



Calibration certificates undergo digital transformation

Thai metrology institute welcomes the digital era



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The Challenge

In this era of rapid technological change, many industries have had to adapt existing systems to make them more futureproof. This is exemplified by the digital transformation of the manufacturing sector's National Quality Infrastructure (NQI). The NQI is an internationally recognized framework that includes metrology, standardization, accreditation, conformity assessment, and market surveillance. The National Institute of Metrology, Thailand (NIMT), which plays a significant role in Thailand's NQI, has been leading efforts to bring a digital transformation to the metrology system.

The challenge is to determine precisely what this new metrology environment should look like in order to support both NIMT's work, and that of our collaborators.

Digital transformation is about more than just technology; it requires employees to gain digital knowledge and skills, the preparation of appropriate infrastructure for storing and sharing resources, and it opens up new, more efficient ways of working.

The NIMT Solution

In the field of metrology, a traceable measurement is one that relates to a primary standard, usually an SI unit, through an unbroken chain of calibrations, each of which have an associated calibration certificate. NIMT has transformed the calibration certificate from analogue and paper-based to a digital calibration certificates, or DCCs.

A DCC is not merely a scanned, electronic copy of a paper calibration certificate. Its format has been defined by EURAMET (European Association of National Metrology Institutes), and adopted worldwide. DCCs need to be machine-readable with a cryptographic signature, traceable directly to the national standards, suited to long-term archiving, and serve as proof of metrological traceability.

NIMT's approach to this involves using XML; a widely used computer language. This simple text-based format is well-suited to representing structured information in a way that complies with existing standards. It produces DCCs that are machine-readable while also easily convertible to PDF, making them human-readable too. In addition, automated communications and processes mean that DCCs can be more efficient and more secure than paper-based certificates.

NIMT has also developed a method for storing DCCs and their associated databases in the cloud, making them easily accessible to customers. The digital storage system confirms the integrity and authenticity of the calibration certificate from NIMT.

The Impact

DCCs are an important step on the road to digital metrological services that will support manufacturing industries now and into the future. DCCs have already been successfully implemented in some of NIMT's services, such as the "standard capacitor" for electrical metrology. It means that an industry customer can now load their DCC directly into a machine and access calibration data, such as the correction values, without human interaction or error. Furthermore, the use of DCCs changes the metrological service model, allowing the customers to obtain the calibration certificate more easily, more quickly, and at lower cost.

The next stage to this digital transformation will involve implementing DCCs at other parts of the NQI, such as calibration laboratories, accreditation organizations, and industries across Thailand.

Customer quote

"The impacts of the digital transformation are being felt by many sectors; metrological organizations are no different. NIMT wants to retain its competitive edge in the world of metrology, so we are embracing the necessary changes now to better prepare for the future."

– Dr. Narin Chanthawong, Main responsibility on Digital Transformation, NIMT