



*Attorneys at Law*

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## THE EMERGENCE OF THE DIGITAL HOME

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Standards involving many new technologies are being developed to make the home of the future possible today. None are more important to that enterprise than a rapidly expanding family of wireless standards – and few have been more competitively (and sometimes contentiously) agreed upon.

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New standards are being developed in multiple areas to enable the digital home, from environmental controls, to networking, to home entertainment, and more. The rapid evolution of the ecosystem of standard setting organizations (both old and new) that is developing these standards provides a current example of how standards infrastructures rapidly develop to address new commercial opportunities.

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When Massachusetts CIO and OpenDocument Format (ODF) champion Peter Quinn announced his resignation last year on Christmas Eve, Massachusetts Governor (and presidential hopeful) Mitt Romney had two choices; stick with ODF, or abandon it. The former would antagonize some, while the latter could leave him vulnerable to charges of "flip flopping" and giving in to special interests. Luckily for the ODF camp, he called the coin toss right.

**Consider This:**      **Body Type Standards, Crash Test Dummies, and Sleeping With Big Agnes**      **14**

What is the size and shape of the "Standard American?" It's a standard that matters more than you might think. And when Americans get larger, then its time to revise the standard.

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## EDITOR'S NOTE

### NOW WE ARE THE JETSONS

Those who have attained the lofty age of 45 or so will remember one of the more successful Hannah Barbera cartoon series, called "The Jetsons." In that series (and in many other books, movies and television shows over the past 75 years), a world was imagined where homes possessed the technology to serve every whim and desire of their owners.

Today, after many decades of anticipation, the digital home is beginning to become a reality, made possible not only by the maturation of various types of technology, but also by the development of a host of standards in areas ranging from telecommunications, to networking, to data formats to an ever-growing family of wireless standards. And if we are not yet able to replicate the home imagined by Ray Bradbury in "The Veldt", we have certainly entered an era where our homes truly will be more comfortable, more safe, more energy efficient and more entertaining than ever before.

The theme of this issue of the **CSB**, therefore, is the SSOs and the standards that are making the digital home possible and in describing these organizations and their work product to illustrate how such an infrastructure can rapidly emerge, utilizing existing organizations and forming new ones. At the same time, I use this evolution to highlight how stakeholders behave when they have much to gain (or lose) as a result of the new standards that are created.

This month's **Editorial** begins the review by examining the most fundamentally important family of standards that are making the digital home possible – the rapidly expanding family of wireless standards that have been, and continue to be, developed.

The **Feature Article** uses the evolution of the digital home as a case study, in order to demonstrate how new standards ecosystems evolve. It does so by taking a closer look at each of the major areas of innovation that is making the digital home a reality, and identifies many of the individual SSOs that have created the standards in each of these areas. It also describes the often "unruly" dynamics that have accompanied - and sometimes impeded - progress in these sectors.

In this month's **Standards Blog** entry, I return to a topic that I have been following since September of last year: the ongoing saga in Massachusetts relating to the adoption of the OpenDocument Format (ODF) by the Commonwealth's Executive Agencies. This particular blog entry (among many that I have posted on this and other topics since the last issue) offers my guess that presidential hopeful Governor Mitt Romney has decided that standing firm behind ODF makes better political sense than flip-flopping and giving in to special interests in the wake of the Abramoff scandal.

In my **Consider This...** essay for this month, I reflect on the fact that the "standard American" is now, shall we say, rather "larger" than not so long ago.

And finally, as usual, I close with **The Rest of the News**, presenting what I thought were some of the most noteworthy news stories and press releases out of the many that I chose and posted at the ConsortiumInfo.org News Portal since the last issue of the **CSB**.

As always, I hope you enjoy this issue.

Best regards,



Andrew Updegrove  
Editor and Publisher  
2005 ANSI President's  
Award for Journalism

## EDITORIAL

# THE WIRELESS (STANDARDS) HOME OF THE FUTURE

Andrew Updegrove

The home has always been enabled by formal standards – both discrete (e.g., the dimensions of lumber, plumbing and electrical components), as well as comprehensive (as with the complex systems of standards that comprise modern building codes). The places where we live are also rife with informal standards borne of convention, such as the standard height of stair risers, kitchen counters and chairs. Even the shapes of our wine glasses and the bottles that we use to fill them conform to shape conventions that have evolved to indicate the liquids that they are intended to contain. In each case, we are so familiar with these design elements that we take them for granted even as we enjoy their benefits, both trivial as well as profound.

Today, there is a new wave of technical standards under development that will revolutionize how we live at home. These standards will change the way we control the increasing number of systems we rely upon to control our domestic environments and to entertain us. They will also make our energy use more efficient, our lives more safe and effortless, and the technical quality (if not, sadly, the content) of our video entertainment more brilliant.

Many of these new products and services were imagined decades ago, such as the videophones that tantalized visitors to the AT&T pavilion at the New York World's Fair of 1964, long before the technology existed to make them a commercial reality. Today, that technology is becoming available, and once futuristic products and services are now, one by one, becoming commonplace. Indeed, a modern cellphone is not much larger than Dick Tracy's "two-way wrist radio" – and contains a Web browser, PDA and other features never imagined when Tracy was a "must read" in the funnies of the '50s.

While a number of technical and economic developments of recent vintage have made this renaissance possible (e.g., cheaper, more powerful chips), no single development will play a greater part than the creation of multiple near, medium and long range wireless capabilities and services, each defined and made possible by standards. These standards are being developed by a wide variety of standard setting organizations, both venerable and accredited (such as IEEE) as well as new consortia (like the Near Field Communication Forum (NFC) and EPC Global).

These services will operate at distances as short as a few centimeters (NFC standards enable tasks such as device-to-device identification), to short distances (as with the RFID devices that will tell us what enters and leaves our homes), to intermediate (such as the Wi-Fi standards that already enable our home networks to operate) to long distance (such as WiMax compliant equipment, which will allow large areas to be served with broadband transmissions from a single transmitter).

These standards will also deliver high definition television data to more vivid flat panel displays without connecting wires, as well as digital music provided by new Internet-based services via other wireless devices. They will also enable the delivery of faster broadband services to and throughout our homes, will permit networks of inexpensive sensors to monitor and control our heat, light and safety, and will allow the dramatic upgrading of entertainment systems. With other standards, we will be able to tell where our pets and (if we wish) our children are at any point in time, while not (we hope) allowing others to track us without our knowledge or permission – a result yet to be guaranteed.

There is even hope that some day – perhaps soon – that most evanescent and desirable of all technical grails may be defined by standards: The Universal Remote. (And woe betide us if this vision proves to be an illusion.)

At the same time, industry is being energized by new product opportunities of many types, and vendors are competing to provide us with new as well as upgraded devices. New "standards profile" consortia such as the Mobile Imaging and Printing Consortium (MIPC) are compiling suites of standards that enable new wireless linkages between devices that did not previously exist, allowing us (for example) to effortlessly print pictures directly from our mobile phones to our home printers.

All of these possibilities are maturing nearly simultaneously, and each relies increasingly on the work of several, and often many, different accredited and unaccredited standard setting organizations.

Unfortunately, with opportunity often comes contention, and it is perhaps no surprise that as the stakes have risen, so has the energy with which individual proposals have been promoted. In some cases, this has been healthy, leading to the overlapping development of multiple technologies (e.g., Wi-Fi, Wi-Lan and Wi-Max), no single one of which will be "right" for all situations. But in other instances, as with USB (the standard that may make home video cabling a thing of the past), rival factions have refused to compromise, leaving the consumer to make confusing decisions where the differences between two competing standards will be of little interest.

Notwithstanding such situations, it is likely that in the space of only a few years the great majority of these new goods and services will become ubiquitous. And, with pervasiveness, they will become just as taken for granted as are the home comforts that we already enjoy, so many of which were made possible by the now-forgotten standards development work of the past.

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## FEATURE ARTICLE

# CASE STUDY: THE UNRULY EMERGENCE OF THE DIGITAL HOME

Andrew Updegrove

**Abstract:** *Although basic electrical devices like thermostats, phones and radios entered our dwellings many decades ago, the long-awaited vision of the "digital home" is only now becoming a reality. The emergence of the futuristic home, controlled by and for the fulfillment of the comfort, safety and enjoyment of its owners, has become possible only with the development of the hundreds of telecommunications, wireless, data format, networking and other standards that have been created by scores of accredited standards development organizations and unaccredited consortia, some venerable, and others new and created specifically for this purpose. An examination of how this new standards development ecosystem has evolved demonstrates how complex standards infrastructures come into existence through the reordering of relationships among existing, and the formation of new, standard setting organizations. Such a review also illustrates how participants behave when commercial opportunities are great, and the stakes for success (or failure) are high.*

**Introduction:** Through the coincidental maturation of a variety of technologies, the New Year has brought a rash of news stories and product announcements relating to innovations in digital home technology. All at once, multi-year research, standards development and commercialization efforts in video delivery and storage technology, wireless services (both "last mile" and in-home), multiple types of display technology, and new PC capabilities are converging at roughly the same time, allowing long-anticipated innovations in home services and systems to become available to consumers.

In each case, these new digital goods and services rely on new standards created within a broad variety of standard setting organizations (SSOs) that are both accredited and non-accredited, broadly targeted and narrowly focused, venerable and brand new. Taken together, the scores of SSOs involved, and the hundreds of standards that they have developed to this purpose, provide a vivid example of the degree to

which our modern, technology-based society is dependent on the largely unseen operation of the global standards development infrastructure.

At the same time, the news has also been rife with stories describing the emergence of rival factions promoting their favorite standards solutions. Sometimes these battles are being fought within existing SSOs, while in other cases new forums have been created to act as auxiliaries to ongoing efforts within an already existing SSO, and in still other instances totally new SSOs have been formed to develop and promote standards. For better or worse, this behavior is typical of the highly competitive operation of the standards development infrastructure, as the exact parameters of a new standard can have profound economic impacts – both positive and negative – on the vendors that participate heavily in the SSO process.

Where such contests have been waged, the efforts of opposing camps have sometimes been reconciled, resulting in the ultimate release of one standard by a single organization. But in others, the effort has failed, leading to the announcement of two standards, each supported by separate but otherwise often substantially equal product lines – thereby leaving the consumer with two options, and little to inform her choice as between the two. This too is typical of the standards development process. Still, given the high stakes and the fact that both SSO participation and the implementation of SSO standards is voluntary, it is a testament to the stability of the standards development process that such results are rare rather than common.

Lastly, the example of the emergence of the digital home illustrates the degree to which consortia have been influential in addressing the needs of the information and communications (ITC) technology industry. Perhaps because so many technologies and product opportunities are brand new in the ITC space, consortia have been utilized to a vastly greater extent here than in traditional industries. Similarly, some of the most active and respected accredited SSOs (such as the IEEE) that are nominally accredited in one country have become global, rather than national organizations – in part, because data knows no borders.

In this article, I survey several of the principal areas of innovation and the resulting new product types that are now reaching the market, and the related SSOs and promotional organizations whose usually complimentary, but sometimes conflicting, efforts are enabling the digital home of the future to (finally) emerge into the present.<sup>1</sup>

**The Technologies:** Homes have made increasing use of sophisticated electronic technologies over the last fifty years, and in many cases the areas of greatest innovation today represent efforts to create ever more sophisticated upgrades to the basic products introduced when electronic technology first entered the home. Chief among them are the following:

**Environmental controls:** The first simple thermostats liberated the homeowner not so long ago from the need to stoke the wood stove or shovel coal into the furnace throughout the day (and night). These controllers, of course, depended on the development of additional technology: the electromechanical means to control and feed coal, oil and gas to furnaces. In the first simple systems, hot air and hot water could literally rise to the occasion, with hot water heat providing manual room by room adjustment through taps placed on individual radiators.

Over time, each new development in home environment technology gave cause to the design of more sophisticated controllers. First, as better means of distributing heat were developed, localized controls became feasible as well as desirable. When central air conditioning became affordable, more attention was paid to the means (fans) to distribute this new luxury equally where needed, and controllers were needed that could regulate both cooling as well as heating. Humidifiers could also be added to the same system, offering the ability to further influence one's immediate environment – and the need for a device to control that variable as well.

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<sup>1</sup> The links in this article lead to SSO descriptions found in the [Consortium and Standards List](#) section of the ConsortiumInfo.org Website. This is the largest and most complete list of accredited and unaccredited standards organizations in existence. Each description includes the purpose and activities of the organization in question, as well as links to its site, and (if publicly available) to its specifications and intellectual property rights policy as well.

With the increasing price of fuels, programmable controllers became attractive, in order (for example) to automatically lower heat at night to conserve energy. Similarly, as alternative energy sources (e.g., active and passive solar systems) were developed, these technologies needed to be accommodated as well. But control was still exercised in most cases by thermostats that remained in many ways not so different than those in use decades ago. The most significant advance was the addition, either locally or centrally, of a computer chip and related technology.

Today, even more elements of the home environment are becoming centrally controlled, resulting in the design of devices that can locally or remotely make adjustments not only of heat, humidity and cooling, but also control light, yard sprinklers, child monitors, security cameras, and the unlocking of doors. A further area of innovation helps address the needs of the elderly and the disabled.

In the course of this evolution, traditional accredited SSOs have created new electromechanical standards to replace or supplement ones they previously created, while other accredited SSOs that previously had no need to commission information technology oriented working groups have realized the need to do so, creating (for example) standards for wireless solutions that are intended to replace wired or cabled services that conform to standards created by older SSOs. At the same time, new organizations have been created that focus solely on the standards needed to enable the digital home.

One example of such a new organization is the Z-Wave Alliance, which has created both a standard as well as a certification and branding process for controllers that are intended to "deliver increased comfort, convenience, safety and security." Over 100 companies implement ZWave compliant products that permit wireless, pre-programmed control not only in traditional areas such as lighting and temperature, but also in more modern applications, such as to control the operation of home theaters, and the heaters and circulators of pools, spas and hot tubs.

Another relatively new consortium (it was formed in 1997) is the Energy Conservation and Home Network Consortium (EchoNet). Its mission is to develop "software and hardware to support a home network that is committed to energy conservation, security, home health care, and other domestic needs" using existing power lines, as well as both radio frequency and infrared devices to enable data transmission without additional wiring.

**Entertainment systems:** The simple radios of the first half of the last century have given way to sophisticated stereos, while simple black and white televisions have evolved into ever-larger flat screen displays. Similarly, VCRs have given rise to "surround sound" home theaters and Tivo players, while new on-demand video services are transcending the traditional limitations of structured programming. And all of the above are converging with the home computer.

Here again, the standards that are enabling this evolution are being created by a mix of old and new SSOs, with (for example), accredited SSOs continuing to serve the safety compliance and certification needs of home electronics, while other SSOs, both accredited, unaccredited and brand new create the standards needed to meet the unique needs of new products and services. Newer consortia in this domain include the Home Audio Visual Organization (HAVi), which brings together consumer electronics, software, semiconductor and computer manufacturers to promote a network architecture designed to enable home audio-video interoperability at the API and middleware levels to allow "plug and play" performance (i.e., new devices that are added to the network identify themselves and negotiate interoperability with existing devices). HAVi standards are intended to be compatible, and work with those of other consortia with similar goals, such as Jini.org and Universal Plug and Play and Forum (UpnP).

A similar effort was launched by the Universal Home API Forum (UHAPI Forum), which also focuses on making home entertainment systems more attractive purchases for homebuyers. The ultimate goal of the UHAPI Forum is to standardize a complete set of open APIs for a variety of appliances such as analog and digital televisions, set-top boxes, DVD players and recorders, printers, personal video recorders, home servers and other consumer audio and video devices.

**Communication:** While the telephone has been present in households for over a hundred years, only in the last thirty has it become revolutionized, first by the development of switching and long distance



transmission technologies that have nearly eliminated the need for human operators, and (through deregulation and the breakdown of monopolies) decreased long distance costs. In the same time period, the humble rotary-dial phone finally gave way first to the push-button phone, then to mobile and wireless base station phones, and now to multi-purpose and multi-service wireless devices that incorporate computer, telephone, video, text messaging, Web access, and other functions, and which are already eliminating the need for land-line accounts for many customers.

The standards used to enable these upgrades range from those regulated through the International Telecommunication Union (ITU) globally and the Federal Communications Commission (FCC) in the United States, to those created by literally scores of accredited SSOs and unaccredited consortia, in the case of multi-function hand held devices.

**Data formats:** Traditional color television is giving way to High Definition television, even as existing DVD players are about to be replaced by two competing standards-based high definition technologies. At the same time, digital radio transmission and reception is just entering the marketplace. The efforts of regulators (in the case of broadcast frequencies) as well as accredited and unaccredited SSOs are involved in these developments (upon which more later).

**Transmission modes:** But the greatest revolution of all unquestionably lies in the means by which these various new devices communicate with each other and are controlled by their owners, as well as the means by which services are delivered to, and by them. The methods being employed to accomplish these goals are diverse, and in each case, are standards based. The categories of progress in this category include the following:

**Connecting to the Network:** The so-called "last mile" constraint to delivering broadband data to the home from the high-capacity fiber optic cable infrastructure that has already been widely deployed has challenged the industry for years. That constraint arises from the limited capacity of existing pole-to-home "twisted pair" copper wire to deliver data at robust speeds. With the cabling of more and more households to allow the purchase of expanded cable television services, however, a new route became available to provide broadband data services: the **cable** infrastructure already largely in place.

The increasing availability of such services, in turn, provided the competitive challenge to the TelCos to finally accelerate the rollout of the infrastructure needed to deliver their own solution: **DSL** coverage. However, just as the TelCos were slow in offering the original DSL service, their reception to the next-generation standard DSL standard ("Very-High-Bit-Rate Digital Subscriber Line 2", or **VDSL2**), approved by the ITU last summer, has been lukewarm, despite the fact that VDSL2 might allow the delivery of such services as pay-per-view video.

Other alternatives include **satellite**, **WiMax** (a long distance microwave frequency analog version of WiFi), and delivery of internet over existing **Powerline** networks, each of which can be useful to serve sparsely populated areas. WiMax and Powerline services may also come to be economically competitive in urban settings as well. And while satellite has been available for some time, fixed-station WiMax is only just now being launched commercially, based on the development work of the IEEE in creating the standard itself, and the certification and promotional work of the supporting WiMax Alliance, which has created the means to test and certify WiMax compliant equipment.

**Integrating data sources, networks and devices:** While it's good news that consumers may now gain access to the Internet via multiple means, this reality presents other challenges, as does the rapidly escalating number of types of devices that consumers would like to use, and the proliferation of Internet-based services they wish to enjoy. These challenges have been met by another crop of new organizations, each of which is dedicated to resolving some subset of these issues.

One example is the Home Gateway Initiative (HGI), which was launched by telecommunications providers in December of 2004 to develop and promote standards to guide manufacturers of the "gateways" that homeowners may need to ensure interoperability among home network(s) and home-based devices, on the one hand, and the wide area network represented by the external Web – and thereby create a greater market for TelCo-provided services.

**Voice over IP:** Just as wireless telephony is challenging landline service, "**VoIP**" technology has become sufficiently sophisticated to provide a real alternative to traditional telephone service. Although this type of service may soon become taken for granted by the user while speaking, its impact on pricing and service models may be profound, driven by freely downloaded (thus far, by more than 262 million people) software such as Skype. Using VoIP, a user can add a handset to a broadband connection, and eliminate her normal phone service entirely, and take advantage of additional features (such as video) as well. The development of the underlying standards for this new service again brings together the old and the new – in this case, the venerable International Telecommunications Union (ITU) and the nouveau Internet Society (ISOC) and the Internet Engineering Task Force (IETF) among other organizations.

**Wireless:** For some time, the IEEE has been the crucible within which most of the wireless activity has occurred that is relevant to the home. That work is identified by a series of numerically designated standards that all begin with "802," to which various numerical and alphabetic suffixes are added to distinguish each tailored application from the next.

While these names may suffice for the engineers that create these standards, the marketing departments of IEEE corporate members have seen fit to attach more accessible names to the technology in order to sell products that rely on these standards. The result has been the popularization of names such as "Wi-Fi" (based on 802.11a, b, and g, to date) and "WiMax" (which utilizes 802.16).

Wi-Fi standards have been extremely useful for enabling the small, localized networks used by homeowners, coffee shops and small businesses, and may in the future be used in broader applications involving "mesh" networks that link multitudes of home and business Wi-Fi routers, each allowing a signal to be handed off to the next. A proposal for the standard to accomplish this result – to be developed by the IEEE as 802.11s – is supported by the Wi-Mesh Alliance

But there are also many additional standards that operate at shorter ranges – some being used at a range of only a few centimeters, and others at a few feet or yards. The best known of these standards is Bluetooth, which was originally developed by Nokia, and is now supported by the Bluetooth SIG. A newer specification is the Near Field Communications standard developed by the Near Field Communications Forum, which operates at a distance of only one or two centimeters, and can be used (for example) to set up the transfer of pictures from a camera to a printer.

**Making life easy:** Just as HAVI and the UHAPI Forum (discussed above) are each seeking to make it more attractive for homeowners to buy audio and video consumer products by enabling cross-vendor "plug and play" performance, other SSOs are making the purchasing of their members' products more tempting by resolving other barriers to realizing the digital home.

One such focus is avoiding the need to install new wiring in order to enjoy the benefits of a home network. While wireless-enabled products are one solution, there are others as well, such as that offered by the Home Phoneline Networking Alliance (or HomePNA, founded in 1998), the mission of which is to ensure adoption of a single standard for utilizing already existing home telephone wiring to permit sharing of a single external Internet connection by multiple computers in a home. Like many other consortia that create standards intended to drive consumer buying behavior, HomePNA also provides a certification testing and branding program.

A similar goal, but a different conduit, is the focus of the HomePlug Powerline Alliance. As this organization's name indicates, the standards, certification program and branding that it offers repurposes existing home electrical wiring to create a home network.

Not all such efforts have been successful, however, as the marketplace has favored some solutions but not others. The HomeRF Working Group, for example, was founded in 1998 to create a home wireless standard optimized for handling voice, data and entertainment applications. The early success of Wi-Fi, and the early focus on lower-density data, rather than voice or entertainment, however, led to its dissolution in 2003. The solutions of other organizations (such as those that repurpose in-home telephone wiring) may prove to be transitional, as other technologies – and in particular wireless solutions that have fewer problems dealing with electromagnetic interference – leapfrog them.



**Getting to yes (but not always):** As noted in the introduction to this article, not all efforts to achieve consensus have been successful, and the points of fracture can vary widely.

For example, as described in the April 2005 issue of the CSB, China continues to push a number of its own home-grown standards, including several wireless specifications. One is called WAPI (for Wired Authentication and Privacy Infrastructure), while another (called TD-SCMA) has been developed as an alternative to two other 3G telephone standards, WCDMA and CDMA2000. China is also active in developing its own RFID standards. In each case, a major motivation is to avoid the expensive patent royalties that Chinese manufacturers would need to pay in order to build to non-Chinese standards.

Similarly, regional standards strategies (particularly in the EU, but also in other areas, such as Southeast Asia), may lead to competing standards initiatives.

The greatest divergences, of course, are among vendors, and the strategies that they adopt in a given instance or market vary. At one extreme, there are individual patent owners that unabashedly work to promote a standard that will reap the greatest royalties, and seek to gather companies around them to support their cause. At the other, there are companies that work within existing organizations to promote their cause, but sometimes break away when they are unsuccessful in achieving their goals.

An example of the first tactic that has had an impact on home products is the long and bitter series of struggles between the proponents of competing specifications for each generation of home DVD players. The first, and most notorious conflict, was the VHS – Betamax format war of the 1970s and 1980s, which doomed content owners to support, and video rental stores to stock, both formats, and ultimately left millions of Betamax owners marooned with players that were compatible only with a format that content owners and video stores eventually abandoned. The sides engaged again with the first generation of home DVD players, until one side gave in to the other – but only for a share of the royalty income from the winning format.

Now, the same industry is at it once again, as it seeks to introduce next generation technology in order to reinvigorate sales to an already saturated market. One group supports a specification called HD-DVD, while another champions a format it calls Blu-ray, each of which has distinct, but not overwhelmingly superior characteristics relative to the other. The battle has been waging for years, and each camp has at one time or another seemed to hold the edge over the other. Until recently, the Blu-Ray group seemed destined to prevail – until Microsoft announced that it would support the HD-DVD standard rather than the Blu-ray format, which led to Hewlett Packard and others switching their support.

Along the way, each of these camps formed its own support group to further develop and promote its specification, and, sadly, neither side has given in. This spring, home video players will reach the stores from each camp, to the distress, once again, of content owners, video rental stores, and confused buyers.

An example of the second type is the struggle that has been ongoing for some time within the IEEE task force that has been seeking to create an Ultra Wide Band (UWB) wireless standard with high enough data transmission rates to permit (for example) the sale of wireless video displays. The task force developing the new standard was successful in winnowing 23 technical submissions down to two, but then stalled. This was in part because the proponents of the two final contenders had each formed their own independent supporting organization and sought to rally as many interested companies to its cause as possible. As a result, neither group could achieve the support of the required majority within the IEEE task force to secure final adoption of its proposal.

When a final effort to reconcile the two competing standards failed, the task force decided to abandon the effort, and let the marketplace decide which of the two alternatives it would finally support. Once again, incompatible competing products will enter the marketplace.

In the middle is a third approach that some SSO members have taken: the creation of new working groups within multiple existing SSOs to address the same problem, and/or the founding of a new consortium (or multiple consortia) to advance favorite approaches. This occurred broadly in the case of early wireless applications, giving rise to multiple specifications, (e.g., Wi-Fi, Bluetooth and HomeRF), all of which were originally claimed by their respective proponents to be suitable for many of the same purposes. Over time, two out of three of the three standards just noted (Wi-Fi and Bluetooth) found their

own niches, where the strengths of the particular specification were found to be the most suitable. The third entrant failed.

Notwithstanding the often over-promising claims of those that promote new specifications, the first standards to enter the field do not necessarily address all needs. As a result, later standards (such as the Near Field Communications standard) are often developed to fill in the gaps where none of the earlier standards prove to be appropriate. In the case of NFC-enabled devices, the full power (and cost) of implementations of earlier standards are not necessary to achieve the results needed.

Second generation standards often follow as well, sometimes promoted by new organizations. For example, the Zigbee Alliance was launched to promote the use of yet another IEEE 802 family standard (802.15.4), just as the Wi-Fi Alliance was formed to promote, brand and certify 802.11a, b and later Wi-Fi standards. But in this case, the new standard was not an upgrade of an earlier IEEE standard, but rather a specification intended to provide a superior, less expensive alternative to Bluetooth-enabled devices. The Zigbee Alliance, in turn, promotes this standard for the particular uses for which it has been optimized, which principally focus on controlling many types of home devices.

Over time, not only does the full set of needed standards tend to evolve as the market matures and purchaser needs become more clearly defined, but the SSOs that were created in a new field often consolidate as well. The Open Mobile Alliance, for example, is the coalescence of many of the early mobile wireless groups that sprang up like mushrooms in the early days of the nascent industry, but later merged into one.

**Summary:** While the names of few standards ever become household words (Wi-Fi being one of the rare exceptions), the emergence of the digital home as a reality provides an excellent example of the little-noticed process whereby large numbers of standards are developed by many old and new SSOs to enable long-awaited visions to become productized. The enormity of the home market for consumer goods and telecommunication-delivered services has also inspired activity that illustrates the types of competitive posturing, alliance-building and other behaviors that often emerge in rapidly evolving market niches where the stakes are high. Finally, the rapid evolution of new technologies to make possible the digital home demonstrates how a mature ecosystem of SSOs – some old, some new – and successive waves of increasingly finely targeted standards (most obviously in this case, wireless standards of multiple types to serve various discrete needs) evolve to provide the interoperability and other standards tools needed to exploit the new commercial opportunity.

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*For a selection of recent stories on digital home standards and wireless standards wars, see this month's <Rest of the News>*

**Appendix: Other Relevant SSOs.** The SSOs mentioned in this article are only a fraction of those that are active in the digitization of the home. The following are some of the other organizations that focus most directly on home applications, but scores of additional SSOs set standards that enable electrical, electronic and digital home services, products and infrastructure as well:

Application Home Initiative, The (TAHI): Develops solutions for issues surrounding connected homes

Association of Home Appliance Manufacturers (AHAM): Represents home appliance manufacturers

Asymmetric Digital Subscriber Line Forum (DSL Forum): Promotes DSL broadband adoption

Audio Engineering Society (AES): Professional society devoted to audio technology

Broadband Content Delivery Forum (BCD Forum): Promotes adoption of broadband networks

Cable Laboratories: Research and development consortium pursuing new cable telecommunications technologies and facilitating interoperability

CDMA Development Group: Promotes development, adoption and standardization of CDMA wireless systems

Consumer Electronics Association (CEA): Promotes the consumer electronics industry

Digital Display Working Group, The (DDWG): Develops industry specifications based on Open IP

Digital Enhanced Cordless Telecommunications Forum (DECT): Promotes digitally enhanced cordless technology

Digital Living Network Alliance (DLNA): Promotes the development of a home wireless interoperable network

Digital Video Broadcasting Project (DVB): Develops standards for the digital television and data services industry

DSL Forum (DSL F): Promotes the development of broadband DSL

DVD Copy Control Association, The (DVD CCA): Licenses the Content Scramble System (CSS) to manufacturers of DVD hardware, discs and related products

DVD Rewritable Alliance (DVD+RW): Develops and promotes a universal rewritable DVD format

Multiband OFDM Alliance (MBOA): Develops specifications based on ultrawideband-based technology

National Electrical Manufacturers Association (NEMA): Promotes the electrical industry

Printer Working Group, The (PWG): Promotes printer interoperability

Telework Consortium: Evaluates telecommunication technologies

TV Anytime Forum: Develops audio-visual specifications

UPnP Implementers Corporation (UIC): Promotes interconnectivity standards and testing

UWB Forum: Promotes Common Signaling Mode (CSM) and Direct Sequence Ultra-Wideband (DS-UWB)

Video Electronics Standards Association (VESA): Promotes and develops display and display interface standards

Voice over IP Security Association (VOIPSA): Addresses VoIP and Information Security issues and concerns

WiMedia Alliance: Promotes wireless connectivity and interoperability

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February 27, 2006

### Mitt Calls the ODF Coin Toss Right

It's no secret that Mitt Romney wants to be president. That means he knows that everything he does and says will be under the microscope, and every decision he makes is an opportunity to further his ambitions - or a chance to call the toss wrong and lose the game. Surprisingly enough, a technical standard has presented one such decision to Romney, and the stakes for calling the toss right for his presidential ambitions may be high.

Massachusetts has been in the middle of a fracas for the past six months that has not only pitted factions of the state government against each other, but also set the largest IT companies in the world in opposition as well. The battle involves a technology standard called OpenDocument Format (ODF), which the State is to implement on January 1, 2007. When the champion of that policy, Massachusetts State CIO Peter Quinn, abruptly announced his resignation on Christmas Eve last year, the man that appointed him had two choices: duck and cover, or gamble that toughing it out would be a shrewd political decision.

That man, of course, is Mitt Romney, and the easiest path available to him was to say that he wished to consult with Quinn's successor about his or her recommendation, and then simply drag his feet in making that appointment as his term as governor rapidly expired.

The riskier path was to stick with his policy, and announce that he would not give in to local forces, including Secretary of the Commonwealth William Francis Galvin (affectionately known locally as the "Dark Prince"), or to "special interests" - in this case Microsoft, which has directed its substantial lobbying forces to heading off ODF at the pass in Massachusetts, lest the virus of implementation spread to other states - because ODF is a format for office productivity suites, and directly threatens Microsoft's vastly lucrative monopoly in that market.

Romney seemed to waver at first, when a spokesman welcomed the news that Microsoft had submitted its rival XML Reference Schema to Ecma for approval as a standard. But then the statements by members of his administration suddenly firmed up, and announcement followed announcement indicating that he would hold firm in his support for ODF.

What happened? Here's what makes sense to me, as I explained it in an interview I gave to Lisa Vaas at Publish.com after Romney's office issued a press release announcing that Quinn's successor would be Louis Gutierrez:

"The whole press release is clearly being used as a vehicle to convey the strong support of Romney for ODF," [Updegrove] said.

The reason Romney is investing political capital in a technological debate likely has to do with Romney's intention to run for president in the next election, Updegrove suggested.

First, because Romney has continued to be asked about the ODF controversy, he had to decide how to come down on it, and he likely wouldn't want to be seen as flip-flopping going into a presidential race.

Second, the Abrahamoff [sic] scandal is likely influencing Romney, as politicians become leery of succumbing to aggressive lobbying, Updegrove said.

"What with the Abrahamoff scandal, and with Microsoft pushing very hard for a reversal, would you rather look like you're giving in to a special interest or would you rather look like you're standing up to a special interest?" he said....

Lest I focus only on the presumed *realpolitik* of Romney's strategy, I should also give him credit for, well, standing up to the local politicians and powerful special interests, when ducking and covering would have been so easy to do. As I said to Vaas in the same interview:

And regardless of the political winds that brought Gutierrez to the position, Updegrave said, Romney merits praise for doing the right thing.

"You have a governor who's deciding what is the smartest thing for [him] to do here, and really, to his credit, he's doing the right thing," he said.

"He's standing up to special interests, he's standing behind the recommendations of the highly skilled professionals that he hired. He's keeping with a policy, he's going against the political maneuvering of [Massachusetts Secretary] William Francis Galvin and others on Beacon Hill, [the location of the Massachusetts State House]. He's sticking with it."

Decisive and principled - not a bad way to be viewed in a presidential campaign, if that's how others decide to view Romney's determination to stay the course as well. But would the story be reported by the press that way? And would it break out of the technical press and into the mainstream media?

It looks like Romney's bet is already paying off. Yesterday, Forbes Magazine (no less) posted a story on Romney and the ODF story at the "Faces in the News" section of its Website that begins:

Goliath software companies and executive resignations are no match for the state of Massachusetts.

The commonwealth said Monday it would stick to its guns and implement open document software standards in every state government agency.

Governor Mitt Romney stood by the policy as his Chief Information Officer Peter Quinn resigned over the issue last month, and has put its foot down by saying it wouldn't natively support the OpenDocument standard in Office 12, due out mid-year.

Granted, the Forbes reporter is a little unclear about what's actually going on at the technical level, but then again, most Massachusetts legislators are, too. The article concludes by commending Massachusetts' steadfastness in its resolve to stand up to Microsoft, saying:

When Massachusetts announced its decision to switch over to [ODF, Microsoft] called the move "inconsistent and discriminatory." The mere fact that Microsoft appears irked by the New England state's plan shows just how powerful a statement Massachusetts is making.

If one state shows it can run its IT operations just fine while shunning Microsoft's dominant software products, the door will be left open for other states, organizations and companies to do the same.

So Romney's decision to stand fast as David against the Goliath of Redmond has begun to succeed in raising his profile nationally. That's good for the Governor – and it's good for everyone that believes in open standards as well.

And it's also good in another, less obvious way: it has been repeatedly noted that Romney's successor will be entitled to replace the state CIO come November, and that the new governor could then abort the ODF transition.



Yes, that's true. But if Romney's stand continues to draw national publicity, what new governor will want to be seen as giving in to Goliath? Every day that this story grows, such a reversal will become more politically untenable.

And one thing more: it will make it easier for other state CIOs to implement ODF as well, off-setting the chilling impact of the Boston *Globe* instigated investigation into Peter Quinn's travel documentation that significantly contributed to his decision to resign as CIO.

Speaking of which: I'm still waiting for *Globe* Ombudsman Richard Chacon to fulfill his promise, made on December 12, to look into the matter. If you happen to be speaking to him or sending him an email, you might ask him when he expects to present the results of his investigation.

Bookmark the Standards Blog at <http://www.consortiuminfo.org/newsblog/> or set up an RSS feed at: <http://www.consortiuminfo.org/rss/>

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## CONSIDER THIS

*The monthly essay formerly found at the Standards Blog tab has been rechristened "Consider This..." We will continue to bring diverse and eclectic reflections on life, standards, and everything to you each month under this new title. Such as this.*

February 27, 2006

### #36 *Body Type Standards, Crash Test Dummies, and Sleeping with Big Agnes*

One of the most universally employed types of standards describes "standard" body sizes and shapes. Most obviously, there is the type of variable standard that we call a "clothes size," which we use to make the selection of clothes more efficient. But there are other types of body standards as well that focus not on variations within the population, but on establishing the maximum or the mean of human dimensional existence. These standards have a multitude of applications, from determining the size and spacing of theatre seats, to the placement of seatbelts in cars to setting the height of doorways.

Sadly, clothes sizes are unregulated, and can therefore verge on the fraudulent (as in the "perfect size 6 dress" someone finds that just fits, after trying many that won't). Body type standards used for other purposes, however, must be highly precise, especially where they are employed for safety purposes. These standards are important not only for designing products (such as the necessary range of adjustment for headrests in cars), but also to test the actual safety of the products after they have been designed.

Determining design reference standards is a relatively straightforward, if tedious, process, since it largely involves a measurement and arithmetic exercise after a test sample has been established. But what about the physical manifestations of those standards that must be created in order to perform safety tests after the designs have been turned into products – like cars?

Initially, the effectiveness of automobile safety designs was evaluated using the rather gruesome, albeit self-explanatory, practice of "cadaver testing." But available cadavers were at best only "standard" by coincidence, tending instead to be older Caucasians. And, as dryly noted in the informative entry in the

Wikipedia titled "Crash Test Dummy" "[C]hild cadavers were not only difficult to obtain, but both legal and public opinion made them effectively unusable."

Up to a point, testing could also be accomplished using "Volunteer testing" (a sub-heading that you may also find in the Wikipedia under the generic Crash Test Dummy entry. (Does this placement represent an editorial comment?) The Wikipedia has this to say regarding human test subjects:

Lawrence Partrick, a now-retired Wayne State University professor, endured some 400 rides on a rocket sled in order to test the effects of rapid deceleration on the human body. He and his students allowed themselves to be smashed in the chest with heavy metal pendulums, impacted in the face by pneumatically-driven rotary hammers, and sprayed with shattered glass to simulate window implosion.

The Wikipedia does not tell us what course Professor Patrick was teaching, or what tuition his students were paying for the privilege of furthering science, but it does record that that the tests tended to leave the Professor "a little sore." Clearly, as enigmatically noted by the Wikipedia, "To gather information about the causes and prevention of injuries and fatalities would require a different kind of subject. But what type of subject might that be?"

One possibility, of course, was to pick on our usual victims: defenseless animals, and recourse to this pool of test subjects was duly made. Mary Roach, writing at Salon.com in an article called I was a Human Crash-test Dummy (she is not actually referring to herself, but to Professor Patrick), quotes from the proceedings of the second annual Stapp Car Crash Conference, held in 1956, as follows:

We saw chimpanzees riding rocket sleds, a bear on an impact swing...We observed a pig, anesthetized and placed in a sitting position on the swing in the harness, crashed into a deep-dish steering wheel at about 10 mph.

Unfortunately, while pigs have many physiological similarities to humans, the ability to sit upright while conscious behind a real steering wheel and hurtling at a wall is not one of them. The quest for the perfect crash test subject therefore continued.



That subject, in its first instantiation, was "Sierra Sam," created in 1949 to help test aircraft ejection seats. Sierra Sam had many lineal descendants, including the Hybrid Family (unimaginatively named Mr. (the adult male), Ms. (yes, the adult female), and Hybrid III (not one, but two children of different genders and sizes – go figure). The next generation of ersatz passengers included SID, CRABI, Thor, and, most recently, Vince and Larry – two talking dummies created in the 1980's by the U.S.

Department of Transportation to promote the use of seatbelts.

But as engaging as Vince and Larry may be, it is not they that we will consider today in this installment of **Consider This....** After all, you can read all about Sierra Sam and his friends at the Wikipedia entry, under sub-headings

such as <http://en.wikipedia.org/wiki/Image:Dummies.jpg>

"Dummy Evolution," "The Future of the Dummy," and "Crash Test Dummies in Popular Culture."

Instead, we are going to consider...Big Agnes.

The significance of Big Agnes is this: while Sierra Sam may have been as American as Apple Pie in 1949, there's been a whole lotta pie (and Big Macs, and nachos, and...) going down the American piehole since then. In consequence, the crash test dummy of the middle of the last century is no longer representative of the nutritionally challenged dummies of 21<sup>st</sup> century America.

The implications of this expansion of the American physique are significant, from a safety perspective. For example, several aircraft crashes have been attributed to the realization that "standard" assumed weights for passengers are no longer representative of typical weights of real passengers. The consequences of this can be particularly dire for smaller aircraft. One such disaster involving a Canadian flight was attributed to the fact that its 10 passengers weighed, on average, 56.7 pounds more than the published standard weights specified in Canadian (and U.S. regulations).

Of course, outmoded standards can have less serene, if still unfortunate, consequences as well. For example, at the same time that Americans (and, apparently, Canadians) have grown heftier, our image-conscious culture has grown more obsessed with attaining the ideal body image of television cast members (if only in our own imaginations). When these two trends combine with other cultural forces, such as our obsession with clothes and sports gear, something has to give.

And so, with that unusually long introduction, let's take a look at an extract from a blog entry that I wrote while hiking and camping in Arizona a few weeks ago, and finally Consider this...

In some ways, it's surprising that I still enjoy camping. When I first started sleeping out as a boy scout in the early 1960's, modern camping equipment was unknown. Gear came from a sporting goods store or perhaps Sears Roebuck, and was all the same wherever you bought it, anyway. My family's first tent was what was referred to as a "pup tent," (I have no idea why), and was made of heavy, stiff canvas. If you were really serious, you could order better gear from L.L.Bean, which in those days operated from a single location of modest size and was actually a real outfitter, rather than a clothing emporium that keeps a few expensive fishing rods around for atmosphere.

Wherever you got your gear (other than from L.L.Bean), a pack was a sack with canvas straps that sought to divide your shoulders from the rest of your body when it was full, and a sleeping bag was a also a sack, of the rectangular persuasion, that (a) cost about 20 bucks, (b) was probably lined with flannel, and (c) used cotton batting as insulation. Even camping gear so basic that someone today (your kid, for example) would assume came from Noah's Ark was unknown – no pack frames, or even what would pass as a usable camp mattress (you could, to be fair, buy a narrow rubber and canvas inflatable mattress that resembled a pool float, and then spend the rest of the night sliding off it).

Camping, therefore, provided neither an opportunity to make a fashion statement nor an occasion to indulge in a love of gadgetry. Nor, for that matter, did it even offer to most mortals a realistic hope of getting a good night's sleep – especially in winter.

In consequence, my own early camping experiences always went something like this:

**Act I (*In which the subject of our drama turns in with trepidation*):** Pitch tent, lay out sleeping bag, cook and eat burnt food, hack around for awhile, put on long underwear, shirt, pants, and two pairs of socks. Fall asleep.

**Act II (*In which the Gods of Camping begin to toy with our hero*):** Wake up one half hour later covered in sweat. Take off shirt, pants, socks and long johns. Fall back asleep.

**Act III (*In which the Gods of Camping call all their friends in to share the fun*):** Wake up shivering; put clothing back on and huddle in sleeping bag. Fall asleep for one half hour. Wake up shivering and put on any other clothing one can find. Try unsuccessfully to get back to sleep.

**Act IV (*In which our hero realizes that he must face up to his heroic and tragic destiny*):** Confirm that there is no more clothing to put on. Get up and chop wood until dawn in order to stay warm.

The Gods of Camping aside (whose existence may only be inferred rather than proven), the tragicomedy above is a sadly accurate rendition of most of my early camping experiences, other than those in the dead of summer.

With time, of course, I became more savvy about such gear as was available, and did lots of backpacking and camping, winter and summer alike. But as the gear got better, I also became a lighter sleeper. Always, that ephemeral good night's sleep lay just beyond my grasp, even though various companies came to realize that there was a lot of money to be made offering high tech camping gear, much of which promised to make comfortable camping a snap.

So it was that about twenty years ago I bought my first down sleeping bag. It handily solved the temperature problem, even on pretty cold nights, and it was light enough for backpacking to boot (assuming you could stuff it into a sack smaller than a Volkswagen Bug). But by then, mummy bags had become the norm, and while I may have been warm, I also felt as confined as King Tut. Sleeping in my usual elbow-out, arm under the pillow, knee out to the side position was impossible, even though I was (and still am) slim. Moreover, rolling over in a mummy bag is an athletic experience, and difficult to pull off absent a fair degree of exertion and liberal muttering of whatever selection of words you find to be most useful and appropriate in situations of this type.

Which brings us to the present, and the planning for my latest camping trip out West. This time, I was determined to find a sleeping bag that would be not only warm, practical in size, and sufficiently roomy to sleep comfortably in, but which would also permit shifting my position without breaking a sweat. Naturally, I turned to the Web to investigate my alternatives.

I soon found that rectangular sleeping bags still exist. Now, they are sold by K-Mart, Wal-Mart and on-line vendors that all probably buy their goods from the same overseas sweatshop. Each one (still) (a) costs about 20 bucks, (b) is probably lined with flannel, and (c) uses cotton batting as insulation. So much for the low end.

At the high end was an endless array of light, down-filled straitjackets that looked more like the winter digs of Monarch butterflies than the comfortable "sleeping systems" they purported to be.

So the next question was whether I could find something in between – light and warm, but also reasonably roomy. I looked with increasing discouragement at site after site, each of which was dedicated to high-end straitjackets or low-end, rectangular ice chests.

Until suddenly I came to a new Website, and there she was – the sleeping bag of my dreams. And this product line had a memorable name to match: "Big Agnes."

I suppose I shouldn't have been surprised to find her, given our Super Sized nation. With 300 million people now, there must be a need for camping gear for the, how to say, "fully figured" camper (both male and female). The matchmaking site where I met my own particular Big Agnes included helpful statistics for girth as well as height (mine, not hers), as well as her over-all proportions. Besides having great vital statistics and room to move, Big Agnes has many other becoming features as well: her bottom is a full length sleeve, into which you can slide, not a paltry 20" wide sleeping pad, but a full 25" mattress. Truly, this was a sleeping system to be desired – a sleeping system for the American body type of Today!

It was love at first sight. My fingers fairly flew to place the cursor over the shopping cart icon, and lovingly give it a click.

So it was that this week, with the greatest of anticipation, and for the very first time, I lay myself down on the desert floor, stared up at the stars blazing overhead, and fell blissfully to sleep, cradled in the warm, welcoming, ample bosom of Big Agnes. For me – and perhaps for you, too - the new standard of camping comfort.

Comments: [updegrove@consortiuminfo.org](mailto:updegrove@consortiuminfo.org)

Read more **Consider This...** entries at: <http://www.consortiuminfo.org/blog/>

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## CALL FOR PAPERS

### THE IEC CENTENARY CHALLENGE

The International Electrotechnical Commission (IEC), in partnership with the IEE, IEEE, and VDE, and in association with *The Economist*, is holding a competition in honor of the close of the "Electric Century." The challenge Website describes the competition as follows:

This initiative is intended to offer the world's academic institutions a challenge of the highest order. Prizes will be awarded for the best papers and case studies (Submissions) on the subject: :

**A. "Consideration of the economic, business and social impact of the development and use of International Standards for end-users at any level of business activity."**

Successful societies have flourished by their ability to trade effectively. Trade has always been supported by perceptions of value based on standards of function, quality and performance. These "standards" can either be:

- Explicit or implicit;
- Formal or Informal.

Whatever the "business context", whenever a transaction takes place there is always a question of "what are the standards of function, quality and performance being offered?"

During the past 100 years there have been more inventions than in all of the previous history of mankind. This unprecedented technological advancement coupled with worldwide trade liberalization demands close examination of the connection between standards and business development.

The impact of standards and standardization in the political, economic, sociological, technological and natural environments at national, regional and international levels will play a significant role on how business and markets develop.

Interested authors are required to register by March 3, 2006, but the deadline for final submission is not until September 1, 2006.