

Digital processes in the quality infrastructure: the digital calibration certificate contribution

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General topics in digital transformation in metrology



- **Digital transformation in metrological services**
(digital certificates, remote services, automation, digital service infrastructures, eLearning)
- **Mathematics and confidence in data**
(artificial intelligence, digital twins and virtual measurements, validation of algorithms, uncertainty in complex systems)
- **Adopting Open Science for metrology**
(research data management, FAIR+X principles, open access)
- **Connectivity and data quality in distributed systems**
(data provenance, security, traceability, interfaces, communication technologies, sensor networks)

Digital Strategy: mission statement



- Foster uptake of digital tools, services and processes amongst its members
- Oversee the digital transformation of metrology and industry and connect the individual developments to a harmonised approach
- Engage with external parties in relevant areas to establish metrological principles for data quality

Overall aim:

EURAMET to take the lead in the digital transformation of the European quality infrastructure

1448 Development of digital calibration certificates

The goal of this project is to foster the development of harmonised digital calibration certificates (DCC) at national metrology institutes and calibration laboratories. The focus is on DCCs with machine interpretable information about the calibration in such a way that it can be utilised for digital workflows in measurement science, calibration, conformity assessment and industry.

1449 Research data management and the European Open Science Cloud

The goal of this project is to foster the development of harmonised research data management (RDM) and metadata standards for metrological data and services. This is the requirement for establishing a joint metrological implementation network of the European Open Science Cloud (EOSC) principles of FAIR data and services. (Findable, Accessible, Interoperable, Reusable).

R1.1 DCC education

- Webinars, mentoring and other capacity building measures
- Foster a basic **understanding of DCCs** and to inform about the current DCC activities at European NMIs

R1.2 DCC test cases

- Identification of suitable **test cases for DCCs** and preparation of draft guidelines
- Active participation of TCs' members strongly recommended
- M4D recommends starting a CSA to support the identification and development of suitable test cases and their documentation

R2.1 Industrial stakeholder engagement

- Following R1.2, **concrete test cases** should be discussed in collaboration with customers and DCC end users to identify further development needs and improve the mutual understanding.
- Establish clear stakeholders for the innovative efforts to meet the industrial needs
- Active participation of TCs' members strongly recommended

R3.1 Sustain collaboration with Eurolab

- Identify needs and ideas from **European (accredited) calibration labs** related to DCC

R5.1 Develop strategic roadmap on DCC

- M4D strongly recommends that a CSA is carried out developing a joint research and development roadmap
- addresses the individual needs of EURAMET groups and Members as well as needs expressed by stakeholders

R5.2 Establish collaboration with QI bodies

- M4D recommends that EURAMET extends existing collaborations with other bodies of the European quality infrastructure

R5.3 Establish collaboration with other RMOs

- M4D recommends that EURAMET establishes a continuous knowledge and information exchange with other RMOs in the area of DCC development