CECIP European Weighing Industry

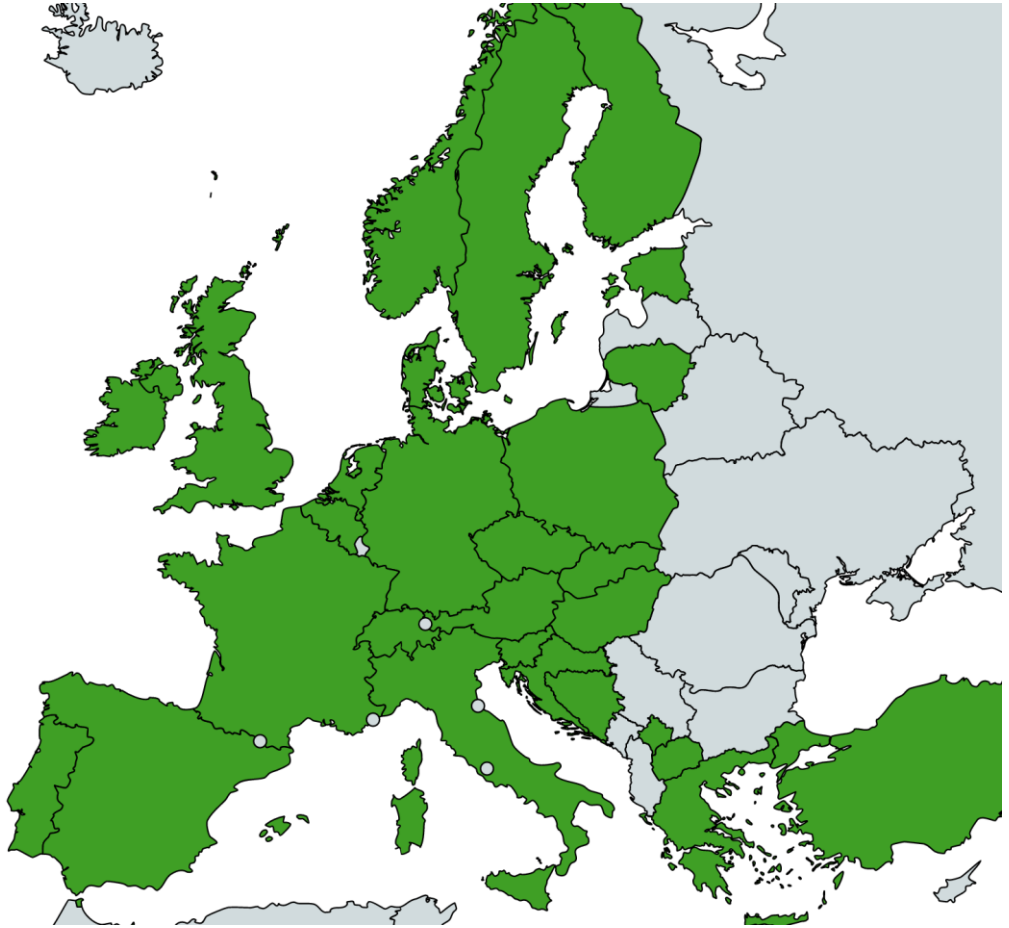
CECIP

European Association
of Weighing Instruments
Manufacturers

Digitalisation in Legal Metrology
25 June 2020

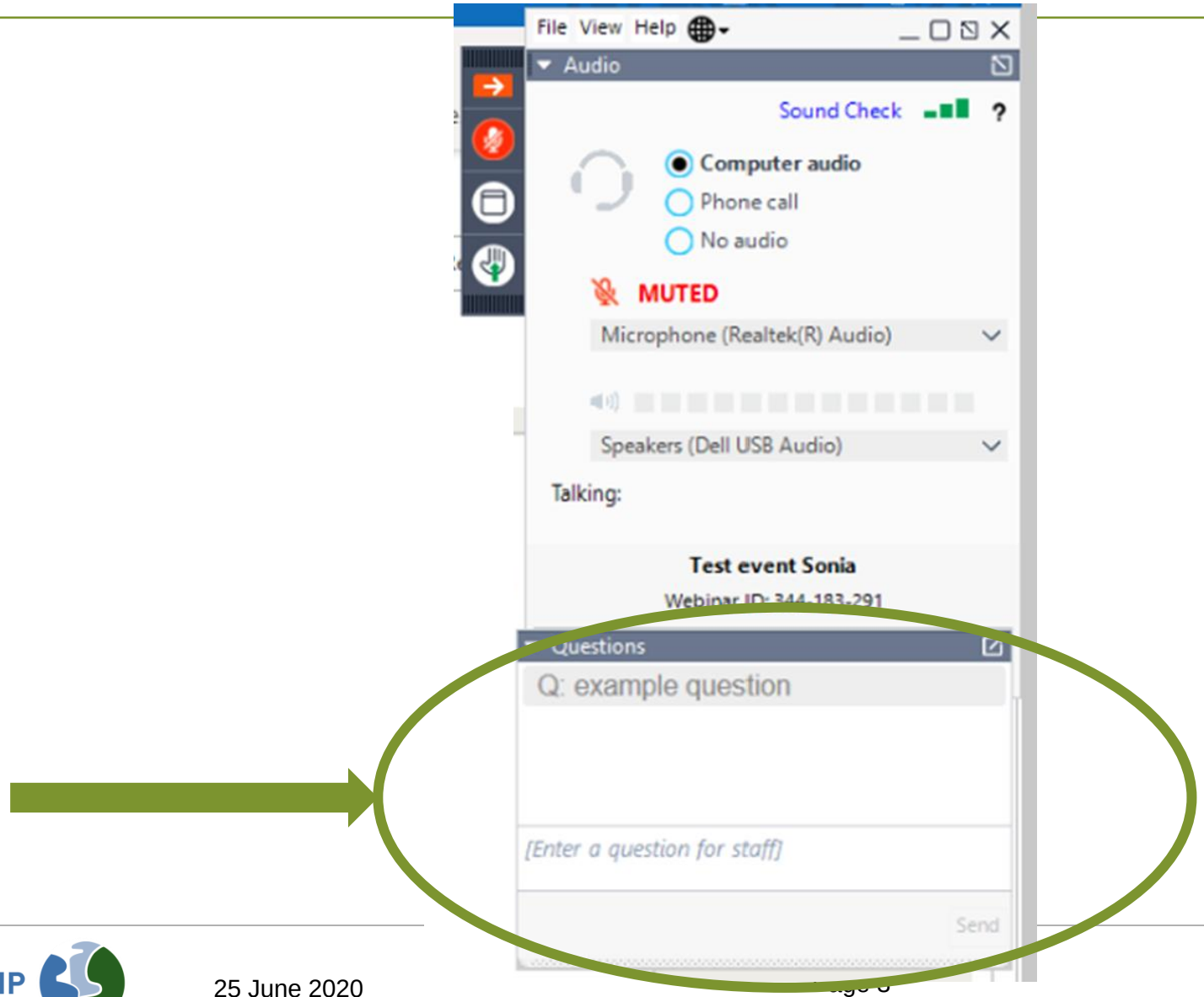
More than 170 participants

- Ministries
- National Metrology Institutes
- Market surveillance authorities
- Universities
- Industry
- …



+ US, India, Tanzania, ….

Instructions chat



Programme

- Welcome
  - Presenters:
    - Karlheinz Banholzer
      - CECIP Legal Metrology Group President & Head of Legal Metrology Sartorius Lab Instruments
    - Florian Thiel
      - PTB Head of Division on Metrological Information Technology & Convenor WELMEC WG7 on software
    - Roman Schwartz
      - President CIML
  - Panel discussion
  - Questions and answers audience

Fast digitalisation

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OIML R76

Uber

NAWI + MID

2004 2007 2009 2010 2014

Digitalisation in all sectors

Right legal framework

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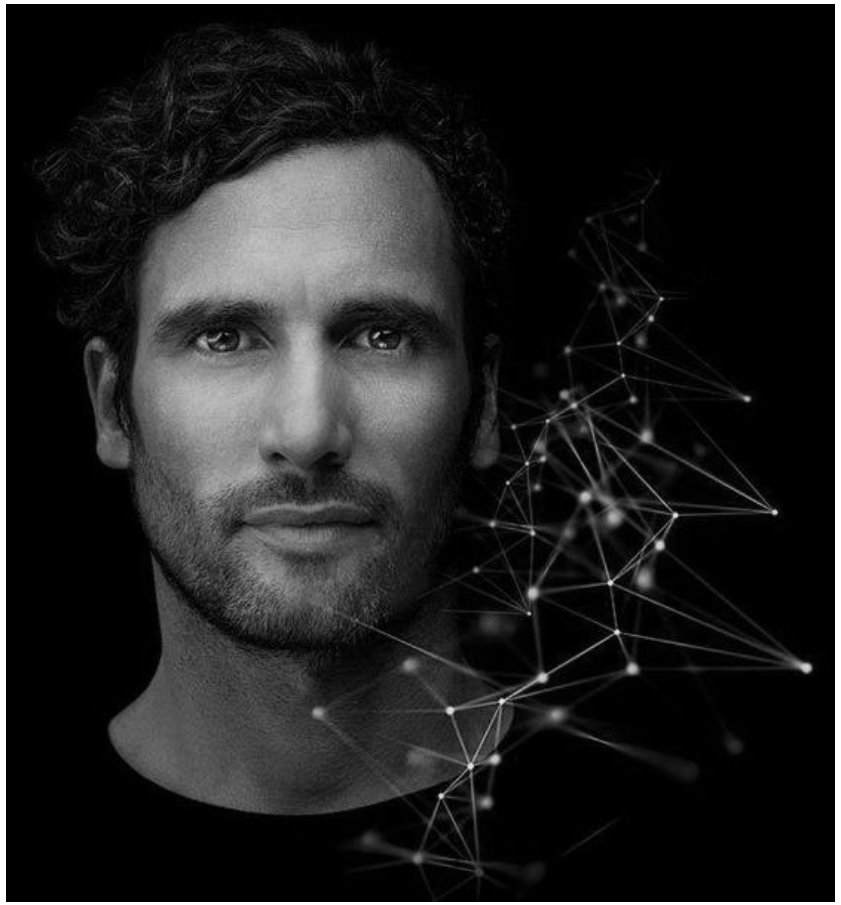
European Association of Weighing Instruments Manufacturers

Legal Metrology Group (LMG)

Karlheinz Banholzer

Digitalization in Legal Metrology

25 June 2020



Benefits of digitalisation

- Make processes more efficient
- Improve customers experience
- Create new business opportunities
- Decrease time-to-market for new developments

Ensure innovations in digitalisation by European weighing industry

EU legislation, OIML Recommendations and WELMEC Guides to **allow innovations** whilst maintaining a high level of **consumer protection**

How?

1. Focus legal metrology requirements on core weighing instruments

2. Essential requirements leading when controlling weighing instruments

(1) Focus legal metrology requirements on core weighing instrument

Future of weighing instruments:

- Differentiated architecture
- Defining boundaries is difficult

Relevant legal framework

- Currently: Regulations development is very slow compared to rapid development of technology

OIML Recommendations in 10 years

Updated in last 10 years	Older than 10 years
OIML R60	OIML R76
OIML R50	OIML R51
OIML R106	OIML R134
OIML R61	

Technology in 10 years

- Goal: Regulation should <u>not</u> prevent innovation

  Flexibility is needed and should ensure confidence **of all stakeholders**

CECIP's position:

- Focus requirements on core instrument that does the weighing
  - Definition to be developed
  - Printer, storage (Alibi), price computing have separate test certificates and may be combined with core instrument.
  - Web services, cloud applications, 'external' displays (by smart phone, tablet...) with separate part or test certificates may be combined with such a core instrument
  - Follow IEC concept to use certified products for safety in defined environments

(2) Current system: Essential requirements starting point

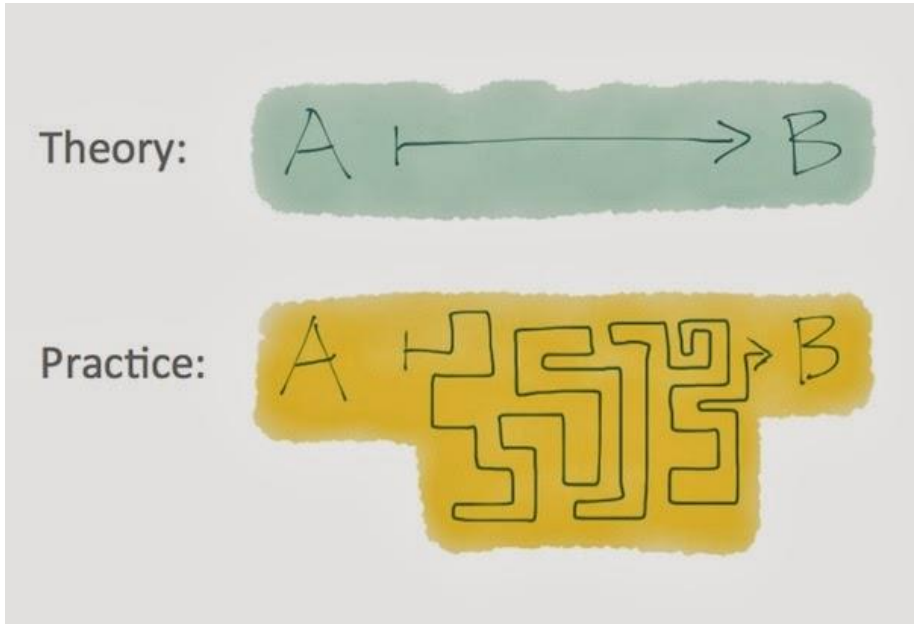
- Essential requirements

➔ harmonised standards

➔ presumption of conformity

Theory is right

Practice is different

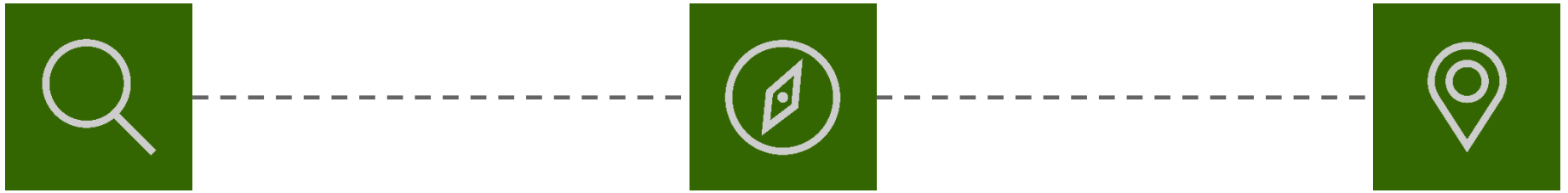


Strictly following requirements limits innovation in digitalization

- Digitalization won't be implemented or would be delayed due to long procedures of modifying guides and standards

CECIP's position: Flexibility needed

- Don't limit weighing industry to innovate
- Make essential requirements leading and not guides and standards



Where we are…

- **Strong regulated** EU Single Market Europe for products
- Directives, Laws, Guidelines **hinder innovation processes** for Legal Metrology
- Harmonized procedure to bring instruments into the **single market**
- **No harmonization** for instruments in service

Where we want to be…

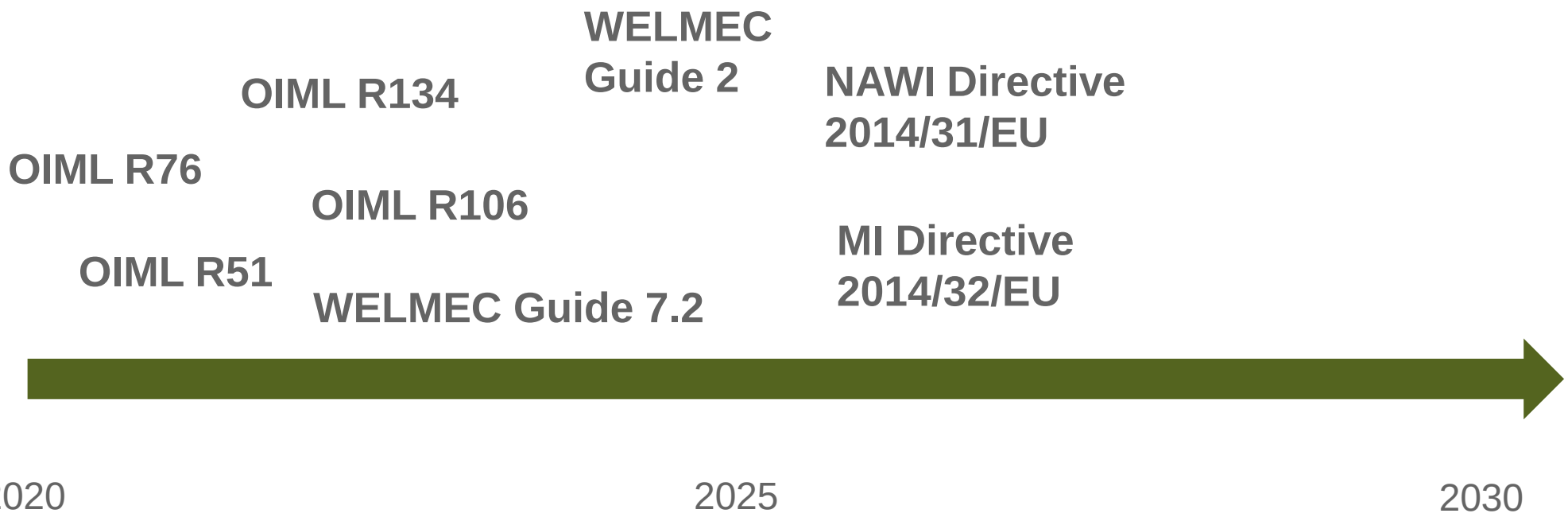
- Make the legal framework **futureproof**
  - Right legal framework focussing on core weighing instrument
- High priority on **consumer protection**
- Directives with essential requirements that allow for innovation
  - Have **authorities allowing for flexibility** in legislation
- **All stakeholders** are called **to promote innovations** in the area of digitalization
- Harmonization for repair and reverification

Where to get started…

- Continue discussion on **futureproof legal framework**
- Include principles in development basic documents or recommendations with OIML and WELMEC guides
  - Less stringent requirement for auxiliary devices
- Discuss **flexibility options** with authorities within wgMI, WELMEC, NoBoMet
- Participate in different digitalisation projects such as **SmarCom, MetrologyCloud**...

Changes needed in legislation, standards, guides

For example:



CECIP European Weighing Industry

Thank you

For more information,
please **contact:**

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Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin
National Metrology Institute

Digital Transformation in Legal Metrology

Florian Thiel

Thursday 25 June 2020

METROLOGY CLOUD

https://metrologycloud.eu

AnGeWaNt
Arbeit an geeichten Waagen
für hybride Wiegeleistungen
an Nutzfahrzeugen

www.angewant.de

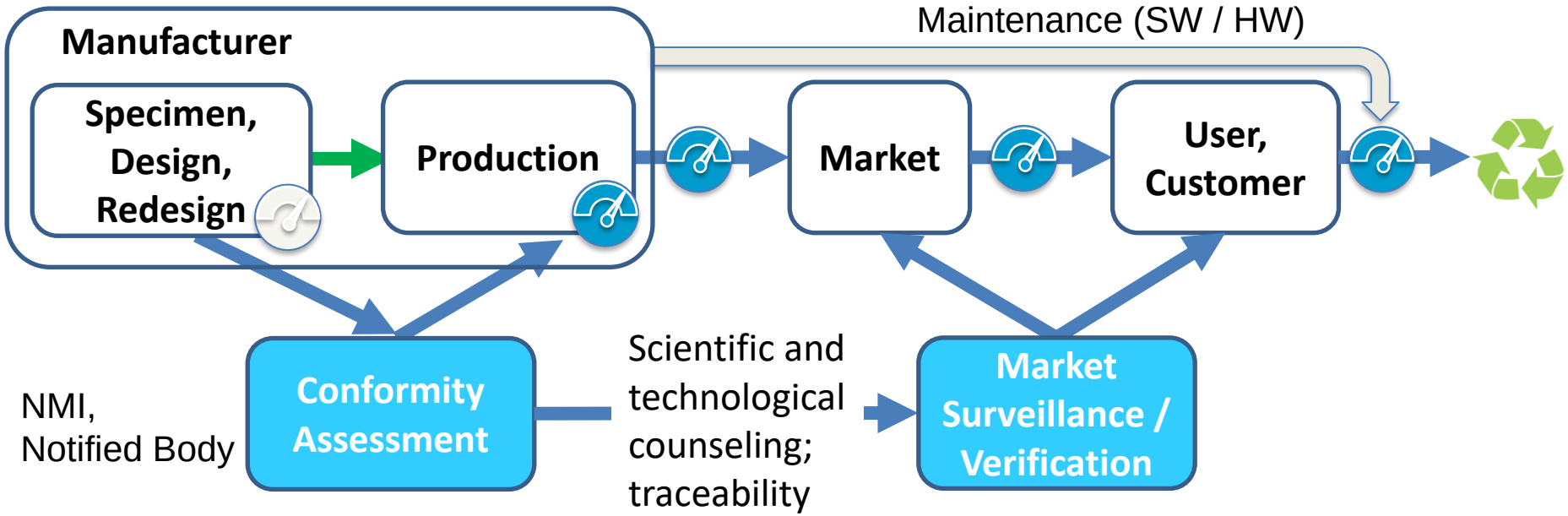
CECIP

Digital Transformation

- European Metrology Cloud
- Work of WELMEC WG 7 „Software“
- CECIP‘s position

Legal Metrology

European Regulations set up a Quality Infrastructure:



Serves in many ways:

- Establishes a ***Chain-of-Trust***
- Acceptance of technology in the market
- Sign of quality in new markets

Digital Transformation of Legal Metrology

European Regulations set up a Quality Infrastructure:

Metrology Cloud: General Objectives

- **Streamline and better Coordinate** processes

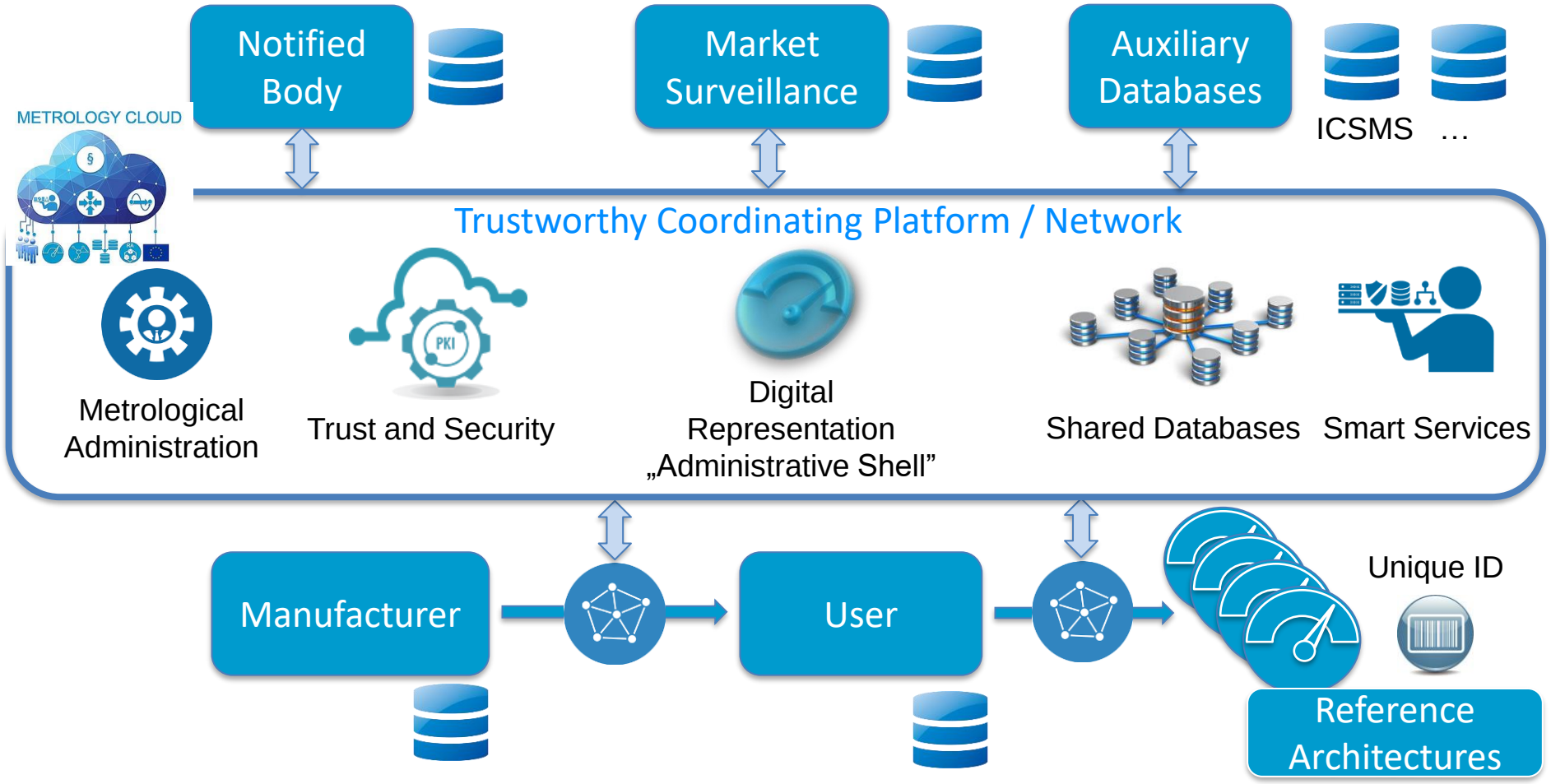
=> <u>Trustworthy Platform</u> (Network)
as a single-point-of contact for all stakeholders
to link their infrastructures, data bases
and services.

- Support innovative products and services
to **remove barriers to innovation**.

=> <u>Reference Architectures</u> and Procedures
(harmonized in Europe via WELMEC WG 7)

MC: Trustworthy Metrological Core Platform

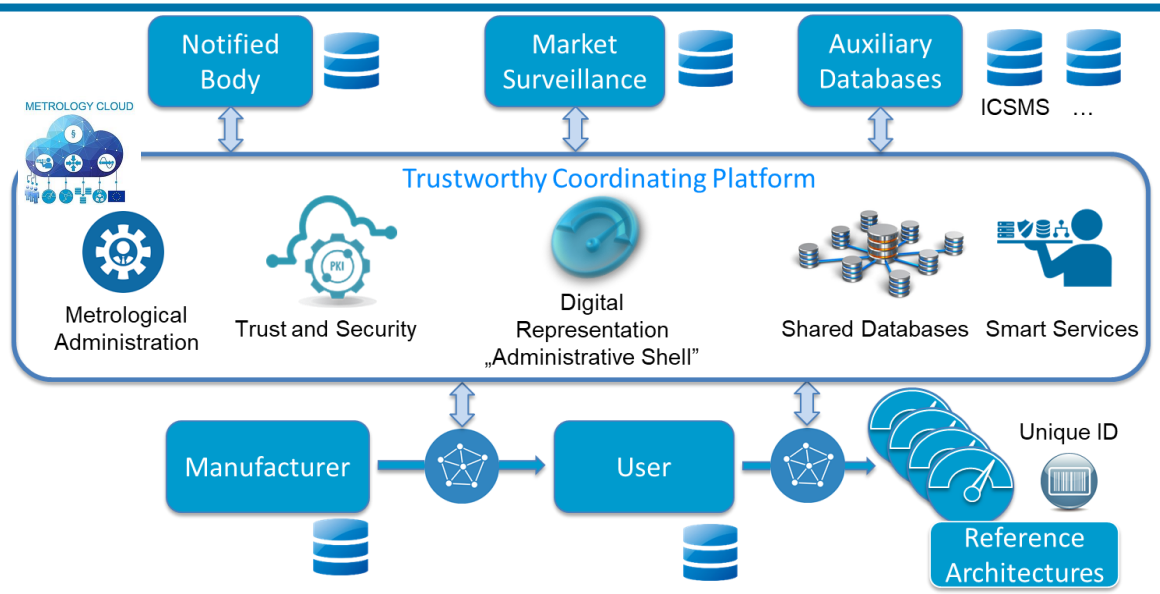
Must join infrastructures and data bases:



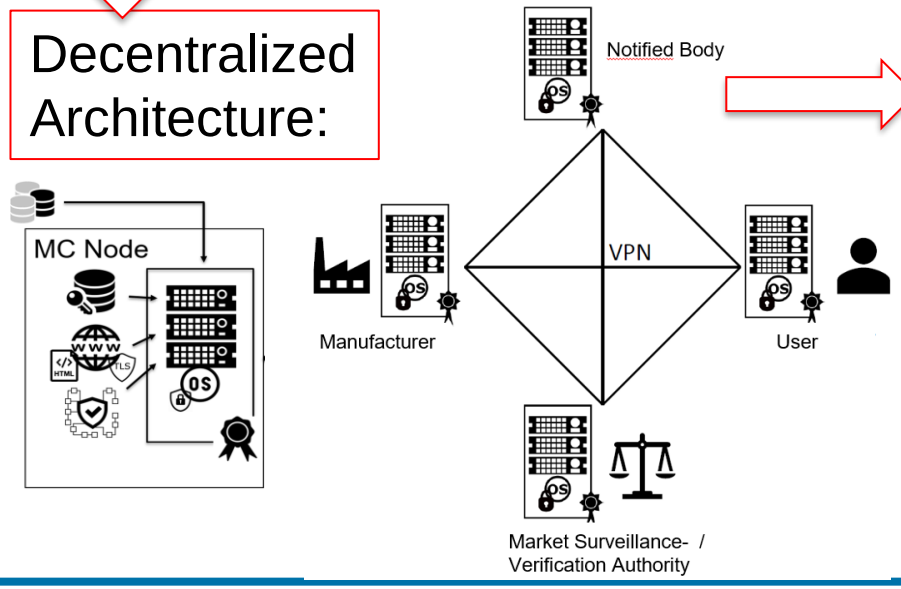
Concept – Architecture - Demonstrator

METROLOGY CLOUD

Concept:

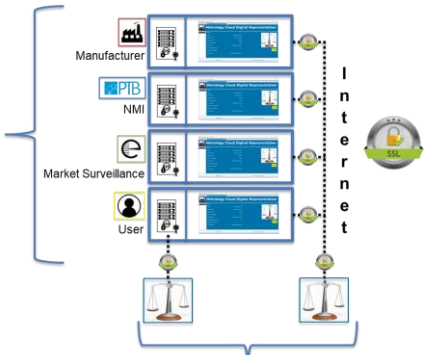


Decentralized Architecture:



Demonstrator:

- 4 Stakeholder Nodes



- 2 Measuring Devices

Be part of the MC-Network!

METROLOGY CLOUD

Trust Elements:

Encrypted Database
with shared schema

Secure Web frontend
for plattform independent access

Immutable Chains (DLT)
for logging, access management and Smart Contract processing

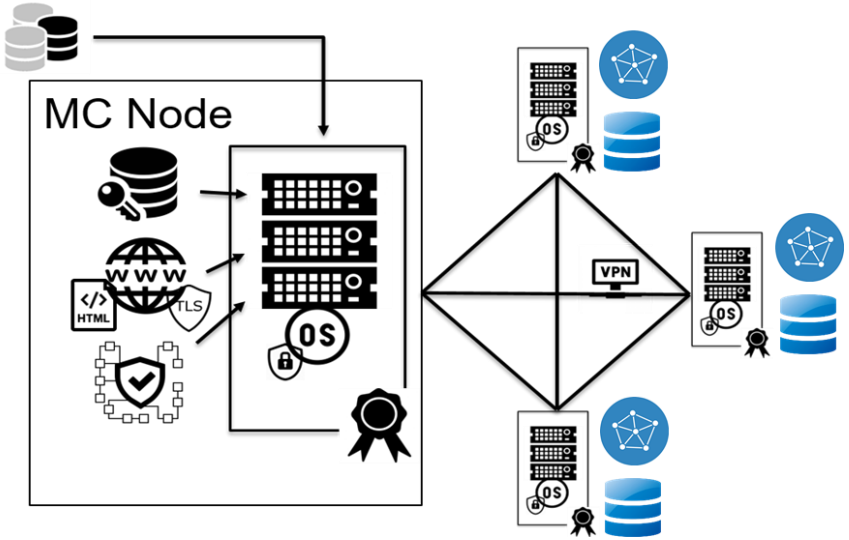
Metrological Administration
via integrated decentralized hard-wired contracts and consensus

To become a part of the MC-Network
install a MC-NODE in your infrastructure.

Contact:

Prof. Dr. Jan Nordholz
(jan.nordholz@ptb.de)

Node Rollout Presentation: Today, June 25th, 15:30 -- 17:30 CEST
https://webconf.vc.dfn.de/mc-wp1-node-rollout/



WE SUPPORT YOU:

- **NODE-Software package** is provided by the MC-Team.
- **Installation and integration** is supported by the MC-Team
- **All you need** is a standard PC or some space on your server and a contact person!

M. Dohlus, M. Nischwitz, A. Yurchenko, R. Meyer, J. Wetzlich and F. Thiel, Designing the European Metrology Cloud, OIML Bulletin, vol. LXI, 2020(1), pp. 8-17,

GAIA-X and the European Metrology Cloud

- **GAIA-X is a federated, open data infrastructure** based on **European values** transferred into a GAIA-X-set of rules [1] (e.g. European Data protection, Trust, Digital sovereignty, …).

- **GAIA-X connects centralised and decentralised infrastructures** in order to turn them into a homogeneous, user-friendly system to both access and share data securely and confidently.

METROLOGY CLOUD

Transfer into a GAIA-X conform Infrastructur- and Data-Ecosystem for the „Metrology Domain“ [2].

„Accepted USE CASE“

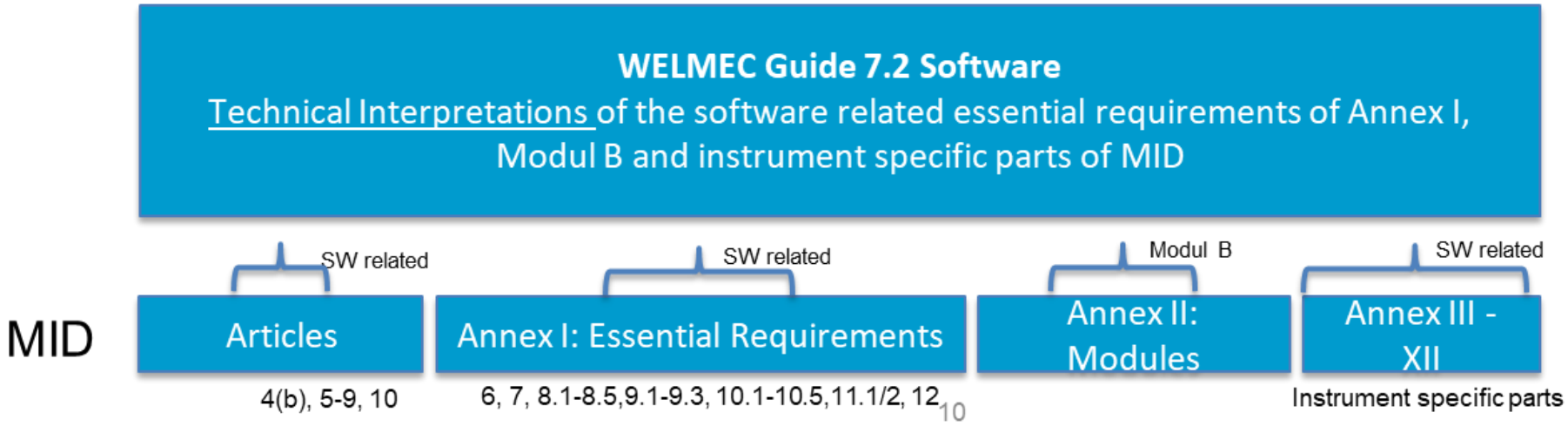
The MC-Node will also become GAIA-X compatibel!

GAIA-X

Policy Rules and Architecture of Standards

https://www.bmwi.de/Redaktion/EN/Dossier/gaia-x.html
https://www.data-infrastructure.eu/GAIAX/Navigation/EN/Home/home.html
[1] www.data-infrastructure.eu/gaia-x-policy-rules-and-architecture-of-standards
[2] https://www.bmwi.de/Redaktion/EN/Artikel/Digital-World/GAIA-X-Use-Cases/quality-infrastructure-digital-qi-digital.html

WELMEC Working Group 7 „Software“



NAWID: WELMEC Guide 2.3 „Guide for Examining Software“ (in NAWIs) is out of date (2005)!

- NAWID software requirements are a subset of the MID requirements (33rd WELMEC Committee meeting 2017)

=> WELMEC Guide 7.2 „Software“ is applicable to AWIs and NAWIs

Replacement of WELMEC Guide 2.3:

- **A new WELMEC Guide 7.5 “Software in NAWIS”** (2020) provides a cross reference between EN45501:2015 and WELMEC Guide 7.2 “Software” and **bridges potential gaps.**

WELMEC Working Group 7 „Software“

Development in software related WELMEC Guides representing the need of the stakeholders:

(2018)

WELMEC Guide 7.2
“Software”
(2015 / 2018 / 2019 /…)

OIML D-31
(2019)

WELMEC Guide 7.3
“Reference Architectures”
(2019)

WELMEC Guide 7.4
“Application of WG 7.2 Software”
(2019)

WELMEC Guide 7.5
“Software in NAWIs”
(2020)

WELMEC Guide 7.X
“Risk Assessment for Software”
(2021)

WELMEC Guide 7.2
“Software”
OS Requirements
(2021)

WELMEC Guide 7.X
“Machine Learning”
(202x)?

. . .

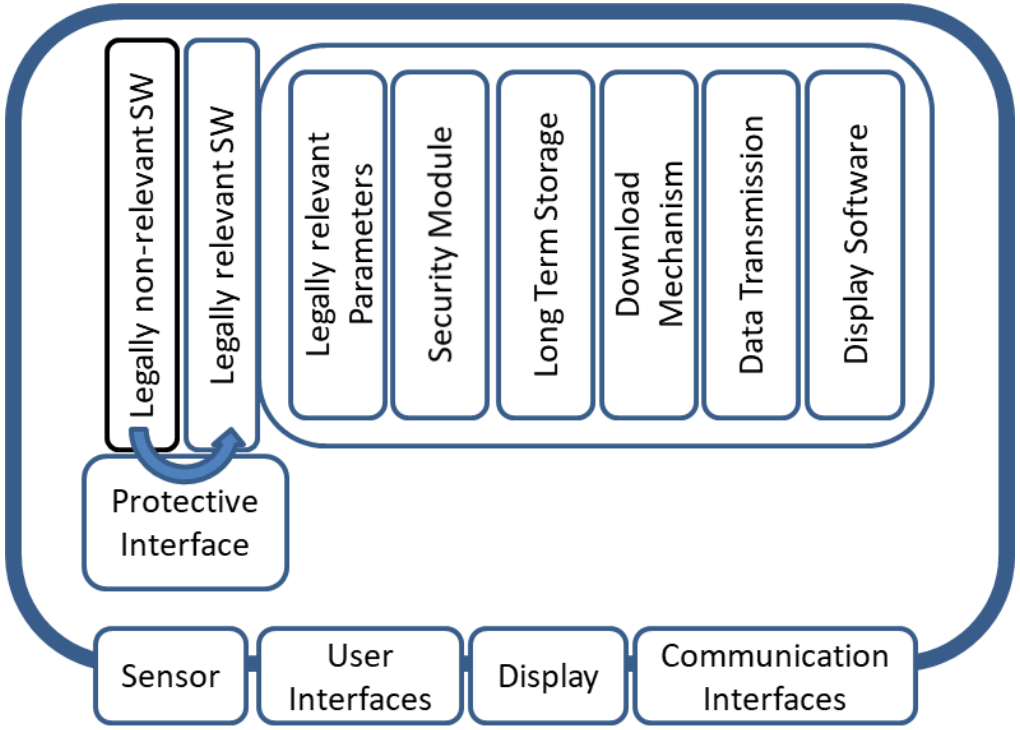
2015 2020 2025

https://www.welmec.org/documents/guides/72/?L=0
https://www.welmec.org/documents/guides/73/?L=0
https://www.welmec.org/documents/guides/74/?L=0

WELMEC Working Group 7 „Software“

WELMEC Guide 7.3: Reference Architectures

WELMEC Guide 7.3, Chapter 3.2.
General Architecture to describe measuring instruments



- **General Architecture** resembles the **refined modular structure** of the WELMEC Guide 7.2 Software Guide (basic requirements and extensions)
- **Instrument specific requirements** must be added to the architecture

- Distributed systems can be described by this architecture.
- Examples are available in WELMEC Guide 7.3 and WELMEC Guide 7.4.

https://www.welmec.org/documents/guides/72/?L=0
https://www.welmec.org/documents/guides/73/?L=0
https://www.welmec.org/documents/guides/74/?L=0

CECIP‘s Position I

CECIP’s Position: Guides, harmonised standards and OIML recommendations…

(1) should be flexible enough to allow innovation
(2) cannot keep up with the rapid developments of weighing instruments
(3) are expected to be strictly followed by manufacturers.

Experience from WELMEC Working Group 7 “Software“:

(1) Essential requirements of MID and the corresponding **WELMEC Guides** (e.g., WELMEC Guide 7.2, 7.3, 7.4) **provide the required flexibility** to support innovation.

(2) **A new draft Guide** or revised Guide **could be available in less than a year**.

(3) The **digital transformation** of the stakeholders is supported, e.g. by the European Metrology Cloud project and reference architectures / services developed within.

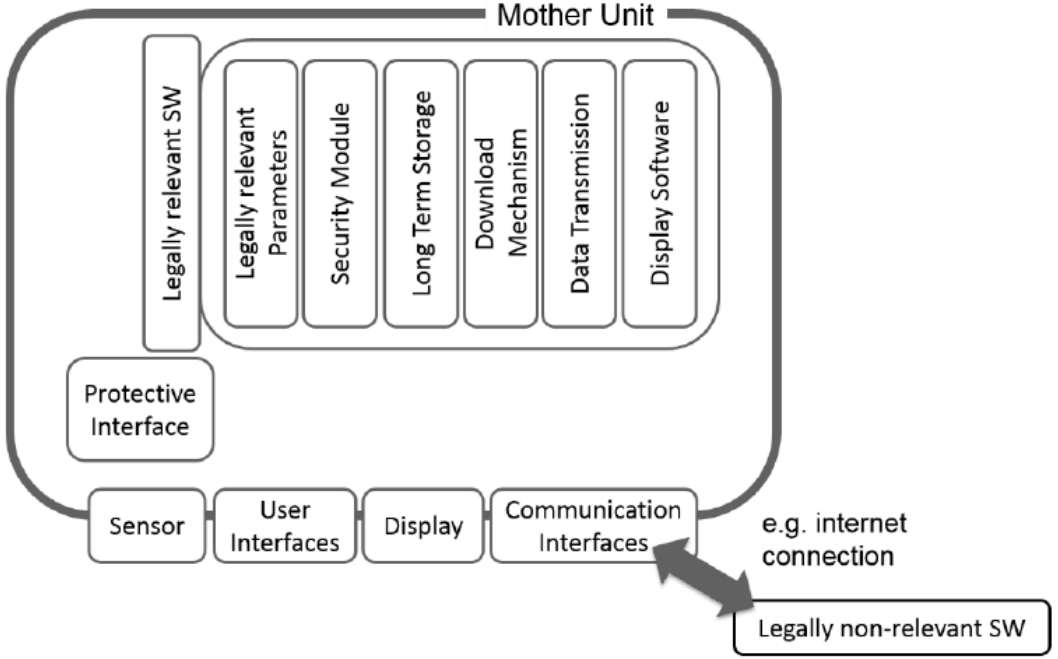
CECIP‘s Position II

Focus on legal metrology requirements for the core weighing instrument:

CECIP: Definition of a “**core instrument”** shall be possible.

Suggestion:

- Apply WELMEC Guide 7.2 or 7.3 or 7.4 to define such a **“core instrument”** and the **“correct”** communication to external modules!



https://www.welmec.org/documents/guides/72/?L=0
https://www.welmec.org/documents/guides/73/?L=0
https://www.welmec.org/documents/guides/74/?L=0

Save the Date!

„Digital Transformation is a Journey not a Destination.“

Let‘s travel together

Source: pwc

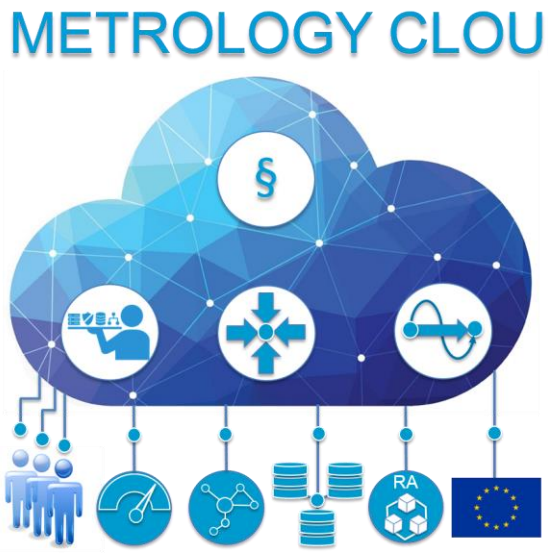
NEXT Event:

OIML Summit “Digital Transformation in Legal Metrolo

5^{th} + 6^{th} May 2021, PTB, Berlin, Germany

OIML Summit 2021 "Digital Transformation in Legal Metrology":
https://www.oiml.org/en/events/oiml-seminars/digital-transformation

Thank you for your attention!



https://digital.ptb.de/MetrologyCloud

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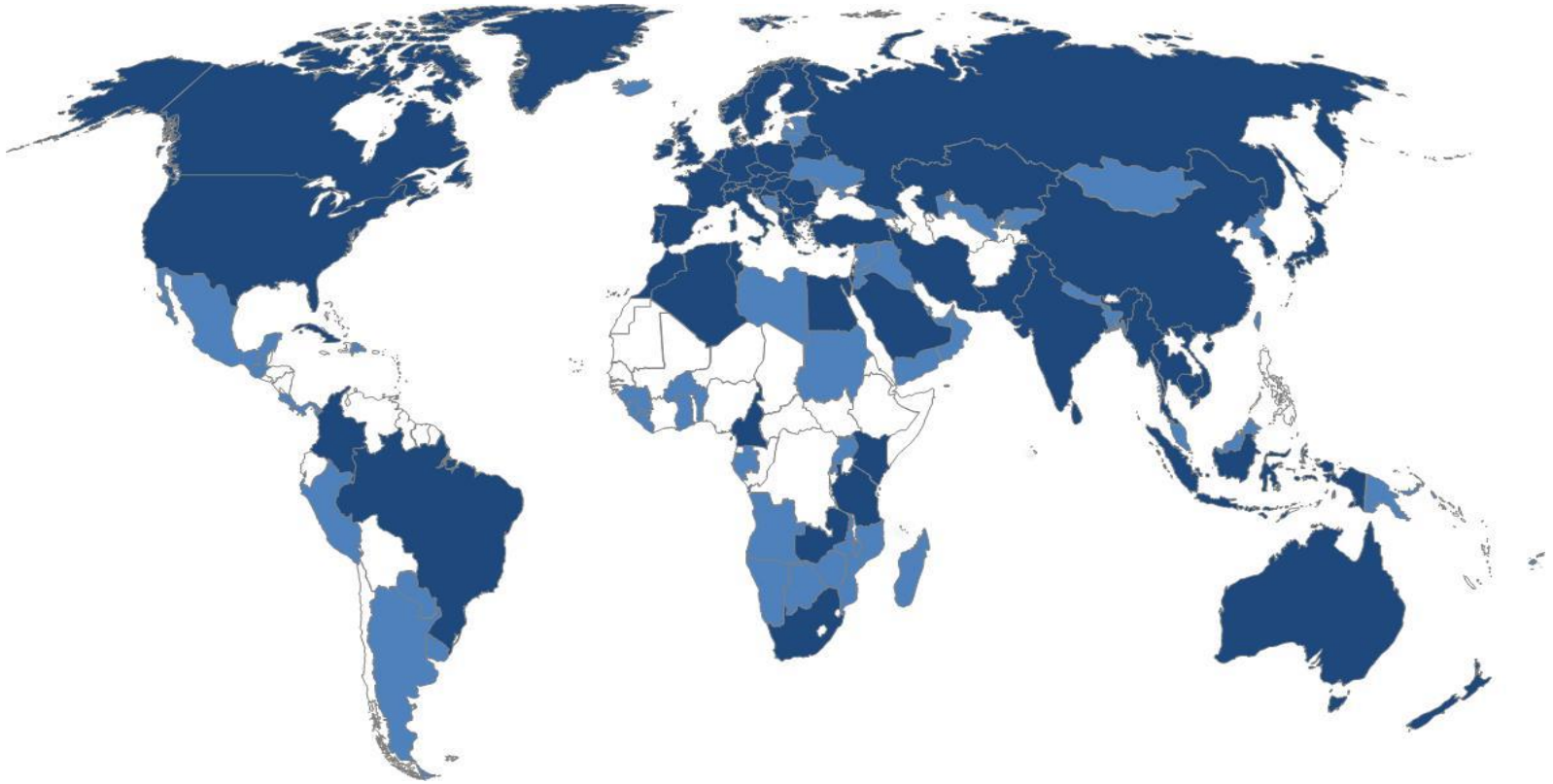
Digitalization in Legal Metrology – Challenges and Opportunities

Roman Schwartz
President, CIML

CECIP webinar “Digitalization in Legal Metrology”
25 June 2020

OIML Membership



www.oiml.org

61 Member States

62 Corresponding Member Countries

OIML Mission

- To enable economies to put in place effective legal metrology infrastructures…
- … that are mutually compatible and internationally recognized…
- … for all areas for which governments take responsibility, such as those which facilitate trade, establish mutual confidence and harmonize the level of consumer protection worldwide.






OIML Activities

- **Technical Work:**

  → 18 TCs / 45 SCs / ≈ 50 Project Groups

  → Global harmonization of metrological requirements and test procedures (e.g. R 51, R 60, R 61, R 76, D 11, D 31)

- **OIML Certification System (OIML-CS):**

  → 37 MI categories / 12 Issuing Authorities / 32 Utilizers

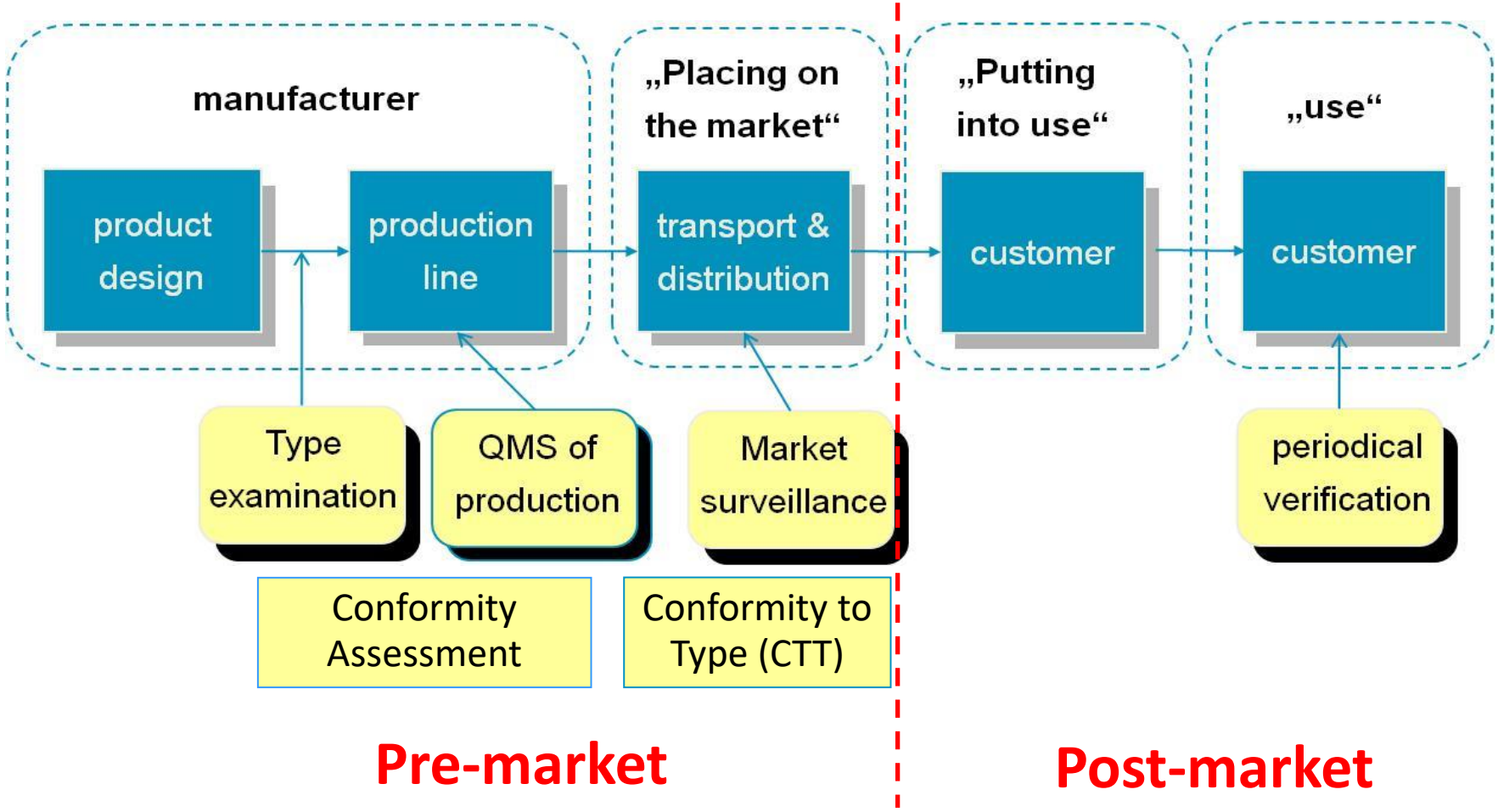
  → Global harmonization of conformity assessment procedures and mutual recognition of test results

- **Support of Countries & Economies with Emerging Metrology Systems (CEEMS)**





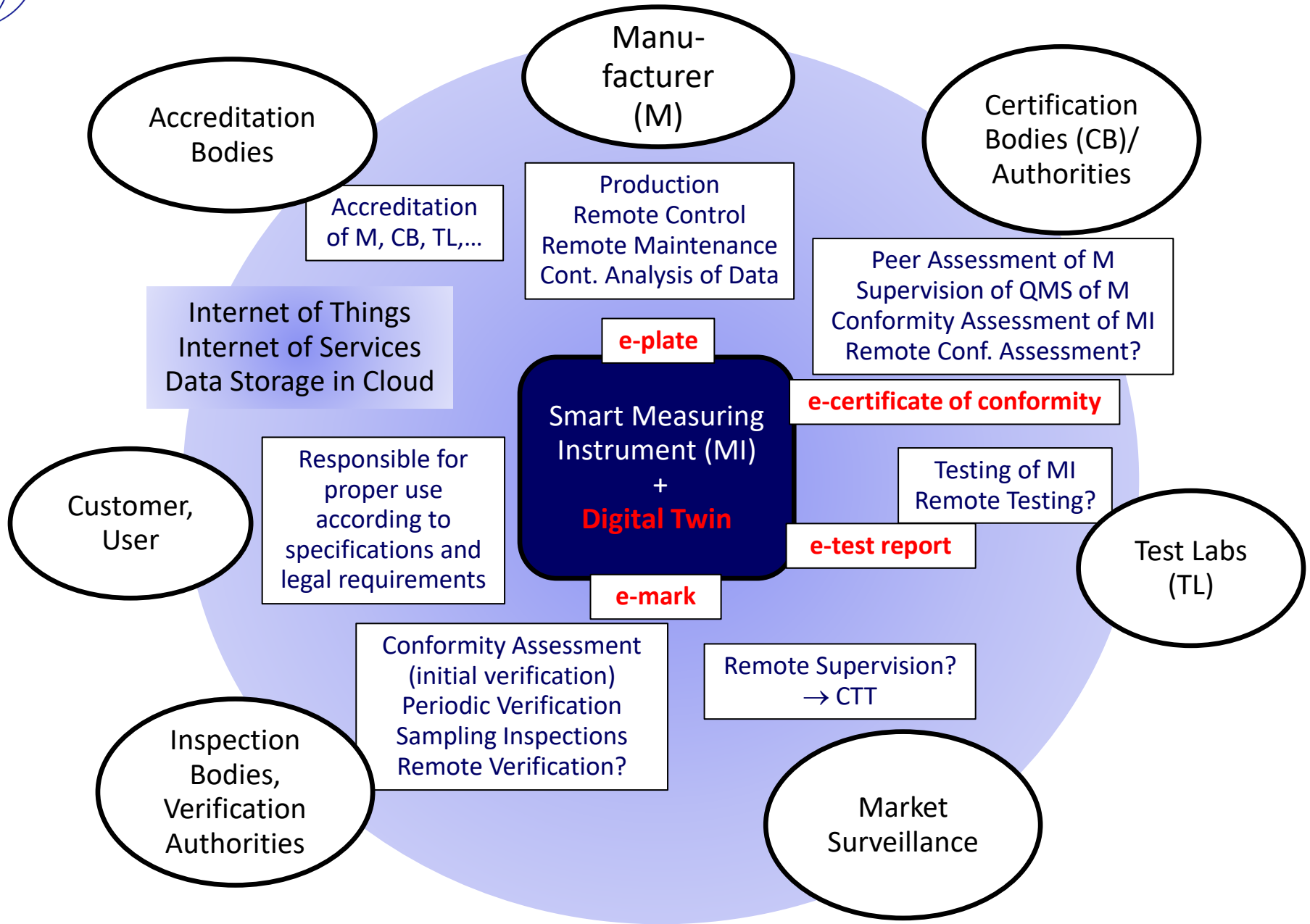

Challenge: Digital transformation of processes during the product life cycle








Vision: Digitalization in Legal Metrology



Questions / proposals to be discussed

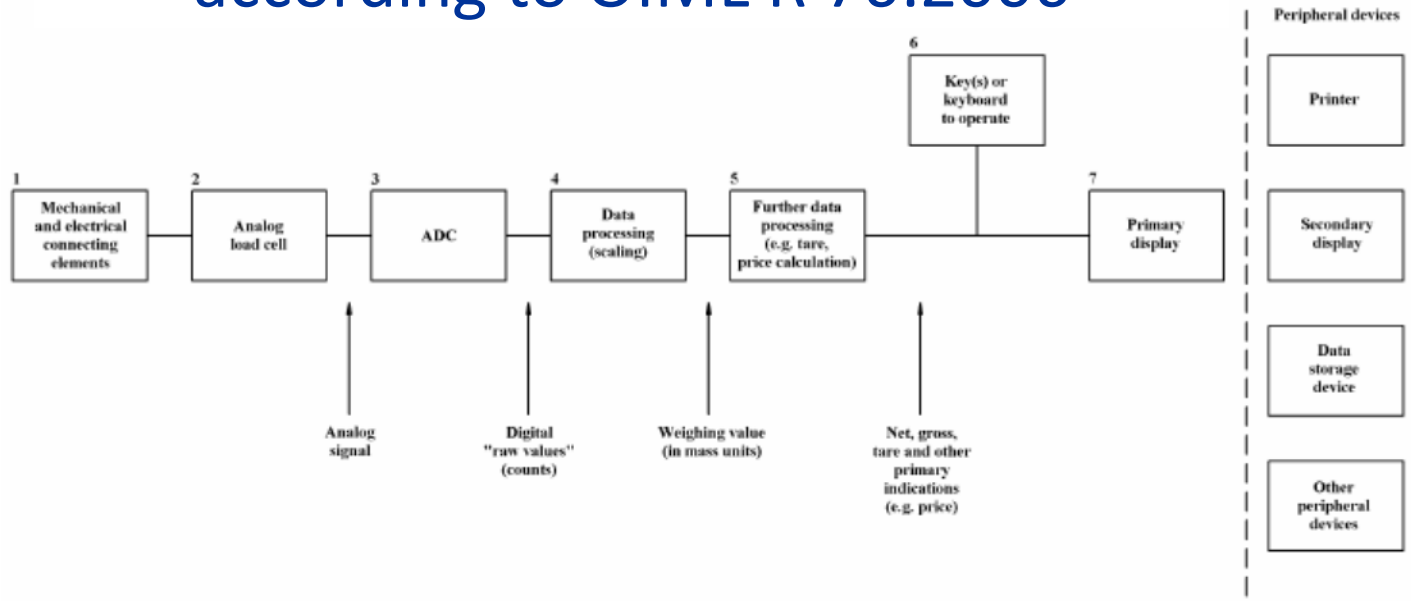
1. Based on the modular concept for NAWIs introduced and detailed in OIML R 76:2006:

   → What exactly is meant by the term "core weighing instrument"?






The modular concept for NAWIs according to OIML R 76:2006



Analog load cell	(T.2.2.1)	2
Digital load cell	(T.2.2.1)	2 + 3 + (4)*
Indicator	(T.2.2.2)	(3) + 4 + (5) + (6) + 7
Analog data processing device	(T.2.2.3)	3 + 4 + (5) + (6)
Digital data processing device	(T.2.2.4)	(4) + 5 + (6)
Terminal	(T.2.2.5)	(5) + 6 + 7
Primary display	(T.2.2.6)	7
Weighing module	(T.2.2.7)	1 + 2 + 3 + 4 + (5) + (6)

* Numbers in brackets indicate options






Provisions for testing and certification of modules of NAWIs according to OIML R 76:2006

Annex A Testing procedures for non-automatic weighing instruments

Annex B Additional tests for electronic instruments

Annex C Testing and certification of indicators and analog data processing devices as modules of non-automatic weighing instruments

Annex D Testing and certification of digital data processing devices, terminals and digital displays as modules of non-automatic weighing instruments

Annex E Testing and certification of weighing modules as modules of non-automatic weighing instruments

Annex F Compatibility checking of modules of non-automatic weighing instruments

Annex G Additional examinations and tests for software-controlled digital devices and instruments






Questions / proposals to be discussed

2. Concerning the improvement of technical requirements for NAWIs:

   → What are the major points / proposals of CECIP and how could CECIP use the ongoing revisions of OIML R 76:2006* and OIML D 31:2019** to feed its position into the responsible Project Groups of TC 9/SC 1 and TC 5/SC 2?

** Non-automatic weighing instruments*

*** General requirements for software-controlled measuring instruments*






Questions / proposals to be discussed

3. Manufacturers have a voice on the OIML-CS Management Committee (MC).

   → Concerning the improvement of global conformity assessment procedures and mutual recognition what are the major points / proposals of CECIP to be discussed by the OIML-CS MC?






Questions / proposals to be discussed

4. Digitalization in legal metrology requires highly competent and experienced personnel for both conformity assessment (CA) and market surveillance (MS).

   → Should an improved cooperation between national / European / international CA and MS Bodies (e.g. by use of video-conferences) be considered?

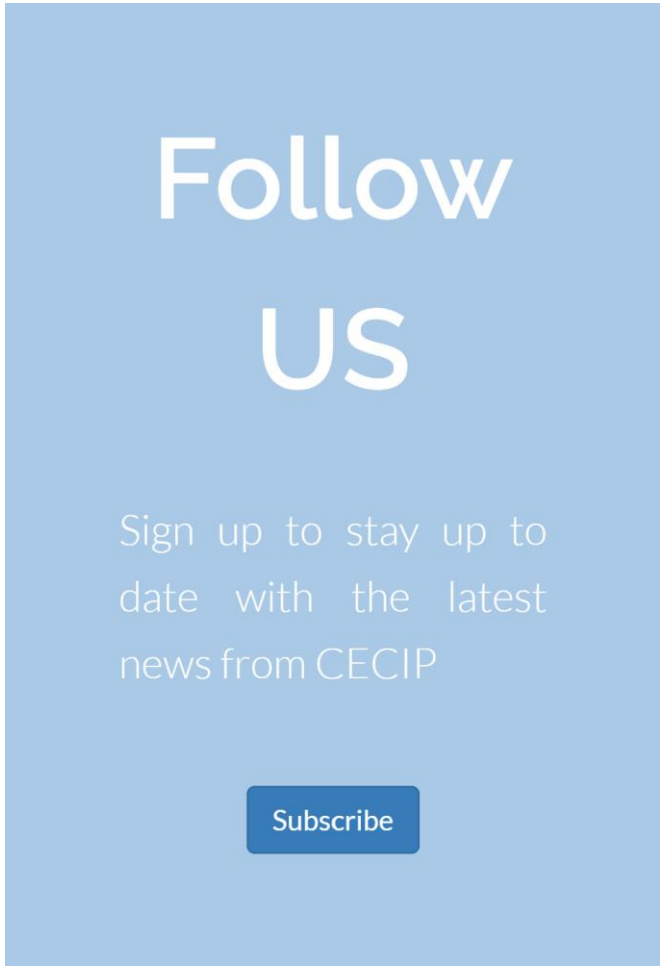
   → Could a respective e-Learning platform help in training of CA personell?






Stay in touch

- Register for the CECIP newsletter



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