

BOOK REVIEW:
***Technology Standards and Standardization Process,
Impact on Innovation and International Competitiveness***

Lectures at Stanford University, September 24 through December 3, 1998

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A series of ten lectures at Stanford University, funded by the National Institute of Science and Technology (NIST) and the Japan External Trade Organization (JETRO), was presented September 24 through December 3, 1998 of which nine are captured in this volume. This lecture series was organized by Dr. R. Dasher, Director of the US-Japan Technology Management Center, School of Engineering, Stanford University. Dr. Dasher begins the volume explaining the expanding importance of technology standards to companies, markets and trade.

The nine presenters provide their views in both written text and copies of lecture foils. Together they address the US and Japanese government, consortia and formal standardization, marketing and industry view of technological standards.

R. Habner, Acting Deputy Director National Institute of Standards and Technology (NIST) opens the series with the current US government position on standards and standards development: observation, reporting and guidance. He organizes standards into four somewhat archaic classifications (where does an air-interface standard fit?):

- Test and measurement
- Product
- Documentation
- Process

He develops what emerges as a common theme of the lecture series: standardization is a pragmatic process with economic consequences to industry and government.

The second governmental view is provided by H. Setoya, Executive Director of the Association of Super Advanced Electronics Technologies (ASET) in Japan.

He describes the function of government coordinated R&D on large electronics development projects. Standards, not a goal, but the result of cooperation, are explained as the outcome of joint development work in specific high investment technologies: semiconductors, liquid crystal displays and magnetic storage.

Both the US and Japanese government papers appear to support minimum regulation or intervention in standards and standardization. But their approaches are quite different. The Americans believe that formal standards may create consensus, while the Japanese see that consensus creates standards.

D. Rhoden, Chairman of the Board Joint Electron Device Engineering Council (JEDEC) and Fellow, VLSI Technology, Inc. provides a clear and knowledgeable view of the standardization process. He describes the changes JEDEC has introduced - electronic mail and the Internet to speed and reduce the cost of their standardization process. He notes some of the future challenges of JEDEC standardization: balancing public awareness of standards development with the need for frank discussions by participants and maintaining relevance during rapid technological change.

R. Toge, VP International Electrotechnical Commission (IEC) and special advisor to the Electronic Industries Association of Japan, describes the background of the IEC (Lord Kelvin was the first president) and current organization consisting 54 national committees. After a recent reorganization, the IEC is creating procedures to convert consortia developed specifications and even proprietary specifications into international consensus standards in a timely manner.

F. Tabrizi is the CEO of the SLDRAM (Sync Link Dynamic Random Access Memory) Consortium and Director of strategic marketing, Hyundai Electronics. Tabrizi explains how the SLDRAM Consortium (a non-accredited standards development organization which pools resources and intellectual property) has worked successfully to develop publicly available specifications (PAS - a consortium's output) for the next generation of DRAM. SLDRAM plans to provide their completed PAS to a formal standards organization such as JEDEC for conversion into formal standards.

G. Moore, author of the popular technology marketing book, *Crossing the Chasm*, looks at the process of standardization from the technology adoption life cycle perspective: innovators, early adopters, early majority, late majority and laggards. He suggests that formal standards develop during the early

majority phase. This reviewer notes that standards develop as anticipatory - prior to the market (e.g., V.34, Object Management Group) as well as responsive - after the market is very well established (e.g., telephone line). He then describes the economic and societal pros and cons of a commercial (consortium) or formal standardization process and provides an interesting view of how proprietary products in a breakthrough market ("Tornado") can serve to dramatically increase a company's market capitalization.

The interrelationship of consortia and formal standards bodies is well shown in these four papers. Dr. Moore explains how consortia are helpful when "crossing the chasm" between early adopters and the early majority. The SLDRAN Consortium provides a good example of this theory. JEDEC and IEC offer examples of where these formal standards organizations are headed in the future and their expanding interest in consortia. Similar views from communications standards development organizations such as the ITU or US National Committee T1, would be very interesting.

D. Robinson, Senior VP Technology, Dolby Laboratories, offers a been-there-done-that industry view of the standardization process. Dolby Laboratories licenses and manufacturers audio processing systems. Robinson explains the drawbacks to participating in standards development including cost to the company, loss of market control and potential imposed conditions. He also explains that formal standards are less essential where there is a breakthrough idea (i.e., new field minimizes the competition), well protected by patents.

J. Cioffi, Professor of Electrical Engineering, Stanford University, explains Digital Subscriber Line (DSL) services for high speed data transfer over telephone lines and the extensive standardization process to achieve DSL standards via ANSI Committee T1 in North America, European Telecommunications Standardization Institute (ETSI) and the International Telecommunications Union (ITU). His view point is as the prime mover in the development of the Discrete Multi-Tone (DMT) technology, which became the basis for the Asymmetric DSL standards world-wide.

B. Tshilombo, Senior Analyst and Program Manager Dataquest, Gartner Group, provides, in acronym laden text, a good overview of the long history and complex process (up to late 1998) of wireless cellular standards development world-wide. He suggests that convergence of the three major 3rd generation wireless proposals is needed or confusion will occur. Given the benefit of passing time, it appears that multi-mode operation of 3rd generation wireless systems is more likely.

Not surprisingly, these three industry experts are most concerned with the outcome of the standards work in their field rather than standards and standardization per se. Mr. Robinson agrees with Dr. Moore's marketing viewpoint about the economic effect of the right technology at the right time. Dr. Cioffi and Mr. Tshilombo provide good examples of the more difficult problems (relating to compatibility) standardizing communications technologies.

The US-Japan Technology Management Center assembled an impressive range of experts to provide their perspective on technology standards and standardization. Contrasting the American and Japanese view of standards and seeing the developing relations between consortia and formal standards development organizations is very useful. But nine viewpoints provide only a glimpse of a subject as broad as technology standards and standardization. An ETSI perspective, the different requirements for standardization of communications systems, product standards or unit standards, perspectives on standards and standardization from a sociological view, and the emergence of etiquette standards are a few of the areas left unexamined in this lecture series. The full scope of technology standards and standardization is not yet in view.

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