THREEDY GmbH

Industrial Metaverse on the web

3D Web Interoperability for the Metaverse BOF

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Threedy GmbH

Pioneers of visual computing - building on 25 years of research!

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25 years of research

Founded in Q3/2020

50 heads by Q2/2023

Internationally experienced team

References

Partner

Exploding demand for industrial 3D

to bring

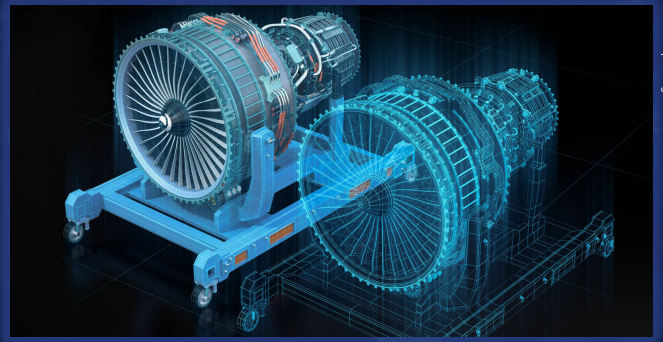
Digital Twins &

Industrial Metaverse

to life!

https://www.ipk.fraunhofer.de/

https://www.autopromotec.com/



https://job-wizards.com/

Customers accelerate

Digital Transformation

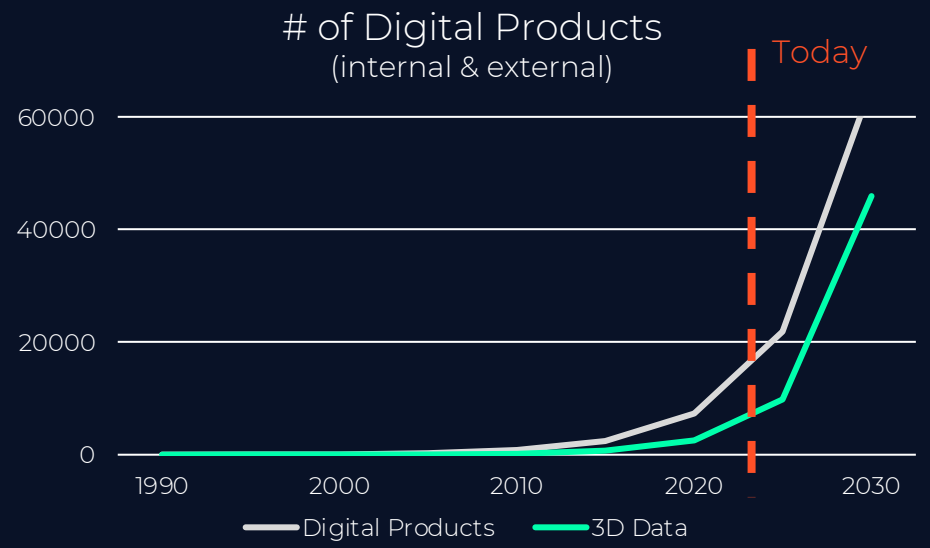
with growing # of tailor-made

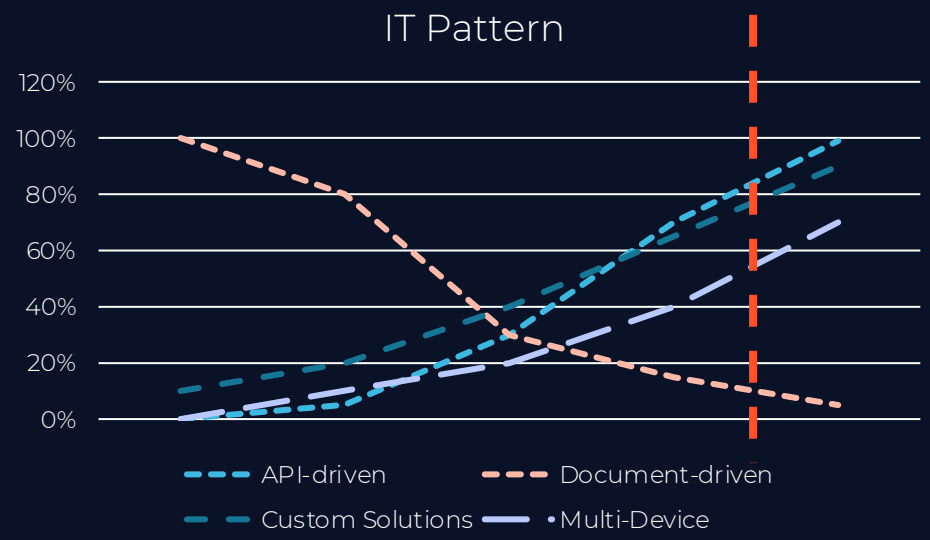
Digital Products

to accelerate

Time to Market

for physical products





Digital Product on the web

Hyperconnectivity

- Progressive data & apps
- Desktop, mobile & XR
- Multi-user, Multi-channel
- Distributed data governance

Interoperability

- Dynamic, user generated content
- Rich user experience
- Mobile first
- Databases & APIs

Static content

- Discrete data
- Single user
- Server compute
- Blocking transmission

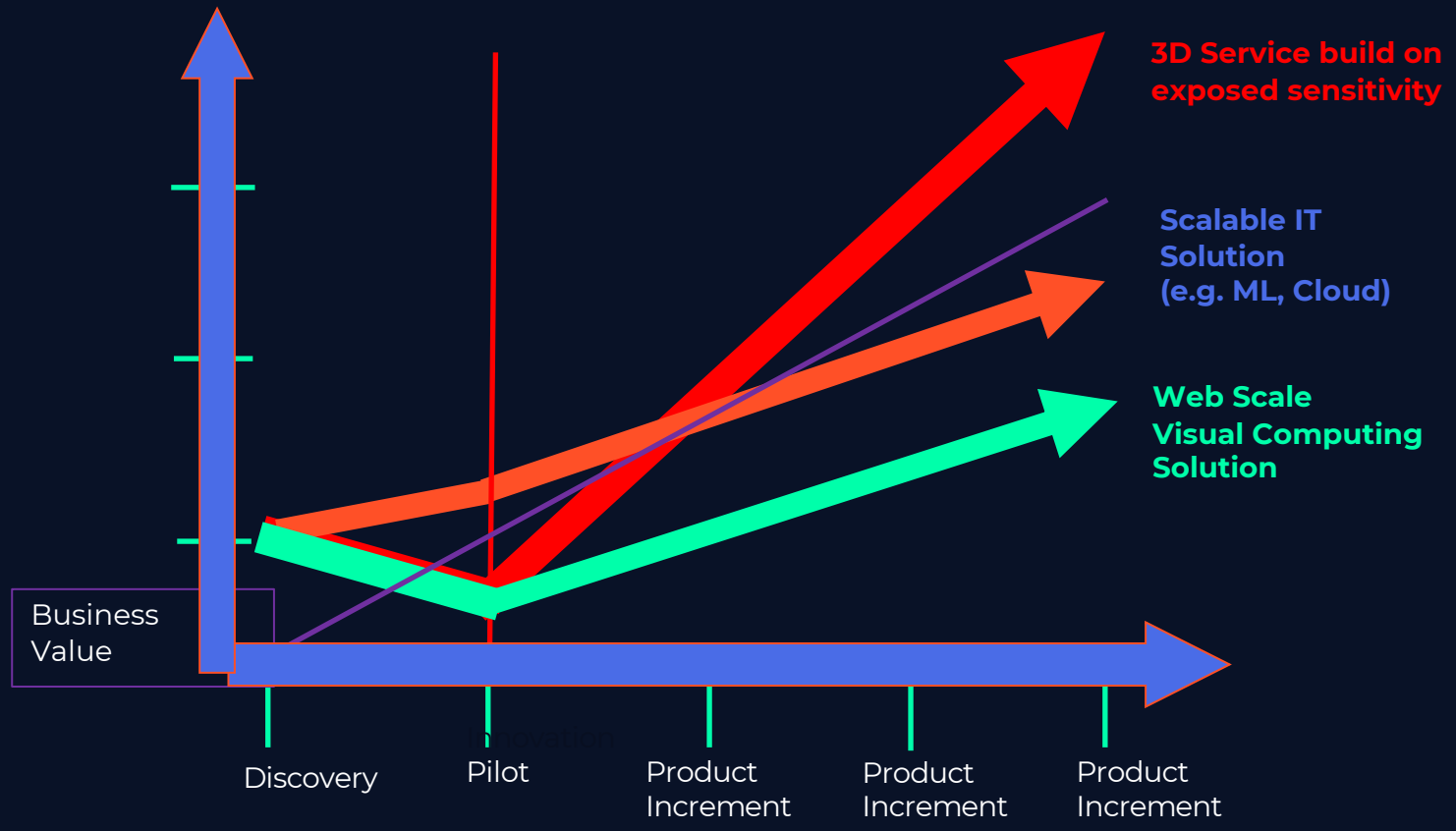
But current 3D technology won't deliver on the 3D data omnipresence!

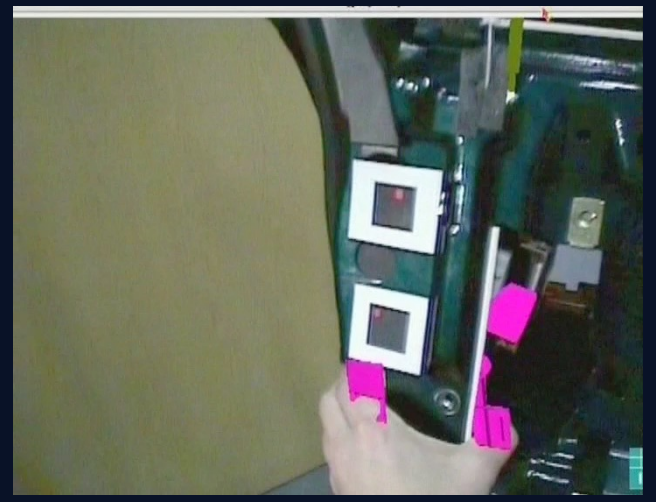
3D Technology Today

- Discrete & closed files
- Coupled transfer & processing
- Server vs. client compute
- Data size & format explosion
- Costly conversion as band-aid fix

Digital Product scalability ☹

“Pilot Purgatory” leads to exploding TCOs





1998, Cebit, Fraunhofer IGD, BMW

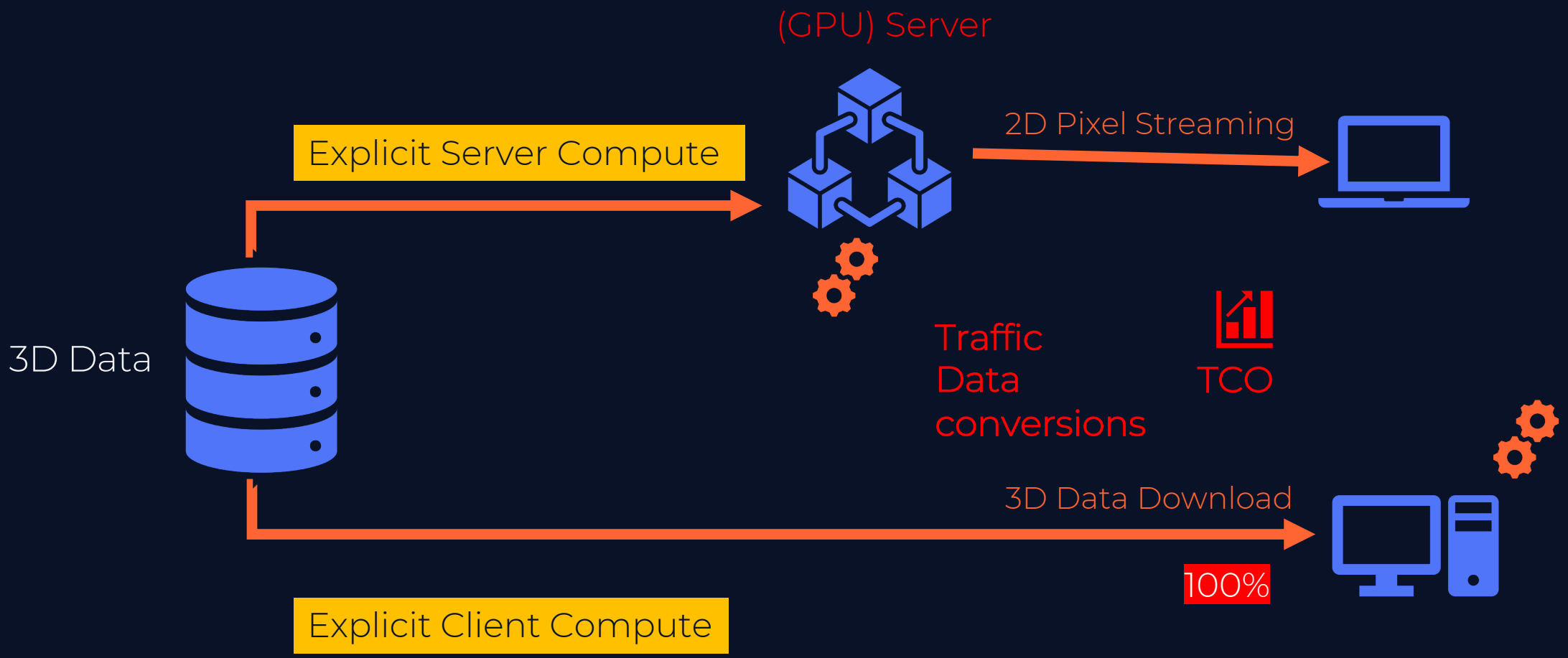
=> “AR-Service is Killer App!”

Status 2023:

- No Standard Solution
- TCO/Cost per Case to high!

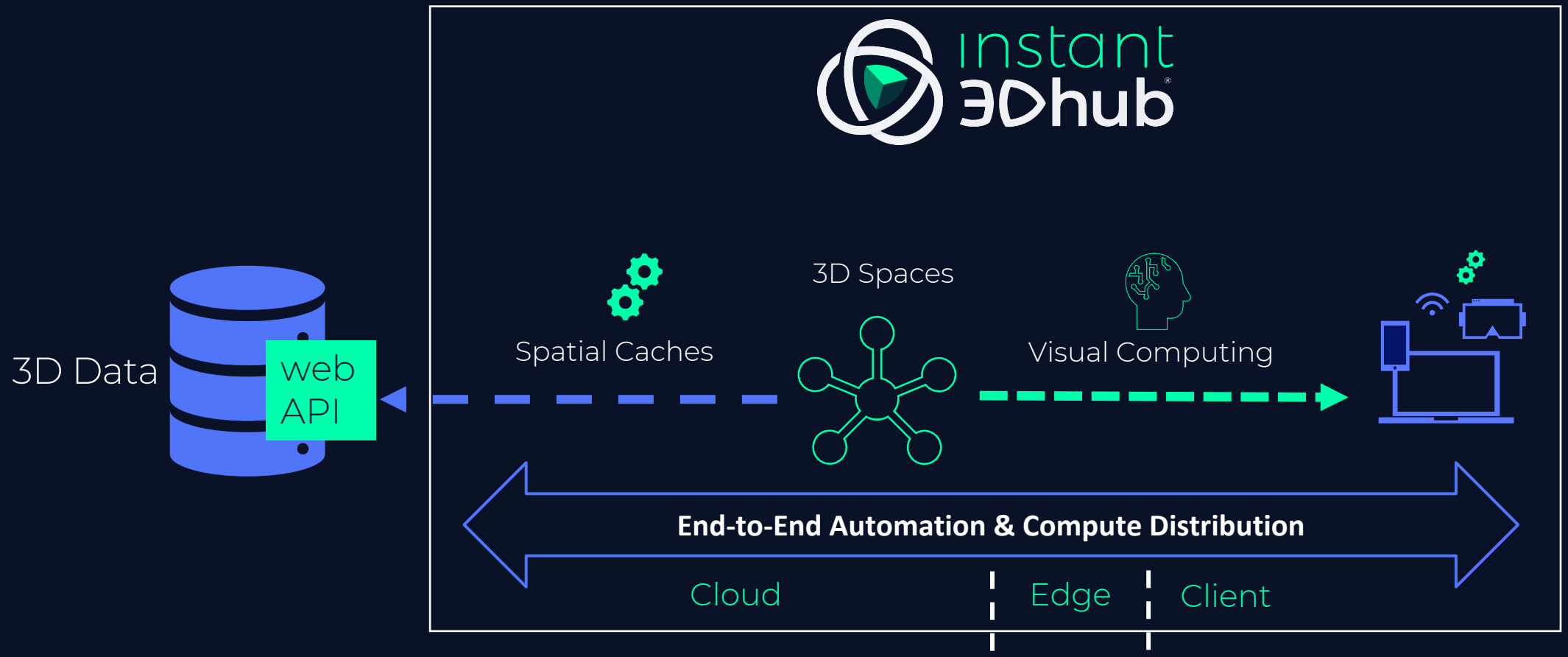
Standard 3D Software Architectures

Download & Local Compute vs. Pixel Streaming



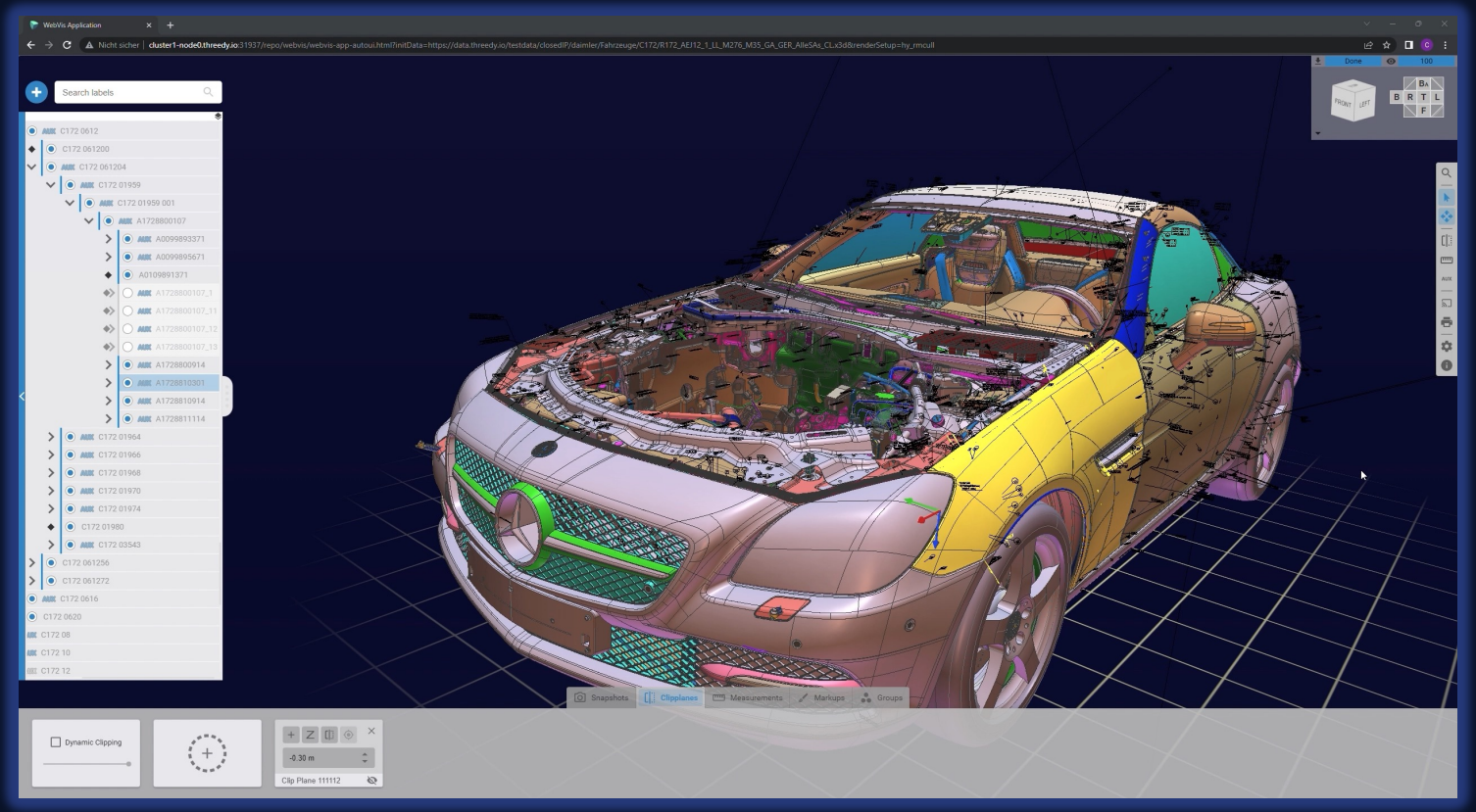
instant3Dhub: Web-Scale Visual Computing Middleware

Service infrastructure to automate & distribute computation



instant3Dhub: “Google Maps for 3D Data”

API-based Company-wide Visual Computing Enablement



Any Data Any Device Any Size

Data integration via
live-links to harmonize
single source(s) of truth
e.g., PLM or Digital Twin
backends

First data-driven
Visual Computing middleware
for fully automated
distributed computation &
progressive streaming

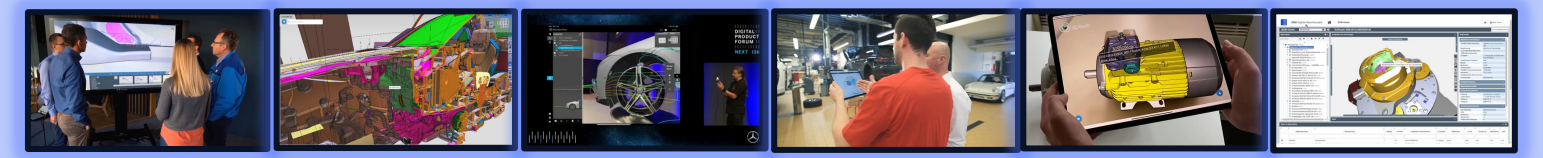
Packaged
Standard Apps
& Custom App
built on service APIs

3D Data and Visual Computing Virtualization

as perfect fit to enable

Digital Products

in modern software infrastructures.



Collaboration Eng. Reviews | Digital Mock-Up | AR for CAx Application | After Sales Repair Guides | IoT AR Maintenance | Field Service Twins

Digital Products

API Composition

Linked Data
Aggregation & Services

instant 3Dhub

3D Spaces

Visual Computing

Identity & Access Management

Data Access

ERP | PDM/PLM | Cloud Store | Graph DB | Data Lake | Data Mesh

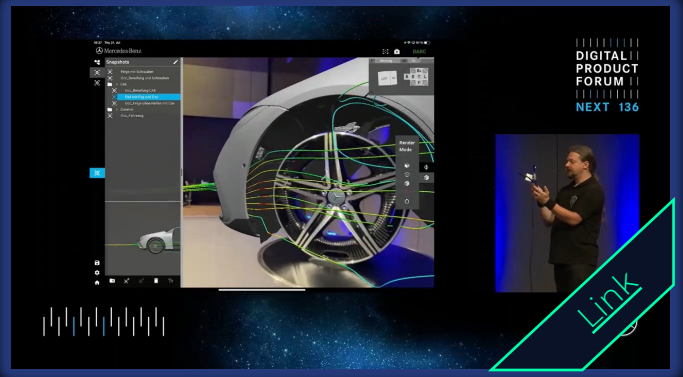
Dynamically compose 3D data of
- any format (e.g., USD, gltf, X3D, OpenJT, step...)
- provisioned by different gateways (e.g., Omniverse, MS Graph, S3, Teamcenter ..)
- for standard and custom apps (e.g., Web, UNREAL, ..)

Eng. & Design .. .. **AfterSales & Service**

BMW

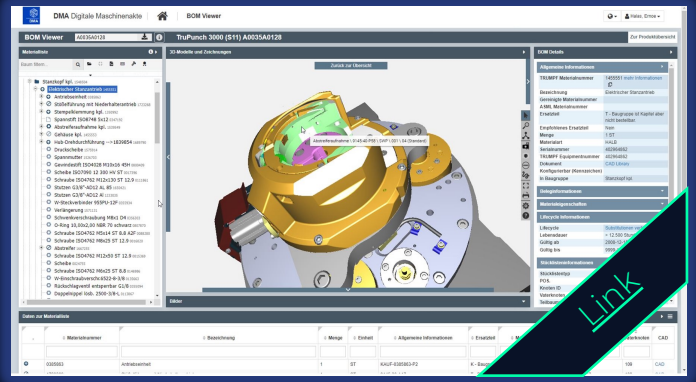
- “Visualization-as-a-Service” infrastructure backbone
- #1 Use Case: Engineering review & collaboration
- > 2.000 daily users for core applications

Mercedes-Benz



- Company-wide End2End 3D enablement
- Various use cases along product lifecycle
- DARC: #1 AR solution for engineering & backbone for XR Application mesh

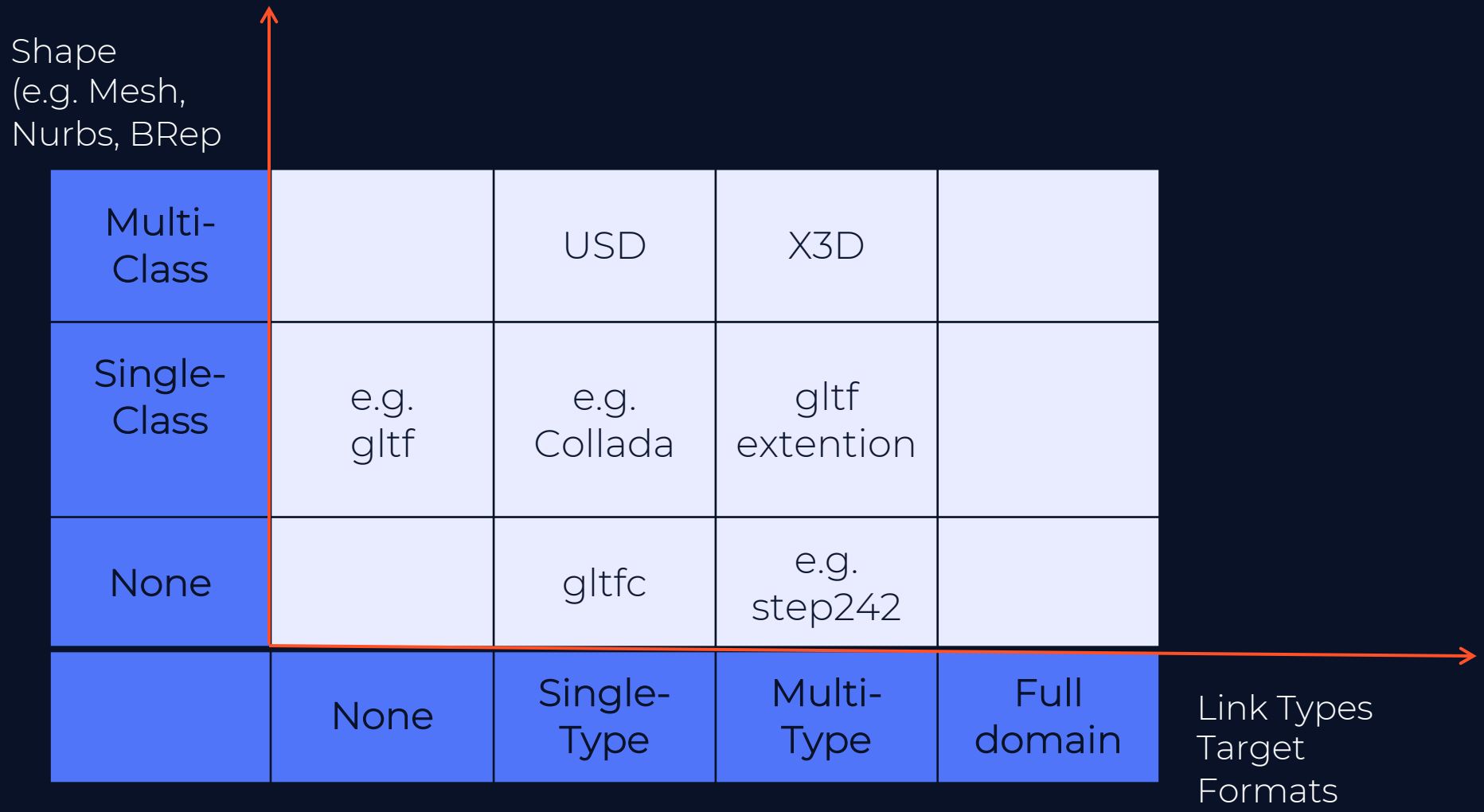
TRUMPF



- Digital twin for worldwide field service
- 1.7k users accessing > 150k product instances
- Deep integration of live 3D & product data

Learnings and Findings

3D Data Formats: Shape Properties and Composability

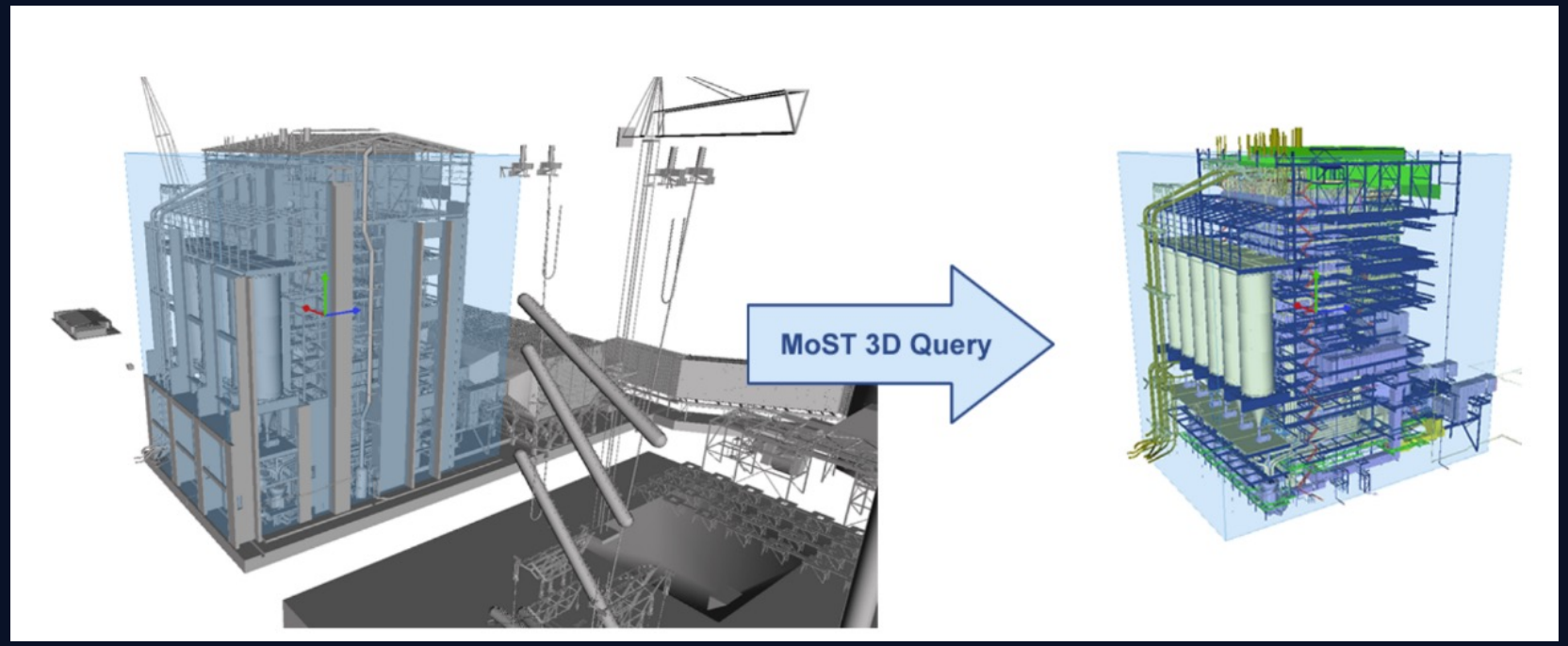


3D Data Formats: Data fragment addressing

Use-Case	Pattern	Existing Fragment Standards	
Initial View Selection	#initialView=”foo”	X3D	
Animation Selection (autoplay ?)	#autoplay=”foo, bar”		
Selection of Scene Nodes	#includeNodes=”foo, bar” #excludeNodes=”foo, bar”	PLMXML	
Selection on Spatial Dimension	#xyzwhd=100,100,50,10,10,100	W3C Media Fragments	
Selection on Temporal Dimension	#t=10,20	W3C Media Fragments	
Material/Appearance selection	#material=”gold”		

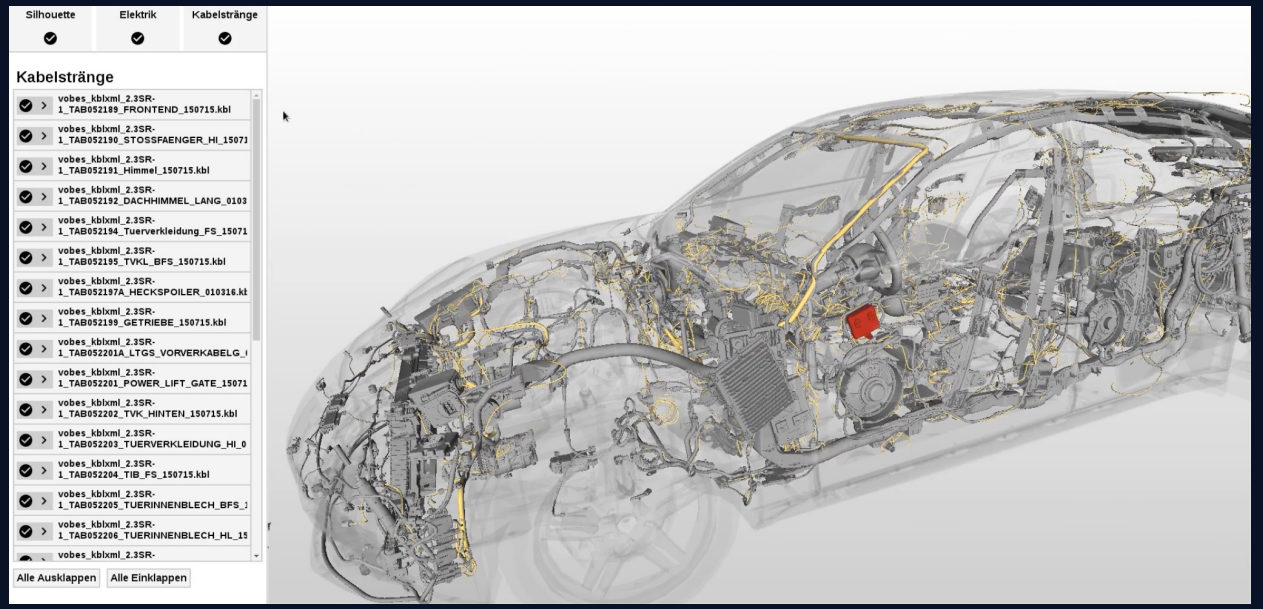
Fragment Example 1/3: Spatial Selection

- Multi-Resource Data
  - Structure => Parts (X3D => STEP)
- Use-case: 3D-Room selection in DMU Session
  - **datagateway.local/most/3423423#xyzwhz=100,100,100,20,20,20**



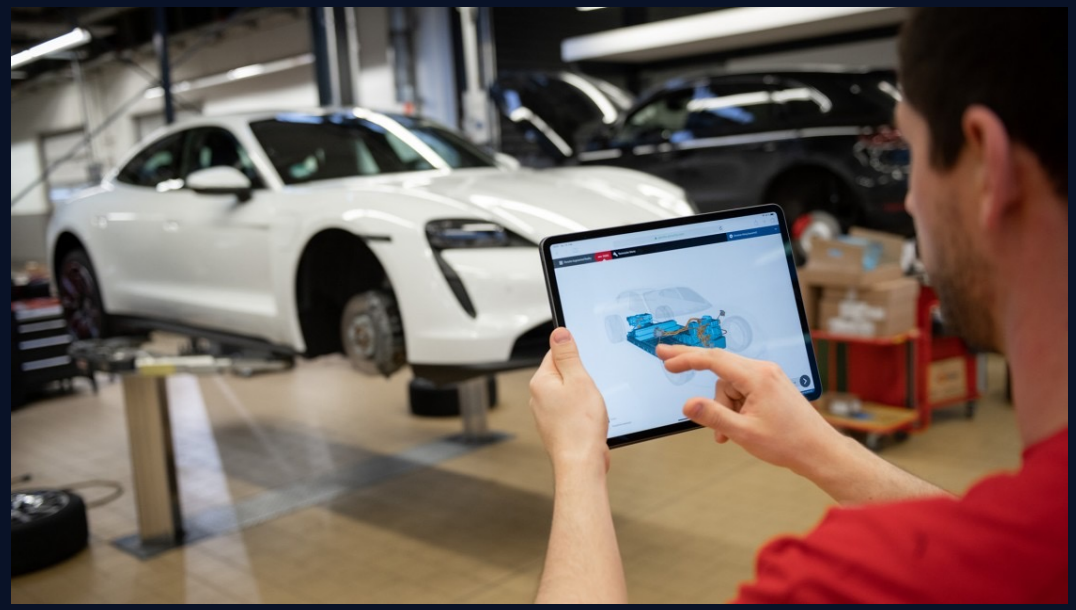
Fragment Example 2/3: Scene Graph Selection

- Multi-Resource Data
  - Variant => Structure => Segment selection (STEP-XML -> STEP-XML -> KBL)
- Use Case: Service-Twin provides setup for scanned VIN (Vehicle identification number)
  - **example.com/variant/434#includeNode=”2343,3424,2224”**



Fragment Example 3/3: Animation Trigger

- Multi-Resource Data
  - Variant => Structure => Animation selection (STEP-XML -> JT -> JT)
- Use Case: AR session with service twin
  - **example.com/variant/393483/repair453#autoplay=”step1”**



What’s next ?

- Allow gltfc with any format?
- Do we need “W3C model fragment” standard?

Rethink industrial 3D

https://www.threedy.io

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