

THE  
STANDARDS  
EDGE

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# INTRODUCTION

*Standards: “Companies used to compete by making things and selling them.*

*In the new economy, the game is often over by the time the first product emerges from the factory. Sometimes it's because a blow-away first entrant effectively sets—and thereafter “owns”—the standard. In other cases, winners (and losers) emerge from backroom bargaining over the technical details that enable complex technologies to work together...”—Wired Magazine, Encyclopedia of the New Economy*

Originally conceived to accompany materials prepared for the Future of Standardization Conference Sponsored by the Massachusetts Institute of Technology, the Department Of Commerce, and the Information Technology Industry Council, the current volume of this book rapidly expanded beyond this original intent. The scope of this work includes additional topics that are critical for a complete understanding of the challenges and opportunities facing the Information and Communications Technology (ICT) industry.

Standards are a powerful management tool—a tool that facilitates cooperation among competitors in the hopes of creating larger markets and accelerating market uptake of technologies. But standards can also serve as a competitive weapon used to propel a company’s technology into the forefront, capture new markets, and leave the competition behind to play catch up, as exemplified by Wired Magazine’s definition of standards above. Regardless of which way standards are used—and most employ both tactics—Chief Information Officers (CIO), Chief Technology Officers (CTO), and their standards teams can leverage this strategic tool to drive technological directions, influence customer expectations, and even promote or disrupt specific technologies and business models. Standards can provide a safety net for designing and evolving IT infrastructure, as long as a company bets on the right ones. And when it all comes down to it—evolving IT architecture, establishing technology strategies, and setting future product directions—what we are really talking about is a bet, a guess, a gamble; albeit an educated one. A gamble in which reputations are built or destroyed, markets are won or lost, and entire corporate infrastructures thrive or fail. A bet that CIOs and CTOs make everyday—not only for their companies but also for themselves and their careers. What they need is an edge, a strategy that propels them ahead and provides an advantage. And the most powerful tool they can turn to is standards. What today’s technology leaders need is “The Standards Edge”.

This book is designed to explore standardization from the viewpoint of today’s CIOs and CTOs. Standardization is a complex and powerful arena—one filled with controversies, modern day battles and, ironically, with the spirit of cooperation. When diverse parties gather to accomplish a task they bring with them their cultural norms, organizational agendas, and, of course, personal beliefs and biases. Combine this with the policies and procedures that are different in every standards setting organization (SSO), and the term “tool” seems slightly understated. Perhaps discipline is a more appropriate term. But armed with the right knowledge and understanding of the processes, strategic options, and issues surrounding standardization, CIOs and CTOs will find it advantageous to integrate standards into their strategy for growth and innovation. To help the reader accomplish this in the shortest amount of time possible, this book fo-

cuses on top level strategies and issues, which are exemplified through real world examples and best practices. Great effort was exerted in gathering articles and input from many of the world's leading experts in intellectual property rights (IPR), economics, sociotechnical dynamics, standardization strategies, and government. The insights and knowledge that they share in this compilation of articles will, I hope, prove invaluable in navigating the standards process and driving organizational strategies.

The first section, "How Standards are Created", examines and untangles the process of standardization, its evolution, the dynamics that affect outcomes, and the discipline of standardization itself. It provides a solid understanding to begin examining standards options and identifying areas of focus.

Section Two, "Maximizing Standards Investments", delves into the creation and implementation of effective standards strategies. From choosing a standard to bet on, to influencing and driving the standards process, to measuring the return on investment, this section serves as a "play book" for CIOs, CTOs, and their standards teams.

When it comes to Information and Communication Technology (ICT), issues abound and standardization is no exception. Considering that IBM was granted over 3000 patents along last year,<sup>1</sup> it's no wonder that Intellectual Property Rights (IPR) issues are at the forefront of this arena. At one point a detail left to the lawyers, executives today must understand and even influence IPR policies if they want their companies to maintain a leadership position and avoid costly legal battles. Section Three, "Influencing IPR Policies", introduces the reader to top-level issues and provides alternative solutions for addressing current IPR problems in standardization and in the ICT industry as a whole.

Section Four addresses current and future "Government Impact on Standardization". The articles in this section explore the question of whether governments should be involved in standardization and, if so, to what extent? Answers to this question will depend upon the reader's personality, upbringing, and culture. In general, Americans, with remnants of the revolutionary spirit, tend to distrust government involvement, preferring that market conditions and private industry prevail. On the other hand, Europeans, many of whom enjoy the benefits of government intervention in such areas as universal healthcare, are more open to government involvement in the standards arena. Standards affect international markets, and those companies that compete globally need to understand and influence the levels of government regulation and its impact on their target markets.

Finally, Section Five—"Standards at Work"—ties the previous sections together through several articles that explore standardization processes, strategies, IPR policies, and government involvement as illustrated in the wireless industry. This extensive case study provides CIOs and CTOs with real world examples of how the topics covered in each of the previous sections can signal success or failure for an organization or an industry.

Standards are a strategic tool that, used effectively, can provide a powerful edge for executive decision makers and their companies. It comes as no surprise to the reader that the role of CIOs and CTOs are changing. Not only are they expected to be technology leaders but business strategists as well. Standards integrate these two areas—providing a means to drive technological innovation and business strategy together. Harvard Business School recently wrote that, "New information technologies such as Web services will require CIOs to master skills that very few have today", says Hagel. "Because enterprises will increasingly be focused on connecting with business partners and defining the

common standards that will enable them to automate the interactions among partners, CIOs will need to become relationship managers and negotiators."<sup>2</sup> This book attempts to provide the necessary knowledge and insight for technology executives to succeed in this new role and leverage standards to obtain a leading edge.

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<sup>1</sup> CIO Magazine, November 2002

<sup>2</sup> HBS Working Knowledge; October 9, 2002



# SECTION I

**D**o the current standardization processes serve the business and technological needs of today's economy? Do they meet the demands of CTOs and CIOs that are faced with mounting pressures to create competitive advantage through technology, improve operational efficiencies, and even predict future technology directions? Considering the minimal attention given to standardization by these executives, one might assume that the answer is a resounding "No". Yet, standards dramatically impact, and can even help to resolve, each of these key challenges.

Standards have progressed from a forum buried in minute technical details to a strategic management tool leveraged to create new markets, increase product uptake, and influence the very direction of technological innovation. As such, CIOs and CTOs can no longer afford to ignore this powerful medium. These executives, along with their standards teams, may want to examine how standardization can be aligned with their organization's strategies and leveraged for competitive advantage. In doing so, the following questions should be considered:

- How do current standardization processes measure up?
- What impact do they have—especially on a specific industry and company?
- What dynamics are essential to the process outcome and how can they be influenced?
- What are the costs and benefits of standardization activities?

While the answers to these questions will vary by individual and organization, one thing is clear--standardization is a complex process that requires a knowledge of politics, economics, and social systems, along with technical prowess, to create a strong impact. Decision makers are faced with the task of navigating and even steering these processes to influence the direction of technology development, policy formation, and the global marketplace. This section attempts to provide an essential background for understanding and operating within the global standardization arena from the perspectives of leading authorities in standardization, economics, technology, and technosocial dynamics.

Martin Libicki sets up the section with his definition of standards and the effect that standards have when they succeed—and when they fail. He concludes that standards often have power over the direction of technology as illustrated by the wireless wars between GSM and CDMA, and GSM's capture of the majority of the global marketplace. But does it matter whether a standard derives from a Standards Development Organization (SDO), Consortia, or an industry group and will a standards origin impact market acceptance? According to Carl Cargill, Director of Standards at Sun Microsystems, the results, not the process, are important—and those results are best measured by the amount of productization that occurs. Cargill provides an essential understanding of the processes that lead to those results by examining the evolution of standards bodies and the battle between Consortia and SDOs.

James Gosling, known as the father of Java™, provides a somewhat sarcastic, although perhaps realistic perspective, on the phases of standardization. And, economist Joseph Farrell and technosocial expert Vladislav Fomin discuss the other side of the picture—the social dynamics and motivations that often determine technological outcomes and provide advice on leveraging those dynamics.

The approaches to standardization vary and the motivators for participating are just as diverse. Given the complexity of the standardization process and the strategic importance of participation in this arena, what skills and talents are essential for success? Henk deVries begins to answer this question by examining whether standardization is a professional or an academic discipline. His comparison of standardization to both fundamental and applied sciences illustrates the diversity of knowledge and skills essential to standards leaders and their teams.

One standards expert that I interviewed described standards as “fun” and even “sexy”. While many might not agree with this description, a surprising number of people enjoy creating standards for standards sake. However, standards that have little impact on a company’s goals or serve only to impede innovation are activities that are not worth the valuable resources of CIOs and CTOs—or their standards teams. Companies who integrate their standards strategy and activities into their goals for growth and innovation, and remain focused and invested in those goals, are the ones that ultimately help to drive market direction, customer expectations, and competitive advantage.

## SECTION II

Forrester states “Betting on a standard can cause an IT exec’s career to go into orbit—or crater.” Their advice? “CTOs and CIOs must scout out which standards will catch on and decide when to leap based on their risk and tolerance.” Take the intricacies of the standards processes described in the previous section and multiply it by 100 standards organizations that impact any Information and Communications Technology (ICT) company and you come up with a task that seems insurmountable—even to the most knowledgeable of standards experts. Short of having a crystal ball to predict the future, which likely have their own set of complex standards, what can time-pressed executives do to hedge their bets and even leverage the standards process?

Armed with the background presented in Section I, this section provides a selection of strategies and best practices—along with exemplary case studies—designed to help leaders and their team members make decisions, play, and even win in the standards arena. The first two chapters of this area strive to simplify the decision making process: Forrester Research offers a guideline for choosing standards and Andrew Updegrove, a lawyer who has helped create consortia for 15 years, delivers valuable advice on not only evaluating and choosing a consortium, but on determining the most effective level of investment for that particular group based on a company’s goals.

But even the best decisions are worthless without a strong implementation plan. For advice in this area, we turn to experts in economics, consortia, and business—all survivors, and even conquerors, of numerous standards battles. Carl Shapiro and Hal Varian, noted economists, discuss the types of standards battles and outline strategies and winning tactics to obtain and hold a leadership position. For an understanding of what drives standards creation, the key issues that CTOs and CIOs should take into account, and the value of a disruptive business model, read Deepak Kamrani’s article on “Standards and Competitive Technology”. Tineke Egyedi and Arjan Loeffen take this concept a step further by exemplifying how succession in standardization occurs in their case study of XML.

Ever dreamed of creating your own consortium or industry group? While this tactic may seem daunting, the formation of these groups to resolve specific needs can result in effective solutions that lead to rapid productization and market uptake. Witness the efforts of Nokia, Ericsson, and Motorola in the creation of the Open Mobile Alliance, which promises to structure the wireless Internet market. Whether you are creating a consortium, or just participating in one, take advantage of the advice provided by authorities such as Andrew Updegrove, David Schell, and Hank Cauley to maximize the value that you receive.

Participation in standardization is not just limited to vendors. End user companies play to influence future technology directions toward their own needs and gain competitive advantage. Jon Siegel, Vice President of Technology Transfer at Object Management Group, discusses the return that these members can expect based on their level of investment.

In the battle for market share, we tend to lose site of the end goal—successful implementation of the technology whether in a multinational corporation or in a device used by a single end user. The article by Eric Monteiro and Ole Hanseth examines how a working corporate infrastructure can and should evolve as exemplified by two case studies.

Standards have the power to make or break new markets, strengthen or diminish critical IT systems—and subsequently advance or destroy the careers of those that control them. Astute CIOs and CTOs recognize standards as a powerful strategic tool and ensure that their company and their standards team leverage that tool for competitive advantage.

## SECTION III

If standards are a powerful strategic management tool, one that helps companies seize new markets along with safeguarding their own IT investments, then Intellectual Property Rights (IPR) can be an organization's guardian angel or the equivalent of carbon monoxide. They are not always evident, even when you look for them, but their presence under the right circumstances can be deadly. Once the sole domain of the courts and law offices, IPR issues now weave themselves into the business decisions, technological directions, and even into everyday devices such as video cameras and radios. CIOs and CTOs can no longer claim blissful ignorance of IPR any more than CEOs can let their attention wane from their organization's accounting practices. In no other area is this fact more apparent—or more convoluted—than in standards.

IPR issues and policies as they relate to standards can protect a company's valued intellectual property, impact international productization efforts, and serve as a powerful competitive weapon. This section takes a look at the most pressing IPR issues and their impact on the standards processes and strategies discussed in Sections I and II of this book. Not surprisingly, the issues are as varied and as controversial as the expert opinions that surround them.

Pamela Samuelson's comprehensive examination of European versus US copyrights illustrates not only the effect that cultural norms can have on policy formation, but more importantly, the diversity of regulations that must be considered when developing standards in an international arena. And when it comes to the standards process itself, the issues tend to multiply:

- Should patents be disclosed in the beginning phase of standards development, preventing companies from furtively promoting their patented technology only to demand high licensing fees once the standard is complete?
- Whose responsibility is it to reveal the patent or to even have knowledge of it? And who should conduct and pay for often expensive and time-consuming patent searches?
- If an SSO is aware that a patented technology may be included in a standard, will a negotiation of licensing terms constitute antitrust activities or actually promote competition?

For a discussion of these issues and possible solutions, read the articles by Lawrence Lessig, Scott Peterson, Therese Hendricks, and Molly Schaffer Van Houweling. Illustrations of these issues and attempted solutions can be found in real world examples that include Hollywood's legislative agenda, the case of GSM, and ETSI's attempt to resolve its IPR issues. Of course, a discussion about IPR would not be complete without consideration of Open Source as covered in Lawrence Rosen's article. Finally, what happens if IT systems fail, resulting in a legal battle? Read Rebecca Bace's article to discover how expert testimonies can be an essential tool—or a detrimental tactic—in legal disputes.

Issues such as these are being decided in courts, by governments, and in standards bodies around the world. As Robert F. Kennedy, past Attorney General and New York Senator, once stated, “Laws can embody standards; governments can enforce laws—but the final task is not a task for government. It is a task for each and every one of us.” CIOs and CTOs have an important choice to make: Influence the direction of IPR policies and standardization by getting involved with their government, standards organizations, and their standards teams...or adhere to the policies and restrictions established by other parties, including the competition

## SECTION IV

Standardization around the world is leveraged by governments to promote free trade while simultaneously creating favorable national trade barriers. It is used to gain national advantage through exclusive market creation in developing countries while also striving to increase global market adoption through international product interoperability. Current and future government involvement can facilitate the standardization process or stifle innovative development. While the level of government involvement varies by country and region, the question remains the same: Should government be involved in standardization and, if so, to what level?

This section features insights from leading government authorities on these issues and explores how CIOs and CTOs, along with their standards teams, can leverage their expertise to influence global government involvement in standardization policies. For a perspective on U.S. and European views on standardization, read the articles by Phillip J. Bond and the Commission of the European Communities. These articles candidly discuss key issues and propose solutions to the problems inherent in standardization today. Andrew Updegrave provides an outside view on government's role in consortia based on his years of experience in setting up successful SSOs. Reading about the issues is helpful, but impacting them requires action. Peter Harter provides insightful advice on the relationship between standards and lobbying—exploring how the two practices are used to influence government policy.

In the area of standardization and in ICT as a whole, government is not only a regulator, but a significant customer as well. However, many are not aware that the U.S. Government's procurement laws exclude specifications by consortia unless a special waiver is requested. Carl Cargill explores this issue and proposes a simple solution to align government procurement policies with today's standardization efforts. Finally, as a customer, the government can be exemplary in implementing and tracking the impact of standards. Read the case studies on GPS and aircraft batteries and components to gain a true understanding of the value of standardization in action.

In considering government's role in standardization, questions to consider include:

- Does a stronger government role guarantee a national market advantage or discourage innovative developments?
- Is it strategic and ethical for governments to leverage and control standardization for national trade advantages?
- Should governments intervene in standardization processes to resolve ongoing challenges such as timing and global IPR concerns?
- What roles should private industry and government play? How can they work together?

ICT companies that compete on a global scale must take these into account when developing standardization strategies. Just as with IPR, involvement or ignorance of the issues and the impact of international government actions can determine a company's success or failure.

Phillip J. Bond, Chief of Staff to the Secretary and Under Secretary for Technology at the U.S. Department of Commerce, states in his article that, “I ...believe there is a big future in standards.” The question is: Who will determine that future and what role will CIOs and CTOs play?

# SECTION V

**T**oo often, standards are viewed as theoretical constructs that generate extensive discussion but little action. In other words, their development process is too archaic and slow to impact the market. While arguments that prove this point--and disprove it--abound, the best way to evaluate standardization is to look at its impact on one industry.

This section explores the development and evolution of the wireless industry. From cooperation on GSM in Europe to competition and fragmentation of the US cellular market, this story of standardization contains all the essential elements of a good Hollywood screenplay: there are battles (controversies and standards wars), romance (cooperation and partnerships), heroes (open standards), and villains (proprietary standards). Okay, there aren't any car chases—but give it time. Perhaps the next standards battle will be settled by a drag race between competing CEOs.

Read these articles to gain an understanding of how the processes, strategies, and issues discussed in previous sections of this book combine to determine the success and the failures of organizations around the world. The lessons learned are not specific to the wireless industry but can apply to the ICT industry as a whole. The CIO and CTO who gain knowledge from the mistakes and successes of the companies illustrated here and then integrate that knowledge into powerful standardization strategies, will go a long way in resolving the pressures to create competitive advantage through technology, improve operational efficiencies, and predict future technology directions.