

# **Information Technology**

## Trends in Information Technology and Telecommunications Standards

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It is a pleasure to be here. Looking out at this audience reminds me of a study conducted by a prestigious eastern university some years ago on people who attend conferences and seminars. The study showed that 20 percent of the audience typically paid very close attention to the speech, took in every word, compared it against their life experiences, and got a lot out of it. Another 30 percent are in and out, and pay attention to part of it. Fully 50 percent don't pay attention at all, and the study further showed that they are day dreaming. So I take some comfort in that study because I know when I finish that at least half of you will be happy.

There are some really dramatic changes underway. If you go back 20 years ago, for most U.S. companies—and I know for Motorola, the vast majority of the market was in the United States. Today that has changed dramatically, with well over 50 % outside the United States, for Motorola and for other companies. Global markets are clearly the focus for today's hi-tech companies as the last two speakers clearly said. Needless to say, hi-tech companies need global standards more than they ever have before. Let's look at the standards venues in information technology and telecommunications. There are two basic categories.



### NIST Centennial Celebration

*Trends in Information Technology and Telecommunications Standards*

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SLIDE 1

Good Morning. I have been asked to speak about current trends in information technology and telecommunications standards.



### Standards and the global IT & telecom industry

- Global markets are critical to the IT and telecom industry
  - Exports are over half of US companies' revenue
  - The fastest growth is outside the US
- Standards and technical specifications provide access to global markets
  - For interoperability, customer equipment portability, regulatory compliance...

*...the IT & telecom industry needs standards*

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### IT/telecom standards venues

- SDOs
  - ITU (Telecom)—UN Treaty Organization
  - ISO/IEC Joint Tech Cmte 1 (JTC 1): IT (storage media, databases, image compression...)
  - IEEE, ETSI, TIA, T1, etc.
- Consortia and others
  - Internet Engineering Task Force, World Wide Web Consortium, ATM Forum, Wireless Access Protocol (WAP) Forum, Bluetooth, Home RF Bus, etc.

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One category is that of the traditional standards development organizations. In the United States, these are the ANSI accredited SDOs. The other category is the consortia and partnership projects. Actually the partnership projects can be between these two, because they are partnerships among the SDOs. Slide 3 gives some examples of standards organizations in both of those categories.

Looking at industry trends, there are some fundamental changes underway now that have been underway for 5 to 10 years. If you look at these trends, globalization, as I have already mentioned, is a very, very important trend. Another important trend is convergence of the various industries—information technology, telecommunications, automobile, and consumer products—which are all coming together. These industries handle standards in various ways. It is interesting to watch the dynamics that play as this happens. Still another trend is the speed of technology development. Introduction of

 **MOTOROLA** **Industry trends**

- IT and telecom industry trends are changing the way the industry uses standards
  - (a) globalization: *global markets/manufacturing*
  - (b) convergence: *IT, telecom, auto, consumer*
  - (c) speed of technology development: *a new product generation every six months. Need standards now!*
  - (d) style of R&D: *much faster and collaboratively*
  - (e) intellectual property rights: *Important. Complex rules. Must be managed wisely in standards activities*
  - (f) narrow profit margins: *invest resources wisely*

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new products is much faster than it has ever been in the past, and it is going to continue in that direction. Research and development is done on a faster time scale, with more collaboration between companies, and companies and governments, so intellectual property rights, and the complex rules that apply to standards organizations are important. Ten years or so ago there were a lot of problems with them, but I think they have been pretty much resolved so that everyone is reasonably comfortable with the rules for Intellectual Property Rights. Of course, narrow profit margins are another concern. I can tell you that this year, in 2001, that is really true. Profit margins are going to zero, and in some cases, negative.

 **MOTOROLA** **Roles of SDOs and consortia**

- SDOs and consortia are searching for their appropriate roles in the face of these trends
- Industry is challenging both SDOs and consortia to find ways to create timely, relevant standards and specifications for global markets
- There's no one best way for standards but...
  - Q: Consortia give speed and technology focus and SDOs give global recognition and open consensus. Can these attributes be combined?*

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As we look at the standards development organizations and consortia, we see that they are searching for their proper role in the face of these trends, with these dramatic changes underway. Companies and industry are challenging both of them to find ways to create

timely and relevant standards for global markets. There is not one best way in every situation to develop standards. Consortia tend to give speed and a technology focus, while the standards development organizations give global recognition and open consensus. A question that one might ask is if these attributes can be combined.

 **MOTOROLA** **Example of bridging SDO & Consortia models**

- Third Generation Partnership Projects
  - global solution for global 3rd generation mobile (broadband voice, multimedia, data)
  - launched in December 1998 by national and regional SDOs (including TIA, T1 in the U.S.)
  - currently 3 partnership projects for wireless
    - 3GPP--3G standards to replace GSM & TDMA
    - 3GPP2--3G standards to replace IS-95 CDMA
    - Public Safety Partnership Project-Between ETSI and TIA to create trans-atlantic broadband wireless standards

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Perhaps the biggest change underway in the last couple of years is the paradigm of partnership projects that has occurred in the wireless telecommunications arena. For example, I am Chair of the ANSI telecommunications standards committee that was formed to engage with ETSI, European Telecommunications Standard Institute, as well as with the Japanese, Chinese, Koreans, et cetera, to develop these global partnership projects. I led a group of U.S. companies around the world meeting with these other organizations. This was an initiative created by the Europeans, by ETSI. It was a very good one.

Let's take a look at what this new paradigm is all about. First, it is a consortium that is created by the standards development organizations. In the case of the third generation wireless partnership projects, the Telecommunications Industry Association (TIA) and Committee (TIAC) are very actively involved in the process for the United States. The projects are global to produce specifications for third generation mobile standards. Launched a little over two years ago, there are currently three partnership projects for wireless.

There is a second partnership project—I will call it cellular partnership projects for third generation cellular standards. So all these competing standards you hear about are really coming down to two; one for wireless and one for cellular.

Then there is a new partnership project that has just been formed which has been in the news recently. The goal of the Public Safety Partnership Project between

 **Partnership Projects (continued)**

- Structure of 3GPP work
  - technical work is by companies and other entities who are members of one of the SDO partners
  - organized in technical projects with global input to write specifications
  - SDO partners transpose specifications into standards by their own processes
  - Ultimately to ITU for global recognition as 3G standards
  - Key is that specification origination in 3GPPs is created by companies worldwide

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ETSA and TIA here in the United States, is to create transatlantic broadband wireless standards. This project is particularly noteworthy because just this week there was a shooting in California, and several years ago there was a shooting in Colorado, Columbine High School. It came to light after all the smoke cleared that the public safety organizations that showed up at the scene could not communicate with one another. They had to send hand signals of all things! The reason was that some of them were using the U.S. standard for their equipment, and others were using the European standard for their equipment. So this public safety partnership project came about as a partnership between Europe and the United States. In fact, the European Commission is funding part of this, and we are working to see if we can get the U.S. government to participate as well on this issue. This partnership is important because many of the players in the standardization process are police chiefs and fire chiefs from small communities that don't have budgets to travel around the United States, much less to Europe, to work on standards.

The structure of the partnership project involves basically bringing together the engineers from companies throughout the world that have an interest in the subject. In the telecommunications arena, it would be the operators, such as Korea Telecom, and Nippon Telephone and Telegraph, and so on, and the equipment manufacturers, such as my company. They meet at different places around the world. If you leave engineers alone, and get the lawyers and the politicians out of the way, these engineers will create some very good specifications that customers can use to procure equipment.

Once created, these specifications go to the regional standards development organizations such as, for example, TIA in the United States, and are issued as their standards. From there, they go into the ITU, the

International Telecommunications Union, to become global standards. The procurement process can begin very early, just as soon as the specifications are ready, or even almost ready.

I was in Switzerland last week in a meeting with 30 or so telecommunications companies, and it is pretty much unanimous, and I didn't hear any dissent from the view that these partnership projects are really working well.



**Example 2: JTC 1**

- ISO/IEC Joint Technical Committee 1: Information Technology
  - consensus international SDO, follows ISO and IEC Directives
  - members from 63 countries in 17 technical subcommittees
- example technologies:
  - database languages, programming languages, image compression (JPEG, MPEG), computer peripheral connection, security, storage media

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Another example of this new paradigm is the JTC-1, the Joint Technical Committee Information Technology area, which is a joint committee between ISO and IEC, which creates global standards, of course. It produces standards that are very important to the IT and the telecommunications industries such as the MPEG and JPEG impression standards.



**JTC 1 (continued)**

- JTC 1 is an "e-SDO"
  - pioneered all-electronic document processing and balloting
- JTC 1 has a pilot program to sell standards on-line at low price, in an electronic format
  - US adoption of JTC 1 C++ programming language standard has been a top revenue generator for ANSI at \$18/download

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JTC-1 is truly an electronic SDO. It has pioneered all electronic document processing and balloting. Beyond

that, it uses hi-tech apparatus such that standards are now developed by using wireless Local Area Networks (LANs). All the engineers come to the meetings with their lap-top computers and communicate right there during the meeting using the LAN as well as conventional communication. Communication is about a 11 megabyte per second data rate inside the room with a direct connection to the Internet so that they can go back to the server on their corporate networks to get information. This really speeds up the standardization process. In this way, you have all the information that you could ever hope to have at your fingertips, with a very fast downloading of the information.

Another aspect of the changing face of standardization is in the sale of standards. For example, JTC-1 has a pilot program to sell standards on-line at low prices in an electronic format. The example given on Slide 9 is the C++ programming language, which is an electronically available standard. This approach is really important because virtually every company that I have talked to believes that most of the costs that goes into creating standards is the time of our engineers. The time for the ones that travel to the standards meetings, as well as for the ones that don't travel, but produce the documents that go into standards is the lion's share of the costs of standardization.

Once the standards are created, we would like to see them promulgated as widely as possible, free on the Internet. We think that is the right way to do it. This isn't quite free, but it certainly is a step in the right direction. The other thing that I would say is that if you look at the resources that hi-tech companies are putting into standards, and that is the engineers, over the last 10 years, there has been a massive migration away from the traditionalist SDOs over to consortia and partnership projects. One of the things that we look at is can the standards, once they are produced, be easily obtained



### JTC 1 (continued)

- JTC 1 "fast track" approval takes consortia specifications to formal standards
  - specifications may be submitted by a national body, a Category A liaison to JTC 1, or other approved specification submitter
  - for fast-track, "up or down" approval
- If specification has global support, fast-track enables quick global ISO/IEC recognition

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free on the Internet as the best way forward? Of course, I should hasten to add that, as I look around the room, some of my friends from SDOs are saying, well, how are we going to fund this?

Of course, the companies have got to come up with another source of funding if we are going to have standards free on the Internet. The JTC-1 has—and cycle time being very important—a fast track approval process that beats the cycle time requirements of industry. Any number of entities that are shown on the slide can submit the specifications into this process. This provides timely standards, and is really a good model.



### JTC 1 (continued)

- US industry is leading effort to allow direct company participation at technical level
  - allow the developers and implementers of the technologies to lead the technical work
  - technical expertise would no longer be artificially divided along geographic lines
  - ISO/IEC national bodies would continue to manage the work of JTC 1
- An experiment to see if direct participation increases responsiveness and relevance

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The U.S. industry is leading an effort to allow direct company participation at the technical level. This is bringing the IT paradigm for new processes and creating standards very close to the one for the telecommunications partnership projects—the one that is working so well. This allows the people developing the standards to work together in doing the technical work, so that technical expertise would no longer be artificially divided along geographic lines. The ISO-IEC national bodies would continue to manage the work of JTC-1. This is an experiment at this point to see how it works. I predict based on the partnership project model and telecommunications that you are going to find that it works really well.

With all of this really good work that ISO is doing, there is a cloud on the horizon that I thought that I ought to mention here today, and that is management system standards. I guess we have had two of them, ISO-9000 and ISO-14000. When ISO-9000 came out, a number of companies came to the conclusion that it didn't add any value. Motorola came to that same conclusion. We were using the Malcolm Baldrige process and 6 sigma, and we found that if you met ISO-9000 that you were only



## A Cloud on the Horizon

- ISO attempts to create Management System Standards industry doesn't want
- A global certification industry has emerged
  - business model is to make money certifying company facilities as meeting standards
  - their business case requires more standards to derive more revenue certifying companies
  - Standards their customers (companies) don't want
- Hurts global consumers

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at say, 3 sigma or 4 sigma. It was actually causing problems with suppliers who said, gee, we meet the global standard, and why do we have to get any better? Well, if you want to supply components to our company, you are going to have to get a lot better. It really was very expensive to have our facilities certified, and you had to become certified because European customers were putting clauses in their contracts that you had to be. They required that your facilities had to be certified ISO-9000 or you couldn't bid on the contracts. It became an absolute requirement with a number of companies having exactly the same experience.

Then several years ago there was an effort to create a new management system standard on occupational health and safety. Well, this brought European and U.S. industry together. It was nearly unanimous. Almost all the companies on both sides of the ocean felt the same way about this; that there was yet another one of these standards that was going to be expensive and would not add any value. We have heard stories of a number of ideas for management system standards coming along. We concluded that what is going on here is that there is an industry that has been created, launched out of ISO-9000, to certify companies' facilities, and make a lot of money doing that. A good businessman will look for new products and new opportunities, and those new products of course are new management system standards that we don't really need.

Now, I am not up here—and I hope that you don't take me as doing this—throwing stones at management system standards, because there are some good ones. For example, the automobile industry has a quality standard, QS-9000, and the telecommunications industry has another one. Motorola and other companies worked very closely with these industries in helping to develop those standards. But those are standards that the customers—that the automobile industry, that the telecommunications industry – say they need. That is great, and that is fine. What I am talking about here are standards that you can't find anybody in the industry that wants them, except the industry that makes money certifying facilities. That's not a good model, and it hurts global consumers.



## Conclusion

- IT and telecom:  
*global, converged, fast, collaborative, innovative, efficient*
- IT and telecom standardization:  
*New standardization models are the same.*

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In conclusion, in the information technology and telecommunications fields, the changes are providing standardization that is global, and it has converged across these various industries. The resulting standards are very good on cycle time, collaborative, and innovative, and the processes are efficient. So the standards approach is working pretty well. If you compare information technology and telecommunications, the models are very similar.

I described the partnership projects for telecommunications and the experiment in JTC-1 because they look to me like they are just exactly the right paradigm to give industry what it needs; a timely, global standards.

Thank you.