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COMET: A multimedia internet based platform for education in measurement

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Abstract

The project COMET provides a multimedia training package for metrology and measurement. The package is developed by a consortium of 10 institutes from 7 European countries. It consists of 31 modules, each dealing with a particular aspect of metrology, and is available in English, German, French and Slovak. Each module is subdivided in three levels (introduction, fundamental, expert) and contains basic text, illustrations, animations and exercises for self-tuition. Special attention is paid to the lay-out of the web page and the navigation structure.

Keywords: Multimedia; Metrology; Education

1. Introduction

The role of measurement is crucial in almost any field: medical and health care, transport and trade, production and factory management, communication and navigation, just to mention a few. Correct measurements (which implies correct interpretation of the results as well) are of paramount significance, since an incorrect measurement result can have a tremendous economical and societal impact. Execution of a measurement not only requires proper skills of the operator of the instrument but also some knowledge about the underlying operation principles. Moreover, to be able to select the most appropriate instrument for a particular measurement task, the operator should have at least some knowledge about the various physical principles and measurement concepts over a wider range. This applies in particular to the many users of measurement equipment which are not (and need not necessarily be) experts in metrology to perform sound and reliable measurements. In modern society knowledge in metrology is necessary also for

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managers and executives, especially of small and medium size enterprises which have not employed their own metrologists. Nevertheless, these managers should consider metrological aspects too for their technological decisions and innovation policy.

A tremendous amount of knowledge on metrology is available in text books, encyclopaedia, scientific and technical journals, documentation from manufacturers and educational material. The problem is to get easy and quick access to just the material required for the actual need. The books found in libraries often appear to be obsolete; manufacturer's documentation rarely offers enough background information; and the Internet provides too much information that is unstructured and often unreliable because not reviewed. Although almost all knowledge is (somewhere) available on the Internet, a non-specialist in metrology will not succeed in having quick access to the material hunted other than by pure chance. On the other hand, the use of Information and Communication Technologies (ICT) for educational purposes is rapidly increasing, and this also applies for measurement science and technology. Many teachers have recognized the potential of this medium to improve the quality and accessibility of educational material. This paper describes one of the initiatives in this field, the COMET project.

2. The COMET project

In the course of 2001 a consortium of 10 institutions from 7 European countries submitted a proposal for an international project "Computer Aided Vocational Training in Measurement and Metrology" (COMET) within the Leonardo da Vinci framework. The acceptation of the project was confirmed, with a contracting period from 01.11.2001 to 31.10.2004. The main aim of the project is the development of a multimedia tool for education in measurement, to be made available as a WEB page. For marketing reasons it was decided to name the developed tool as Metromedia.

The ten institutions that take part in the project are (with their *responsibility*)

- Vienna University of Technology; University Extension Centre (Austria), *coordination*.
- Vienna University of Technology; Institute of Production Technology (Austria), *expert texts*.
- Austrian Standards Institute (Austria), *expert texts*.
- Steinbeis Transfer Centre (Germany), *expert texts*.
- Western Greece and Epirus U.E.T.P. (Greece), *calculation programmes*.
- Institut Méditerranéen de la Qualité (France), *expert texts*.
- University of Twente (Netherlands), *expert texts*.
- Slovak University of Technology (Slovak Republic), *expert texts, graphics and formatting*.
- Mega & Loman, Ltd. (Slovak Republic), *WEB page*.
- Whitestone Business Communications (United Kingdom), *English corrections*.

The objectives of the project are to improve the skills and competences of people and to improve the quality of and access to continuing vocational training in the field of metrology, as well as to exploiting the potential of information and communication technologies in vocational training.

The primary target group of the project includes staff working in metrology laboratories of industrial enterprises, calibration and testing laboratories. In addition, it is expected that this multimedia training package will be widely used also for the training of managers especially of small and medium enterprises (SMEs), testing and calibration laboratories as well as for students in their initial vocational training. The multimedia training package will be developed in four languages: English, German, French and Slovak. This will enable its direct use in local languages of many European countries.

The final product consists of

(a) multimedia courseware including lectures (text blocks); exercises; tests; and supporting modules (calculation tools, dictionary), all in hypertext form and supported by graphics (including full-colour pictures, computer animations and video sequences). The multimedia courseware will be available on a WEB-site as well as on CDROM (DVD-ROM, respectively).
(b) supporting teaching material in printed form (including textbooks, working sheets for lectures and exercises, tables, tests, dictionary, etc.).

Since the area of metrology and measurement is very wide, only particular topics have been selected. The whole content is organised and developed in so-called modules; in total 31 modules are to be