



Art of the Possible

Digital Transformation in Industrial Machinery

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79%

Future growth relies
on digital tools

30%

Manufacturing companies
are digitally mature





21.5 hours

per person per week

MANUFACTURING

PROCUREMENT

QUALITY

SERVICE

DESIGN
ENGINEERING

SUPPLIER



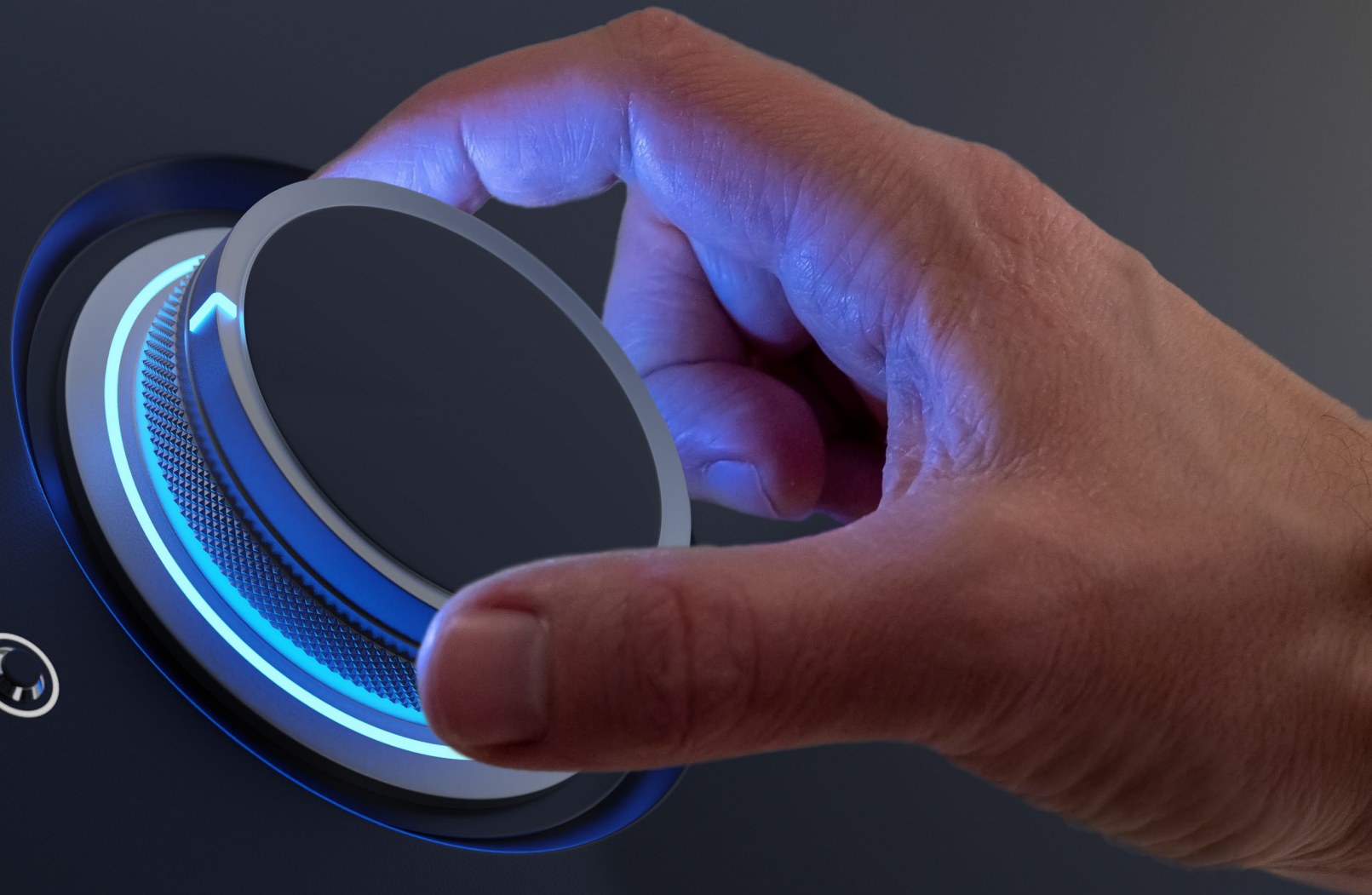
80%

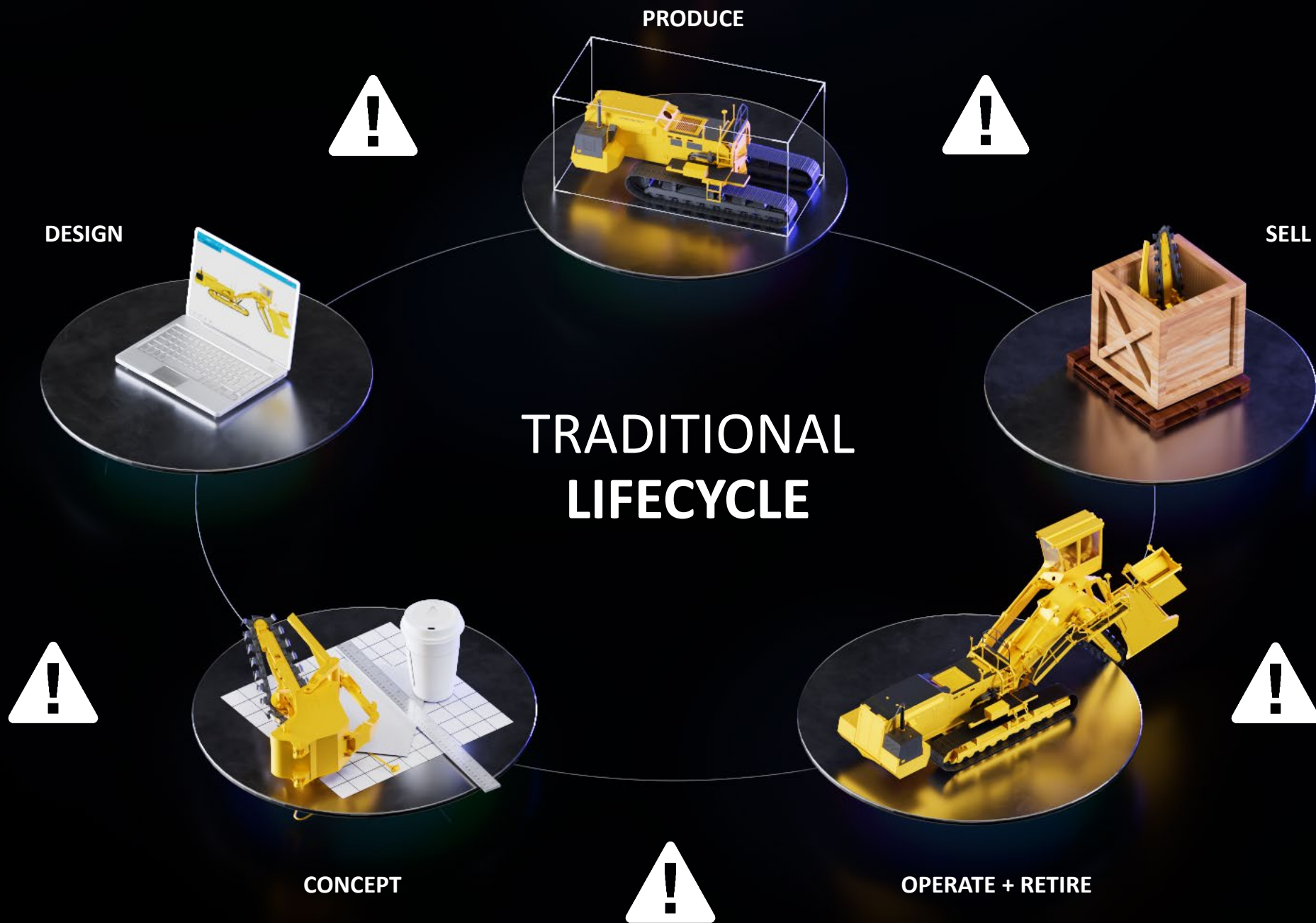
of business data
goes unused*

*Source: IDC Report

NEW WAY

OLD WAY







MASS CUSTOMIZATION

```
graph TD; PRODUCE --- SELL; SELL --- OPERATE_RETIRE[OPERATE + RETIRE]; OPERATE_RETIRE --- CONCEPT; CONCEPT --- DESIGN; DESIGN --- PRODUCE
```

Sales Automation

Increase Win Rate

- Generate customer demand by making information and data available earlier in the process.
- Ensure data reuse and consistency from the beginning of the sales cycle.
- Execute sales specific workflows adhering to rules and parameters.





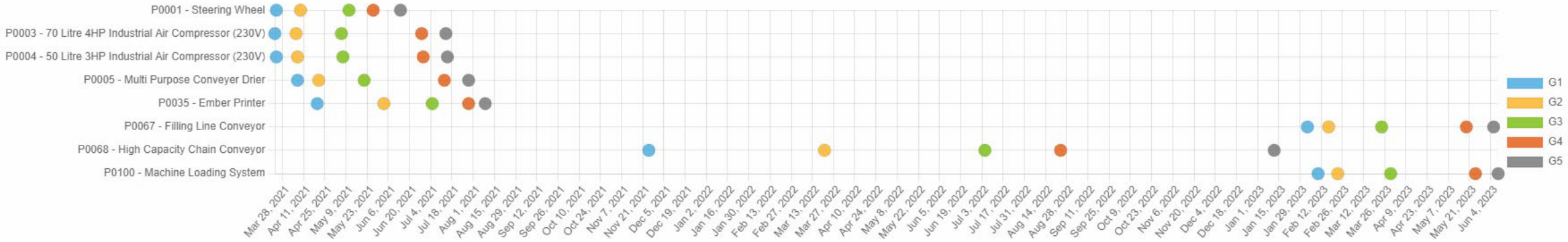
Project Management

New Product Introduction

- Utilise project templates to define all related information, ensuring everyone has visibility of what's happening and where.
- Align all stakeholders across various departments by managing tasks and deliverables needed to define, develop, and launch a new product on time.



Gates Timeline



Status Report

Project	Schedule	Resources	Budget	Risks
P0001 - Steering Wheel	2	2	3	2
P0003 - 70 Litre 4HP Industrial Air Compressor (230V)				
P0004 - 50 Litre 3HP Industrial Air Compressor (230V)				
P0005 - Multi Purpose Conveyor Drier	2	2	4	1
P0035 - Ember Printer	3	3	1	2
P0067 - Filling Line Conveyor	2	2	3	2
P0068 - High Capacity Chain Conveyor	2	2	2	3
P0100 - Machine Loading System	2	2	2	3

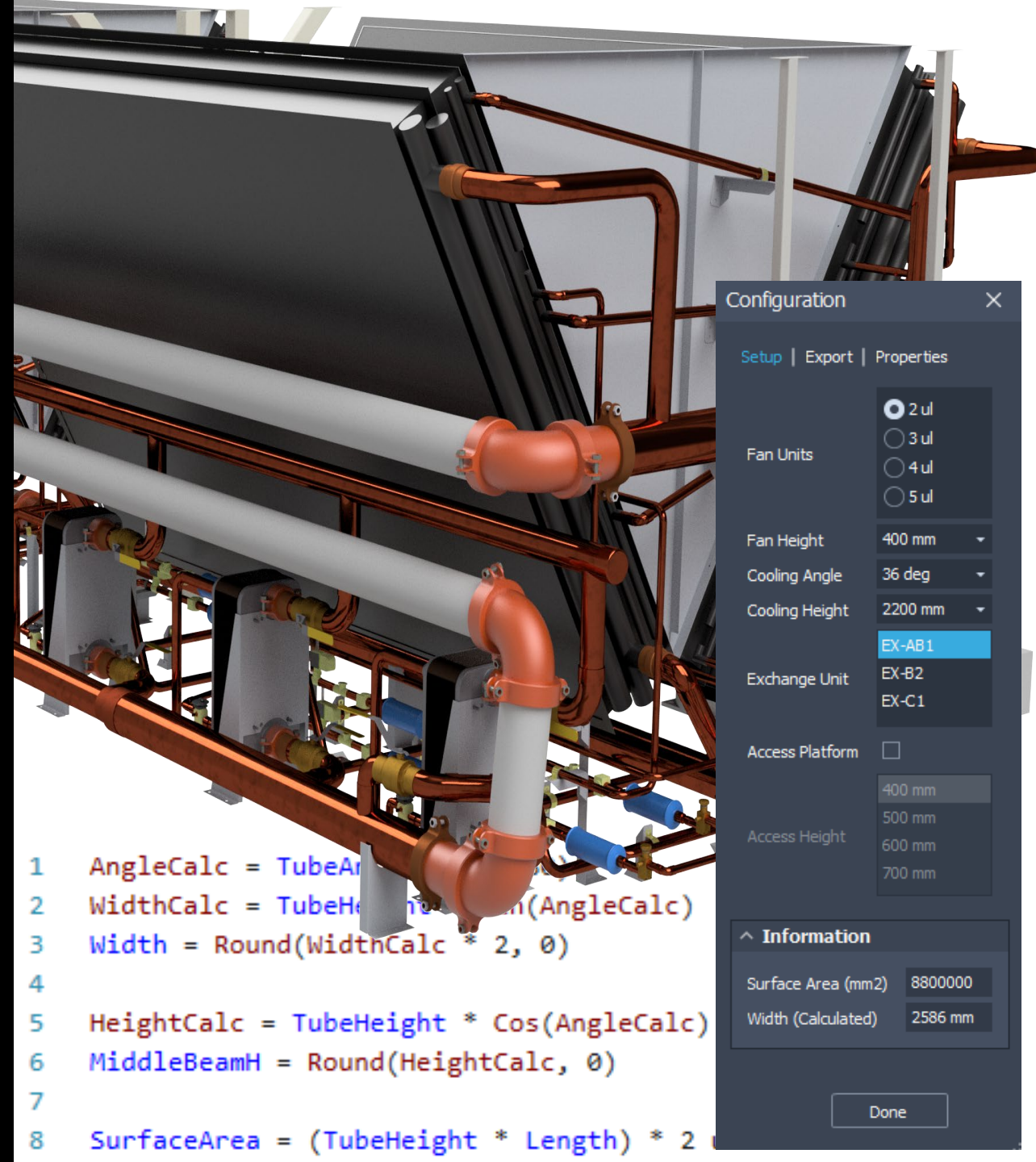
KPIs

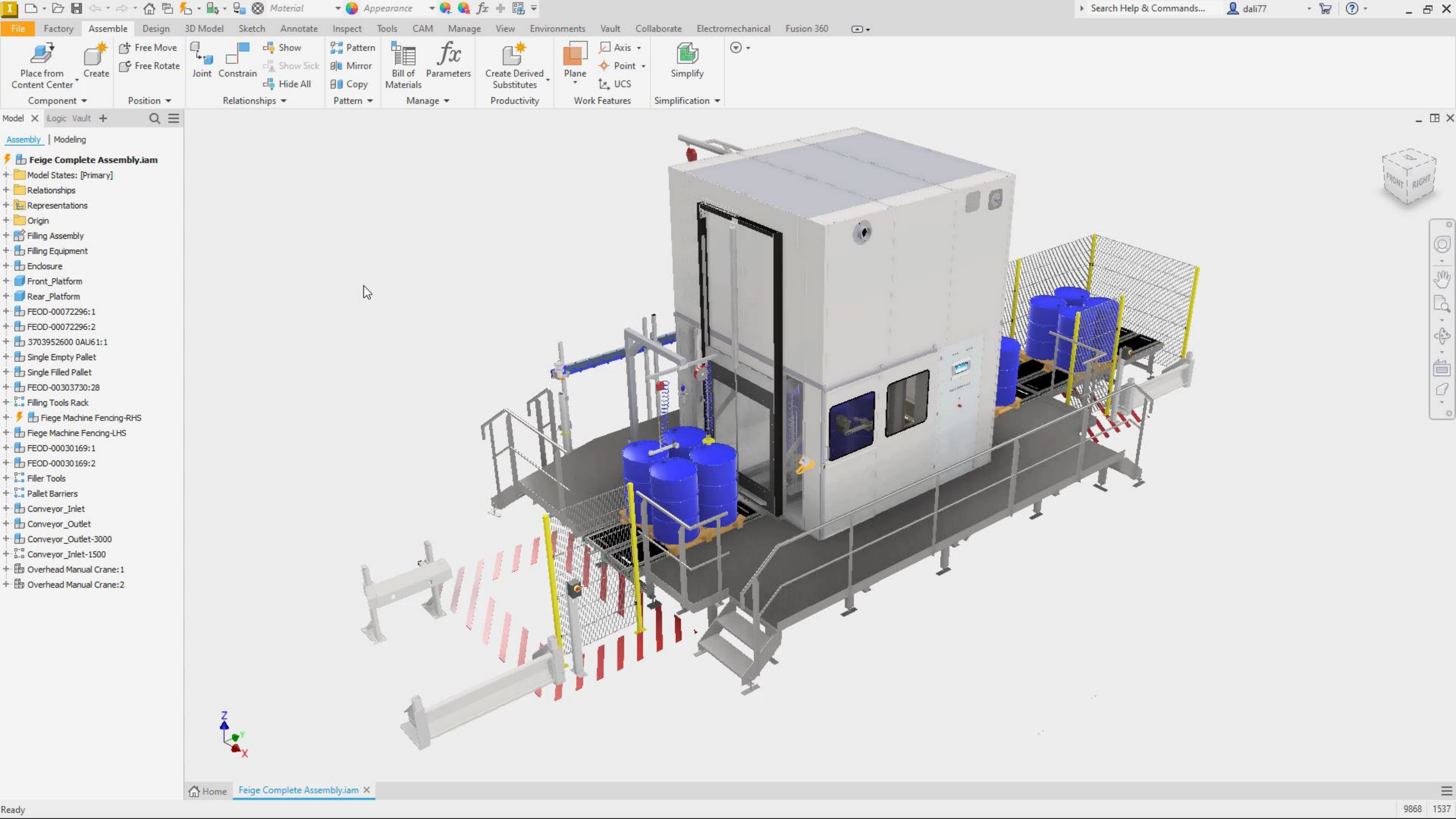
Project	Progress	Budget	Phase Progress
P0001 - Steering Wheel	G1 G2 G3 G4 G5	109%	
P0003 - 70 Litre 4HP Industrial Air Compressor (230V)	G1 G2 G3 G4 G5	75%	
P0004 - 50 Litre 3HP Industrial Air Compressor (230V)	G1 G2 G3 G4 G5	133%	38%
P0005 - Multi Purpose Conveyor Drier	G1 G2 G3 G4 G5	105%	62%
P0035 - Ember Printer	G1 G2 G3 G4 G5	72%	100%
P0067 - Filling Line Conveyor	G1 G2 G3 G4 G5	10%	78%
P0068 - High Capacity Chain Conveyor	G1 G2 G3 G4 G5	28%	90%
P0100 - Machine Loading System	G1 G2 G3 G4 G5	8%	78%

Design Automation

Reduce Non-Value-Add Processes

- Develop reusable designs and automate repetitive tasks.
- Ensure consistent design approaches whilst adhering to specific rules and parameters.
- Provides the foundation to additional process automation capabilities.





Viewrail

Manufacturer of stair parts & custom staircase systems

“

We went from completing an average of 3 engineer-to-order stair systems a week to 150 projects a month.

”

JJ Johnson

Chief Operating Officer



DIGITAL COLLABORATION

The diagram illustrates a digital collaboration process. At the center is a 3D model of a yellow construction crane. Surrounding this central model is a circular flow of five stages, each represented by a dark blue circle with white text: PRODUCE (at the top), DESIGN (top-left), CONCEPT (bottom-left), OPERATE + RETIRE (bottom-right), and SELL (top-right). The stages are connected by a thin white line. The entire scene is set against a dark background. In the bottom-left corner, the text 'MASS CUSTOMIZATION' is displayed. Two circular platforms are visible: one in the top-left showing a wireframe model of the crane with two small human figures, and another in the bottom-right showing a solid yellow model of the crane.

MASS
CUSTOMIZATION

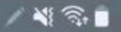
Data Management

Improve Time to Market

- Speeds up the product development process but utilizing a central data environment for all design related documentation.
- Enables collaboration across projects, combining work across disciplines, consistent reviewing of designs and helps deliver data to downstream stakeholders and customers.



12:00 Fri, 5 Aug



Search



Samsung



Google



Microsoft



Galaxy Picks



Play Store



Galaxy Store



Samsung Notes



My Files



Phone



Messages



Internet



Camera



Gallery



Calculator



Calendar



Clock



Settings



YT Music



Spotify



Zoom



Sketchbook



Quick measure



Kindle



Vault



Supply Chain Management

Improve Supply Chain Agility

- Collaborate and capture insights across the entire organization, from design to manufacturing and suppliers.
- Enable project members to make informed decisions quickly by breaking down data silos and having access to the right data at the right time.





Untitled



AUTODESK FUSION 360
Pilot Project Team Hub

+ New...

Open...

Recent Data

Projects

Process

Settings

All Projects

- > 3D Printer Projects
- > Admin Project
- > Assets
- > Collaboration
- > Default Project
- > Generative Design
- > **Mechanical Equipment Project** ...

Mechanical Equipment Project

[Content](#) [Project Members \(4\)](#)

Upload

New Folder



<input type="checkbox"/>	Name ▲	Owner	Size	Last Updated
<input type="checkbox"/>	Trash			
<input type="checkbox"/>	Design Files	Timucin Tasdemir		Oct 28, 2021
<input type="checkbox"/>	Generative Design	Timucin Tasdemir		Jun 3, 2021
<input type="checkbox"/>	House	Timucin Tasdemir		Jun 27, 2020
<input type="checkbox"/>	Office Files	Timucin Tasdemir		Apr 20, 2019
<input type="checkbox"/>	Simulation	Timucin Tasdemir		Oct 28, 2021
<input type="checkbox"/>	Supplier Files	Timucin Tasdemir		1 day ago

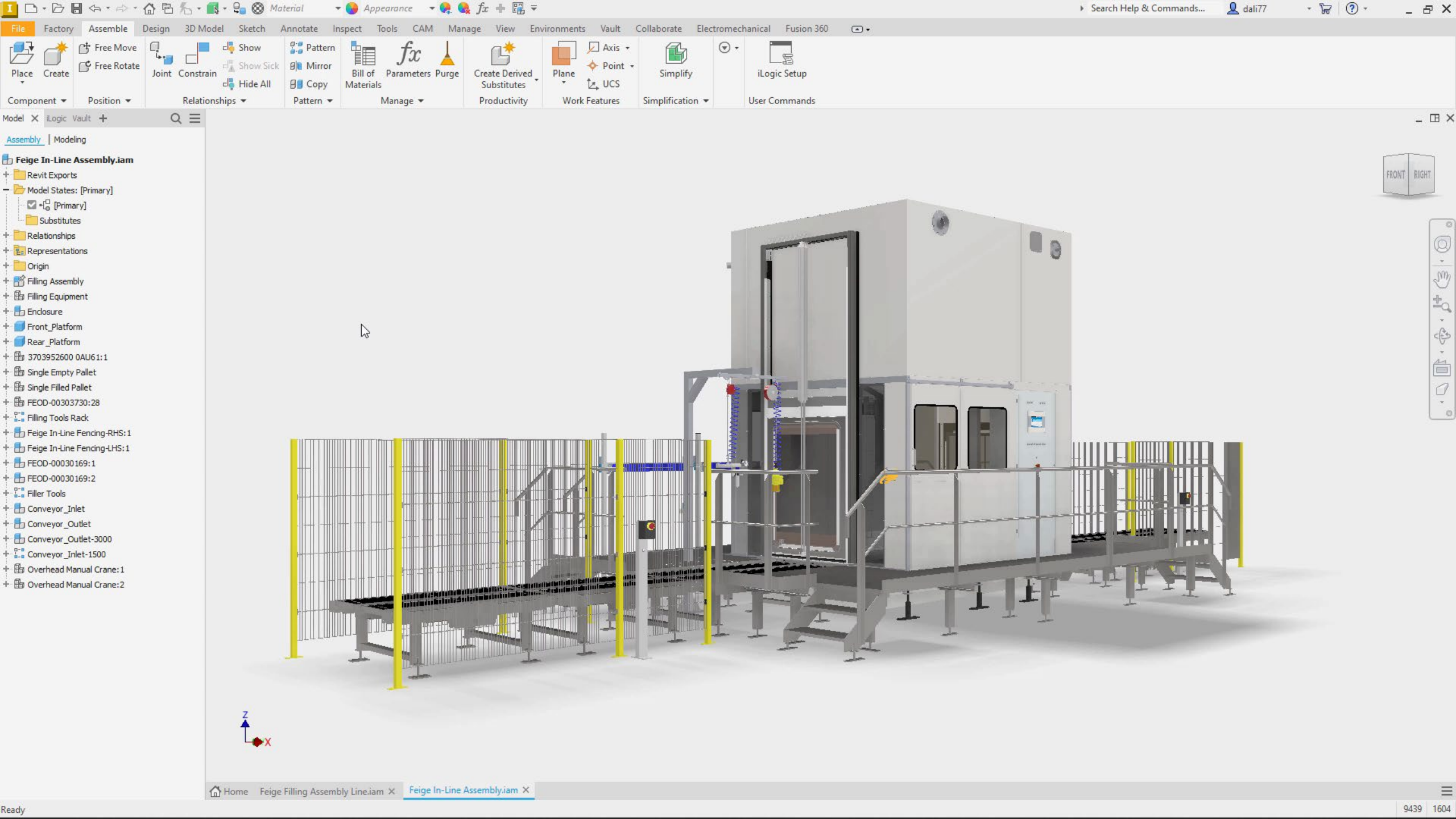
Project Details

Design Collaboration

Improve Collaboration

- Enable multiple departments, suppliers, and clients to consume design data in formats that offer greater levels of value.
- Improve how decisions in one part of the process, influence the outcomes of all related stakeholders.





Benson Industries

Building Products

“

**Our design delays were reduced
by 50% and product errors
lowered by 40%.**

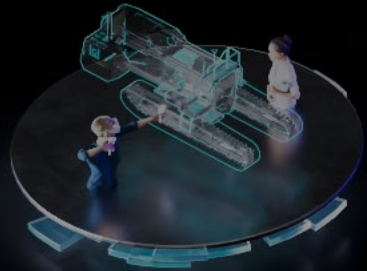
”

Radu Stancescu

Autodesk Inventor Administrator



**DIGITAL
COLLABORATION**



FLEXIBLE MANUFACTURING

DESIGN

SELL

CONCEPT

OPERATE +
RETIRE

**MASS
CUSTOMIZATION**

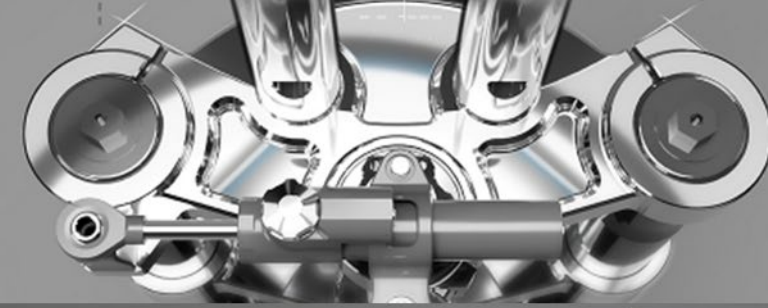


Design for Manufacture

Increase Product Development Agility

- Transform product development by exploring greater design iterations in less time.
- Reduce product cost with more informed decisions, from material selection, manufacturing methods and product performance.
- Improve product performance through light weighting, increased structural integrity and extended durability.

Human Design
Weight **3 kg**
Safety Factor **2.7**
Cost **\$**



2.5 Axis Generative
Weight **2.3 kg (-23%)**
Safety Factor **2.2**
Cost **\$**

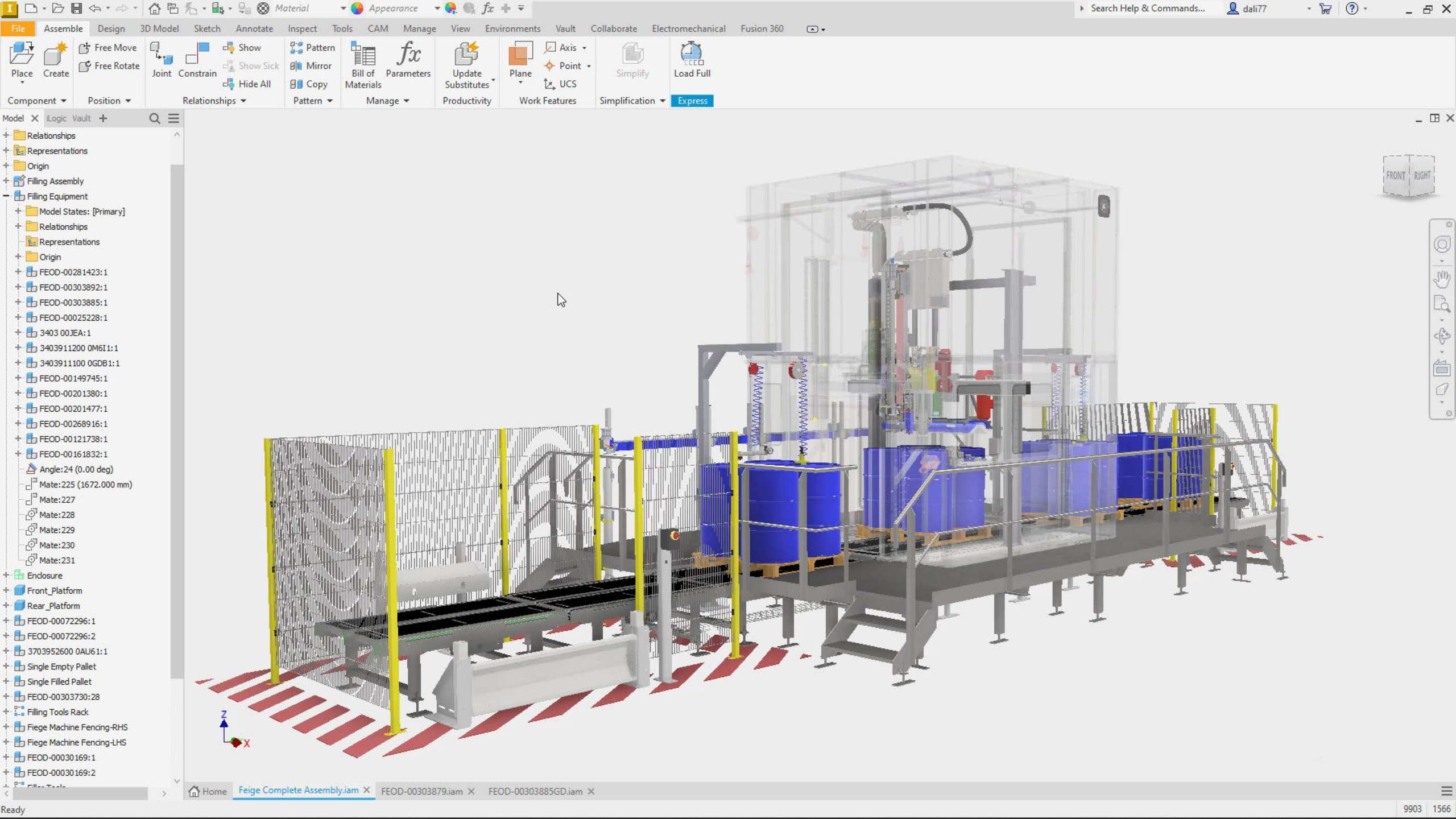


3 Axis Generative
Weight **2.3 kg (-23%)**
Safety Factor **2.3**
Cost **\$\$**



Additive Generative
Weight **2.2 kg (-26%)**
Safety Factor **2**
Cost **\$\$\$**



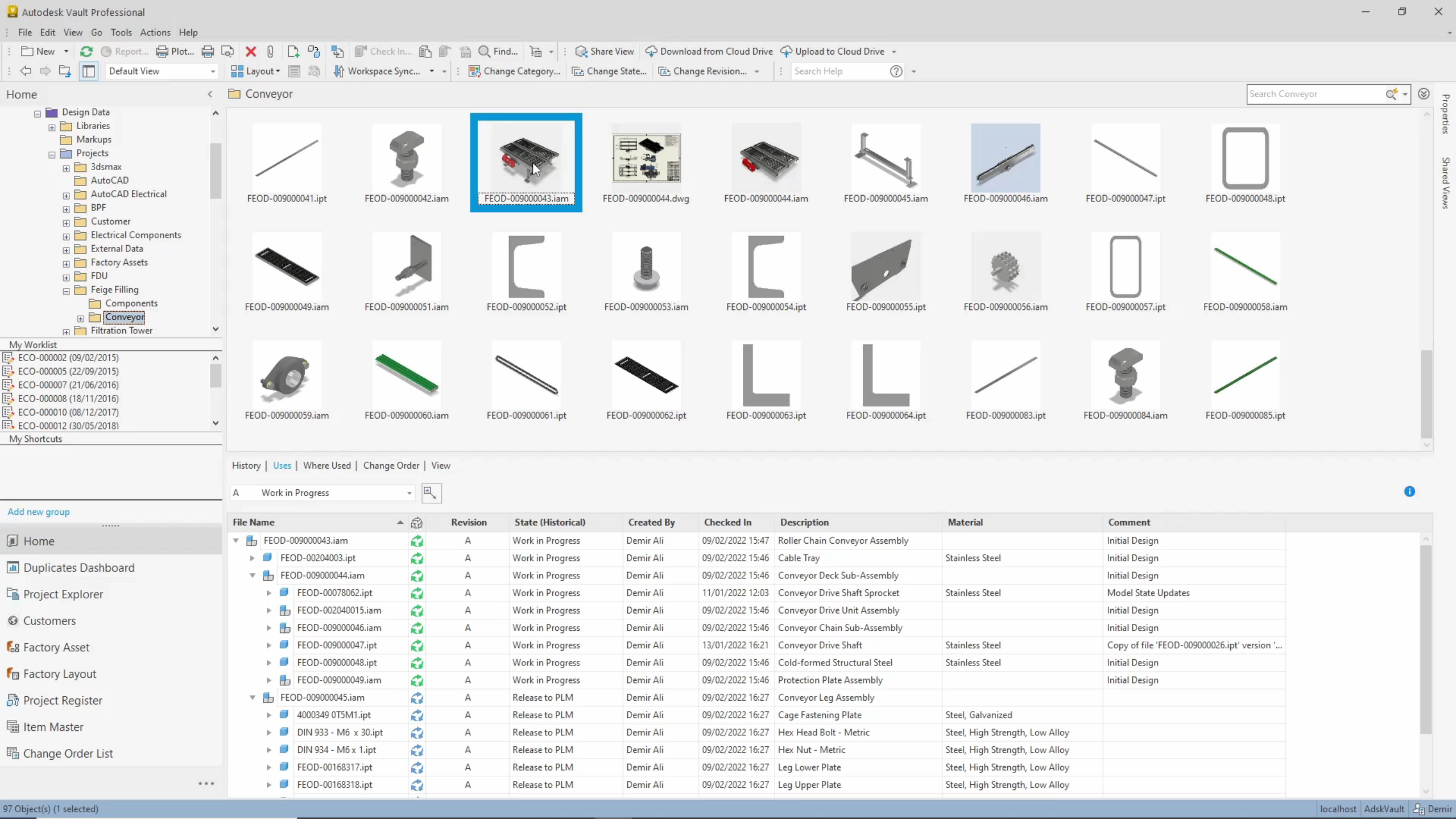


Bill of Materials Management

Reduce Defects & Non-Conformities

- Generate and share your BOM with downstream functions, so they are working with a complete definition of the product for better product performance and business results.
- Ensure everyone is referencing the correct version and reduce the risk of downstream errors and re-work.





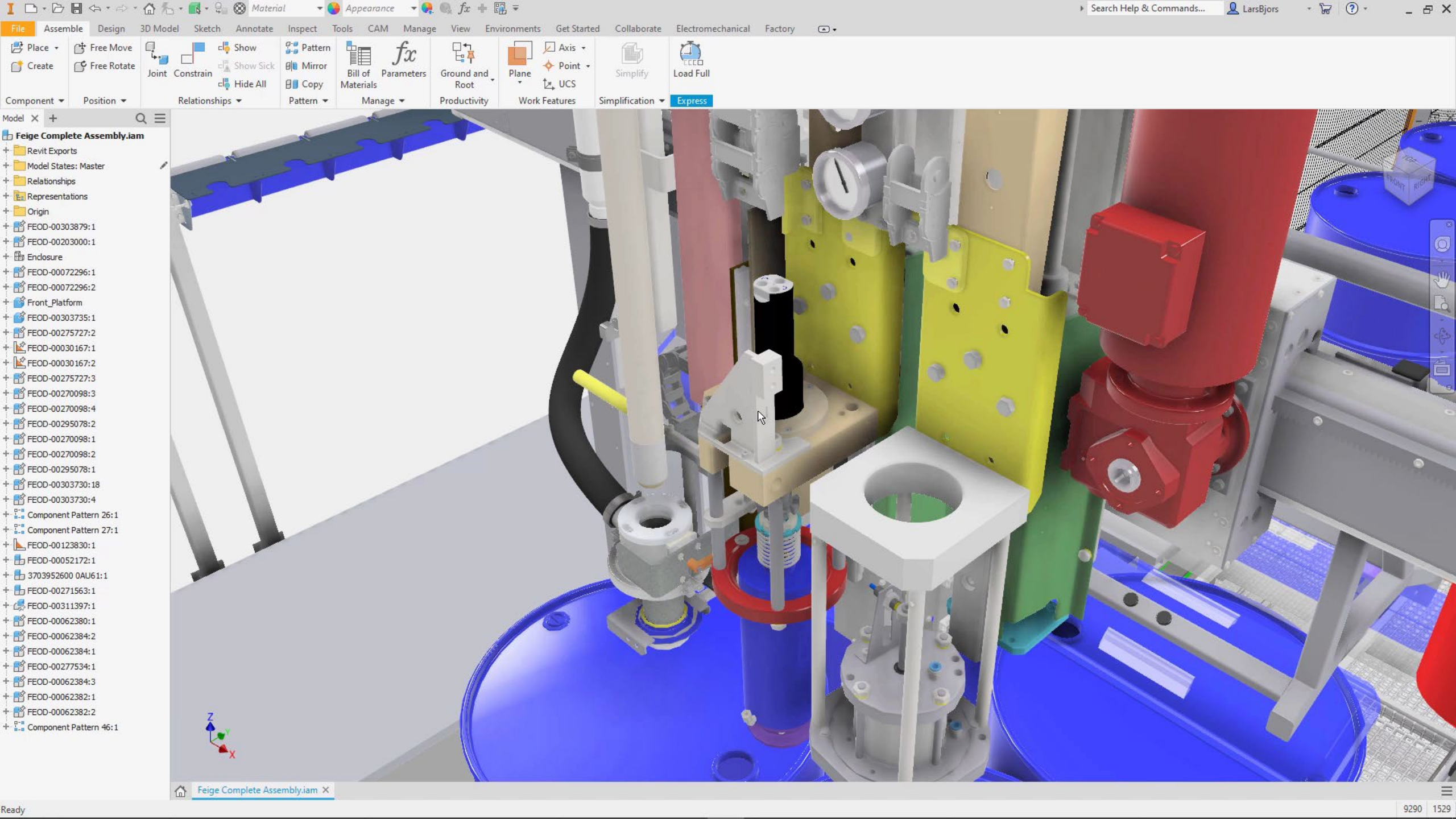
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FEOD-009000043.iam	A	Work in Progress	Demir Ali	09/02/2022 15:47	Roller Chain Conveyor Assembly		Initial Design
FEOD-00204003.ipt	A	Work in Progress	Demir Ali	09/02/2022 15:46	Cable Tray	Stainless Steel	Initial Design
FEOD-009000044.iam	A	Work in Progress	Demir Ali	09/02/2022 15:46	Conveyor Deck Sub-Assembly		Initial Design
FEOD-00078062.ipt	A	Work in Progress	Demir Ali	11/01/2022 12:03	Conveyor Drive Shaft Sprocket	Stainless Steel	Model State Updates
FEOD-002040015.iam	A	Work in Progress	Demir Ali	09/02/2022 15:46	Conveyor Drive Unit Assembly		Initial Design
FEOD-009000046.iam	A	Work in Progress	Demir Ali	09/02/2022 15:46	Conveyor Chain Sub-Assembly		Initial Design
FEOD-009000047.ipt	A	Work in Progress	Demir Ali	13/01/2022 16:21	Conveyor Drive Shaft	Stainless Steel	Copy of file 'FEOD-009000026.ipt' version '...
FEOD-009000048.ipt	A	Work in Progress	Demir Ali	09/02/2022 15:46	Cold-formed Structural Steel	Stainless Steel	Initial Design
FEOD-009000049.iam	A	Work in Progress	Demir Ali	09/02/2022 15:46	Protection Plate Assembly		Initial Design
FEOD-009000045.iam	A	Release to PLM	Demir Ali	09/02/2022 16:27	Conveyor Leg Assembly		
4000349 0T5M1.ipt	A	Release to PLM	Demir Ali	09/02/2022 16:27	Cage Fastening Plate	Steel, Galvanized	
DIN 933 - M6 x 30.ipt	A	Release to PLM	Demir Ali	09/02/2022 16:27	Hex Head Bolt - Metric	Steel, High Strength, Low Alloy	
DIN 934 - M6 x 1.ipt	A	Release to PLM	Demir Ali	09/02/2022 16:27	Hex Nut - Metric	Steel, High Strength, Low Alloy	
FEOD-00168317.ipt	A	Release to PLM	Demir Ali	09/02/2022 16:27	Leg Lower Plate	Steel, High Strength, Low Alloy	
FEOD-00168318.ipt	A	Release to PLM	Demir Ali	09/02/2022 16:27	Leg Upper Plate	Steel, High Strength, Low Alloy	

Manufacturing Process Automation

Increase Manufacturing Throughput

- Reduce non-value add processes by simulating and verifying machining, reducing downtime and resulting in safe, optimized toolpaths, providing confidence for unattended production.
- Improve production times by utilizing on machine verification for automated setup, machining validation and helping connect final inspection.





WARREN SERVICES

Sub-Contract Manufacturer

“

We have identified how to cut the production planning cycle in half, with no loss in quality or accuracy.

”

William Bridgman
Chairman

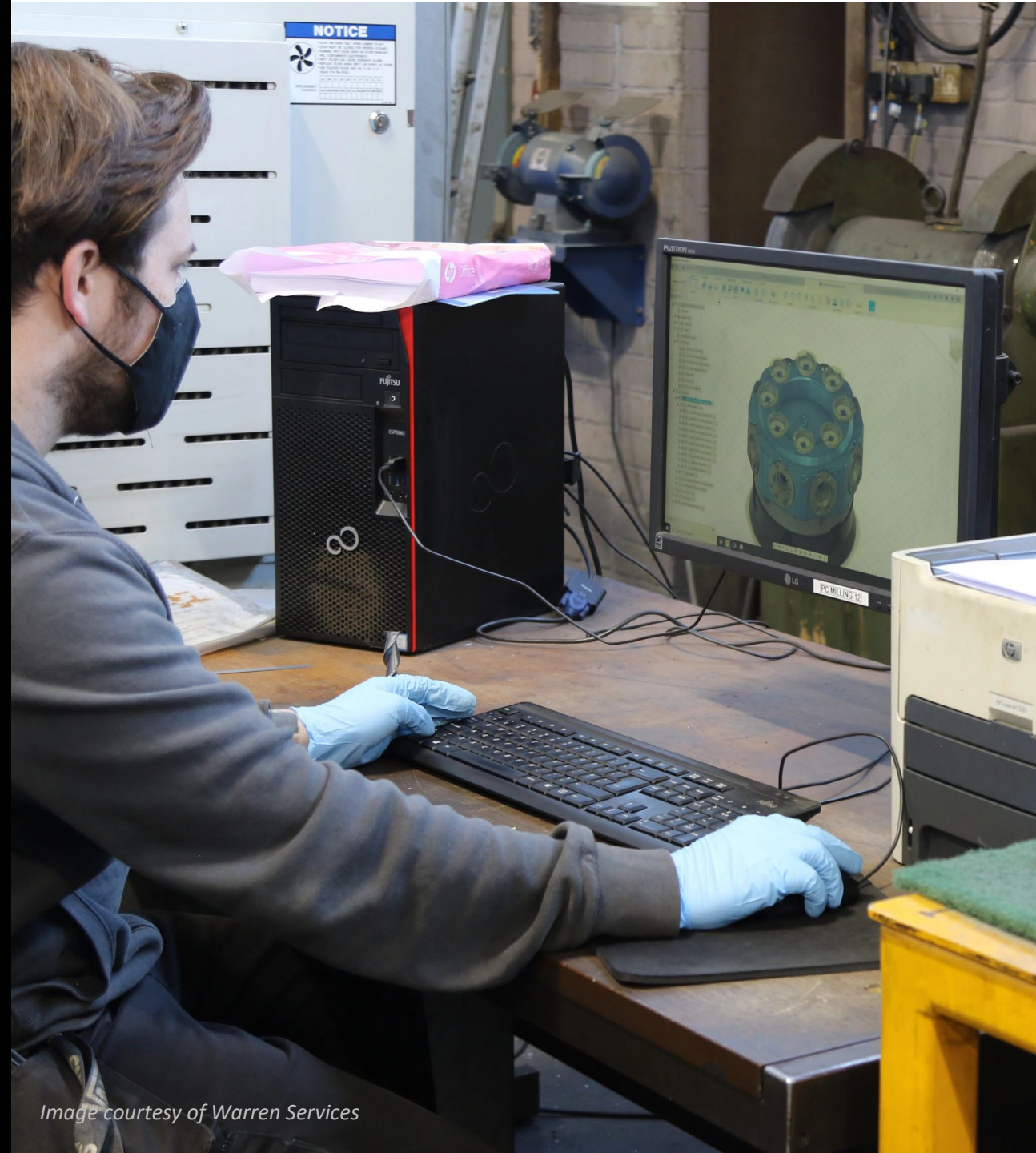


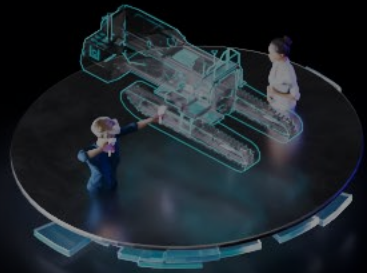
Image courtesy of Warren Services

**DIGITAL
COLLABORATION**

**FLEXIBLE
MANUFACTURING**

CUSTOMER EXPERIENCE

**MASS
CUSTOMIZATION**



DESIGN

SELL

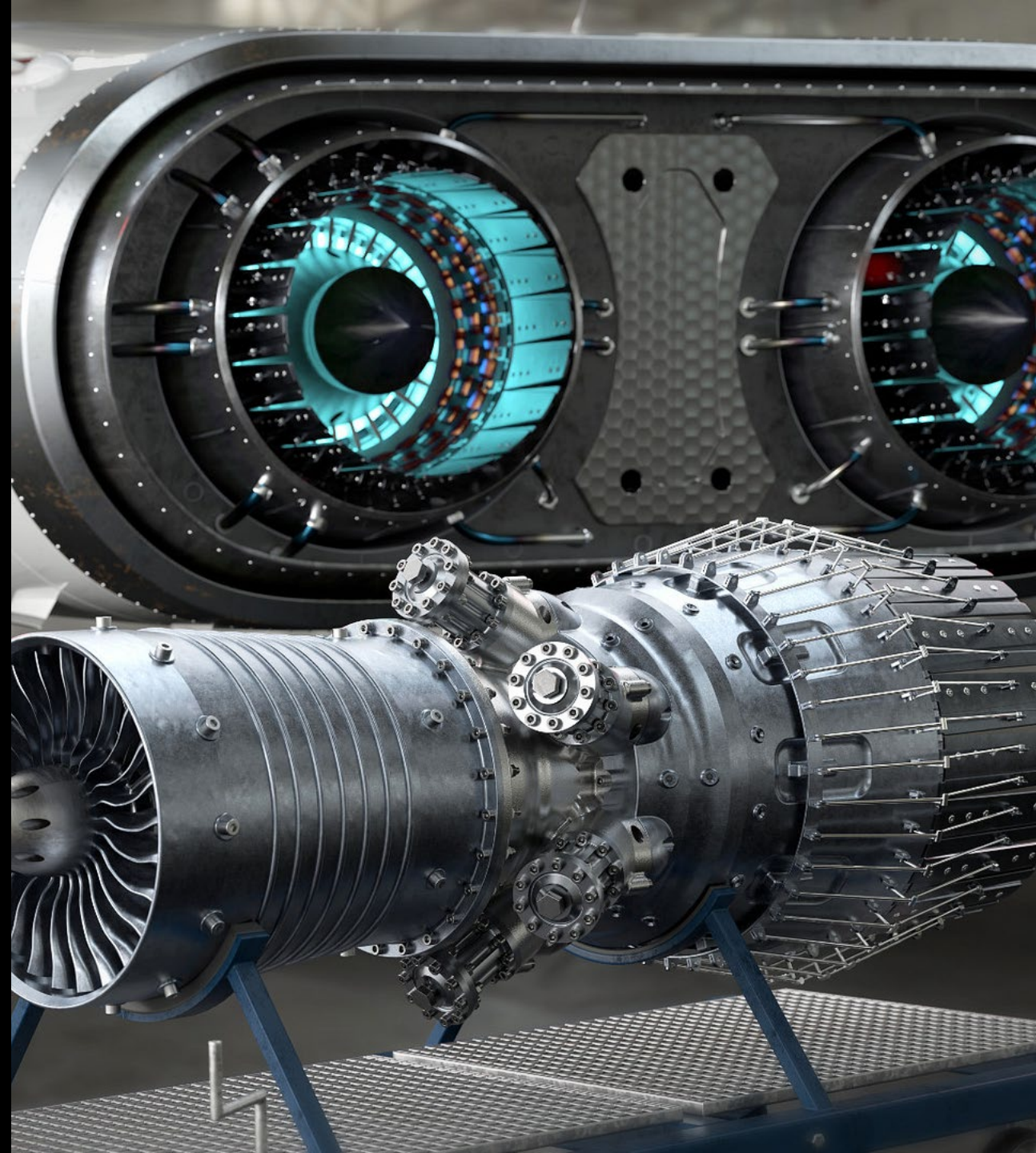
CONCEPT

OPERATE +
RETIRE

Design Visualisation

Improve Sales Cycle Time

- Enable teams to work together, developing and realising concepts earlier, whilst iterating designs faster.
- Enable customers to buy into ideas sooner, by presenting product options or by demonstrating how it's going to function, all prior to manufacturing.



File Assemble Design 3D Model Sketch Annotate Inspect Tools Manage View Environments Collaborate Electromechanical Fusion 360

Object Visibility iMate Glyphs Center of Gravity Degrees of Freedom Half Section View Slice Graphics Visual Style Visual Presets Perspective Textures On Shadows Ground Plane Refine Appearance Reflections One Light Ray Tracing User Interface Clean Screen Switch Arrange New Reset UI Layout Windows Full Navigation Wheel Pan Zoom Previous Orbit Home View Navigate



Service Parts Management

Increase Market Share

- Provide greater value by ensuring everyone who needs it, has access to the latest information.
- Benefit further from the valuable model data, by using it to assist installation teams, operators and equipment maintenance personnel.





Wokingham

UV index : Low Humidity : 91%



11°



Fri

Sat

Sun

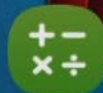
Mon

Tue

08:32



Clock



Calculator



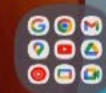
Microsoft



Fusion 360 Manage



Play Store



Google



Hosokawa Micron Ltd

Particle & Powder Processing

“

Demonstrating changes
live in this way has cut 4 ~
6 weeks off delivery times

”

Adam Harper

Product Manager (High Containment)



**FLEXIBLE
MANUFACTURING**

**CUSTOMER
EXPERIENCE**

**DIGITAL
COLLABORATION**

SMART SERVICES

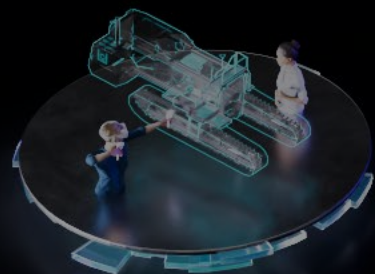
DESIGN

SELL

CONCEPT

OPERATE +
RETIRE

**MASS
CUSTOMIZATION**

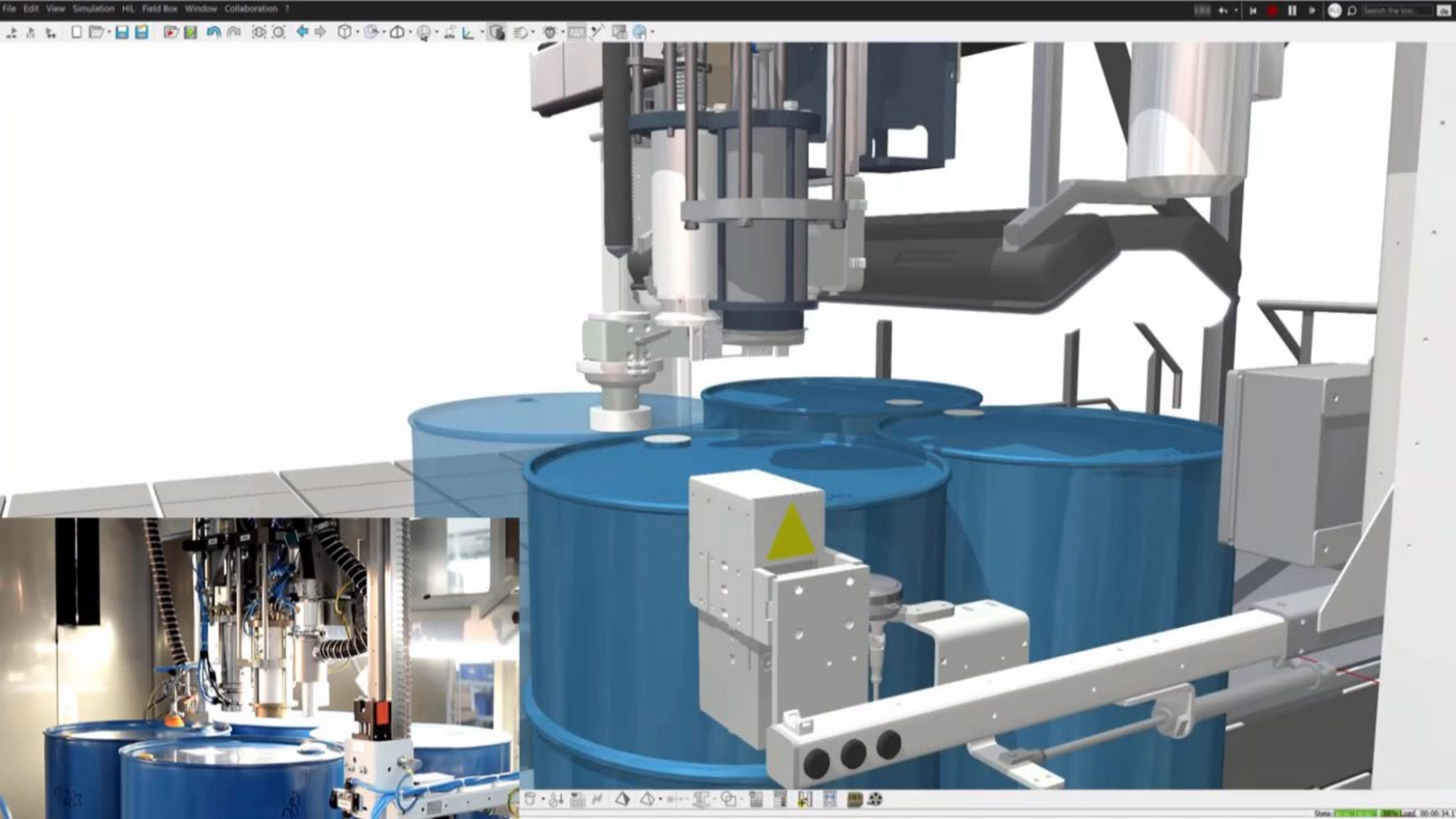


Machine Simulation

Reduce Resource Consumption

- Develop solutions faster by utilising the 3D data for virtual commissioning and the associated output to PLC systems.
- Improve quality and reliability by analysing in-production insights against the virtual representation.

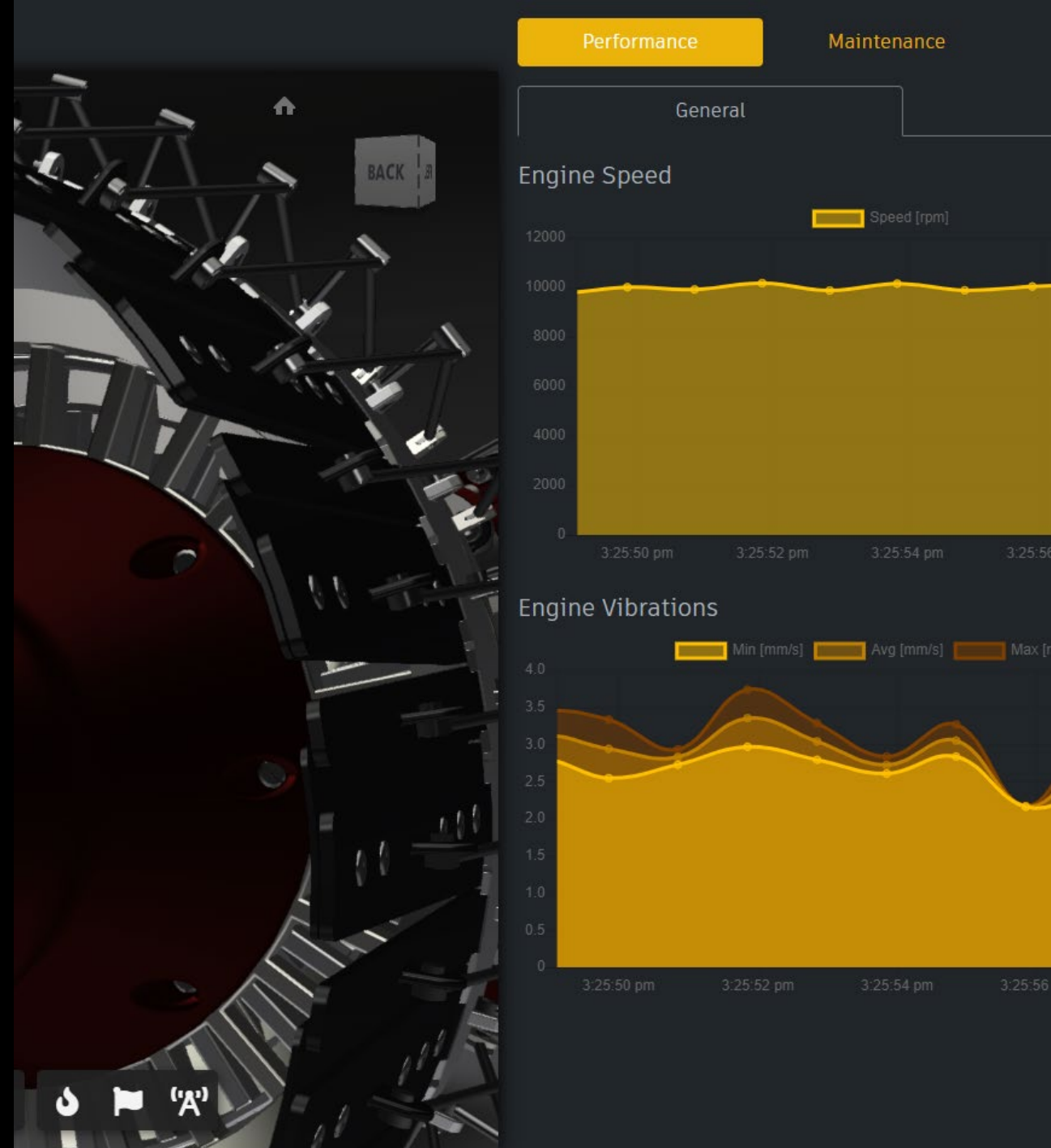




Digital Twin

Expand Product Offerings

- Provide a competitive differentiation by delivering digital representations of the customer assets.
- Connect various sources of data to help present and understand the health of a machine throughout its operational lifecycle.





dormakaba

Smart access and security solutions

“

We have gone from being a component manufacturer to a solution provider for smart networked access systems.

”

Alwin Berninger
COO DACH

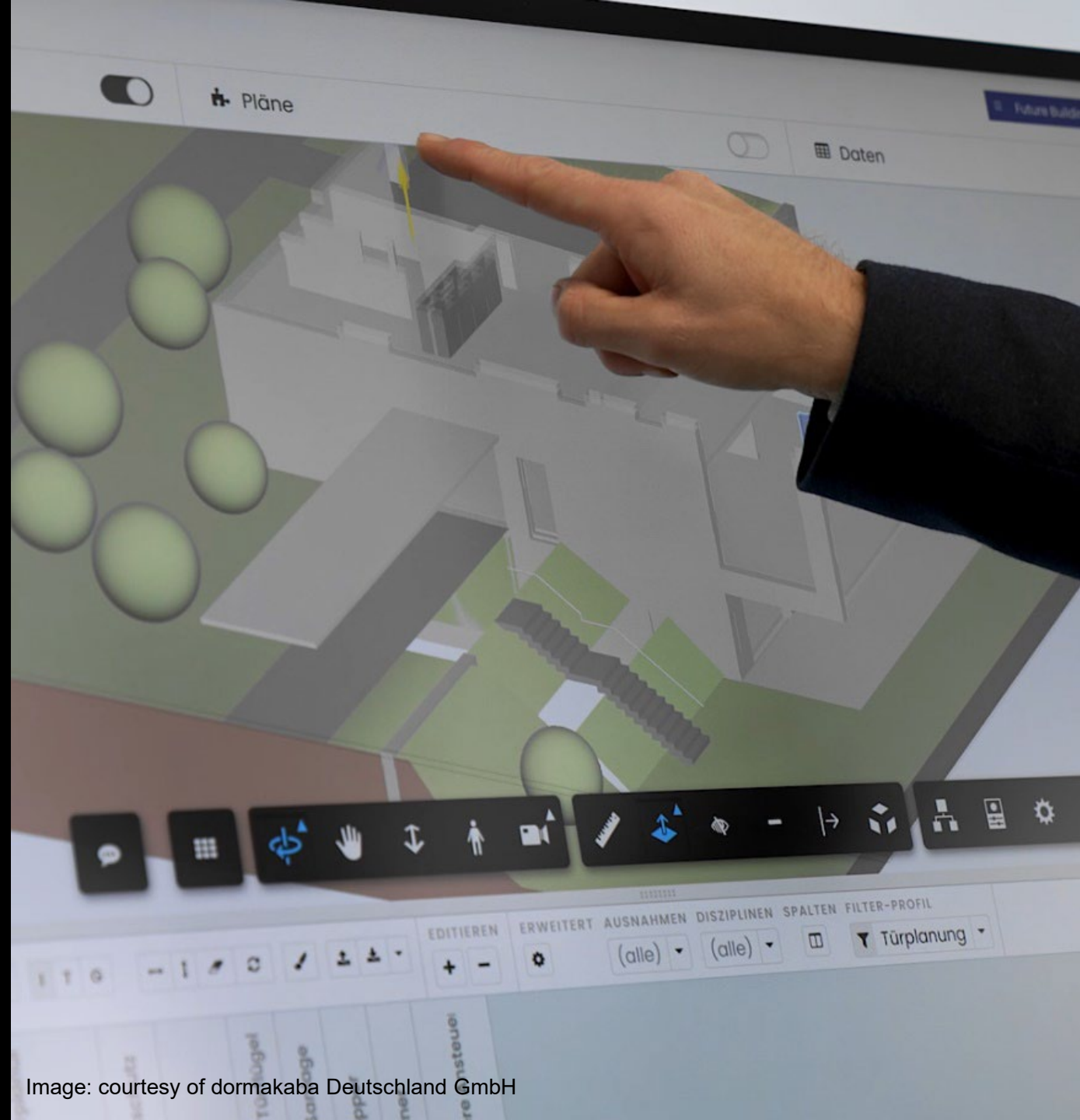


Image: courtesy of dormakaba Deutschland GmbH

**FLEXIBLE
MANUFACTURING**

**CUSTOMER
EXPERIENCE**

**DIGITAL
COLLABORATION**

**MASS
CUSTOMIZATION**

**SMART
SERVICES**



Digital transformation is yielding **benefits**



Cost
reductions



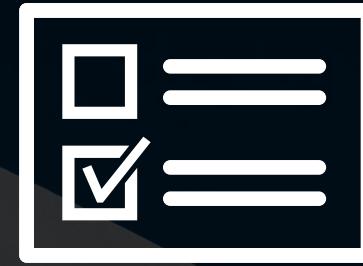
Increased
innovation



Improved ability
to launch product
and services faster



DIGITAL TRANSFORMATION WORKSHOP



DISCOVERY ACTIVITIES



IDENTIFY



QUANTIFY



JUSTIFY



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