

Practical Ideas from Professors: Standards Education in Your Courses

Teaching Standards in Information Technology



About the Department of Informatics in the Faculty of Information Technology at the Tallinn University of Technology

With a research and teaching staff of approximately 150, the Faculty of Information Technology at Tallinn University of Technology (TUT) in Tallinn, Estonia, instructs approximately 2500 students. Within the Faculty of Information Technology is the Department of Informatics, which offers a B.Sc. and an M.Sc. in Informatics, a B.Sc. and an M.Sc. (Master of Science in Engineering) in Business Information Technology, and a Ph.D. in Informatics. Research labs in the Faculty of Information Technology include the Industrial Data Mining Laboratory, the Laboratory of Socio-Technical Systems, the Laboratory of Sensor Systems and Web Services, and the Laboratory of E-Government Development Technologies. General informatics classes are also offered in a majority of study programs at TUT.

Using Standards in Information Technology

The modern information society that educators prepare their students to succeed in revolves around a solid and robust information infrastructure. Information and communications technology (ICT) standards are an essential part of this infrastructure. It is therefore of great value for students to form an appreciation and understanding of ICT standards.

I incorporate standardization themes and content into the lectures I teach. These include:

- Global open ICT standardization
- Standards: the concepts and essence of ICT and e-service standards
- International and European ICT standardization
- Standardization processes at the state level
- Trusted information infrastructures supporting public services and systems



Taavi Valdlo

Taavi Valdlo has been an ICT standardization lecturer at Tallinn University of Technology and Tallinn University, both located in the capital of Estonia, since 2007. He is a member of the European Standardization Academy (EURAS), and previously served as: secretary of the Estonian IT Standardization Technical Committee, a member of the European multi-stakeholder platform on ICT standardization, and as a member of the CEN/CENELEC ICT Forum. From 2005 until 2014, Valdlo served as Specialist in Charge of IT Standardization for the Estonian Department of State Information Systems, Ministry of Economic Affairs and Communications. Prior to that he was Senior Standardization Expert of the Estonian Informatics Centre.

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Using Standards in Information Technology (continued):

Additional standardization content that I incorporate into the lectures I teach includes:

- European multi-stakeholder platform on ICT standardization
- EU ICT standardization policy, legislation, and rolling plan
- European interoperability framework
- Technical standards in relation to technical regulations and legislation; regulatory use of standards
- Standards and e-government process innovation, e-government services, and emerging technologies standards
- Standards and innovation: smart cities, smart grid, cloud computing, Internet of Things

Some of the specific technical standards that I explore in my lectures are:

- IT Service Management standards family, ISO/IEC 20000
- Information Security Management Systems standards, ISO/IEC 27000 series
- Systems and Software Lifecycle Processes standards, ISO/IEC/IEEE 12207 and ISO/IEC/IEEE 15288
- Cloud Computing basic standards, ISO/IEC 17788:2014 Cloud Computing Overview and Vocabulary and ISO/IEC 17789:2014 Cloud Computing Reference Architecture

With exposure to specific standardization-oriented information in their university education, students learn about the needs, expectations, and requirements of ICT standardization stakeholders. They acquire

knowledge about the work directions of international and European formal ICT standardization technical committees, including ISO/IEC JTC1, ITU-T, IEC TC100, CEN, and ETSI.

In addition, students become familiar with ICT standards consortia and fora such as IEEE, IETF, W3C, OMG, Unicode, OASIS, WS-I, ECMA, ISACA, ASTM International, INCITS, etc. They develop an awareness of not just the different standards developing organizations but also the common structures, procedures, and terminology among them, as well as how their policies, standards, and specifications differ.

It is important for students to discover the attributes of the ICT standardization processes (openness, consensus, balance, transparency), and standards content (maintenance, availability, IPR, relevance, neutrality, stability, quality). It is also valuable for them to understand technological neutrality and innovative pre-commercial public procurement, which helps to prevent lock-in.

ICT standardization topics can be integrated into existing informatics classes. In addition, these topics can be considered as future research and work direction for students' specialization, including for bachelor and master's theses, future Ph.D. research, and ICT standardization practical involvement, such as presentations at conferences and publications. One example of a master's thesis topic that explores the benefits of technology standards is: "Efficiency from using standards for IT projects."

For more information on Standards and Standards development, visit
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