VDMA

MEASURING AND TESTING TECHNOLOGY

INDUSTRIAL LENGTH MEASURING TECHNOLOGY

Quo Vadis Metrology

Challenges and Trends in the (near) Future

3DMC 3D METROLOGY CONFERENCE

17 SEPTEMBER 2025,
PROF. DR. HEIKO WENZEL-SCHINZER

ADVANCING EUROPE'S MACHINERY INDUSTRY

01 Introduction

About me ...
Prof. Dr. Heiko Wenzel-Schinzer

Role #1

Professorship in Business Administration, Business Consulting and Process Management

Area: Department of Economics and Information Sciences

University of Applied Sciences Merseburg

Role #2

CDO and Chairman of the Advisory Board

WENZEL Group GmbH & Co. KG

Role #3

Chairman of the Board Length Measurement Technology

VDMA

To understand Wenzel better: Our range of services at a glance

Development, production, sales and service of innovative measurement technology

Portable Measuring	Stationary Coordinate Measuring				Computer Tomography	Design Solutions
Mobile measuring solutions	Laboratory measuring machines	Shopfloor machines	Gear measuring machines	Optical highspeed Scanning machines	Industrial CT	Horizontal arm machines for Clay Milling
Applications: Automotive industry, ...	Applications: Automotive industry, aerospace, medical technology, energy, ...	Applications: Manufacturing industries ...	Applications: Automotive industry, aerospace, energy ...	Medical technology, aerospace, tool and mold making, prototyping, etc.	• Applications: Automotive industry, plastics industry, medical industry, ...	Applications: Mobility - Design studios

Automation

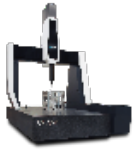
Sensors

Software, Training

Evaluation systems, accessories

Customized solutions, used machines, service & repair







VDMA

02 VDMA

VDMA

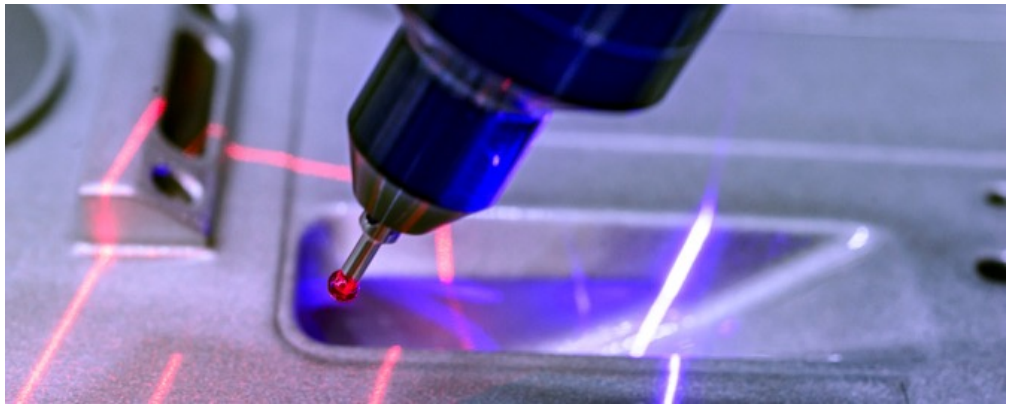
The Association

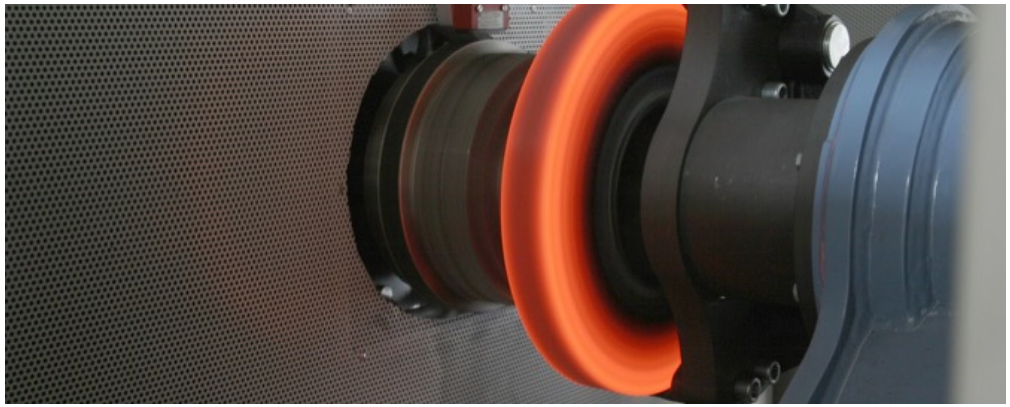
The VDMA represents 3600 German and European mechanical and plant engineering companies. The industry stands for innovation, export orientation and SMEs.

The companies employ around 3 million people in the EU-27, more than 1.2 million of them in Germany alone.

This makes mechanical and plant engineering the largest employer among the capital goods industries, both in the EU-27 and in Germany.

Source: VDMA





VDMA

Measuring and Testing Technology

Measuring and Testing Technology is one of 35 Trade Associations within VDMA

More than 200 members VDMA Measuring and Testing Technology are manufacturers of

- Industrial length measurement technology
- Testing technology
- Weighing technology

With their products, they lay the foundations for high quality and efficiency in production, reliable material properties, and consumer protection.

Sources: VDMA, Renk, Bizerba

Services – VDMA Measuring and Testing Technology

Communications & Public Relations
- Manufacturer directory: members and products
- Trade fairs such as AMB, EMO, Intec, Control
  - Organisation of joint exhibition stands
  - Technology forums
  - Participation in trade fair advisory boards
- Publication of articles for the trade press, online platforms and social media

Statistics & Economic Forecasts
- Monthly VDMA order intake and turnover statistics
- Exclusive quarterly economic surveys
- Specific evaluations of production and foreign trade data

Market Intelligence & Studies
- Weekly automotive news updates
- Bi-weekly investment insights for aerospace and composites sectors
- Initiating market research focused on specific countries

Technical Representation of Interests
- In national and European standardisation bodies (DIN and CEN)
- In accreditation committees
- In advisory boards of the Federal Government

Development of Industry Standards
- Interoperability
- Equipment safety
- Sustainability

Current Projects – OPC UA GMS

Open Platform Communication Unified Architecture Geometric Measurement Systems

- A secure, standardized protocol for industrial data exchange across platforms and systems.
- Enables integration and communication of devices used for geometric measurement.
- Supports efficient data transfer, quality assurance, and process optimization.
- Promotes interoperability between different systems and manufacturers.

Key Development Areas in OPC UA GMS

1. Job Management

- Harmonization with other working groups
- Goal: Better integration of GMS into automation

2. Key Figures

- Extension to static/dynamic machine status
- Insights into part quality
- Insights into measurement quality

Current Projects – I++DME

I++DME (Inspection Plus Plus Dimensional Measurement Equipment) is carried out in partnership with WZL

- I++DME is a standardized interface for coordinate measuring machines (CMMs) and measurement software.
- It enables manufacturer-independent communication and smooth integration into automated production processes.
- Version 2.5 is widely adopted across the industry.
- The standard is being further developed in partnership with WZL to meet modern requirements and support new sensor technologies.

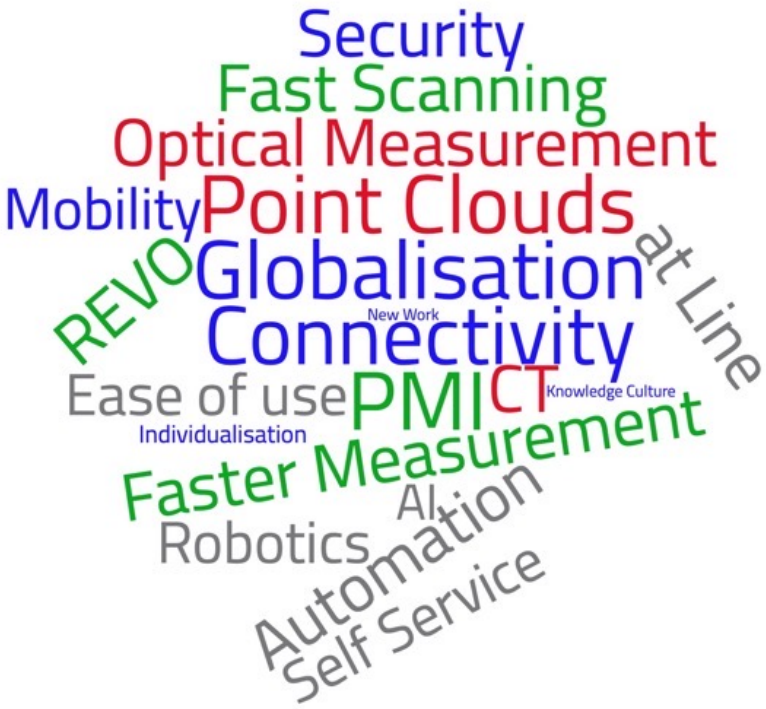
Current Projects – Carbon Footprint of a Product

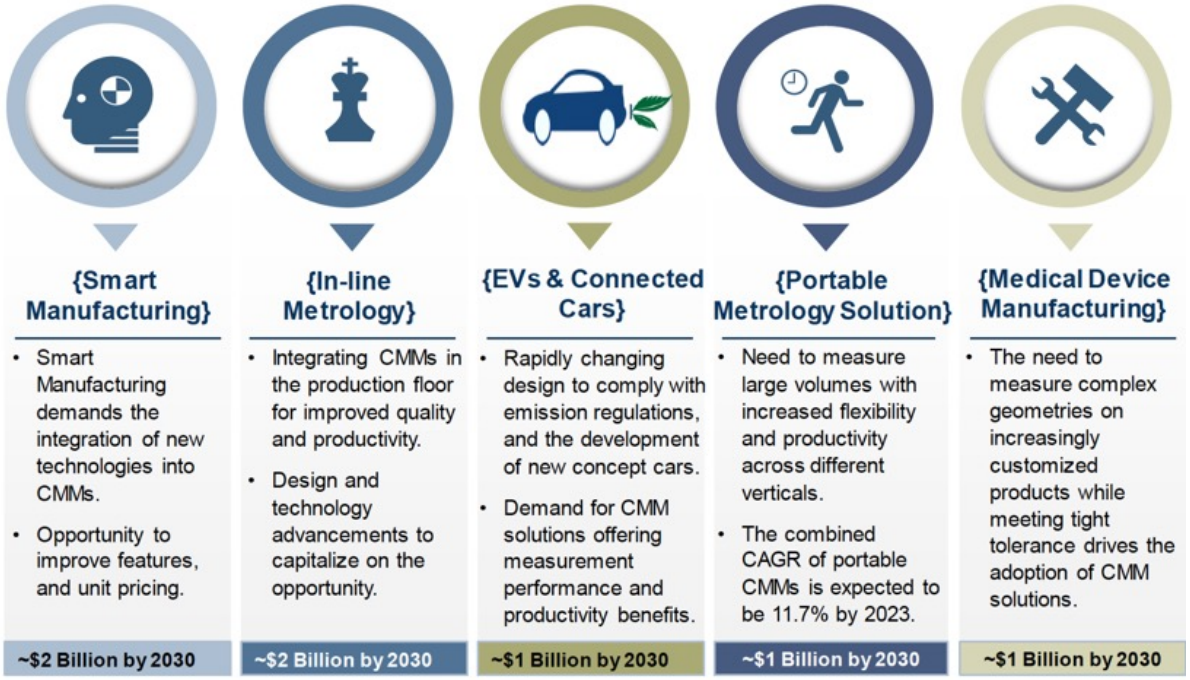
VDMA develops a standardized guideline (VDMA standard sheet) to calculate the carbon footprint of products in measurement and testing technology

- Focus on cradle to gate: from raw material extraction to the factory gate.
- Enables simple and practical calculations.
- Supports companies in complying with the CSRD and GHG Protocol through this standard.
- Creates a competitive advantage through transparent and comparable sustainability metrics.
  - Even though smaller suppliers are not yet required to report, their customers are increasingly asking them for CO_2 data.
    - Those who can provide this data demonstrate transparency, meet customer requirements, and strengthen their competitive position.

03 Key Drivers

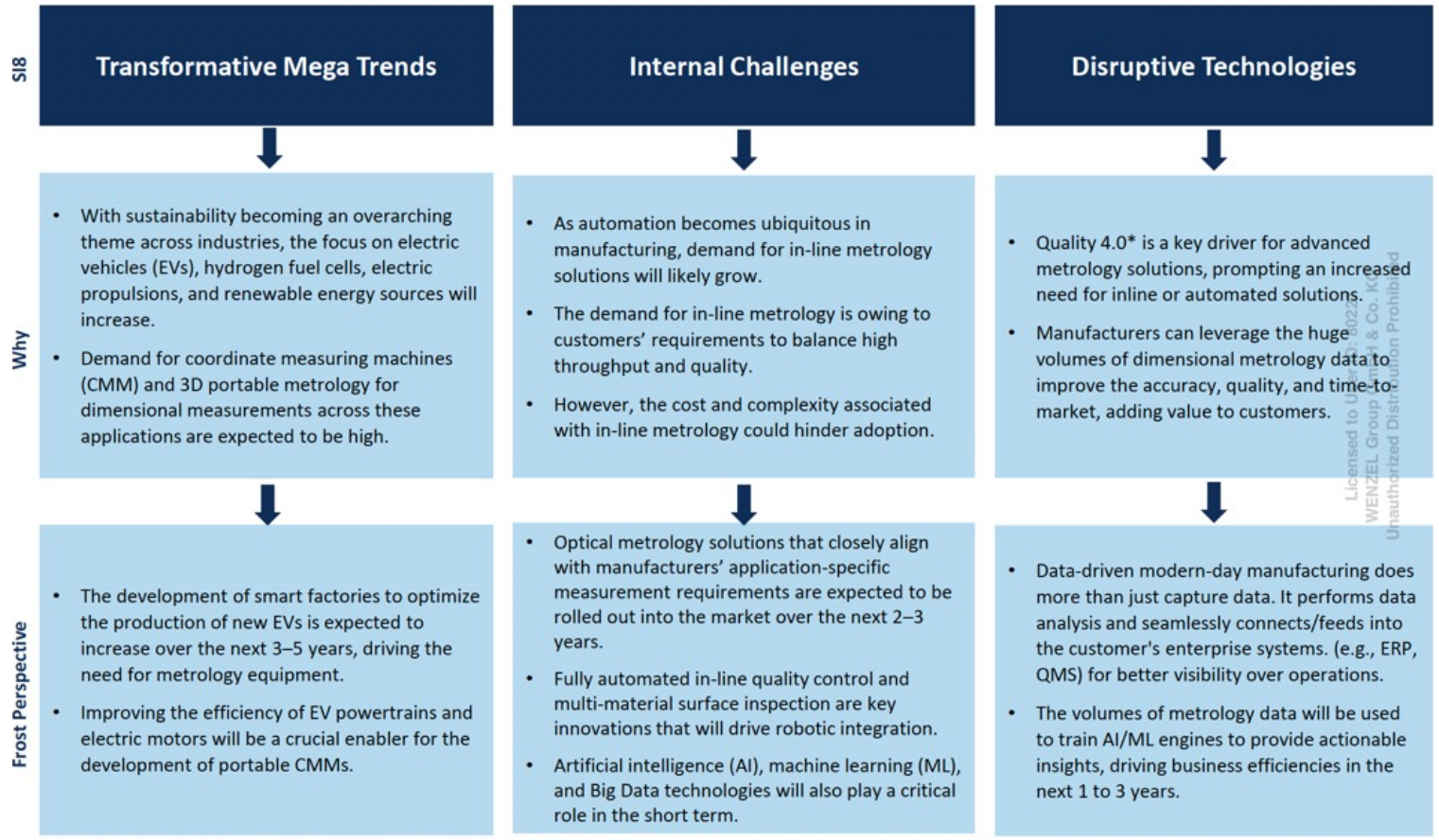
KEY DRIVERS IN METROLOGY





S: Frost & Sullivan

The Impact of the Top Three Strategic Imperatives on Industry 4.0 Metrology



*Quality 4.0 is the shift toward continuous monitoring and control by regulating manufacturing processes against just identifying quality compliance issues.

Source: Frost & Sullivan

Important Events in 2007

Tesla presents the first E-Roadster

Start of the financial crisis

What was the most used App in 2007?

Answer: NONE!

Download
GPRS: 53 Kbit/s
LTE: 300 Mbit/s
5G: up to 10 Gbit/s

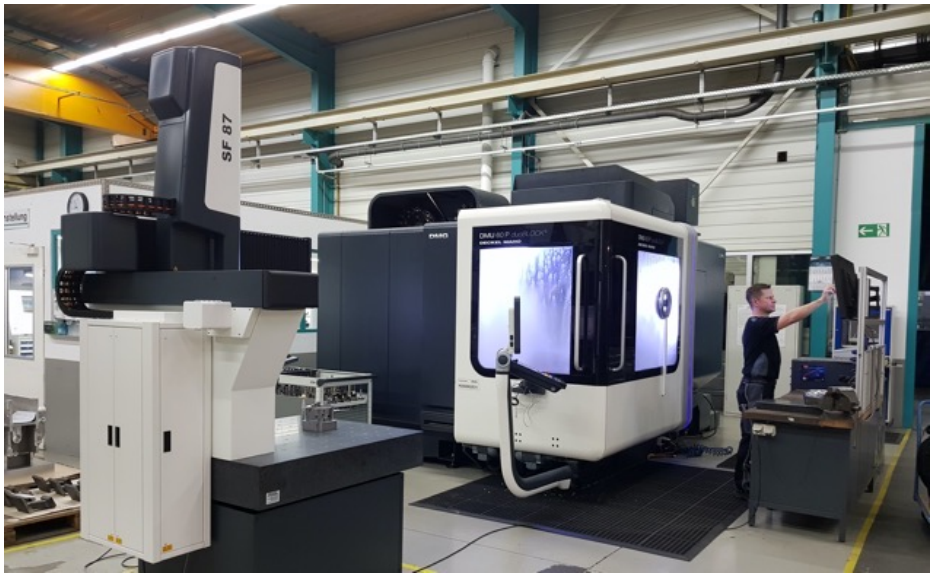
Steve Jobs introduced the iPhone on 9.1.2007

New election of the Pope in Rome 2005 and 2013 - same place, same event ...

04 Key Trends

Trend #1 - Place of measurement is more flexible

Measuring in the metrology center
Clean
Controlled temperature
No vibrations



Measuring directly in production
Not „always“ clean
Not Controlled temperature
Not vibration free

Location of measurement changes the focus

FOCUS: CONTROL THE PROCESS
Repeatability is most important

FOCUS: CONTROL THE PARTS
Absolute accuracy is most important

MEASUREMENT DIRECTLY IN PRODUCTION

Raw parts

on-machine measure

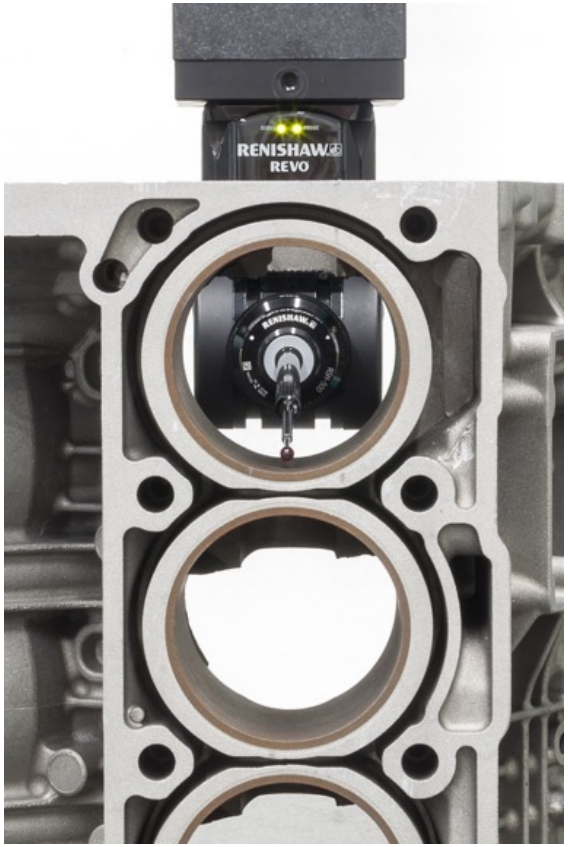
on-machine m nt

End product

In-line / at-line measurement

„OFF-LINE“ measurement
IN THE MEASURING ROOM

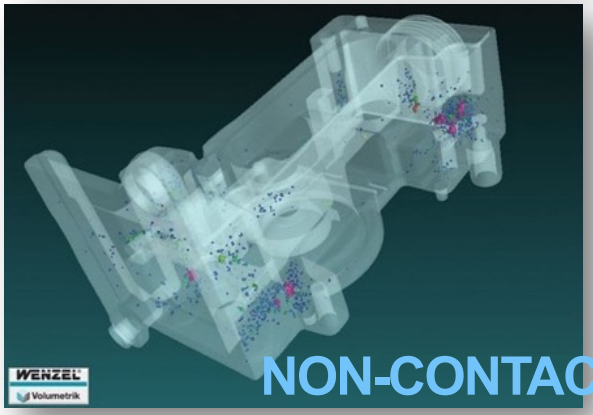
Trend #2 - Measurement has to be faster



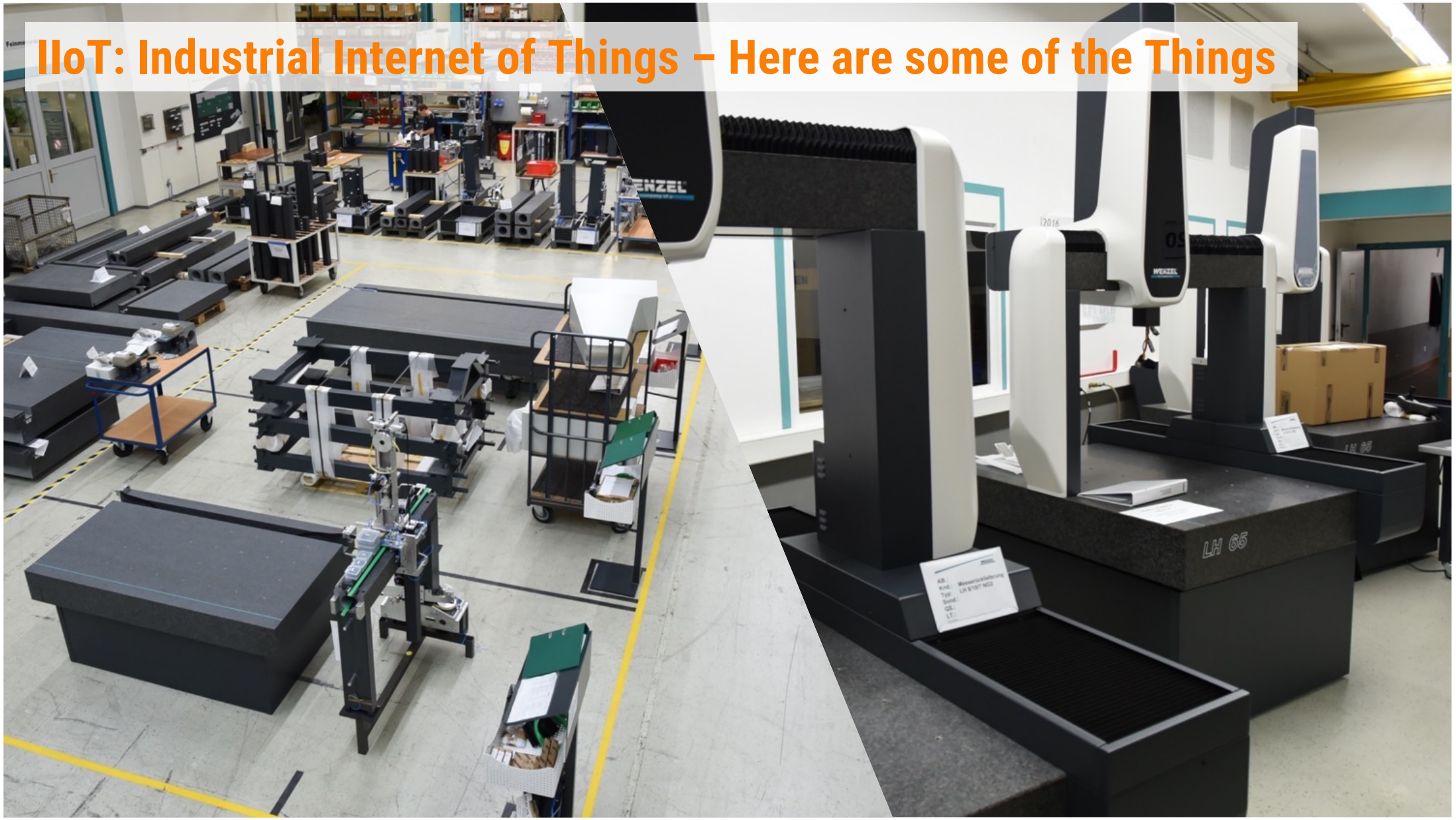
Trend #3 - Twin Transition

At least there were similarities in the hairstyle...

Digitalization in measurement technology

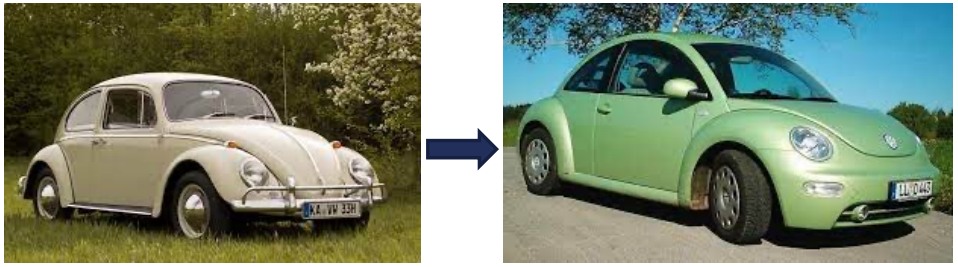


IIoT: Industrial Internet of Things – Here are some of the Things



PRODUCTS RECEIVE SEVERAL UPGRADES IN THE LIFE CYCLE AND GET BETTER!

WHAT DIGITALIZATION IN MACHINERY MEANS ...

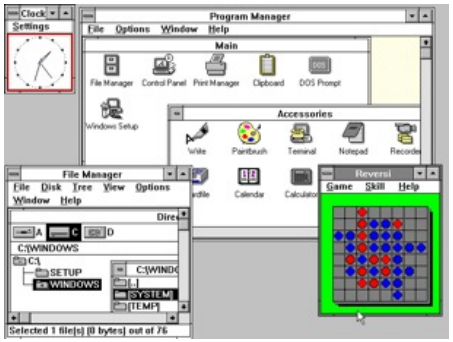


Improve performance => new hardware

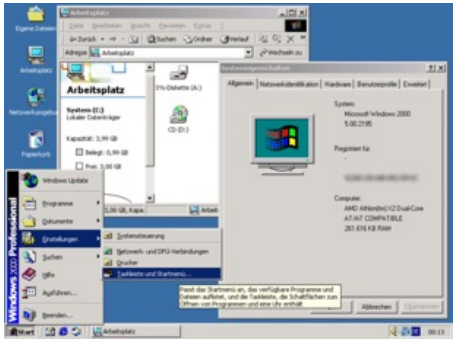
Improve performance => new software

How can I manage technology change over 30 years?

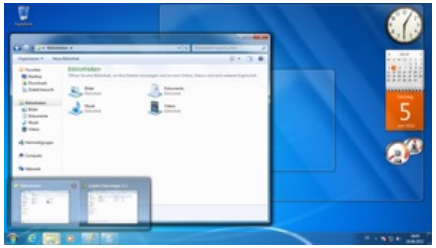
1990 - Windows 3.0



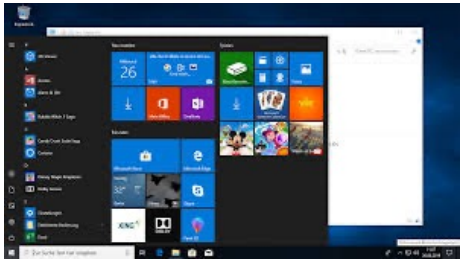
2000 - Windows 2000



2010 - Windows 7



2015/2021 - Windows 10/11

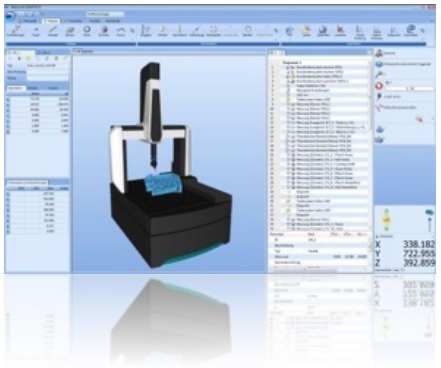


How many of production machines are accessible via the network?

Trend #4 - Automation

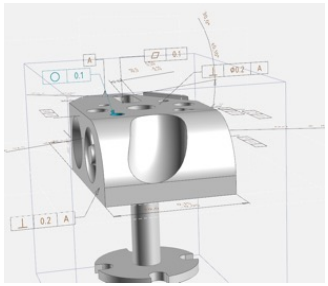
Integration in-line
„1-stop-2-measure“

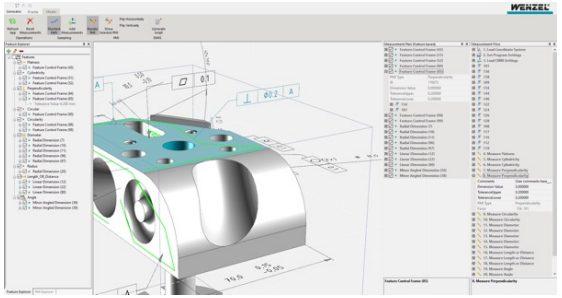
Response to processing centre
„closed loop“



Digitalized measuring procedure
„1-click-2-measure“

Measurement programs are created partially automatically





Prepare
- Import CAD file

PMI Explorer
- Extract PMI
- Visualize PMI

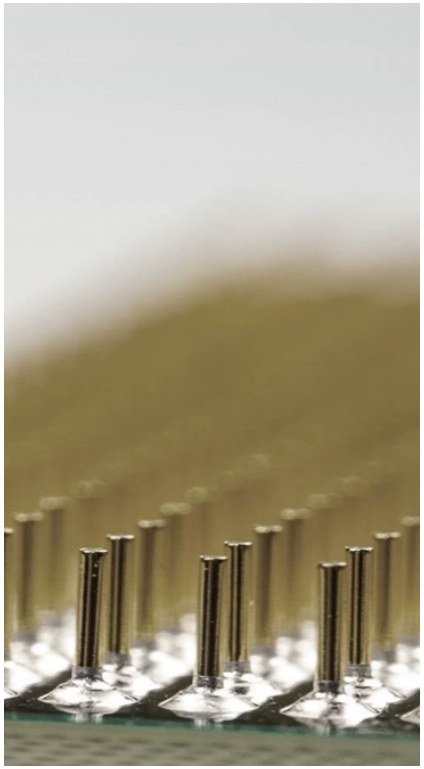
Feature Explorer
- Check PMI
- Edit PMI
- Add PMI

Inspection Planner
- Check references
- Connect features and tolerances

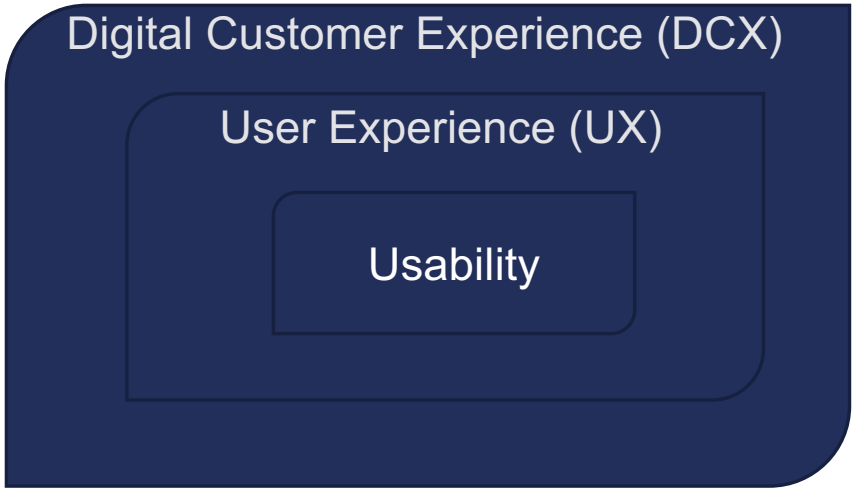
Produce
- Select features
- Export inspection plan

AI - challenges for measurement technology

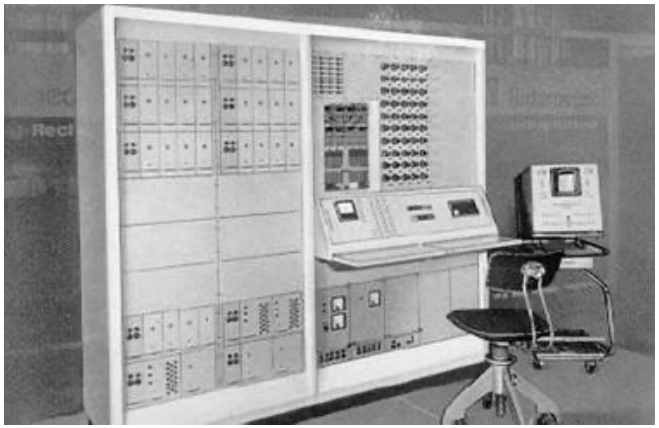
RECORD	STORAGE	CARE
ANALYSIS	SEARCH	SHARING
TRANSFER	VISUALIZATION	SECRET



Trend #5: Usability is (more) important



Usability



Apple's success has a lot to do with usability and is changing the way we interact with technology ...

Usability

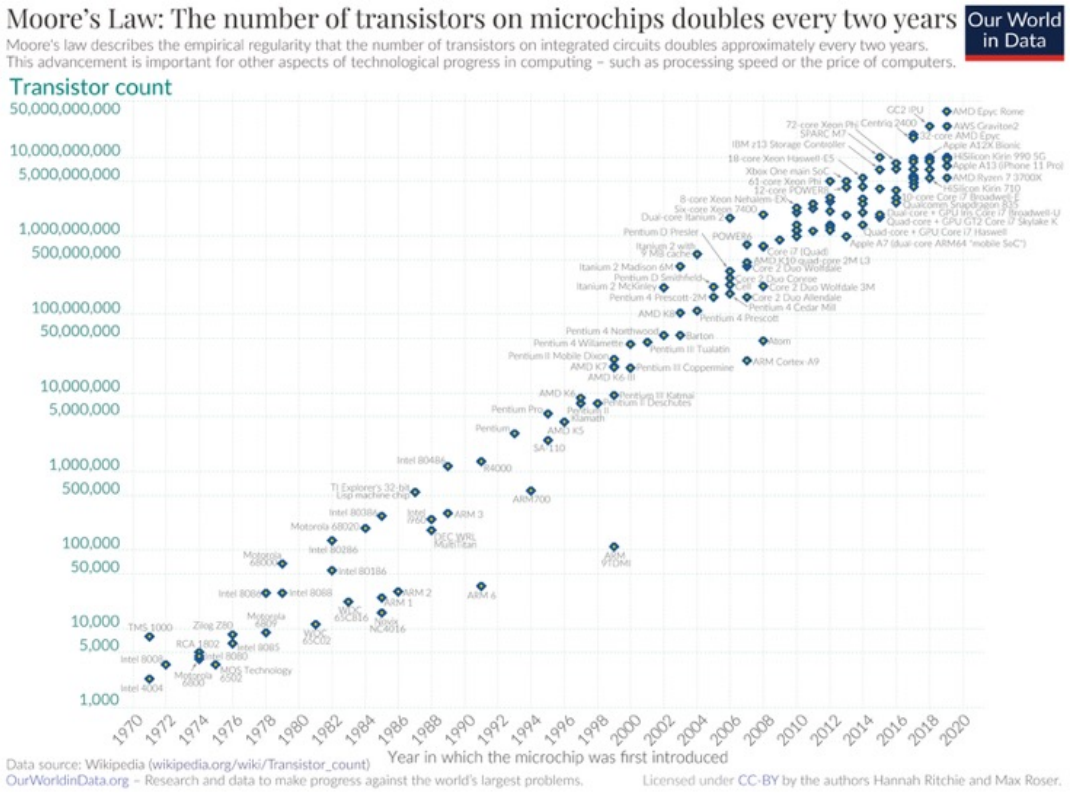

ANZEIGEFELD
Einzahlung mit 2 €-Münzen nicht mehr möglich!
CLIMOTAX - KASSE 6, BITTE KARTE STECKEN
EINZAHLUNG
1 KARTE STECKEN
2 TASTE [N] DRÜCKEN:
3 GELD EINZAHLEN
TASTE "BELEG" DRÜCKEN
4 KARTENRÜCKGABE-TASTE DRÜCKEN
TV
BELEG
GELD-RÜCKGABE
B
HINWEIS !!!
BERECHTIGUNG WIRD IM ANZEIGEFELD ANGEZEIGT
KARTEN-RÜCKGABE
4
GELDRÜCKGABE
A KARTE STECKEN
B GELDRÜCKGABE-TASTE DRÜCKEN
KARTE STECKEN
1 A
Wichtige Hinweise
für unsere Patienten
Bei Nichtbenutzen der Climotax-Magnetkarte verfällt das darauf gespeicherte Guthaben nach 30 Tagen
Bitte bei Geldrückgabe beachten
Auszahlung nur in vollen 10 Cent-Beträgen(abgerundet) möglich!

05 Take Aways

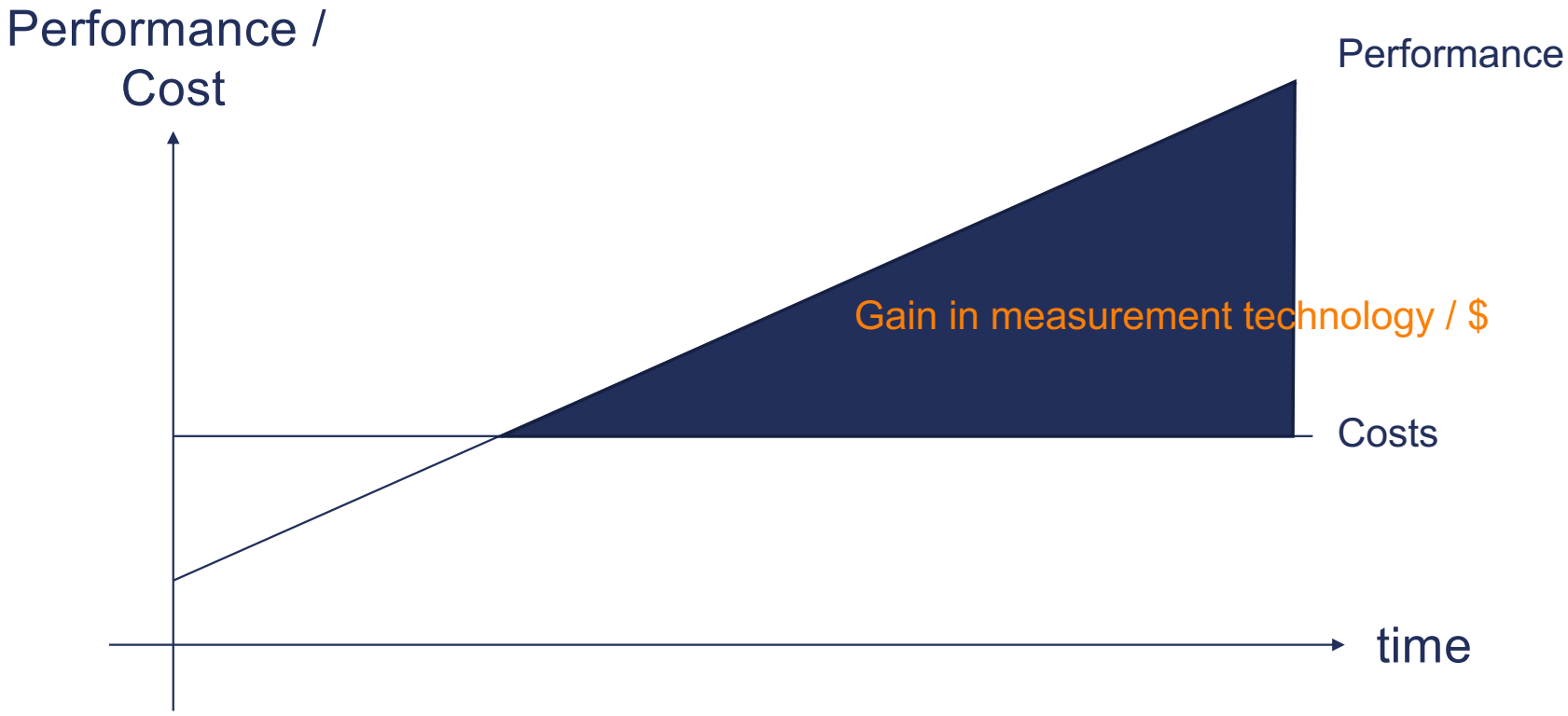
Innovation will not stop!

Gordon Moore in 1965

„If the auto industry advanced as rapidly as the semiconductor industry, a Rolls Royce would get half a million miles per gallon, and it would be cheaper to throw it away than to park it.“



„ Moore's law“ in Metrology



Measurement technology is "only" a means to an end, but the decisive ....

- Time is becoming increasingly essential in the measurement process
  - Optical sensors are great innovations on CMMs here
  - In the production fast measuring and evaluation of few criteria takes place
  - In the measuring room a detailed evaluation with very many data takes place

- Comparability required
  - On one machine over time
  - Between machines (CNC measuring machines)
  - Between production sites

- Feedback / closed loop between CNC measuring machines becomes more important

- User is in focus

CONTACT

Thank you for your attention

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