Software and ICT-related Challenges in Legal Metrology

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IT technologies have evolved significantly over the past ten years – namely embedded systems, the Internet of Things (IoT), cyber physical systems, cloud computing and big data concepts. These have converged into completely new technology fields like the industrial Internet and smart services. These fields offer technology- and data-driven possibilities which can be exploited for the benefit of all stakeholders in legal metrology, e.g. to reduce development costs, overcome typical barriers to innovation, and speed up the time to market of new products.

We therefore thought it was high time to once again bring together all stakeholders in legal metrology to discuss the challenges and opportunities the digital single market offers.

Following our two successful workshops on *Operating Systems in Measurement Instruments and Other Software Problems in Legal Metrology and the Protection of Measurement Data in legal metrology and Related Challenges,* which were very well received by the international metrological community, we offered another two-day workshop entitled *Software and ICT-related Challenges in Legal Metrology* on 21 and 22 June 2017. This covered contemporary challenges and chances regarding software and IT in legal metrology under the guiding theme:

Advanced technology meets daily practice.

The workshop was chaired by Florian Thiel from PTB, the convener of the WELMEC Working Group 7 "Software", and assisted by Marko Esche secretary for the chairmanship of OIML TC 5/SC 2 "Software", as well as further colleagues from PTB.

About 130 participants from all over Europe as well as from China, Japan, Africa and South America attended this workshop, which was supported by OIML, WELMEC and the Helmholtz Fonds e.V. and was organized by PTB's department 8.5 "Metrological IT".

The aim of this workshop was to bring together experts from different technical disciplines as well as representatives from industry, science, testing authorities, notified bodies and regulatory authorities to discuss challenges, approaches and solutions concerning IT-related metrological issues.

At its 51st meeting in October 2016, under Resolution No. 2016/20 (Agenda Item 9.1.2.2), the CIML approved – as a new project in TC 5/SC 2 "Software" – the revision of OIML D 31:2008 General requirements for software controlled measuring instruments. This workshop offered the opportunity to identify and discuss items that are considered relevant enough to be introduced in a revision of WELMEC Guide 7.2 Software and a revision of OIML D 31.

Stakeholder needs

The workshop was oriented directly towards stakeholders' needs since its form and topics were directly derived from the result of a survey among all WELMEC members which was confirmed by WELMEC WG 7 Software. The needs of market surveillance in particular were addressed. Many experts, such as representatives of industry (e.g. CECIP and CECOD), notified bodies, the European Commission, EURAMET, etc., contributed actively to the discussions. All these contributions, together with contributions from PTB, formed the skeleton of the workshop which steered both discussions and the finding of solutions and opportunities.

Relevance for other regulated areas

The topics covered by the workshop also attracted the attention of manufacturers from other regulated areas. The major manufacturers of cash gaming machines, which are also subject to legal control, also attended the workshop to see if the ideas presented to secure data systems are transferable.

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Results

The workshop showed again the need for conforming solutions covering new technologies. Such reference architectures for the basic technologies like embedded devices (IoT), distributed instruments, the development of general and instrument-specific reference architectures, e.g. for weighing instruments, heat meters, fuel dispensers, etc. are required. These general and instrument-specific reference architectures must encompass the fulfilment of the essential requirements, a verification method which provides easy inspection of a meter on the market and an adequate risk analysis which considers contemporary threats. For the latter, attack vectors, i.e. a scheme on how these threats could be realized, are needed to guarantee the comparability of the analysis between the manufacturers and the notified bodies.

This is considered the most effective way that the "knowledge gap" between the manufacturers and the regulative bodies could be bridged and furthermore will streamline the process of conformity assessment and verification in the field.

During the course of the workshop, PTB offered several such solutions, e.g. for IoT devices, cloud computing and a procedure for risk assessment which is already in use.

Publication of presentations

The workshop's presentations are available at the following PTB website:
http://www.ptb.de/cms/en/ptb/fachabteilungen/abt8/fb-85/nicht-im-menue/publications-and-events/3rd-workshop-software-and-ict-related-challenges-in-legal-metrology.html

Figure 1:
Picture of the workshop's participants.

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