打破行业壁垒，连通数据孤岛

--Autodesk集成式工厂建模助力企业加速实现数字化转型

杨 博
欧特克软件（中国）有限公司 制造业市场战略总监

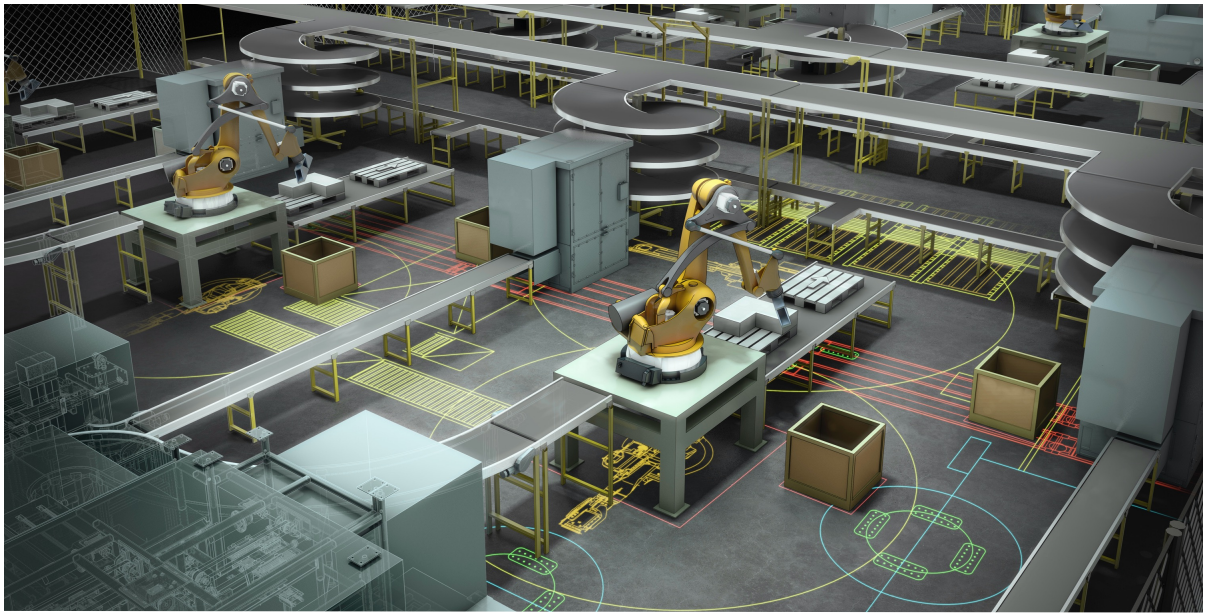


Image courtesy of the Dubai Futures Foundation


Image courtesy of Parsons Brinckerhoff.


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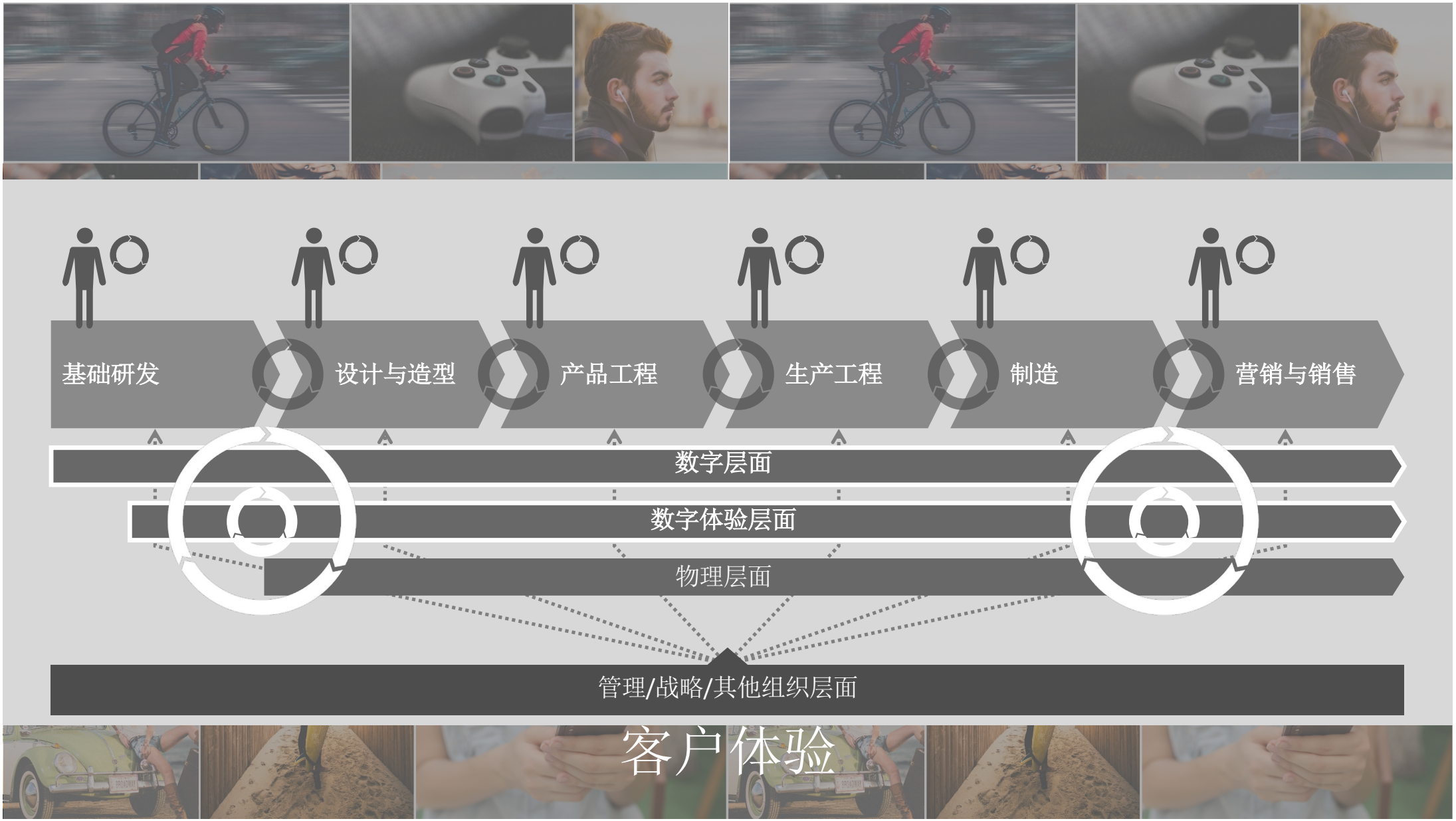
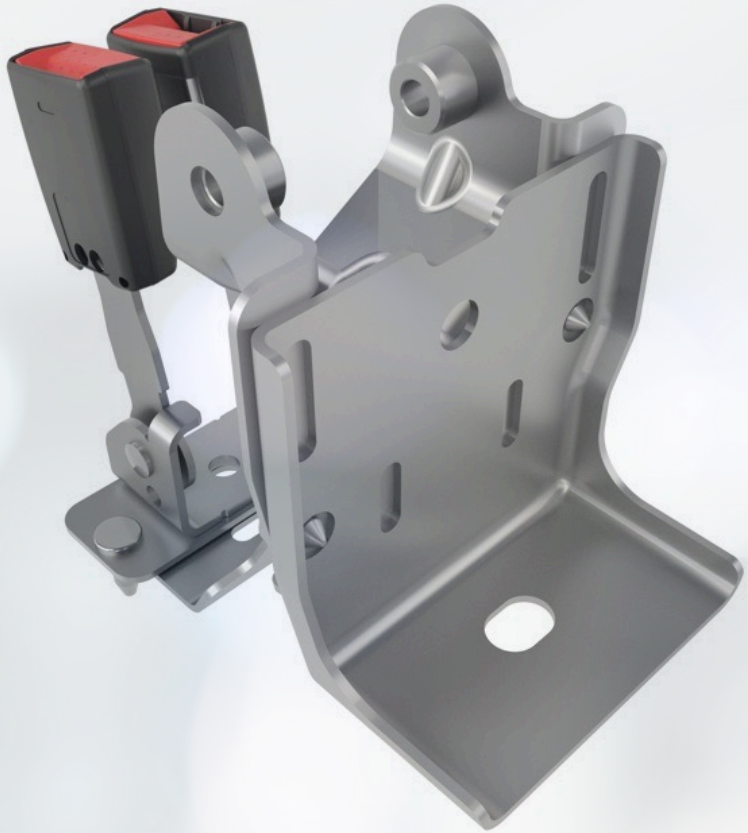
以产品为核心

以体验为核心


基础研发
设计与造型
产品工程
生产工程
制造
营销与销售
数字层面
数字体验层面
物理层面
管理/战略/其他组织层面
客户体验

变化
创造
机会



GENERAL MOTORS

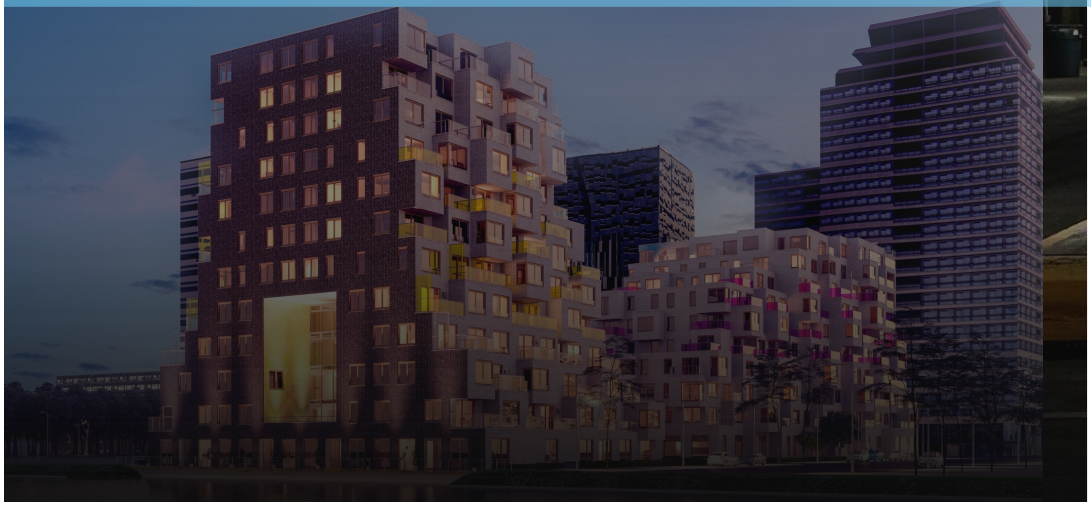
商业影响

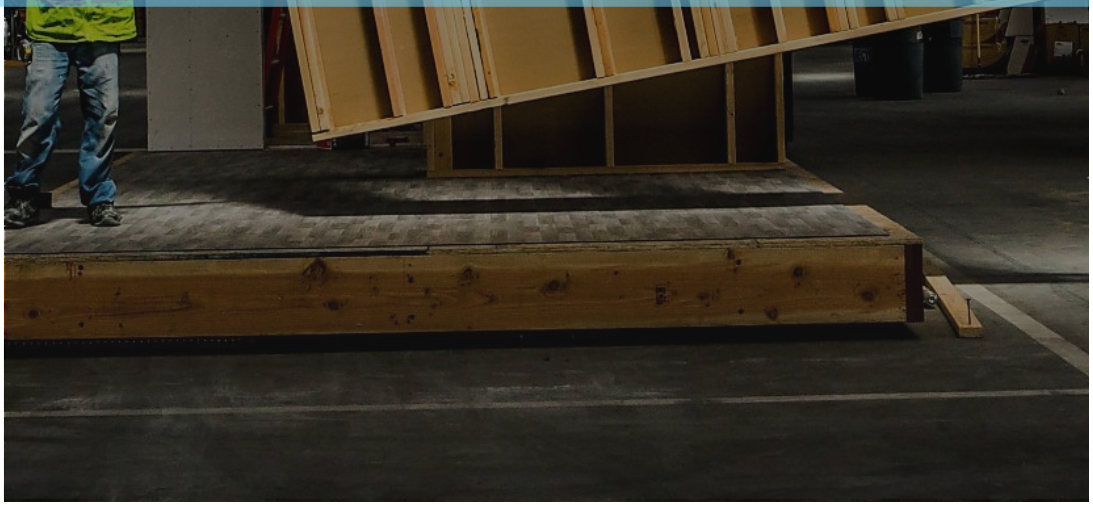
- 节省成本
- 减少装配时间
- 简化供应链
- 提高质量控制
- 提高性能

我们的PIXBOT是全球首

AUTODESK

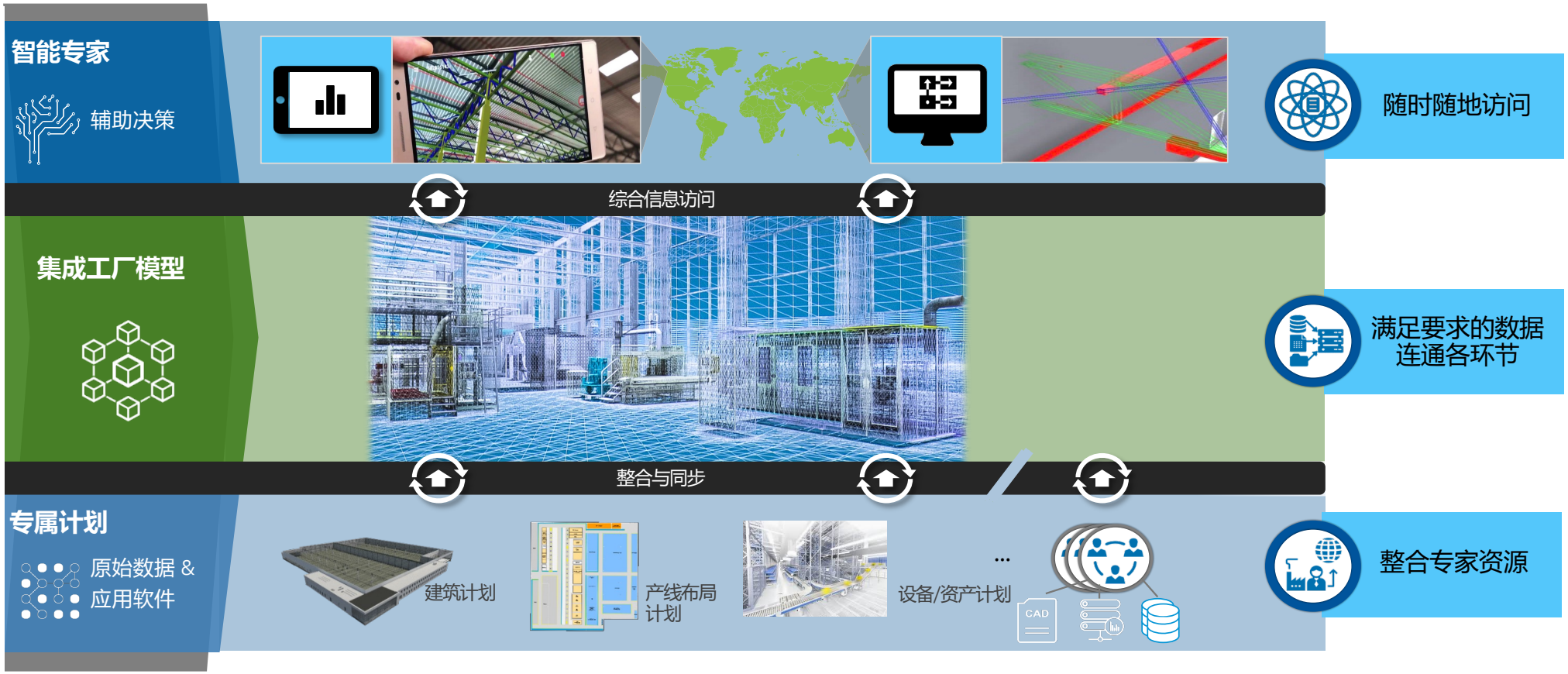
制造+建筑=集成式工厂建模






AUTODESK

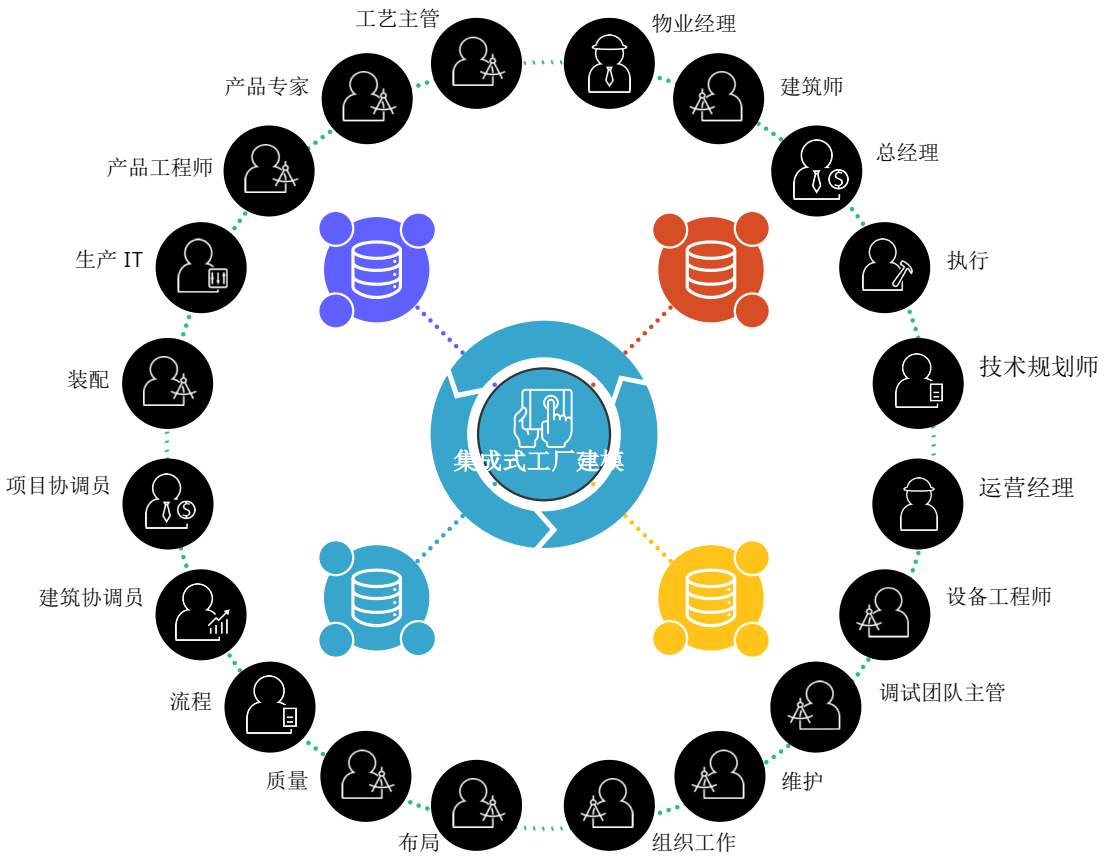
集成式工厂建模


智能专家
辅助决策
综合信息访问
集成工厂模型
整合与同步
专属计划
原始数据 &
应用软件
建筑计划
产线布局
计划
设备/资产计划
...
CAD
随时随地访问
满足要求的数据
连通各环节
整合专家资源

集成式工厂建模集成并协调所有利益相关方及其工具

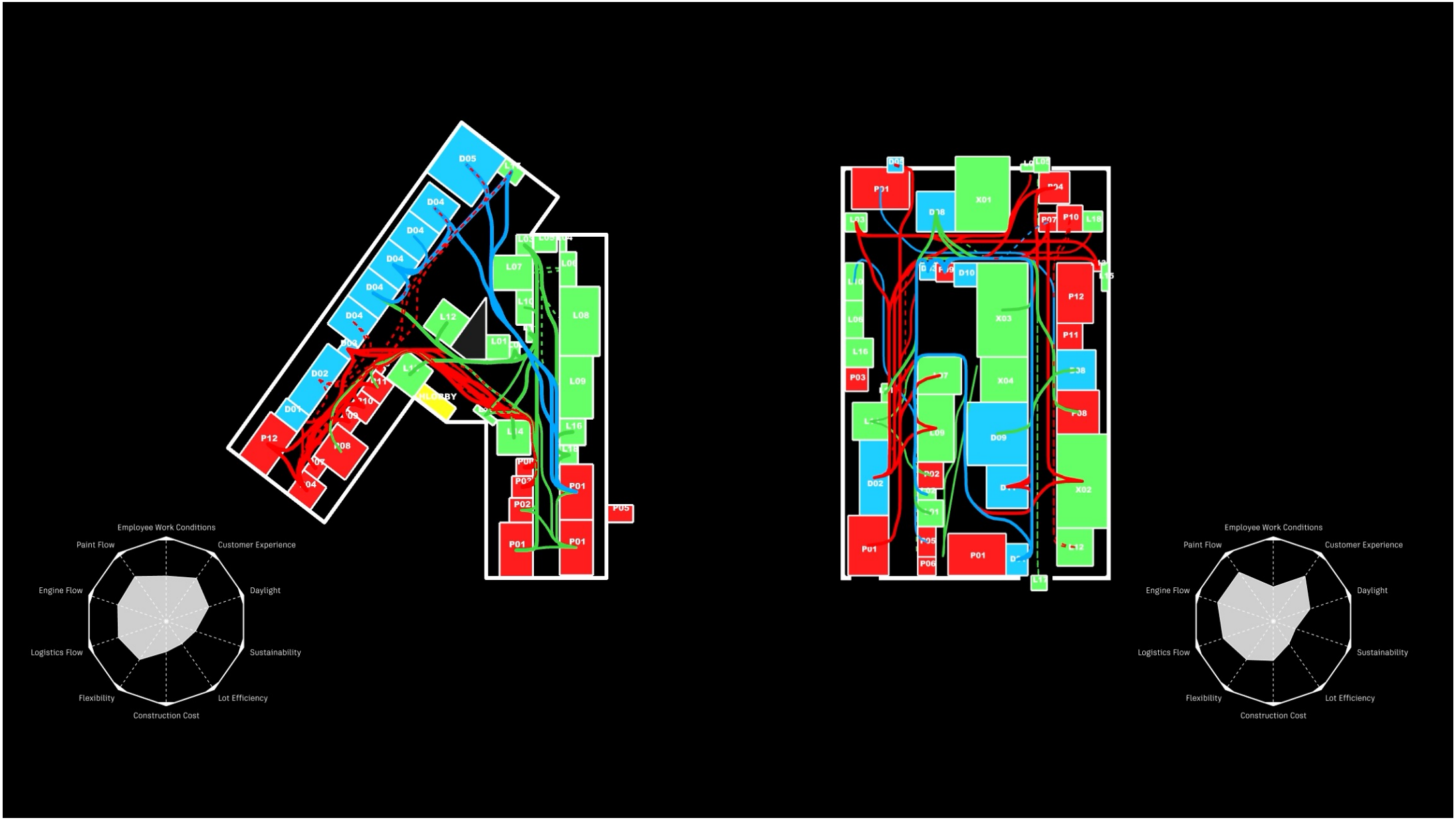
产品工程

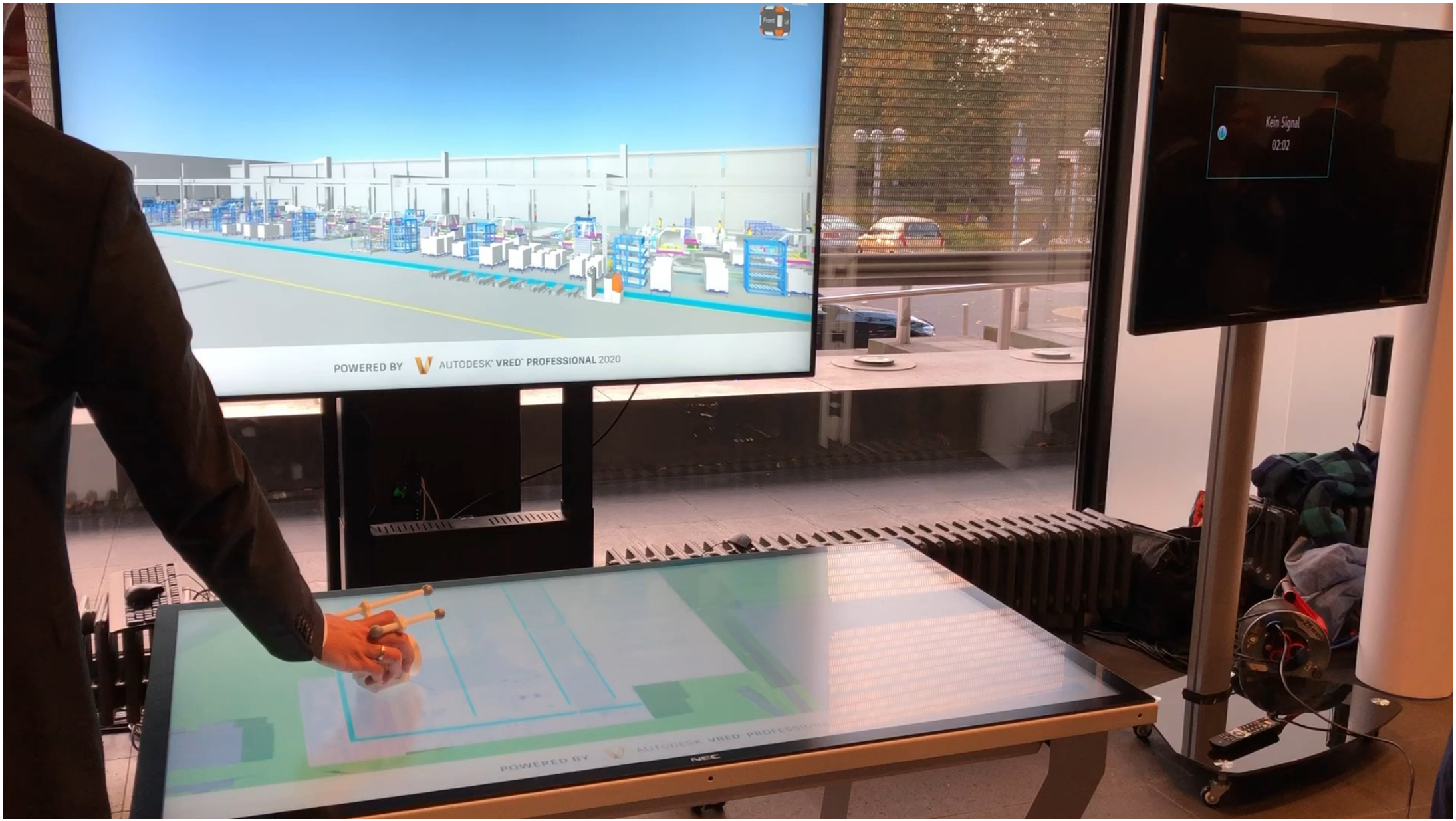
项目团队

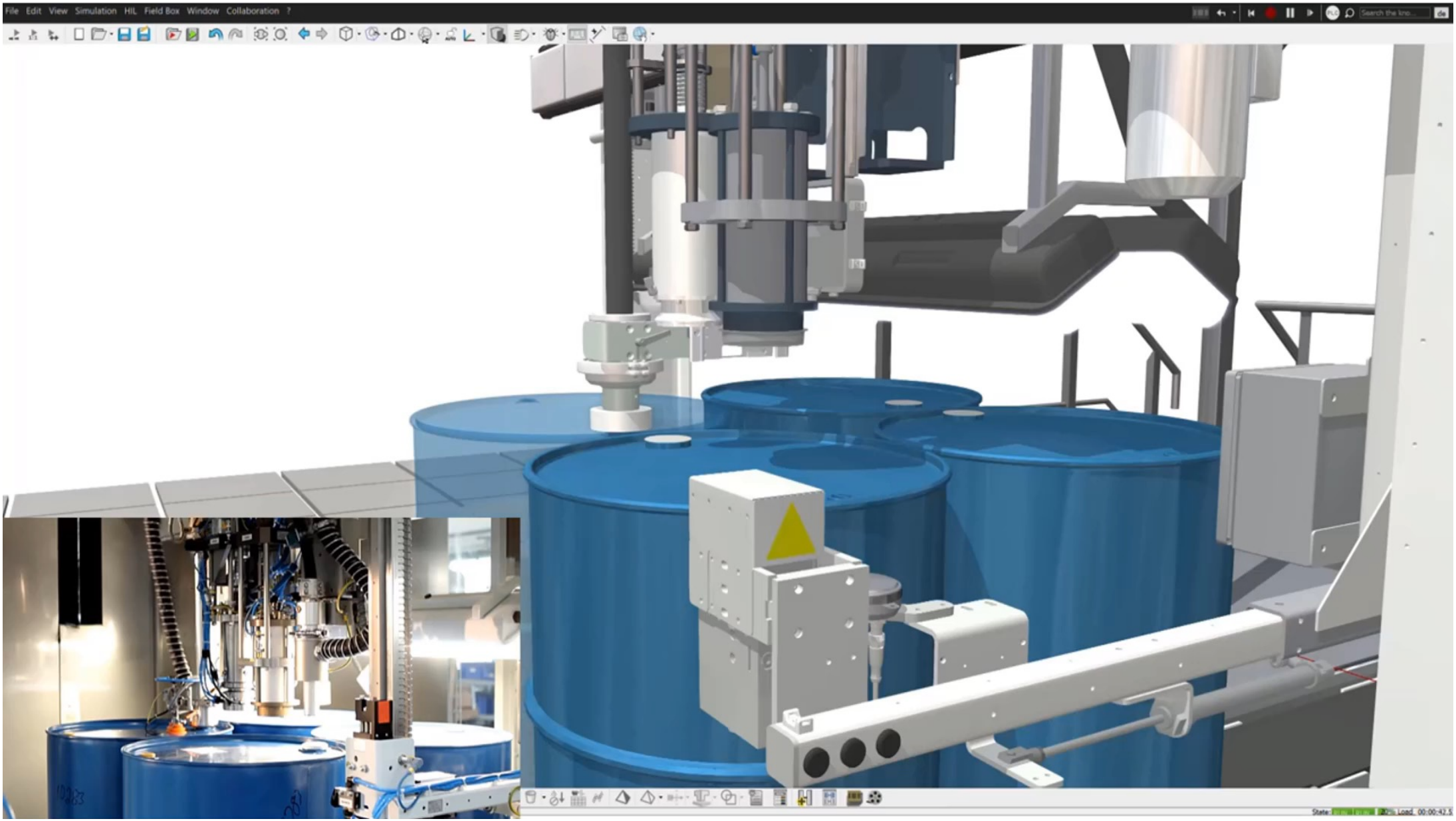


外部建筑团队

设备供应商


D05
D04
D04
D04
D04
D04
D04
D02
D01
P12
P08
L12
L01
L07
L08
L09
L16
L14
P01
P02
P03
P05
Employee Work Conditions
Customer Experience
Daylight
Sustainability
Lot Efficiency
Construction Cost
Flexibility
Logistics Flow
Engine Flow
Paint Flow
P01
X01
D18
P10
P12
P11
X03
X04
D10
D09
D02
X02
P02
P06
Employee Work Conditions
Customer Experience
Daylight
Sustainability
Lot Efficiency
Construction Cost
Flexibility
Logistics Flow
Engine Flow
Paint Flow


POWERED BY AUTODESK VRED PROFESSIONAL 2020
Kein Signal
02:02
POWERED BY
NEC


File Edit View Simulation HIL Field Box Window Collaboration ?

总览-集成式工厂建模

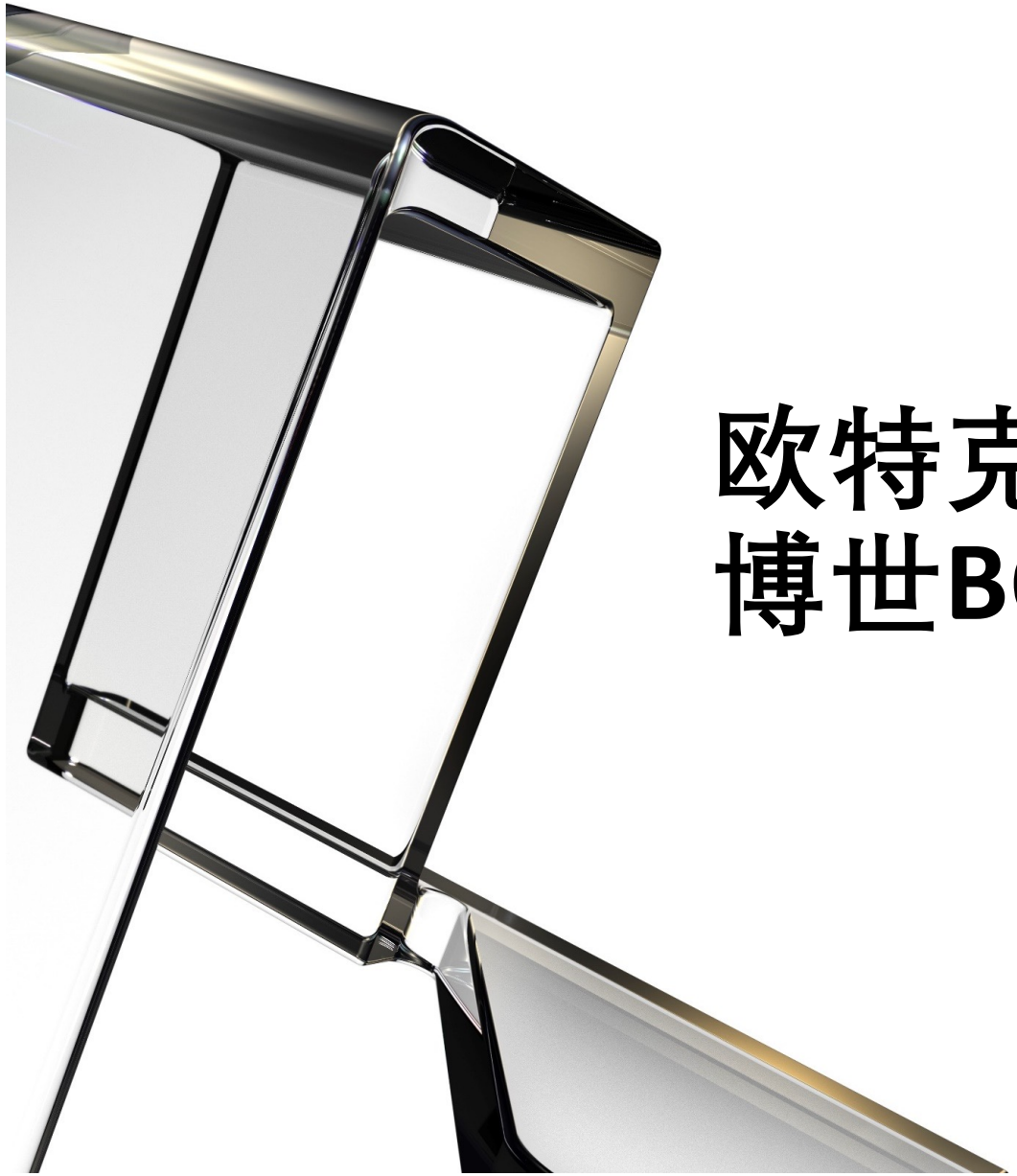
满足工厂全生命周期各个阶段要求的统一的模型

基础设施

建筑

MEP

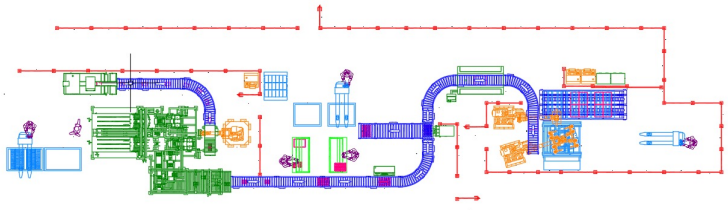
产线/流程

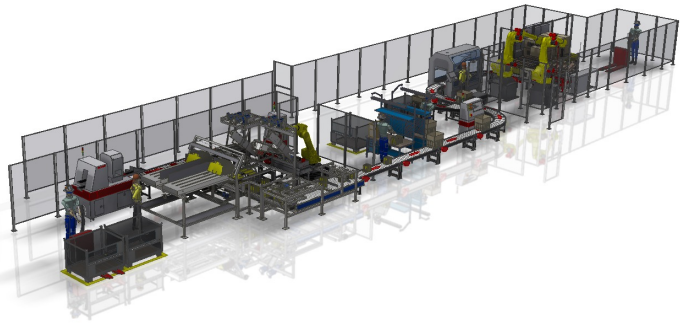


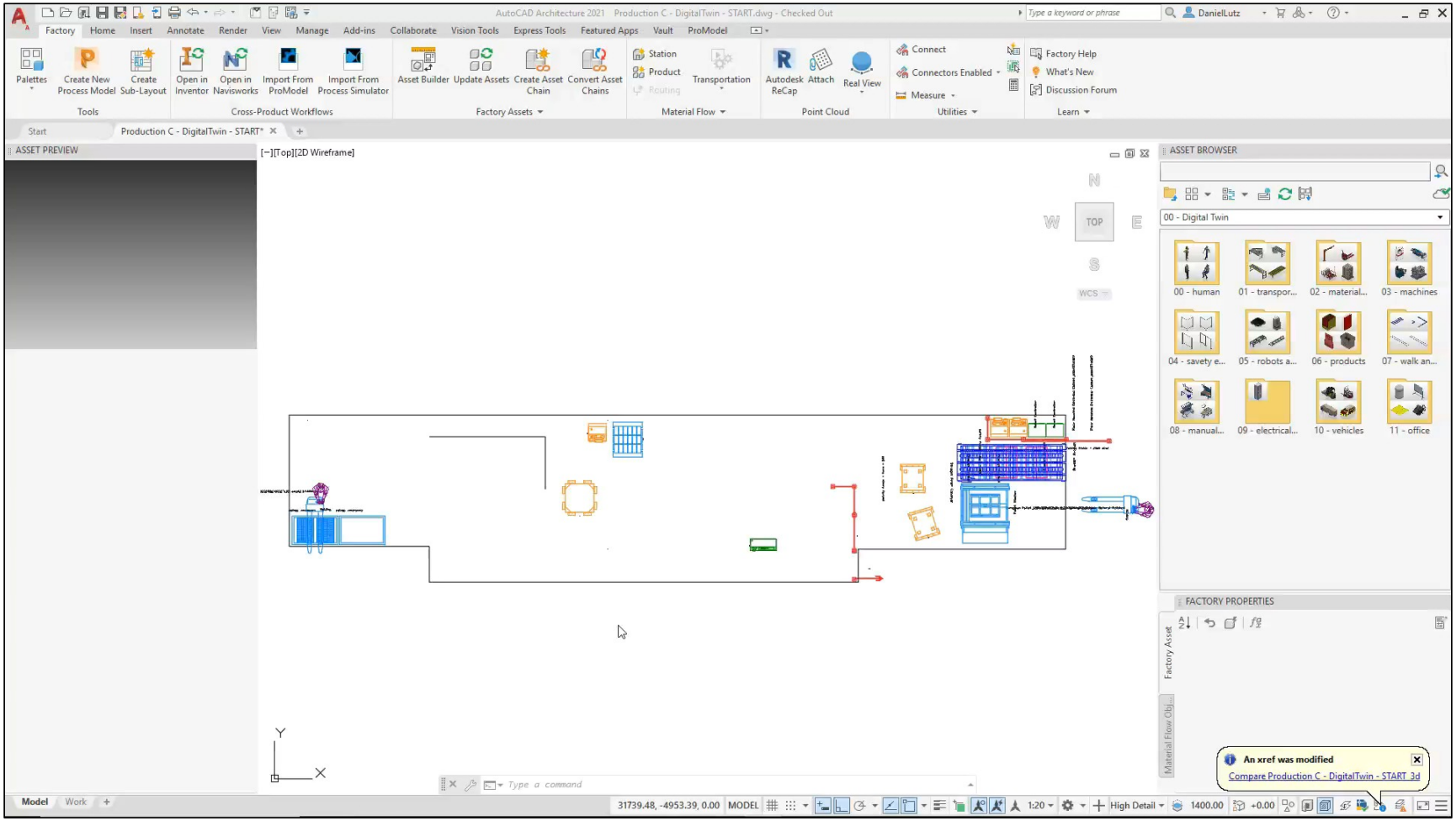
欧特克集成式工厂建模在博世BOSCH工厂中的应用

随着技术的迭代，工厂项目越来越复杂，设备多，摆放密，单纯用AUTOCAD在二维环境中进行工艺、物流设备摆放，由于缺少Z轴信息，很容易在现场安装时出现干涉等问题，那么为什么很多工程师还在坚持.....

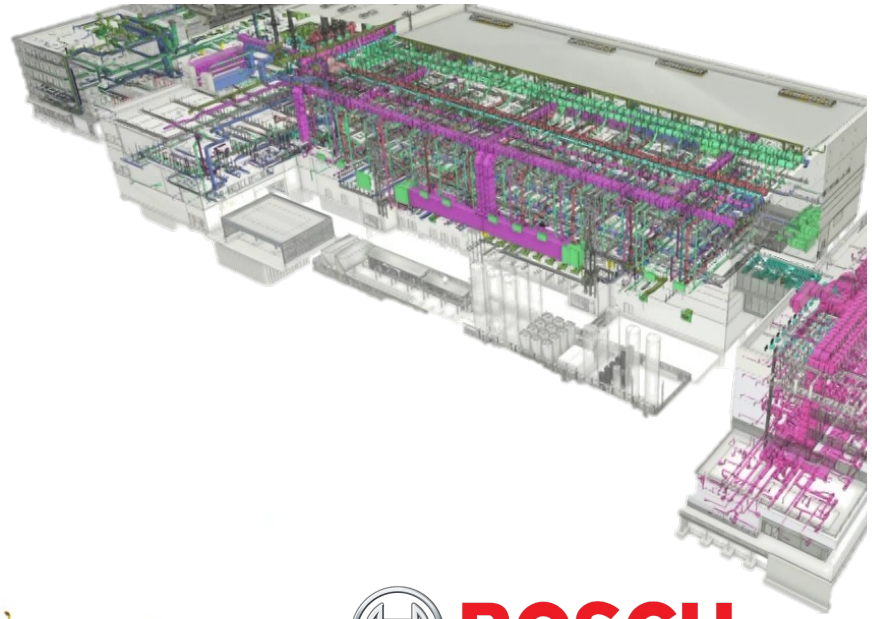
用二维不用三维

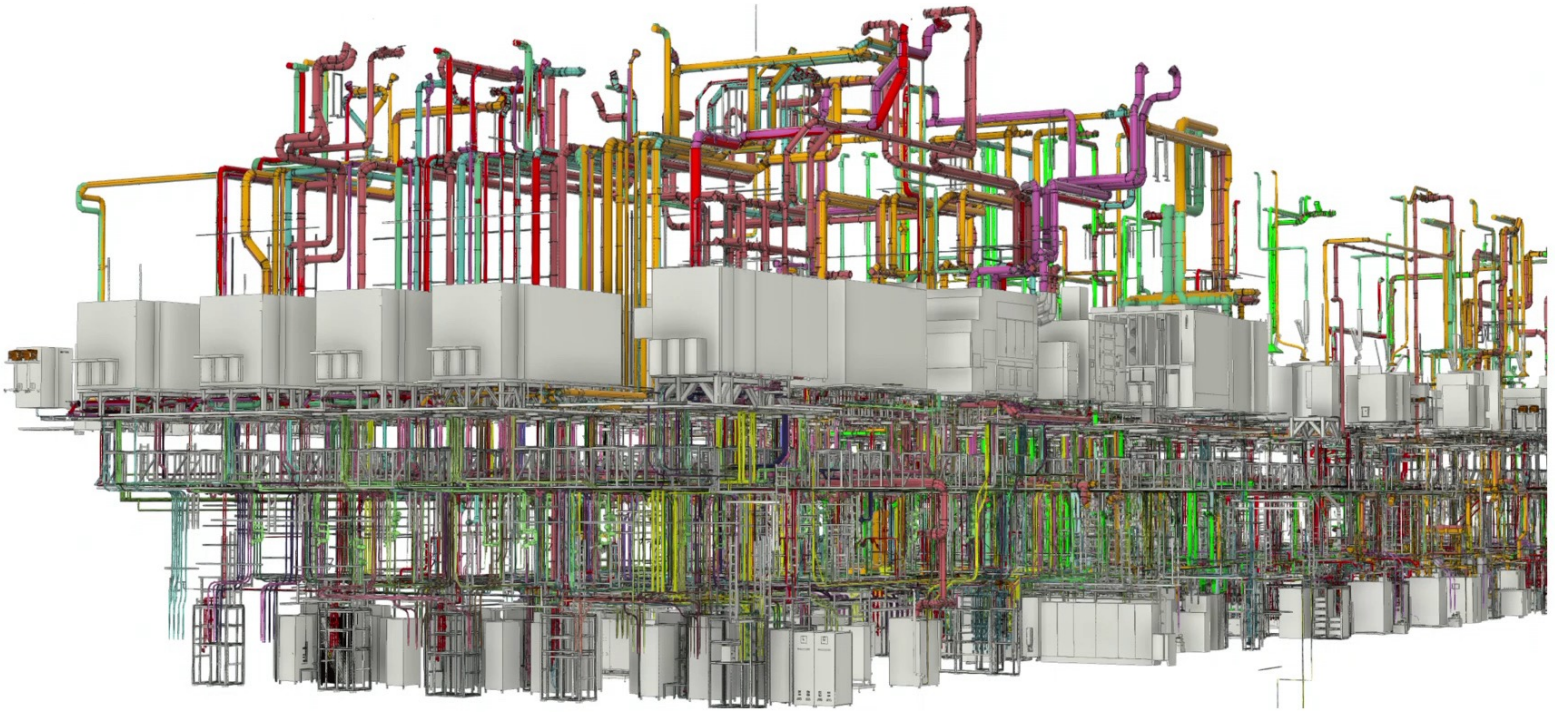





AutoCAD Architecture 2021 Production C - DigitalTwin - START.dwg - Checked Out
Factory
Home
Insert
Annotate
Render
View
Manage
Add-ins
Collaborate
Vision Tools
Express Tools
Featured Apps
Vault
ProModel
Palettes
Create New Process Model
Create Sub-Layout
Tools
Open in Inventor
Open in Navisworks
Import From ProModel
Import From Process Simulator
Cross-Product Workflows
Asset Builder
Update Assets
Create Asset Chain
Convert Asset Chains
Factory Assets
Station
Product
Routing
Transportation
Material Flow
Autodesk ReCap
Attach
Real View
Point Cloud
Connect
Connectors Enabled
Measure
Utilities
Factory Help
What's New
Discussion Forum
Learn
Start
Production C - DigitalTwin - START*
ASSET PREVIEW
[−][Top][2D Wireframe]
N
W
TOP
E
S
WCS
ASSET BROWSER
00 - Digital Twin
00 - human
01 - transpor...
02 - material...
03 - machines
04 - savety e...
05 - robots a...
06 - products
07 - walk an...
08 - manual...
09 - electrical...
10 - vehicles
11 - office
FACTORY PROPERTIES
Factory Asset
Material Flow Obj...
An xref was modified
Compare Production C - DigitalTwin - START.3d
Y
X
Type a command
Model
Work
31739.48, -4953.39, 0.00
MODEL
1:20
High Detail
1400.00
+0.00

博世半导体晶圆厂简介

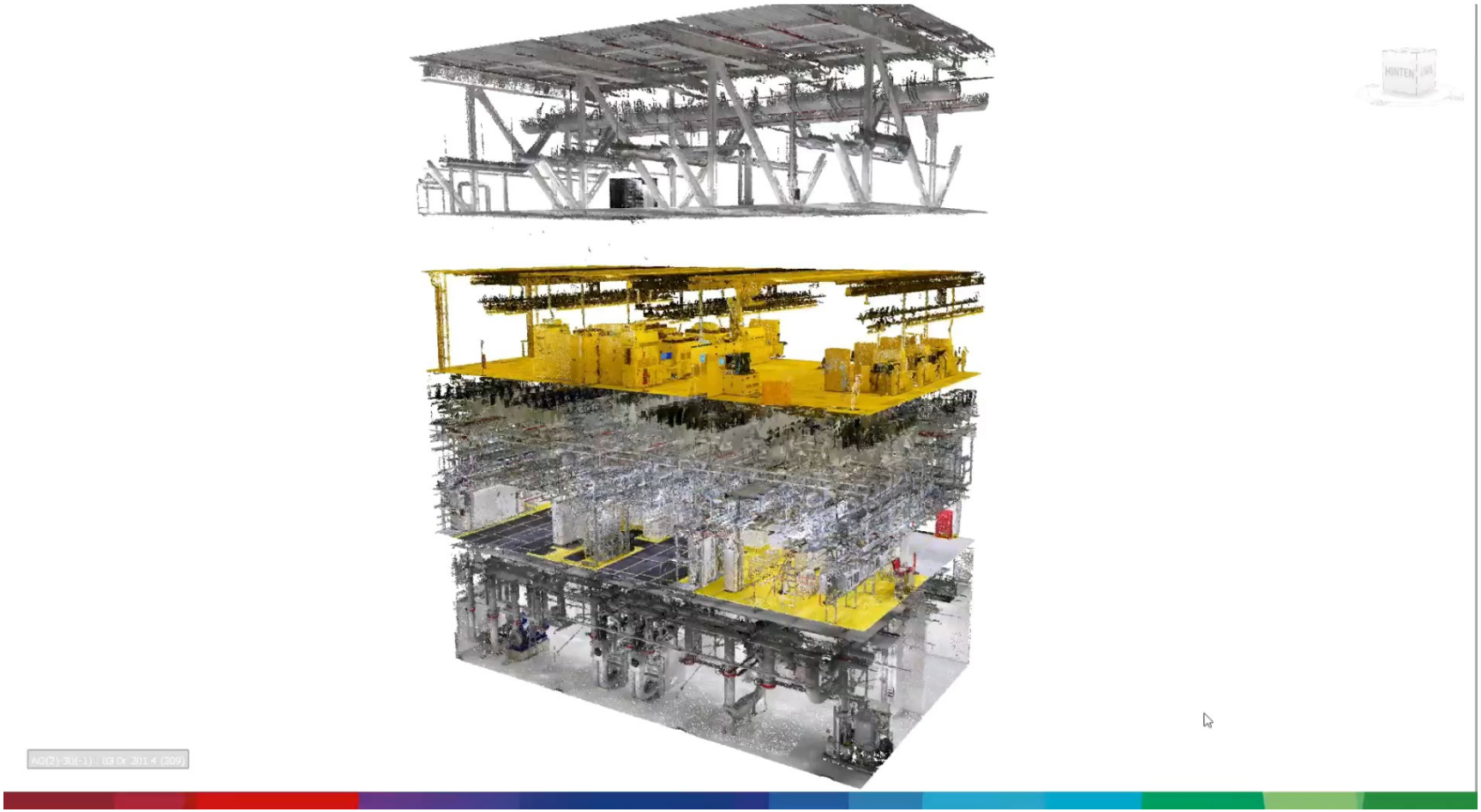




BOSCH

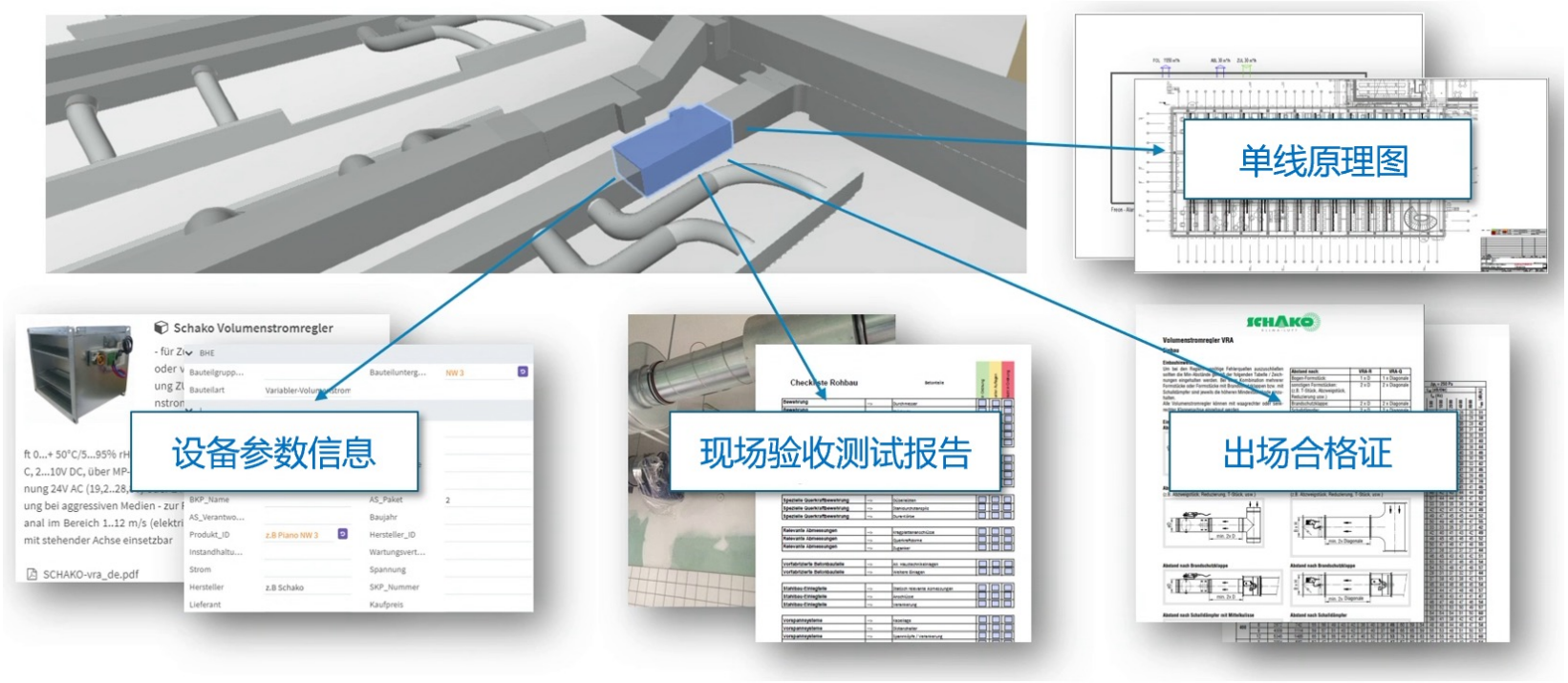
BIM数据	
4 层	建筑
90,000 平米	建筑面积
3,416 个	Revit文件
559,028 个	模型对象
3,800 种	构件分类
12,517,380 个	参数

- **激光扫描技术：**工程人员在REVIT中读取厂区点云数据，并以此为依据进行设备摆放，管路布置以及构件设计。大大提高工作效率和准确性。

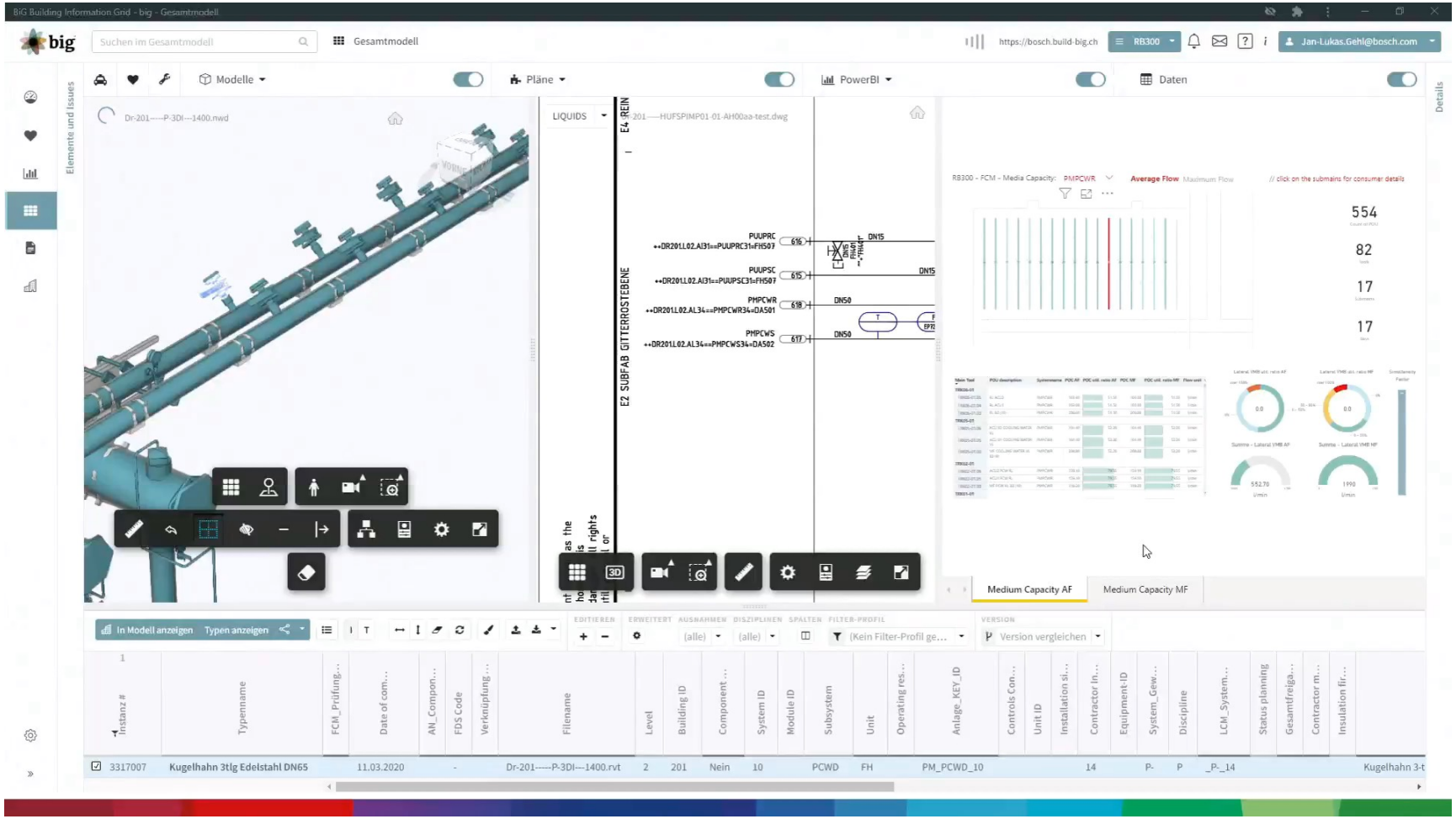


博世工厂数字化交付已经取代了传统卷册图纸，
数字化交付的主要内容……

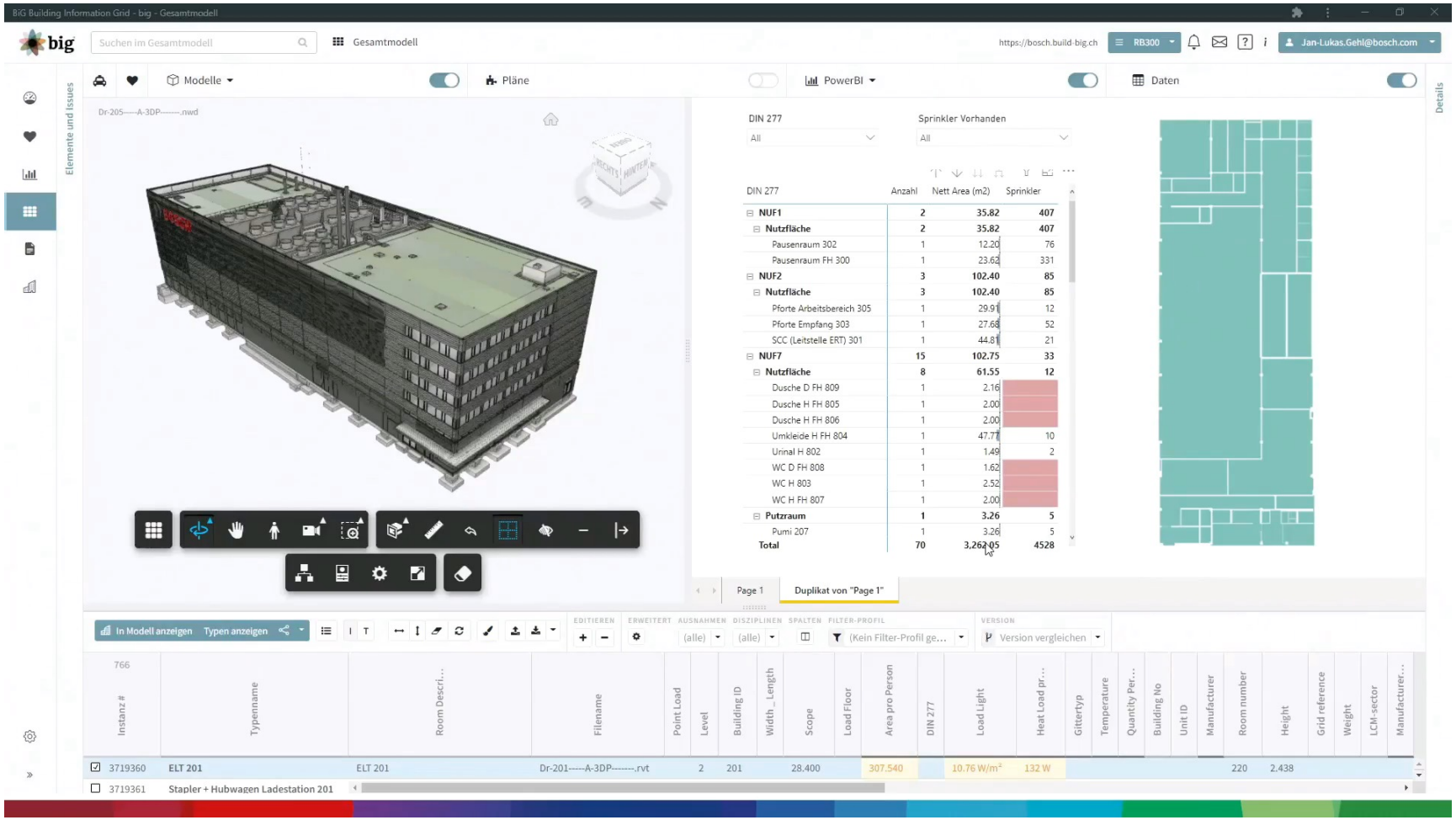
数据　　三维模型　　文档



- **透明化运营：**半导体晶圆生产用到**50**种气体和**40**种液体，这些气液管道的监控与维护是运营阶段的重要工作。博世晶圆厂基于**AUTODESK FORGE**开发控制中台，提高工厂运营透明度。

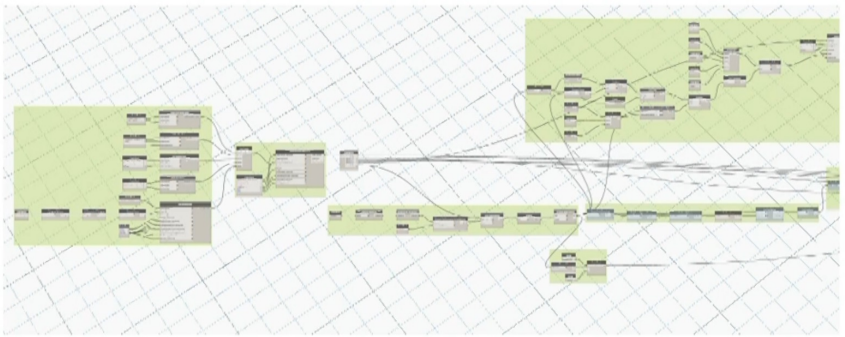


- **透明化运营：**办公室、会议室、车间等建筑房间信息查询的应用

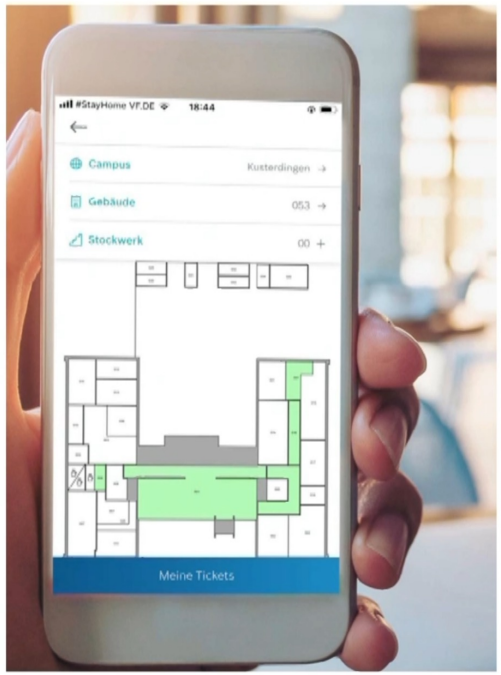


- **智慧工单系统：**博世晶圆厂智慧工单系统利用**Revit Dynamo**，实现Revit模型和手机应用之间的自动化数据传输流动

厂房Revit模型



Revit Dynamo可视化编程语言



工单系统手机应用

- **智慧运维系统：**设计建造模型在运维阶段的应用