

Metrology Knowledge Transfer in the European Metrology Research Programme

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Abstract

Metrology knowledge transfer (KT) activities promote innovation, growth and welfare. The expectations and experiences of metrology KT of European stakeholders have been analysed in a survey, workshop and report conducted as part of a new EU ERA-NET project iMERA – Implementing a Metrology Research Area. Metrology KT is a two-way information exchange between national metrology institutes (NMIs) and metrology stakeholders (universities, practitioners, industry, regulators) and covers a wide range of measurement needs/subjects as well a broad spectrum of KT mechanisms. This calls for a specific, proactive coordinated action of metrology KT in Europe, over and above usual knowledge transfer attached to any project.

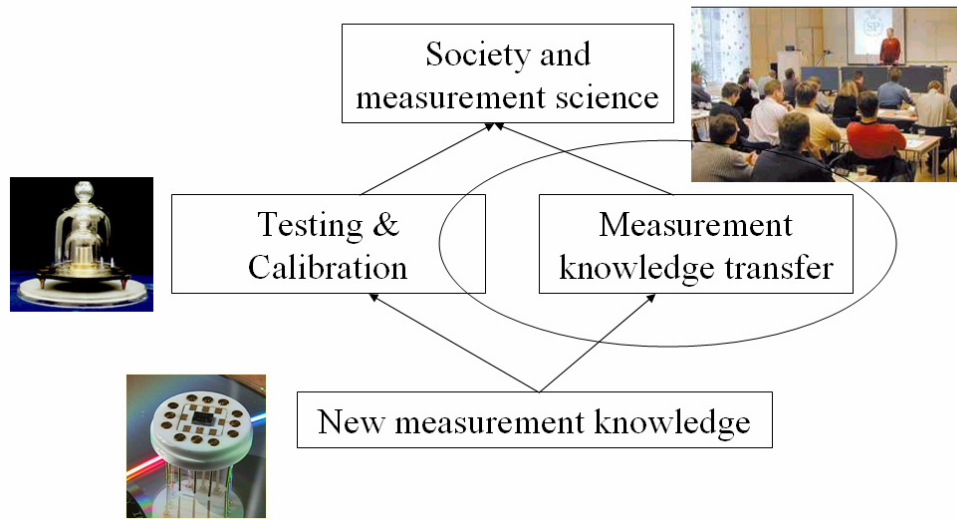
1 Introduction

Reliable measurement results are important in almost every aspect of our daily life, ranging from fundamental science, through health and safety to global trade.

It is therefore not surprising that one of the more essential ingredients in improving trade, innovation, growth and well-being is efficient **transfer of measurement knowledge**. This is in line with the more general observation made by the European Commission in its so-called ‘Lisbon’ strategy, which emphasises the role not only of research but also education (and innovation) in encouraging growth and employment [1].

The ERA-NET iMERA project has several tasks addressing stakeholder interaction and knowledge transfer (KT). This gives some opportunity of spreading awareness and obtaining feedback, and encouraging active participation, from various societal groups not immediately in the measurement research sphere. The task has included two surveys and a European workshop during 2005 which identified opportunities for practitioners to improve national KT activities (iMERA T1.4 [2]).

Critical success factors for innovation & trade:



Pendrill & Schmidt 2005

Figure 1 Critical success factors for innovation & trade performance [3].

Alongside improving testing and calibration methods, new measurement knowledge created in metrological research can also be exchanged with stakeholders as a key action in enhancing measurement-related trade and innovation are shown in figure 1. Such critical success factors as new knowledge creation and good knowledge transfer are internationally recognised as essential in enhancing trade and innovation [4].

What are the best mechanisms of transferring and what aspects of metrological knowledge are most needed? What would a European metrology KT programme achieve which has significant added value to a mere collection of national programmes? How should metrology KT be part of the future European Metrology Research Programme? Answers to these questions, as studied in surveys and workshops of the present iMERA T1.4 KT task, are given in the project results [5].

Metrology KT is a two-way information exchange between national metrology institutes (NMIs) and metrology stakeholders (universities, practitioners, industry, regulators). A wide variety of knowledge transfer mechanisms have evolved to different degrees in participating countries such as direct research collaboration with industry, collaborations with regulatory agencies, universities etc, “metrology clubs” - interest groups around specific topics, best practice guides, scientific publications and participation in documentary standards activities.

2 Survey

A European survey conducted during 2005 in iMERA of the various national approaches to transferring the knowledge generated by metrological R&D activities gave some indication of the expectations and experiences of metrology KT of European stakeholders, particularly, which are the best ways of learning about measurement and which measurement subjects are the most interesting. In the iMERA KT survey of 2005, overall no great differences were found amongst the various metrology knowledge transfer **mechanisms** with respect to the benefit as perceived by stakeholders. Nevertheless, university training in metrology is ranked somewhat lower than say NMI research collaboration in terms of benefit of these mechanisms of metrology KT.

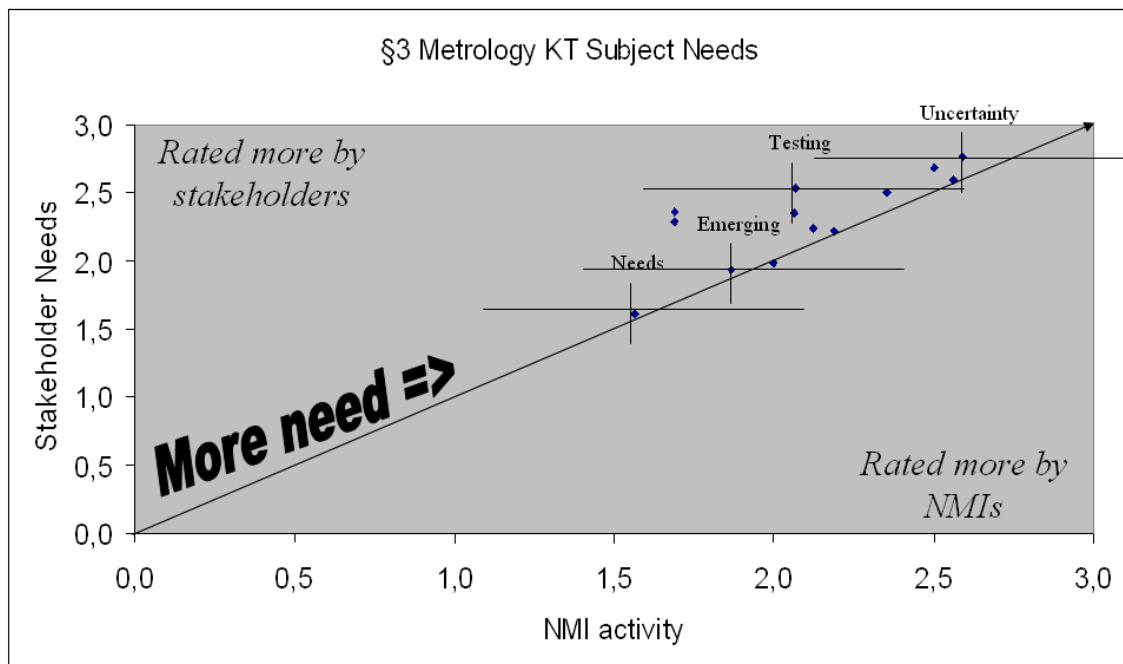


Figure 2 Ranking (absolute) by stakeholders and NMIs of the need of different metrology KT **subjects**, including 95% confidence intervals [5]

Similarly, there are no great differences overall amongst the various **subjects** of metrology in the need as perceived by stakeholders (figure 2). Nevertheless, metrology training in the emerging technologies (such as bio, nano, etc) and in societal needs are ranked lower than say training in measurement uncertainty and quality assurance. The overall low ranking of an emerging technology is to be expected and is in line with investigations of the overall awareness of European citizens in emerging technologies such as nanotechnology. Emerging technologies such as nanotechnology are also typically more of a research issue than an industrial concern at the early stages of development, and perhaps calibration laboratories are arguably more research-oriented than industry. The survey also investigated the rating of the various metrology KT mechanisms and subjects by stakeholders compared with NMIs. In most cases, stakeholders appeared to give higher ratings than NMIs, that is, NMIs have a tendency to underestimate the value of metrology KT.

3 Workshop

At a one-day workshop, held in Berlin (DE) on 1st December 2005, coordinated by the iMERA T1.4 KT team and attended by representatives of many European NMIs and other stakeholders in Metrology KT, presentations were made not only of the survey results but also four case studies – two NMIs and two stakeholder organisations – of metrology KT. In workshop break-out discussions, the nature of and suggested plans for metrology KT as part of the projected European Metrology Research Programme were formulated [5].

For the future, the workshop formulated a number of recommendations where the aim is to improve the effectiveness of metrology KT as a means of improving knowledge level of metrology in the European Union and elsewhere.

4 Conclusion and Recommendations

Metrology knowledge transfer:

- Should be an important element in the European Metrology Research Programme since new measurement knowledge, created in research, needs to be transferred to be useful.
- is a key factor in metrology's impact on modern society since better measurement is an essential component in promoting innovation, growth and welfare.
- is a two-way information exchange between NMIs and metrology stakeholders (universities, practitioners, industry, regulators).
- covers a wide range of measurement needs/subjects as well as a broad spectrum of KT mechanisms.

This calls for a **specific, proactive coordinated action** of metrology KT in Europe, over and above the usual knowledge transfer attached to any project. There is need for some creativity since, to date, relatively few NMIs have dedicated KT staff and projects; there are different levels of engagement in the innovation agenda; the high development costs of training and the development of guides etc is not being maximised at the European level and metrology KT across national boundaries is important for raising competitiveness across the EU. There is good support for taking KT forward into Article 169 especially from those that would find it more difficult to engage in the research agenda.

A number of recommended actions to this end are given in the conclusion [5].

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