



SIEMENS
Ingenuity for life

Industrialized Digital Additive Manufacturing

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Changing the way the world designs and manufactures



FOURTH INDUSTRIAL REVOLUTION



Artificial
Intelligence



Industrial
Internet
of Things



Big Data and
Analytics



Robotics



3D Printing

TRANSFORMING MANUFACTURING



Rapid
Innovation



Shorter Time
to Market



Less
Inventory



More Efficient
Supply Chains



Higher Capital
Efficiency



How an end-to-end Workflow supports Digital Manufacturing



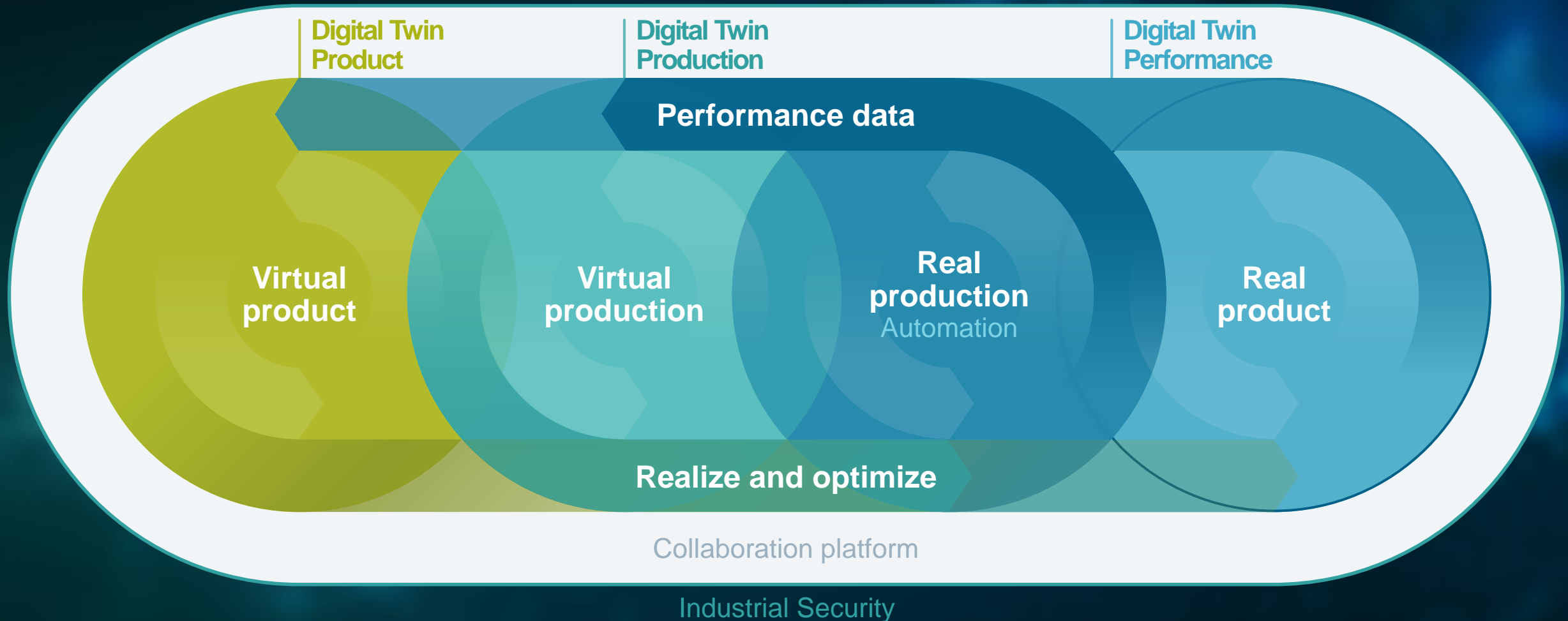
A duct inside the HP Jet Fusion 3D printer cools the printheads: 6 parts | costs of ~30 \$

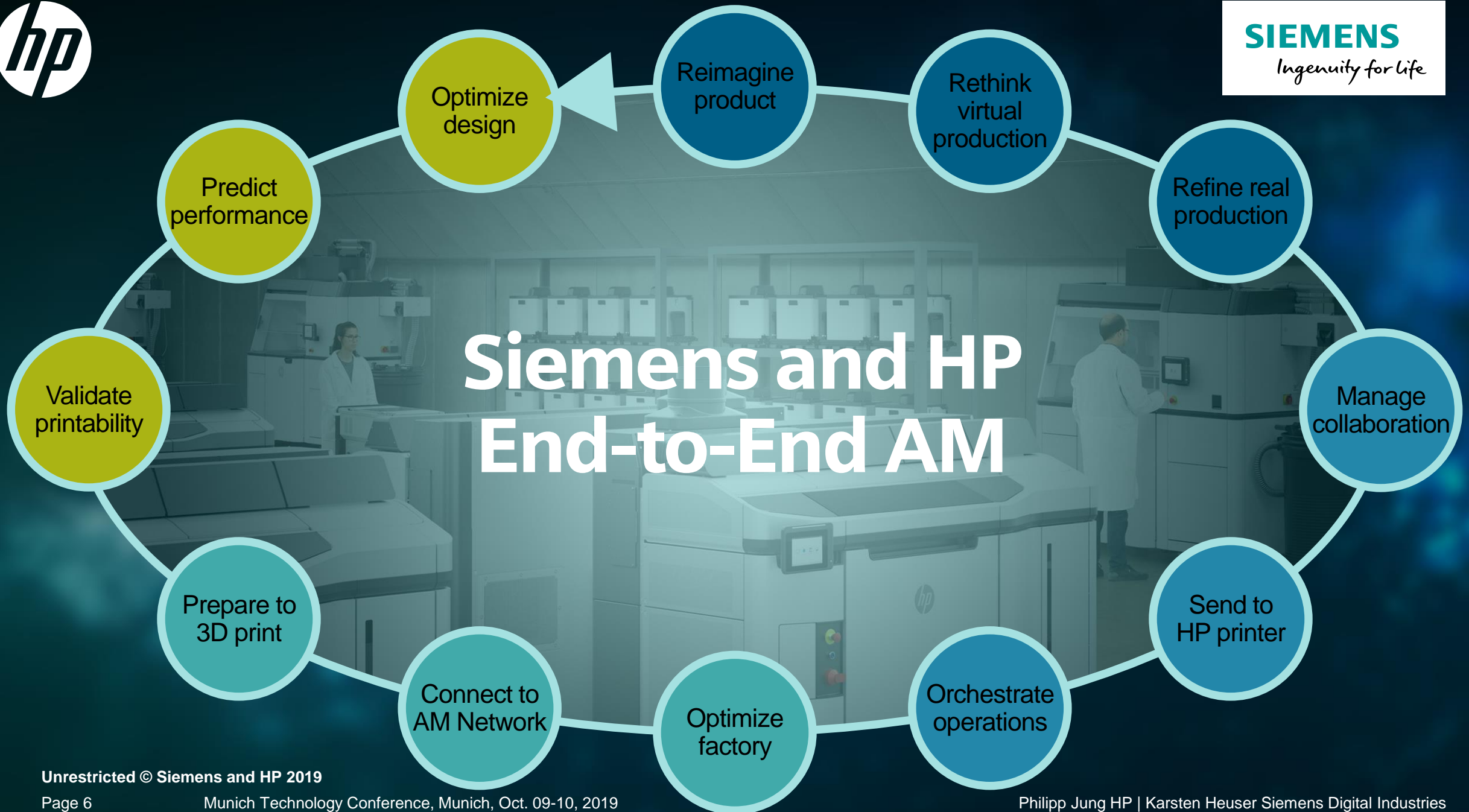


The more efficient the duct is, the faster the printheads can run...and the less they need changing.



Industrialized Additive Manufacturing with seamlessly integrated HP and Siemens solutions

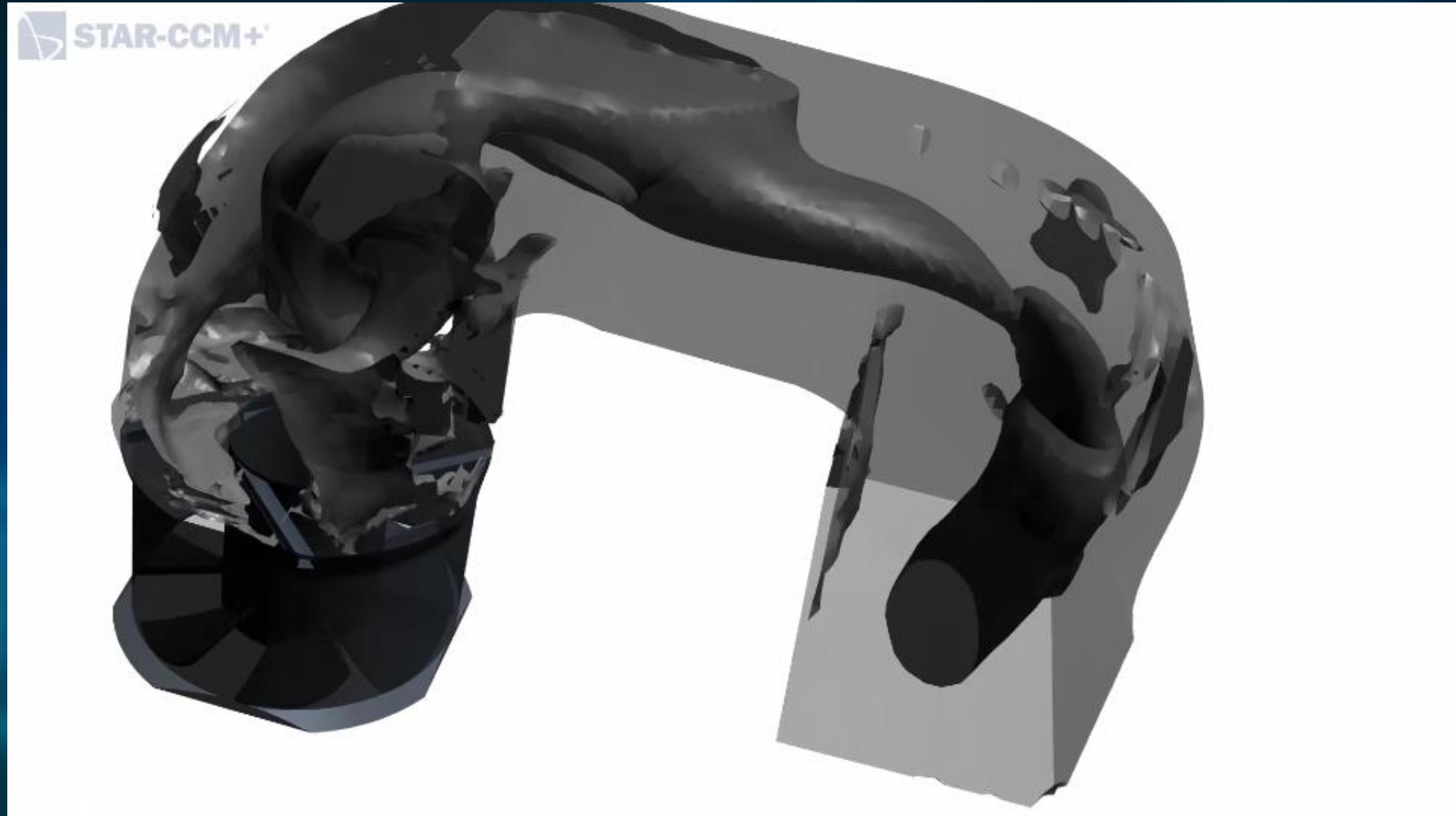
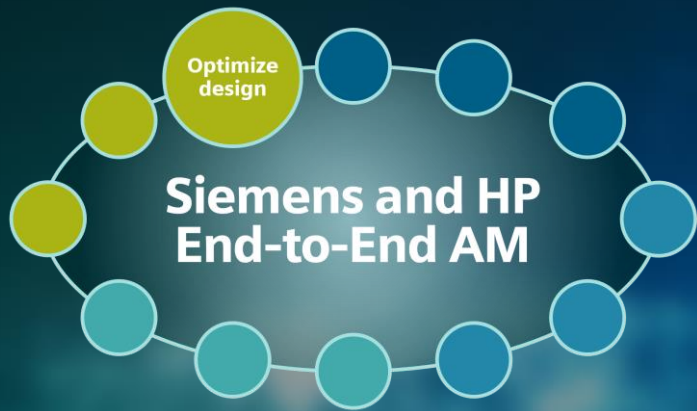




Siemens and HP End-to-End AM

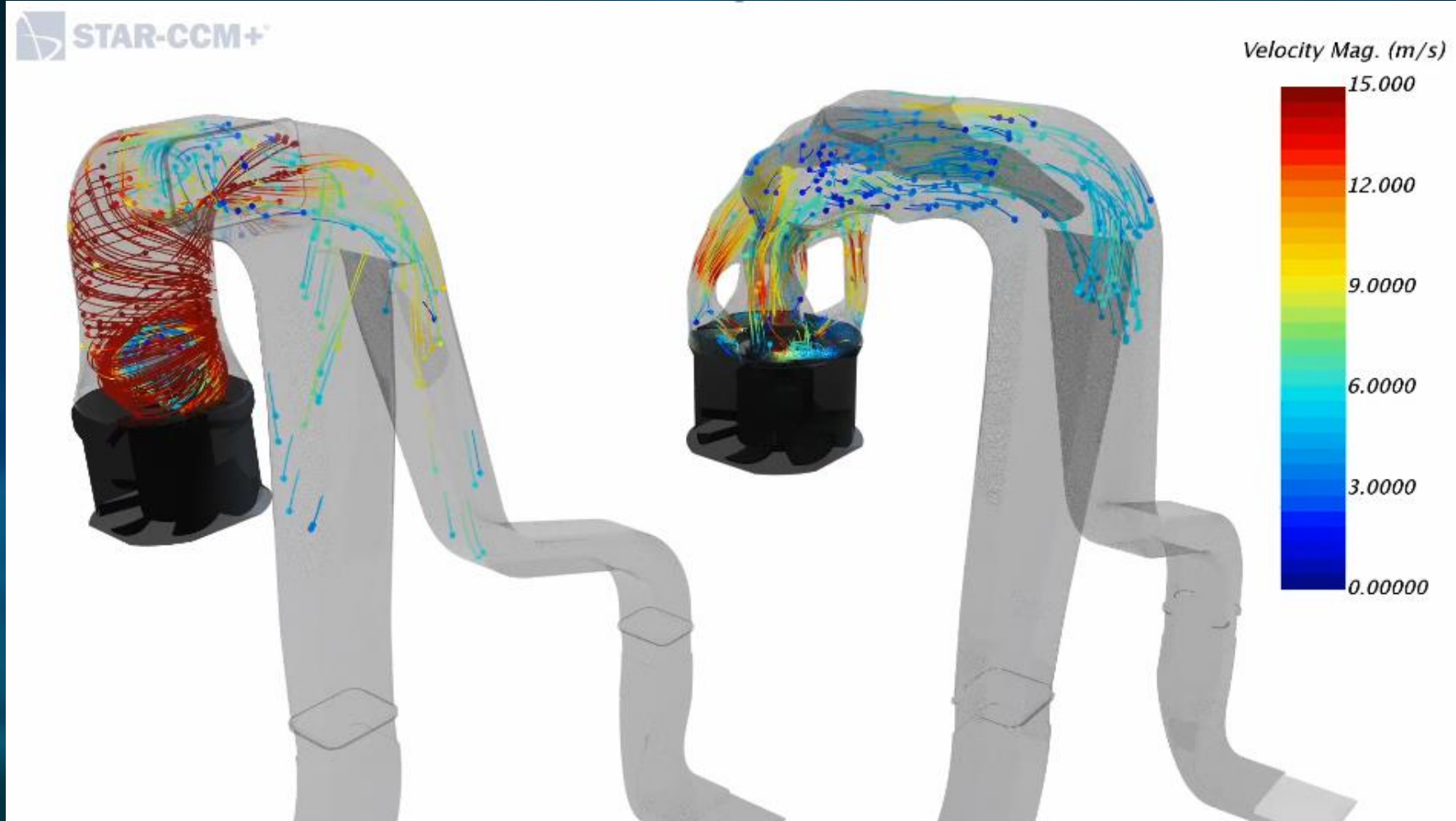
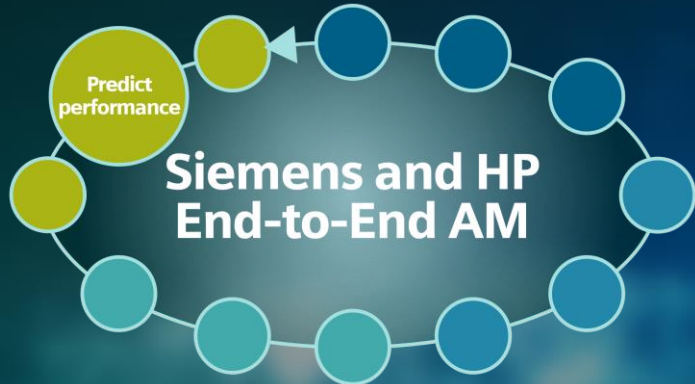


Use topology optimization and convergent modeling to reshape conventional parts



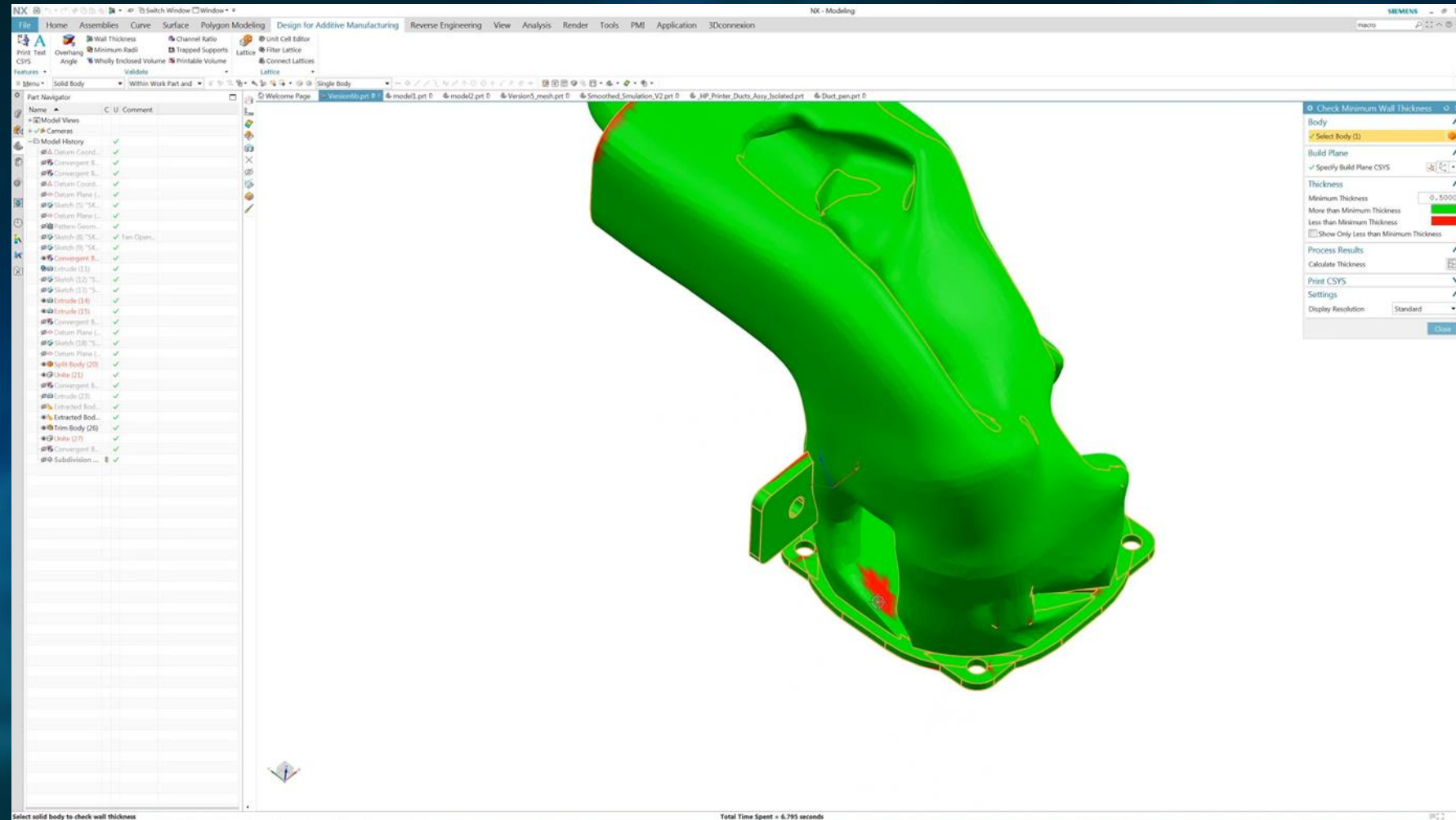
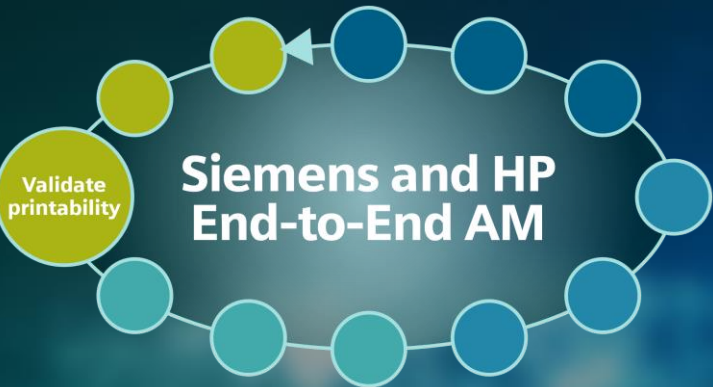


Analyze design for such loads as strength, acoustics, vibration, motion, flow and heat



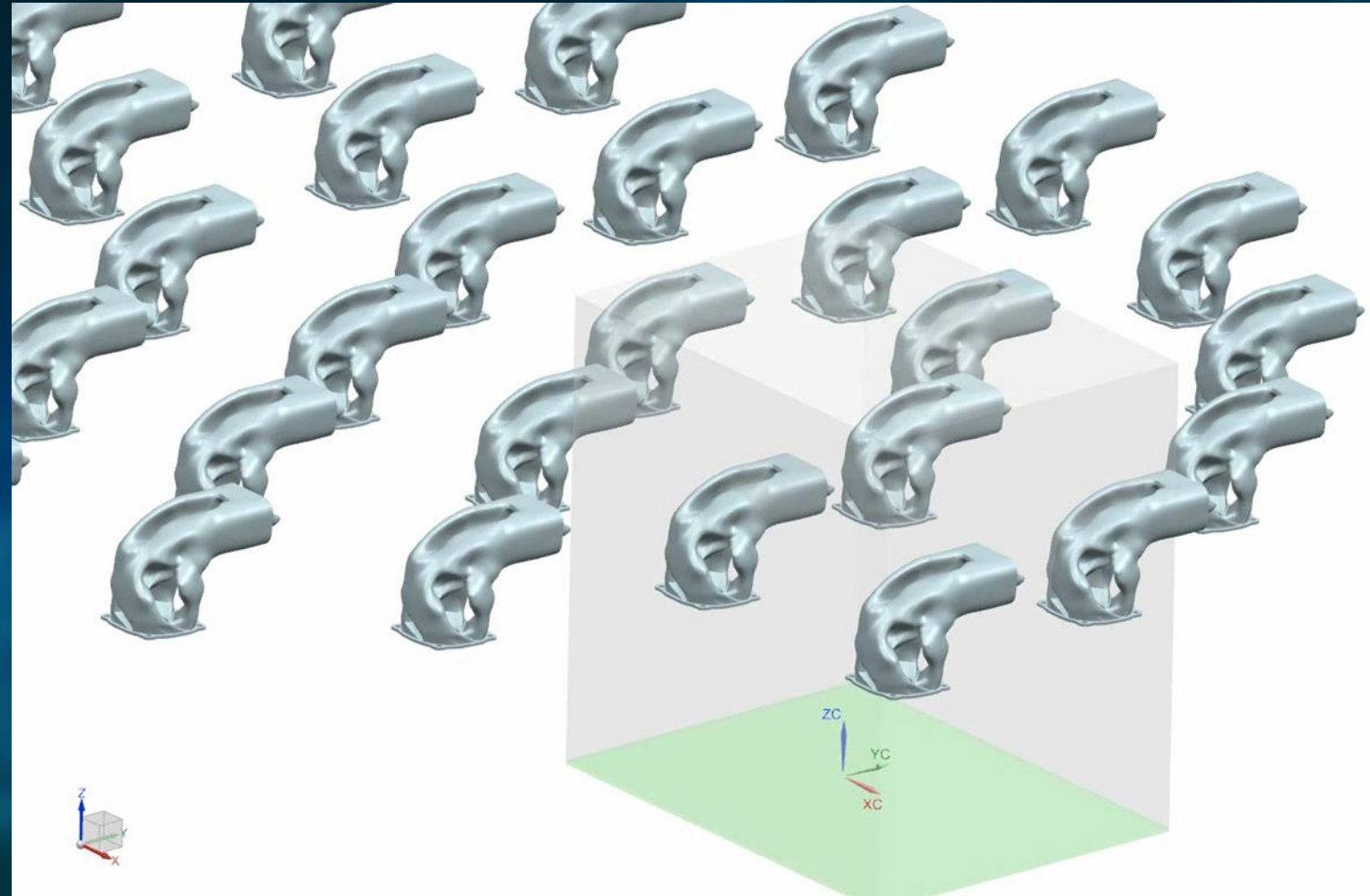
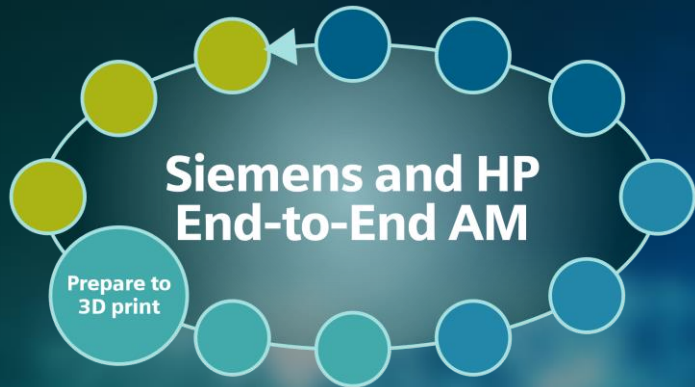


Improve print yield, checking design for such rules as wall thickness and enclosed volumes



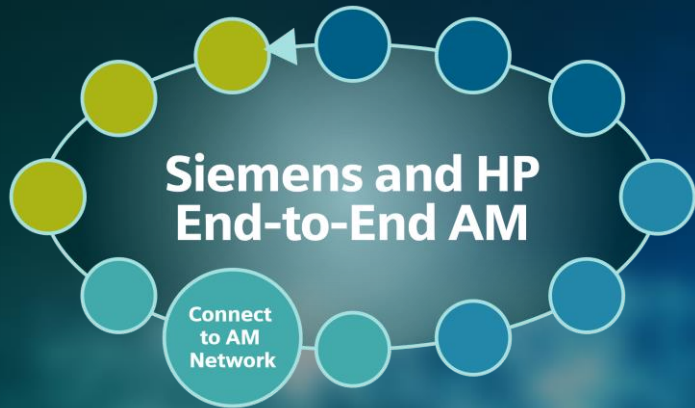


Use automated nesting to arrange parts in build volume, saving material and cycle time





Connect to on-line Additive Manufacturing Network to find HP MJF print resources



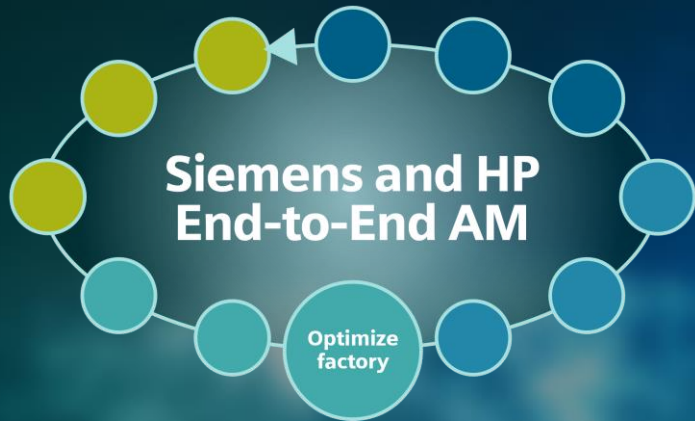
The screenshot shows a web browser window titled "AM Network" with the URL "https://demo.amn.dm-labs.com/#/workspace/parts/parts-list". The page header includes "Additive Manufacturing Network" and a user profile "david.swisa@siemens.com". A "New Order" button is visible in the top right. The main content area is titled "My Workspace" and includes a checkbox for "Show only my orders". Under the "DRAFTS" section, three parts are listed:

Part Name	Last Updated	Order ID
Cubo Trebol Inf 1	8 May, 2019	417
knee plate	7 May, 2019	414
Tractor Lever	6 May, 2019	404

Below the parts list, a message states "No Parts for this Order". A chat icon is located in the bottom right corner of the interface.

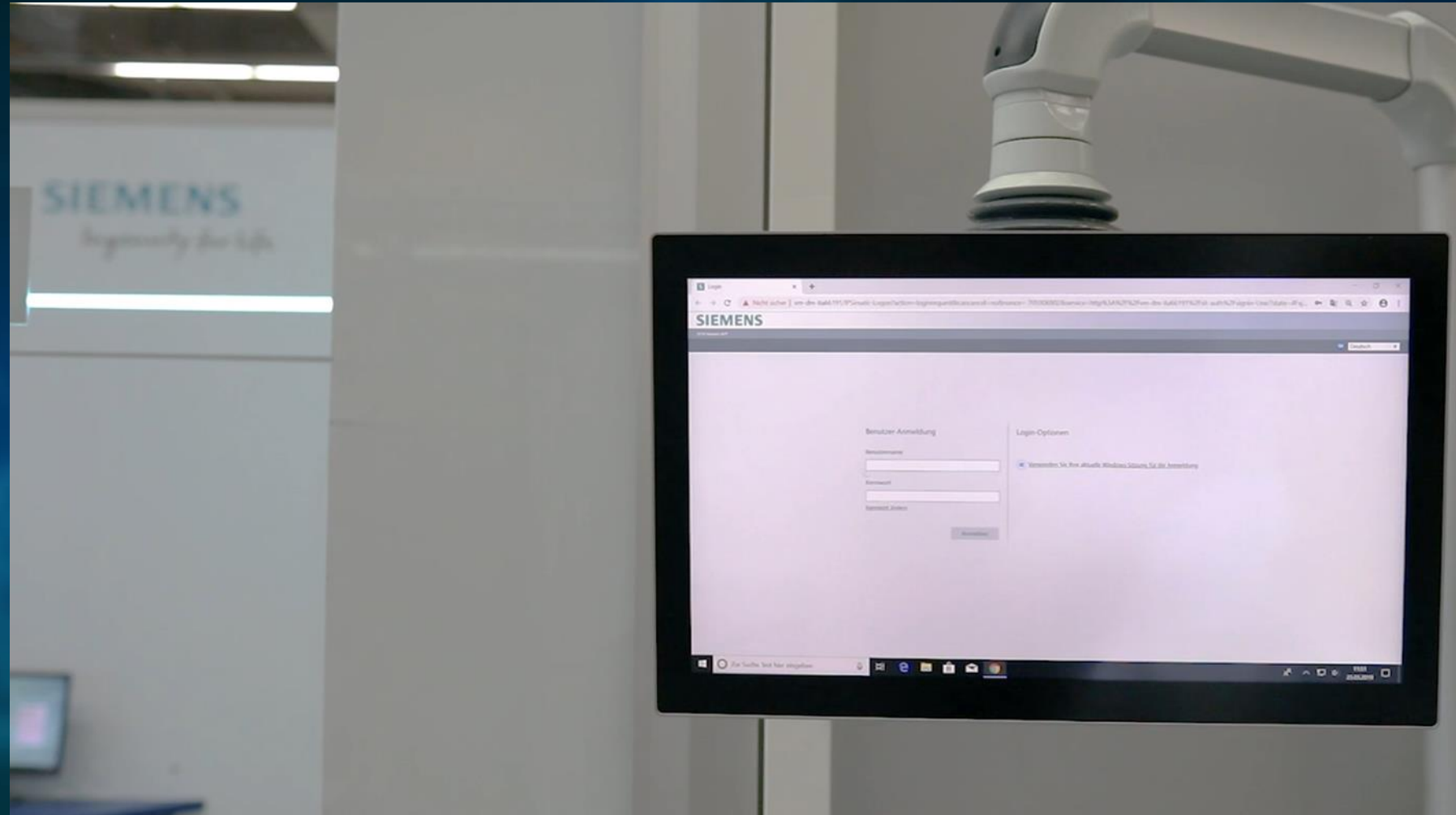
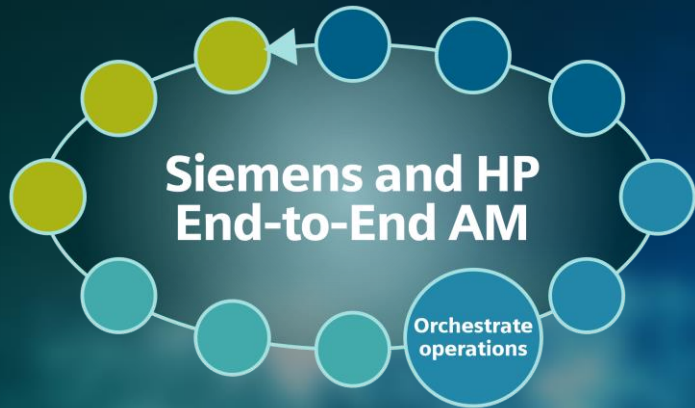


Model, simulate, and optimize equipment, material and workers in HP 3D print process



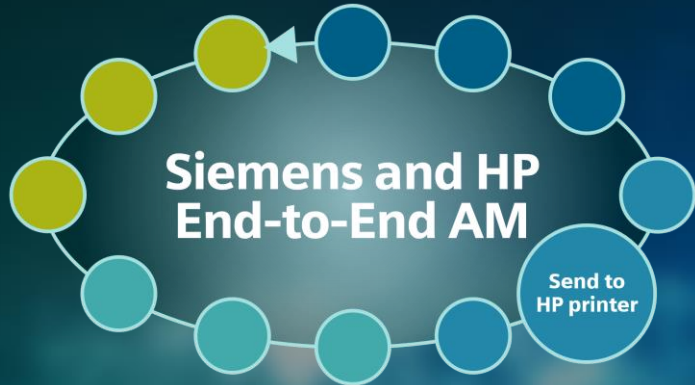


Ensure production efficiency, quality control, and traceability with AM execution system



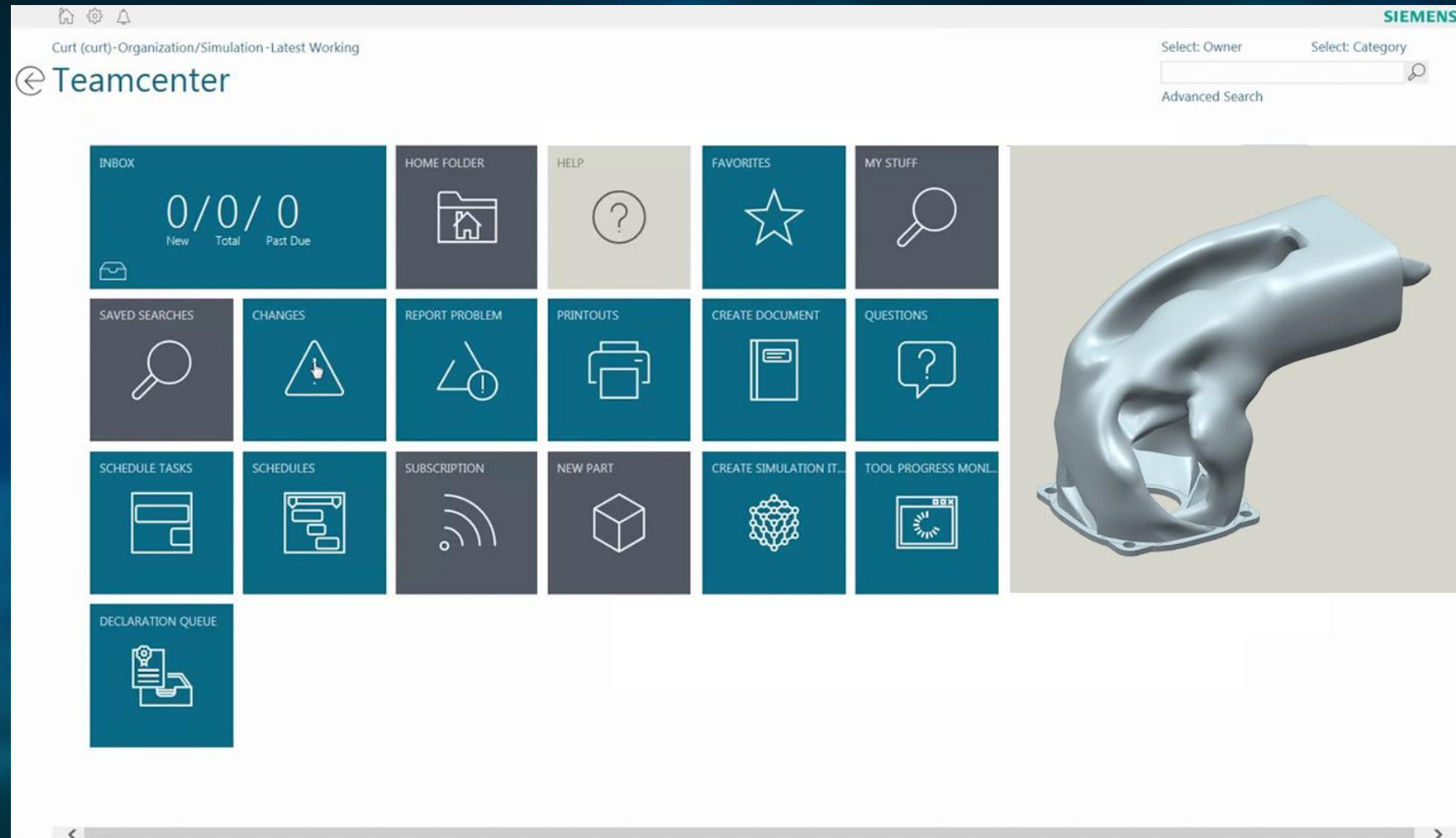
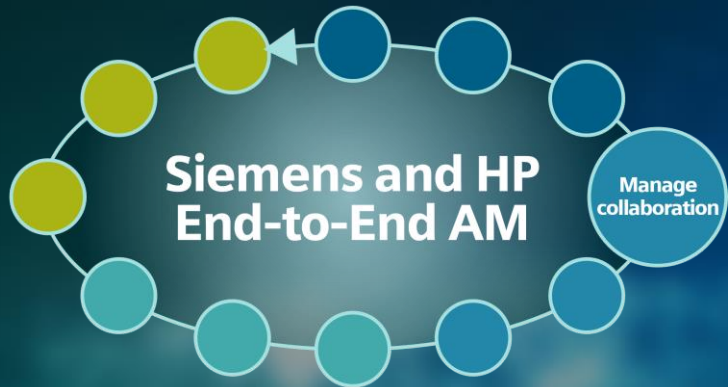


Unleash new growth and scale production with HP's advanced plastics 3D printing solutions



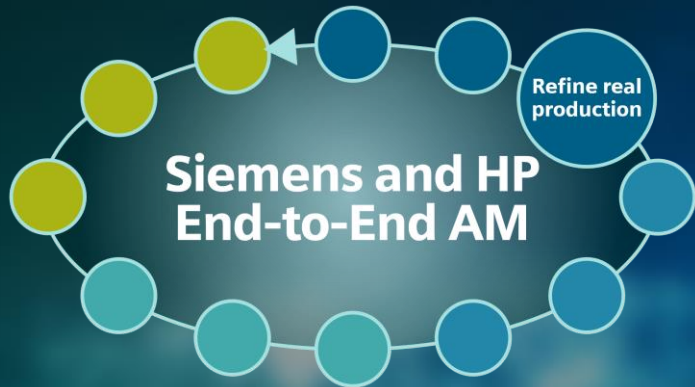


Manage workflows and enable collaboration across the entire 3D print digital thread











Use MindSphere AM Monitoring to gain insights that help improve production performance

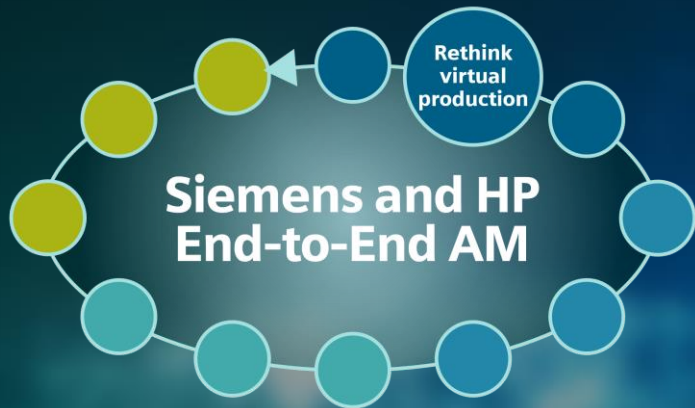


AM Monitoring Suite

 <p>HP Jet Fusion 580 Color 3D</p> <p>Status: Waiting</p> <p>Previous order: Deckel-Part 2</p> <p>Job status: Completed</p> <p>End timestamp: 2019-04-16 - 19:14</p>	 <p>HP Jet Fusion 3D 5210</p> <p>Status: Printing</p> <p>Order name: DC_Dimensional_AC_5502</p> <p>Job status: Ongoing</p> <p>Completion rate: 42%</p>	 <p>DMG Mori Lasertec 65 3D</p> <p>Status: Online</p>
 <p>EOS P 500 (virtual)</p> <p>Status: Online</p>	 <p>EOS M 300-4 (virtual)</p> <p>Status: Offline</p>	 <p>Comau NJ130 2.0</p> <p>Status: Offline</p>

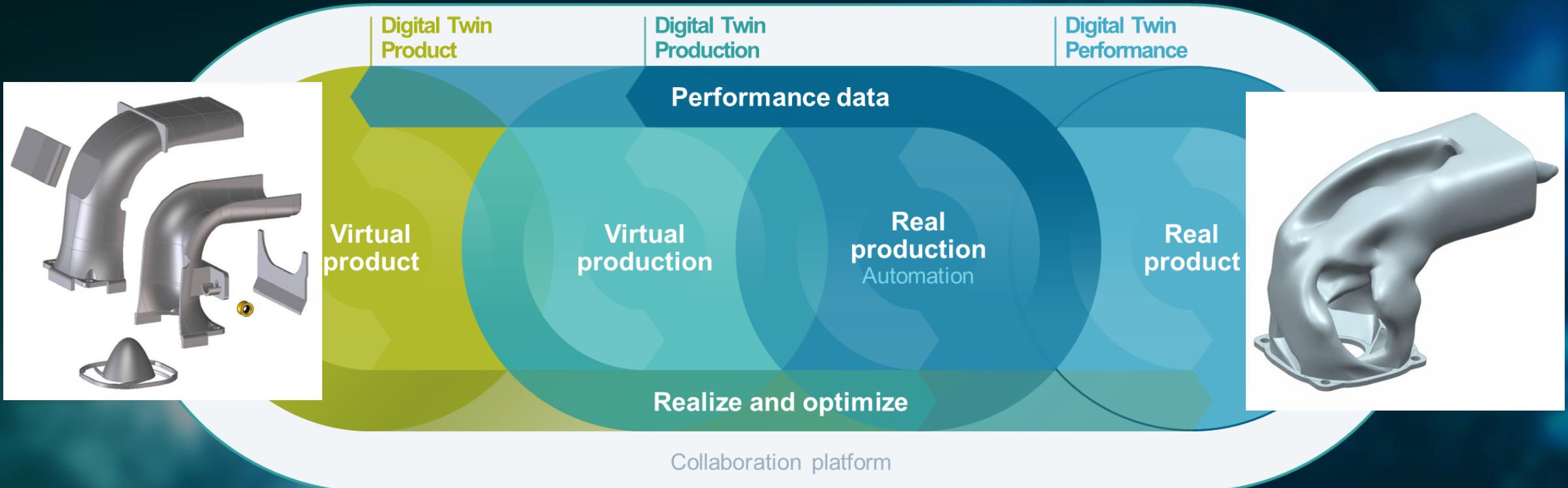


Feed insights back into your production digital twin to optimize future process plans





Seamlessly integrated HP Siemens workflow making HP printer more efficient



Industrial Security

> 34% **Cost reduction**
from 6 injection molded to 1 printed part

> 22% **Flow improvement**
enables 15% higher speed of hp's printer

75.0% **Faster Development**



How to improve the cooling of an E-Car battery with industrialized Additive Manufacturing ready to scale?



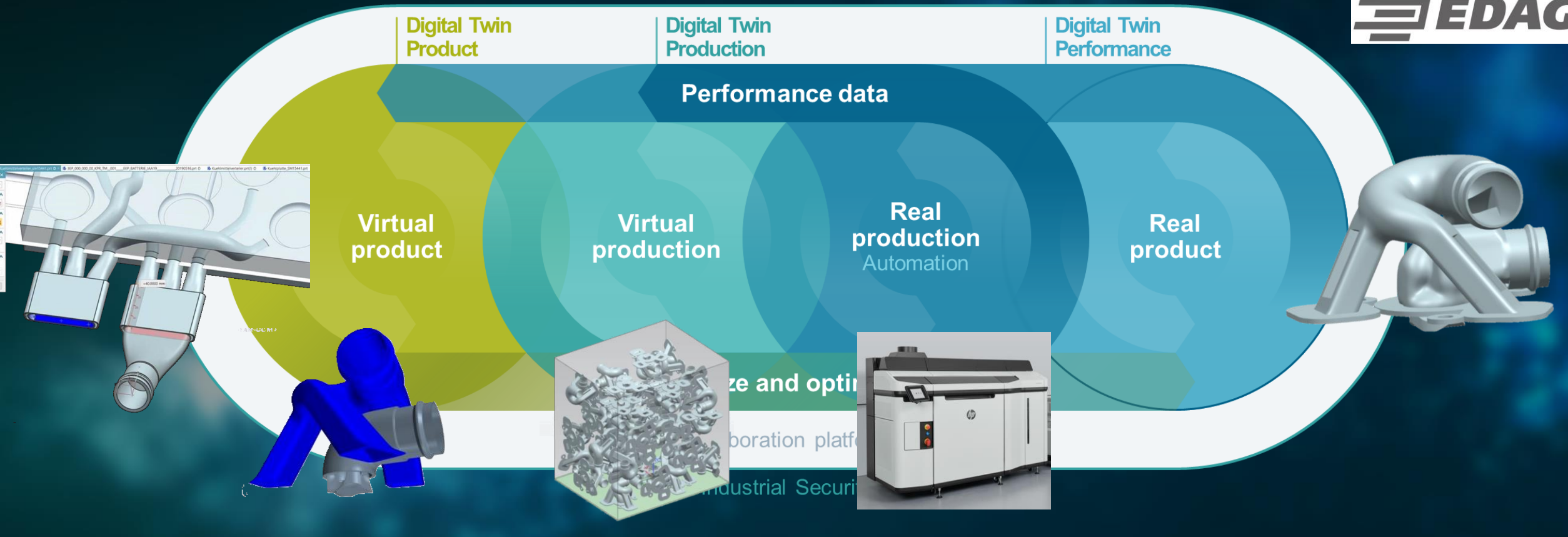
Modular and scalable battery system

SCALEbat





How to improve the cooling of an E-Car battery with industrialized Additive Manufacturing ready to scale?



> 20% **FLOW IMPROVEMENT**
improves battery cooling

10 - 15€ **PART COST** & scalability to
100,000 – 300,000 parts p.a. with HP MJF 5200



Thank you

SIEMENS
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