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Interoperability

- Guest Interview
  Sweden's Minister for Trade
- Developing "good" standards

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Standards make the world go around

Standards and interoperability are two sides of the same coin. As the saying goes, water seeks its own level. The rationale behind standards – whether for products, terminology, symbols or systems – is precisely to make "things fit together", so that all stakeholders can communicate and understand each other seamlessly. This principle is the first and foremost prerequisite for effective interoperability.

There is an example that standardizers like to bring up when talking about the origins of standards – the standardization of the stones and bricks that were the building-blocks of the first major man-made structures.

The Egyptians quickly understood that building pyramids would be impossible without some form of standards for the thousands of workers placing thousands of blocks to form their impressive structures. Without standards, neither the Keops Pyramid, nor the Lighthouse of Alexandria, would belong to the Seven Wonders of the World.

The biblical storytelling of a language that became many languages to prevent the Tower of Babel from reaching the sky, illustrates what happens when the absence of a common standard leads to a failure of interoperability – progress comes to a halt.

As history progressed, standards were developed to further increase efficiency and reduce costs in response to industry needs.

Standardization focused on the individual needs of specific sectors in a technical systems framework. The result has been the dissemination of globally harmonized International Standards promoting the compatibility of a huge variety of products and services. The logistic sector is a true representative of this revolutionizing development, with transport as an evident case of the benefits of interoperability.

Many more examples abound. But the interoperability promoted through standards is disregarded (almost taken for granted) by users when it is functioning well. Interoperability, in these cases, is considered an inherent property of the product.

But were it to fail in an essential area, the interoperability "disaster" would hit newspaper and magazine headlines, and news channels from one corner of the earth to the other.

Our increasing wealth and the innovative developments of the present create needs that call for more effective interoperability, despite the growing complexity of these interactions. The development of today's products and systems – requiring both traditional engineering and electrotechnical and telecommunications solutions – makes rather complicated demands on interoperability.

What we have seen during the past 20 to 30 years is only the beginning. The massive investment in the electric car that the coming years will see, both with respect to research, innovation and product development, serves as a good example.

The electric car of the future will require a completely new approach to interoperability, to ensure that this complex vehicle – a computer on four wheels – operates as intended.

The electric car will make heavy demands on the supporting infrastructure. For example, an intelligent network of recharging stations must be provided to enable a large number of cars, parked at almost the same time, to be recharged overnight and be ready the next morning. Making this work requires an effective interaction of numerous and very different standards.

Organizations developing International Standards are therefore under immense pressure to deliver standards which can interact to a degree, and in ways that have never been seen before.

This creates opportunities, but also dangers for these international organizations. The opportunities lie in the potential for closer cooperation between leading international organizations to establish the consistent, coherent solutions demanded by the market. The dangers are that the organizations may fail to join forces, adopting sectorial rather than overall solutions. Certainly, standards would still be delivered, but they would be produced outside the circle of players best equipped to secure their development. ■

Jacob Holmblad
ISO Vice-President (technical management)

ISO 31000 highlighted at UNECE conference

ISO Secretary-General Rob Steele addressed the United Nations Economic Commission for Europe (UNECE) conference on risk assessment and management in Geneva, Switzerland, in November 2009. The event aimed to exchange experience at national, regional and international levels on using risk-assessment and risk-management tool, when developing and applying technical standards and regulations.

In his presentation, Mr. Steele highlighted the newly published International Standard on risk management, ISO 31000. The standard provides principles, a framework and a process for managing any form of risk (see page 46).

Following Mr. Steele's address, UNECE Executive Secretary Ján Kubiš highlighted the standard's applicability within the UN and expressed his expectation to see gathered experts provide guidance to member States in setting up a well-balanced regulatory "toolbox", one that adequately protects from hazards, without stifling innovation or entrepreneurship.

As an outcome of the conference, a group of experts on risk assessment and management will continue to consider issues discussed at the conference under the auspices of the UNECE.

Advancing metrology

An investigative workshop on physiological quantities and SI units, organized by the International Bureau of Weights and Measures (BIPM), brought together metrology experts and those responsible for writing and applying standards and health and safety legislation.

The objective was to spot potential challenges and identify possible steps forward. Presentations highlighted the need for improved metrology in physiological quantities. The upcoming ISO and IEC series on physiological quantities and their units attracted considerable interest.

At the annual meeting of the Joint Committee for Guides in Metrology (JCGM), discussions focused on the advancement of guides on the evaluation of measurement data. Representatives of eight member organizations attended. Work has started on the long-term revision of the *Guide to the expression of uncertainty in measurement (GUM)*.

2009 saw the publication of the *Introduction to the expression of uncertainty in measurement*, and the circulation of two draft guides: *The role of measurement uncertainty in conformity assessment*, and a second supplement to the GUM, *Models with any number of output quantities*. Work on a third supplement to the GUM, *Modelling*, is underway.

A corrigenda will be published in 2010 for the *International vocabulary of metrology – Basic and general concepts and associated terms (VIM)*.

Both events took place in late 2009.

Big Bang recreated

A re-creation of the conditions following the Big Bang will now be possible with the successful restart of the Large Hadron Collider (LHC) in November 2009.

Operated by the European Organization for Nuclear Research (CERN), the LHC is the world's largest particle accelerator. Located in a tunnel measuring 27 km, it lies some 100 metres below the French-Swiss border near Geneva.

The LHC works by circulating two beams of protons which travel in opposite directions close to the speed of light. The beams smash into each other at allotted points, creating new particles of matter. The resulting data promises to reveal fundamental insights into the nature of the universe.

The LHC is making good progress and CERN is steadily increasing the energy of the accelerator.

CERN and ISO have a longstanding cooperation and many International Standards have been applied in the construction and operation of the LHC. Notably, CERN is a liaison member of five ISO committees covering terminology, nuclear energy, vacuum technology, information technology and telecommunications and information exchange between systems.

CERN recently collaborated with *ISO Focus,* kindly supplying the cover photo of the November/December issue on "Continual competence," featuring Prof. John Ellis, an eminent CERN theoretical physicist.

World Standards Day 2010

Accessibility has become a global concern for the design of products services and environments. ISO, the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU) have therefore chosen, within the framework of the World Standards Cooperation (WSC), to focus on accessibility as the theme for World Standards Day, to take place on 14 October 2010.

According to the World Health Organization, about 650 million people are disabled, more then 500 million of them in developing countries.

As able-bodied people grow older, failing sight and hearing, and reduced mobility and strength, confront them with accessibility issues. Pregnant women, or mothers with baby carriages, can also experience similar problems.

Strategic views

The International Federation of Standards Users (IFAN) held its 36th Members' Assembly in Berlin, Germany. Some 35 participants from nine countries attended, representing national members from standards user organizations and corporate members from both industrial and commercial sectors.

The event, held in October 2009, featured presentations from IFAN President Ross Wraight and key organizations involved in standardization and industry.

In his presentation, ISO Secretary-General Rob Steele outlined the current trends and challenges of a global world, and how standards could help.

"The world needs global solutions to complex and inter-related issues," said Mr. Steele. International Standards can bridge gaps, but we must ensure that the needs of small business, NGOs and consumers are met, and that they understand this. "We must continuously aim to be better and more relevant", he said.

The third annual IFAN international conference will be held in 2010 in conjunction with the 37th Members' Assembly, in Indonesia.

Participants at IFAN's member's assembly.

Sweden's Minister for Trade
Ewa Björling


Photo : Pawel Flato

Ewa Björling is Minister for Trade in Sweden's Ministry of Foreign Affairs. She was appointed to the post in 2007, having served as a member of the Committee on Foreign Affairs in 2002-2007, as a deputy member of the Advisory Council on Foreign Affairs in 2006-2007, a deputy member of the Committee on the Constitution in 2006-2007 and a deputy member of the Committee on Education in 2006-2007.

Her previous appointments have included Chair of the Swedish National Council for HIV Prevention in 2007, Board member of the Swedish Social Insurance Office in 2004-2007, a deputy member of the Bank of Sweden Tercentenary Foundation in 2006-2007, a deputy member of the Swedish Gene Technology Advisory Board in 2003-2007 and Chair of the Swedish delegation to the Euro-Mediterranean Parliamentary Assembly in 2006-2007. From 2003 to 2007, she was a Board member of the Swedish International Development Agency (SIDA).

Prior to her national appointments, her activities have included several terms of office in municipal government.

Ms. Björling is a registered dental surgeon with a university degree in dental surgery from the *Karolinska Institutet*.


Photo : Ylva Sundgren

Ewa Björling says that International Standards play an important role in facilitating trade through the promotion of safety, quality and technical compatibility.

ISO Focus+: In a recent speech, you underlined an open, international trading system as being a key element for recovery from the global economic crisis of recent years. What contributions do you see International Standards making?

Ewa Björling: I believe that International Standards in general – and their use in technical regulations on products, production methods and services – play an important role in facilitating trade through the promotion of safety, quality and technical compatibility.

International Standards can be thought of as providing a common language for traders. The benefits that are derived are significant. International Standards thereby facilitate trade and improve efficiency in production.

I'm hoping that ISO 26000 will clarify social responsibility.

The general view that International Standards can promote trade is also empirically supported. The Organisation for Economic Co-operation and Development (OECD), among others, has shown that about 80% of all trade is affected by standards. Consequently, it should be more efficient if we have one internationally agreed standard, rather than many differing standards.

ISO Focus+: Traditionally, many governments have sought to achieve objectives through regulations, but you seem to be an advocate for voluntary International Standards and encourage participation in their development. In your opinion, what are the advantages of International Standards? Do they encourage the innovation which you also advocate?

Ewa Björling: Our Swedish experiences over the years have taught us that there are important benefits from participating in the international standardization process. Among other things, an active participation ensures that national priorities and circumstances are reflected in International Standards.

Participation in the development of global standards can also provide a forum for exchange of technical information with representatives from international industrial and scientific organisations. This is something valuable in itself, not the least because it promotes innovations.

ISO Focus+: Are the benefits of a globalized economy reserved principally for the richer nations, such as Sweden, and less for developing countries? Or can International Standards help to ensure that developing countries are not left by the side of the road?

Ewa Björling: Many developing countries have expressed concerns that the increased number of standards and technical regulations, including labelling and certification schemes, is hampering their export opportunities. I share this concern.

A major trade restriction for developing countries, but also for small and medium-sized enterprises in developed countries, is the lack of institutional and technical capacity to handle the variety of these standards, certification and labelling schemes.

The problems are often practical in nature. It can be about the identification of which standards are needed for a certain market. How to get access to and pay for the technology that is required to comply with the standard? Or, how to demonstrate that the product actually fulfills the requirements?

The harmonisation of existing national standards, and certification and labelling schemes, or the development of new international schemes, can therefore contribute to avoiding unnecessary trade restrictions.

I am convinced that developing countries have a great potential to compete on the global market. This potential must be utilised, and should not be hampered by the inability to influence the design of a standard and thus the inability to use International Standards.

We can work with both general and more specific issues in trying to solve this situation. In January 2008, for example, the Swedish Government launched a project in order to strengthen developing countries' opportunities to increased trade with climate-friendly goods and services, by means of International Standards.

One purpose is to support developing countries that want to participate in the development of the ISO standard on carbon footprints (ISO 14067). The goal of the project in this regard is to enable developing countries to take an active part in the development of the standard, by influencing the content right from the start.

Photo : Holger Staffansson

An aerial shot of the Swedish Parliament in Stockholm.

International Standards provide a common language.

ISO Focus+: You have said that trade is in important part of the response to the climate change challenge and also that global problems like climate change can only be solved by global solutions. But is economic development compatible with measures to tackle climate change? How do International Standards relate to these issues?

Ewa Björling: A reduction in greenhouse gases does not need to hamper economic growth. Since 1990, Sweden's GDP has grown by roughly 48 %. At the same time, our carbon dioxide emissions decreased by almost 9 %. This clearly shows that it is possible to create economic growth while reducing waste and the use of non-renewable energy sources at the same time.

Climate standards could help to spread climate-friendly knowledge and technology, support innovation, enhance knowledge in climate-friendly technology, increase market opportunities and, in the long run, boost economic growth and welfare.

Open and competitive global markets also spur innovation and technological progress. And technology is, of course, a key element in moving towards a low-carbon economy.

ISO Focus+: You have pointed out that the hundreds of climate change initiatives worldwide risk creating non-tariff barriers to trade and expressed your support for a single focus based on International Standards. How has your position evolved following the COP15 climate change conference in Copenhagen last December? What concrete action is Sweden taking or planning to encourage the use of International Standards in this area?

Ewa Björling: The unsatisfactory outcome of the Copenhagen meeting has strengthened my belief that we should increase our efforts to work with all the various tools that we have available, trade policy, standardization and environmental technology, for example.

About 80 % of all trade is affected by standards.

One of the more concrete initiatives we have taken is to launch an initiative on the liberalization of trade in climate-friendly technologies, as a core element of a broader agreement among World Trade Organization members on environmental goods and services.

I'm hoping that we can move this issue forward during 2010 and that such a solution would remove both tariffs and non-tariff barriers.

ISO Focus+: In partnership with Brazil, Sweden provides the joint leadership and secretariat for the ISO working group developing ISO 26000, the International Standard which will provide guidance on social responsibility and which is targeted for publication in late 2010. What are your expectations of this standard? Can a voluntary guidance standard really make a practical, positive difference?

Ewa Björling: For Sweden, the promotion of corporate social responsibility (CSR) is an important link between two cornerstones of our foreign policy : a free trade policy and a foreign and development policy that strongly emphasizes the importance of human rights and a sustainable global development.

As the Swedish minister responsible for CSR, I have already seen that many companies are successfully using this important tool in their everyday work around the world, so I'm more then convinced that it can make a practical difference. But we need more businesses and organizations to take voluntary social responsibility. I'm hoping that the ISO 26000 standard will clarify the meaning of social responsibility and facilitate efforts to contribute to sustainable development. ■

Interoperability

by Maria Lazarte

Have you ever wished for a remote control that could operate all your electronic equipment? Or that spare parts were always easily available? Most of us take for granted that we can buy paper that will fit any printer, that software will work in all computers, or that our electronic money transfers will be accepted by banks in other countries.

But the ability of products and services to interact with each other is largely enabled by International Standards representing global consensus amongst stakeholders.

Promoting interoperability is one of the key roles of ISO standards – from those for the most basic of parts, like screws, fasteners or rolling bearings to complex processes, like the standard for the exchange of product model data (STEP) used in industrial automation.

By disseminating harmonized specifications and state-of-the-art know-how, International Standards promote the compatibility of spare parts, accessories and components among product models, lines and brands.

Manufacturers can then outsource parts confident that they will be compatible with their products, which helps them to better channel research efforts and market new technologies – for example an automobile manufacturer outsourcing its GPS technology.

With interoperability standards, businesses can become more competitive, which in turn results in fair prices, and a wider and better choice of products for consumers.

Interoperability also increases product lifespan, which reduces waste and contributes to environmental sustainability.

But the benefits of ISO standards are not limited to products. Standards for services facilitate transactions, increase transparency and improve overall service delivery in, for example, financial transactions or health informatics.

Standards also enable the interoperability of systems and processes, which can significantly reduce manufacturing costs and improve efficiency both internally within an organization and between organizations – for instance, data related standards can help ensure the quality of information transferred, avoid duplication of efforts and assure consistency between suppliers.

In addition, International Standards enable the interoperability of knowledge, which facilitates access to information and resources to people from around the world, whether through library and archiving standards, country or language codes or accessible file formats like JPEG, to name a few.

ISO standards can also facilitate forward interoperability. For example, they can ensure the longevity of information, so that archive data saved on CDs can be still be read years from now, despite advances in technology.

In fact, by their very nature, ISO standards all contribute to interoperability, be they for road vehicles, transport and packaging, building and construction, medical devices, information technology, and much more.

As for the example given at the beginning of this article, the dream of a device to control all electronic equipment is not far off from becoming a reality. But its success will depend greatly on the International Standards enabling the interoperability of systems – from the technology used by different equipment to communicate, to a user-friendly interface (see page 11). ■

Maria Lazarte is Assistant Editor, *ISO Focus+*.

Failure
is not an option

by T. S. Mohan

Lack of interoperability in everyday products results in countless inefficiencies and unnecessary costs for consumers. Consider, for instance, personal electronic items. Mobile phone batteries and laptop chargers are widely non-interoperable across brands despite serving the same purpose. Print cartridges for personal printers are not only incompatible, but their short lifespan is an environmental hazard.

The same applies to commonly used medical products. Blood sugar test strips and kits, as well as insulin pens and cartridges are clear examples. In almost all aspects of our daily life, incompatible and non-interoperable products burden consumers and contribute to the proliferation of environmental waste. This negative impact is particularly significant for developing and emerging economics, where resources are often limited.

Drawing the line

Popular consumer products not only serve specific needs, but eventually become part of the human story. Can we imagine our lives without mobile phones or computers, or many of the other commodities we now take for granted?

The protection of intellectual property (IP) has encouraged many of these developments. But too often companies resort to incompatible and non-interoperable products and accessories as a means to maximize their profits.

It could be argued that, during the initial stages of a successful product's evolution, this is an acceptable development strategy, particularly in small or restricted markets. But where do we draw the line? Once a product reaches a certain threshold – whether volume, usage or arrival of competition – then incompatibility outlives its purpose. Furthering of this strategy hinders competition, impacts the economy, creates unnecessary costs and inconvenience for consumers and increases waste.

Moreover, the production of incompatible products is not always a good business strategy. Failure to offer interoperable products may make it harder for innovators and small businesses to enter new market niches.

Figure 1 illustrates the evolution of a consumer product over time and with greater degrees of interoperability. It maps the gradual reduction of the proprietary core with the growth and usage of the interoperable open standards driven interfaces and components.

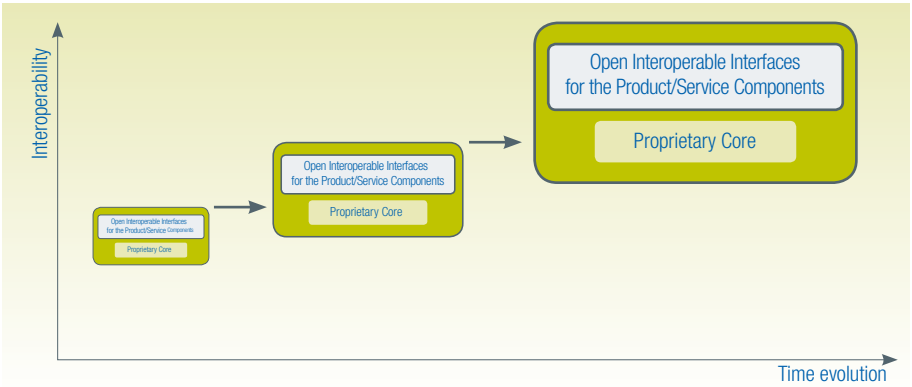


Figure 1 : *The evolution of a niche consumer product into a popular one driven by openness.*

An Indian perspective

With over a billion people, India is an economy with an enormous potential. At the same time, the majority of the population has a very limited purchasing power. Given the plethora of non-interoperable and yet popular customer goods, how does the Indian consumer face it? Very simply put, the attitude is one of resignation and working around it. As said in many languages around the country by consumers and vendors alike, *Thoda adjust karo* or *Swalpa adjust maadi* – "Adjust a little".

The Indian consumer, like many others around the world, puts up with the situation fatalistically despite the time and energy lost, the money spent less wisely, lost productivity, goodwill and opportunities. The economic damage is both subtle and huge. The Indian consumer is a sleeping giant who needs to be woken up – this calls for more proactive consumer advocacy groups creation in industry.

Why this non-interoperability?

If it goes against the needs of customers and even of business, why are non-interoperable goods prevalent? The culprit is the widespread commercial effort to build brand beyond what is legitimate. This includes vendor lock-in due to proprietary designs, technologies or processes.

> *The economic damage is both subtle and huge.*

The latter can also create barriers for other competitors striving to enter a market. The result are fewer players (monopolies) and higher costs. Some subtly unethical business practices and mindsets may also come into play, such as the not-so-fair trade practice of retaining exclusivity of a consumer good much beyond its "sell-by date", perhaps through willfully wrong usage of IP rights.

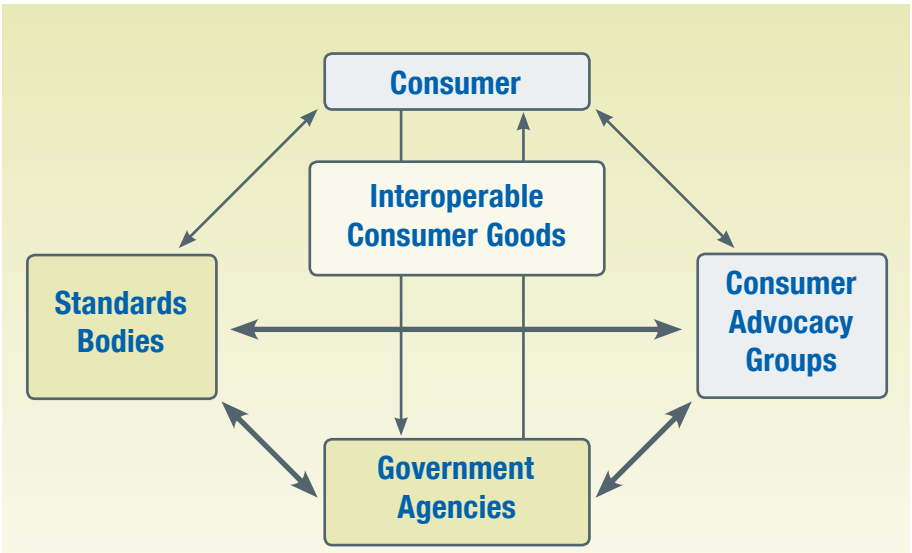


Figure 2 : *The key stakeholders and the need for public-private partnership.*

Overcoming mindblocks

Several mind blocks get in the way of interoperability. Below are some suggestions to overcome them.

Promote healthy relationships and partnerships between key stakeholders of consumer goods. **Figure 2** illustrates the need for a successful and sustained public-private partnership. In addition to businesses that generate interoperable consumer goods, interoperability is mainly driven by advocacy groups along with standards bodies and governmental agencies.

The governments, its agencies and consumer advocacy groups along with industry should promote interoperability standards as a priority.

Interoperability, as well as interoperable products and services certifications, could be made mandatory for certain products, especially with health, safety or environmental considerations.

The public at large needs to be educated on the immense benefits, tangible and intangible, as well as short and long term, of interoperability. This is best done by business schools, universities and standards bodies. In fact, they should advocate business models that promote early open standards for the "interfaces" and "components" in their products and services.

Promote public-private partnerships for accelerating interoperability changes both in mindsets as well as in products and services.

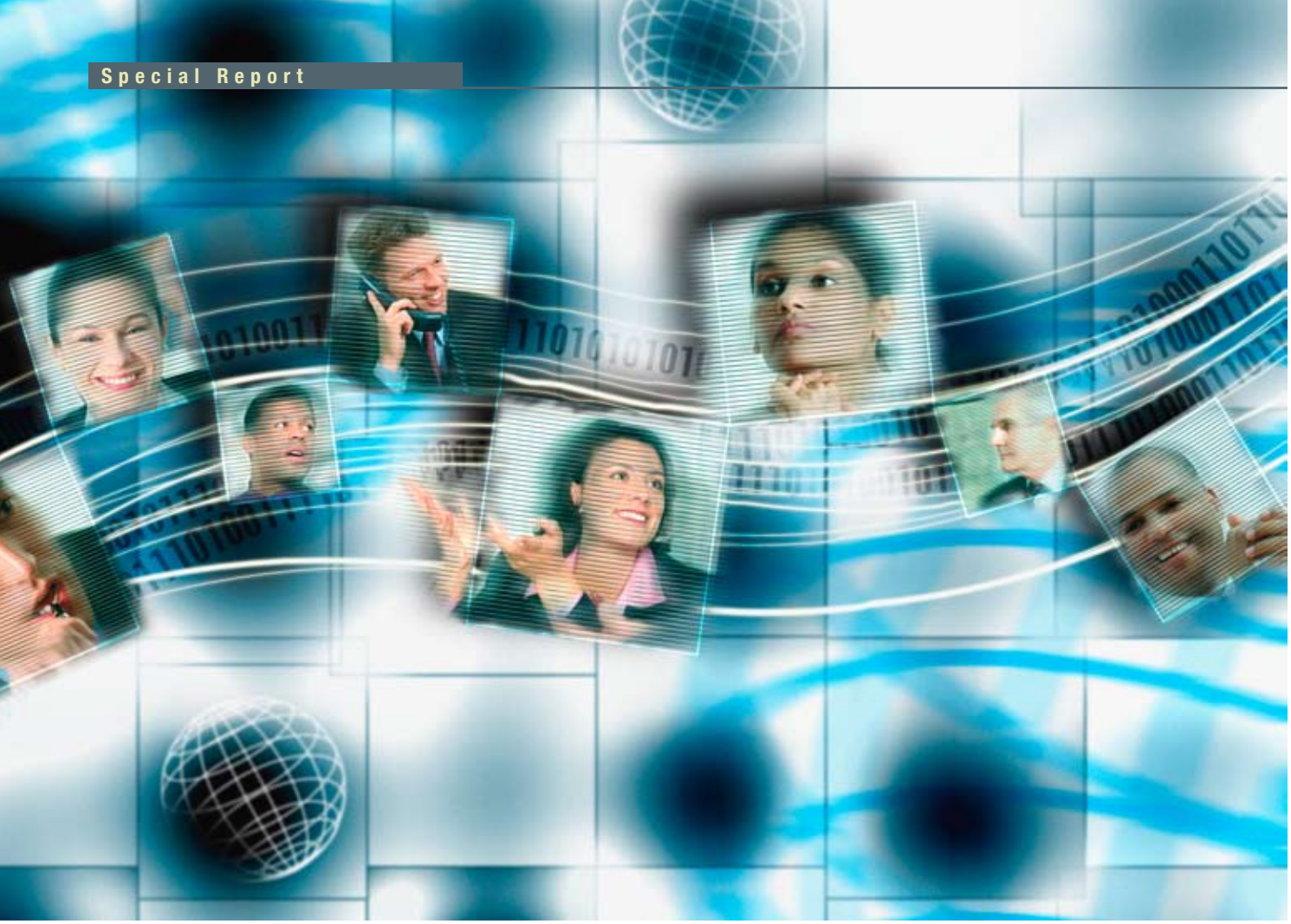
Proactively promote increased awareness amongst important stakeholders about key interoperability issues in specific domains and categories that can result in action campaigns and immediate benefits visibility.

Promote ethical and environmentally aware business practices.

Best practice from the software world

Interoperability drives much of the open enterprise level mature software products that have been through several lifecycle implementations.

There are several best practices to be shared. Amongst them is the ability to design for interoperability. This is done by first identifying all usage interfaces for a product or its components. Then, it is necessary to ensure that these are designed to be universal as well as by "compenentizing" as much as possible. The latter refers



to components which are soundly architected with well designed interfaces. In fact, components are the core of a sound design for interoperability.

While the design for interoperability is an iterative process, several challenges may emerge, such as the co-existence of many versions of a product. The key is that these should be driven by markets. The need to ensure interoperability must be triggered when consumer products or services cross certain threshold market densities, which could be defined by professional bodies actively working for consumers in that technical area.

How can standardization help ?

Standards bodies can pursue several proactive avenues to push for interoperability. They can encourage interoperability standards for a broad range of products and services as well as their components. A need that can be brought to attention by consumer advocacy groups.

Standards bodies, in association with appropriate stakeholders including governmental agencies, consumer advocacy groups and industry can develop, publish and actively disseminate interoperability guidelines and best practices.

To achieve this, they can proactively track market proliferations for consumer products and services – through authentic and usable market research. They can work closely with stakeholders for public policy formulation and mentoring. They can be drivers in setting up commodity triggers for product or service volumes that will call for more proactive interoperability designs. They can help identify key issues, incompatible products and components, build consensus, formulate recommendations and influence decisions – public or private.

Already many ISO standards promote interoperability for a diversity of products and services worldwide. The ISO Committee for consumer policy (ISO/COPOLCO) has paid particular attention to this issue and in 2009 organized a workshop in India dedicated to interoperability of consumer products. But clearly, much more remains to be done.

More relevant and vital

Bringing about interoperability for consumer products and services requires a change in mindset amongst key decision makers, products manufacturers and service providers. Given the fast changing economic scenarios worldwide and the many opportunities in these tough times, the need for interoperability has become all the more relevant and vital. ■

About the author

Dr. T. S. Mohan works at Infosys Technologies E&R's ECom Research Lab as a Principal Researcher. His research interests include distributed systems, high performance computing, cloud and grid as well as software architecture and engineering. He has over 22 years experience in the academia and industry. Dr. Mohan holds a Masters and PhD in computer science from the Indian Institute of Science, where he worked for about a decade before moving into the industry. He can be reached at : **subramanian_mohan@infosys.com**.

A dream…

The universal remote console

by Gottfried Zimmermann and Gregg Vanderheiden

Imagine you are on business travel, checking into a hotel in a foreign city.
You enter the room and the air conditioning automatically sets to your preferred daytime room temperature. The TV displays a welcome screen. You pull out your smart phone and use it to switch to your favorite news channel.
Even though all products and systems in the room are new to you, you feel a familiarity because your smart phone is showing the same interface that you use for your home appliances.

As this is your own personalized interface, the controls are shown in your native language, so you don't have to decipher the labels on the systems in the room which may be in a language foreign to you.

And it gets even better. While you wait for the news to start, with a few touches on your smart phone, you program the TV to wake you up with your favourite song at 6 a.m. the next morning. No fussing around with complicated and unknown alarm clocks. Your can take your personal user interface wherever you go.

And think about elders, some of whom would like a much simpler interface than that offered to the general public. They would no longer have to learn how to use a new interface each time a device has to be replaced or when they are traveling or visiting family.

…come true

This ideal scenario – with its vision of a personal controller or universal remote console (URC) that can be used with products at home, work and in public systems – is just an example of what "intelligent" environments and pluggable user interfaces should be able to do for you in the future. A dream that may be realized sooner than you think.

You can take your personal user interface wherever you go.

Technology enabling wireless connectivity and networked computing is already available, providing methods for seamless discovery, controlling and eventing.

But at the moment, user interfaces still have to be authored separately for each controller platform. Furthermore, many existing interfaces are neither intuitive nor easy to understand for many users.

What is needed is a standardized, versatile user interface description for products. A kind of "user interface socket" to which any personal device or "URC" can connect to discover, access and control a product.

A solid user interface description alone could support diverse URC technologies – including direct manipulation techniques via desktop computers and personal digital assistants (PDAs), or voice recognition and natural language technologies used by PDAs and wearable computers. Such an approach could also enable older products to be controlled with new user interface technologies (e.g. natural language processing).

Designed for all

Developing product interfaces that are both advanced enough to satisfy the needs of experts, while remaining simple for other users is not an easy task.

This can be partly handled through settings in the product. But beyond this, a mechanism would be needed to allow users to plug-in or connect alternate interfaces that better meet their needs and conventions. This would allow users to carry an interface that works for them across products. This can be especially important for

URC vs. the traditional universal remote

URC (universal remote console) standards enable a number of functions that go beyond the current universal remote control mechanisms.

Product display information – The URC remote console is capable of knowing and displaying the complete state of a product thanks to its bi-directional communication.

User notifications – Users can be notified about important events, such as when an oven reaches a selected temperature, or a microwave completes its operation.

Network neutral – URC standards do not assume a particular network or protocol. The technology could work equally well over LAN, wireless Ethernet (WiFi), Bluetooth, HomePlug, etc. It could even be possible to enable communication through household wiring, so that simply plugging an appliance into a power socket is enough to connect it to the network.

Modality independence – The URC standards allow for all media and modalities. The same URC could present a verbal interface to a person while driving, yet present a visual interface to the same person when in a noisy environment.

Use whatever control device is handy – Users can control a product with whatever device is handy, such as programming their DVD or VCR player from their desktop computer upstairs to record a show they are missing.

Highly customized user interfaces – In addition to allowing URCs to build a user interface on the fly, device (target) manufacturers could also provide specialized, carefully crafted user interfaces with a particular look and feel. For instance, a custom interface that works on any iPhone or Windows Mobile. They could provide a user interface in Flash or Silverlight. Or, they could offer a highly functional interface that only ran on their proprietary remote control, while still providing the basic information needed so the product can be controlled from any generic URC compatible device.

Dynamically upgradeable – Users that have access to the Internet could upgrade to improved interfaces developed by the target's manufacturer.

Multi-language – Although there may only be place for one set of labels on the front of a product, the URC standard makes it very easy for manufacturers to provide labels in many languages. Alternatively, network resources can be used to call up translations into languages not supported by the target device itself.

Allows (real) natural language and intelligent controllers /agents – The standard supports the provision of additional context, status and local and remote semantic information to support multiple levels of natural language and intelligent controllers. It would be possible, for instance, to "converse" with the controller as if it were a person who the user is asking to operate a device.

the elderly, who have trouble learning new interfaces each time they encounter a different version of the same device.

Interoperability is critical to realizing the vision of personalized and pluggable user interfaces for electronic devices and services. An International Standard on pluggable user interfaces has a key role to play here.

Such a standard would facilitate user interfaces that adapt or can be adapted to a user's personal needs and preferences. It would allow interfaces that are easy to use and that employ various modalities for input and output. And it would enable special user interfaces provided by third parties for specific user groups such as children, older persons or persons with disabilities.

With this in mind, subcommittee SC 35, *User interfaces* of ISO/IEC JTC1, *Information technology*, published a new multi-part International Standard in 2008

promoting the interoperability of URCs interfaces, ISO/IEC 24752, *Information technology – User interfaces – Universal remote console*.

The basics

The goal of URC technology is to allow any device or service to be accessed and manipulated by any controller. Users can then select a user interface that fits their needs and preferences, using input and output modalities, and interaction mechanisms that they are familiar with and work well with them.

Interoperability is critical to enable personalized and pluggable user interfaces.

In the following, we refer to the devices and services that are to be controlled as *targets*, and to the controller devices and their user interfaces as URCs.

To enable URCs to control a target without any prior knowledge of each other some "common understandings" need to be in place.

The first part of ISO/IEC 24752, Part 1 : *Framework*, defines the components of the URC framework and specifies the "common understandings" between them as conformance requirements, stated in terms of high-level interaction.

A key part of this interaction is the sharing of control and access information through XML documents.

Learn more

While the fundamental components and XML languages are specified by ISO/IEC standards, essential implementation guidelines and other support documents are provided as technical reports by the OpenURC Consortium (see **http://myurc.org/TR/**).

Readers interested in the technical aspects of the standard and its implementation should start with the technical primer available at **http://myurc.org/TR/urc-tech-primer1.0**.

ISO/IEC 24752, does not determine a specific networking protocol between a URC and a target. It only defines requirements for such a networking platform. The idea is that the URC related interaction could be implemented on top of existing networking platforms that support device discovery, control and eventing – such as UPnP (universal plug and play), Web services, HomePlug, etc.

You can run a URC environment at home and use pluggable user interfaces and similar resources in a constrained environment such as a local network. However, the real power of the URC framework unfolds if applied to a global ecosystem.

In such a scenario, different parties contribute the different parts necessary to build flexible user interfaces : providers of devices and services, providers of network services, providers of controllers, providers of pluggable user interfaces, and the users.

A key component of the URC ecosystem is the resource server, which acts as a market place for sharing various resources enabling personalized and pluggable user interfaces. Currently, a pilot resource server is being operated by dot UI (**dotui.com**).

The OpenURC consortium

There is a growing community of technology developers applying the URC standards. The impact of implementations will be maximized by sharing resources and following common guidelines. This is one of the objectives of the OpenURC Consortium (**www.myurc.org**). Everybody can join this community to build a URC ecosystem that will facilitate simple, flexible, and accessible user interfaces.

Currently, there are about a dozen European projects built upon the URC and the universal control hub (UCH) technology, including research and industrial organizations such as DFKI, the University of Prague, VicomTech, Siemens and Sun Microsystems.

The first project of this kind in Europe was i2home (**www.i2home.org**), which spearheaded the use of URC technology in the field of ambient assistive living. ■

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About the authors

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Dr. Gottfried Zimmermann is an expert on IT usability and accessibility. He received a PhD in computer science from the University of Stuttgart, Germany, in 1999. In 2000, he joined the Trace Center of the University of Wisconsin-Madison, USA, where he focused on research and development in the area of Universal Design in current and next-generation information and communication technologies. In 2003, he founded Access Technologies Group, a consulting company for ICT accessibility. Recently, he became junior professor of Media Informatics at the University of Tübingen, Germany. He has also been the technical coordinator of the European i2home project since 2006.

The challenging world of screw threads

by Li Xiaobin

Screw threads have two big advantages. One is that they connect parts together, enabling designers and manufacturers to produce highly complicated machines and equipment. The other is that they can be disassembled, making it easy to replace worn or damaged components, extending the life of machinery and equipment, and reducing the cost of use and maintenance.

Screw threads are the basic elements of manufacturing, and they are widely used across almost every branch in industry. Which is why the ISO technical committee responsible for standards on screw threads received the first designation, ISO/TC 1.

The job ahead

With the continual growth in global production and trade, ISO International Standards for screw threads have gained in importance.

Firstly, engineers around the world need to be able to identify screw threads correctly – there are about 500 screw threads in existence, and it is not always easy to distinguish among them.

Secondly, engineers want unified basic dimensions and tolerances for screw threads, as well as the ability to check them in a uniform manner.

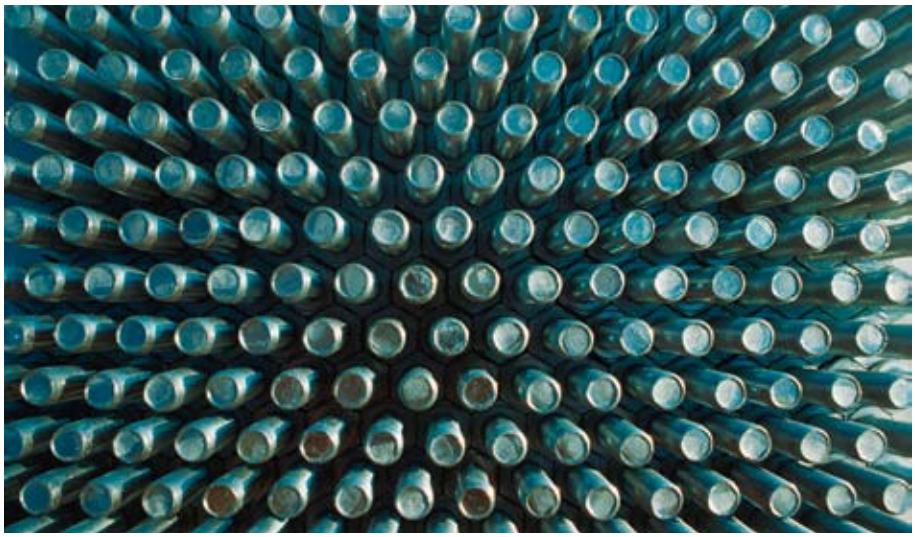
Thirdly, engineers would like to see all screw thread standards conceived and set out in the same way. or using a similar technology system, as well as to be able to use the same vocabulary and symbols in relation to screw threads. Only ISO International Standards fulfil all these needs.

Many industrialized countries have adopted, or are in the process of adopting, ISO standards on screw threads as their national standards. Currently, there are 20 of these International Standards, covering four kinds of screw threads, including a vocabulary of related terms. But there are none for the remaining types, such as buttress screw threads. This creates several limitations, specifically concerning interoperability of products.

Engineers are therefore correct in expecting that ISO/TC 1 actively fills the gaps as soon as possible. At a minimum, the committee should tackle the most widely used screw threads, and develop a drafting platform with a unified vocabulary, symbols, designation and technical system.

Other technical committees within ISO could use this platform as a basis for drafting standards for special types of screw threads. This would make it simpler for users to understand the requirements of these special screw threads, and contribute to keeping the number of screw threads in the world to the minimum ideal. There is also a need to develop International Standards covering the designations and symbols applying to most kinds of screw threads.

But before we get there, it is first necessary to revise and supplement the ISO standards that already exist. This is the current mission of ISO/TC 1, and about 11 International Standards will be looked at in this phase.



Modern assembly lines and electronic products require greater precision and ever-smaller screw threads. At the same time, as the connection reliability of screw threads becomes increasingly important, the user needs more and more reliable methods to gauge screw threads, calculate their strength and lock their joints.

Development trends in the field are towards more accuracy and miniaturization and more reliable gauging, strength and locking. These are the bases for the long-term work of ISO/TC 1. About 30 International Standards will be dealt with in this phase.

New guidelines

In order to put the work of ISO/TC 1 forward promptly, the planning of new standards and the revision of current ones are to be based on the following guidelines.

The documents are to be drafted, and their priority determined according to global demand for each screw thread type. At present, both metric and inch screw threads are used in international trade, and both are clearly needed. If we had no International Standards for inch screw threads for example, manufacturers would continue to rely on a multiplicity of national standards, which is highly inconvenient for users.

Miniature screw threads, metric threads with transition fit, metric threads with interference fit, metric extra-fine pitch threads and metric taper threads should be introduced. These screw threads form a large family of metric threads.

We need to establish a system of screw threads, and increase awareness of the goals of ISO/TC 1's work. The system should include all standards for screw threads and satisfy the needs of thread production.

The standards will address specifications for profile, diameter and pitch combinations, basic dimensions, tolerances and designation, gauges and gauging. These are the five basic aspects of screw threads, which form a comprehensive whole and are crucial to the success of a standard.

For screw threads with many diameter and pitch combinations – those with a variety of tolerances and those which are used in larger quantities – each of the five basic aspects will be covered as an individual International Standard or a separate part of a standard. This will make it easier to revise and refer to a particular aspect in the future.

For screw threads used in larger quantities, it will be advantageous to add sections on limits in size, measuring cylinders, etc., which will enable designers to choose and produce these screw threads more easily.

It is important to take into account, as much as possible, the different existing national standards during the preparation of an International Standard.

For each new work item, a dedicated working group will be established to prepare the document.

For issues that could not achieve consensus, an annex will be added to the standard to explain differences between nations.

Challenges

There are a number of potential risks to the timely completion of the ISO/TC 1 work programme, outlined below.

- *Existing diversity*
  If a new International Standard differs from a national one, that country will incur enormous expense in adopting the new standard. Due to the lack of consistent international standardization in this area in the past, there is currently a wide disparity between different national standards for screw threads. This makes the work of harmonization more difficult and lengthens the time required to draft a standard.
- *Differing interests*
  Each industry and regional standard-developing organization has its own business interests. For example, some European countries do not use inch screw threads, while North America uses them in large quantities.
- *Fastener threads only*
  In some countries the screw thread standards are prepared by national fastener committees, which are only interested in screw threads for fasteners. This leads to a narrow scope for screw thread.
- *Expecting national standards to become international*
  Some large markets may expect their national standards to be adopted internationally outside of the ISO consensus-building process.

Clearly, many challenges lie ahead, and ISO/TC 1 has an ambitious road map. We are confident that with motivation and effort, the committee will be successful. Our goal is to build up a solid and globally harmonized portfolio of standards responding to the latest technologies and today's market need for interoperability. ■

About the author

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Simple solutions

for more transparent financial transactions

by Jean-Yves Garnier

Each country has its own cultural and social background, and this diversity enriches originality in all domains of life. The same applies to banking and, consequently, payment instruments vary enormously from one country to another.

The different ways in which regulators identify financial institutions are also an expression of this richness. Banks have created their own systems, and there are a multiplicity of ways to designate customer account numbers.

This diversity has been a fact of the banking world. But with steady growth in the volume of transnational financial traffic, customers are demanding simpler business solutions. This in turn is putting pressure on the banking community to improve interoperability.

One key tool is the International Bank Account Number (IBAN) specified in ISO's multi-part standard ISO 13616, *Financial services – International bank account number (IBAN)*.

IBAN allows cross-border identification and validity checks of bank accounts. Originally created by the European Committee for Banking Standards, it was published as an ISO standard in 1997. As an annex to the standard, the registration authority, the *S*ociety for Worldwide Interbank Financial Telecommunication, better known by its acronym, SWIFT, maintains a list of adhering countries.

Easier for customers

IBAN is comprised of an alpha-2 country code based on ISO 3166-1:2006, *Codes for the representation of names of countries and their subdivisions – Part 1 : Country codes*. The code is followed by two check-digits (calculated according to ISO/IEC 7064:2003, *Information technology – Security techniques – Check character systems*) and a container of 30 alphanumeric characters for the national bank account number (usually called BBAN for Basic Bank Account Number).

All banks in Europe deliver an IBAN account number to their clients. The clients then simply supply this number to counterparties to ensure rapid and secure payments.

IBAN has become the key for ensuring interoperability of payments in Euro, an initiative driven by banks through the SEPA (Single Euro Payments Area)[1]. The reason for this is simple : in a participating country it is easy for a bank to check the validity of a standardized BBAN. But if other methods have been used to create this BBAN verification may be impossible, and the bank may be left with only the banking contact details supplied by the client.

1) The SEPA is an initiative for the creation of a Euro zone in which all electronic payments are considered domestic, and where a difference between national and intra-European cross border payments does not exist.

Evolution of the BIC

Why does the latest version of ISO 9362, published in 2009, refer to the BIC as a business code and not a banking code as in its 1994 edition?

BIC and IBAN were designed to identify banks, not customers. But as corporations got more involved in their financial transactions it became evident that there was also a need for their clear and unambiguous identification.

Banks and corporations agreed that it made sense to use the same structure used in BIC to identify companies. After all, banks are simply companies offering financial services. The scope of ISO 9362 was consequently broadened and the BIC is now known as the business identification code.

Any legal entity can now be identified with a BIC, and everyone can verify the code. The BIC is particularly useful when an account number is not relevant for identifying customers. It facilitates exchanges end to end from customer to customer, and helps in handling risk and security matters such as anti-money laundering monitoring.

IBAN promotes the interoperability of banking transactions by safely ensuring the validity of an account. It removes the need to apply different national or individual bank rules each time a BBAN needs to be verified.

Because of its clear advantages several others countries have also adopted the standard including Israel, Mauritius, Tunisia, Turkey, Saudi Arabia and Switzerland. In total, 46 countries already use IBAN for easier exchange of payments.

Now even better with BIC

IBAN on its own was not sufficient to ensure the best possible interoperability of financial transactions. It still remained that bank codes can only be checked in the issuing country, as usually banks are identified by their national regulatory authority.

To reach an optimal level of interoperability, the banking community created an identifier code known as BIC. This ISO standard, ISO 9362:2009, *Banking – Banking telecommunication messages – Business identifier code (BIC),* specifies a unique worldwide identifier for each bank, and may also include the specific location of the bank (see **Box**).

The identifier was so efficient that SWIFT decided to use it for routing messages on its network.

Customers demand simpler business solutions.

The BIC structure may be eight to 11 characters long, composed of:

- Bank code (letters only) – four characters
- ISO 3166-1 alpha-2 country code (letters only) – two characters
- Location code (letters and digits) – two characters
- Branch code – three characters.

The greatest advantage of BIC is its simplicity: a unique four-digit identifier for each bank in the world plus the country and its location within the country.

The registry is easily accessible at SWIFT, assigned as registration authority by ISO/TC 68, *Financial services*, the committee that developed the BIC and IBAN standards. Anyone can verify the existence of a BIC and the name of the financial institution on the Internet (**www.swift.com**)

Reliable pillars

Reliable interoperability was achieved using BIC and IBAN together. European banks rely on both to deliver account identification to their customers. On various media, clients are provided with the BIC of their financial institution and the IBAN corresponding to the account that they maintain at this institution.

The SEPA is built on these two pillars, which allow sending payments all over Europe as securely as inside a country. The increasing use of these standards and the evolution of their scope are driving the banking community and their clients to a more efficient way of making business.

Worldwide adoption of the system will further improve not only interoperability, but also security, reliability, speed and traceability. ■

About the author

Jean-Yves Garnier is an independent consultant and Chair of ISO/TC 68/SC 7, *Core Banking*. He served on the Board of SWIFT.

Reliable pallets

carrying world trade on their backs

by John M. B. Mead

Although pallets are largely taken for granted, these humble, flat, structures can be said to form one of the basic blocks of global supply chains. Billions are currently in existence, a mark of confidence based on 50 years of worldwide experience.

Their success lies in their ability to satisfy the needs of every user in any conceivable handling environment, whether for simple movements, for storage, or in guaranteeing safety in point-of-sale applications.

But their task has not been easy. Empty or loaded, pallets are handled by fork lift trucks or pallet trucks, placed in automated racking systems, stacked pallet-load on pallet-load, moved on twin conveyors, loaded in shipping containers and moved through arctic and tropical conditions. In addition, they must support a wide variety of loads and strapping methods, and endure dynamic loads and impacts from equipment drivers in a hurry.

Providing solutions

With the explosion of global trading, the necessity has risen to address formerly regional or local concerns in a wider international context. In response, ISO technical committee ISO/TC 51, *Pallets for unit load method of materials handling*, has developed and updated a wide portfolio of standards to meet these needs.

ISO/TC 51 deals with pallets of all materials, including those with integral superstructures (boxes) and slip sheets (thin unit handling devices usually made from kraft board, fibreboard or plastic).

Its standards specify sizes, performance, and give guidelines for repair and reuse, together with a full set of definitions.

Particular attention has been given to wooden pallets, which estimates indicate are by far the most common, used in more than 90% of applications worldwide. Among the aspects ISO/TC 51 has standardized are assessments for all aspects of timber size, strength and damage resistance. The committee has also targeted fixings (nails), which as key strength factors their performance is crucial.

World of choice

The economics of operating reusable pallet systems favours wood in most circumstances. However, plastic pallets in a variety of materials and designs have been adopted to meet special operational needs.

Pallets must perform even under harsh conditions.

Moreover, the shortage and high cost of wood in some Asian countries has created further incentive for improvements. Corrugated paper pallets are used for lighter loads, and reconstituted wood materials are suitable for other purposes. Lightweight aluminium pallets have proved useful in airfreight applications.

Used once, used twice

To define specifications and performance for the different types of pallets, we must take into account the uses and loads that a pallet may be required to meet.

For instance, a basic system may need only single-face pallets with three bearers to carry a load on a flat truck for one

trip. The pallets would not return once empty.

When loaded, these pallets must have enough clearance to accept a pallet truck under the deck. They must not sag at the edges when lifted, as this could cause the load to slip. And they must be of a size that suits the truck and the storage conditions at either end. Finally, as a packaging material they must meet recycling requirements.

Many pallets are designed for single-load use and for a particular set of handling and storage. They are often custom sized to suit user requirements. However, if designed for general use, the pallets' trip cost would be dramatically reduced if they are then reused, either by the recipient of the goods or by a pallet recycler who places them back on the market.

A day in the life

Because pallets are prime reusable packaging, many volume users take advantage of available pallet pools. But pallets in general pools must be able to perform in any combination of handling and storage, including worst case scenarios. This is what the daily challenges in the life of a pallet look like.

Empty pallets in a stack are moved by either a pallet truck or a fork-truck. The tynes of the forks need enough friction under the top deck to prevent the stack from moving. Similarly, there needs to be sufficient friction between the base and the top deck of the pallet underneath to avoid slippage.

When the stack of pallets is placed in a "destacker" at the production line, their size accuracy has to conform to the limits of the machine, with no protruding parts.

The pallets may be placed onto a twin track conveyor and the load automatically placed sack-by-sack or box-by-box onto the deck, perhaps with some eccentricity. Some dynamic load may arise in the process.

Pallets may then be strapped or wrapped before being conveyed to an automatic stacker and stored up to 30 meters high. The clearances for loaded pallets will have to conform to the equipment. The pallets will then deflect until stability is reached. The gaps needed for the retrieval of each pallet cannot be too tight. For cold storage, pallets must be able to withstand freezing temperatures.

A pallet with its loads may then be shipped directly in a container, and "pin wheeling" for size and accuracy may be needed to optimise the load. This requires entry capability on any of the four faces.

The container may then move through the tropics, subjecting the pallet to high temperatures and humidity. The pallet must be able to conform with specifications for size and performance even under these conditions.

The loaded pallet may then be stacked on top of another loaded pallet with an uneven top surface, and it must keep its stability.

At the start of each new handling phase, the pallet is inspected for safety to ensure no structural damage has occurred.

Throughout all this, the pallet must remain safe for humans and plants and not harbour any health threats. Wood pallets shipped to most countries are required to be treated to conform to the plant health authorities standard ISPM 15, established by the International Plant Protection Convention.

Safe arrival

So how does a user know that the load will safely reach its destination on a selected pallet?

Dealing with all these interrelated issues has required considerable flexibility in ISO/TC 51. Defining the huge variety of terms used in the field has been a considerable task in itself. These can be found in ISO 445:2008, *Pallets for materials handling – Vocabulary*.

Pallets are largely taken for granted.

Size and accuracy are key. ISO/TC 51 has defined six sizes of pallets for use between the major trading regions of the world (ISO 6780:2003, *Flat pallets for intercontinental materials handling – Principal dimensions and tolerance*). Each region has independently developed its own standard size, and each infrastructure became modular according to those sizes.

The cost of change is currently prohibitive, so pallets of different dimensions will continue to require customized handling methods, for instance, a pallet of a size used for imports but not domestically, can be shipped as goods back to the point of origin. On the other hand, ISO standards specify uniform accuracy requirements, which facilitates handling.

Where pallets are assembled from components, their size and quality can be controlled with a series of standards. The performance of a wood pallet is significantly affected by the fixings used, and standardized tests can be used to demonstrate their capability.

Good everywhere

How can performance be assessed given the large variety of conditions in which pallets are used?

ISO/TC 51 has developed a comprehensive test standard for pallets of any material. ISO 8611 for flat pallets, is a three-part standard providing guidance for methodology, performance and use selection and criteria, as well as maximum working load performance. It also advises on the effect of typical loads and strapping, on the unit load performance.

The criteria in the six tests for performance and the seven optional tests for durability have all been evaluated against real-world performance. Acceptable deflections and accuracy reflect current practices and safety requirements.

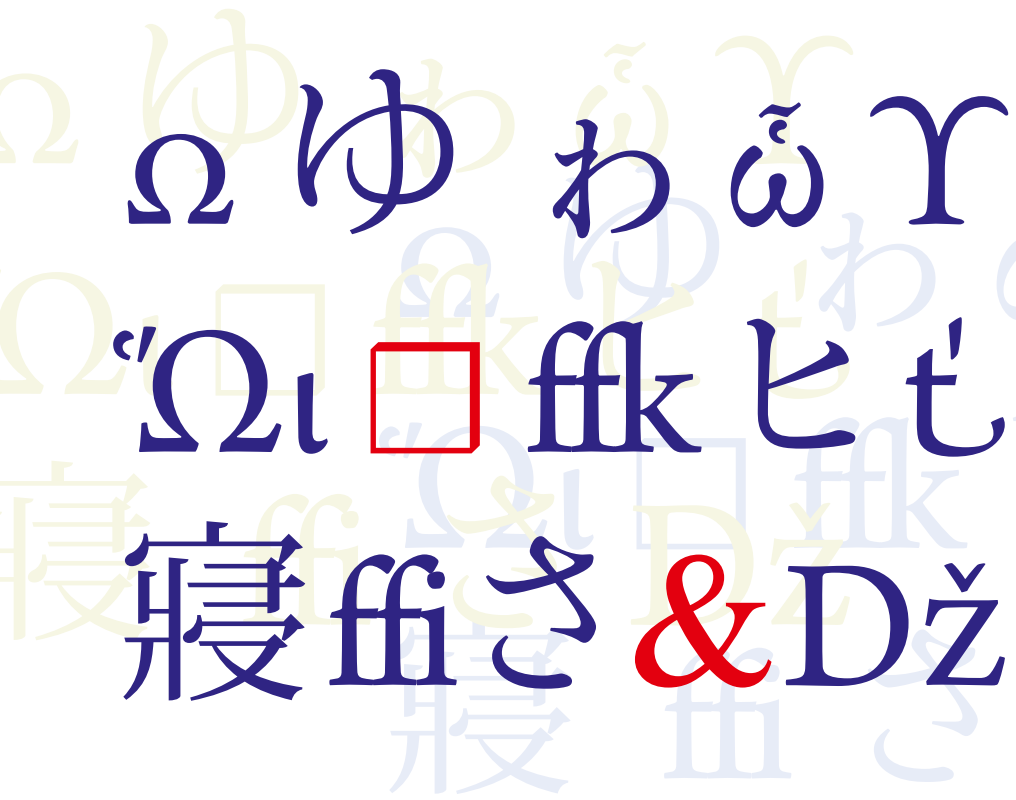
A pallet can only be said to pass the ISO tests if the conditions and load are specified and all the related criteria are met.

For reusable pallets, there is a repair and inspection ISO standard developed jointly with the European Committee for Standardization (CEN).

It must be emphasised that the safety of a reused pallet depends on the inspection process put in place by the user. Companies or agencies maintaining pools of pallets must assume responsibility for repair assurance. ■

About the author

John M. B. Mead is Chair of ISO/TC 51, *Pallets for unit load method of materials handling*. He has worked in the pallet industry for 30 years, becoming CEO of the United Kingdom's major group involved in manufacturing, controlling and repairing pallets, followed by a period with the industry in the USA. He has developed pallet quality and reuse programmes.



What you see is what you get

Getting e-communication right

by Deborah Anderson

Virtually all modern computer operating systems and browsers adhere to the International Standard for character encoding defined in ISO/IEC 10646:2003, *Information technology – Universal Multiple-Octet Coded Character Set (UCS),* and its sister, the Unicode Standard (**www.unicode.org**). Widely used in applications and fonts, ISO/IEC 10646 has been adopted by many national standards bodies.

How it works

The standard assigns a unique number to each text element (or “character”) used by the world’s written languages. For example, the Latin lowercase letter “e” is assigned the hexadecimal value “0065”, which is its “code point”. This same numerical value, 0065, is used in operating systems and other applications for the letter “e.” This assignment will remain the same, regardless of computer platform or software application.

The success and widespread adoption of ISO/IEC 10646 and Unicode is readily visible to anyone who, for example, types an e-mail message with an accented “é”, a Greek “ε”, or a Cyrillic “И” on a Macintosh computer in Europe or the USA, knowing that the text will be correctly rendered for a Windows PC user in Ethiopia, without any of the “□”,“?” or other “nonsense” symbols that were so common in the early days of personal computers.

Synched

The need for a single International Standard became evident in the 1980s, when hundreds of standards, or “code-pages,” were in existence. The standards varied from country to country, and even from company to company. For example, a bank receiving data from another bank could not be sure of its accuracy, unless they were both using the very same standard.

For businesses, governments, and academics, the conflicting standards created chaos. So, in 1991, ISO, the International Electrotechnical Commission (IEC) and the Unicode Consortium agreed to combine their efforts on standardization, making the characters in ISO/IEC 10646 and the Unicode Standard identical. This close relationship between ISO and the Unicode Consortium continues today. ISO/IEC 10646 and Unicode both contain the same repertoire. Unicode, however, goes somewhat further, including detailed character specifications, character data, and algorithms for implementers, so characters can be uniformly treated on various computer platforms.

With ISO/IEC 10646, text communications can be reliably sent, received and searched.

All new scripts and characters must be approved by both the ISO/IEC and the Unicode committees. The ISO/IEC working group on coded character sets, ISO/IEC JTC 1, *Information technology,* SC 2, *Coded character sets*, WG 2, *Universal coded character set* (**http://std.dkuug.dk/JTC1/SC2/WG2/**), is composed of representatives from some 50 national standards bodies. The Unicode Technical Committee on the other hand, is made up of Unicode Consortium members, which largely consist of computer company representatives.

The Unicode Technical Committee ensures that new scripts and characters can be implemented on current platforms and software. While national bodies promote ISO/IEC 10646 in their home countries, computer companies apply the standard to computers and software, so that the interchange of text can be truly interoperable around the globe.

For minorities and historians too

While the scripts used to write the major languages of the world are covered by ISO/IEC 10646, more than 80 scripts used for minority and historical languages are not yet included (for a listing, see **www.linguistics.berkeley.edu/sei**).

The benefits of ISO/IEC 10646 and Unicode cannot be underestimated. Global text communication via email, on Web pages, cell phones, and in word-processing documents can now be reliably sent, received and located by search engines because they are using a single standard. This has impacted business, governments, non-governmental agencies, academics, and individuals, all of whom use the Internet to do business, send messages and transfer documents.

The growing choice of characters has given rise to some security concerns, such as spoofing, where look-alike characters are used in domain names to redirect users to fake Websites. These attacks can have serious effects on businesses and governments, and the issue is being actively addressed by the Unicode Consortium. (See Unicode Technical Standard #39 **www.unicode.org/reports/tr39/**).

This means that some minority language users cannot write in their native writing system, nor can the documents reflecting their cultural and literary heritage be made accessible and searchable because they are not part of the International Standard.

The Miao script, which is used in China today by some 500 000 users, is not yet included in ISO/IEC 10646 (Unicode), which makes interchanges of text using this script in email or on Web pages very difficult. Another script missing from the standard is Mende, used in Sierra Leone and Liberia. For many modern minority language users, using their own native script is a matter of pride and cultural recognition, whereas being forced to communicate in the official script of the government may bring with it political, cultural, or religious baggage.

In a similar vein, scholars working on ancient scripts cannot reliably send historical texts without worrying that their colleagues might not receive the same characters. For example, scholars working on Linear A, a script used in Crete in the second millennium B.C., would be greatly assisted by having these characters in the standard, as that would eliminate the need to meticulously describe each symbol when sending e-mails or documents. Similarly, historic materials, such as those in the Takri script of northern India and surrounding areas, used from the 17th until the mid-20th century, could be made widely available for study and research.

Virtually all computers adhere to ISO/IEC 10646 and the Unicode Standard.

Fortunately, projects, such as the Script Encoding Initiative at the University of California, Berkeley, have been working with scholars and users to fill in the gaps. Their goal is for all eligible scripts of the world to be included in ISO/IEC 10646 and Unicode. The two committees are continuing to receive, review, and accept characters and scripts into ISO/IEC 10646 (/Unicode). The latest version of the Unicode Standard, Version 5.2, now includes more than 100 000 characters (**www.unicode.org/versions/Unicode5.2.0/**).

While tremendous progress has been made, the effort to complete the job must continue, so that all historic and modern scripts will be accessible and interoperable long into the future. ■

About the author

Deborah Anderson is a researcher in the Department of Linguistics at the University of California at Berkeley where she is project leader of the Script Encoding Initiative. She is the liaison representative to ISO/IEC/JTC 1/SC 2 for UC Berkeley and a member of the USA delegation to SC 2/WG 2. She is also a Technical Director of the Unicode Consortium.

Standardized standards?

The case of the multiple identifiers

by F.X. Nuttall

In order to differentiate published books, music, film and serial publications from each other, these are often ascribed "identifiers" made up of alphanumeric sequences that uniquely and unambiguously identify a resource. Within ISO/TC 46, *Information and documentation*, subcommittee SC 9, *Identification and description,* develops standards for content identifiers of information and technology.

In addition to ensuring that the world's cultural works are classified in a clear and globally harmonized way, SC 9 standards often require that a related metadata set succinctly describe the identifier's main characteristics. The standards are an important asset for the academic and cultural industries.

Beginnings

The first, and possibly the best-known identifier developed by SC 9, is the International Standard Book Number (ISBN), ISO 2108:2005, originally developed in 1970.

The ISBN fulfilled a well-identified business case in the physical world of paper books. But since then, year after year, more industries have felt the need to properly identify their resources and the family of SC 9 identifiers has grown to comprise nine members:

- **ISBN** – ISO 2108:2005 for books
- **ISAN** – ISO 15706-1 : 2002, ISO 15706-2:2007 for audiovisual works
- **ISMN** – ISO 10957:2009 for printed music
- **ISRC** – ISO 3901:2001 for sound recordings
- **ISSN** – ISO 3297:2007 for serial publications

- **ISTC** – ISO 21047:2009 for textual works
- **ISWC** – ISO 15707:2001 for musical works
- **DOI** – ISO 26324 for persistent resolution (not yet published)
- **ISNI** – ISO 27729 for names (not yet published).

From industry silos to interoperability

However, although most industries contributing to SC 9 recognized the need for a standardized identification scheme, many fell short of a strong business case justifying the investment to fully deploy these standards. As a result, most identification schemes are only used within an industry sector, with little or no interaction with other sectors.

It is only very recently that the nascent digital media market imposed new business rules on all industry players. For example, a typical music store will only carry, at best a few 100 thousand music references and 10 thousand movies. Apple's iTunes, on the other hand, now offers more than 12 million music tracks and Netflix more than 100 000 films.

The amount of information to be processed by the digital media value chain has exploded to the point where traditional methods for identifying cultural goods no longer work efficiently.

To make things worse, new "compound objects" have emerged. Audio books are an interesting example. They are called books, and would carry an ISBN, but they are also sound recordings (ISRC) of textual works (ISTC) performed by readers (ISNI). This

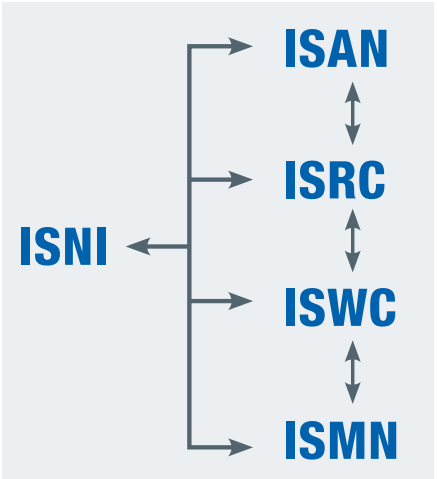
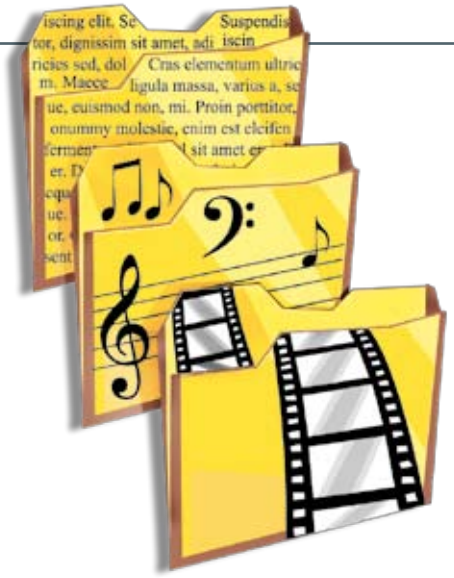


Figure 1– *Relationships between identifiers for an audio-visual work.*



reality is now knocking on SC 9's door.

Paving the way forward

How can we facilitate interoperability? How do we establish links between identifiers that do not necessarily look alike, and that do not share common structures?

Every identifier developed by SC 9 has so far responded to a market need, but operated within a silo in a given industry sector. Consequently, every SC 9 identifier was designed differently, somewhere along the line, the subcommittee forgot to standardize its own standards.

So what can we do? In 2008, the SC 9 Identifier Interoperability Working Group

ISO 8459 was developed during revolutionary technological change.

(IIWG) was created to explore the issue. The first task of the group has been to identify the possible relationships between identifiers. This work will result into a map of "interoperabilities".

Figure 1 shows an example of such a map for an audio-visual work (ISAN) embedding sound recordings (ISRC) that are performances of musical works (ISWC) represented on a music score (ISMN). In this scenario, each contributor is assigned an ISNI.

Mapping relationships

Each arrow in **Figure 1** represents a relationship. The tricky part is to express these relationships in an unambiguous natural language that can also be interpreted by computers. A simple starting point is to agree on a set of expressions, such as [ISNI #] "is the author of" [ISWC #]. But even for such a simple expression, agreement is needed on all the terms.

This is harder than it seems. A textual work *author*, for instance, is not the same as a musical work *author*. We then enter into the more complex domain of data dictionaries where terms are hierarchically sorted and organized in classes.

Combining interoperability maps and data dictionaries moves us into the field of ontology. The results are elegant and powerful representations of complex businesses such as the digital media industry. But in this author's opinion, they still fall short of solving practical issues.

One such issue hindering the interoperability of SC 9 identifiers is the lack of "hooks" for establishing links between identifiers. The metadata sets defined within the ISO standards are not sufficient. For instance, ISAN's metadata set does not allow referencing the sound recordings of its soundtrack.

We are forced to revert to external, non-standardized metadata sets and fuzzy matching rules. Despite appearing to work, these "quick wins" hinder cross-industry initiatives in the long-term.

Enabling the interoperability of its identifiers is now one of the key goals of SC 9. Although the standardization of SC 9 standards sounds like a tautology, it may prove to be a simple solution to a complex problem. ■

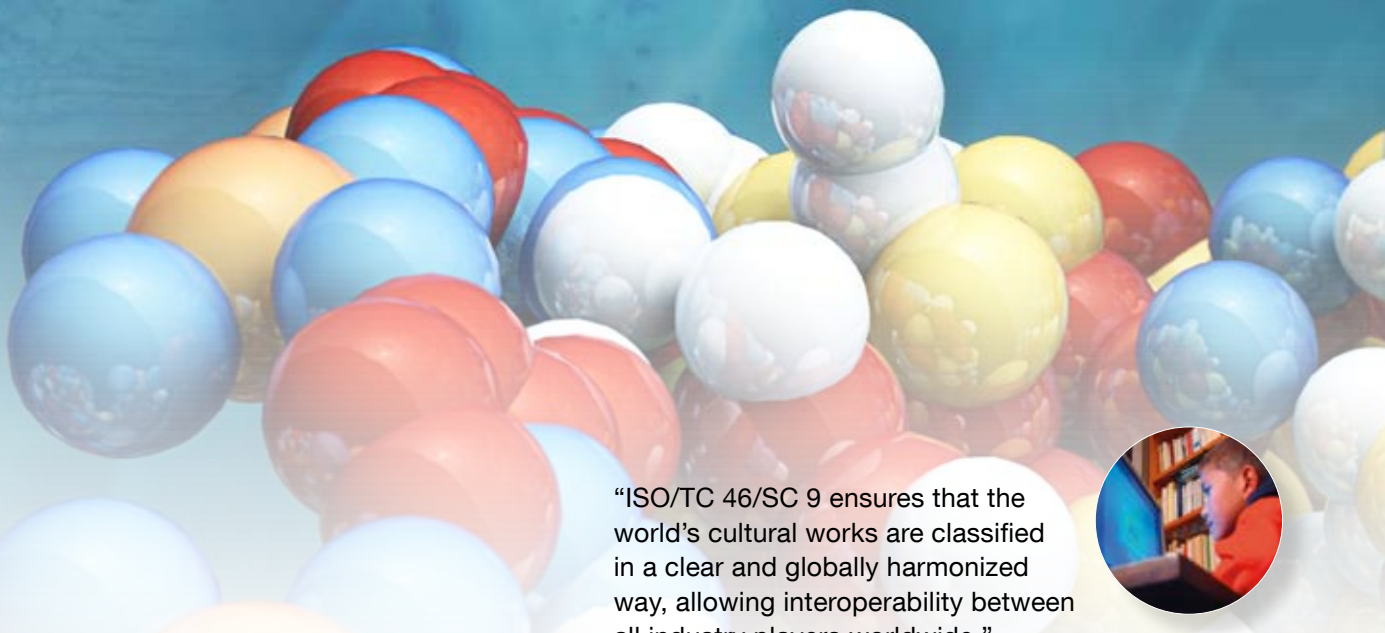
About the author

F.X. Nuttall is an independent expert in the field of digital copyright. Mr. Nuttall is the Convenor of ISO/TC 46/SC 9/WG 6, *International Standard Name Identifier (ISNI)* and editor of the forthcoming ISO 27729. He represents the international confederation of authors and composers (CISAC) in ISO/TC 46/SC 9, and is a founding member of ISWC, ISTC and ISAN. He is also the editor of ISO/IEC 21000-15, *MPEG-21 event reporting*.

Interoperability

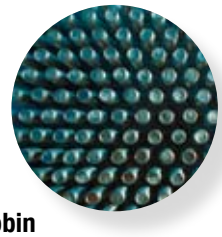
Does it fit, will it work, and can standards help?

Genes, like those coded in this DNA strand, may have different roles, but all work together as one organism. Likewise, products, services and processes co-exist in interconnection enabled by International Standards. When interoperability fails, the resulting roadblocks impair progress, raise costs and generate inefficiency.



"Many ISO standards, used extensively in several countries, promote interoperability for a diversity of products and services worldwide – making life simpler, less expensive, more enriching and eco-friendly."

T.S. Mohan
Principal researcher, Infosys



To achieve interoperability, engineers require ISO International Standards that ensure unified basic dimensions, tolerances and gauging for screw threads."

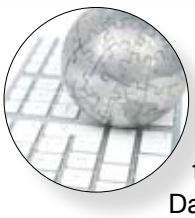
Li Xiaobin
Secretary of ISO/TC 1, *Screw threads*

"ISO standards for pallets specify uniform accuracy requirements, which facilitate handling and interoperability."

John M. B. Mead
Chair, ISO/TC 51, *Pallets for unit load method of materials handling*

"ISO/TC 46/SC 9 ensures that the world's cultural works are classified in a clear and globally harmonized way, allowing interoperability between all industry players worldwide."

F.X. Nuttall
Convenor, ISO/TC 46/SC 9/WG 6, *International Standard Name Identifier (ISNI)*

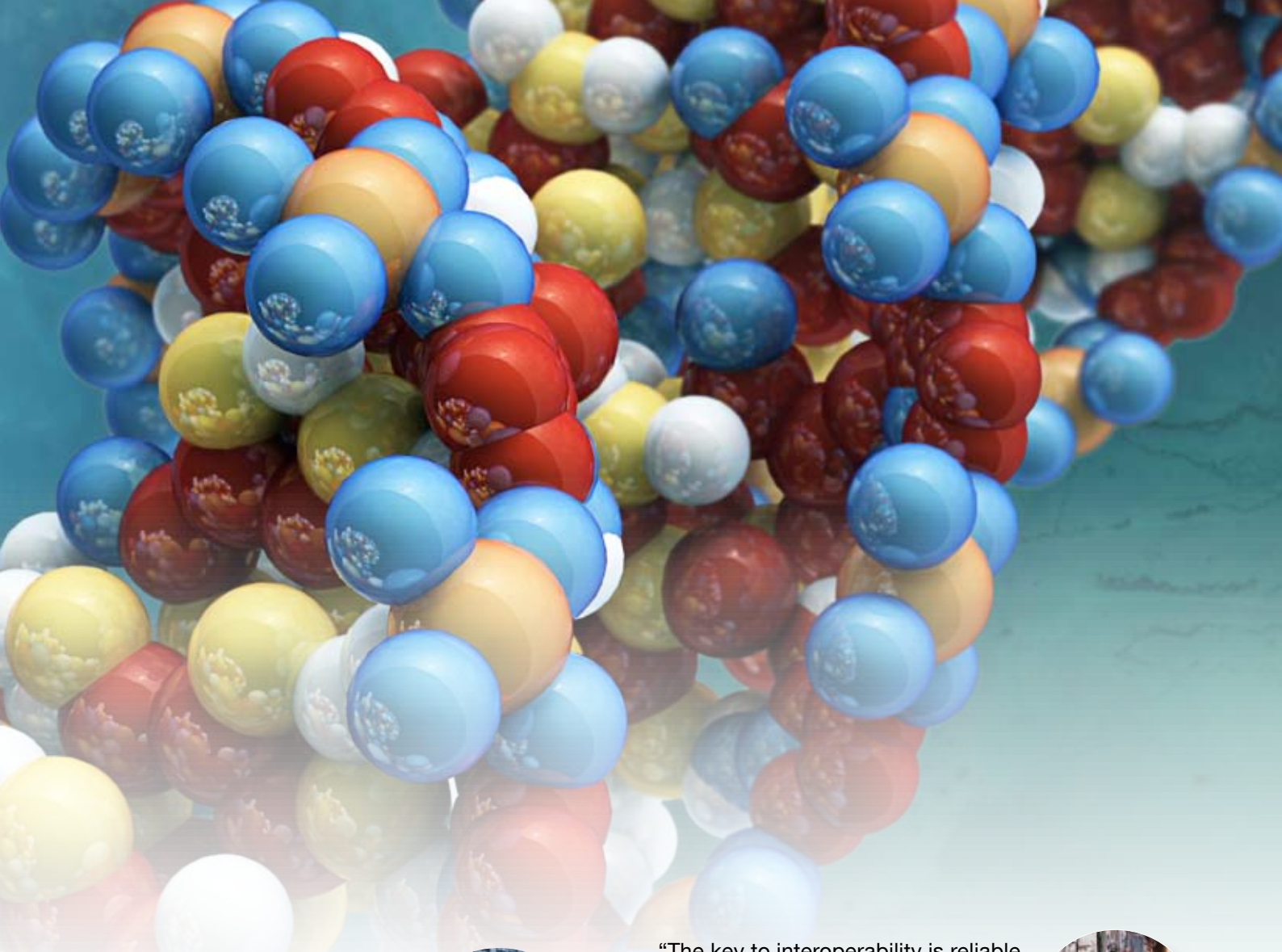


"By providing open access to the terms and definitions of all subject fields in ISO, the ISO Concept Database contributes to increasing consistency between standards, which is a key pre-condition for interoperability."

Reinhard Weissinger
Manager, Research, education and strategy, ISO Central Secretariat

"Global text communication via e-mail, on Web pages, cell phones, and in word-processing documents can now be reliably sent, received and located by search engines, thanks to a single character encoding standard, ISO/IEC 10646 (and amendments), that ensures interoperability."

Deborah Anderson,
Liaison representative, ISO/IEC/JTC 1/SC 2, *Coded character sets*



"ISO 10303 STEP (i.e. 203, 209, 232, and 239) has been adopted across Lockheed Martin Aeronautics Company (LM Aero). The standard is extensively valuable in LM Aero's daily business for accomplishing data interoperability with its team partners and suppliers."

Mike Jahadi,
Lockheed Martin Technical Fellow

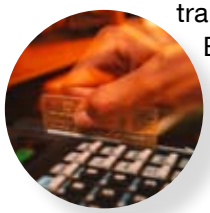
"Interoperability is critical to enable personalized and pluggable user interfaces for electronic devices and services. An ISO International Standard is key."

Gottfried Zimmerman
Junior Professor of Media Informatics, University of Tübingen,
and **Gregg Vanderheiden**
Director, Trace Research and Development Center, University of Wisconsin-Madison

"The key to interoperability is reliable data mapping. ISO 8000 data quality and ISO/TS 22745 open technical dictionaries, lower the cost and increase the reliability of data mapping."

Peter R. Benson,
Convenor, ISO/TC 184/SC 4/QC, *Quality committee*

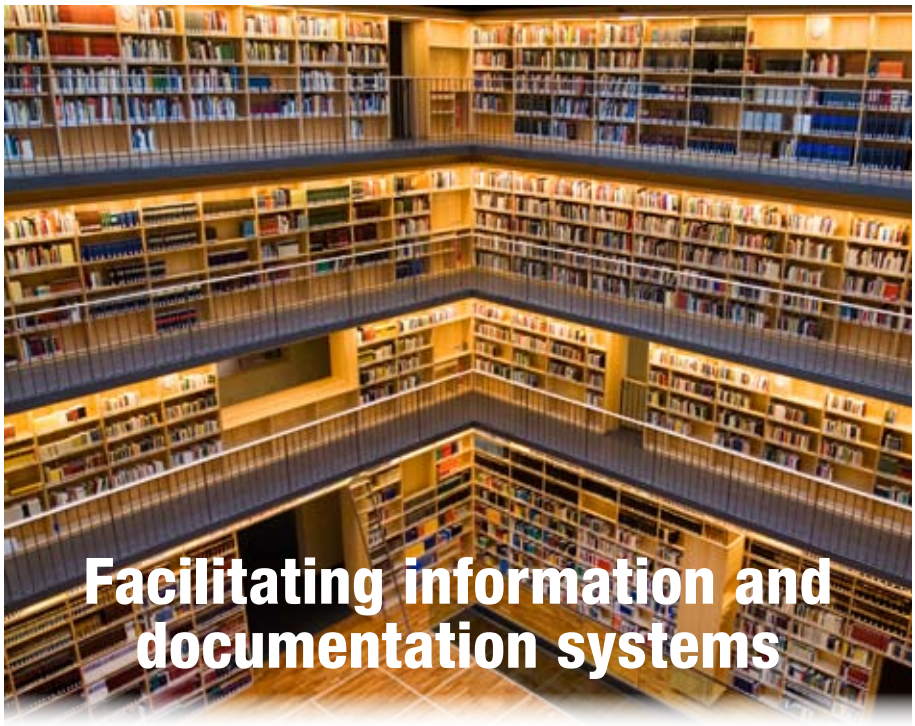
"Reliable end-to-end interoperability of banking transactions has been achieved using BIC (ISO standard number) and IBAN (ISO standard number) codes together."



Jean-Yves Garnier
Chair, ISO/TC 68/SC 7, *Core Banking*

"ISO 8459 provides common definitions for data elements exchanged in protocol messages between systems, thus facilitating interoperability between them."

Janifer Gatenby,
Convenor, ISO/TC 46/SC 4/WG 7, D*ata elements*



Facilitating information and documentation systems in changing times

by Janifer Gatenby

Within ISO/TC 46, *Information and documentation,* subcommittee SC 4, *Technical interoperability,* plays a key role in facilitating interoperability among systems and organizations. Recently, the subcommittee has finalized two important standards discussed below that will underpin interoperability among library and related systems, services and databases.

Organization of data elements for cultural institutions

The first is ISO 2146, *Information and documentation – Registry services for libraries and related organizations*, soon to be published, which will facilitate the organization of data elements concerning services and resources of cultural institutions.

ISO 2146 will provide a model for establishing standard data elements and structures to be used in the creation of registries describing the collections, parties, activities and services provided by libraries and related organizations.

The abstract model in ISO 2146 is object-oriented, so that it can be converted to machine readable formats such as XML. The standard does not prescribe content encoding, allowing different ontologies and controlled vocabularies.

Registries are employed to provide services involving multiple databases and systems, particularly for the discovery to delivery process. For example, the WorldCat institution registry (**www.worldcat.org/registry**) – which used the ISO 2146 model in its conception – includes information on libraries' resolver services. This information is used by third-party systems to seamlessly provide authorized access to restricted content.

As discovery becomes increasingly global in scale, systems require either international registries or a series of interoperable regional and national registries. Registry information also supports interoperability with collection management systems and digital repositories, discovery services, delivery services and reference services.

Common definitions for data exchange

An important tool enabling the interoperability of standards in bibliographic and library domains comprising content schemas, protocols, profiles and models is ISO 8459:2009, *Information and documentation – Bibliographic data element directory for use in data exchange and enquiry*. This standard provides common definitions for data elements exchanged in protocol messages between systems.

Originally published as a multi-part standard, ISO 8459 has evolved over the years. Its first part, published more than 20 years ago, addressed interloan applications, standardizing terms used in forms exchanged among libraries. Its second part looked at acquisitions applications, focusing on electronic ordering data elements, and the third was dedicated to information retrieval applications.

ISO 8459 provides common definitions for library data elements.

ISO 8459's original fourth part, published in the 1990s, focused on circulation applications, and was subsequently used as the base for the National Information Standards Organization Circulation Interchange Protocol, NISO NCIP (Z39.83). The last and fifth part, published in 2004, looked at data elements for the exchange of cataloguing data and metadata. The 2009 version of ISO 8459 replaces and revises all former parts.

Consolidation

It was always the intention to consolidate the five parts of ISO 8459. These were originally developed during a period of revolutionary technological change. Data transmissions leapt from paper to electronic communications, which advanced from narrowband to broadband to Web-based protocols. The ISO 8459 drafters anticipated that numerous elements would need to be redefined, deleted or added.

It was not easy to determine a method for consolidating the different elements. After several false starts, it was decided to map these elements to data elements within protocols in current use. Missing elements were added, and those that had no clear current role were discarded.

This approach offered, in addition, a simple method for elements in one protocol to be mapped to another. The protocols and schemas mapped include:

- EDItEUR
- ISO 10161 for interlibrary loan application (ISO ILL)
- Z39.83 (NCIP)
- OpenURL Request Transfer Message
- Open Archives Initiative-Protocol for Metadata Harvesting (OAI-PMH)
- Z39.50
- SRU (search/retrieval via URL)
- SRU record update
- ISO 20775:2009 for schema for holdings information
- ISO 2146 for registry services for libraries and related organizations (not yet published).

Most of these standards – except EDItEUR and OAI-PMH – employed one or more of the ISO 8459 parts in their development. With the exception of the basic Dublin Core elements (ISO 15836:2009), which were included in the original part 5 and ONIX [1], no metadata standards for bibliographic description were mapped because the scope of ISO 8459 is on exchange of information at the message level.

There are 588 data elements in the consolidated version, 451 of which were sourced from the original five parts (consolidated from more than 991 elements) and 137 added from the selected protocols.

In total, 876 elements were mapped from the protocols to the data elements, as equivalents or as examples. The actual protocol mappings (which are not part of the official standard) are available for online searching at: **iso8459.oclc.org**.

At the same time, the elements were consolidated along conceptual lines so that loans, inter-library loans and acquisitions requests were all considered as varieties of acquisitions requests. Overdue loan notices, interlibrary loan recalls and acquisitions claims were all considered as varieties of claims.

1) Stands for ONline Information eXchange and refers to an XML schema for representing book industry product information

ISO 8459 was developed during revolutionary technological change.

The conceptual grouping enables system developers, who typically employ multiple standards, to use the identified inter-relationships and definitions in their database designs. The full French translation serves development of multi-lingual interfaces. Other national bodies associated with ISO may also consider translation into other languages.

Aligning data elements

The main role, however, is not to support system development directly, but to act as a reference for the development of new protocols, models and schemas.

ISO 20775:2009, *Information and documentation – Schema for holdings information,* and the OpenURL Request Transfer messages both drew heavily on ISO 8459 during their development.

NISO's NCIP also refers to ISO 8459, and the delivery community has expressed interest in the mappings that show the equivalences of the data elements in different protocols, although the names are almost always different.

By inheriting element names and definitions, new standards can be developed in an efficient manner that directly relates them to existing standards in the field. ■

About the author

Janifer Gatenby has worked at the Online Computer Library Center (OCLC) since 2000. Her current role is Research Integration and Standards which involves her with Web, data and identifier services that enable external systems to interoperate with OCLC's data resources. She has been involved in the development of many International Standards, including ISO 23950:1998 for information retrieval (Z39.50) and the ZIG, SRU, SRU record update, the ISO Holdings Schema (ISO 20775), the registry model (ISO 2146) and OpenURL Request Transfer Message. She is currently involved in the development of the International Standard Name Identifier (ISO 27729) and the International Collection Identifier (ISO 27730).

Data quality

The key to interoperability

by Peter R. Benson

There is no doubt that we are in the information age, when those working directly with products or services are a minority, greatly outnumbered by those dealing with the digital representation of goods or services.

This shift can be traced to the late 1950s, when it was first noticed in the USA that the population of white collar workers exceeded blue collar workers. The origin of this change probably has its roots in Guttenberg's invention of the printing press in 1440, and while it took 550 years before we saw the first signs of the World Wide Web, it only took another 10 years for the search engines to emerge and play a dominant role in information retrieval.

The result has been ever faster and cheaper access to information.

Data quality is at the heart of communication between both individuals and machines.

In recording music, the fidelity of the final product will depend on the technology used to record, transport and recreate the original sound. When you consider that Beethoven continued to compose masterpieces even after he was completely deaf, you cannot fail to be impressed at the capability of musical notation as a data record, and of course, Beethoven's skill in using it.

It is not hard to understand the significance of data quality, as most of us have suffered from the consequences of data errors, and cases are reported daily on every news media.

In my case, a simple transposition of two digits in a social security number on my tax return caused the IRS (Internal Revenue Service in the USA) to ask for an explanation as to how I could claim to be divorced for 10 years from a 14-year-old girl living in Utah. Luckily, the misunderstanding was easily fixed.

But beyond simple transpositions, which can be attributed to human error, the failure to explicitly tag data is too often the source of catastrophic and even fatal errors.

Examples include the loss of the Mars Climate Orbiter and the Korean Air MD-11 crash in 1999 – both accidents were caused by confusion between the imperial and metric systems, a simple error that continues to cause fatal mistakes that could easily be avoided.

Data quality is an important problem both for individuals and companies of all sizes. The cost of poor quality data represents a significant tax on all transactions, paid by every company and every individual.

Not gone unnoticed

Industry experience shows that by identifying duplication in vendor, material and service master data, companies can save as much as 15 % of their expenditure. This is a huge saving.

The problem has not gone unnoticed. While ERP application providers have focused their energy on solving data access, and providing a consistent data view, specialized master data quality solution companies are focused on solving master data quality problems.

The meaning of master data quality

Master data identifies and describes individuals, organizations, locations, assets, materials, goods, services, processes, procedures, rules and regulations.

Understanding the role master data plays for determining the quality of data as a whole, was an important part of the work of ISO/TC 184, *Automation systems and integration,* SC 4, *Industrial data*, WG 13, *Industrial data quality* (working group developing ISO 8000).

ISO 8000-110:2009, Part 110*: Master data: Exchange of characteristic data: Syntax, semantic encoding, and conformance to data specification* describes the fundamental characteristics that define master data quality: syntax, semantic encoding and fitness to requirements.

Syntax is often taken for granted, but in the early development of the standard a request was submitted asking that term "information" be used instead of "data" on the grounds that the two terms were synonymous, and information as a term was more marketable.

In the end, the document actually proved that the terms were different, and it did so without even having to be read. How was that possible? The document was created as a pdf file but arrived with a file extension of pdx – which is not a

known syntax. While the document may have contained good information, poor data quality made it inaccessible.

Semantic encoding was more challenging. Although it was clear that there was a problem, the solution was more difficult to agree on. The absence of explicit semantic encoding is at the heart of the unit of measure errors referred to earlier. Simply requiring that all data be explicitly labeled is the first half of the solution. The resolution of the labels to a definition is the other half. The quality of the label definitions themselves was considered out of scope.

ISO 8000-110:2009, requires that semantic encoding exists either by reference to an external open technical dictionary, or by being contained in the data itself.

Conformity to data specifications has its root in the definition of quality in ISO 9000:2008, *Quality management systems – Fundamentals and vocabulary*.

In ISO 9000, quality is defined as the degree to which a set of inherent characteristics fulfills requirements. ISO 8000-110:2009 extends this by requiring that conformity to the requirements be measured by a computer as the conformance to a data specification.

A typical data clause

The contractor, sub-contractor or supplier shall, *as and when requested to do so*, supply technical data in electronic format on any of the items covered in this contract as follows:

The data shall be ISO 8000-110:2009 compliant.

- The data shall comply with registered ISO/TS 22745-30 compliant Identification Guides.
- The data shall be encoded using concept identifiers from an ISO/TS 22745 compliant open technical dictionary that supports free resolution to concept definitions.
- The data shall be provided in an ISO/TS 22745-40 compliant Extensible Markup Language (xml) format.

An able duo

It follows that if ISO 8000-110:2009 specifies that conformity to the requirements be measured by a computer, the requirements must also be computer sensible and this is achieved using ISO/TS 22745-30:2009, *Industrial automation systems and integration – Open technical dictionaries, and their application to master data,* part 30: *Identification guide representation*.

The multi-part ISO/TS 22745 contains specifications on how to create data requirement statements and provide examples in XML.

ISO 8000-110 is providing industry with a first step towards better quality data.

In practice, companies use the XML format contained in ISO/TS 22745-30 to specify data requirements, and they also use the XML format contained in ISO/TS 22745-40 for the exchange of master data. Both use the ISO/TS 22745 open technical dictionary for semantic encoding.

A number of application providers have also realized that an ISO/TS 22745-30 data requirements statement can be used to represent any requirement for data, from a tax return through to any Website form, and provides an easy way to create ISO 8000 quality data.

A requirement in most countries

Providing the data necessary for the safe and efficient operation of plant and equipment is an established legal requirement in most countries. Buyers have been quick to indicate their intended use of ISO 8000-110:2009 in their purchase orders and contracts. See Box for an example of a typical data clause.

For this requirement, it is important that creating ISO 8000-110:2009 compliant data does not require the payment of any license fees, or the use of specialized software and is within the technical ability of all businesses regardless of the size.

While XML is the preferred format, ISO 8000-110:2009 quality data can be provided as a spreadsheet, database or even a word processed document.

The only challenge is confirming the fulfillment of requirements, and for this a data requirement statement is required. This can also be provided as an empty database, a spreadsheet template or any form fill document or Web form. Fundamentally, creating quality master data that is compliant with ISO 8000-110:2009 is easy – and that is the intent.

Towards better quality

By putting this all together, ISO 8000-110:2009 is providing industry with a first step in the journey towards better quality data. It is also a critical component of the Cataloging at Source (C@S) initiative. Many expect that this initiative will fundamentally change business by providing immediate access to authoritative data in a usable form. This will bring with it traceable data that can be reliably mapped between applications – the end of incomplete data and inaccurate information.

Finally, ISO 8000-110:2009 is starting to raise awareness of the importance of portable master data. By this we mean master data that can be maintained independent of hardware, operating system and application software. With the deployment of Software as a Service (SaaS) architectures, ISO 8000-110:2009 portable master data is the antidote to data lock-in. ■

About the author

Peter R. Benson is Project leader for ISO 22745 and ISO 8000. He is Convenor of the ISO/TC 184/SC 4/QC (quality committee). Mr. Benson is the Executive Director and Chief Technical Officer of the Electronic Commerce Code Management Association (ECCMA). He is an expert in distributed information systems, content encoding and master data management. Mr. Benson is known for the design, development and global promotion of the UN Standard Products and Services Code (UNSPSC) and more recently for the design of the eOTD, an internationally recognized open technical dictionary based on the NATO codification system.

Platform for progress

The ISO Concept Database

by Reinhard Weissinger

Over the last few years there has been a significant increase in the use of databases to store structured content from ISO standards, whether published or under development.

More and more ISO committees are using databases to store structured elements such as:

- Terms and definitions
- Graphical symbols
- Codes of all types
- Data dictionaries
- Product properties
- Elements of classification systems
- Units of measurement (including conversion factors).

Until now, no platform was available to bring the content from the more than 18 000 ISO standards into a single source.

Standards users have also been increasingly requesting to have this content available in reusable formats. This would allow them to upload data into their own systems and applications. They would also be able to exchange product-related information directly between computers, which is not possible if the content resides only in the form of documents.

To address this challenge, the ISO Central Secretariat has developed a new application, called the ISO Concept Database (ISO/CDB). The ISO/CDB provides a harmonized platform for the search, development and maintenance of structured content. The first version was released in October 2009, and can be accessed at **cdb.iso.org**.

With the ISO/CDB it is possible to search for concepts from over 18 000 ISO standards. Initially, three important categories of concepts are covered: terms and definitions, graphical symbols and codes (country, currency, language and script). Additional ones will be added in the future.

More than 160 000 terms

The ISO/CDB contains terminological entries extracted from the terms and definitions clauses of almost all ISO standards (close to 160 000 entries as of December 2009). An additional 45 000 terminological entries are included from standards that have already been withdrawn.

The ISO/CDB allows users, including standards writers, to retrieve this information. A great advantage is that differences and overlaps between definitions of the same or similar concepts can be easily spotted, contributing to future consolidation and harmonization of terms in the various subject fields of ISO.

Over 4 000 graphical symbols

The ISO/CDB contains at the moment, more than 4 000 symbols from different subject fields (for use on equipment, safety signs, public information symbols, symbols for use in diagrams), and additional symbols are being added.

Widely used codes

Many ISO standards contain coding schemas, and a selected number of these, including country, currency, language and script codes, are now available from the ISO/CDB. Additional coding schemas will be added in the future.

Publicly accessible

The ISO/CDB applies an access model based on a public information layer (implemented through a "guest login"). This means that most of the information is publicly accessible without requiring any special authentication or subscription.

It is expected that this access model will facilitate the dissemination of knowledge about standards, and will also contribute to increasing the demand for standards documents.

Additional access features to be added soon include download services, and access to the ISO/CDB through Web-services.

Maintaining and developing content

In addition to being the key resource for standardized elements, the ISO/CDB is also a platform for their maintenance and development. This means that in the foreseeable future, structured elements still under development in different committees will be visible from the ISO/CDB. This will facilitate committee-internal and cross-committee dialogue, and harmonization of such elements.

For this reason, a special group under the ISO Technical Management Board has developed the *Procedure for the de-*

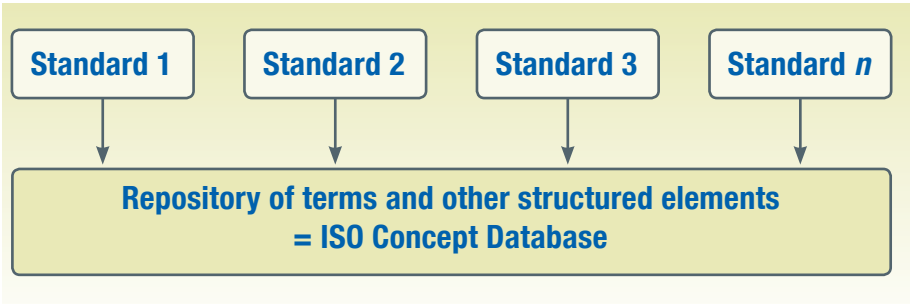


Figure 1 – *Terms defined in standards will be kept in a common platform.*

velopment and maintenance of standards in database format, published as Annex ST in the ISO Supplement to the ISO/IEC Directives. The TMB procedure, which is available at **www.iso.org/directives**, supports the four main processes of the development and maintenance of standards:

- Development of new standards
- Maintenance of existing standards
- Withdrawal of elements from standards
- Systematic review of standards.

ISO is in the process of implementing this procedure with a view to making a second release of the ISO/CDB available during the first half of 2010.

Impact on future standards development

More granular access

The visibility of key components in standards, such as terms, symbols and codes, will contribute to a higher degree of harmonization between standards in the same and related subject fields.

The ISO/CDB can be used as a convenient tool, during the development of new standards, to investigate which subjects have already been addressed in existing standards, and to compare new content with existing material.

Beyond this, the ISO/CDB constitutes an important tool for accessing the content of standards at a deeper level. It can be helpful for finding out which subject fields have been covered in which standards and by which committees.

Ongoing maintenance

The ISO/CDB supports a model of continuous maintenance for the content of standards, which is simpler than the conventional model.

The usual ISO process to maintain standards requires a ballot on a new project (new work item proposal) aiming to revise a standard or to publish an amendment for an existing standard.

With the standards as database procedure, the standards can be seen as being continuously in "maintenance mode", which facilitates faster and possibly more frequent updates.

New structures of content

Many ISO standards contain "terms and definitions" clauses comprising the terminology used in a particular standard. Prior to the ISO/CDB release, it was not easy to ensure consistency between concepts across standards, or coordinate concepts used in related, but different subject fields.

Most of the information is publicly accessible.

A new model, already applied by some ISO committees, may evolve which requires the collection of all terms, definitions and other structured elements in a centralized repository.

New elements are first added to this centralized repository and go through a check to ensure consistency with existing terms. Only after this step, a new entry can be referenced from the standard in which it is used. In this form, consistency checks will become part of the regular standards development process.

Terms representing a particular concept will be used more consistently because they will be kept in the repository of terms, outside of any specific standard. Standards can then reference or incorporate these terms (as shown in **Figure 1**).

More frequent releases

The ongoing modification of structured elements will generate a need for more frequent releases and updates of existing standards. This will ensure that the collection of standards remains consistent and up-to-date.

Standards architecture and component-based development

More generally, what is described above, points in the direction of the application, more than today, of an architectural approach to standards development that ensures consistency of related standards.

A core element here is the creation of repositories of components which, similar to software libraries, can be (re)used in individual standards, and which are maintained as an integrated whole – rather than at present where they are maintained separately as parts of individual documents.

From this perspective, the ISO/CDB can be seen as a step towards a new approach. One that will lead to more rapid standards development and standards maintenance, and a higher degree of consistency between suites of related standards.

Conclusions

The ISO Concept Database provides a new platform, in terms of visibility and accessibility of content. It has brought together into a single source, structured elements used in many ISO standards, both published and under development.

Making these elements visible also poses a challenge because in some instances, overlaps, contradictions and lack of alignment between standards become apparent. But this can also lead to ensuring increased consistency in future work.

The ISO/CDB has the potential to be a key element in a new approach to standards development. This approach is characterized by applying more architectural approaches to the standards development process, and introducing repositories of re-usable components as one of its key building blocks. ■

About the author

Reinhard Weissinger is Manager, Research, Education and Strategy at the ISO Central Secretariat and business leader of the ISO/CDB project.

ISO tackles sustainable events

No one would deny that conferences, concerts, sports competitions and festivals have clear and unique social, economic and environmental benefits. At the same time, the organization of these events can generate considerable waste and have other negative impacts. To harmonize the event industry's global efforts to tackle this challenge, ISO will develop an International Standard promoting the sustainable management of events.

The standard will be produced by a new ISO project committee, ISO/PC 250, *Sustainability in event management*. About 30 countries are already involved as participants or observers.

Fiona Pelham, Chair of ISO/PC 250, explains, "The future standard will provide a framework which event planners, venues and other members of the event supply chain can use to implement, maintain and improve sustainability within their way of working."

The standard (ISO 20121) will take a management systems approach requiring identification of key sustainability issues like venue selection, operating procedures, supply chain management, procurement, communications, transport and others.

It will respond to the unique needs and nature of the events sector with an innovative and flexible approach geared to producing results. It will be applicable to any organization or individual (whether clients, suppliers, or event managers) working with all types of events (exhibitions, sporting competitions, concerts, etc.).

The proposal for the development of ISO 20121 was jointly submitted by the ISO members for Brazil (ABNT) and for the United Kingdom (BSI). Following London's original bid for the 2012 Olympics, which recognized the need for such a standard, BSI developed a national standard, BS 8901, which generated international interest. Among the organizations to have expressed support for an International Standard are the International Olympic Committee (IOC) and the Ministry of Foreign Affairs of Denmark, host of COP 15, the UN Climate Change Conference.

ISO 20121 is expected to be finalized in 2012 to coincide with the London Olympics.

New ISO Web and voice conference tool

A Web and voice conference tool is now available for ISO meetings. The tool is expected to make an important contribution to the work of technical committees and save valuable time and resources.

Web conferencing allows people with an internet connection to join a meeting from their computer. With the new Web and voice conferencing tool – GoToMeeting (**www.gotomeeting.com**) – users can make presentations, view and work on documents, and share information displayed on their screens and saved in their computers, in a secure online environment.

The voice conference option allows users to actively talk to each other. ISO offers a free call back option. This means that participants can join the meeting from anywhere in the world and the telephone charges are paid by ISO.

To set up a Web and voice conference for your committee, send an e-mail with your meeting details to **tcsupport@iso.org**. Up to 20 people can participate. But be careful, this must be done at least three weeks in advance. A reply will be sent 10 days prior to the conference with all necessary details e.g. PIN, telephone number, dedicated URL and helpful guidance.

There are an estimated seven ISO meetings held each day somewhere in the world. Already several meetings have been held with GoToMeeting, and the number continues to grow!

Sustainable bioenergy

ISO will develop an International Standard to address sustainability issues linked to bioenergy. The standard will be produced by a new ISO project committee, ISO/PC 248, *Sustainability criteria for bioenergy*.

ISO/PC 248 will bring together international expertise and state-of-the-art best practice to discuss the social, economic and environmental aspects of the production, supply chain, and use of bioenergy, and identify criteria that could prevent it from being environmentally destructive or socially aggressive.

The decision to develop the standard responds to the growing international interest in bioenergy, and the current lack of globally harmonized sustainability criteria.

Already some 29 countries are involved as participants or observers, including large markets such as China and the USA. Brazil (ISO member ABNT) and Germany (ISO member DIN) will provide the secretariat and leadership of the committee under a twinned arrangement.

The future standard (ISO 13065) should make an important contribution to this global goal by, for example, helping avoid technical barriers to trade on bioenergy. ISO 13065 will disseminate technical know-how and stimulate the ongoing pursuit for quality through the incentive to research.

The standard is expected to be a key tool in helping governments meet their alternative fuel targets.

In addition to tackling social and environmental issues, the standard will make bioenergy more competitive to the benefit of both national and international markets. ISO 13065 will be particularly valuable in helping developing countries producers to compete.

ISO/PC 248 will hold its first meeting in April 2010.

Surfing on hot topics

Over 100 marketing and communication experts from more than 60 organizations from around the world, attended the 2nd ISO and IEC Marketing and Communication Forum in December 2009.

The event promoted the exchange of views and experiences, and looked at new opportunities for communicating on standards and standardization activities and increasing their use and sales. It was open to ISO members, IEC national committees, as well as ISO and IEC distributors and resellers.

Participants learnt about possible strategies for communicating to new audiences through the use, of social media tools like Twitter, Facebook, LinkedIn and the other Web 2.0 channels.

From a marketing and sales perspective, XML, e-books, standards in mobile format and e-learning platforms were presented as opportunities for the development of new products and services.

Participants actively participated in the discussions by proposing priority actions for ISO and IEC during break-out brainstorming sessions.

Participants in the ISO and IEC Forum (© Johannes Stern).

The feedback received from the audience confirmed the success of the event and the necessity for marketing and communication experts in the ISO and IEC communities to meet regularly. A 3rd edition of the ISO and IEC Marketing and Communication Forum will therefore be organized within the next two years.

Singapore's green commitments

In the context of Singapore's energy week, SPRING, the ISO member for the country, organized an event focusing on quality and standards.

Participants in the first ISO/TC 91, Surface active agents*, plenary in 17 years.*

Former ISO Secretary-General Alan Bryden speaks on green standards during Singapore's energy week.

Former ISO Secretary-General Alan Bryden was the keynote speaker. He highlighted the contribution of International Standards to promoting the development and use of clean energy technologies and practices to an audience of about 400 participants representing SPRING's key stakeholders.

Mr. Bryden gave concrete examples of current developments in ISO and IEC (International Electrotechnical Commission) in areas of particular interest to the region, such as sustainable building design and operation, intelligent transport systems, "green" IT (e.g. data centres and smart grids), electrical vehicles and related infrastructures, energy management and the promotion of renewable energies.

Singapore has embarked in an ambitious programme covering many of these areas, with an emphasis on electrical cars and renewable energy. Mr. Bryden met with key industrial players and government agencies during the event in November 2009, and welcomed Singapore's increased involvement in, and take up of, International Standards.

Surfactants committee restarted

The ISO committee on surface active agents, ISO/TC 91, recently reactivated, has held its first meeting in 17 years.

Also known as surfactants, surface active agents are found in many household products such as soaps, detergents, conditioners and shampoos. They are also used in industrial manufacturing, in areas as varied as food processing, metallurgy, pharmaceuticals and public works. Excluding soap, the worldwide estimation of surfactants exceeds five million tonnes.

The first ISO/TC 91 plenary held after its reactivation took place in November 2009, in Tokyo, Japan, hosted by JISC, the ISO member for the country. Some 14 participants from key organizations in the field attended the meeting held at the Japan Soap and Detergent Association.

The committee reviewed its scope, and discussed nine proposals for the revision of current standards.

Two new working groups (WG) on analytical methods (WG 1) and microbiology (WG 2) were established.

ISIRI, ISO member for the Islamic Republic of Iran holds the secretariat of ISO/TC 91, which has 17 participant and 34 observer countries.

Consumers focus on financial services

by Dana Kissinger-Matray

The world financial crisis has had serious negative impacts on consumer welfare in many respects. This was one of the main reasons behind the decision by the ISO Committee on consumer policy (ISO/COPOLCO) to hold an international workshop on financial services and consumer protection during its annual meeting in May 2010.

The workshop will take place in conjunction with the ISO/COPOLCO plenary meeting in Bali, Indonesia, on 26 May 2010, hosted by the ISO member for the country, the National Standardization Agency (BSN).

It will explore how International Standards can help ensure consumer protection for certain aspects of financial services. Areas to be addressed include:

- Access to financial services, including alternative mechanisms such as microfinance and mobile exchange of financial data and transactions
- Financial literacy: disclosure and informed choice, minimum required information, commonly understood terms and definitions allowing comparability of financial services, and consumer education (interest rates, consumer redress, debt management)
- Ethics in financial services: consumers' participation in ethical investments; concerns with "pay day" loans, fair financial contract terms, high interest rates, vulnerable consumers and "cooling off" periods, independence of financial advisors and core criteria for best practices.

For more information, contact **copolco@iso.org**.

Dana Kissinger-Matray is Secretary of the ISO Committee on consumer policy.

Building confidence in conformity assessment

by Sean MacCurtain

Over 110 conformity assessment experts representing 37 countries and 15 international organizations attended the 22nd ISO Committee on conformity assessment (ISO/CASCO) plenary in Geneva, Switzerland, in November 2009. It offered members the opportunity to discuss issues of common concern in conformity assessment.

In his opening remarks, ISO Secretary-General Rob Steele spoke about the ability of standards and conformity assessment to build confidence and trust. He went on to encourage all players to act together to ensure the implementation of conformity assessment standards.

Mr. Steele emphasized that the current economic situation required ISO committees to re-examine what was really needed, including whether the needs of suppliers, customers and consumers of the conformity assessment community are being met.

Addressing the plenary, the committee's Chair, Olivier Peyrat, highlighted the year's achievements, particularly with regards to the increased awareness of the ISO/CASCO toolbox (set of conformity assessment standards and guides), and the progress made in the technical work programme.

In addition to highlighting the work in progress, the plenary approved the 2010

ISO/CASCO plenary in Geneva, Switzerland, in November 2009.

work programme, which includes the development of auditor specific competence criteria in collaboration with relevant ISO technical committees.

Among the other highlights were :

- The ISO/UNIDO publication, *Building Trust*, aimed specifically at developing economies and considered a reference for conformity assessment
- CASCO's recently introduced interpretation process which has resulted in the completion of two requests with another four in progress.

Sean MacCurtain is Secretary of the ISO Committee on conformity assessment (ISO/CASCO).

Participants in the ISO/ITC regional consultation event in Kuala Lumpur, Malaysia.

Standards supporting trade promotion institutions for export success

by Roswitha Franz

ISO, in collaboration with the International Trade Centre (ITC), organized a regional consultation event in Kuala Lumpur, Malaysia, in December 2009. Some 40 senior officials from trade promotion organizations (TPOs) and national standard bodies (NSBs) representing 16 countries in the region came together to support the international competitiveness of small and medium sized enterprises (SMEs).

For the first time, TPOs and NSBs came together to discuss challenges and find the best approach to develop and strengthen cooperation. The three-day event was hosted by the Department of Standards Malaysia (DSM) in collaboration with the Malaysia External Trade Development Cooperation (MATRADE).

In her opening remarks, DSM Director-General Ms. Puan Fadilah Baharin stated that both Standards Malaysia and MATRADE have unique objectives but that, at the same time, complement each other by providing services to the private sector to facilitate export trade. She went on to say that consultations and collaborations between TPOs and NSBs are important to address the constraints of exporters.

The consultation, through country case studies, plenary discussions and break-out sessions, led to clear definitions of the individual roles of TPOs and NSBs, as well as to the identification of possible areas of collaboration, for example, information linkages, capacity building and advisory services, and interventions along sector specific value chains.

Based on the consultation, a joint ISO/ITC publication will be developed emphasizing the linkages between NSBs and TPOs as well as focusing on the key issues, solutions and best practices.

The event was organized with the financial contribution of the Swedish International Development Cooperation Agency (SIDA).

Roswitha Franz is Project Manager, ISO Development and Training Services, at the ISO Central Secretariat.

IT for developing countries

by Diego Giol

Over 50 ISO members in developing countries are expected to benefit from IT tools and related assistance (ICTDEV) over the next two years.

Launched last September, the ICTDEV project aims to assist ISO members in developing countries to not only strengthen their information and communication technologies, but to further help in the process and management of national standards creation. So far, Tanzania, Mauritius, Lebanon, Macedonia, Nigeria, Uzbekistan, Cote d'Ivoire and Ethiopia have benefited from the project.

Participants in Nigeria benefit from ISO's IT tools and related assistance (ICTDEV).

Accessing and participating in international standardization requires the ability to use and implement electronic communication and IT tools. Assistance is provided in the form of equipment, software, and training courses which are held at the NSB premises.

The provision of hardware (which includes a server, PCs and peripherals) makes sure that ISO members dispose of the appropriate infrastructure to participate in the creation of standards, while the software – and training in using it – helps national standard bodies (NSBs) build capacity and internal knowledge.

Though all countries in the project's first stage benefited from the same assistance, attention was given to meet the specific needs of each country. Subsequent phases of the project will include the implementation of a number of IT tools.

An inter-departmental ISO Central Secretariat team has worked on the specification of tools, the definition of requisites and the preparation of monitoring indicators to make sure that the different needs are addressed.

ICTDEV is carried out under the ISO Action Plan for developing countries.

Diego Giol is Project Manager, ISO Development and Training Services, at ISO Central Secretariat.

ISO training 2010

by Glenn Bosmans

ISO Central Secretariat (ISO/CS) each year organizes training for ISO members and professionals engaged in standards development activities. In 2010, a total of 13 individual courses will be made available, with the majority being organized as part of three ISO Secretaries' Weeks. Each week will consist of three individual courses to be held over five days.

The purpose of Secretaries' Week is to train ISO members hosting, or considering to host, secretariats of ISO technical committees and subcommittees. More specifically, the training focuses on the appointed secretaries and their support staff.

The following are scheduled to be held in Geneva this year:

ISO Secretaries' Week (March)

- 22 March
  Procedures for ISO secretaries
- 23-24 March
  eServices for ISO secretaries
- 25-26 March
  Drafting standards in accordance with the ISO/IEC Directives part 2, using ISO 98

Participants and trainers at the ISO Secretaries' Week in November 2009.

ISO Secretaries' Week (June)

- 14 June
  Procedures for ISO secretaries
- 15-16 June
  eServices for ISO secretaries
- 17-18 June
  Drafting standards in accordance with the ISO/IEC Directives part 2, using the ISO authoring template

ISO Secretaries' Week (November)

- 1 November
  Procedures for ISO secretaries
- 2-3 November
  eServices for ISO secretaries
- 4-5 November
  Drafting standards in accordance with the ISO/IEC Directives part 2, using the ISO authoring template

In addition, ISO will organize the following courses in 2010:

- 13-15 April
  Introduction to ISO eServices (with emphasis on national mirror committee (NMC) document dissemination service)
- 4 - 6 May
  Marketing and promotion of International Standards
- 12-14 October
  Introduction to ISO eServices (with emphasis on NMC document dissemination service)
- 29-30 November
  Good standardization practice

To attend, participants must complete the pre-registration form available at **www.iso.org/training-dates.** Participation is free, but places are limited. No financial assistance is granted.

Glenn Bosmans is Project Manager, ISO Development and Training Services, at ISO Central Secretariat.

MSS underpin efforts for safe food supply chains

The relevance of the ISO management system standards (MSS) approach to a wide range of issues is again underlined – this time in relation to food safety.

Farmers can now improve their overall performance and financial results, as well as increase customer confidence and satisfaction with a new ISO management system standard for implementing an ISO 9001 quality management system (QMS) for crop production.

ISO 22006:2009, *Quality management systems – Guidelines for the application of ISO 9001:2008 to crop production*, can be used with farm operations of any size, growing all types of food, feed and non-food crops.

ISO 22006 provides step-by-step guidance through the requirements of ISO 9001:2008 with a practical approach to crop operations. The standard provides pertinent subject-specific tips and suggestions, and uses agricultural terminology. Among its unique features is a user-friendly flow diagram listing all the farm operation activities to help determine how they fit together and where there is need for improvement.

Mark Ames, the standard project leader, says: "ISO 22006 takes a recognized generic management solution and turns it into a down-to-earth tool that farmers can link to their particular needs."

ISO 22006 is a down-to-earth tool for farmers.

Richard Cantrill, Convenor of the working group that developed the standard (ISO/TC 34/WG 12) adds: "The standard will give farmers a powerful advantage. Although on the one hand, the application of a quality management system can take some initial added effort, overall, this is built from existing activities and should not cause excessive paperwork or lack of flexibility.

"On the other hand, a solid QMS can bring important net benefits, not only to farmers, but also to their clients and customers."

ISO 22006 does not add or change any of the requirements in ISO 9001 and is not intended for certification, although it can be a useful tool in helping prepare for certification to ISO 9001.

ISO 22006 is part of the ISO 22000 family of standards developed by ISO technical committee ISO/TC 34, *Food products*, focusing on the food and feed supply chains.

New SC on MSS

ISO/TC 34 has set up a new subcommittee, SC 17, on food safety management systems to handle the development of future guidelines and standards in the ISO 22000 family. Its secretariat is operated by Danish Standards, with Jacob Faergemand as Chair and Berit Behbahani as acting secretary. Its first meeting in September 2009 in Copenhagen was a big success, attracting participation for six continents.

The intention is to demonstrate to the food industry, from farmers to retailers, that ISO can deliver the standards needed by all stakeholders of the global supply chain for food and feed.

The first concrete result of its work came with the recent publication of ISO

technical specification ISO/TS 22002-1:2009, *Prerequesite programmes on food safety* – Part 1 : *Food manufacturing*, which sets out requirements for prerequisite programmes needed to realize safe products and provide food that is safe for human consumption.

It is intended to be used in conjunction with, and to support, ISO 22000:2005 which gives requirements for a food safety management system.

The new technical specification has a huge potential impact since, according to the latest figures, some 8 200 organizations in 112 countries were independently certified to ISO 22000:2005 at the end of 2008.

ISO/TS 22002-1 specifies requirements for establishing, implementing and maintaining prerequisite programmes designed to help food manufacturers be able to control :

- The likelihood of introducing food safety hazards to the product through the work environment
- Biological, chemical and physical contamination of the product, including cross contamination between products
- Food safety hazard levels in the product and product processing environment.

Jacob Faergemand comments : " As the introduction of food safety hazards can occur at the manufacturing stage of the food supply chain, a hygienic environment is essential. That is why this ISO technical specification is very useful in reducing the likelihood that products will be exposed to hazards, that they will be contaminated, and that hazards will proliferate."

The new technical specification applies to all organizations involved in the manufacturing step of the food chain, regardless of size or complexity. ■

Portuguese school gives ISO 9001 top marks

by Sandra Feliciano

A Portuguese school has seen many benefits from ISO 9001 implementation including better control of educational and other school activities, greater customer satisfaction, and improved school image.

Should you visit Colégio João de Barros (CJB), an ISO 9001-certified private high school near Coimbra, Portugal, you must use your digital card at the main gate, or be verified by a smiling guard as a legitimate non-card holding visitor, to access the campus.

After a short walk you'll reach a marble entrance displaying many sports trophies and a plasma monitor screen scrolling management data such as quality objectives, client satisfaction survey findings, the school quality policy, exam and sports results and other information for students, teachers and employees.

Every second year it shows clips from the school's famous biennial musical show attended by more than 1 000 people, and the local press.

But these are not the only features that make CJB unusual. The school, which opened in 1988 to provide education serv-

ices to approximately 700 students between the ages of 10 and 18, is one of very few in Portugal to have achieved ISO 9001 quality management system (QMS) certification.

Dispelling the myth

Although the Portuguese educational system is highly regulated, only 18 high schools had become ISO 9001-certified by April 2009.

> *More is yet to come, including ISO 14001.*

The myth still exists that ISO 9001 was designed mainly for industry, is nearly impossible to implement in such a complex human environment as a school, and that most institutions bold enough to try have trouble merging national regulations with the requirements of the standard; also, that it results in unnecessary records duplication and excessive bureaucracy. Not exactly encouraging!

Secret of success

So, what is the secret behind CJB's successful ISO 9001 certification? Having an engineer as school director and owner (who also owns an accredited vehicle inspection centre) may well have inspired a more enlightened approach to quality management, and top-down motivation.

According to him, the key was in assembling a group of teachers who spent three years analyzing and testing the standard, and developing the best way to apply it to the school.

ISO 9001 implementation was based on two principles – that the quality management system (QMS) should:

- Reflect school practices so it would be easily understood and accepted by employees
- Not be imposed by top management, but implemented only after verification of benefits by employees.

A plasma monitor screen at CJB school's entrance scrolls continuous information about quality process indicators and objectives, client satisfaction survey results, reminders of the school quality policy, exam and sports results and other information for students, teachers and employees.

*CJB's quality team, from left: Professional Management Course Director, **Rosàrio Goucha**; Portuguese Department Coordinator/School Theatre Director, **Irene Paquim**; Social and Human Science Department Coordinator, **Manuela Trindade**; Dean/Pedagogical Director, **Valter Branco**; French Department Coordinator/Pedagogical Subdirector, **Fàtima Vestia**; Chemistry and Physics Department Coordinator, **Afonso Neves**.*

A pioneering group of teachers attended a 270-hour ISO 9001-based QMS training course, followed by a second course, "Improving management towards excellence", lasting 280 hours, 90 of which covered internal audits.

The total training programme started in December 2003 and was completed in February 2006, during which time the teacher group developed all QMS documentation. However, the group decided to apply for ISO 9001 certification only when they felt the system was successfully implemented and accepted by all. This was achieved in September 2007, following the final certification audit by EIC – Empresa Internacional de Certificação, S.A.

System integration

Apart from a few short-term executive training courses, the group managed the implementation process by themselves without any external consultancy help. The result was a smooth integration of national regulations and ISO 9001 requirements.

Benefits

CJB's objective in implementing an ISO 9001-based QMS was to improve the control of procedures, achieve greater accuracy in assessing educational activities,

and promote the school image. To what extent have they achieved those goals in the two years since certification?

According to the quality team, they consider their QMS to be in its teen years and still developing, yet they have already seen many benefits to the school through:

- Establishing measurable objectives
- Setting indicators and goals to evaluate objectives
- Better control of educational and other school functions
- Better assessment of the strengths and weaknesses of all school activities
- Better control of procedures and documentation
- Validation of learning assessment tools
- Greater customer satisfaction
- Improved school image through certification of the implemented system.

Advice to others

For CJB, ISO 9001 implementation and certification has been an intensive four-year process culminating in very worthwhile benefits for the school. So what advice could be given to other schools contemplating the same journey?

Obviously, before beginning the process, the school management should explain the concepts of quality management and quality management systems to all employees, and outline the expected advantages of QMS implementation. It should organize Q&A and awareness sessions covering ISO 9001 requirements, with the aim of taking ownership of its own tailor made system, and not one imposed by a consultant.

A colourful scene from the school's 2009 musical show, a celebrated local event held every two years.

Four other key recommendations can be also added:

1. Don't start QMS implementation before comparing local legal requirements and those of ISO 9001, and creating a matrix showing the equivalence between the two. Education is highly regulated in many countries, and most ISO 9001 requirements may already be taken into consideration in applicable regulations, even if under a different name or form.

Taking these initial precautions will avoid much unnecessary paperwork and duplication of activities.

> *The myth still exists that ISO 9001 was designed mainly for industry.*

2. Take full advantage of ISO 9001 clause 7.3 *Design and Development.* This allows educational institutions to exercise their pedagogical autonomy and promote those educational characteristics that differentiate them from other schools.

3. Use ISO 9001:2008 clause 7.6 *Control of monitoring and measuring equipment* to stimulate discussion about methods to increase the accuracy of tests, exams and other learning assessment tools.

4. Enrol school students in the project. You may be surprised at the huge amount of energy and ideas they offer if properly guided. Their involvement can even be integrated in the educational curriculum.

Looking ahead

As visitors leave the school, they might notice two solar panels on the roof. This environmentally friendly energy system was designed, built and installed by teachers and students of the school's advanced electronics class. Although it was a pilot project and does not yet free the school from its monthly energy bill, more is yet to come, including ISO 14001 environmental management system implementation — the next challenge! ■

About the author

Sandra Feliciano is an auditor, consultant and trainer in management systems and member of subcommittee SC 36, *Information technology for learning, education and training*, of the joint technical committee ISO/IEC JTC 1, *Information technology*. She also works on IPQ/APQ CT 80, the technical committee for quality management and quality assurance at Instituto Português da Qualidade (IPQ), the Portuguese liaison with ISO TC 176, *Quality management and quality assurance*, and also sits on IPQ's CS/11 sector committee for education and training.
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Lockheed Martin boasts big benefits from STEP

by Mike Jahadi

As part of ongoing efforts to foster product affordability, in 1998 Lockheed Martin Aeronautics Company (LM Aero) implemented the international data exchange standard ISO 10303 – commonly known as the Standard for the Exchange of Product Model Data, or STEP – in all its programmes (i.e. F-16, T-50, F-2, F-22, F-35 etc.).

A majority of total aircraft cost today comes from our suppliers of raw material, fabricated parts, entire subsystems and support equipment. It is imperative that prime contractors "lean out" the supplier value chain, and one of the ways to do this is to take advantage of advances in digital information transfer.

Lockheed Martin Aeronautics initiated full implementation of the STEP standard for technical data exchange with its suppliers. Since then, STEP has provided significant improvements in accuracy, cost, and delivery time of purchased items for aircraft.

Seamless information flow

Traditionally, large volumes of engineering data were transmitted manually, in hard copies, to potential suppliers in bid packages. Data often had to be interpreted and re-entered into different data systems, resulting in time delays and errors.

Using STEP, data quickly and accurately transmitted electronically to first-tier suppliers, and if needed, retransmitted to lower-tier suppliers.

The production data base is updated daily. Potential suppliers are notified via e-mail of business opportunities that could be of interest to them. They are directed to a secure Web site information vault where they can download the engineering data, directly and quickly. What used to take weeks is now done in a matter of minutes.

We are in an age where large amounts of data are required to be moved throughout the LM Aero enterprise – across departments and among widely dispersed sites. STEP is a fundamental part of our strategy. It is the great enabler that provides the highest quality data exchange available and allows us to exchange product data with our suppliers and team members on a daily basis.

Savings across the board

At LM Aero, STEP has realized significant savings and process improvements. For example, within engineering design, pilot programmes have shown a 10% improvement in reliability of data exchange, a 10% process savings for non-composite parts, and a 50% process savings for composites.

For manufacturing, the projected savings for tool design on Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) systems is 27%, and 38% for NC (Numerical Control) CAM systems due to elimination of data re-entry.

In a major rebid of F-16 machined parts, involving about 2,300 part numbers and about 50 potential suppliers, use of STEP provided a 95% reduction in material costs and a 52% reduction in labour

by the prime contractor – not counting similar savings by the suppliers.

After the certification of ISO 10303-203:1994 *Industrial automation systems and integration – Product data representation and exchange* – Part 203 : *Application protocol : Configuration controlled 3D designs of mechanical parts and assemblies*, the protocol has been extensively valuable in LM Aero's daily business to accomplish data interoperability with its team partners and suppliers.

New areas for interoperability

LM Aero is also investing in other areas of the STEP standard to address interoperability challenges such as the following application protocols (AP) of ISO 10303 :

- Part 209 : AP : Composite and metal structural analysis
- Part 232 : AP : Technical data package (TDP)
- Part 239 : AP : Product life cycle support (PLCS)
- Product data management (PDM) schema.

STEP provided a 95 % reduction in material costs.

In the case of Part 209, LM Aero sees this as a technology to enable data interoperability and data retention for composite parts and engineering data analysis. In addition, Part 232 enables TDP delivery to our customers.

Part 239 (PLCS) is becoming widely adopted for logistic support, and LM Aero is working toward the implementation of this standard. Last year, Aerospace Industries Association (AIA) endorsed the use of the PLCS standard by its member companies.

Accelerating STEP

Prior to implementing STEP, the process for exchanging data between companies and vendors was considerably slower and more expensive. Custom software for data exchange had to be developed, and data re-entry added to the overall expense of building fighter aircraft.

STEP, on the other hand, captures the complexities of fighter aircraft design, manufacture and support in a digital format that is customized for the fighter aircraft industry.

To achieve this capability, Lockheed Martin banded together in 1988 with other industrial companies and formed PDES, Inc.

Lockheed Martin is a founding member of this consortium that continues today with 24 industry and government members who represent more than USD 500 billion in annual revenue and sales. PDES, Inc. is a global leader in accelerating the development and deployment of the STEP standard for digital product data.

STEP is a fundamental part of our strategy.

The importance of membership in PDES, Inc. has been validated across the Lockheed Martin Aeronautics Company and is aligned with our business imperatives of *perform, perfect, win and grow*.

Initiatives like PDES, Inc. are consistent with our focus on seamless information flow across the entire virtual value stream. Membership has brought us great payback, particularly because of our participation in STEP pilot projects – lessons learned and knowledge sharing have been invaluable. PDES, Inc. has provided a very effective forum for our companies to cooperate.

The bottom line

The principle driver behind standards like STEP is the increasing emphasis on affordability by the customer, which in turn is driven by reduced defense budgets in the USA and abroad. Therefore, the entire industry has to strive to become a leaner manufacturer. ■

About Lockheed Martin

Headquartered in Bethesda, Maryland, USA, Lockheed Martin is a global security company that employs about 140 000 people worldwide. The corporation is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services, and in 2008 reported sales of USD 42.7 billion.

Lockheed Martin's operating units are organized into broad business areas.

Aeronautics, with approximately USD 11.5 billion in 2008 sales, includes tactical aircraft, airlift, and aeronautical research and development lines of business.

Electronic systems, with approximately USD 11.6 billion in 2008 sales, includes missiles and fire control, naval systems, platform integration, simulation and training and energy programmes lines of business.

Information systems and global services, with approximately USD 11.6 billion in 2008 sales, includes C4I, federal services, government and commercial IT solutions.

Space systems, with approximately USD 8 billion in 2008 sales, includes space launch, commercial satellites, government satellites, and strategic missiles lines of business.

About the author

Dr. Mike Jahadi is a Lockheed Martin Technical Fellow. He is responsible for the identification and prioritization of new technologies in support of product design manufacturing and analysis of all CAD/CAM/CAE related research and development activities within LM Aeronautics and across Lockheed Martin Corporation. Dr. Jahadi is President and Chairman of the PDES, Inc. Executive Board. In addition, he is an associate fellow member of the American Institute of Aeronautics and Astronautics (AIAA), and serves as Chairman of the AIAA Computer Aided Enterprise Solutions Technical Committee.

Developing "good" standards

by Jerry Smith and Pete Nielsen

Now, that's a good standard! It may not sound like much, but in our sometimes stuffy world of standards, this is high praise. But what does it take for a standard to receive such an accolade?

We have observed a few characteristics of "good" standards, as well as various approaches to establishing consensus-based information and communications technology (ICT) standards. You may find these observations to be applicable in the development of good standards.

What is a good standard?

Many technically excellent standards will never be hailed as good standards. Technical excellence is a baseline requirement for all standards. Without it, a standard has no chance of being considered good.

At a minimum, standards should specify all requirements needed to achieve a stated level of compatibility or interoperability in a product-independent manner, and include them in a way that is:

- Clear, coherent and non-ambiguous
- Technically implementable, not bound to specific technologies
- Testable
- Scalable.

For ICT standards, it is imperative to allow for, and even require, porting across platforms, enterprises, industry sectors, regional and national boundaries and global entities.

Another prerequisite is that the standard is published by an accredited standard developing organization or standards setting organization (SDO/SSO). This is not simply about branding, or about keeping with tradition.

Today, we live in a world of wikis, where anonymous experts propagate unattributable and unverifiable knowledge in global forums. Standards publishers must live apart from that world because critical systems, upon which lives, fortunes and nations depend, demand that technical excellence from bona-fide experts underlies the standard on which these systems are built.

Recognized SDOs/SSOs have established reputations within their relevant technical, professional and marketplace communities, as objective authorities in their spheres of activity. To the end-user, accreditation means that the standard has been created, approved, adopted and published via a formal process, and that configuration management of the specification has been established.

Accreditation will ensure clarity and a degree of control by the SDO/SSO. It means that that a formal process is in place to manage and maintain/update the document, with mechanisms to track versions, fixes and addendums. A standard from an accredited SDO/SSO will also be free of intellectual property restrictions and related constraints.

More is needed

Despite all the above, a technically excellent standard, published in a timely manner by an accredited organization, does not guarantee that it will be recognized as a good standard.

A standard specifies how a set of interoperating technologies should interface. But it is what is done with that specification by systems developers – how and how often it is implemented – that meas-

ures the true success of a standard. Standards are ultimately judged by marketplace acceptance; specifically, whether commercial off-the-shelf (COTS) systems are built and sold, based on particular open standards. For this to happen, the following is needed:

- End-users (manufacturers) must be aware of the standards
- Standards must be easily available to end-users
- Standards must be seen by end-users as solving real problems and providing real utility.

The CEO of a major aircraft company recently stated at an industry conference, "Markets – not standards committees – determine which standards will be the winners."

Decided by votes

By incorporating user, consumer, and business operations requirements into standards, we encourage industry to develop and build compliant commercial products, available as open standards conforming COTS, or compliant COTS.

Each time implementations are built in accordance with a standard, it is a vote of confidence in that standard. The overriding metric for determining whether a standard is good is how ubiquitous and numerous are the conforming implementations – in other words, how many votes are cast in its favour.

As more vendors offer compliant COTS, prices go down, the number of standardized products goes up, and reliability, robustness and interchangeability increases. This significantly enhances interoperability.

A balancing act

Having looked at characteristics of a good standard, it is reasonable to ask how to develop one. Although standards creation may be regarded as science, their development process may be considered an art, requiring balancing issues to achieve a result that is technically functional and attractive to end users.

Below are some observations from standards processes that have worked well.

Standards vs. technology

There is a tipping point in timing between technology evolution and standards setting. If a standard is established too early, innovation and creativity may be stifled. Setting it too late may invite marketplace chaos and unnecessary costs. Most readers will remember the battle between Beta and VHS videotape standards as a good example.

Good vs. perfect

Waiting until a standard is perfect before publishing invites would-be standards users to charge ahead with proprietary solutions. The art is in knowing when a standard is ready for initial release. Setting up an effective means to capture user-discovered defects will allow fixes and enhancements to be incorporated in later versions.

Performance vs. process

Specifying the process for building a product can be a recipe for disaster. Users and consumers are interested in the performance of the final product – not the process used to get there.

Teamwork involves work

Participants in the standards setting process should include the end user community of technologists, vendors, testers, users, academics, consumers and governments. High membership fees and resource-intensive investments – such as extensive face-to-face meetings requiring significant travel expenses and time away from the office – can be barriers for small and medium-size enterprise participation in standardization activities.

If participation is unaffordable for small and entrepreneurial players, then innovation in the standards process will have to come from the established, well funded organizations, who are not generally known for innovation.

Reaching over the wall

Though it is a touchy subject, we should not fail to mention the reality of "rice bowls" – a polite antagonism between constituencies in the standards development world. Addressing the clash

of styles between the consortia, Internet and *de jure* communities, such as ISO, is an ongoing challenge to SDO/SSO leadership. Our observation is that each community has much to contribute to the standardization process.

We have found that consortia of commercial and non-profit entities are good at rapid technology development and the formal *de jure* standards process is good for consensus building; but the reverse is generally not true.

Standards are ultimately judged by marketplace acceptance.

Contrary to popular conception, the *de jure* standards activities, professional societies, industry associations and consortia generally don't actually compete: each has a role, scope, and purpose upon which to capitalize.

Combining the best that each community has to offer is a very effective model for standards creation, accreditation and global acceptance. The trick is in finding a level playing field that encourages open collaboration. The lesson is to not let collective egos and special interests subvert the process.

Marketplace realities

If all goes well, we now have a technically excellent standard developed in a timely manner by SDO/SDO experts, who collaborated closely with the end user community. But is it a good standard? Not yet.

We are sorry to acknowledge that the world is usually not holding its breath waiting for your standard to be published.

In fact, most people – even engineers and technologists – find standards and the standardization process to be a boring topic.

Programme and project managers are keenly interested in budgets and schedules but frequently view standards as obstacles. CEOs usually do not see standards and participation in standardization activities as helping boost their stock price for the next quarter. Standardization is not a high profile issue with politicians. Consumers are only interested in the final product and fail to appreciate the role and value of standards in helping them obtain interoperable goods and services.

An effective standards development process needs to appreciate this often discouraging reality, and to push on. The other side of this reality is that if:

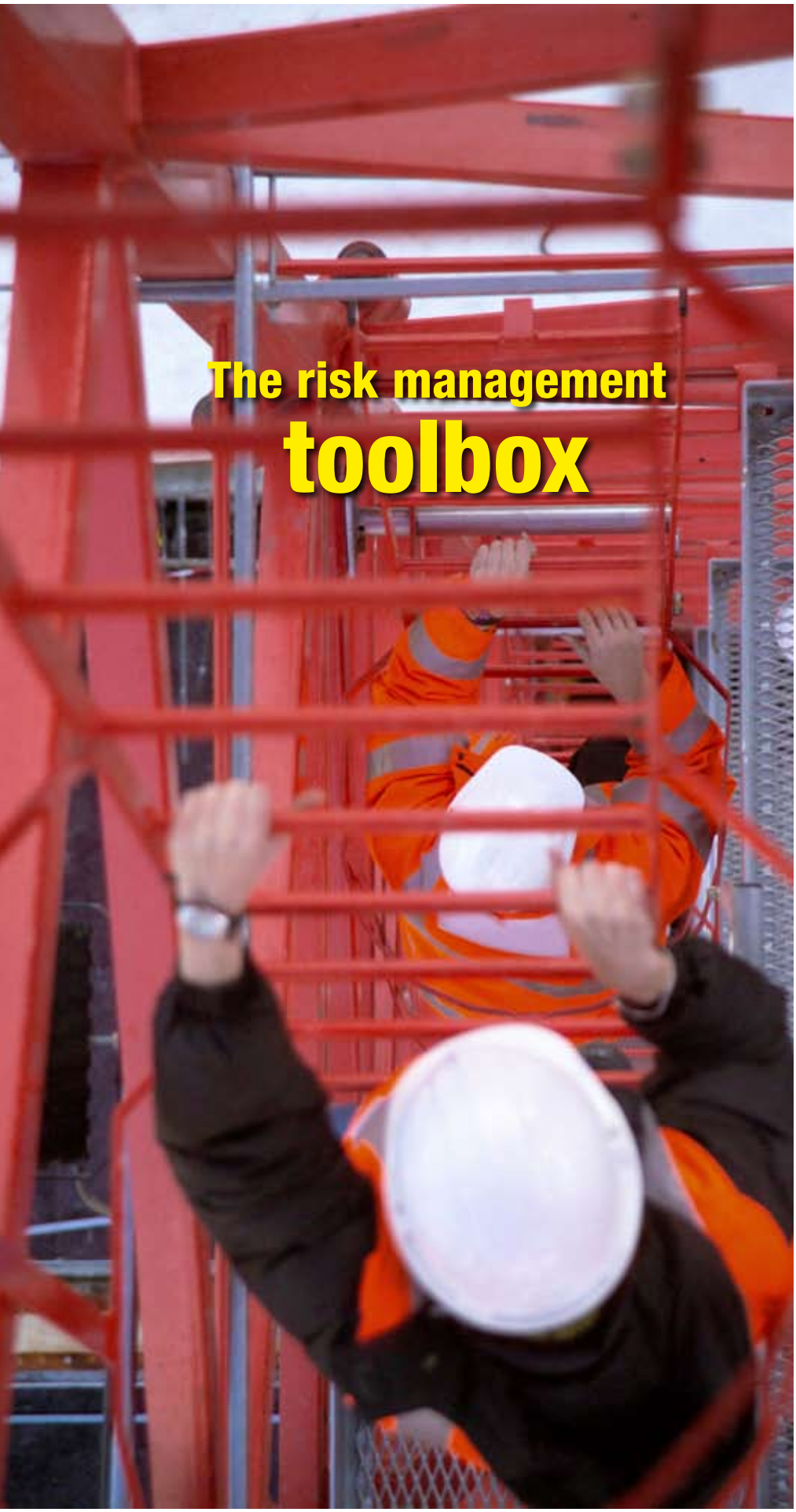
- The standard is timed right, and
- It solves a real-world problem, and
- It addresses end user concerns, and
- It allows freedom of implementation, and
- End-users are aware of it, *then*...
  …industry players will line up to implement the standard.

That is a very good indication you have developed a good standard. ■

About the authors

Jerry Smith manages participation in global standards activities for the US Department of Defense, and has served as Secretary of subcommittee SC 4, *Industrial data,* of ISO/TC 184, *Automation systems and integration*, since 1998.

Pete Nielsen is Chief Operating Officer (COO) of Animus Solutions, Inc, a Florida-based IT consultancy, and serves as Honorary Consul for the Republic of Uganda. He is also COO of the Intellegere Foundation, a non-profit foundation established to enhance standards awareness in the global marketplace.



The risk management toolbox

by Maria Lazarte and Sandrine Tranchard

Organizations can now benefit from a well-stocked toolbox for risk management featuring:

- ISO 31000:2009, *Risk management – Principles and guidelines*
- ISO Guide 73:2009, *Risk management vocabulary*
- ISO/IEC 31010:2009, *Risk management – Risk assessment techniques*.

Tackling uncertainty

Risks affecting organizations may have consequences in terms of societal, environmental, technological, safety and security outcomes; commercial, financial and economic results, as well as social, cultural and political reputation impacts. ISO 31000:2009 will help organizations of all types and sizes to manage risk effectively.

ISO 31000 provides principles, a framework and a process for managing any form of risk in a transparent, systematic and credible manner within any scope or context. It recommends that organizations develop, implement and continuously improve a risk management framework as an integral component of their management system.

Kevin W. Knight AM[1)], Chair of the ISO working group that developed the standard explains, "ISO 31000 is a practical document that seeks to assist organizations in developing their own approach to the management of risk. But this is not a standard that organizations can seek certification to. By implementing ISO 31000, organizations can compare their risk management practices with an internationally recognized benchmark, providing sound principles for effective management."

ISO Guide 73:2009, *Risk management vocabulary*, complements ISO 31000 by providing a collection of terms and definitions relating to the management of risk.

ISO 31000 is designed to help organizations:

- Increase the likelihood of achieving objectives
- Encourage proactive management
- Be aware of the need to identify and treat risk throughout the organization
- Improve the identification of opportunities and threats

1) Order of Australia

- Comply with relevant legal and regulatory requirements and international norms
- Improve financial reporting
- Improve governance
- Improve stakeholder confidence and trust
- Establish a reliable basis for decision making and planning
- Improve controls
- Effectively allocate and use resources for risk treatment
- Improve operational effectiveness and efficiency
- Enhance health and safety performance, as well as environmental protection
- Improve loss prevention and incident management
- Minimize losses
- Improve organizational learning
- Improve organizational resilience.

"Risk is inherent in all activities. And it can be argued that the global financial crisis resulted from the failure of boards and executive management to effectively manage risk. ISO 31000 is expected to help industry and commerce, public and private, to confidently emerge from the crisis," said Mr. Knight.

Risk assessment

When risks occur, organizations always have to ask the question: "Is the level of risk tolerable or acceptable, and does it require further treatment?"

Risk assessment is an integral part of risk management which provides a structured process for organizations to identify how objectives may be affected. It is used to analyse risk in terms of consequences and their probabilities, before the organization decides on further treatment, if required.

The third standard, ISO/IEC 31010:2009, *Risk management – Risk assessment techniques,* has been developed jointly by ISO and its partner IEC (International Electrotechnical Commission).

Risk assessment provides decision-makers and responsible parties with an improved understanding of risks that could affect achievement of objectives, as well as of the adequacy and effectiveness of controls already in place. The standard provides a basis for decision about the most appropriate approach to treat particular risks and select between options.

ISO/IEC 31010 will assist organizations in implementing the risk management principles and guidelines provided in ISO 31000.

ISO/IEC 31010 reflects current good practice and answers the following questions:

- What can happen and why?
- What are the consequences?
- What is the probability of their future occurrence?
- Are there any factors that mitigate the consequences of the risk or that reduce the probability of the risk?

The application of a range of techniques is introduced, with specific references to other relevant International Standards. Risk assessment is not a stand-alone activity and should be fully integrated into the other components in the risk management process.

Eric Mahy, Project leader of the standard comments, "ISO/IEC 31010 has been developed for application by both the risk management novice and the seasoned risk professional. It forms part of an integrated risk management structure of standards, developed with a view to providing a 'best practice' approach."

To be used by all

ISO 31000, ISO Guide 73, ISO/IEC 31010 can be applied to any public, private or community enterprise, association, group or individual. The documents will be useful to:

- Those responsible for implementing risk management within their organizations
- Those who need to ensure that an organization manages risk
- Those needing to evaluate an organization' practices in managing risk
- Developers of standards, guides procedures and codes of practice relating to the management of risk.

ISO 31000 and ISO Guide 73 were developed by the ISO Working Group on Risk Management while, ISO/IEC 31010:2009 was prepared by IEC technical committee 56, *Dependability,* together with the ISO Working Group on Risk Management.

Maria Lazarte is Assistant Editor, *ISO Focus+*.
Sandrine Tranchard is Communication Officer, ISO Central Secretariat.

Tackling environmental challenges with the ISO 14000 family

by Roger Frost

ISO has published a new, updated brochure providing a basic introduction, as its title indicates, to *Environmental management – The ISO 14000 family of International Standards*.

The 12-page, colour brochure is the latest edition of a successful publication first released in 1998, two years after the launching of the first standards in the ISO 14000 family. Since then, the ISO 14000 standards have achieved a worldwide impact and the brochure gives a concise idea of how the family has evolved to provide comprehensive solutions to the range of environmental challenges facing business, government and society today.

The brochure was authored by experts from ISO technical committee ISO/TC 207, *Environmental management*, which is responsible for the ISO 14000 family. They point out that the ISO 14000 standards not only provide environmental benefits, but also significant tangible economic benefits, including the following:

- Reduced raw material/resource use
- Reduced energy consumption
- Improved process efficiency
- Reduced waste generation and disposal costs
- Utilization of recoverable resources.

The brochure includes an overview of the standards making up the ISO 14000 family. The best known standard is ISO 14001:2004. By the end of December 2008, the standard was being used by organizations in 155 countries as a framework for environmental management systems (EMS) to manage better the impact of their activities on the environment and to demonstrate sound environmental management. Other published standards, which can be used independently or in combination with ISO 14001 and with each other, address the following topics:

- Environmental performance
- Environmental labels and declarations
- Life-cycle assessment
- Greenhouse gas (GHG) accounting, verification and accreditation

- Environmental communication
- Environmental aspects in product standards.

Further documents now under development provide tools for the following activities:

- Eco-efficiency assessment
- Material flow cost accounting
- Carbon footprint of products (and its calculation)
- Phased implementation of an EMS
- Eco-design
- Quantitative environmental evaluation
- Competence requirements for GHG validators and verifiers.

The ISO 14000 family is designed to be implemented according to the same Plan-Do-Check-Act (PDCA) cycle underlying all ISO management systems standards. A table in the brochure classifies the ISO 14000 standards according their optimal place in the PDCA cycle. Other sections cover the following aspects:

- ISO's overall contribution to the environment, which goes beyond the work ISO/TC 207
- Environmental management and sustainability
- An introduction to ISO/TC 207, including its origins and the global participation in its work.

Because the work of ISO/TC 207 is constantly evolving, the committee's section on the ISO Web site should be consulted for the latest information on its work programme and membership. However, the new edition of the ISO 14000 brochure answers a need for a basic, but comprehensive introduction for distribution at conferences, or requested by potential users of the standards, and by students.

Environmental management – The ISO 14000 family of International Standards, which is published in English and French paper editions, is available free of charge (fee for postage and handling of bulk orders) from the ISO Central Secretariat through the ISO Store or by contacting the Marketing, Communication and Information department (**sales@iso.org**). It can also be obtained from ISO national member institutes. The brochure is also available as a PDF file on the ISO Web site (**www.iso.org**).

Roger Frost is Head of Communication Services, ISO Central Secretariat.

A world fit for children

More than 2 000 children die every day as a result of an accident and every year tens of millions more worldwide are taken to hospital with injuries that often leave them with lifelong disabilities, according to a 2008 report by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF).

The *World Report on Child Injury Prevention* concludes that many injuries are preventable. According to its findings, if proven prevention measures were adopted everywhere, at least 1 000 children's lives could be saved every day.

The March 2010 issue of *ISO Focus+* brings together a portfolio of articles that showcase ISO standards as prevention measures, as well as areas of particular concern for children and how they are being addressed by ISO.

Articles will cover an array of standardization topics, from the safety of toys to child seat restraint systems, child-resistant packaging on dangerous goods, protective equipment against drowning, child-resistant lighters and bicycle safety, to ISO/IEC Guide 50, *Safety aspects – Guidelines for child safety* – which, if taken into account, prevent many injuries to children or at least reduce their severity.

The input from other stakeholders will also be covered, including the LEGO Group, the Toy Industry Association, the European Association for the Co-ordination of Consumer Representation in Standardization and the Danish Consumer Council. Child-oriented initiatives – such as ISO 14000 Kid's Programme and Underwriters Laboratories and Disney's Smart Safety Programme – will also be covered.

An interview with Arnie Rubin, CEO of Funrise Toys Ltd. and President of the International Council of Toy Industries (ICTI), discusses the challenges to international harmonization and the added value of "one standard, one test and one certification of compliance", as well as the importance of ISO International Standards, particularly ISO 8124 for the safety of toys.

If one single message emerges from this issue, it is: *ISO improves the safety and well-being of children and contributes to the overall improvement of their daily lives.*

Learn more about how ISO standards serve as proven prevention measures in our next issue of *ISO Focus+* – contributing to making a better, safer world for our children, for us, and the entire human race. ■

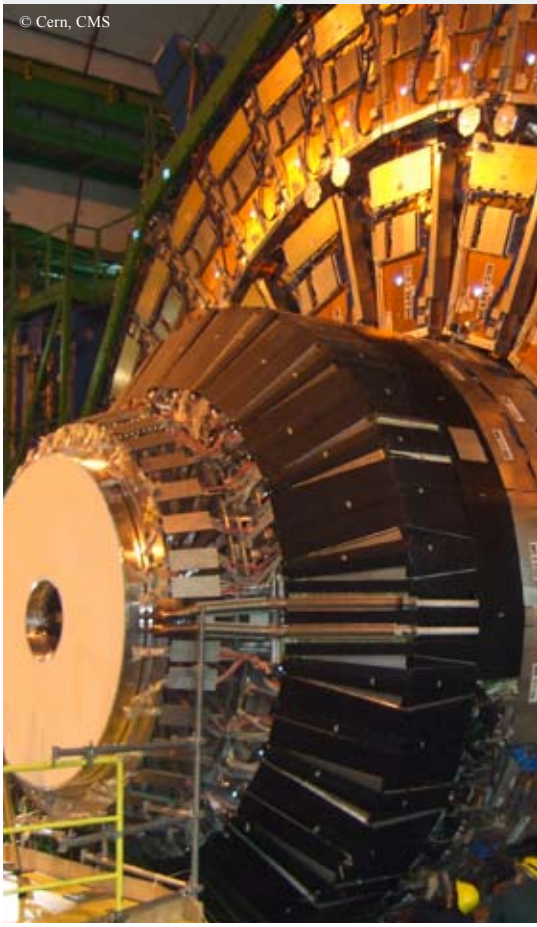
How standards support innovation

Professor Knut Blind, a European academician working in the field of standardization, recently spoke with *ISO Focus+* to share his observations of how standards support innovation and competition.

In his first *ISO Focus+* interview, Prof. Blind says, "Standards clearly support the diffusion of new products into the marketplace, and that supports economic growth. If you just have ideas that don't get turned into new products, then there will be no economic benefit."

He goes on to discuss the add value of standards to CEOs, and why it's important for them to participate. "It's clearly worthwhile for most companies or whole economies to invest in standardization, but it's still not easy to convince CEOs, especially in small and medium-sized companies, about the value of engagement in standardization."

For more of Prof. Blind's interview, don't miss the next issue of *ISO Focus+*. ■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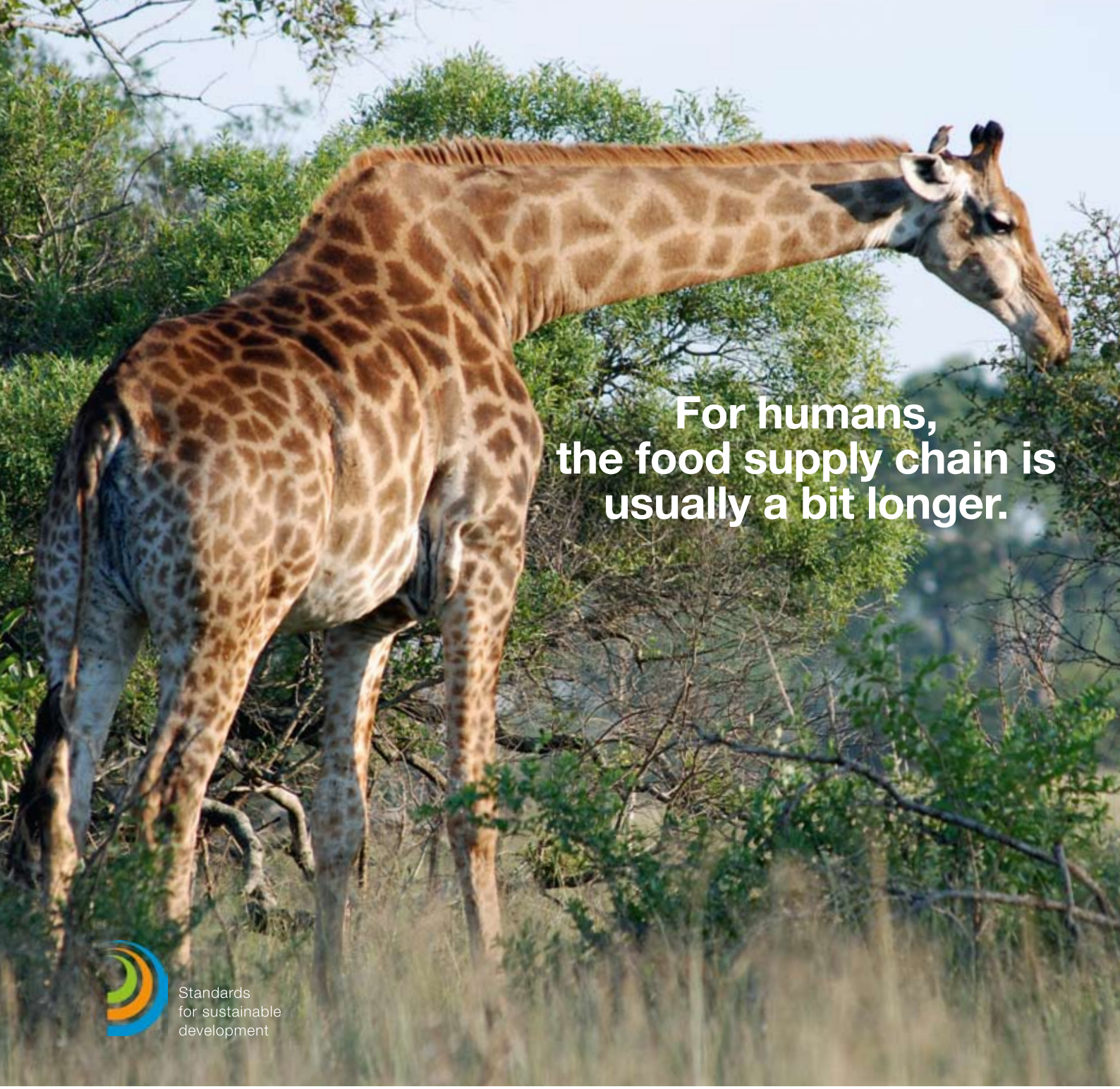

The ISO Pack on Food Safety Management Systems on CD.

The supply chain that puts food from the farm on to our table is a bit longer than in nature. It can stretch across continents and include producers, processors, transport and storage operators, and retail outlets. **The ISO 22000 family of standards** helps all types of operator in the supply chain to implement management systems that ensure the food we eat is safe. **The ISO Pack on Food Safety Management Systems** includes on one CD the entire ISO 22000 family of standards, in **English** and in **French**. It costs just 322 Swiss francs (about USD 300 – EUR 219).

Available from ISO national member institutes (listed with contact details on the ISO Web site at **www.iso.org**) and from the ISO Central Secretariat Webstore at **www.iso.org/isostore** or e-mail to **sales@iso.org**.

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