

The Evolution of Telecom Standards

By Cliff Halevi

Once upon a time, prior to 1984, in a world that now seems like a very long time ago, the world of telecom standards was a rather simple matter. Back then, AT&T's Bell Labs would invent technologies and design the equipment, AT&T's Western Electric would build the equipment, and AT&T's Long Lines Department and local Bell Operating Companies would procure and deploy the equipment. A perfect closed system. The system was stable and it worked, but the stability of a monopolistic system also meant that the pace of technology introduction was very slow as the forces of competition and innovation were not yet part of the landscape. The breakup of AT&T in the early 80's, and the divestment of its local carrier and manufacturing arms meant a sea change in the industry and this change was reflected in the evolution of the standards development organizations that arose to address the needs of a reinvented industry.

One of the first entities to address this need was an organization called Bell Communications Research or Bellcore. Bellcore was more or less the part of the former Bell Labs that supported the Regional Bell Operating Companies (RBOCs, aka Baby Bells) and one of its primary tasks was to create "generic requirements" documents that described the architecture, operation and function of almost every aspect of the telecom network. The idea behind these GRs was to provide the industry with a library of requirements that were sufficiently detailed to enable new companies to build equipment that would interoperate with each other. The result was an explosion of creativity and entrepreneurship that saw the creation of thousands of new entrants who started to make "GR conformant" equipment as part of an ever-growing ecosystem of vendors. Almost overnight, an industry that was reliant on a few large manufacturers became a dynamic competitive arena with carriers now having the freedom to engage with a multiplicity of vendors.

While Bellcore continued to generate and update the "generic requirements", the rapidly growing telecom industry saw the need for the development of even more open (and possibly less expensive) industry-wide standards development process. Part of this impetus was the desire to broaden the base of companies which supported the development of



standards since most of the costs were being borne by the larger companies, but this goal was tempered with the desire of the major carriers and vendors to play a dominant role in any subsequent standards development organization (SDO). In North America, the Telecommunications Industry Association (TIA) was the vendors' primary venue for industry standards, and ATIS was created, in part, as an SDO more attuned to carriers' interests. Bellcore, being the developer of "generic requirements" which were de facto industry standards, and being jointly owned by the largest carriers (i.e., the Baby Bells), was thus in prime position (because of their expertise and access to Baby Bell funding), to provide the expertise, resources and coordination support for much of the standards work going on in North American SDOs in the late 80's and through the 90's, as work proceeded in areas such as SONET, ISDN, AIN, CCS/SS7, Wireless, Network Management, Numbering & Routing, Performance, DSL, etc.

In those days, the primary standards arena was domestic, with North American standards developed in ATIS and TIA, and then brought to the ITU-T in Geneva as the starting point for "international versions" of these standards.

Around 2000, after the telecom bubble burst, the telecom industry started to consolidate. Further contraction occurred in the post-9/11 economic downturn and in the more recent worldwide economic turmoil. RBOCs were starting to compete with each other more and more (or were swallowing each other up.) Changing technologies and business models brought in competition with and from other players in the formerly separate worlds of cable, internet and

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wireless. Many new startups made their appearance too. Many did not survive, and many were bought up by larger companies with deep pockets seeking a global presence. All these changes facilitated a further increase in globalization, which was reflected in a shift to more global standards. This global shift was evidenced by the rise of many SDOs with global addresses, such as IETF, IEEE and 3GPP. In addition, instead of the ITU-T (the UN-chartered worldwide SDO) using US standards as the basis for subsequent international standards, more and more technologies were brought directly to the ITU-T for development, with many ITU-T standards then being brought back to the US (to ATIS, for example) to undergo the “delta” changes needed to conform to any North American-specific architectural or regulatory differences.

With the global economic situation still rocky, the industry remains very cautious and has become even more reliant on standardized architectures and technologies, since standardized solutions ensure interoperability and enable a “one product” approach (or at least a “fewer products” approach) that enables companies to take advantage of the economies of scale by offering technologies and products that can be marketed worldwide. Add to this the increasingly fast pace of technological development and the result has been a profusion of new standards bodies and forums that have sprung up around a growing number of telecom technology areas such as Wireless, NGN, Multimedia, VoIP, Network Management, Optical Transmission & Networking, Security, Performance, etc. Part of this new landscape includes new smaller entities such as the Femto Forum and the NGMN



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Alliance. Some entities that are not that old are starting to become quite established and large, such as WiMax Forum, OMA, the TM Forum and the ubiquitous 3GPP whose wireless work seems to affect all parts of the network as wireless-wireline network convergence becomes a reality. And at the other end of the spectrum, the major standards entities such as ITU-T, ATIS, TIA, IETF, IEEE and ETSI aren't standing still either, and are creating new committees to address a multiplicity of new standards challenges in such new topics as Cloud Computing as well as in other areas where telecom technologies are being applied to other industries, such as Automotive Telematics, Healthcare Telematics and Smart Grid.

Not only are there many more standards committees today, and not only are they meeting more often, with virtual meetings scheduled in-between face to face meetings, but the meeting locations are now more global as well. Twenty years ago a standards expert based in the US primarily attended standards meetings that were within the continental US with only a few “international” meetings. Ten years ago that same expert might have had to start attending a number of meetings in Europe (mostly Geneva) with an occasional meeting in Asia now and then. Nowadays however, most standards experts expect to have more than half their business travel outside the US, and increasingly in locales that are widely spread across the globe, especially across Asia.

But with airfares and travel costs exploding and an ever increasing number of far-flung meeting locales, companies that want or need to participate are finding it increasingly hard to track, let alone send participants to so many standards bodies.

As mentioned above, the move to an open standards process was motivated by a desire to reduce the costs of standards development, in part by broadening the base of companies providing resources. Aside from paying membership dues, companies that wish to participate must send their tech experts to numerous standards meetings. When the salary and T&L costs are factored in, the cost of participating in standards is often several orders of magnitude higher than

the membership dues that are assessed by each standards committee.

While the world of telecom standards has changed dramatically, the reasons that companies participate in standards remains the same. These reasons can be boiled down to the following key concepts: strategic advantage, allocation of resources, identification of competitors and partners, and information transfer.

Strategic Advantage: Standards affect companies in different ways, depending on whether you are an incumbent with well-entrenched offerings or a startup with a “game changer” technology. In the case of an incumbent, following the development of a technology standard not only applies to new business opportunities but also protecting an old business. If you are a carrier (or vendor) that buys (or sells) say, multimillion dollar equipment and a new vendor comes along with a box based on a new technology that provides comparable features for a fraction of the price, you now have a vested interest in that technology standard.

Allocation of Resources: The standards arena is often characterized as a horse race between competing technologies. It is also a voluntary process, whose progress is wholly dependent on the resources that member companies devote to the process. If your competitor pours on the resources to double the number of technical contributions to accelerate the incorporation of their specific technologies into developing standards, you need to know that so you can respond, either by devoting more resources

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yourself or by taking some other course of action.

Early Identification of Potential Partners and

Competitors: For a company engaged in standards, an important factor is not only identifying your competitors, but identifying potential partners to help achieve your business goals. As much as possible, companies seek partners that possess the clout and political networking skills that can get things done within the organization.

A key point is that the best technology does not always “win the race.” The “winners” are the companies that have the best business plan and who establish the partnerships necessary for bringing a specification to fruition.

Information Transfer: Most companies participate in standards to transfer information in two directions. Companies submit technical contributions to standards bodies in order to ensure that developed standards are based as much as possible on the architecture and technology that supports their business model and operations. Conversely, a company’s product and/or service developers need to know about the latest standards to ensure that their products are services will support or conform to the



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standards that being standardized by the industry, which is increasingly a requirement that buyers demand. Thus, this information transfer requires information that is comprehensive, timely and well-organized. Information must also be tailored for different audiences within a company. For example, the person who attends the standards meeting, the tech expert or developer in the lab, the corporate standards manager who deploys internal resources on technology development, and the senior executive who oversees multiple departments, all access and interpret information in various ways.

Bellcore is now known as Telcordia and although the industry's reliance on their GRs is diminishing, new GRs are still being developed and updated, since GRs by definition are immediately implementable in ways that standards, with their numerous options and lack of specificity, are not. Telcordia is still one of the major players, in terms of leadership and technical contributions, driving telecom standards developments in all the major US and international standards bodies. This time, however, Telcordia's technical experts are not just providing consulting services to the former Bell companies, but are actively involved in support of carriers and vendors, from large to small, from wireless to wireline, domestic and international, not to mention a myriad of government agencies. This multi-client posture has allowed Telcordia to engage in standards-related consulting projects as a trusted advisor to companies in all parts of the industry and worldwide.

As mentioned above, with so many standards bodies, with some working cooperatively on similar projects while others seeming to work at cross-purposes, it can be difficult to navigate the shifting technology, business, and political machinations within each organization.

Even the most-connected telecom players can be challenged with where to start, prioritizing which SDOs to engage in, discerning the roles of current members within an organization, and generally determining how to best maximize their involvement. In addition, a large company may have different business units that approach a technology standard from different, not necessarily complementary angles.

Companies need accurate, reliable information with a vendor-neutral assessment of a standards body's goals, members, and accomplishments to make informed decisions on devoting resources to join an organization. More than 10 years ago, Telcordia recognized the need for a repository of telecom standards-related information and – given the

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company's involvement in all of the top bodies – built a “standards knowledgebase” offering.

Today, the Telcordia® Standards Knowledgebase is a web-based subscription service with up-to-date, detailed information and analysis on virtually all of the world's major telecom standards forums, including 3GPP, ATIS-sponsored committees, IEEE 802, IETF, ITU-T Study Groups, OIF, TM Forum, as well as newly emerging standards bodies such as Femto Forum, NGMN Alliance and more.

With standards bodies, there are a lot of moving targets. Companies constantly shift; the strategies within companies constantly shift. Technologies move ahead and leapfrog each other.

The Telcordia Standards Knowledgebase is the only industry offering that provides a big-picture perspective on the developments of standards bodies, helping users understand the significance of recent happenings even if they have never been to a committee meeting.