



# Intelligent Metrology for Future Production

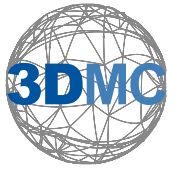
Digital, Sustainable, Resilient

Chair of Intelligence in Quality Sensing



# Intelligent Metrology for Future Production | Digital, Sustainable, Resilient

## New Challenges in Production Engineering

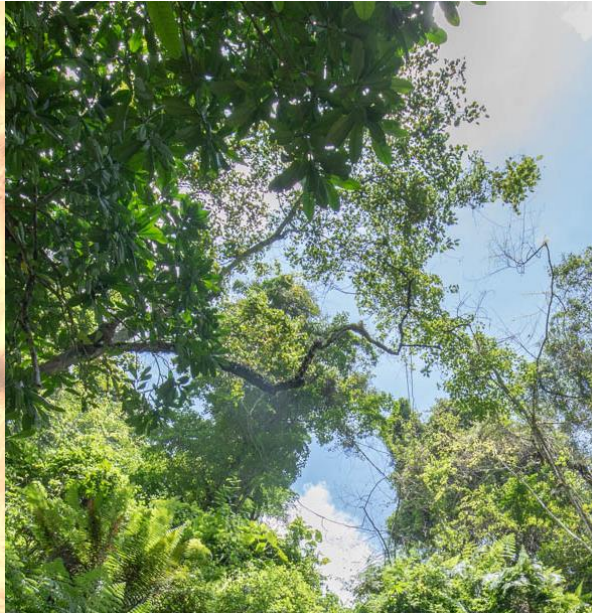


**70%**

lack of confidence among CXOs in their organizations to react to disruptive events.

Deloitte (2021): Building The Resilient Organization

**Resilience**



**91%**

of the global economy (GDP-based) is captured under net zero pledges in 2022.

Net Zero Tracker (2024): Net Zero Stocktake 2022

**Sustainability**



**8 Mio.**

forecasted decrease in available workforce in Germany by 2050.

Hellwanger et al. (2023): Modeling Migration Dynamics in Stochastic Labor Supply Forecasting

**Demography**



**829 Bil.**

expected data volume of data economy in the European Union by 2025.

European Council (2024): A digital future for Europe

**Digitalization**



## Trends in Industrial Metrology

## Metrology for Trending Products

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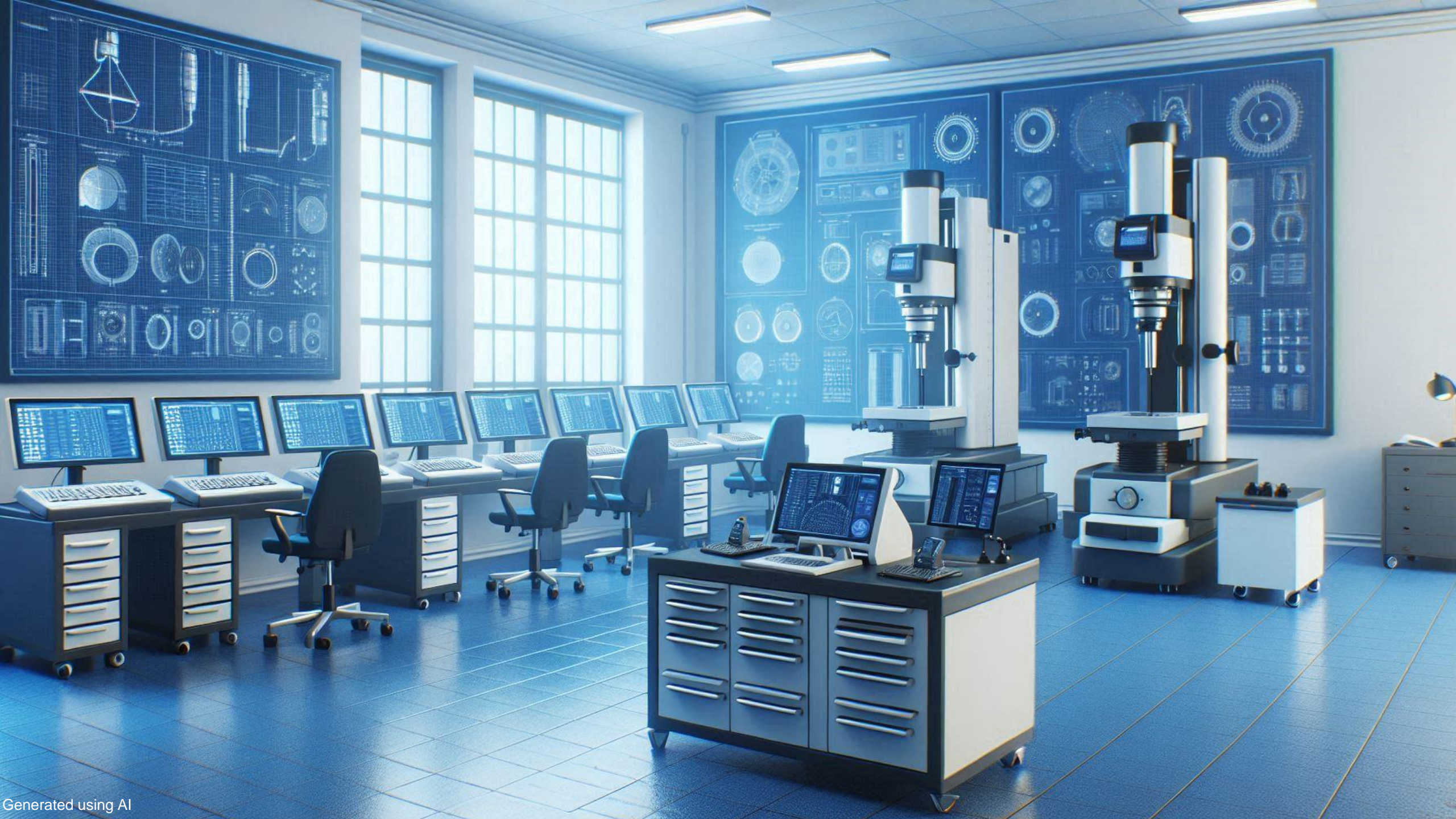


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- Quality Management is far from reactive nowadays
- Industrial Metrology must consider forward data flows, especially inline, predictive and virtual approaches
- Traceable metrology data blends with other sources of sensing (e.g. machine data, customer feedback) to holistic sources of information

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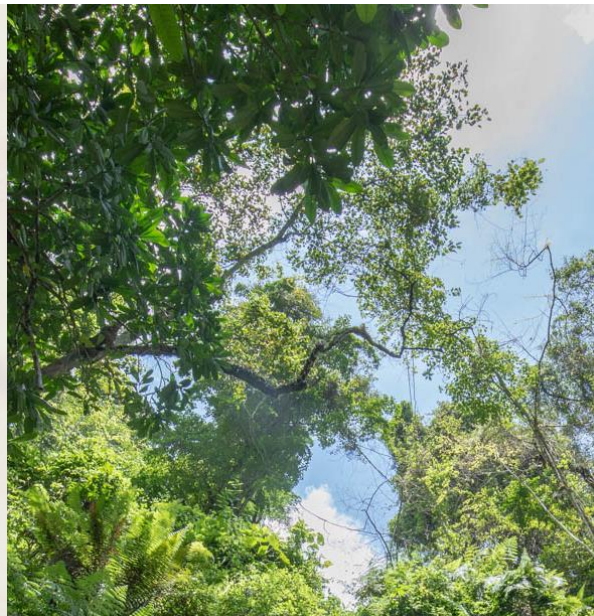


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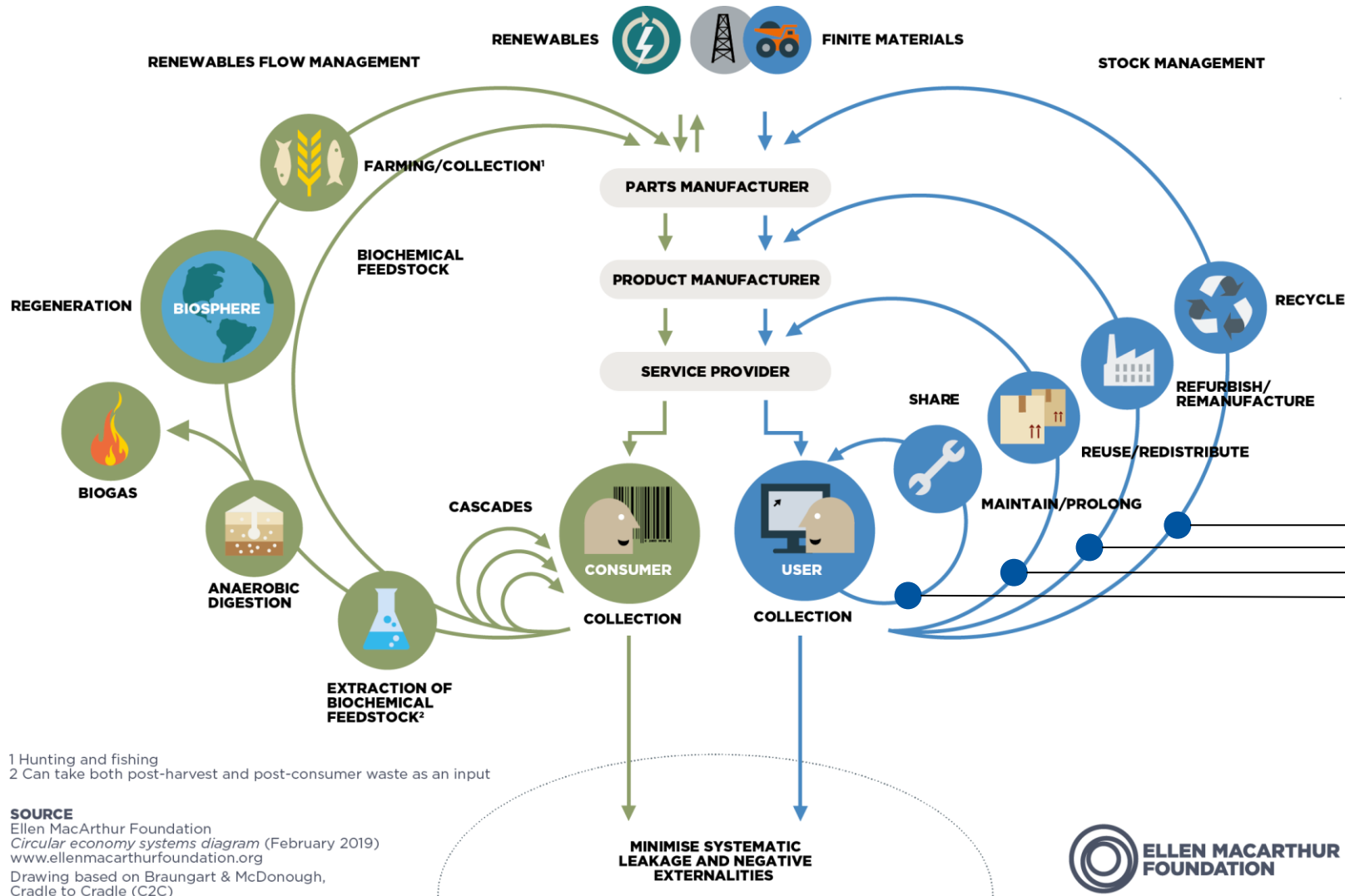


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## Industrial Metrology

### Traditional, “sustainable” objectives

- Improve quality
- Increase efficiency
- Reduce reject

### Which role does Metrology have in R-Strategies?

### Possible, new objectives

- Assert quality for reuse
- Digitalize current state for refurbishment
- Sustain prolonging actions
- Establish trust in shared goods
- ...



# Intelligence in Quality Sensing New Challenges in Production Engineering







Generated using AI



- A paradigm shift in automation is required to solve challenges in production engineering, e.g. automated disassembly
- Future automation relies on intelligent approaches with imperative need for real-time, in-situ information provided by metrology
- To establish complex automation systems, industrial metrology must integrate with digital twins and communication infrastructure

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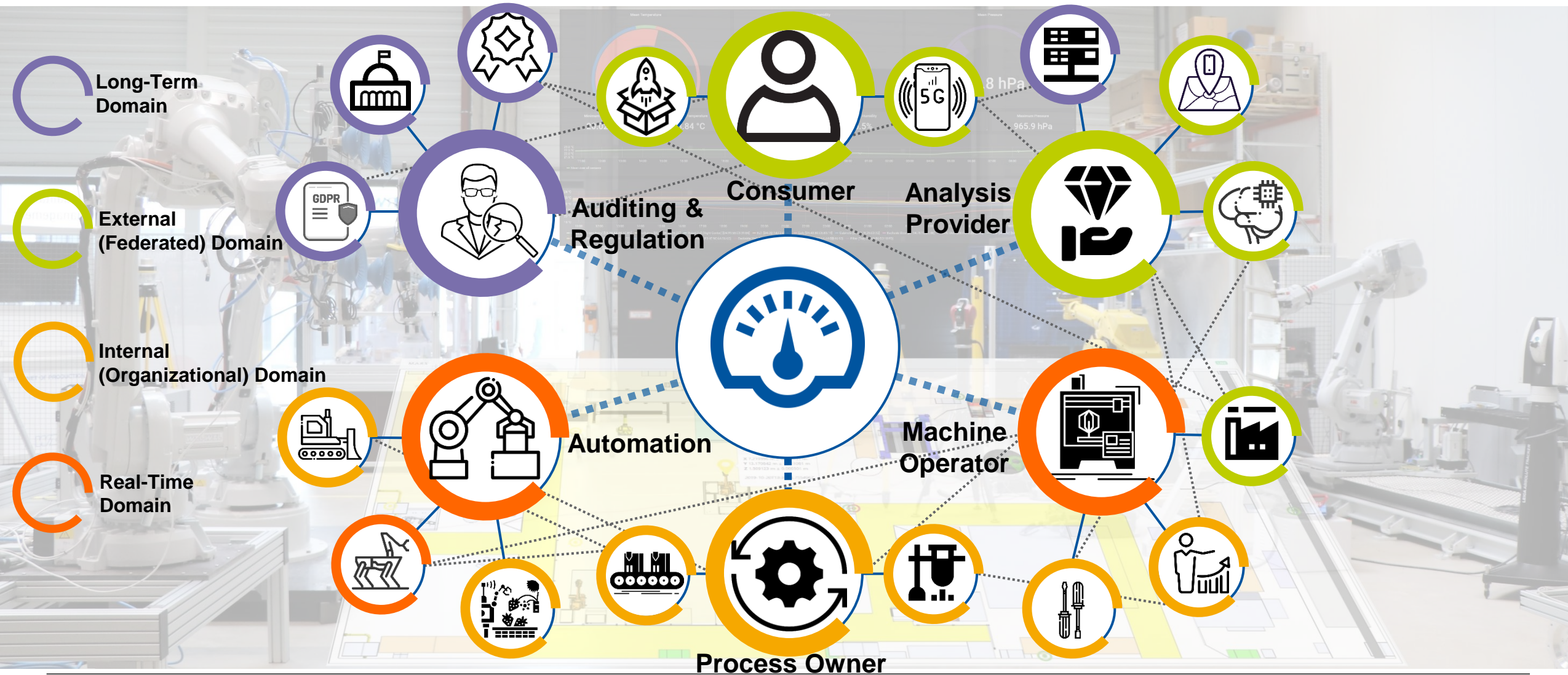
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# Digitalization Connectivity and Data Stakeholders

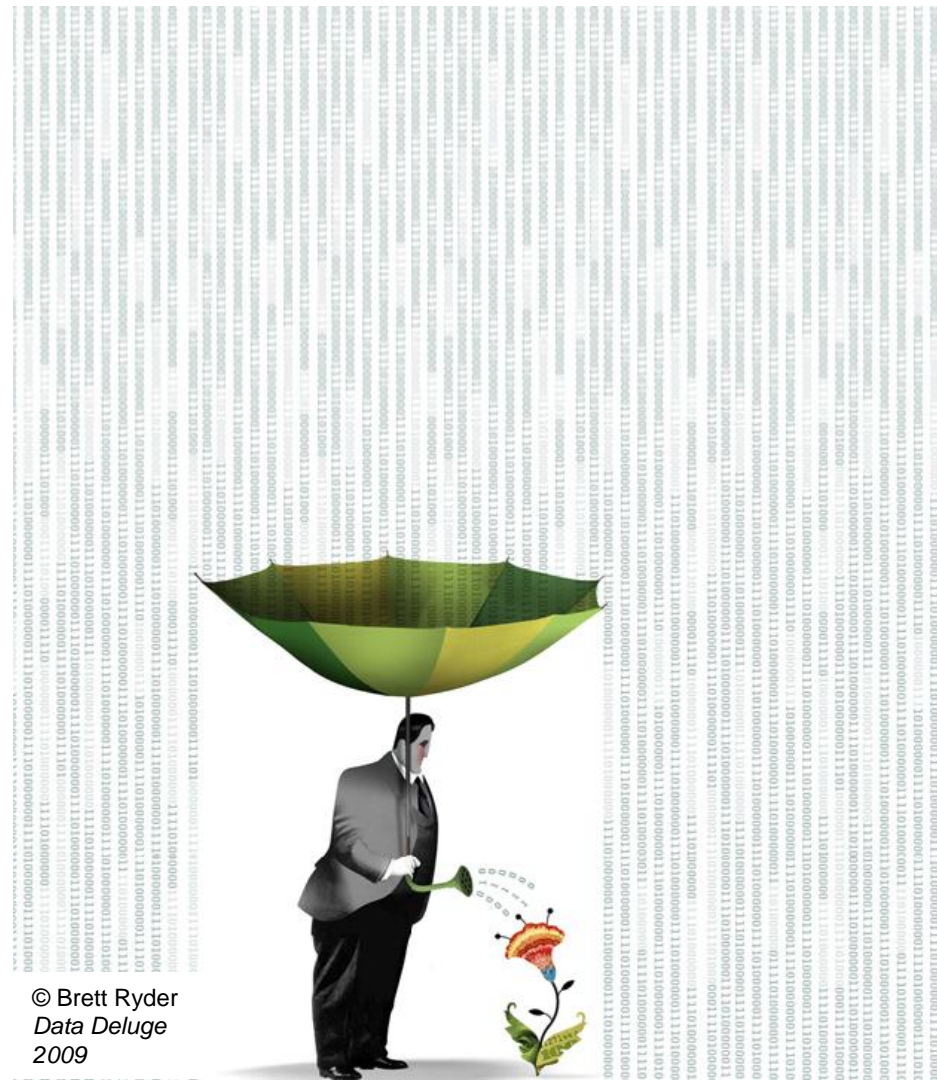




- A plethora of stakeholders and data consumers, might even unknown, must be considered for Industrial Metrology data
- Industrial Metrology should be able to integrate with relevant standards and legal requirements (e.g. digital product passports)
- The unique selling point and strengths of the Industrial Metrology community in the AI hype era can be claimed now (before others do?)



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Data Deluge  
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*In an era where data is ubiquitous, superfluous and artificial intelligence tremendously progressing, provisioning and delivering reliable information at the right time is key.*

***That's what Metrology does at its heart.***