Comment

Standardizing knowledge? You are kidding, aren't you?

Not really. What good is knowledge if it cannot be represented and communicated?

Knowledge management is the sum of knowledge representation and knowledge communication. Then there is information, which is an important component of knowledge. Roughly, you could say that information is data with meaning, and knowledge is information that can be used and reused.

Knowledge management is as old as the written word. People have been storing representations of knowledge in systematic ways in dictionaries and encyclopaedias and libraries. Storing is simple; retrieving and using this knowledge may be something entirely different. Enabling computer systems to utilize stored knowledge adds yet another level.

The building of knowledge-based computer systems is changing things around us. It is a development from "press-8-for-a-weather-report-for-tomorrow"-type systems to "I want to go somewhere nice and warm for my holidays next week within a budget of EUR 1 000".

We are seeing fragments of these systems in various fields, such as public transport, traffic and weather information. New advanced applications are constantly being developed. We are engaging computers to carry out more routine tasks, thereby allowing us to enjoy more interesting and complex ones. The issue is not that computers are "taking our jobs", but rather that with so much information around, computers are needed to filter it.

Of the scores of bits and pieces that make up a complete representation of knowledge, a large portion is being standardized, creating almost too many layers of standards. Interoperability between standards and systems is crucial for success, and that means interoperability on all levels: technical, operational and semantic.

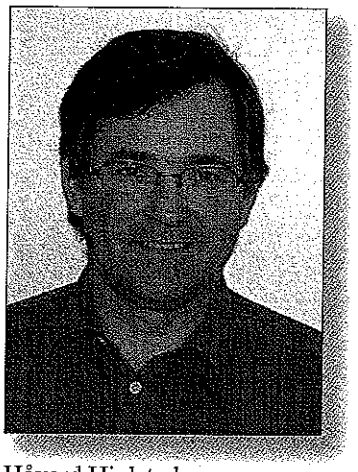
"Knowledge management systems can be used for so much more than asking about the weather and the next bus."

Semantic interoperability is about different systems understanding each other's language. A lot of it is terminology; not just terms and definitions, but explicit and machine-usable links between concepts. Virtually all standardization committees deal with terminology – many of them even develop it – and all standards are based on terminology. But for a knowledge-based system to be as efficient as possible, the terminology that is available needs to be highly reliable and consistent. We are seeing the emergence of sophisticated ontologies, semantic Webs and Topic Maps. The higher the quality and level of standardization in these activities, the higher the likeliness of success.

In addition, the information needed for any one particular application or query is likely to be found in many different locations. We certainly do not want to duplicate information, involving duplication of effort, and additional sources of inconsistencies.

For instance, the sentence, "John Smith is Managing Director of the ABC Company, which was founded eight years ago", can, using the same information, be structured as follows: "company: ABC Company; founded: 1998; person: John Smith; function: Managing Director". The point of this example is to show how, ideally, any software should be able to access any piece of information (obviously with protection mechanisms for personal and sensitive information) regardless of language or structure.

Knowledge management systems can be used for so much more than asking about the weather and the next bus. We will see applications within e-learning, e-government, e-administration – within all e-things. It will add new aspects to computer-assisted translation and technical writing. It will also impact on design and engineering. Standardizers have an important role to play in all this, as we will see throughout this issue of *ISO Focus*: Knowledge management is, quite simply, about everything.



Håvard Hjulstad

Chair of ISO/TC 37, *Terminology and other language and content resources*

Main Focus

Managing knowledge

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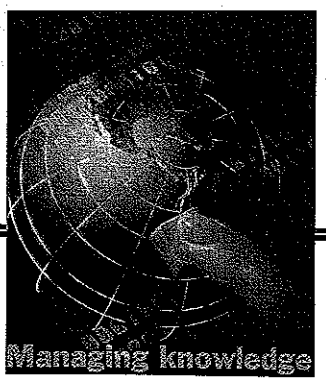
Expanding the ISO e-learning programme

by Daniele Gerundino, Strategic Adviser to the ISO Secretary-General

In a past issue of *ISO Focus*[1] we underlined that, within ISO, the creation of competences to support national participation in international standardization is the highest priority to be covered by education and training activities, targeting national standards bodies and notably those from developing countries.

For this reason, the ISO Central Secretariat, with the support of two sponsoring members (DIN Deutsches Institut für Normung and the Japanese Industrial Standards Committee, JISC), has undertaken the development of a comprehensive e-learning programme targeting the role of the expert in international standardization management. The programme addresses the training needs of staff members within national standards bodies (primarily

1) The ISO e-learning programme, *ISO Focus* April 2005.



technical officers who already have a certain background in standardization, at least at the national level), with a view to transfering the knowledge necessary to effectively support their institutes' involvement in international standardization.

The programme includes three independent – albeit interrelated modules – dealing with the key activities that an expert in international standardization management should master:

- *Assessing priorities for standardization;*
- *Managing participation in international standardization;*
- *Implementing International Standards.*

The first Module, presented in *ISO Focus* last year[1], was very successfully tested in 2005 by a pilot group of learners (ten students from five different countries) and is now operational as a regular ISO Central Secretariat course (the second edition of Module one is underway, with 15 students from 12 countries).

The second Module was delivered in 2005 and is described in more detail below. Its pilot implementation started in January 2006 with a group of 10 students from five countries.

Development of the third Module is underway and by the end of 2006, the entire ISO e-learning programme, *Expert in international standardization management*, will be fully operational.

To underline the scale of this effort and achievement, it is worth noting that the three modules include more than a hundred content elements (such as informative documents, guides, Power Point presentations, templates and software tools); these materials are fully harmonized, i.e. they share common design principles and content classification, as well as look and feel and can be reused in a variety of contexts, such as classroom courses, new customized e-learning modules, as well as information services.

Retaining knowledge through experience

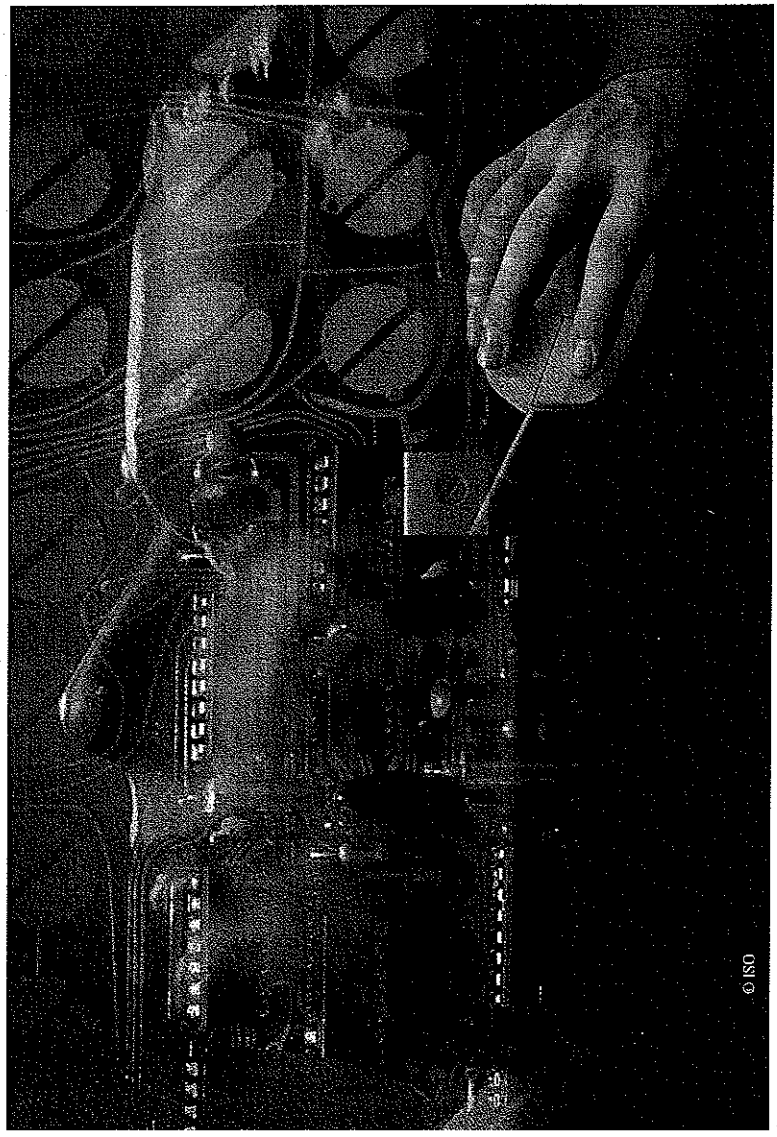
Before presenting in more detail Module 2, *Participating in international standardization,* it is useful to refresh the principles of "learning by doing" on which the ISO e-learning programme is based.

As Roger Schank has noted in one of his books[2], "*learning by doing works because it strikes at the basic memory processes that humans rely upon. We learn how to do things and then learn how what we have learned is wrong or right. We learn when our rules apply and when they must be modified. We learn when our rules can be generalized and when exceptional cases must be noted. [...] Intuitively, we all know this is the case. The more experience someone has with a given situation, the more effective he or she is in that situation. It follows that the best way to teach an employee is to let him or her work on a job that requires the skills you're trying to teach, and eventually that employee will pick them up*" [through an iterative process of fail and practice].

Modern information technologies and notably the Web provide an ideal platform for developing contexts where students can actually do things and learn through such an iterative process. A powerful approach consists in creating simulations or elaborate stories within which the student has to play a role for the duration of the course.

"*The student pretends to live in a fictional world in which events happen and he must deal with what to do in the situations presented to him. After such an experience a student feels as if he really had experienced what the designers of the course intended for him to experience*[3]". If the story and its context are well designed, the student's will remember "his or her own experience", and more likely retain the knowledge acquired through that experience.

Of course this is not a simple task. The Web is an exceptional information delivery mechanism – but uploading documents on the Web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2) Roger Schank, *Designing world class e-learning,* Mc Graw Hill, 2002.

3) Roger Schank, *ISO Focus,* April 2005.

and making them available to a certain audience (maybe with multiple choice questions at the end, to test the mnemonics of students) is one thing, but creating a context where students can have a fulfilling learning experience, acquiring lasting elements of knowledge and skills needed for their profession, is quite another.

This is a fascinating subject, but is not possible to go in further detail within this article. I just want to underline that building an effective e-learning system along the lines outlined above, requires the combination of very careful instructional design with the power of the Web for information delivery and interaction support.

Instructional design is indeed the key aspect and is the one to which the ISO project team has dedicated most efforts (with the valuable support of Roger Schank's team from Socratic Arts).

"The creation of competences to support national participation in international standardization is the highest priority."

In summary, the ISO e-learning modules are designed on the basis of the following key points:

- Clear identification of the objectives and key tasks to be performed by the target role/function, and thorough analysis of the main teaching points (including important issues, and ways to address problems and obstacles concerning the selected tasks – to be transferred to the students through the "story" context);
- Collection of specific materials (primarily case studies and real life experiences – as well as extensive materials and tools for analysis and guidance) related to the undertaking of the various tasks identified;
- Creation of simulations (the stories) around which to structure the core learning experience;
- Assignment to the learner of tasks to be accomplished and deliverables to be produced for each task to be performed (against which the learner's work will be evaluated);
- Provision of comprehensive supporting materials, helping the student to execute the various tasks;
- Use of a structured environment supporting interactions between the learner and the tutor, and among students;
- Use of general information and descriptive material (guides, textbooks, official documents, presentations, templates/tools) as side content, to be used as supporting material.

All the stories take place in a fictitious country, Southistan, within its national standards body, Southistan Bureau of Standards (SBS). Learners play the role of a technical officer, with assignments to be performed for each of the three modules.

All modules are Web-mentored and facilitated, meaning that as the student works through assignments on the course Web site, she/he will send questions and final work products to a mentor via the Internet. The mentor will review and provide feedback on students' work in each task, until they submit their final deliverable. At the end of each task, the mentor opens a discussion forum and takes this opportunity to standardize the deliverables produced by the various students prior to opening the next task.

Managing participation in international standardization

Module 1 addresses planning activities that an expert in international standardization management should be able to undertake to effectively allow his/her country to take full advantage from international standardization: analyzing and defining fields of national interest, evaluating strategic alternatives (such as adoption of published International Standards or participation to the standards development process), assessing potential stakeholders' participation, and estimating resources needed to support the process.

If a national standards institute has already defined the fields of national interest and selected those priority items, Module 2 will assist them to participate in International Standards development.

An expert in international standardization management should be able to effectively organize and support the participation of national interests in the international standardization process, and ensure correct and timely application of the ISO/IEC Directives.

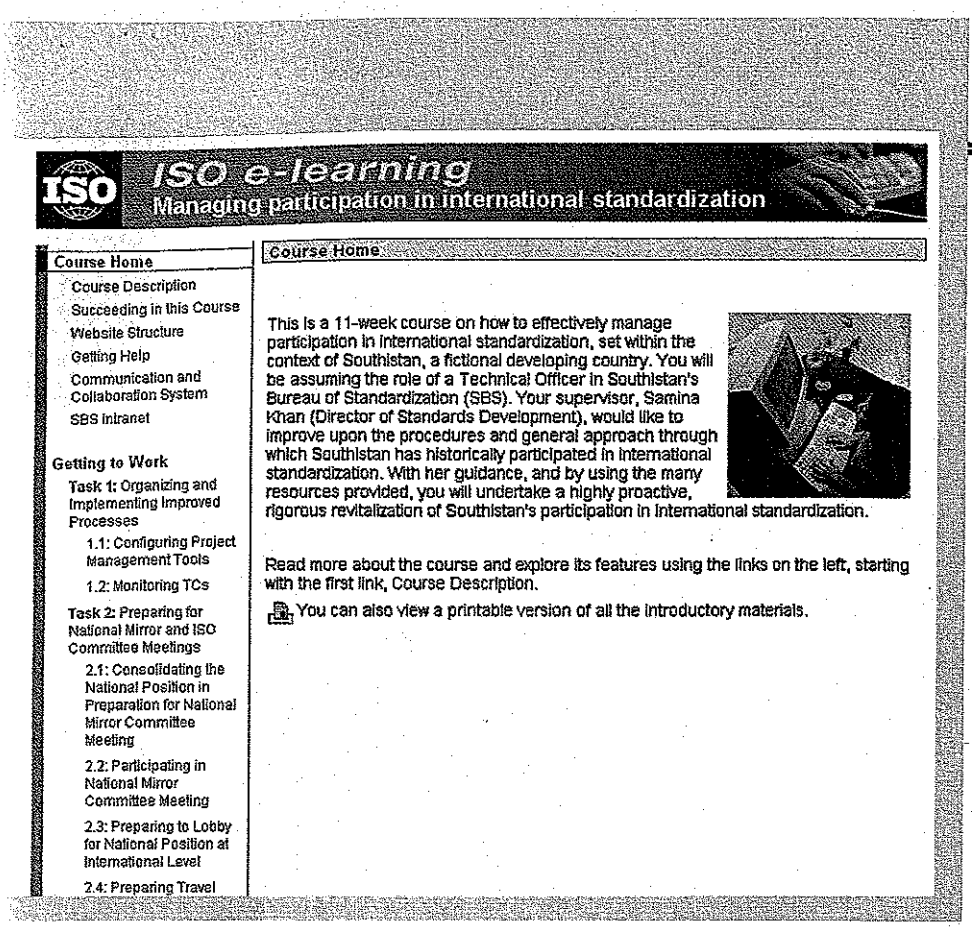
The second ISO e-learning Module, *Managing participation in international standardization*, offers a comprehensive didactical environment where professionals from ISO national standards bodies who already have some experience in standardization, can acquire or significantly expand their knowledge on participation in international standardization.

The module provides an environment within which the learner has to apply concretely the procedures for standards development work, practice with tools (e.g. project and document management systems) supporting the process, deal with consensus building and promoting national positions on specific content issues (taken from real ISO standards projects).

"The programme will be completed and fully operational by the end of 2006."

By participating in Module 2, professionals from ISO national standards will be able to strengthen their abilities to:

1. Manage rigorously and efficiently the circulation of relevant information and documents to all national stakeholders involved in the standardization process;
2. Monitor the activities of TC/SCs' work where the national standards body is a participating member or observer member, and to secure rigorous and efficient project management for national mirror committees (for all work items of interest);



3. Organize and support the dialogue among national interests and the consolidation of national positions on the relevant work items;
4. Support and promote consolidated national postions at the international level;
5. Organize and support the participation of national delegations in technical and subcommittee meetings.

The student acting in the role of a technical officer of Southistan Bureau of Standards, with several years of experience, is asked by his supervisor (the technical director) to manage a certain number of technical committees with a view to revitalizing their activity and improving SBS' participation in international standardization.

The module's duration is about 11 weeks, with students working approximately one hour per day.

The module is subdivided in two main tasks and six sub-tasks, covering the following topics:

- **Task 1: Organizing and implementing improved processes:**
  - Subtask 1.1: *Configuring project management tools*;
  - Subtask 1.2: *Monitoring technical committees*;
- **Task 2: Preparing for national mirror and ISO committees meetings:**
  - Subtask 2.1: *Consolidating the national position in preparation for national mirror committee meeting*;
  - Subtask 2.2: *Participating in national mirror committee meeting*;
  - Subtask 2.3: *Preparing to lobby for national positions at the international level*;
  - Subtask 2.4: *Preparing travel logistics for an international meeting*.

The pilot implementation

The pilot session of the module, *Managing participation in international standardization*, started in January 2006 and, at the time of writing, is underway.

Ten students – all professionals in standardization from national standards bodies from five different countries with various levels of experience – are participating in the course, along with one ISO Central Secretariat employee. Many national standards bodies from the test countries (Argentina, Croatia, Malaysia, Saint Lucia and South Africa) have contributed to the course design and development phase, providing input and documentation (concerning processes, case histories and difficulties associated to the activities covered by the course).

Learners have taken a little time to get started but the course is so far on schedule and progressing well.

The next steps

The feedback received by all those who have been involved with the ISO e-learning programme is very positive and encouraging – including feedback from the sponsors of the project (DIN, Deutsches Institut für Normung, and the Japanese Industrial Standards Committee, JISC).

The programme will be completed and fully operational by the end of 2006. ISO Central Secretariat will then have the opportunity to organize a few sessions each year, covering a significant audience of professionals from national standards bodies (several dozens per year).

There is, however, much more to be done: the learning materials developed so far will be available to all ISO members, who will have the opportunity to reuse them in a variety of different contexts. ISO Central Secretariat itself plans to reuse some of the materials developed to provide new and complementary Web-based information services targeting other user groups.

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