AUTODESK

Vom Lieferanten zum Partner

Digitale Integration in Fabrikplanungsprojekte für Anlagen- und Systemlieferanten

Markus Speiser
Director Central Europe Design & Manufacturing

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Wie sieht die Fabrik aus, die sich

selbst steuert,
flexibel auf Marktanforderungen reagiert,
Ressourcen optimal nutzt?

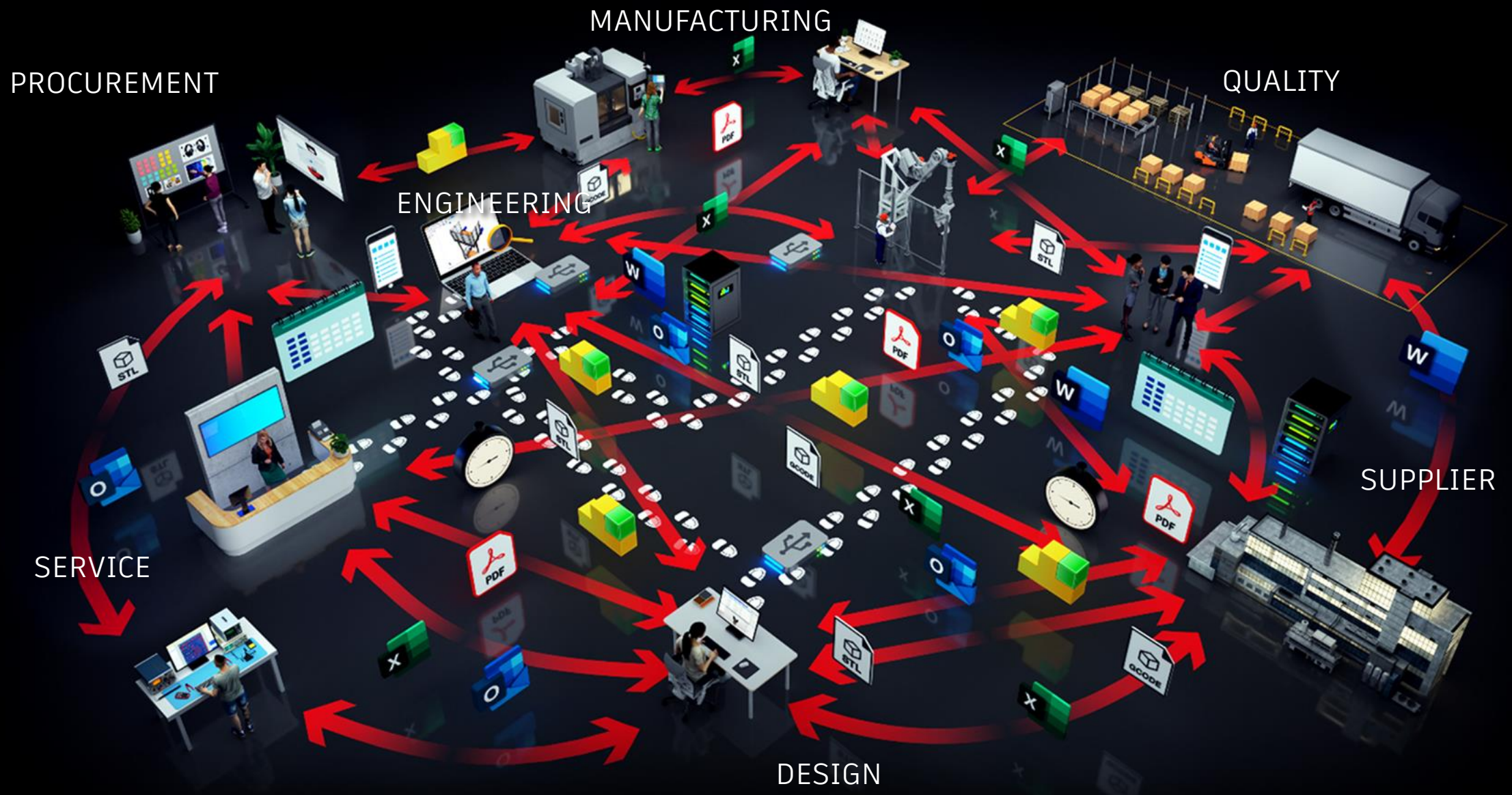

Macroeconomic Volatility
Supply Chain Disruption
Regulations, Compliance & ESG
Treiber für Veränderung
-
Digitalisierung, Effizienz, Nachhaltigkeit
Digital Technologies
Talent
AI

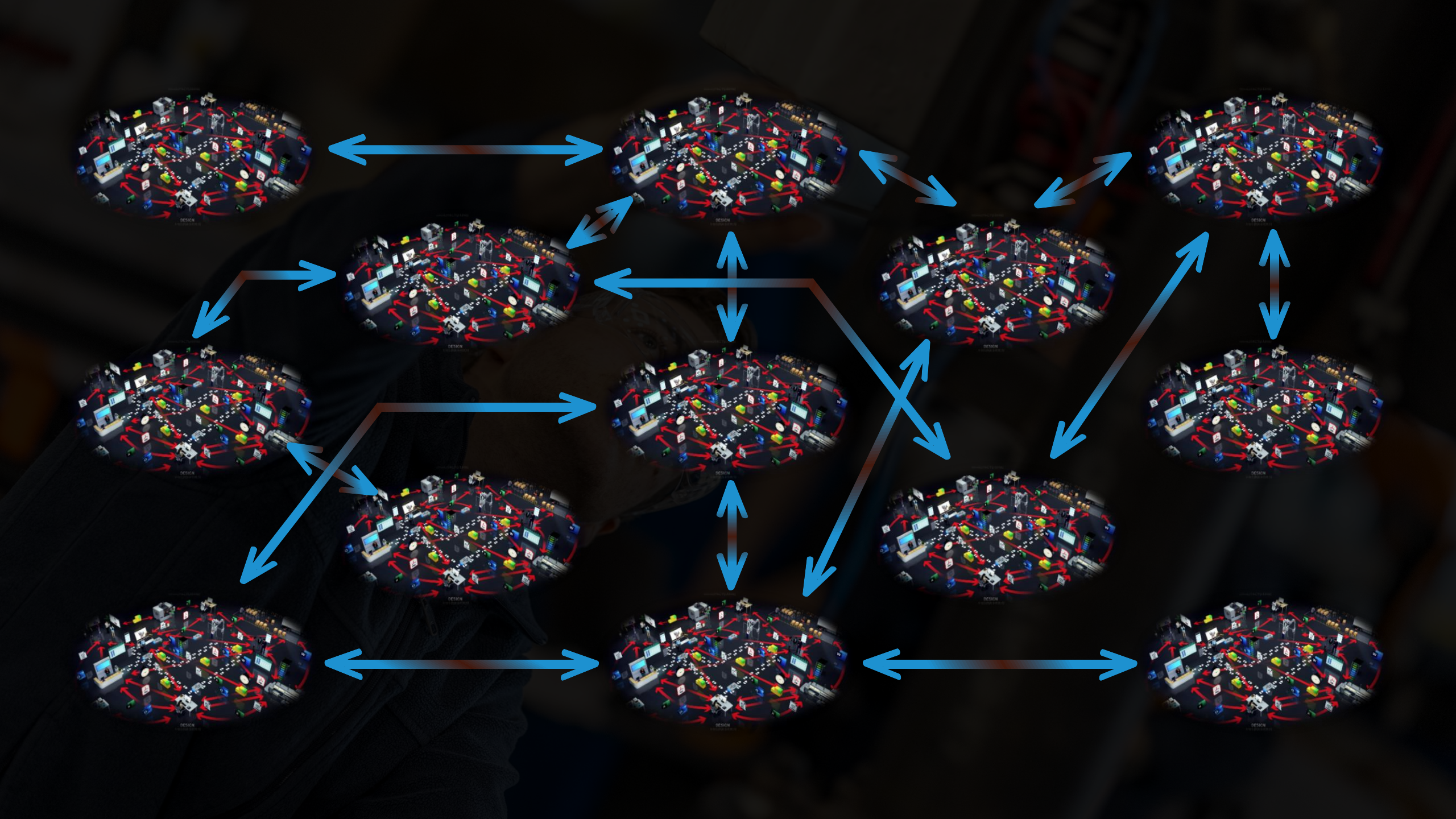
Von der klassischen Fabrik zur integrierten Smart Factory

Klassische Fabrik

Integriertes Fabrikmodell

Smart Factory


MANUFACTURING
PROCUREMENT
QUALITY
ENGINEERING
SUPPLIER
SERVICE
DESIGN



Building Information Modeling

BIM (Building Information Modeling) ist ein **modellbasierter Prozess**, der es Architekten, Ingenieuren, Bauherren und Auftragnehmern ermöglicht, Gebäude und Infrastrukturen zu **beschaffen, zu planen, zu bauen und zu verwalten**.

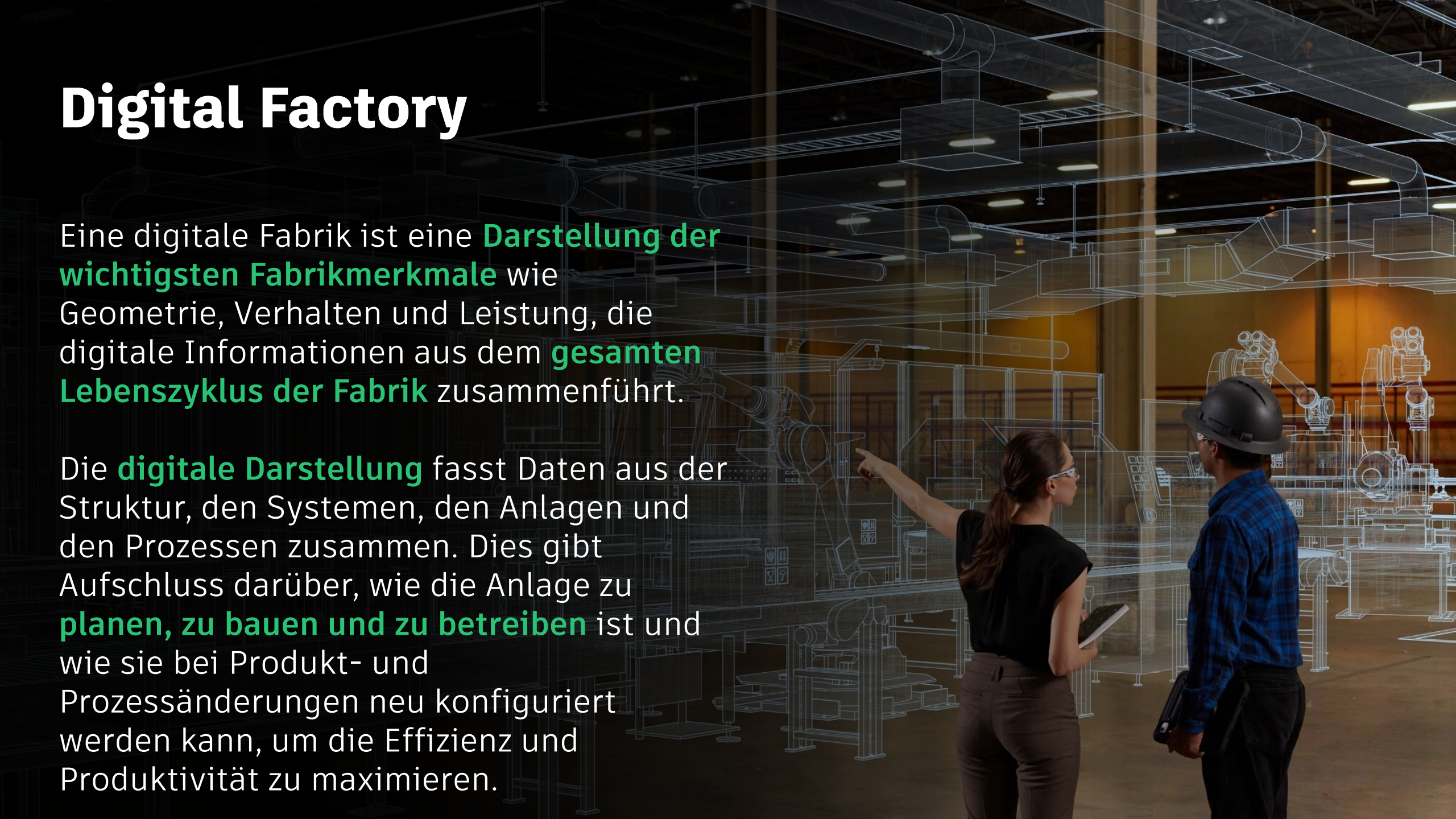
Der Kern von BIM ist eine **digitale Darstellung der physischen und funktionalen Merkmale** einer Immobilie.

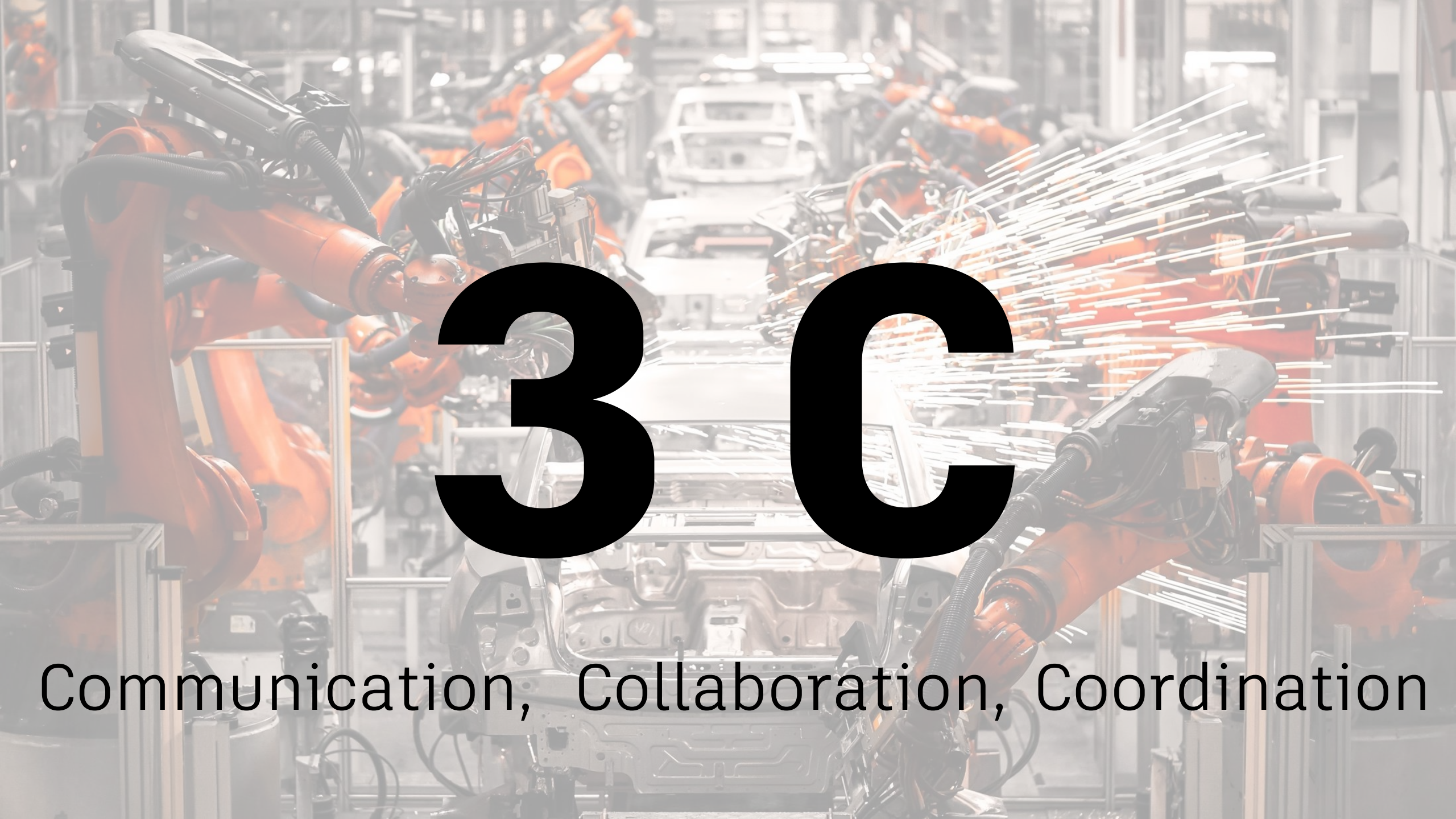
Image created by Autodesk AI

Digital Factory

Eine digitale Fabrik ist eine **Darstellung der wichtigsten Fabrikmerkmale** wie Geometrie, Verhalten und Leistung, die digitale Informationen aus dem **gesamten Lebenszyklus der Fabrik** zusammenführt.

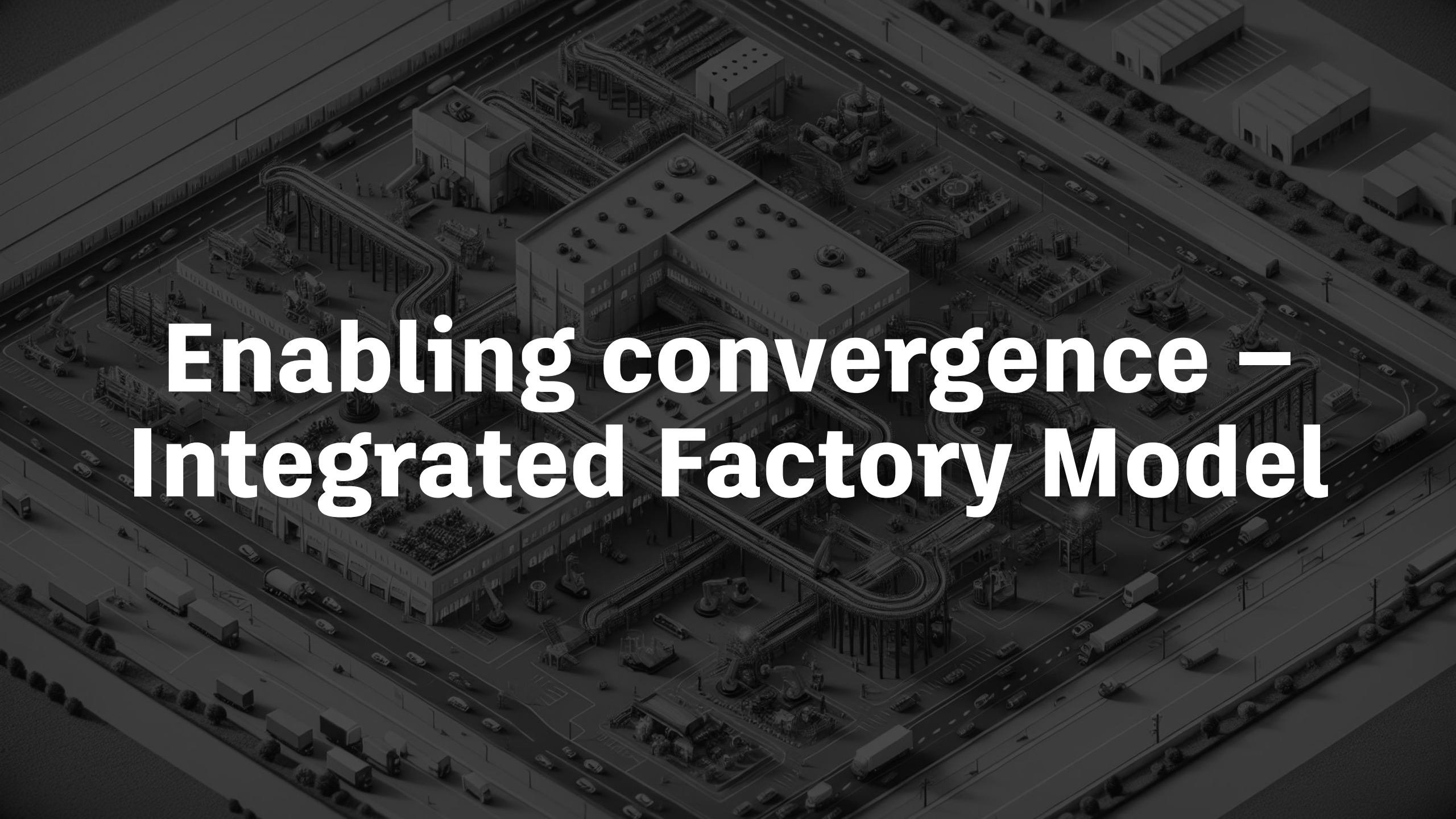
Die **digitale Darstellung** fasst Daten aus der Struktur, den Systemen, den Anlagen und den Prozessen zusammen. Dies gibt Aufschluss darüber, wie die Anlage zu **planen, zu bauen und zu betreiben** ist und wie sie bei Produkt- und Prozessänderungen neu konfiguriert werden kann, um die Effizienz und Produktivität zu maximieren.





3 C

Communication, Collaboration, Coordination



Enabling convergence – Integrated Factory Model

Integrated Factory Modeling

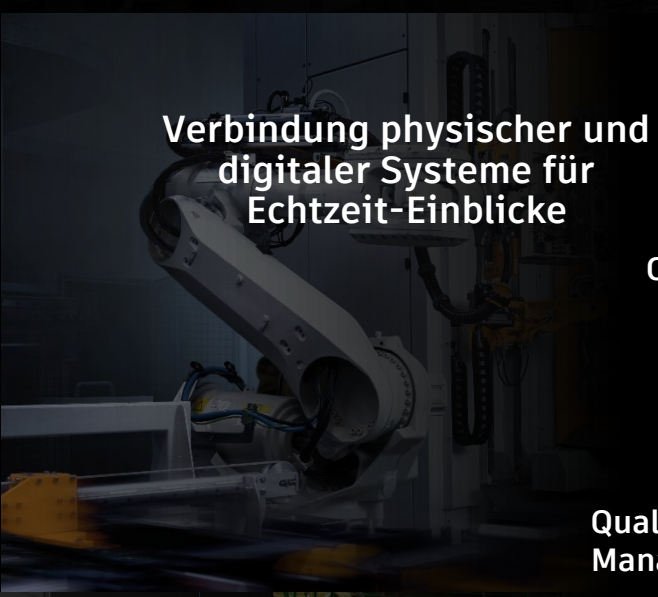
- IFM - Die Konvergenz von BIM und Digitaler Fabrik

IFM ist eine **Methode**, die verschiedene Projektbeteiligte in allen Phasen des Lebenszyklus einer Fabrik miteinander verbindet, um eine bessere Koordinierung zu erreichen, indem eine **aktuelle, zentral gespeicherte digitale Darstellung der gesamten Fabrik** mit **allen zugehörigen Informationen** von allen Lieferanten erstellt und verwaltet wird.

Dies umfasst alle Anlagen, die für einen wertvolleren und nachhaltigeren Fertigungsprozess in der Zukunft relevant sind.

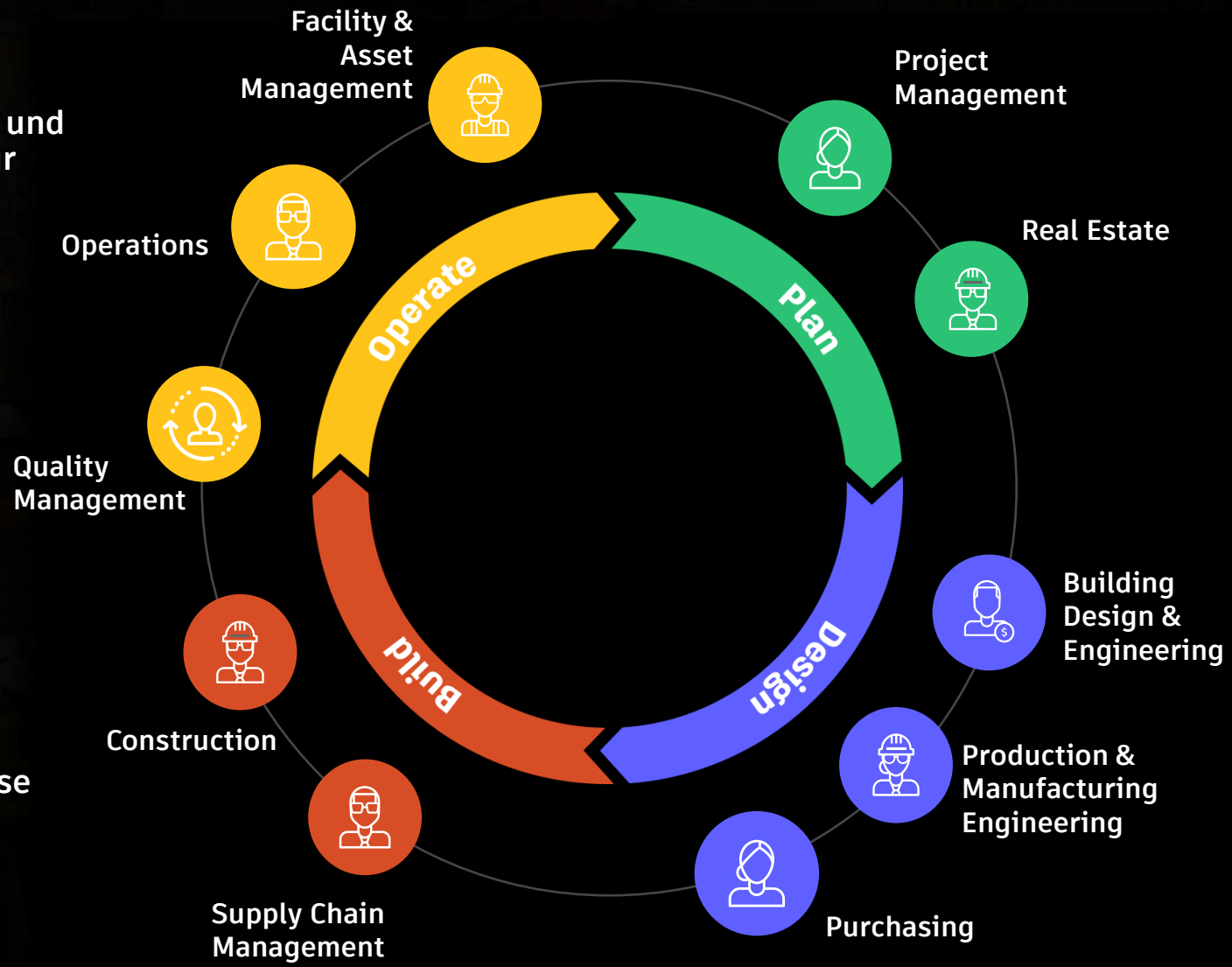
Image created by Autodesk AI

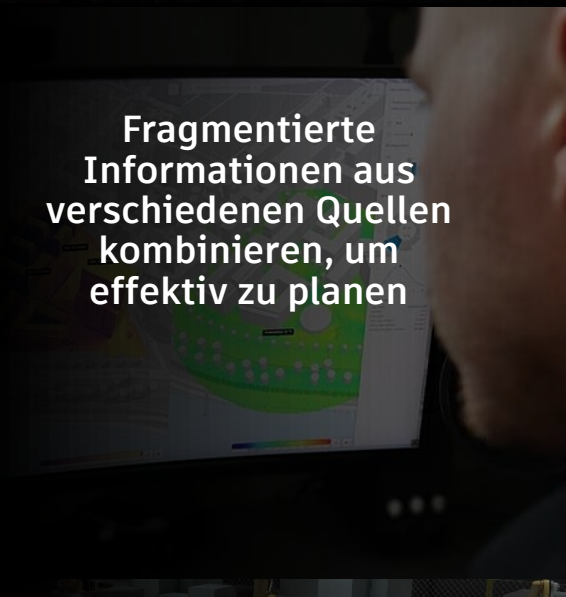
The Challenge



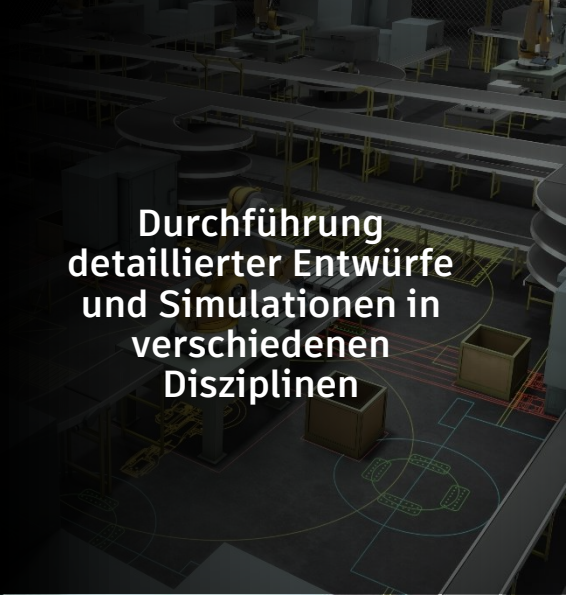
Verbindung physischer und digitaler Systeme für Echtzeit-Einblicke

Risiken und Abfall während der Bauphase minimieren





Fragmentierte Informationen aus verschiedenen Quellen kombinieren, um effektiv zu planen



Durchführung detaillierter Entwürfe und Simulationen in verschiedenen Disziplinen

Zielbild - Integrated Factory Modeling (IFM)

Die Konvergenz von BIM und Digitaler Fabrikplanung

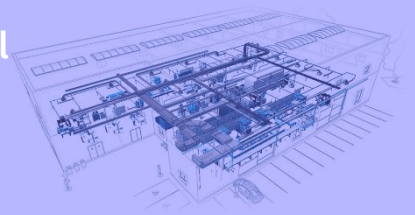
Smart Expert

Entscheidungs-unterstützung

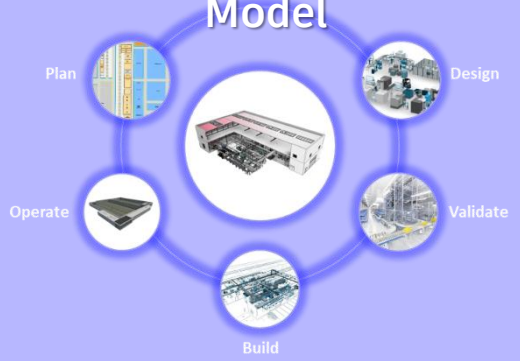
Zugriff auf jedem Endgerät

Multimodaler Informationszugang

Ganzheitliches, integriertes Kollaborationsmodell



Integrated Factory Model

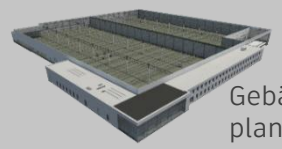


Ein einzelner Datensatz über alle Disziplinen

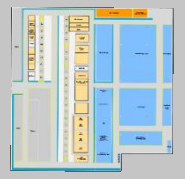
Aggregation und Synchronisierung

Fachplaner

Rohdaten & Anwender-Software



Gebäude-planer



Layout-planer

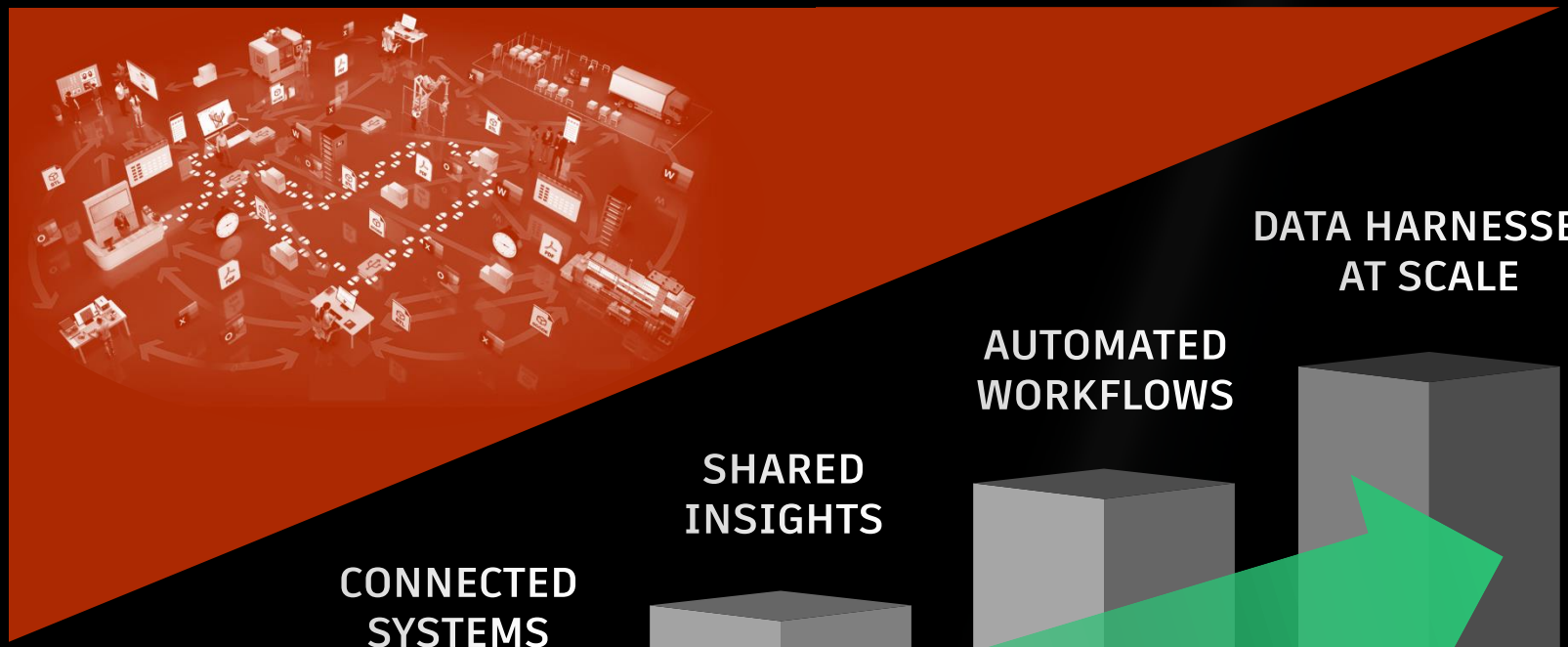
Betriebsmittel-planer

...

Integration von Experten & Lieferanten

Data Effort

Data Value



SILOED DATA

CONNECTED SYSTEMS

SHARED INSIGHTS

AUTOMATED WORKFLOWS

DATA HARNESSED AT SCALE

From Silos to Synergies

The Autodesk Platform unifies data and connects workflows

> **Autodesk Platform Services (APS) powers the Design & Make Platform by connecting to all your business processes & systems.**

Business Processes

Enterprise System Integration
ERP, CRM, Viewing, Planning, Scheduling, Cost, Fabrication, Maintenance, Purchasing etc.

Partner Ecosystem

Industry Alliances

Cloud & Desktop Partners
~10K members

70+ File Formats

Independent Formats
buildingSMART IFC
Neutral IGES

3rd Party Formats
Bentley MicroStation
Dassault Catia CATPART
PTC Creo PRT
Trimble SketchUp
Siemens STL

MOTHERSON SAS INTEGRATED ASSEMBLIES

Image: BEOS AG

Motherson SAS drives Operational Excellence with Autodesk Digital Twins

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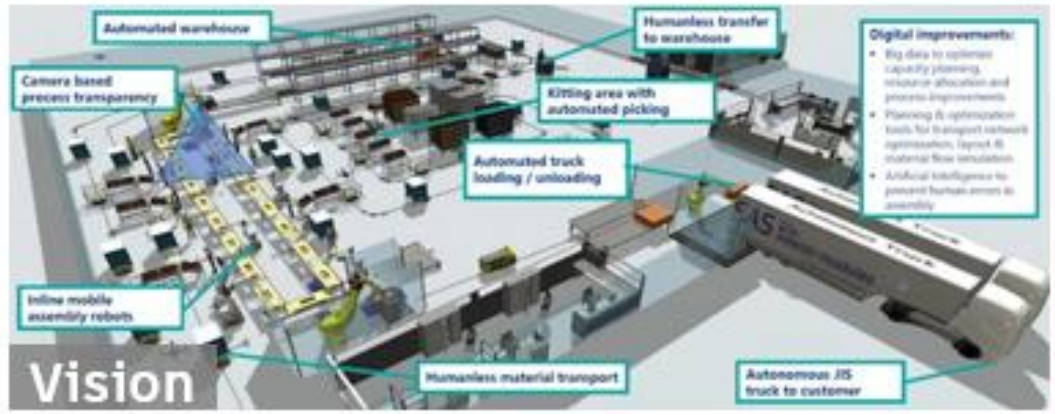
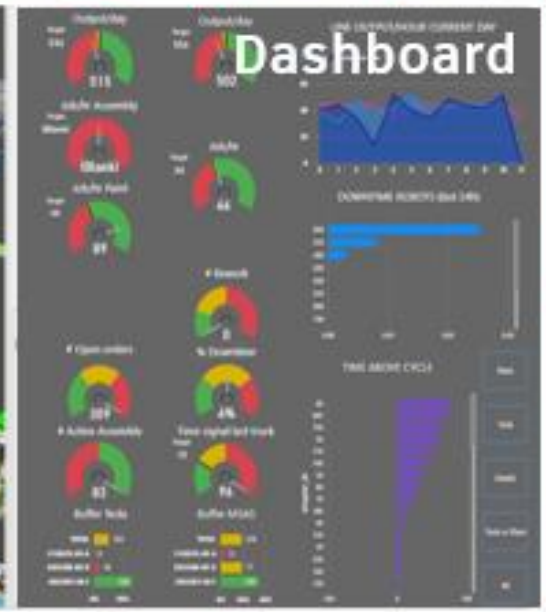
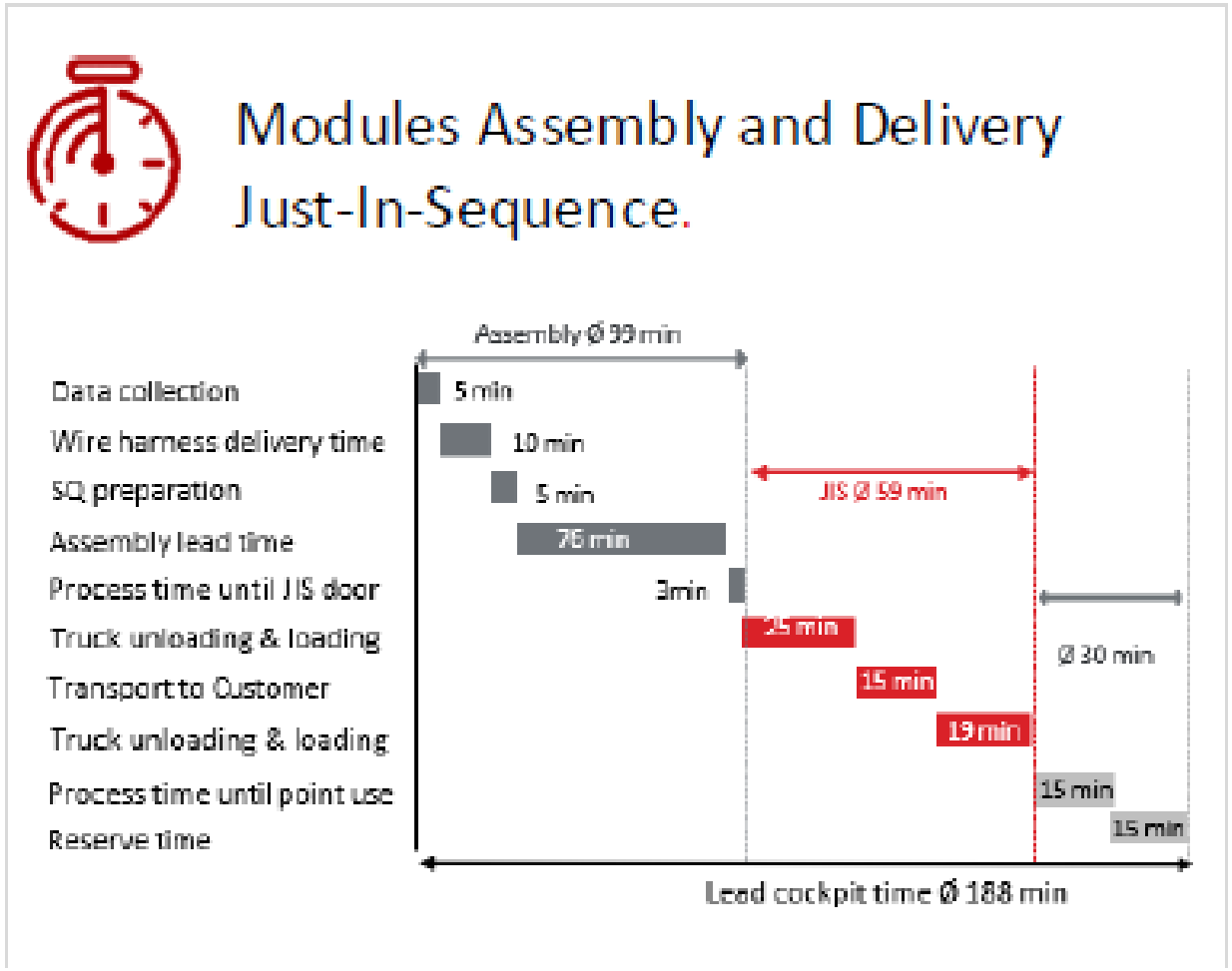




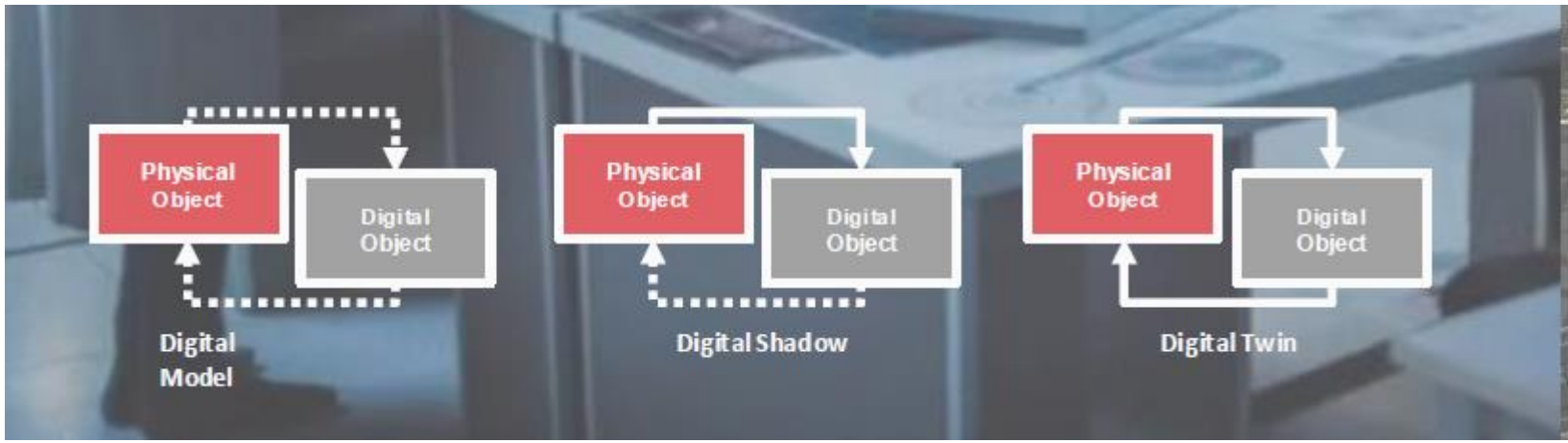
Outcomes

- Agile Decision-Making & Production Flexibility for Global Operations
- Improved Energy Efficiency & Foundation for Resource Optimisation
- Downtime Reduction & Continuous Improvement through Data Analysis

Operational Exzellenz durch digitalen Zwilling




AUTODESK
motherson
FlexSim
Returnables
GAP 1
GAP 2
TOP 5
Camera
00:00,00


Physical Object
Digital Object
Digital Model
Physical Object
Digital Object
Digital Shadow
Physical Object
Digital Object
Digital Twin

Key Take Aways | Motherson SAS driving Operational Excellence through Digital Twins

motherson

Benefits

- Real-Time Monitoring & Process Optimization
- Downtime Reduction & Continuous Improvement through Data Analysis
- Energy Efficiency & Resource Optimisation
- Agile Decision-Making & Production Flexibility for Global Operations
- Simulation for Green and Brown Field

Lessons Learned

- Start with the outcome
- User stories first (KPIs, sensors, architecture, systems)
- Allow time to test
- Optimize for latency. System fast, reliable, and ready to scale

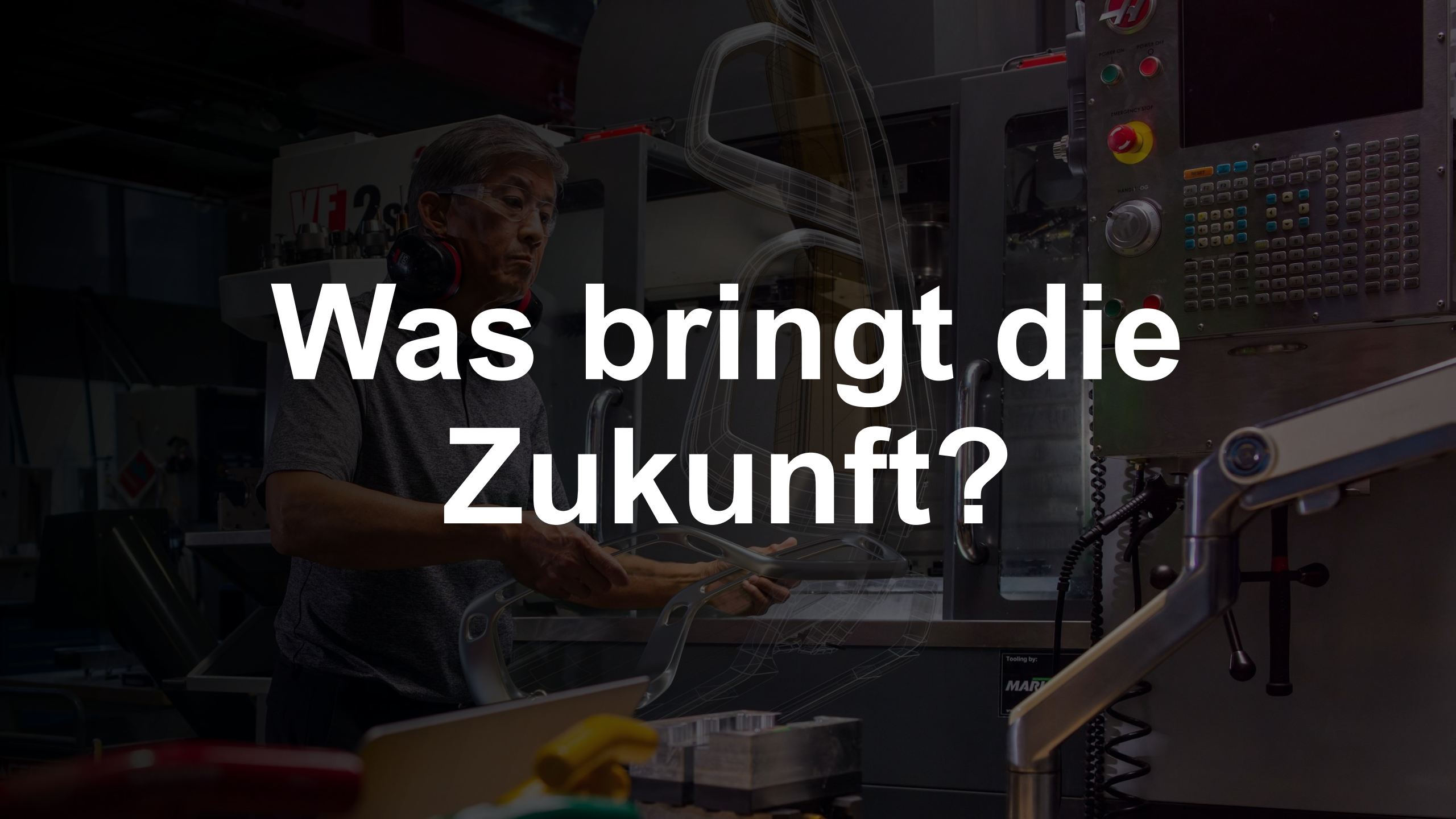
Key Take Aways

It is a cross-domain project.
Not an IT-project
Not a ME-project
Not a project to be delivered by external consultant

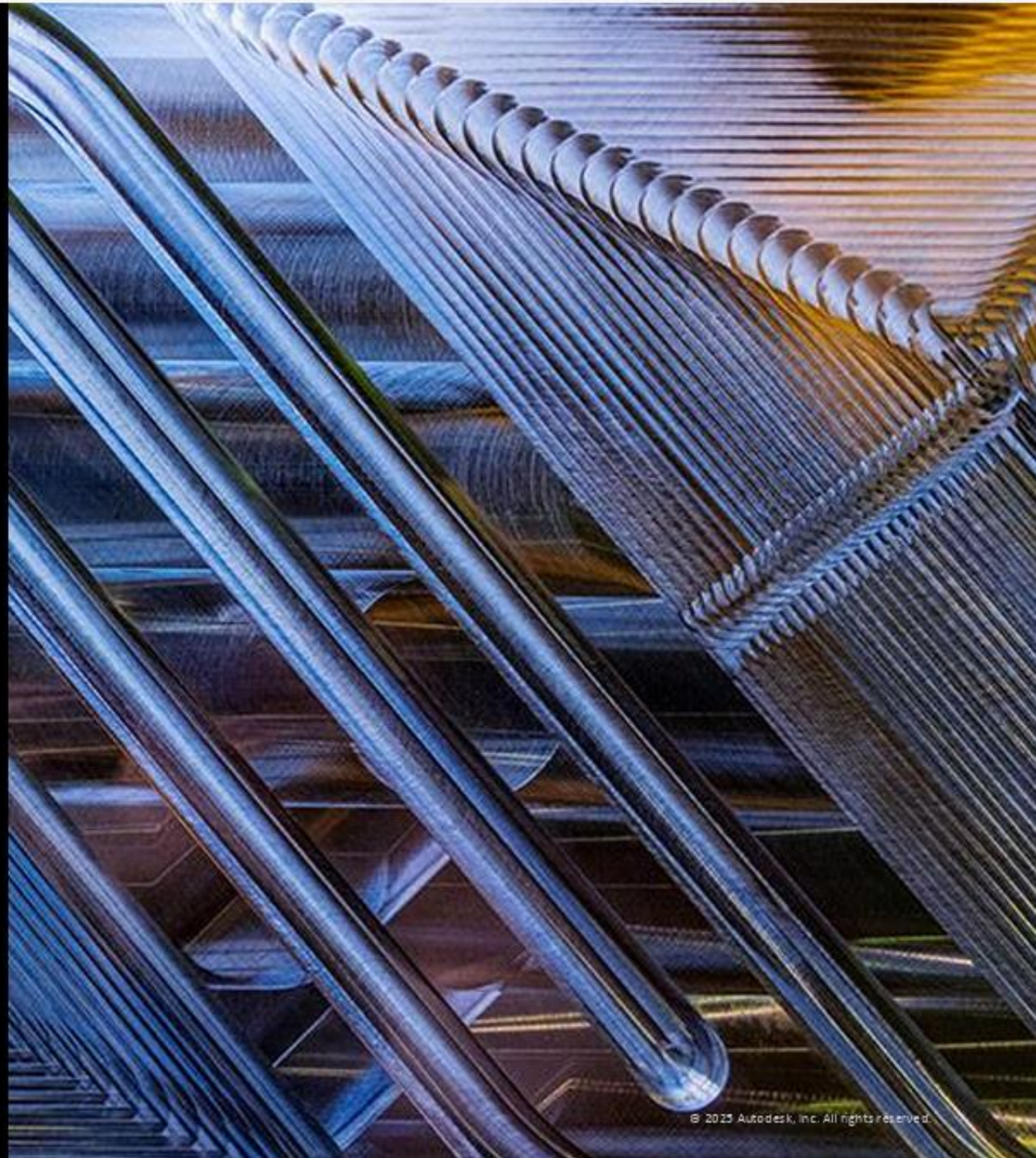
Step-by-step approach
Digital-Model
Digital-Shadow
Digital-Twin *(bi-directionally connected)*

Holistic End-to-End platform is mandatory to scale up solution to large scope (24 locations)

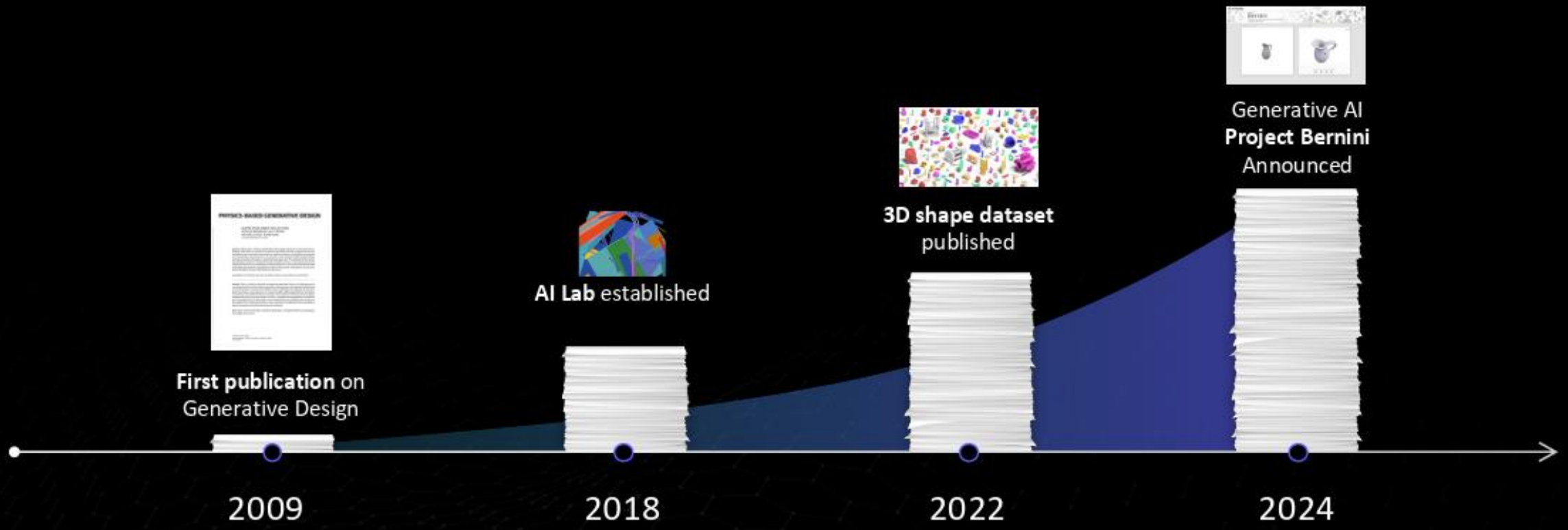
As we embark on a Transformation, People matter, too !


Was bringt die Zukunft?

Autodesk AI



History of Research

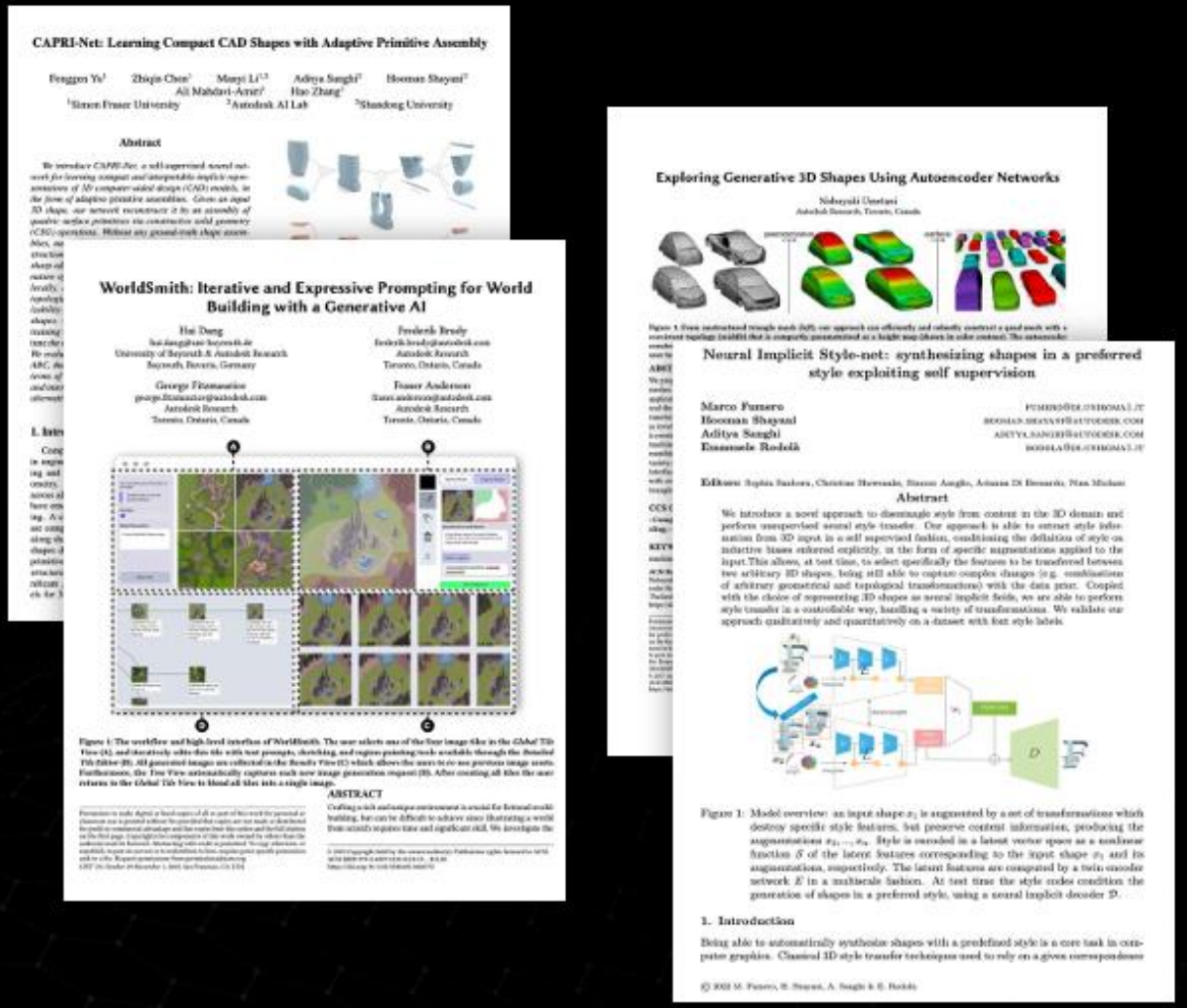


Since 2009

90+

AI Research Papers

World's leading publisher of
AI research for CAD geometry



Generative AI 3D shape creation

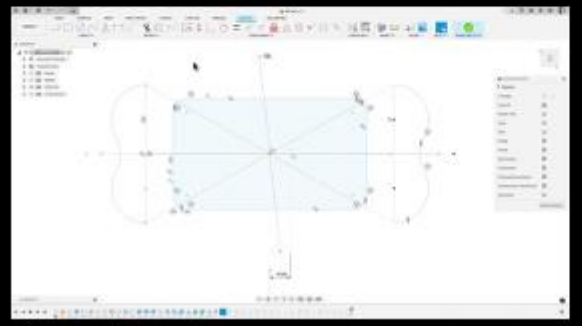
D&M | Design | Research

Project Bernini is a research effort focused on developing generative AI for Design and Make industries.
https://adsknews.autodesk.com/en/news/research-project-bernini/

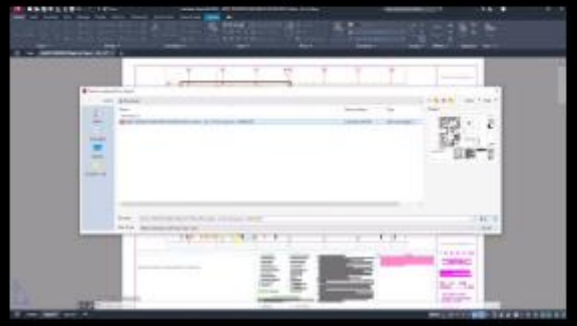
Autodesk AI – What is it?

***40+ AI-powered features** across many products, including...*

Fusion AutoConstrain

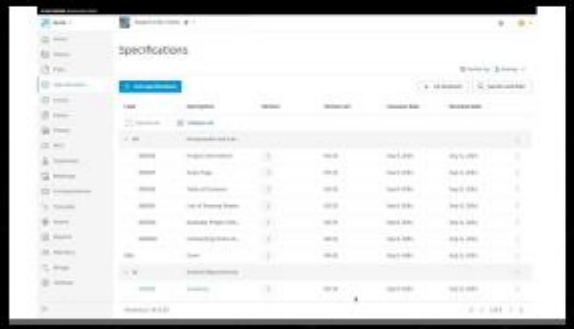


AutoCAD Markup Assist



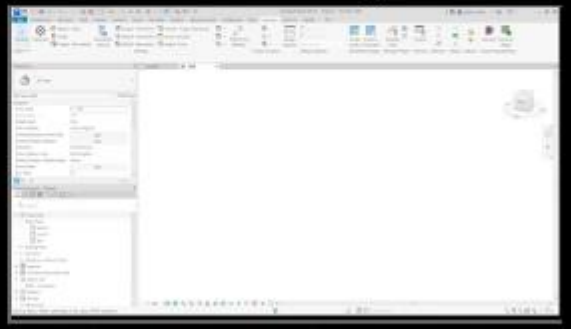
Maya Motion Maker

Autodesk Assistant

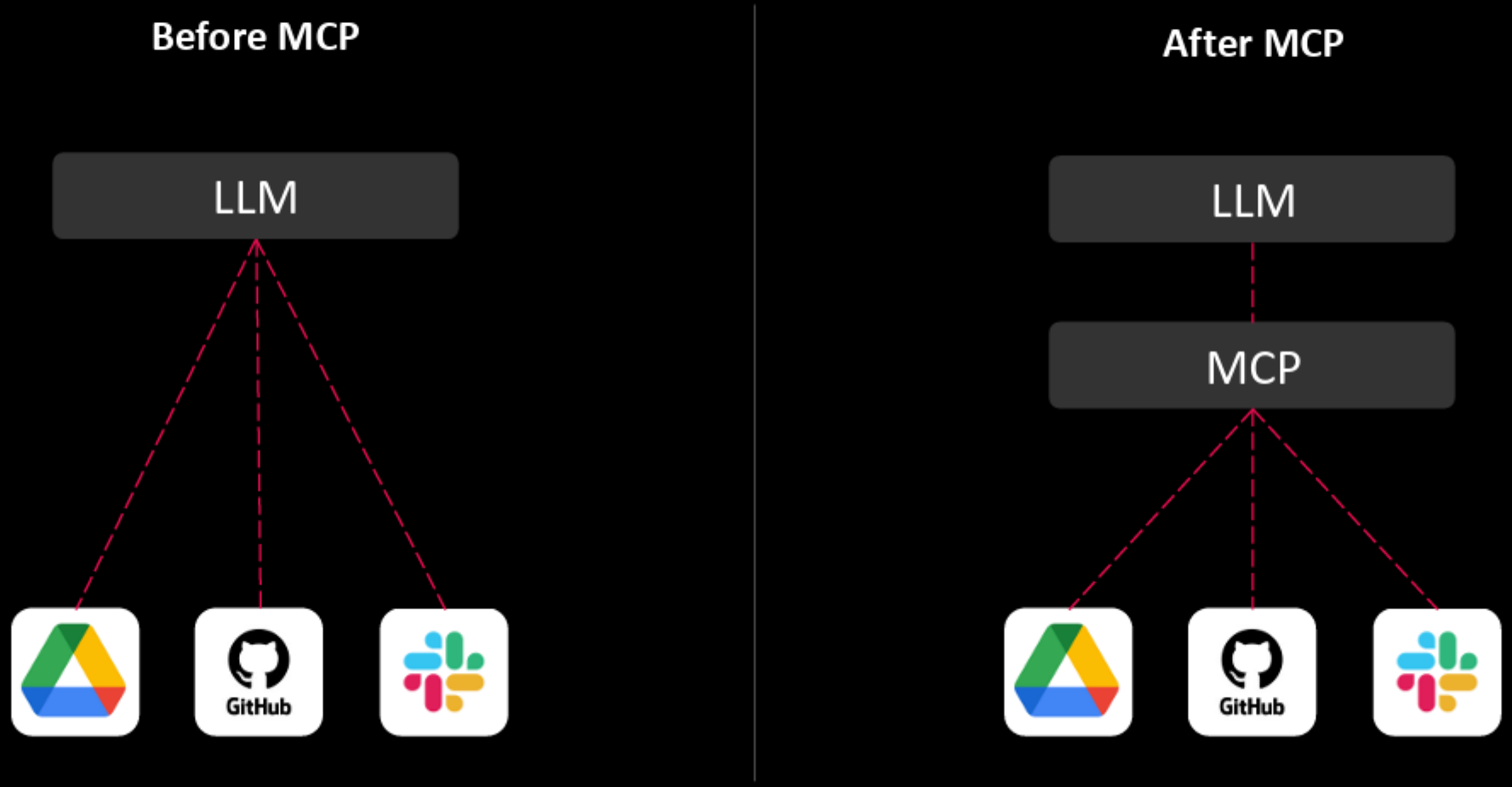


Autodesk Construction IQ

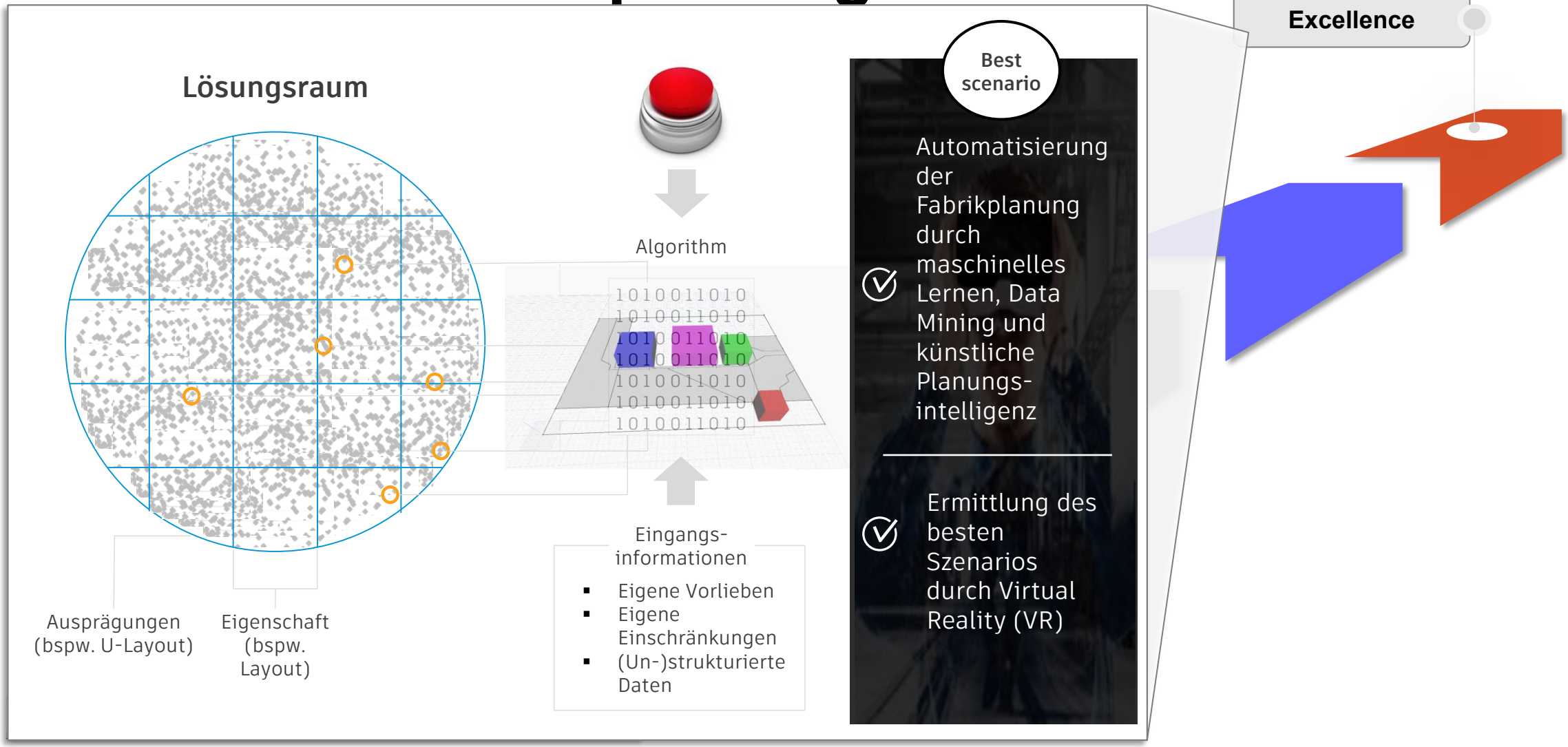
Revit Generative Design

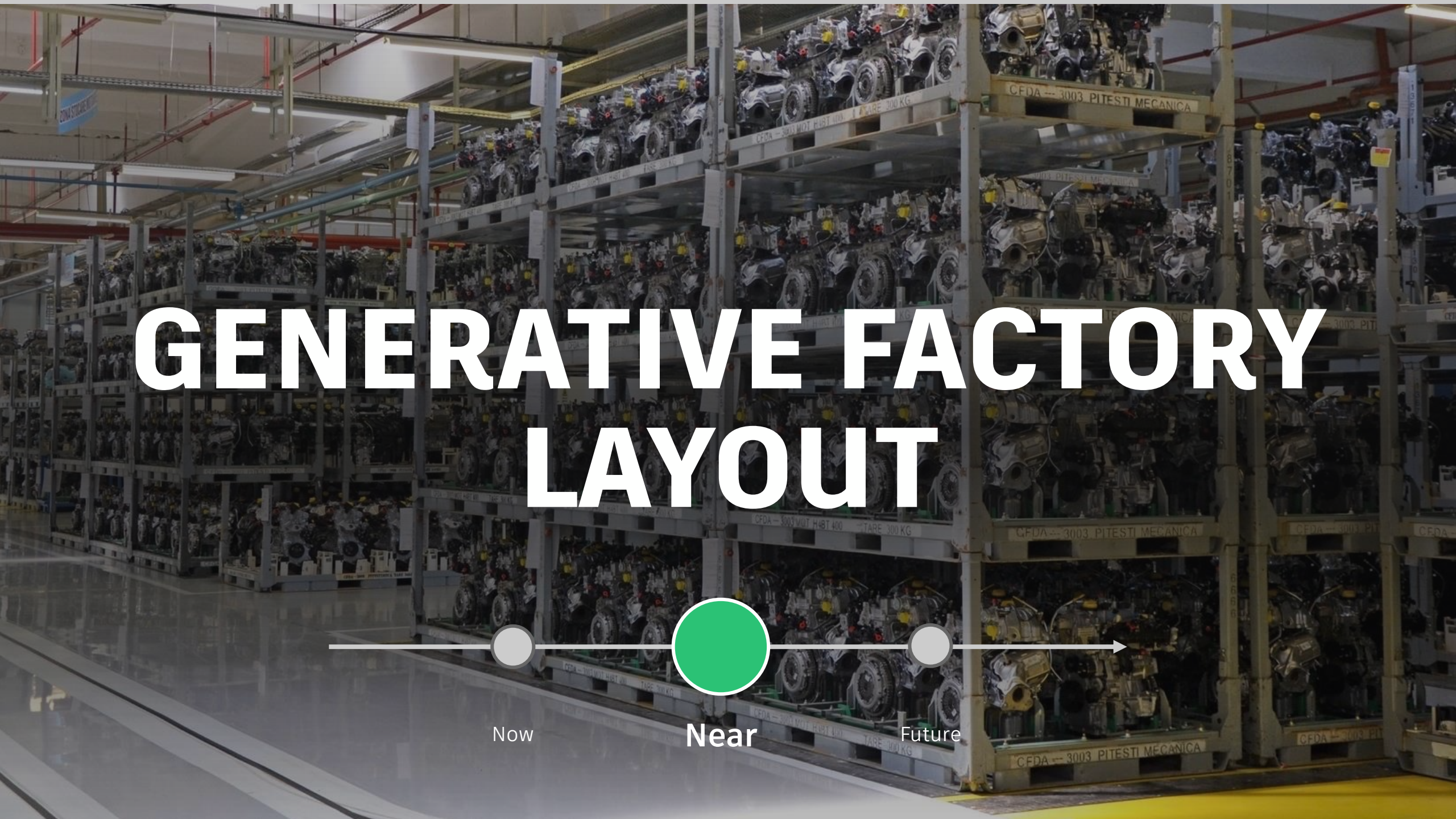


MCPs Changing the Platform Development



Algorithmik bietet großer Potential für die Zukunft der Fabrikplanung





GENERATIVE FACTORY LAYOUT

Now

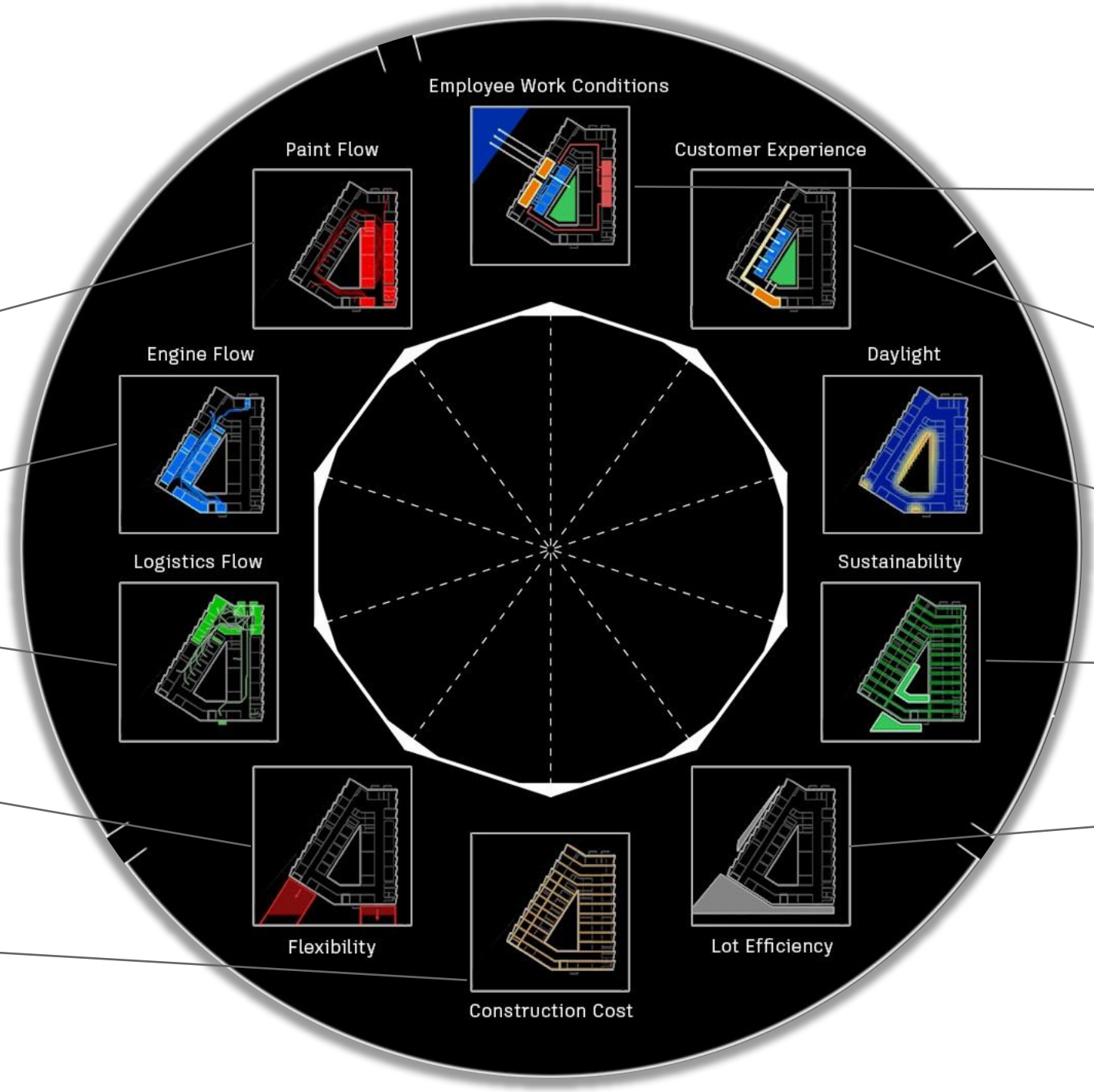
Near

Future

AIRBUS

Requirement Definition

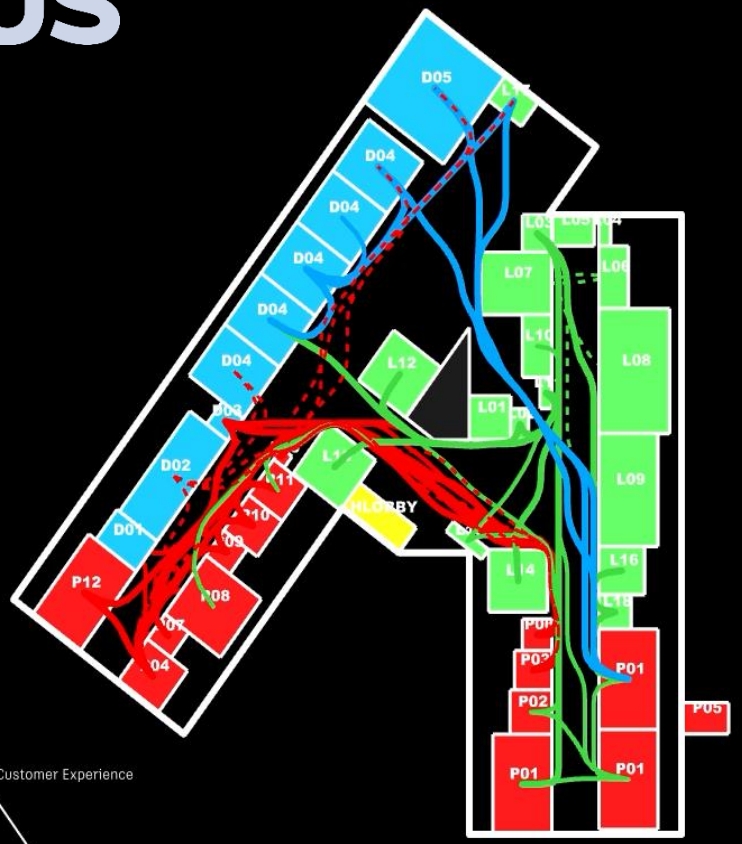
- Paint Flow
- Engine Flow
- Logistics Flow
- Flexibility
- Construction costs

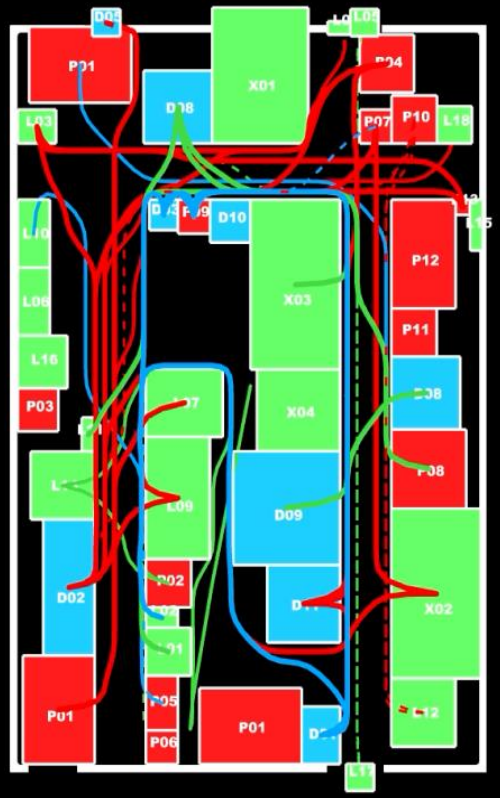


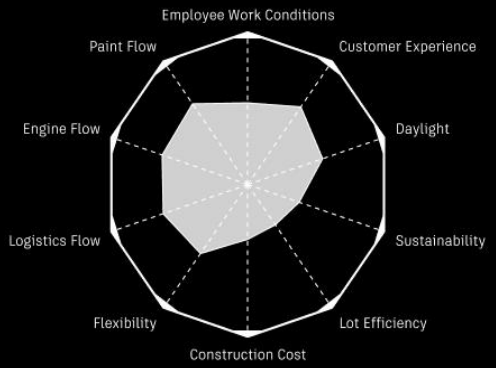
- Employee Work Conditions
- Customer Experience
- Daylight
- Sustainability
- Lot efficiency

Image courtesy of Airbus

AIRBUS







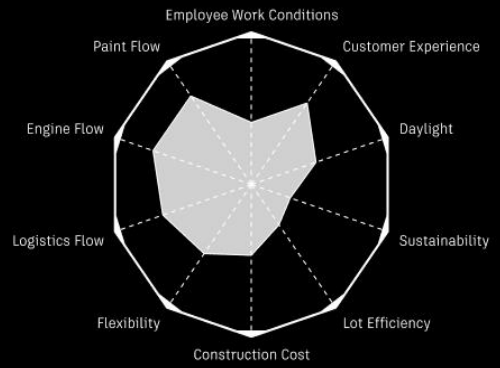
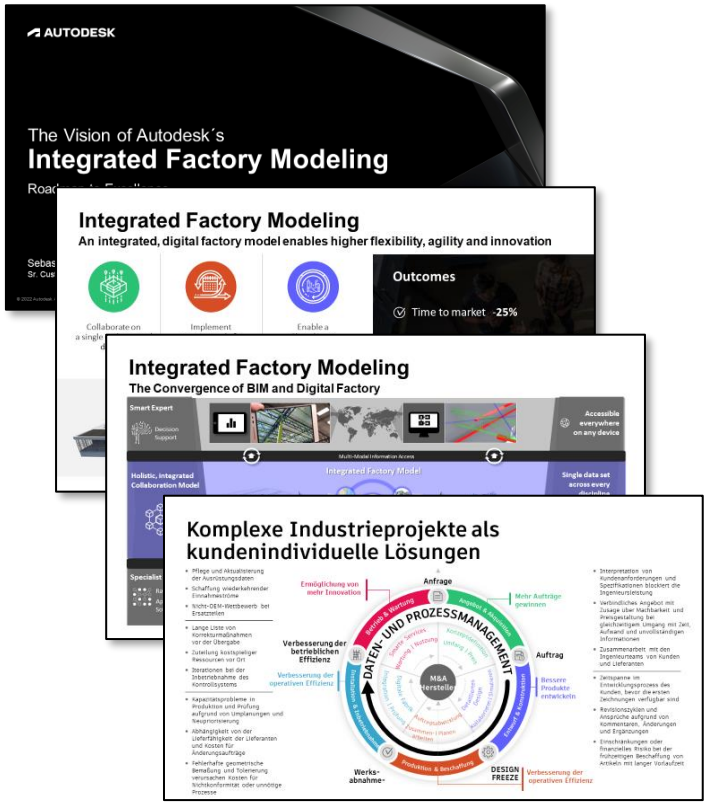


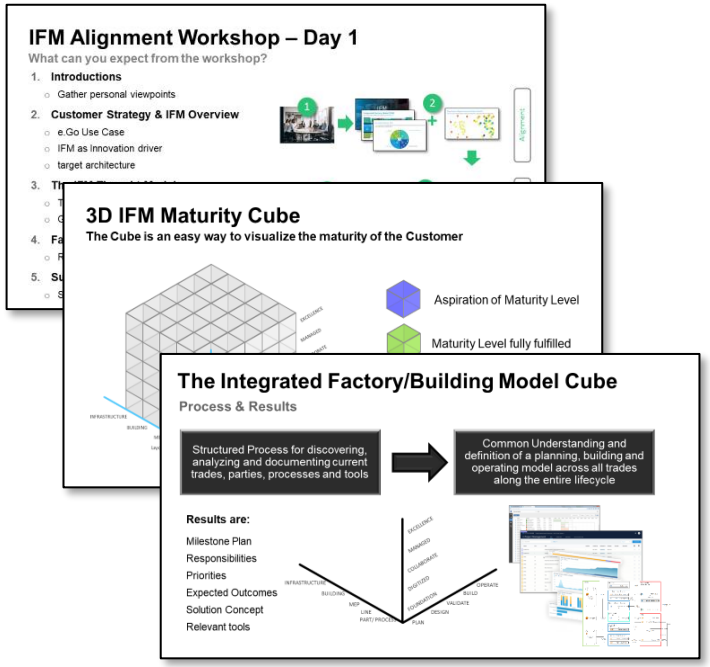
Image courtesy of Airbus

Ihr Start mit IFM - einfacher 3-Schritte-Ansatz



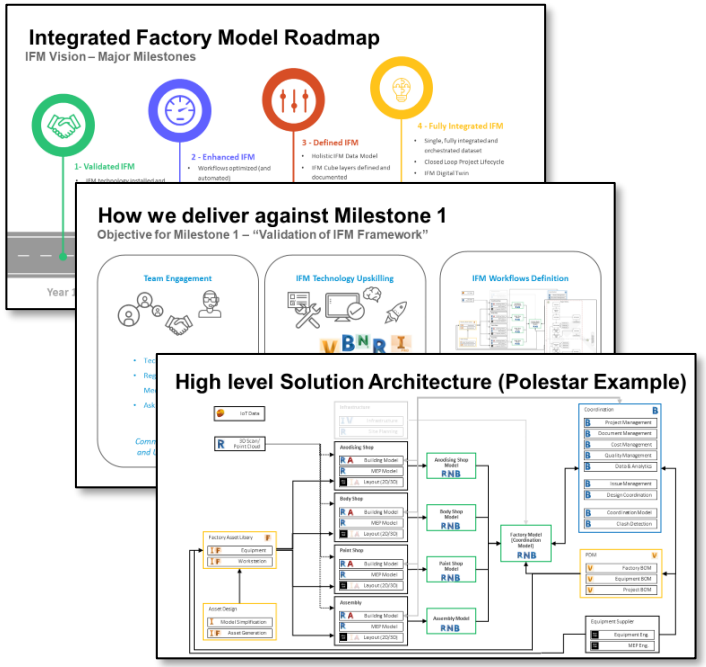
Schritt 1

Autodesk IFM Vision Präsentation & Identifizierung des Use Cases



Schritt 2

Status Quo & Discovery-Workshop



Schritt 3

Definition einer spez. Lösungs-architektur & Roadmap

5 Key Take Aways

1. Die Industrie ist im digitalen Wandel und Sie können von dieser partizipieren

2. Daten sind das Öl für die ITF Umsetzung

3. BIM ist Schlüsselkompetenz und wird im Lebenszyklus gedacht

4. Das Zielbild ihrer Kunden sind digitale Zwillinge, aber sie brauchen SIE um diese zu erreichen

5. Digitale Zwillinge und Algorithmik sind keine Gefahr, sondern eine Chance

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Make Anything