POSITION PAPER

IT Standardization: The Billion Dollar Strategy

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ABSTRACT

This article summarizes key incentives for vendors, users, government and individuals to participate in the standardization process. It argues that standards can expand markets at all points in the market life cycle, with overall impact measured in billions of dollars. The authors hope to encourage standards involvement, and also future research and analysis that might quantify the financial value of standardization for vendors and users.

Keywords: government role; individual benefits; standards value; user incentives; vendor incentives

“Standards are like keys always hung at the same nail – they free up your mind for more useful thoughts.” – Anonymous

INTRODUCTION

Information Technology standards are commonly perceived as having evolved from what was once a cooperative effort by engineers and standards groups (to achieve a consensus aimed at the common good) to a cutthroat struggle by a single company or group of allies to gain market dominance by manipulating standards.

This view is an invitation to anti-trust challenges; to rejection of standards in public procurement or as a foundation for public policy; and for preemption of standards initiatives by other industries or regulatory processes. Standards can grow markets, bring sustained value to users, encourage productive government relations and improve engineering excellence; but not if the IT industry fulfills the above perception.

WHY STANDARDIZE?

The IEEE 802 local area network standards support a $15 billion per year market. The POSIX/UNIX standards provide an additional $18 billion per year in the UNIX market (Unter, 1996). Internet and World Wide Web standards exceed these in terms of both financial and social impact, and are totally dependent on a foun-
The social impact of the Internet, and the value to both government and diverse industries, has led to active legislative and regulatory processes affecting the information technology (IT) market in the United States (U.S.) and other jurisdictions. The information technology industry must develop a coherent and responsive approach to IT standardization requirements and associated policy implications. If we fail in this, we will not enjoy the full market growth that is possible, and we risk intervention by government. Here we will look at the incentives for standardization by providers (to make money), users (to save money), government (for the public good) and individuals (professional recognition).

**PROVIDER INCENTIVE**

Standards are one way to have a multibillion-dollar impact on IT markets over an extended period of time. For example, Figure 1 is the classic market curve: market value over time. The area under the curves is the cumulative market value. Early in the curve (a), standards can be used to increase the pace of adoption, thereby increasing the market size more quickly. The consumer electronic industry has learned this, and in order to enable rapid growth, introductions of new technology (for example, CD or DVD) are preceded by agreement on key standards. In the IT industry, the early acceptance of POSIX/UNIX standards and adoption of these in procurement policies accelerated commercial acceptance (FIPS 151, 1986).

As the market is established, standards can increase the overall market size (b). This is how the local area network standards have sustained their impact: by expanding functionality with technology while maintaining compatibility. Ongoing evolution of these standards and their adoption at the international level have provided for ongoing market growth and increased acceptance. As the market goes into its mature phases, standards can be used to extend the life (c) and provide incremental return on investment. We see this with the ongoing, albeit slow, evolution of standards for Cobol, Fortran and CD-ROMs. In mature areas, standards can be augmented to address specific niche segments and opportunities. The influence of the POSIX standards on the creation of Linux (Torvalds, 1991) provides an interesting example of the extension of a market as a result of standards availability.

The classic market curve operates over multiple years, and providers should measure the impact of the standardization investment in multiple billions of dollars of market growth over a 3+-year period. If the market is not measured in the billions, or targeted as an investment over many years, it is probably not a candidate for standards.
Billion Dollar Impact of Standards

- IEEE Std. 802 local area network, $15 billion per year
- IEEE POSIX and X/Open UNIX, $18 billion per year
- IETF TCP/IP – The Internet
- W3C HTML – The World Wide Web

How do standards have this impact? Standards establish a clear communication of capability between the customer and the supplier. We see this every day as consumers: from light bulbs and shoe sizes to electrical codes and highway signs. In some cases, conformance testing and/or branding (such as the Underwriters Laboratories label) can be used to complement the actual specifications and references (for example, DIN 400 for film speed). In some areas, customers are a driving force behind standards, and in other areas, they participate to ensure their needs are met.

Why should a company invest in standards? Standards do not happen without some industry investment. In areas where product development proceeds concurrently with standards development, participants have an inside view of the changes and issues that will affect conformance. Also, participants have a voice in the process to ensure that the standard accommodates their plans and are not unnecessarily limiting.

“Being there” provides a view into the market: the market leaders, the customers and the forces that are establishing the substance and perceptions that will affect market acceptance. Proactive players can help set the tone, as well as the content, of both the standards and the resulting market environment. Standards are neither necessary nor sufficient in this context, but one of the tools for building a market presence and influence.

Finally, as standards move into the view of the customers, the participants in the standards process have a path to the customer, providing insight and guidance based on the standards experience. Customer confidence and purchasing is governed by a combination of the value of the standard and the credibility that suppliers have in terms of delivering that value.

Vendors can gain insight by looking at the standards from the consumer perspective. In what areas will buyers tolerate a lower price or “innovation” over standards conformance and an open market in purchasing? Answers will differ, both by the area of consideration and by the individual making the decision. Consider examples such as: a new integrated circuit that uses nonstandard pin-outs or power; a PC board with a different bus, a peripheral that has a unique interconnect, media or format, a new removable media form factor or a different keyboard layout.

USER INCENTIVE

- **Y2K Example:** Users experienced the benefits and costs of applying standards in addressing the year 2000 problems. The prevalent use of standard Cobol made it easier to deal with corrections, while the lack of strategic application of software engineering standards made the changes necessary.

Incentives for standards’ users complement those of the provider. Clear communications about capabilities, confidence in functional characteristics and participation in the larger-size market benefit the consumer. The buyer also will want to encourage competitive supply and differ-
entiation based on true value added, not just on incompatibility of supplier products. User investment in retraining, re-engineering and acquiring new capabilities can be minimized though effective adoption of standards.

Standards will not happen if users are not going to buy! Vendors are looking for users who can articulate their need for, and commitment to, purchasing standards-based products. There is a catch-22 here if vendors wait for user demand, and users wait for vendor supply. However, establishing a purchasing intent can be done, and participation in the standard definition provides a clear message about needs and commitment to vendors. Some vendors will prefer locking in users with higher profit margins in a smaller market rather than competing in an open market. Without user demand for standards, users cannot expect vendor compliance.

Standards’ participation allows users to define the objectives for the standards in terms of the problems they need to solve. They can keep the standards work on course as it progresses, and verify that they have what they need in the balloting process.

Ultimately, users vote with their pocketbooks. When purchasers require that products “must conform to xxx,” vendors get the message (particularly if the user truly values that specification). If users are willing to accept less for a lower price or neat features; vendors will hear that message, as well. User purchasing trends can either reinforce the value of standards investment or erode that value. The broader the user community demands for conformance, the greater the value to the user community in terms of immediate applicability, and also in ongoing compatibility.

Users who consider the life-cycle cost of their investments must be willing to invest at the front end to ensure that the costs are lower for the inevitable maintenance and replacement cycles. Standards are a strategic investment for users. Application of standards should be based on expectation of multiple millions of dollars of lowered costs and/or increased productivity over a multiyear cycle. This must be the basis for user investment in formal standards (participation, procurement and application). Intra-industry standards tend to get this attention, with buyers like GM actively involved in SAE standards along with suppliers, or computer vendors active in physical layer communications standards along with communications suppliers. This is less common with areas such as IT standards, which may be of high value to non-IT organizations, but they fail to invest in the process.

Once the motivation is clear, participation provides additional insight for the user. Users can ascertain the competence and commitment of the vendors through interaction in the meetings. Also, user contact with other experts can provide for increased effectiveness and productivity for the user in application of the standard.

GOVERNMENT INCENTIVE

Government players have an additional set of incentives to make sure the needed IT standards happen (Garcia, 1993). The world of convergence is the market of the future. National competitiveness, employment, new industry, educational reform, improved healthcare and delivery of government services are dependent on this standardized infrastructure. Moreover, in a worldwide context, this means hundreds of government bodies with strong interests; and in many cases, with power and authority to solve problems.
though regulatory means if the industry does not succeed in establishing the required standards. Most of the barriers to this brave new world are policy and political barriers, and many of these have significant technology components. These include protecting intellectual property, privacy, universal access (rural, handicapped and disadvantaged), protecting children, controlling crime, providing trustable (and taxable) commerce, and so forth. Government addresses these barriers in terms of the public good. Government statements on deregulation and market choice are often coupled with a “public good” escape clause, keeping the door open for intervention. In the U.S., OMB 119a, public law 104-113 and the Telecommunications Act of 1996 all reference government application of volunteer consensus standards, where such standards exist as the preferred way to meet government objectives.

The international market is faced with convergence as the boundaries disappear between communications, entertainment, IT and related industries. A simple rule of thumb in this converged market is: If products or services from some entity can cut into your market (or eliminate it), they are a competitor. Do not let your traditional competitive assumptions blind you to this reality. Also, every competitor is a potential ally, with strengths and weaknesses that may complement your businesses. Significantly, we are playing by different rules. The IT industry has traditionally avoided and resisted regulatory or legislative involvement, whereas telecommunications and broadcast companies have learned to use these as part of their core competencies. You will not find many advocates of government intervention, but you will find that government is increasingly involved in the converged world of the 21st century. (Note in Rep. Sensenbrenner’s quote, it is “how,” not “whether” the IT industry is to be regulated.)

“Speed in the legislative and regulatory process is measured in months if not years. A Congressional session is two years. Many bills take more than one session to be enacted into law. In the world of information technology, a month is an eternity. Legislation is often obsolete by the time it is enacted.

“There is no simple means of reconciling these differences. A key, however, is flexibility. Congress and the Administration must avoid burdening the development of information technologies with overly prescriptive regulations.

“The dynamic nature of the Internet is an asset to our nation’s economy. It is an asset we cannot afford to stifle.”

Rep. F. James Sensenbrenner, Jr.
Chairman House Committee on Science

IT industry partners and customers in diverse industries need a coherent, competitive, robust computing and networking environment to build their businesses. Failure to provide interoperability, compatibility, portability and ease of use may well interfere with their business growth. IT standards are not just a factor in growth of the IT industry, but also a factor in the growth of other industries. These other industries may not be as tolerant of the petty deviations that have been the tradition of differentiation in the IT industry. Government intervention is one tool these affected players may apply to “fix” problems in the IT industry. We have seen this already with legislation on copyright protection (such as with DVDs) and with proposals for new intellectual property protections, and U.S. government (internal) standards for software and Web accessibility (Access Board Standards, 2000).
The IT industry needs to take a mature, credible and proactive role in responding to the needs of complementary industries and the interests of governments. U.S. law and policy give strong preference to accredited standards as a basis for regulatory action and procurement policy. Similar consideration exists in Europe and deference to international standards is a cornerstone of the World Trade Organization in its objective of eliminating trade barriers. It is time for the IT industry to reinvest in the standardization that is required to minimize government intervention and to meet the needs of affected communities of interest.

INDIVIDUAL INCENTIVE

Individual technical experts, often senior engineers directly involved in product development and planning, ultimately are the foundation of the standards process. While some may participate because of personal interest, most are actively involved and supported by their employers for the reasons previously outlined in this article (provider, user and government). Individuals can find standards activities one of the most rewarding of their careers.

Standards meetings occur at off-site locations and bring together technical experts from diverse industry organizations. Dialogue occurs in meeting rooms, in the halls and over dinners. Influence is developed over time, based on mutual respect, technical competence and professional integrity. The give-and-take involved in standardization is one of the validation points of industry peer recognition and respect. This can be a motivating factor that is rarely available for organizations though internal operations.

"To the most outstanding team leader in the field of computer engineering standards in recognition of outstanding skills, a dedication to diplomacy, team facilitating and joint achievement in the areas where individual aspirations, corporate competition and organizational rivalry could otherwise be counter to the common good." (Description of the IEEE Computer Society “Hans Karlsson Award”)

Continued individual contribution creates opportunities for leadership and the development or expression of valuable communications and project management skills. Effective standards leaders also become visible industry spokespersons. These individuals provide contact points for the press and consultants, and advise governmental procurement and regulatory processes. Contacts with users extend beyond the standards meetings into user-initiated contacts and opportunities for customer site discussions.

Champions/spokespersons are essential as part of building visibility and acceptance for the resulting standards, and for generating the full market value for the investment. Their impact is greatest when the participants also develop articles for publications, books, tutorials, conference sessions and other materials that facilitates broad industry acceptance and application of the standards.

Standards involvement can be one of the most challenging and rewarding tasks for technical experts. It provides them the opportunity to develop new skills and to prove their expertise and collaboration capabilities. The relationships developed through this process can provide the basis for broad industry recognition, increased technical awareness and a vision, as well as a voice into the future of technology.
THE BOTTOM LINE

IT standards are one key to increased growth in the IT industry and also in other industries. There is an ongoing need for standards to facilitate this growth, to provide investment protection for users and to meet government objectives for the emerging information infrastructure. Failure to deliver essential standards may result in government intervention either to meet public sector objectives or to respond to pressure from affected industries. When the standards are done right, we have an economic and social benefit for providers, consumers, government and the individuals involved. The challenge for the IT industry and profession is to control our destiny, lest others do this for us.

REFERENCES


ENDNOTES

1 Unter ascribes 30% of HP’s UNIX revenue to the standards efforts; the $18 billion dollar amount is a projection of this to the total 1996 UNIX systems market.

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PROJECT DESCRIPTIONS

COPRAS:
Improving the Interface Between Research and Standardization

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ABSTRACT

The Cooperation Platform for Research and Standards (COPRAS) aims to optimize the interface between ICT research and standardization. It will survey research projects in the EU-funded 6th Framework Programme (FP6) for standards related output, and serve as a platform to those projects seeking a cost-effective interface with standards bodies. In doing so, it will help projects upgrading their output and speed up market adoption of research results. Also, COPRAS will produce generic guidelines, supporting future research projects to build an interface to standardizations into their proposals, already at an early stage. In doing so, it will bring research and standardization closer together.

Keywords: information systems R&D; information systems standardization development

INTRODUCTION

Standardization and research carried out under European Framework Programmes are closely connected. In many cases, research aiming to resolve technical and scientific problems can be used to develop a new standard or to improve an existing one. It can even be used to anticipate future standards. Moreover, research that is initiated for commercial or academic reasons and not primarily aiming at developing standards may still contain elements supporting ongoing or new standardization processes, or may benefit from interfacing with standards bodies by upgrading its result or by improving the dissemination of its output.

Standardization processes are carried out for a number of reasons, such as the establishment of compatibility and interoperability, the removal of trade barriers through harmonization or the safety and health of citizens. Stakeholders generally benefiting from standards are industry, consumers and governments. Therefore, research projects are usually invited to keep standards bodies informed about contributions they can make.
However, standardization is also beneficial to research projects themselves, as they desire to upgrade their results and wish to better exploit their output. For example, developing new standards can help to increase the quality of a product or even build a competitive advantage; it can create the ability to test according to internationally agreed principles or it may in some cases enable the exploitation of intellectual property. In addition, research projects may benefit from higher international recognition, networking opportunities or the ability to access collective expertise when entering into standardization processes.

In order to facilitate and improve cooperation, and to optimize the interface between research projects and standards bodies, the European Standards Organizations CEN, CENELEC and ETSI, together with The Open Group and the World Wide Web Consortium, initiated the Cooperation Platform for Research and Standards (COPRAS). This project, also funded by the EU under the 6th Framework Programme and backed by the ICT Standards Board (the coordinating platform for ICT standardization in Europe), was launched February 2004, and will run for 3 years.

COPRAS primarily focuses on research projects addressing Information Society Technologies (IST). IST is one of the thematic priority areas for EU-funded research and envisages contributing to realizing European policies for the knowledge society. One of the adopted strategies in this respect is to:

“aim for an accelerated transition to a competitive and dynamic knowledge economy capable of sustainable growth. This requires wider adoption, broader availability and an extension of IST applications and services in all economic and public sectors and in society as a whole”.

As IST are regarded as “key underlying technologies for easier and efficient knowledge creation, sharing and exploitation,” one of the important objectives is to foster research that may “contribute to the increase of innovation and competitiveness in European business and industry” which, to a greater or lesser extent, always involves standardization; for example, ensuring the developed technology is properly defined and inter-working between systems is guaranteed. By providing IST research projects with a comprehensive interface with the standards community, COPRAS aims to establish a more efficient and cost-effective way of facilitating the exchange of relevant information and output between research projects and standards bodies.

**OBJECTIVES**

It has long been recognized that the interface between standards and research is crucial to the success of both activities, and experience shows that standards emerging from cooperative research have a higher rate of success in international consensus building processes. Moreover, specifically in ICT development, an essential aspect is to ensure standardization and research proceeding in parallel, enabling cross-fertilization. This will allow that standards bodies receive contributions from the research community rapidly, and will make research projects familiar with the latest developments in standardization.

COPRAS’ objective, therefore, is to act as a platform for FP6 IST projects that wish to upgrade their deliverables or otherwise touch upon standardization issues during the course of their research. By pro-
viding a catalytic focal point for standard-
ization activities, the platform enables re-
search projects to overcome a potential
barrier to standards-based solutions and
provides guidance on how to approach the
most relevant standardization body in the
ICT domain. In doing so, it also provides
research projects with a cost-effective way
of setting up an interface with the stan-
dards world while giving them a high con-
trol over the output of these processes and
handing them a means to validate their work
with a wider audience, as well.

SCOPE AND MODUS
OPERANDI

During its lifespan, COPRAS will
address IST research projects in the first
three calls of the FP6 Programme and de-
fine tailored Standardization Action Plans
together with projects. However, not all IST
projects generate contributions to standard-
ization and not all projects will actively seek
cooperation through the COPRAS plat-
form. Some may only require regular up-
dates on ongoing standardization processes,
while others envisage producing complete
technical specifications that will have to be
processed through standards bodies. On the
other hand, projects may have limited re-
sources to establish intensive cooperation,
may produce results difficult to match with
ongoing standardization activity, or there
may be confidentiality issues preventing
projects from cooperating with external
bodies.

For these reasons, COPRAS will not
be capable of defining concrete standard-
ization paths with all FP6 IST projects.
However, it will survey all and select those
likely to benefit most from their cooper-
ation with standards bodies or expected to
generate the most useful input to standard-
ization activity. On the other hand, in cases
where projects already have managed to
establish a well-functioning interface to-
wards standardization, the need for assis-
tance from the COPRAS project may be
less or not needed. In any case, as
COPRAS wants make an effort not to lock
out any of the research projects desiring
so from cooperation through the platform,
it has carefully chosen its methodological
steps for addressing all FP6 research
projects.

METHODOLOGICAL
STEPS AND PROJECT
SELECTION

For the purpose of selecting projects,
a number of systematic consecutive steps
addressing research projects in FP6 IST
calls 1, 2 and 3 will be applied. These steps
will identify a ‘COPRAS Community,’ en-
compassing projects that will benefit from
interfacing with standards bodies, and a
‘COPRAS Programme,’ encompassing
selected projects that COPRAS will de-
velop concrete standardization paths with.

In order to identify the COPRAS
Community, all FP6 IST projects in calls 1,
2 and 3 will be contacted for the purpose
of gathering information on standards-re-
lated issues. Questionnaires focusing on
projects’ involvement with, and expecta-
tions from, standardization, as well as on
the exact scope of the projects, will estab-
lish the main instrument during this phase
of the project. The results of the informa-
tion-gathering process will enable
COPRAS to draw a complete picture of
the research project’s requirements for in-
terfacing with the standards community.
They will allow all projects addressing stan-
dards-related issues to be identified and
included in an informal network enabling communication and information exchange between research projects and standards bodies, thus establishing the COPRAS Community.

To identify the COPRAS Programme, results of the information-gathering process will be analyzed and projects will be clustered around the standardization issues they actually address, as well as across different thematic areas. This will increase the effectiveness of cooperation between individual projects and between research projects and standards bodies. Following this, selection criteria for including individual projects into the COPRAS Programme will be defined. These criteria will relate to ongoing activity in standardization working groups, to the timing and resources of individual projects as well as to the overall relevance of research projects’ results, to the objectives of the IST Programme. Selected projects will be invited to participate in kickoff meetings for each of the clusters in order to define concrete follow-up for the third step; that is, the development of tailored standardization paths for each of the selected projects.

As a last step, COPRAS, together with each of the selected projects, will identify contributions to and from standardization, and define tailor-made Standardization Action Plans. These plans will contain all necessary arrangements, ensuring a coherent and effective cooperation, such as milestones, target dates and commercial rationale. This will not only ensure projects’ participation in relevant existing standardization processes, but also indicate where and when new standardization activities will have to be initiated. Upon conclusion of the third step, Standardization Action Plans can be executed by research projects and identified standardization working groups.

Based on the results and experience it will gather from installing the cooperation platform, COPRAS will develop generic material describing rationale, generic benefits, cooperation and communication methods, and best practices of interfacing between IST research projects and standardization. It will identify the main standards bodies relevant to the IST research community and will serve as a guide to those seeking to identify the appropriate organization or contact point to interface with. The generic material will enable those in the process of making plans or proposals for future research projects to build the most appropriate and cost-effective way of interfacing with standards bodies into their bids.

Figure 1. Methodological steps in the COPRAS selection process
IMPLEMENTATION & INITIAL RESULTS

Throughout its three-year life span, COPRAS will go through a full cycle of methodological steps for each of the 3 calls. It will, therefore, move in parallel to research projects rather than wait for them to produce their results. This will enable it to generate results at a relatively early stage, supporting ongoing projects and helping optimize the use of feedback from research projects for the improvement of its own processes.

During April 2004, the distribution of questionnaires, accompanied by an information package, kicked off the information-gathering process and the actual COPRAS project. A total of 164 projects in call 1 were approached and invited to submit their response. As a result, responses and information were received from more than 55% of projects, which was aggregated and combined in a report generating a first overview of FP6 IST research projects’ generic as well as specific requirements and contributions with respect to ICT standardization.

The analysis of information gathered from research projects in call 1 and the selection of projects is taking place during summer 2004. Based on results in earlier, similar situations, COPRAS expects to be able to invite 8%-10% of originally targeted research projects to participate in the COPRAS programme. With respect to research projects in call 1, this translates into a target of 14 to 18 projects that COPRAS will actually envisage to develop tailored Standardization Action Plans with during the third methodological step. An overview of the timing of the further methodological steps addressing FP6 IST projects across all three calls is displayed in Figure 3.

BUSINESS CASE

The results of the COPRAS project will be beneficial to all stakeholders in standardization processes. While current and
future research projects will have a cost-effective way of interfacing with standards bodies, upgrading (the exploitation potential of) their results and getting access to external expertise, standards bodies will receive an opportunity to avoid overlap in their work and better organize the flow of work. Consequently, COPRAS presents a clear business case to many research projects.

First, research projects as well as their consortium partners will benefit from more efficient interfacing with standards bodies, because it enables them to develop more useful results and exploit their output more effectively. It can, for example, create a competitive advantage for products or services based on new standards; it can create an opportunity for exploiting IPR related to a project’s results and used in standards; or it will simply prevent projects from reinventing the wheel and consequently save resources. Many projects or companies participating in projects, however, do not have the budget, time or resources to arrange for this interfacing and find their way though a maze or standards bodies in the ICT world by themselves, specifically as standardization work many times proves to be expensive and time consuming. This is specifically the case for companies in the SME segment that have limited resources and therefore may not be in a position to secure their access to standardization processes. By providing a single point and a standardized way of interfacing, COPRAS will strongly reduce cost involved in finding the right standards body to cooperate with and actually deploying this cooperation.

Second, COPRAS will speed up industry and market adoption of projects’ output, allowing an earlier exploitation of research results. Typically, RTD projects can be separated in three phases: 1) analysis of (user) requirements, where functional specifications are developed; 2) development of technical solutions, where technical specifications are developed and; 3) a pilot phase, where the proposed solutions are implemented in a test environment. Standardization processes traditionally start towards the end of the pilot phase of projects. As these can take a considerable period (e.g., between two and four years) this creates a ‘gap’ between the termination of the
research project and the availability (and exploitation potential) of standards it generated. Because COPRAS enables research projects to start interfacing with standards bodies at a much earlier stage during the course of their project, this ‘standardization gap’ will be considerably reduced, consequently moving the point where exploitation of research results can start to an earlier time.

**SUMMARY & CONCLUSION**

Many research projects may find it difficult to find the right point in time or the right way to consolidate their research efforts: While there is the need to build momentum for interfacing with standards bodies throughout the project’s life time, standardization processes take time, and drafting standards is generally being done on a voluntary basis. Resources for these activities may not always be foreseen in project budgets or – specifically for SMEs – participating in the standardization processes may therefore be considered a significant investment difficult to overcome.

The COPRAS project sets out to address these issues by contacting and selecting research projects in FP6 IST calls 1, 2 and 3 for participation in a cooperation platform with standards bodies. It will bring ICT research and standardization closer together and specifically optimizes the interface between IST projects and standardization. It will help research projects to define the right momentum for starting these processes and will facilitate the interface between research and standardization in such a way that the time gap between the availability of research projects’ final deliverables and the availability of standards resulting from them will be shortened significantly.

COPRAS will bring substantial benefits to all stakeholders in standardization processes. It will make standards available earlier to industry and the general public and will therefore support furthering European leadership in the generic and applied technologies at the heart of the knowledge economy. Moreover, it will present research projects with a clear economic rational for their cooperation with standards bodies and help them upgrade their results in the most cost-effective way.

Through COPRAS, the standards bodies have taken the initiative to address the requirement that is upon many research projects: to interface with the standards community and to optimize processes involved with this requirement. Through the platform it will build, the project will produce information and guidelines supporting all those involved in future IST research projects and related standardization activities, to optimize the effectiveness and efficiency of their mutual cooperation. In doing so, COPRAS will consolidate its results and arrange dissemination and future usage of the project’s results, thus ensuring persistent relevance of its output.

Bart Brusse is an independent consultant active in digital media and ICT standardization. Over the past years he has been working with several standards bodies such as DVB, ETSI and CENELEC and is currently managing the COPRAS project on behalf of CEN, the European Committee for Standardisation. Mr. Brusse has a background in the cable television industry working during the 90’s as head of Strategy and Business Development for CASEMA, one of the leading Dutch MSOs, and holds a BA in sociology and an MSc in mass communication.
Networked Organizations: Research into Standards and Standardization — NO-REST: A Project of the Sixth Framework Programme

Knut Blind, The Fraunhofer Institute for Systems and Innovation Research, Denmark

BACKGROUND

Systems supporting e-commerce and e-government do not emerge in a vacuum, but are intimately linked with a wide range of existing systems. Their purpose is to ensure effective interoperability between systems that are developed and operated in different arenas of control (in different organisations or in businesses and the home). This means that the issue of technical interoperability becomes accentuated. However, in addition to this, there are issues of organizational interoperability, of interoperability of business semantics and process models. In order to achieve this, one needs to ensure that the way information is handled at all ends is compatible with the nature of the cooperation. The interpretation and handling of the information transferred through, stored and manipulated by these systems needs to be effectively coordinated. This adds another layer of complexity as, again, there is no central authority to enforce such coordination. Standards play an important role in this situation: for example, as templates for business processes or in providing a mechanism for translation. There may, however, also be severe side effects of standardization, since it can be expected that inter-organizational technologies exhibit strong network externalities which may lead to unwanted lock-in to particular business models.

The project NO-REST focuses on the study of the evolution of standards and their implementation in a dynamic environment, and on the mutual influences between them. To this end, NO-REST will look at the application of standards, and will analyze how standards and their implementations are subject to change incurred by the environment within which they are implemented. Moreover, the origin of standards (i.e., SDOs, consortia, etc.) will be analyzed with respect to the impact this origin may have on a standard’s market success. The environment within which a standard will be implemented has many facets, some of which may change over time. These include, for example, the IT environment, business models and processes, as well as relations with customers, suppliers, business partners, etc. The implementation of a standard needs to be adaptable to changes in
such an environment. As a result, the original implementation will likewise change over time, and may well become incompatible to the original standard. This effect may be observed in many different local environments, potentially yielding a number of incompatible implementations of a standard. NO-REST will analyze this development and will devise an analytical framework for a causal model of such changes. This, in turn, will help understand the nature of these changes and will allow for the formulation of adequate countermeasures or – even better – for the derivation of conclusions for developing standards in the future and possible mechanisms to feed back these changes continuously into dynamic standards building.

Once the dynamic elements in the life cycle of a standard have been understood, the project will develop a methodology for an integrated impact assessment of a standard. This will be based upon, and integrate, the insights gained thus far. This will enable an assessment of the likely impact a given standard may have in an e-business/e-government environment.

**CONCEPTUAL STRUCTURE OF THE PROJECT**

Based on the above background and the objectives of the project, the conceptual structure of the project assumes the existence of a marketplace for standards and standardization processes. Accordingly, the project will focus on both the supply and demand sides of standards for networked organisations and their interaction, which causes the dynamics of standards. Consequently, the following three aspects of standards and standardization will be investigated by NO-REST.

**The Supply Side**

This part of the NO-REST project will look at the origins of standards. That is, the institutional setting and the internal mechanisms of the different standardization bodies (SDOs, consortia, industry fora) will be analyzed, as will various other characteristics that may have an impact on the uptake and performance of a standard in the marketplace. Since we observe an increasing competition between the different suppliers of services related to “standards,” also caused by the need to increase the “dynamics” of standards and the progress in IT infrastructure technologies, new organisations evolved and former traditional “business” and organizational models are substituted by new – often Internet-based – models. For example, even national SDOs have introduced remote access to standardization processes (livelink in DIN).

The analysis also includes the adaptability of the supply side in the sense of how well the individual organisations cope with, and possibly influence, changes of the environment within which they have to function. Also, aspects such as the ‘credibility’ of a standards-setting organization in a specific technical domain will be analyzed. That is, how the environment from which a standard specification emerged influence its performance in the market.

**The Demand Side**

Here, the project will analyze the impact of the environment within which networking organisations are integrated. Derived from their objectives, including business models, and the relevant framework conditions, we will derive their demand for standards. In particular, this includes a study of the interaction of newly implemented
standards with existing e-business/e-government networks, and especially of how the latter may shape the former over time. Work will also include a study of if and how the business model of the implementing organization has an impact on an implemented standard.

**The Dynamics of Standards**

The various factors that impact the emergence and implementation of a standard will be identified and analyzed. These activities will integrate the work described above. The outcome of a critical review of the existing relevant literature will be integrated, as well. Moreover, the gradual modification of (the implementation of) a standard through its adaptation to a specific environment will be examined and its feedback to the standardization organisations and possible further generations of the former standard. Taken together, these research results will yield a good understanding of the dynamics of standards; that is, how their implementations change over time due to external influences. The new model about the dynamics of standards is similar to the discharge of the linear model of innovation, by non-linear models taking into account various feedback loops. Appropriate counter measures, designed to maintain the compatibility and interoperability of the various different implementations, will be devised.

**IMPACT ASSESSMENT**

The above three working steps provide the groundwork for the development of a dynamic model of standardization and standards. Although in the dynamic evolution of standards we have already considered the impacts on the standardization process itself, the objective of this last working step is to assess the impact of (the implementations of) standards and their dynamics on both private and public networking organisations at the micro level and their comprehensive impact on the systems, or macro level. In a first step, the relevant impact dimensions will be identified. In a second step, we will design assessment tools for ex-post and ex-ante-impact assessments, respectively. Finally, we will select appropriate examples to perform an impact assessment in practice. The feasibility, methods and results of the performed impact assessments will be evaluated. Based on these experiences, final guidelines for tools for an impact assessment will be proposed and distributed among the relevant stakeholders in standardization processes.

**SUMMARY**

The NO-REST project aims to investigate the applicability and dynamics of standards in the e-business and e-government sectors, and to develop guidelines for tools for the assessment of their performance and of the impact they have on networked organisations. To this end, NO-REST will evaluate the various standards development platforms, examine how implementations affect standards and interoperability, and do a reactive performance analysis of standards as well as a proactive integrated impact assessment.

NO-REST will look at the application of standards and will analyze how standards and their implementations are subject to change incurred by the environment within which they are implemented. The project will then devise an analytical framework for a causal model of such changes. This, in turn, will help understanding of the
nature of these changes and will allow for the formulation of adequate counter measures or – even better – for the derivation of conclusions for developing standards in the future, and possible mechanisms to feed back these changes continuously into dynamic standards building.

The project will also analyze the various standards-setting organisations, with a focus on how they react to – and influence – the dynamics of the environment within which they work. This will also include an analysis of the relation between the ‘credibility’ of a standards-setting organization; that is, to what extent does the origin of a standard influence its viability in the marketplace. The project will then establish if and how a standard’s origin affects its performance, and will set up guidelines helping those who wish to create a standard decide which standards-setting organization to select.

Finally, based on the above, NO-REST will develop and apply a methodology to help assess a posteriori, the performance of a standard. This will ultimately contribute to guidelines and tools to evaluate – a priori – the impact a standard will have on the market.

Knut Blind studied economics, political science and psychology at the University of Freiburg and at Brock University (Canada). He received a BA with distinction in 1990 and diploma in economics in 1992. He received a doctoral degree in 1995 and was honored with the F.A. V. Hayek-Award 1996 of the economics Faculty of the University of Freiburg. From 1993 to 1995, Blind was research fellow at the Institute for Public Finance at the University of Freiburg. Since 1996 he has been a senior researcher at the Fraunhofer Institute Systems and Innovation Research, and in 2001 he was appointed deputy head of the department Technology Analysis and Innovation Strategies. In April 2003, he completed his ‘habilitation’ on driving forces and economic impacts of standardization to the faculty of economics at the University of Kassel. Besides standardization, he extended his research focus also to include regulatory issues having an impact on new markets. Since April 2004, he has managed an institute-wide task force on ‘innovation and regulation.'
EVENT REPORT

Innovation and Legislation: Standardization in Conflict

Ken Krechmer, Fellow, University of Colorado - Boulder, USA

ABSTRACT

This colloquium generally supported the commercialization of standardization as evidenced by the growing success of consortia (SDOs successes, such as GSM cellular, were also in evidence); supported the U.S. laissez-faire standardization regime (although international participants were less enthusiastic); identified the increasing tensions between intellectual property rights and communications standards; and highlighted the need for more formal standards education programs. The colloquium was held December 4-6, 2003, in Washington, D.C.

INTRODUCTION

This colloquium brought together 95 participants from the different disciplines that relate to U.S. standards – the worldwide IT industry, consortia, U.S. and international formal standards development organizations (SDOs), law, academia, major end users and the U.S. federal government. Maryfran Johnson, editor-in-chief of Computerworld provided excellent leadership as the colloquium chair. The colloquium Web site is at www.standardsconference.org. Copies of the presentations are to be added to this site. The two-day colloquium, which opened with a keynote by Phillip Bond, Under Secretary for Technology Administration (U.S. Dept. of Commerce), was organized into a series of four sessions of three to four speakers each:

1. Technical Use of Standardization: Managing Innovation, Creating Technology, Managing Change.
3. The Business of Standards: Creation, Destruction and Preservation of IPR.
4. Internationalization and Standardization: Creation of National and International Markets

Bond indicated the U.S. support for a technology-neutral approach to standardization and regulation and a minimum of governmental intervention in standardization. He noted, however, federal activity in the following areas:

- Medical records.
SESSION 1

Rob Gingell, chief engineer, Sun Fellow and vice president, Sun Microsystems presented a view of the standardization process as the relationship between technology and products with a chaotic region where technology is applied to the become products. The chaotic region is the focus of this conference. Ken Krechmer noted that the chaotic region can be further broken down into anticipatory, participatory and responsive standardization as it relates to the introduction of products. Don Purcell, Catholic University, noted that the results of a survey of U.S. universities found only three U.S. universities have courses on standards (Catholic University, University of Maryland and University of Colorado). Also in this session, Tony Scott of General Motors gave an overview of the world-wide operations of GM as they relate to standards. IT costs at GM have declined from $4 billion in 1996 to $3 billion in 2003, and the increasing use of standards has been a factor in this cost decline.

SESSION 2

Toru Yamauchi, director of the Industrial Standards Research Office, Japanese Ministry of Economy, Trade and Industry, explained the Japanese concerns regarding intellectual property rights (IPR) costs, indicating that the current reasonable and non-discriminatory policy of SDOs does not go far enough. Dale Hatfield (ex-FCC, now University of Colorado-Boulder) noted his concerns that system architecture impacts the openness of the system and in public networks may need to be reviewed even prior to standardization. Gail Levine of the Federal Trade Commission discussed the October 2003 FTC report “To Promote Innovation” and other FTC actions. This new FTC report recommends a number of changes to reduce IPR problems. (FTC reports are available at www.ftc.gov). Andrew Updegrove, of Lucash, Gesmer & Updegrove, noted that there may be a delay in adjudication of the Rambus case. Andy maintains a Web site on consortia related issues at www.consortiuminfo.org. Carl Cargill, of Sun Microsystems and the instigator of this colloquium, noted his concerns over the Eolas patent on Web browsing (No. 5,838,906) and Levine indicated that this patent was being reviewed by the U.S. Patent and Trademark Office.

SESSION 3

Ray Alderman of VITA provided the unbridled capitalist view, noting that his consortia does not tolerate IPR on its work and will sue if necessary to prevent IPR issues from reducing the market success of their specifications. Deepak Kamlani, Global Inventures, explained that his company manages 12 different IT-related consortia, which he describes as the monetization of standardization. But overall, he thought that the European model of support for standardization represented a better approach than the U.S. laissez-faire approach. Carl Cargill spoke his concerns that the old standardization regimes were not prepared to address today’s problems and that a more innovative approach to standardization is required.
SESSION 4

Mike Smith of ISO and Jack Sheldon of IEC provided the SDO view of standardization. Unfortunately, the ITU was not represented at this colloquium. In response to a question on the continuing value of JTC1, Sheldon indicated that this was being looked at but no major changes are foreseen. Karl-Heinz Rosenbrock of ETSI provided the success story of GSM explaining that ETSI addressed the IPR issues and has promoted GSM world-wide. Robert Noth of John Deere provided the view of an international standards user and participant view, noting the need his company has for flexible standards that allow changes as their markets demand.

CLOSING

At the closing, Ken noted that consortia offer three desired functions: a place to negotiate intellectual property rights, one stop world-wide standardization and the promotion of new standards. SDOs need to address these requirements to remain competitive players in communications standards development.

ACKNOWLEDGMENTS

This colloquium was sponsored by Sun Microsystems and JEDEC as well as Georgetown University, AOL, Global Inventures, Oracle, Samsung and the Consumer Electronics Association. The first colloquium in this series was held in Boston about a year ago and future colloquia are planned. A book of papers on standards and standardization, The Standards Edge: Dynamic Tension™, is also in production and will be distributed in January 2004. Contact Sherrie Bolin (sherrie@sbolin.com) if interested.
EVENT REPORT

Standards and Public Policy:
Hosted by Federal Reserve Bank of Chicago

Scott Gallagher, James Madison University, USA

INTRODUCTION

Perhaps spurred by the rise of alternative payment systems (PayPal, anyone?), the Federal Reserve Bank of Chicago has taken an interest in present-day standards work. At a conference organized by Victor Stango (Federal Reserve Bank of Chicago) and Shane Greenstien (Northwestern University), about 35 Fed economists, academic scholars and industry managers gathered to discuss a range of issues concerning standards, standard setting and the resulting public policy implications.

DISCUSSIONS

The most attention was focused on the issues surrounding formal standard-setting organizations (SSO), such as the International Telecommunications Union. The experiences of the v.90 modem standard in front of two separate formal standard-setting bodies drew attention from two scholars. The presentation of Mark Rysman, of Boston University, offered a micro perspective, stressing the tacit costs of attempting coordination through these bodies and offering nine lessons, ranging from vote stacking and the structure of the SSO to the absence of side payments, for how firms could enhance their experiences with these organizations.

Examining the same event in a different SSO, Neil Gandal, from Tel Aviv University, focused on the interaction of competitive dynamics between firms developing their intellectual property, competing in the market and maneuvering in the SSO in the standard-setting process. Josh Learner of Harvard suggested the potential importance for firms “shopping” their standards around different SSOs in order to gain additional legitimacy for their standards.

Industry participants stressed that firms can go even farther than shopping their standards to different SSOs; firms often set up their own consortia to create standards. Frequently this is done to foster firm competitive advantage. Dick Langlois, of the University of Connecticut, described how numerous semiconductor equipment manufacturers had created standards to enable them to compete more effectively against the dominant firm in their industry, Applied Materials. Charles Steinfield of Michigan State described the considerable success that the U.S. home mortgage industry has had in developing common information system standards for loan applications and processing, thereby lowering costs considerably.

Unfortunately, all is not well in the world of standards. Tim Simcoe of the University of California – Berkeley dis-
cussed the longer time it was taking the IETF to arrive at standards. He found that common explanations such as more complex standards and more firms involved in the standard-setting process didn’t fully explain the longer time needed. Joel West, from San Jose State, discussed the challenges of pinning down exactly what open standards were and the resulting public policy challenges, since open standards are close to being public goods. Industry participants, such as Carl Cargill of Sun Microsystems, were concerned about the proliferation of standard-setting bodies – “any organization with four or more letters including two vowels” – that were becoming little more than marketing vehicles and imperiling interconnectivity between information technology products.

Of course, no standards conference is complete without some discussion of potentially anti-competitive behavior by firms. Tim Bresnahan of Stanford discussed in detail the battle between Microsoft and Netscape in browsers. Jeff Mackie-Mason, from Michigan and Janet Netz, ApplEcon, discussed the potential for translators to facilitate “one-way” standards.

Public policy implications were present in many of the papers. In a provocative talk, Joe Farrell, of the University of California—Berkeley, suggested that not only may the traditional focus on “does the best technology win” be misplaced, but he also challenged long-standing notions that competition between standards on the component level is better than competition on the system level. Rather, he suggested public policy concerns such as economic efficiency and maximizing consumer surplus could be carefully mapped, and then the level where competition occurred could be shaded by policy makers. Luis Cabral, of New York University, modeled what is probably an all-too-frequent occurrence, government intervention in standards when the regulator is ignorant. The political economic challenges of “rolling out” a new standard on a large scale was discussed by Marco Ottaviani’s (London Business School) presentation on digital and high-definition TV.

In addition to these explicit public-policy issues, a number of important policy implications were also understood from many presentations. Consistent with many standard formation models, consumers behave in interesting ways, including failing to change or upgrade their browser despite thinking they are using the latest version. Another important policy is that standards of some form or type will emerge, though they just might not be very good standards. An interested Federal Reserve will want to ensure that the standards arrived at concerning payments are widely supported and enable interconnectivity.

ACKNOWLEDGMENTS

Additional information on the conference, including electronic copies of the papers, is available at www.chicagofed.org/news_and_conferences/conferences_and_events/2004_standards_emerging_payments_agenda.cfm, and an edited volume of the papers is expected later this year.
EVENT REPORT

9th Annual Workshop of the European Academy for Standardisation

Kai Jakobs, Editor-in-Chief

INTRODUCTION

The 9th Annual Workshop of the ‘European Academy for Standardisation’ (EURAS) took place May 13-14, 2004, in Paris. It was hosted by AFNOR, the French SDO. About 40 people attended the event. The programme comprised 22 papers, a boat trip on the Rivers Seine and – as a welcome event – a fire alarm exercise.

Once we had gone through this exercise, the conference was opened by an invited session entitled Cultural Evolution of European Standardisation, featuring Florence Nicolas, CEN’s vice president on policy. This set the scene nicely for subsequent sessions, which included such diverse topics as Standardisation in Europe, Education and Standardisation, Impact of Standardisation and, as usual, Economics of Standardisation.

In the following, please note that the selection of papers briefly described is purely subjective (i.e., I picked those I liked best), and has nothing to do with the objective quality or scientific importance of a paper.

DISCUSSIONS

EURAS covers all areas of standardisation, and although IT has typically been the most prominent single domain, there has always been ‘digressions’ into other areas. This time, the most memorable presentation was by Pauline M.H. Mazumdar, of the University of Toronto, and was entitled Serology, Standardisation and Collective Security: the Standardisation Commission of the League of Nations, 1920-1939, which focused on the case of the Tetanus anti-serum. In the earliest days of standardisation of therapeutic sera, starting in the last decade of the 19th century, Germany was at the forefront, and most other nations were happy to accept the German standards. The situation changed thanks to World War I, and Mazumdar’s paper presents a fascinating account of how, under the umbrella of the then newly formed League of Nations, researchers tried to cooperate despite animosities between erstwhile enemies. It also shows that individuals were instrumental in maintaining this cooperation (a situation that can still be observed today in standards setting),
and adds an example that war is indeed the father of all things.

Another interesting presentation was given by Jean-Michel Borde, entitled Training and Education for Standardization in Europe – Survey Report. The survey showed that in Europe very little effort is devoted to training and education in standardisation at the university level. It also showed that business schools do not normally address the topic at all. Maybe even more importantly, the apparent general lack of understanding of the subject, and its importance for industry and the economy, is quite frightening.

Along similar lines, and indeed part of the same project, was a study on the Role and Best Practices of Technical Officers in Standards Setting Organizations, by Françoise Bousquet. The paper proposed a training syllabus for technical officers employed by standards-setting bodies (whether consortium or formal SDO). Technical officers are considered a major part of the “standardisation infrastructure,” and need adequate training to live up to the requirements of their jobs. As a result of a survey, Bousquet proposes a number of topics that should be covered by such a syllabus. These include the standards-setting process of which the technical officers are part, the value of the standards they help develop, standardisation as a tool for gathering competitive intelligence, as well as IPR and patents.

To have all stakeholders on board is an important aspect in many standards-setting activities, especially for formal SDOs. The paper Removing Barriers for Participation in Formal Standardization, by Henk J. de Vries et al., tries to identify the various barriers that potential participants may face, and what could be done to remove them. They identified 27 such barriers, which they group into five categories. Remedies are suggested for each barrier. Also, common wisdom has it that primarily the “weak” stakeholders (e.g., SMEs, users) are facing such barriers. Yet, the authors observe that whether or not a certain stakeholder is weak depends on the standard concerned; there are hardly any stakeholders that are weak per se.

Users are typically considered “weak” stakeholders (and, quite frequently, they are). The paper XML Standards and Standard Settings: The Case of XML Standards in the NHS Scotland, by Raluca Bunduchi et al., shows that users also face other problems that originate from well outside the standards-setting arena. The case study highlights the importance of political, organisational and economic factors for shaping the development of standards on the user side. The approach to XML standards development in the NHS Scotland is the result of the combination of and interaction between an array of political, organisational, cultural and technical factors.

If you trust the participants (which I think you can), people enjoyed the workshop. This even holds true despite the extremely tight schedule, with hardly any time left for sight seeing (except for the river cruise).

ACKNOWLEDGMENTS

Thanks are due to AFNOR, and specifically to Yves Buntzly, for the hospitality and local organisation work. And if the above has whetted your appetite – copies of the proceedings can be obtained from Heide Coenen at coenen@hermes1.econ.uni-hamburg.de, and the full programme can be found at www.euras.org/Parisprogramme2004-2.pdf
BOOK REVIEW

The Standards Edge: Dynamic Tension

Reviewed by: Deependra Moitra, Infosys Technologies Ltd., India

Over the last couple of years, my interest in the area of standards and the process of standardization has risen substantially. But attempts to equip myself with knowledge on various facets of standardization have largely led to disappointment for two reasons: scarce literature available on the subject and lack of integrated perspectives that facilitate a holistic understanding about standardization. My disappointment is almost over! Standards Edge, I pleasantly discovered, is a unique resource that provides comprehensive coverage of technological and standards issues and their impact on businesses. The book contains several essays on various aspects of standards and standardization, and while the quality and analytical depth of essays vary, by and large, I find this book to be a useful contribution. Therefore, I recommend this book to everyone interested in standards and standardization.

With the proliferation of technologies and intensification of technology-based competition, the role of standards has assumed critical importance. As a result, the process and dynamics of standardization have grown in both importance and complexity. Standards Edge presents diverse but reasonably well-integrated perspectives from various stakeholders on standards and the process of standardization. It examines standardization as a strategic tool for corporate success, and its various chapters provide strategies that can be implemented for leveraging standardization and strengthening its overall impact.

Standards Edge has 31 chapters, organized into five sections: Strengthening the System, Government Influence, IPR Solutions, Strategic Standardization and Cross-Industry Impact.

Strengthening the System has eight chapters, and deals with the standardization systems, its challenges and its solutions for evolving a stronger standardization process. Beginning with a chapter that presents an ecological view of standards, it emphasizes the need to balance economic, social and technical interests in standardization. Following this, there are two excellent essays: one discusses standards for standardization, introducing the notion of the organizational field in the overall context of competitiveness, and another analyzes the interrelationship between standardization and innovation. This section also deals with areas such as ICT standardization and innovation, and standardization policies for the information economy among other things.

The Government Influence section deals with government influence and involvement in standardization, and presents
eight chapters dealing with policies and regulations-related issues and their impact on trade. Two chapters deal with European policy and regulations-related perspectives on standardization, whereas two more chapters provide similar perspectives in the U.S. context. Chapter 13 is an interesting chapter that discusses government-industry interaction in the global standardization process. This section has another chapter that deals with Internet standards-setting bodies, in which emphasis has been laid out for better public policy and greater public participation in standardization process.

The IPR Solutions section, with four chapters, seeks to analyze the various considerations related to intellectual property rights in the entire gamut of standardization. The first two chapters in this section, both of which I found useful, advocate separating proprietary vs. non-proprietary technologies for standards and striving for symmetry between intellectual property rights and compatibility interests. Another essay (Chapter 20) discusses competitive policies in the light of intellectual property rights and standardization.

The Strategic Standardization section offers pragmatic advice on developing and deploying a leverageable standardization strategy in the real-life business setting. There are 12 chapters in this section, discussing standardization strategies for specific markets, rights tools and timing for the right standardization strategies, corporate standards management, best practices in standards setting, customer involvement in the process of standardization, and standardization in the context of open-source software, among other things. There are two particularly useful chapters in this section: Chapters 23 and 31. Chapter 23, which deals with innovation strategy and corporate standards management, presents a useful approach and guidelines on how standards management within a corporation can be successfully tied to its innovation agenda and leveraged for marketplace success. Chapter 31, which discusses standardization, consumerism and commercial success in the context of open-source software, offers an insightful analysis of the impact of standardization and open-source software on innovation.

Finally, the nine chapters in the Cross-Industry Impact section attempt to capture and cross-pollinate the ICT standardization efforts in various industries, including case studies from General Motors, John Deere and a life science start-up company’s involvement in standardization. Among other things, this section offers a chapter that outlines strategies telecom operators can consider for maximizing benefits of standardization. There are also chapters dealing with data standards, health informatics standards, and the problems and consequences of non-interoperability.

While overall this is a useful book, I find it suffers from similar problems of many edited volumes. First, the quality of contents and analytical depth across chapters vary significantly, resulting in some very appealing chapters and some not so useful. For example, Chapter 2 (Standards for Standards Setting), Chapter 3 (Standardization as a Guardian of Innovation), Chapter 18 (IPR Paralysis in Standardization), Chapter 22 (Strategic Standardization: Right Tool, Right Time, Right Job), Chapter 23 (Innovation Strategy and Corporate Standards Management) and Chapter 23 (Open Source Software, Standardization, Consumerism and Making Money) distinctly stand out because of the quality and usefulness of their contents. The other chapters are either peripheral in nature (e.g., Chapter 4 on ICT Standardization) or, compared to those identified above, don’t offer the same degree of analytical depth or useful cover-
age. Also, some chapters appear to be a misfit in this volume. For example, I do not find Chapter 14 (Testing – A Key to Building Trust and Confidence in IT Systems) nor Chapter 6 (Architecture as a Policy) as fitting the aims and scope of this edited volume. Finally, I believe it would have helped if the editor had synthesized the key implications at the end of each section, much like is done to introduce each section.

Notwithstanding the shortcomings, Standards Edge is a useful and timely contribution to the world of standards and standardization. The editor has done a commendable job in bringing together diverse (and often ignored) perspectives on standards and the process of standardization. I would tend to agree with the editor that the contents of this book, when properly operationalized, have the potential to enable companies achieve the “standards edge.” I recommend this book to anyone looking to acquire a holistic perspective on standards and standardization.

Deependra Moitra is currently general manager of research at Infosys Technologies. Previously, he worked as general manager at Bell Laboratories/Lucent Technologies India R&D facility in Bangalore, which he co-founded. Prior to that, he led the software project and quality management function in Siemens Public Communication Network Division’s communication software group and worked as a scientist in the Indian Space Research Organization. His current interests and research projects focus on management of emerging information technologies, standardization in IT, IT led business innovations, adaptive enterprises, management of R&D in IT services firms, and management of technological innovation. Deependra is a senior member of the IEEE and an executive advisory panel members for the Academy of Management Executive.