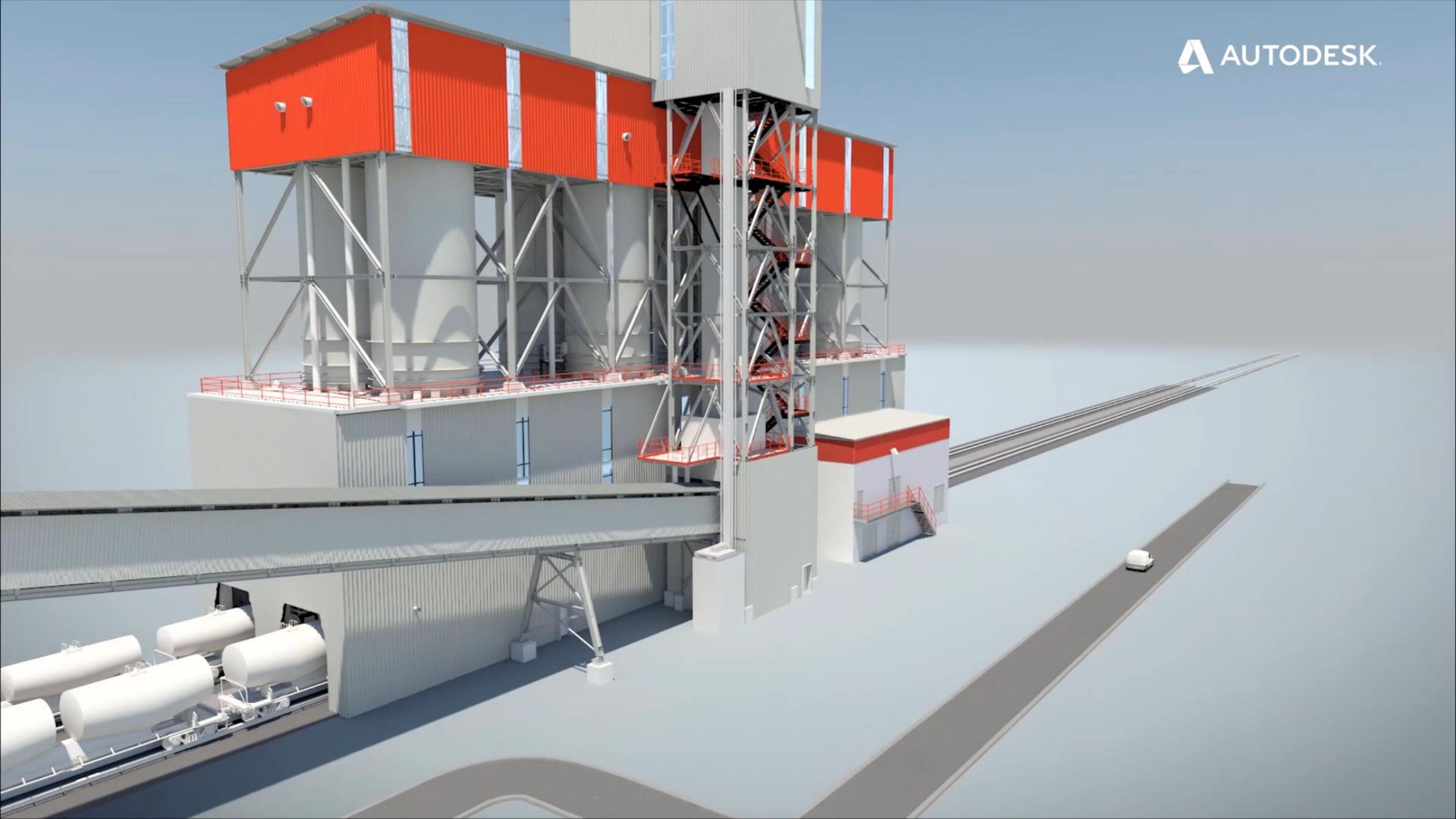
01 - INTERN | 02 - AUTODESK | 03 - PRIVAT | 05 - SONSTIGES | YouTube | Upchain | Autodesk BIM 360... | Integrated Factory... | YouTube | Maps

AUTODESK Tandem | Facilities | Manage | IFM - Digital Factory | Daniel Lutz's Account

Filters
Assets
Files
Docs
Systems
Streams
Spaces
Users
Charts
History
Inventory



visualisation


AUTODESK.

Cloud rendering mit Navisworks

Inventor Professional

Revit

Navisworks Manage

AUTODESK Rendering

AUTODESK

Rendering – AR – VR mit VRED

Inventor Professional

Revit

Navisworks Manage

fbx

dwfx

VRED

AUTODESK

IrisVR / The Wild

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