Digital Twin

IAQG Supplier Forum, Berlin

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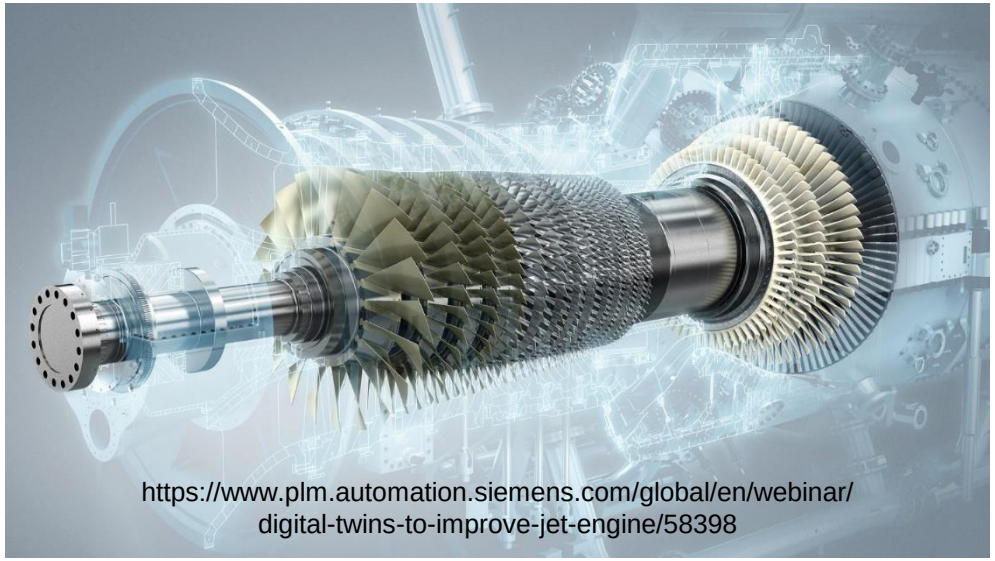
18.10.2019

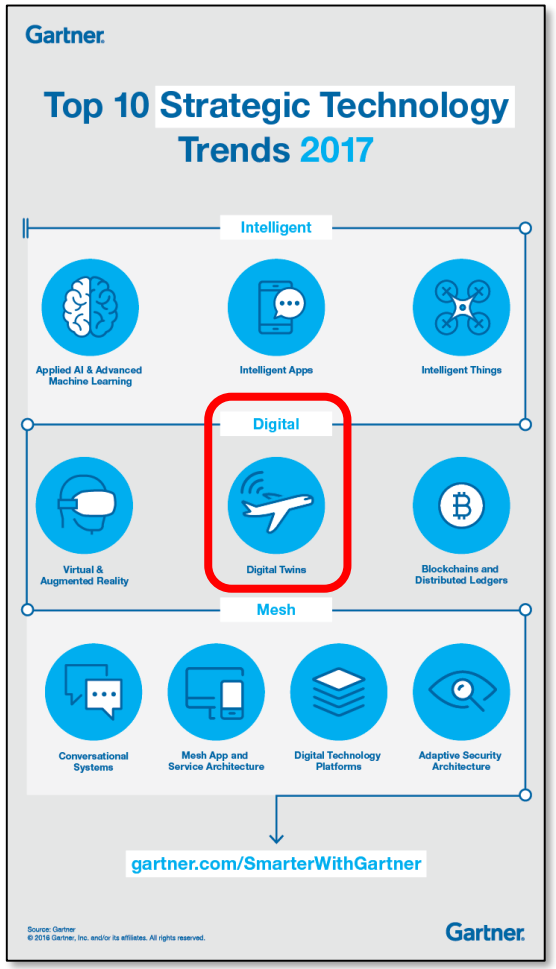
The Digital Twin – just another Buzzword?

	Google Hits (14.10.2019)	.and. Quality / Qualität / Qualite	.and. Supplier / Lieferant / Fournisseur
Digital Twin	309 Mio	144 Mio	48 Mio
Digitaler Zwilling	3 Mio	1 Mio	0.1 Mio
Jumeau Numerique	4 Mio	1 Mio	0.2 Mio

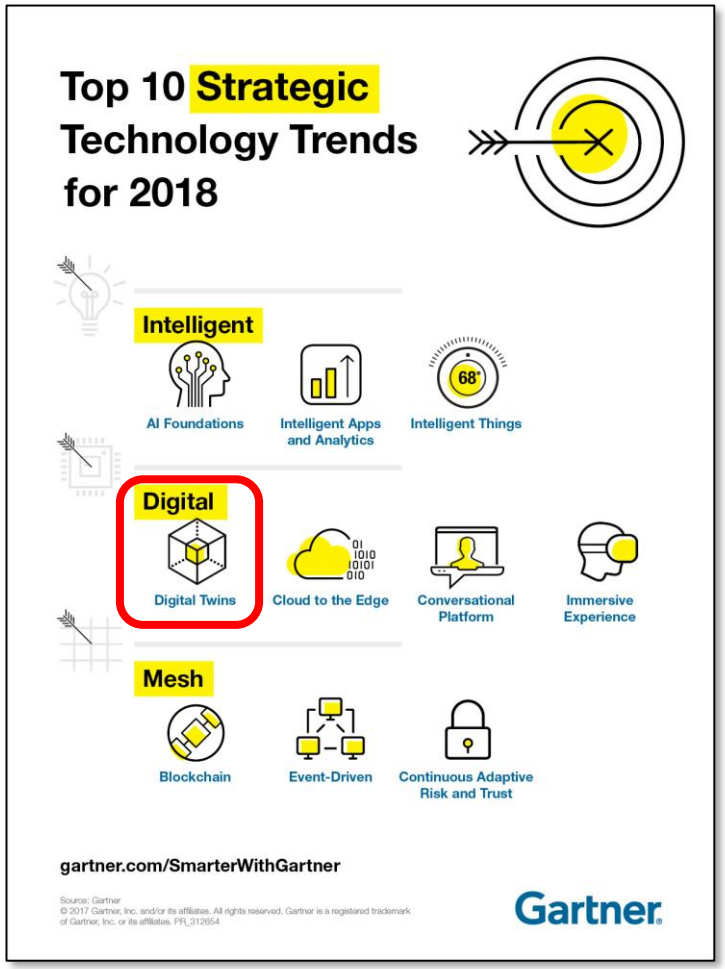
https://www.ge.com/reports/
ge-launch-standalone-digital-business-sell-majority-stake-servicemax/


https://www.plm.automation.siemens.com/global/en/webinar/
digital-twins-to-improve-jet-engine/58398

The Digital Twin – just another Buzzword?



https://www.gartner.com/smarterwithgartner/gartners-top-10-technology-trends-2017/



https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2018/

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Definition of Digital Twin (Source: Gartner IT-Glossary)

A digital twin is a

- *digital representation of a*
- *real-world entity or system.*

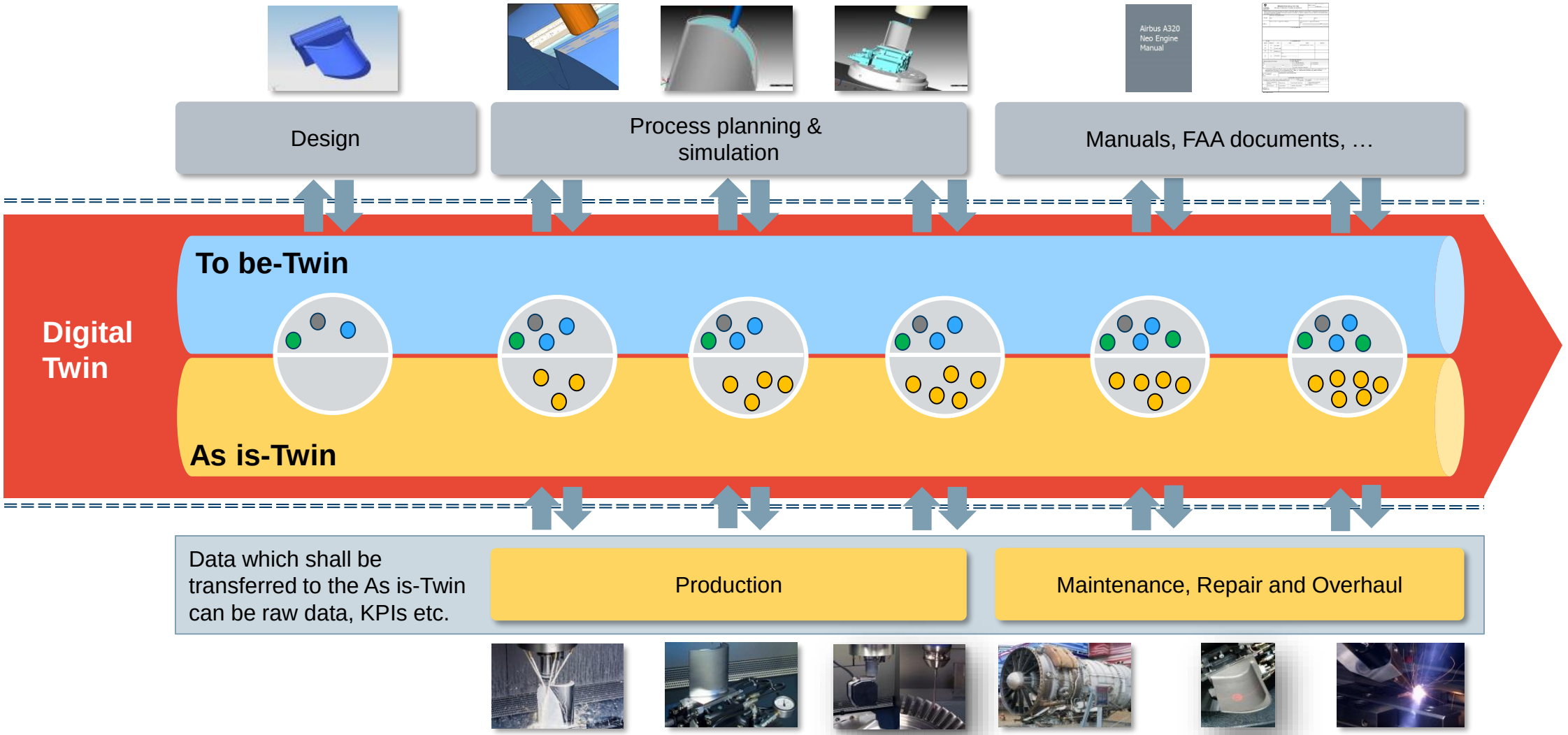
The implementation of a digital twin is an encapsulated software object or model that mirrors a

- *unique object,*
- *process,*
- *organization,*
- *person or*
- *other abstraction.*

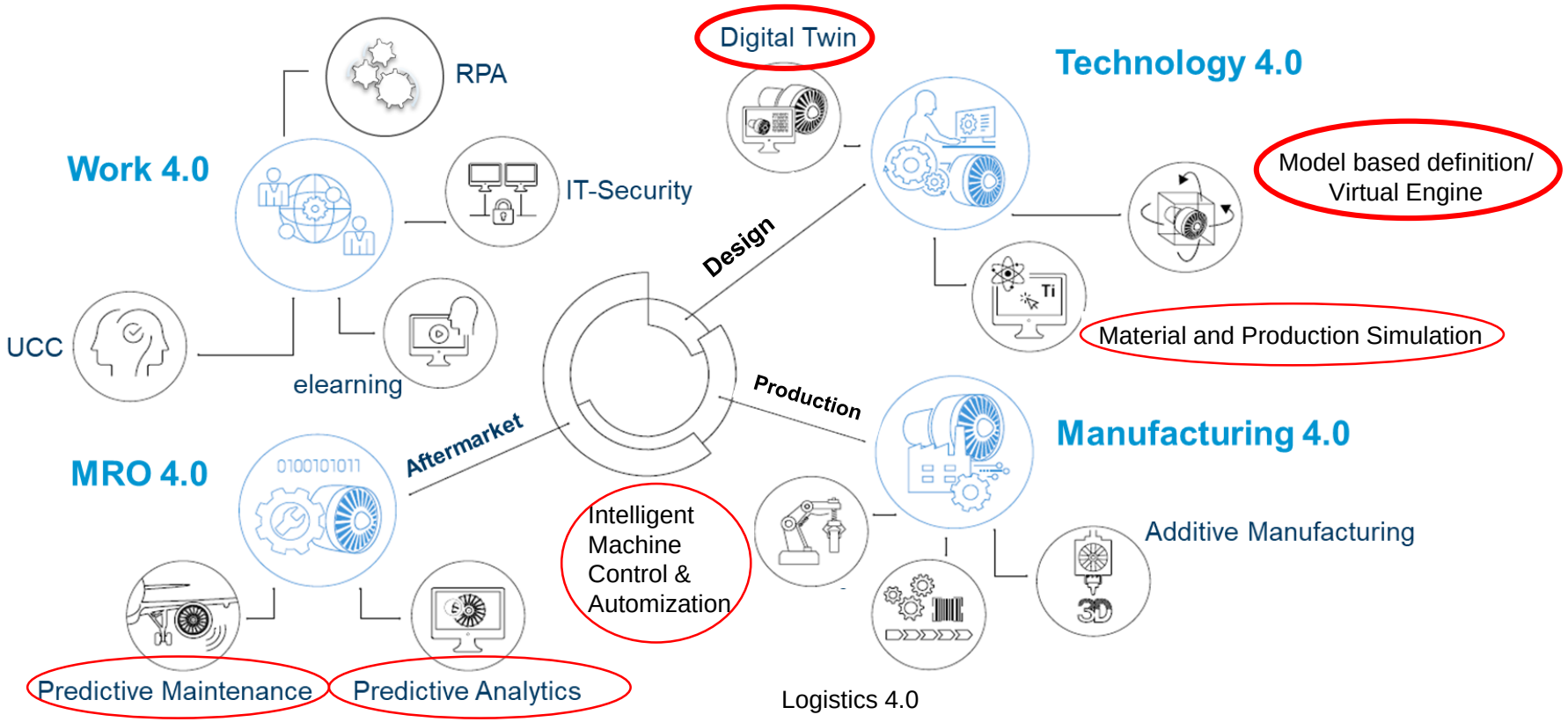
(…)

https://www.gartner.com/it-glossary/digital-twin

Digital Twin for Product „Engine“



The Digital Twin is Part of MTU‘s Digitalization Strategy

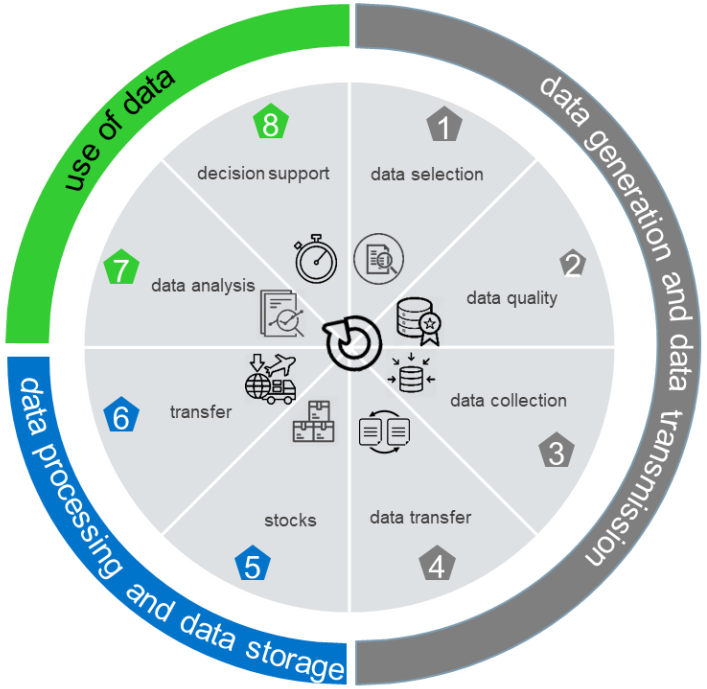


Example for Digital Twin in the Context of Quality

Usage of Quality Data

Objective

- Utilization of Inspection Data
- Electronical transfer of quality data to Digital Twin
- Change in quality handling
  - From today: Focus on parts with quality deficits in the past
  - To future: Focus on parts with currently critical process quality



Benefits

- optimize process quality and reduce / avoid non-conformances, reworking etc.
- closed loop to design with the possibility of quick design changes
  → improve efficiency for production
- react quickly in case of decreasing process quality
  → avoid problems with module delivery to OEM due to problems with parts production

Example for Digital Twin and Model Based Definition (3D only)

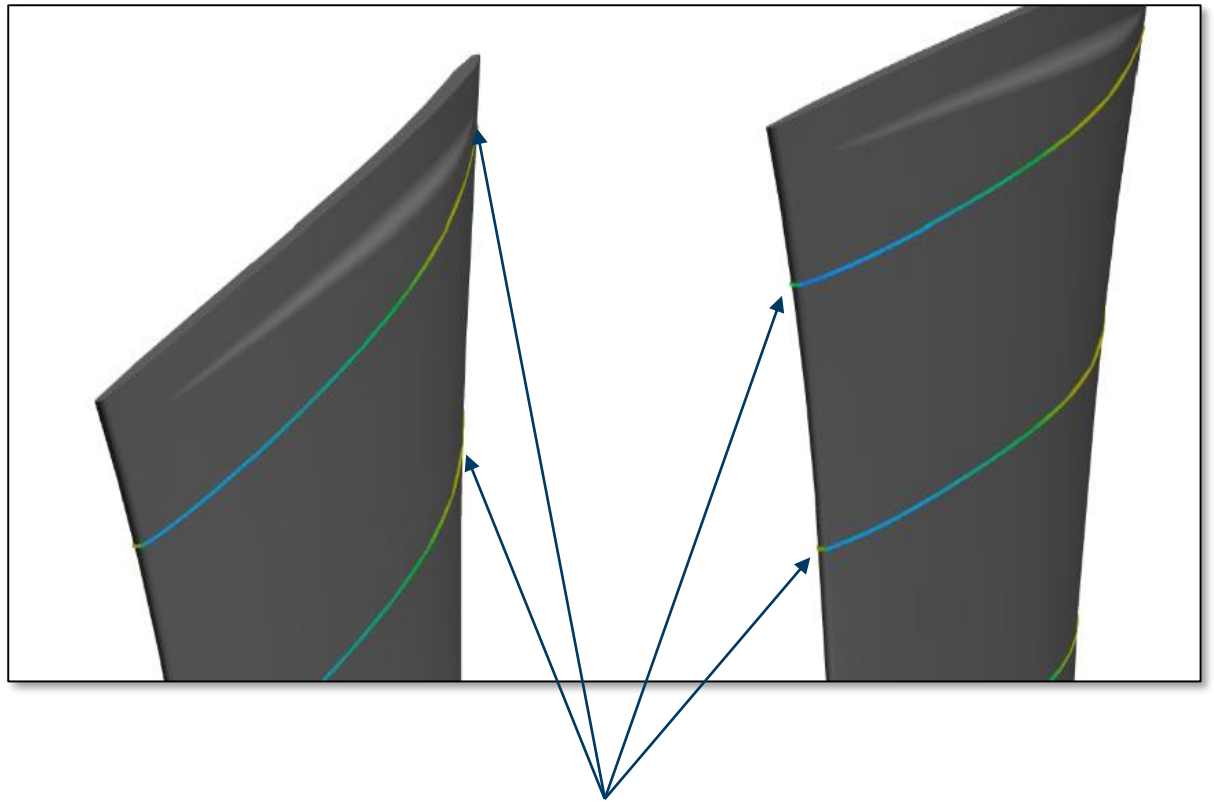
Usage of Production Data Together with CAD-Geometry and PMIs

Precondition:

Product Manufacturing Information (PMI) is added in the design phase to the CAD-model of the part

Objective:

- Continuously show measured data during / after the production at the position of the PMI in the CAD-model
- Realize potential problems early in the production process
- Changes in production can be implemented before non-conformances occur
- Simplify non-conformance management
- Closed-loop back to design
  → optimize the design to reduce / avoid non-conformances



Position of PMIs along the Profile

Summary

- The Digital Twin is one of the Top strategic technology trends –
  and its implementation and usage will definitely grow over the next years.
- One of its main advantadges is the single point of truth for all product-relevant data
  and the connection between the different sources (design, production and MRO).
- The Digital Twin is not necessarily covered by one single IT system.
  But the navigation between different IT systems must be possible to profit from the Digital Twin‘s potentials
- The Digital Twin in combination with a move to a purely 3D-based product definition will offer a lot of additional chances for all involved parties.

Thank you for your attention!