

GLOBAL STANDARDS NETWORKS

Rawan Shah
Chief Strategy Officer
Alynd, Inc.

Global Standards Networks create the frameworks for common operations, transparency and interoperability across private, public and civic sectors worldwide. They create common designs that commercial organizations can implement as products or services to offer to end-customers. They organize collective best practices into common approved sets to elevate an overall sector or industry. They find the balance between theoretical ideals and practical needs to meet market demand. And they drive global adoption of these standards using free-market forces, rather than governmental regulation.



Table of Contents

Idea in Brief	1
Defining Characteristics of Global Standards Networks	1
The Internet Engineering Task Force	4
The World Wide Web Consortium	6
The Global Reporting Initiative	7
The US Green Building Council	9
How Standards Networks Transform Global Problem Solving	10
Operational Model and Stakeholder Roles	10
<i>Administrative Body</i>	11
<i>Standards Development Group</i>	11
<i>Standards Implementers</i>	12
<i>End Users</i>	12
Funding and Support	12
Voluntary Adoption	13
Driving Engagement	14
Balancing Interests across Stakeholders	14
Resiliency	15
Standards in a Lifecycle	16
Managing Multiple Layers of Measurement	17
Implications for Network Leaders	20
<i>Formation</i>	20
<i>Growth</i>	22
<i>Maturity</i>	23
Conclusion	25
Endnotes	26
About the Author	30
About Global Solution Networks	31





Idea in Brief

Global Standards Networks—one of the ten network types identified in our Global Solution Networks research¹—create the frameworks for common operations, transparency and interoperability across private-public-civic sectors worldwide. They create common designs that commercial organizations can implement as products or services to offer to end-customers. They organize collective best practices into common approved sets to elevate an overall sector or industry. They find the balance between theoretical ideals and practical needs to meet market demand. And they drive successful adoption of these standards on a global level through appealing business and technical rationales, based on free market forces, rather than governmental regulation.

By bringing participants from small businesses, large enterprises, academia, government and other institutions into open public forums and transparent discussions, networks such as the Internet Society, the World Wide Web Consortium, the US Green Business Council and the Global Reporting Initiative support the creation, development, ratification, and lifecycle management of standards. They then promote and market these standards through a combination of direct efforts, partnerships and commercial implementations. While the direct 'customers' of these Global Standards Networks may be the implementing commercial vendors, agencies or service providers, the beneficiaries span far further—from private citizens to organizational and government employees working locally, nationally or globally.

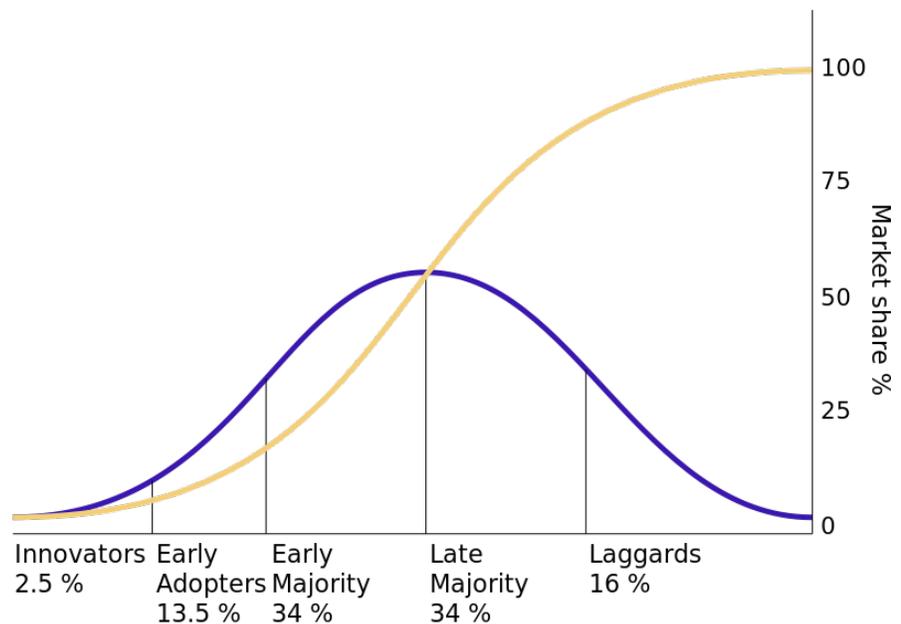
Defining Characteristics of Global Standards Networks

Regardless of our best attempts to plan for it, innovation at its heart is a collaborative, creative process, best supported by the market forces of free enterprise. On its own, a free market allows the forces of competition to elicit success for the best new ideas. By definition, this requires sufficient demand for and adoption of the idea.

State-based institutions can mandate usage through compliance, but enforcement is not adoption. Organic adoption of ideas in society is spread from person-to-person, organization-to-organization, with a basis of economic logic, practical application and social proof. Alternatively, states can offer incentives to inspire adoption and use. However, compliance and incentives are not usually applied until there is already a substantial base of parties interested in the idea. A better approach to spur early innovation is adoption in a competitive market.

“...standards form the fundamental building blocks for product development by establishing consistent protocols that can be universally understood and adopted.”

Free markets create two possible paths: proprietary ideas and open solutions. Proprietary implementations can generate a cascade of successes for years on end, but eventually will hit the limitations of a single organization's innovation efforts. Open solutions, in contrast, diffuse the risk across more stakeholders, particularly in the early development stage when, as described in Everett Rogers' "Diffusion of Innovation" theory, an innovative idea or invention has not yet generated interest by the "early adopters" whose influence will carry the concept into the mainstream.² Opening and sharing an innovative idea with a range of interested participants increases both innovation and exposure, which helps motivate the early adopters to put the idea to the test. Given sufficient visibility and awareness, open solutions help more innovations blossom earlier, more broadly and more deeply.



The diffusion of innovations according to Rogers. With successive groups of consumers adopting the new technology (shown in blue), its market share (yellow) will eventually reach the saturation level.³

Once an open solution has reached a sufficient degree of maturity and gained multiple invested participants, we begin to hear the call for open standards. Standardization is a transition from adolescence to adulthood of the innovation. The idea has survived the growing pains of implementation, adoption and competition, but to reach the next level it needs broadly accepted conventions on semantics, points of interface and rules of interaction.

In other words, standards form the fundamental building blocks for product development by establishing consistent protocols that can be universally understood and adopted. This helps fuel compatibility and interoperability and simplifies product development—and it speeds time-to-market. Standards also make it easier to understand and compare competing

“ *These networks engage the expertise of individuals, academic institutions, civil organizations and, most of all, private sector enterprise. They allow open membership and participation at various levels in development, implementation, advocacy and leadership.* ”

products or reports. As standards are globally adopted and applied in many markets, they also fuel international trade.

For standards to truly grow to a global level, they need a transparent network that disseminates the idea, reexamines the needs and uncovers the true potential across different organizations, environments and cultures. While individual nations may focus the lens of policy using their preferred local views on socio-economic environments, individual rights or cultural norms, global standards are frequently built with a neutral foundation of evidence or scientific support by a network of organizations that have a shared stake in the promotion and adoption of the idea.

Global Standards Networks that have succeeded provide a basis of interoperability or commonality for citizens, organizations and nations across the world. These networks engage the expertise of individuals, academic institutions, civil organizations and, most of all, private sector enterprise. They allow open membership and participation at various levels in development, implementation, advocacy and leadership. The transparency of the participation process (including activity and output) is anathema to oligarchic views that favor a powerful few. Their inclusivity balances the biases of commercial interests and favors merit-based approaches.

Effective Global Standards Networks partner with other coalitions, interest groups and even other standards bodies to further the understanding of a topic, invite co-operation and explore cross-integration. They rely on participating stakeholders to carry the market awareness load as part of product development and service delivery for end-use customers. In a revitalizing cycle, they anticipate future needs in cooperation with the many customer channels of their participating stakeholders.

This study examines the operational models of three different varieties of Global Standards Networks in these successful examples:

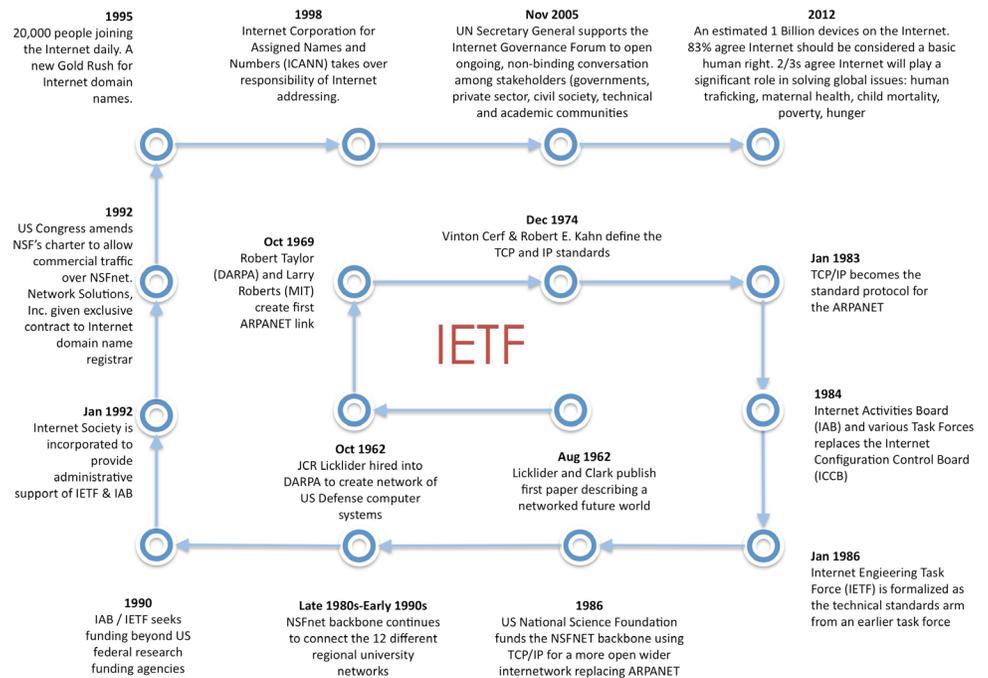
- **Global Standards Networks for Communications—** Impacting over 2.7 billion people worldwide in 2013,⁴ technology standards set by the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C) define the virtual world of commerce, information sharing, civic and business operations that has accelerated the development of human connectivity.
- **Global Standards Networks for Sustainability Reporting—**The Global Reporting Initiative (GRI) provides a framework that organizations can use to report the economic, environmental and social impacts of their resource use, supply chains and activities. The Framework has been adopted by over 5,900⁵ organizations in every industry and continent.
- **Global Standards Networks for Building Design & Construction—**The US Green Business Council’s *Leadership in Energy and Environmental Design* (LEED)



certification program established standards for energy efficiency in building design for residences, offices, healthcare facilities and factories worldwide, such as the King Abdullah University of Science and Technology Campus (Saudi Arabia), Taipei 101 Tower (Taipei, Taiwan), and the FBI Chicago Field Office building (Chicago, USA).

The Internet Engineering Task Force

The Internet represents one of the greatest achievements of the 20th century, impacting over 2.7 billion people worldwide in 2013.⁶ This technological marvel is bound not by a centralized infrastructure—thousands of small and large vendors provide hundreds of thousands of Internet connectivity products⁷—but by standard protocols and rules of engagement established through the Internet Society (ISOC) and the Internet Engineering Task Force (IETF). The IETF bases its principles on open process, a volunteer core of participants, technically competent input, rough consensus, running software code and shared ownership of the intellectual property.⁸



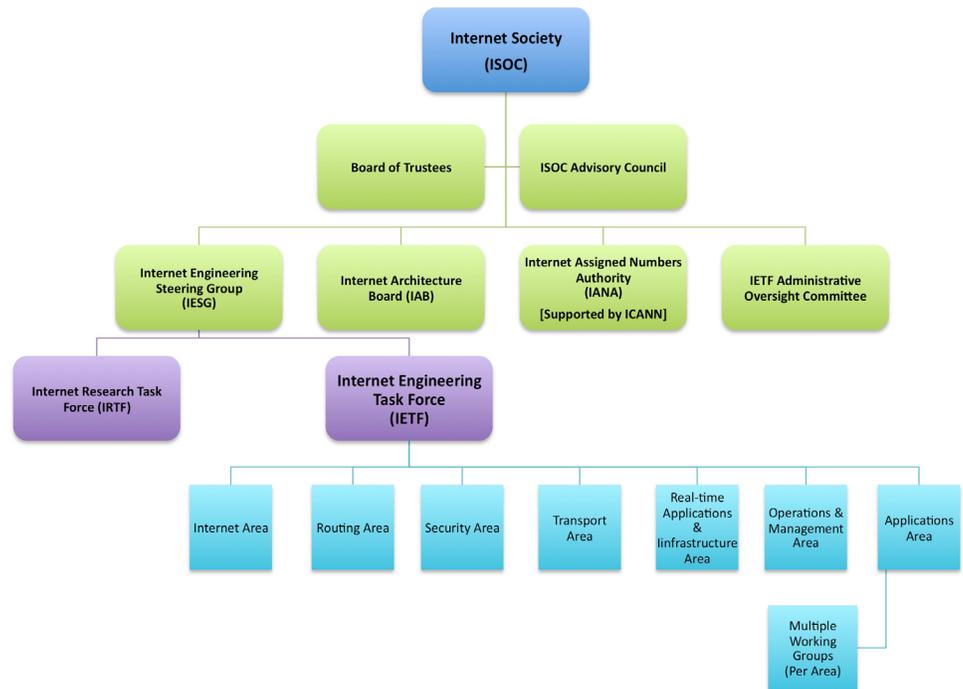
A Brief Timeline of Internet Standards Network and its Supporting organizations

“The IETF is unique,” said Russ Housley, chair of the IETF. “Unlike other standards bodies, the IETF avoids formal hierarchy where possible, [with] no membership fees. All interested parties are invited to participate in the technical evolution and stability of the Internet. The IETF’s standards are available online, without charge, providing



a platform for the continued growth and evolution of the Internet.” Per Lynn St. Amour, first President and CEO of the ISOC, “The success of the IETF has largely been due to a pragmatic, consensus-based approach to technology standards development.”⁹

The IETF organization began replacing earlier administrative bodies in January 1986. In 1992, an administrative parent organization, the ISOC, was formed “to assure the open development, evolution and use of the Internet for the benefit of all people throughout the world.”¹⁰ Beyond its IETF standards arm, the ISOC is also parent to other units that coordinate the common core operations of the Internet.¹¹ The Internet Society claims a member base of over 65,000 individuals, with 100 global chapters and representing over 145 member organizations.¹²



The Organizational Units of the Internet Society

The success of the IETF over the decades has led to sustained development of the Internet and an ever increasing scale of use that reached nearly 2.5 billion users as of June 2012.¹³ The IETF has grown in operations and areas of coverage, but there are still changes looming. The standardization process of the IETF faces increasing pressure from international participants.¹⁴ While the process is open, American engineers have authored 81% of the standards. Among the critics, Chinese engineers have contributed 2% of standards; India 1%; and Russia a bare 0.2%.¹⁵ The cultural divide in the development of the Internet was expressed in 2011, when the Indian government called for



“ *The majority of the world’s 2 billion+ Internet users are likely unaware that the Internet and the World Wide Web are not the same thing. To many, the Web is the Internet, but in fact the World Wide Web is but one of many applications and protocols accessed via the Internet.* ”

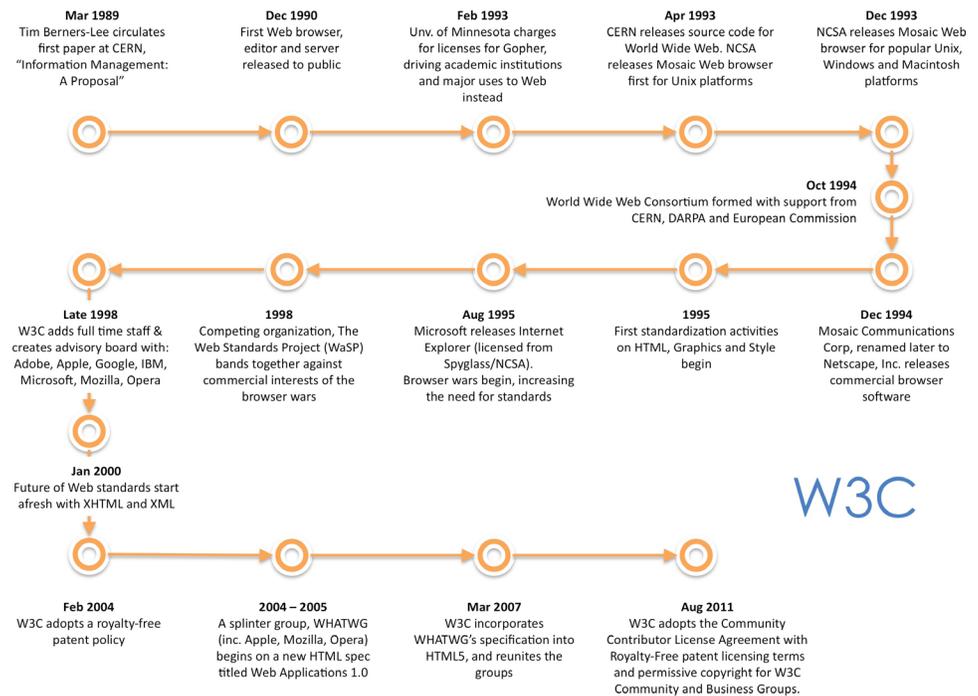
the creation of a new body that would oversee and coordinate all Internet standards and governance functions.¹⁶ Such challenges to the standardization process will likely continue as more nations, with a spectrum of cultural expectations and limitations, develop their growing Internet bases.

The World Wide Web Consortium

Many of the world’s 2 billion+ Internet users are likely unaware that the Internet and the World Wide Web are not the same thing. To many, the Web is the Internet, but in fact the World Wide Web is but one of many applications and protocols accessed via the Internet. The advent of the Web has disrupted centuries-old industry models through (a) disintermediation of supply chains; (b) transforming physical information goods such as movies, music, books and newspapers into digital formats for faster distribution; or (c) creating new market opportunities through innovative online technologies. Indeed, Web giants such as Amazon, Google, Netflix or Alibaba simply would not exist without the Internet.

The Web emerged when Tim Berners-Lee released the first Web browser and server in 1991 in order to help researchers at the Conseil Européen pour la Recherche Nucléaire (CERN) to share information across different locations.¹⁷ The scientists at CERN needed an easy-to-use and flexible substitute for strictly formatted papers and databases that would allow them to document and share their cumulative knowledge. A common issue in academic and organizational circles across the Internet, Berners-Lee’s approach rapidly spread worldwide, leading to the eventual formation of the World Wide Web Consortium (W3C) standards network in 1994 at MIT, supported by CERN, the European Commission and DARPA in the US. By 1995, Web traffic on the Internet is estimated to have surpassed the prior leading application, Email, and led to a doubling of Internet use each year for several years in a row.¹⁸





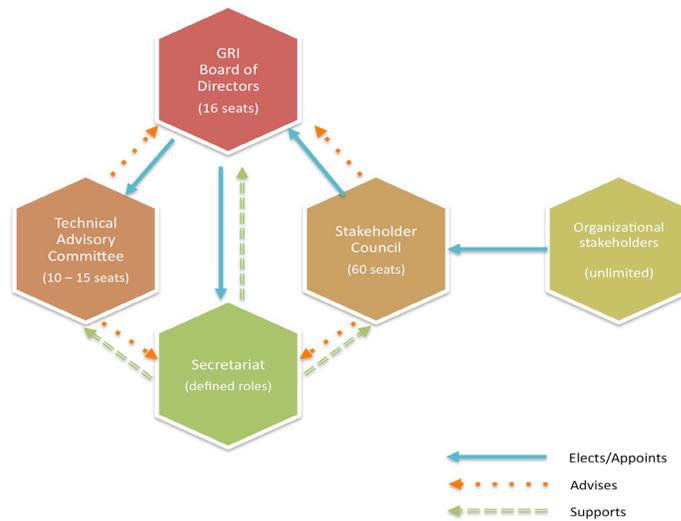
A Timeline of the World Wide Web Consortium

The mission of the W3C is to “lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web.”¹⁹ Its primary occupation is maintaining the HTML standard—the markup language that defines the way Web sites display data and graphical content. Rapidly growing mobile usage, however, could end up making HTML less relevant.²⁰ Mobile computing is shifting toward more use of custom apps that can bypass the Web in favor of direct access. Despite W3C’s development of new Web specifications like HTML5, many of the apps for Apple iOS and Android platforms do not rely on HTML Web standards at all, yet provide interactive elements desired by users. This shift toward proprietary and competing open interfaces may ultimately undermine the W3C’s leadership direction.

The Global Reporting Initiative

A descendant of the social movements in the 1970s, the idea that corporations should provide greater transparency through voluntary sustainability reporting first took hold as part of “corporate social responsibility” initiatives in large multinational companies.²¹ However, most sustainability reports in the early days failed to conform to a consistent set of standards (in fact, no such standards existed), which rendered much of the reporting meaningless and made it impossible to benchmark the performance of a given company against others in the industry or region. The inconsistency in reporting practices led to calls for a common set of





GRI organizational units

Within ten years, the small band of relatively unknown institutional entrepreneurs, with very limited resources and political power,²⁵ was able to draw royalty, well-known politicians, corporate CEOs and high-level members of multilateral institutions to their first Amsterdam conference in 2006. In a 2013 study, KPMG International reported that GRI had become the “most widely used voluntary reporting framework, far exceeding the use of national standards and other guidelines...”²⁶ and that it was used by 82% of the world’s largest 250 companies.²⁷ Today, the GRI not only maintains reporting standards, it provides a number of services, including coaching and training, software certification, “beginners” reporting guidance for small and medium-sized enterprises and certification of completed reports.

The US Green Building Council

In April 1993, representatives from approximately 60 firms and nonprofits met at the American Institute of Architects to found the US Green Building Council (USGBC), a non-profit led by Rick Fedrizzi, David Gottfried and Mike Italiano, to promote energy efficiency in the construction industry.²⁸ In 1994, Robert K. Watson of the Natural Resources Defense Council, a non-profit environmental advocacy group and member of the USGBC, spearheaded the development of the *Leadership in Energy and Environmental Design* (LEED) standard, as LEED Steering Committee founding chairman.

LEED was in part inspired by the desire to create a US version of the UK’s *Building Research Establishment Environmental Assessment Method* (BREEAM), as well as Canada’s *Building Environmental Performance Assessment Criteria* (BEPAC).²⁹ Using a broad-based consensus process



that included non-profit organizations, government agencies, architects, engineers, developers, builders and product manufacturers, the LEED 1.0 standard was released in 1998, followed by LEED 2.0 in 2000.³⁰

While the BREEAM standard continues to lead in the UK, where it is embedded in the local and national regulations, LEED has surpassed it in the international arena. For comparison, there were 1,091 LEED projects undergoing certification in South America compared to only three for BREEAM.³¹ The success of LEED over BREEAM or Green Star (Australia & New Zealand) is part technical and part advocacy. Earlier on, LEED, unlike BREEAM, expanded its focus from building design and construction into building operations and performance, which provided a more robust measure of efficiency. LEED is also not location-bound like Green Star, making it easier to internationalize.³²

By 2012, the USGBC had 77 chapters, 12,758 member organizations and 196,537 LEED-certified professionals.³³ The directory managed by USGBC in 2012 lists nearly 64,000 construction projects certified to LEED³⁴ standards. The total gross space covered by all LEED projects is approaching 1 billion square meters (over 9 billion square feet) worldwide.³⁵

LEED v4 was released in June 2013 with provisions to encourage greater transparency by building products manufacturers, giving points for the use of materials from manufacturers that have disclosed information related to each product's environmental and health impacts. LEED v4 also encourages transparency of sourcing and "supplier commitments to responsible practices for 90 percent of a product's raw materials."³⁶

How Standards Networks Transform Global Problem Solving

Operational Model and Stakeholder Roles

In the 1980s, the Internet we now know nearly wasn't. Open Systems Interconnect (OSI) developed by ISO—the International Organization for Standardization representing 164 nation-state members—was considered inevitable for adoption by nations worldwide. OSI had broad involvement from global state-based institutions, even support from the original parent of ARPANET, the US Department of Defense. Yet, by the 1990s, this battle for the primacy of data networks had been won by the Internet Protocols³⁷ due to its technical simplicity and the IETF's simpler and smaller



network approach which side-stepped large committees of engineers and policymakers in OSI.

While simple, agile operations make sense for standards networks early on, based on our study, they eventually mature with the development of four key functions:

- The administrative body
- The standards development workgroups or committees
- The standards implementers, adopters, vendors or service providers
- The end-users—typically customers or users of standards Implementers

Administrative Body

The administrative body guides overall operation of the network, the external view of the standards, and impact on broader society. It acts as the official link to other coalitions, networks or state-based and policy-setting institutions. The IETF has the Internet Society. The W3C has its own administrative operations but also interfaces through the World Wide Web Foundation. The GRI has its Secretariat and Board of Advisors as well as its policy arm, Government Relations, International Organizations and Development & Advocacy (GIDA).³⁸

Standards Development Group

Each network maintains a technical standards development body that manages the proposals, creation and lifecycle of the standard. For the IETF, the Internet Engineering Steering Group and the Internet Architecture Board govern. The W3C core leadership group leads the individual specification groups. The LEED Standards Committee covers this aspect, while the GRI has its Technical Advisory Committee and a Stakeholder Council.³⁹ They may in turn have a number of workgroups, where most of the stakeholder activity lies, each devoted to a particular aspect to be standardized. The IETF has seven areas, each with anywhere from 12 to 25 separate workgroups focused on a particular technology standard. LEED has five major construction categories and workgroups.

Each workgroup can be seen as a multi-stakeholder network of its own, involving participants as individuals or groups from commercial, civil society or public institutions. The IETF and W3C allow open membership at no cost, with enrollment per workgroup or at a broad organizational level. The GRI has a common Stakeholder Council and holds an open call for members each year from mediating institutions, civil society organizations, business and labor. The Stakeholder Council advises on strategic and policy issues and debates proposed changes to the content of GRI's framework.⁴⁰



Standards Implementers

The role of standards implementers varies by the network. They build and sell products or services that are used by their end-users: software vendors for the IETF and W3C, service providers and assessors for GRI and LEED. Organizations may take on the implementer role for themselves, do the primary assessment, then document and submit for review, as is the case for GRI.

There can also be a chain of organizations involved that is serving different elements of the standard, or different interoperable standards brought together. For the Internet, you can have implementations from different vendors of systems for network traffic, network security, traffic load balancing and quality management, that all interoperate. For the Web, you may have one organization that hosts the Web site in one locale and a different one that hosts it in another country. For GRI conformance, an organization may take on the task to collect all the necessary data itself, but use data management software from a GRI approved provider such as KPMG.

End Users

End-customers are the ones who eventually benefit. Internet and Web users do not need to understand the standard at all to use it daily in their work. Employees who walk into a LEED Platinum-Certified building may benefit greatly from a healthy environment provided by their employer (the implementer). GRI documentation allows Watchdog Networks (another network type in our GSN taxonomy) to monitor the social and environmental performance of Implementing organizations.

Funding and Support

As they grow, Global Standards Networks diversify their support base. The IETF left its original home at DARPA decades ago and now is financially supported by funding through diverse foundations and commercial organizations via the ISOC. The W3C spread from its origins at CERN and MIT to four key hosts in academic institutions across the globe (MIT in the USA, ERCIM in France, Keio University in Japan and Beihang University in China).⁴¹ Its 70 staff members are spread equally across these sites. The USGBC is supported through its broad membership, regional chapters and professional certification program.

GRI is funded through a combination of participating organizational stakeholders; core support grants from governments, foundations and international organizations; corporate and government projects and events; and revenue from products and services such as publications, training, reporting applications checks and certification.⁴² In addition, there is commercial support in the activities of data partners who manage the Sustainability Disclosure Database,⁴³ and software and service partners who offer products and services to collect data and manage reporting.⁴⁴



“Global Standards Networks rely on voluntary adoption of their work rather than mandatory compliance enforced by a state-based institution. ...Without direct legal enforcement, this is conformance to the standard, not compliance.”

Voluntary Adoption

Global Standards Networks rely on voluntary adoption of their work rather than mandatory compliance enforced by a state-based institution. While voluntary, standards implementers and adopters must meet specified definitions and minimum requirements. Without direct legal enforcement, this is conformance to the standard, not compliance.

IETF and W3C have “bake-offs” that determine broad system-level conformance of various implementations through interoperability testing by the various vendors. Dr. Joel Snyder, a member of the Network World Magazine Test Alliance, explained that building a thorough test suite could be incredibly complex; for example, one determined engineer once wrote a 600-page interoperability test document for a particular standard. Practicality dictates dynamic live testing over pre-defined test scenarios to determine the possibilities.

While the IETF and W3C do not do so, the GRI and LEED Standards networks take conformance to a high degree of formality through certifications. They have certified service providers that document a project implementation, apply for formal recognition of its conformance, and approve its addition to a national or global registry. This can be a cost factor for smaller projects and organizations, but is considered an award of distinction (LEED) or essential (GRI) to the operations of larger organizations.

While the key basis remains voluntary adoption, the construct of the standard can still be adopted at the national or international level. The *Group of Friends of Paragraph 47* was established in 2012 during the UN Conference on Sustainable Development with the goal of promoting corporate sustainability in member countries through the use of shared policy models. The group demonstrates the national adoption of GRI standards and derives support at the UN level. LEED standards can be adopted nationally, or in local versions that still meet the criteria.

The W3C has an interesting approach to formal official recognition of their standards by state-based institutions in the IT field. Per Mr. Jaffe of the W3C, “We are considered a *de facto* standards org, while the [ISO, the Organization for International Standards] a *de jure*. If there comes a time that a standard we’ve created is something that we or they believe is something that should be incorporated as a *de jure* standard—none of us want to have duplication—we make a Publicly Accessible Specification submission, and the ISO votes on that to give that dual recognition.” This pairing with a recognized official body and the pass-through of standards reduces duplication, though only applied as necessary.



“...one of the key pillars of [GRI’s] success has been the ability to maintain a balance between the individual and collective interests of its diverse constituencies, between inclusivity and efficient pursuit of technical objectives, and between building a new institution and not challenging the existing institutions and power relations.”

Driving Engagement

All four networks in our study involve stakeholders from government, civil society, the private sector, academic institutions and individual citizens. The emphasis tends to be on private sector commercial participation. For example, of the 387 official member organizations of the W3C in 2013, about 66% are commercial, 17% academic institutions and the remainder a combination of public sector administrative bodies, civil organizations or other public-private consortiums.⁴⁵

GRI renews the memberships of some of its 60-member Stakeholder Council at specific annual periods through open calls from its broader organizational membership of businesses, civil society organizations, investment institutions, mediating institutions and labor organizations.⁴⁶ The USGBC casts a wide net to engage the citizenry as well as civil groups and coalitions across industries. It has a broad advocacy initiative to involve individual members across its local chapters that includes: nine different policy priorities from jobs to building incentives and financing;⁴⁷ seven active campaigns in the USA and internationally (e.g., green schools, green affordable housing, improving energy data access);⁴⁸ and interactions with ten other green industry coalitions (e.g., Coalition for Better Buildings, UNEP Sustainable Buildings & Climate Initiative, and the Data Access and Transparency Alliance).⁴⁹

Members of Global Standards Networks are typically not limited by geographic location or national origin. While a significant amount of work occurs remotely over via conference calls, over Internet mailing lists and through other online collaborative tools, periodic in-person live meetings often represent key moments in the development of a standard. These in-person events help to bring the participating members closer and ensure devotion of their time and attention. Such in-person events create a limiting factor in terms of travel cost, time and availability. This holds true for all four networks studied.

Balancing Interests across Stakeholders

The founders of the GRI have observed that one of the key pillars of the network’s success has been the ability to maintain a balance between the individual and collective interests of its diverse constituencies, between inclusivity and efficient pursuit of technical objectives, and between building a new institution and not challenging the existing institutions and power relations. To achieve this precarious balance, the founders framed the GRI initiative in a way that emphasized its instrumental value as an efficiency gain for a very wide range of diverse actors—companies, civil society organizations, organized labor, the financial sector and others.⁵⁰

While this framing was important to GRI’s success, it created the potential for future problems and obstacles, such as unrealistic and mutually competing expectations, unresolved value conflicts and the absence of a shared



“ *The resiliency of a Global Standards Network is tested by its ability to survive divergent interests of stakeholders and possible schisms.* ”

vision of the GRI across the three roles of developers, implementers and end-customers. In this sense, the GRI case exposes one of the fundamental dilemmas confronting global solution networks that are dependent on or committed to mobilizing a coalition of diverse stakeholders.⁵¹

Another challenge is to maintain the focus and energies of participating standards developers over the long-term, especially for smaller organizations with fewer resources to dedicate to standard-setting activities. Larger organizations have the wherewithal to dedicate an internal expert to a standards process—typically a senior technical or business leader. Smaller organizations and individuals, on the other hand, must balance their staff availability with other priorities and work duties.

Resiliency

The resiliency of a Global Standards Network is tested by its ability to survive divergent interests of stakeholders and possible schisms. For example, as Global Standards Networks grow, they may face internal pressures to abandon their consensus-based approach to decision making. Resiliency comes from maintaining unity, pulling powerful dissenters into the fold and championing the greater growth of the field over individual stakeholder interests. It also comes from keeping pace with the needs of the market.

For example, the W3C survived the commercial browser wars (circa 1995-97) between Netscape Inc.’s Mozilla™ browser, and Microsoft Corporation’s Internet Explorer®, when each company added proprietary extensions that created a schism in the Web information space. While each company greatly expanded its user base, the schism also threatened to split the Web. It took the perseverance of open standards advocates, and mass education of end-customers, to eventually tip the balance in favor interoperable standards.

Twice the W3C survived rival standards efforts. Frustrated with the commercial browser wars, the grassroots Web Standards Project (WaSP) emerged in 1998 to promote strict use of a specific set of standards from W3C with other non-W3C standards such as ECMAScript, a standard created for global information and technology and consumer electronics interests. Eventually, the W3C caught up with the growth of technology to integrate, address or include these technical capabilities, obviating the need for the WaSP set.

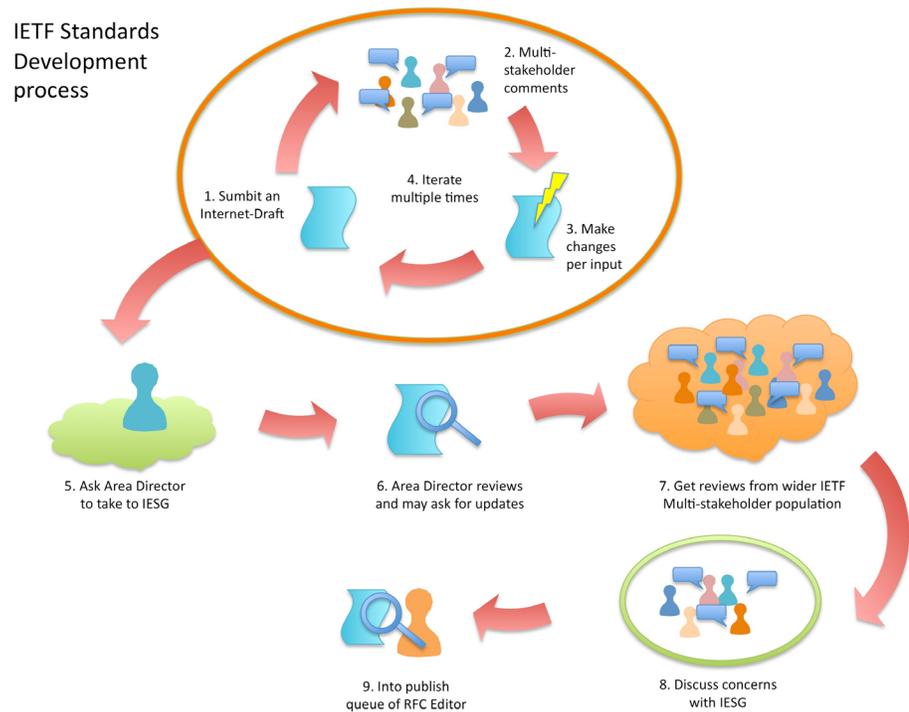
In 2004, Apple, the Mozilla Foundation and Opera Software founded the Web Hypertext Application Technology Working Group (WHATWG), on concerns that the W3C’s new XHTML 2.0 standard showed “disregard for the needs of real-world authors”⁵² as it threatened to make older Web content incompatible. In 2009, W3C allowed XHTML 2.0 to expire and pursued joint work with WHATWG instead, under the banner of HTML5, with final standardization completion targeted for the end of 2014.⁵³



“The products of these networks—the standards they create—need to evolve through a lifecycle in which new standards come into existence and obsolete standards are phased out.”

Standards in a Lifecycle

The products of these networks—the standards they create—need to evolve through a lifecycle in which new standards come into existence and obsolete standards are phased out. The IETF’s history of publishing thousands of standards is perhaps the best example of a well-oiled system for managing standards in a lifecycle. The 9-step review process to go from initial pre-standard concept to a published RFC⁵⁴ is applied to all types of documents including those intended to be standards, best current practices, informational findings, experimental findings and historic findings.



The IETF standards development process

At the earliest stages of the standards lifecycle there must be sufficient technical knowledge, sufficient interest and sufficient adoption by the masses to sustain volunteer participation in standards creation. The mass adoption can lead to commercial interest and invite private sector innovation and entrepreneurship, which will eventually lead to demand for standards. Technical domains with a high rate of innovation require processes for detecting new opportunities for standards early. Per Mr. Jeff Jaffe at the W3C:

We used to work on the next generation of standards, but we didn't work on pre-standardization activity. As a result, it was very hard to start new things. As part of retaining our long-term resiliency and vitality, we felt we needed to be closer to the innovation. We invented a new concept

“ A lifecycle view should also include plans for eventual obsolescence and decommissioning of a standard. ... problems ... can occur when Global Standards Networks try to move forward too quickly without backward compatibility. ”

two and a half years ago called Community Groups, where any in the community can come to our watering hole on pre-standardization topics. We try to build our funnel for new ideas for 3 to 5 years from now. In two and a half years, we went from 1,500 to over 3,000 engineers.

A lifecycle view should also include plans for eventual obsolescence and decommissioning of a standard. For example, GRI's older G1 and G2 standards are now considered obsolete, and only G3, G3.1 and G4 compatible reporting results are considered useful or viable. With registries tracking the state of each implementation, it becomes easy for anyone to detect and denote who is at what version. For interoperability-focused Global Standards Networks such as the IETF and W3C, however, there needs to be some degree of backward compatibility support to sustain the operational environments of end-customers. In some cases, market adoption dynamics may require participants to maintain simultaneous operation of multiple versions of standards. The W3C/WHATWG schism is an example of the problems that can occur when Global Standards Networks try to move forward too quickly without backward compatibility.

Managing Multiple Layers of Measurement

Global Standards Networks need to consider multiple layers of measurement and evaluation to assess the different roles Global Standards Networks play, including administration, development, implementation and end-customer usage. Jaffe, of the W3C, says:

It won't surprise you to learn that we have layered definitions of success. At the highest level, the objective is to lead the Web to its full potential. Overall, the Web [has been] growing in technical capability ... increasing its impact on society, and doing it in a way that is interoperable ... for 25 years. [So] we have been doing that reasonably well. We also have internal metrics for our team with a list of our objectives. For example, here's what we have to do in Web Payments, in Accessibility, and so on. We do that through the year, and aspire to hit that objective. ... [Lastly,] as an organization we have finance, growth, budget, size and quality of membership metrics.

This multi-level approach examines three factors: long-term network direction, technical standards management and business-operations. To measure quality of involvement by stakeholders, they track participation by each standards working group in a database; the number of groups each Implementing organization participates in; the number of people overall from each Implementing organization; the number of emails they send out; and whether the members are passively listening or actively contributing to standards development.



GRI tracks organizational participation through submissions to its Sustainability Disclosure Database. The database serves as a searchable repository and benchmarking tool to facilitate “easy comparison of GRI disclosure within and between sectors and regions around the globe.”⁵⁵ By February 2014, 5,909 organizations had submitted 13,620 reports conforming to the GRI framework, and 16,402 reports overall.⁵⁶ LEED has a similar registry in the USGBC Directory of projects that describes each project, the scorecard of credits on which it was awarded, location information and peer-reviewed best practices and stories about the implemented project.

Sustainability Disclosure Database

HOME SEARCH **BENCHMARK** REGISTER REPORT ABOUT LOGIN Change language



Benchmark GRI disclosures

Select the Guidelines version(s) and/or Sector Supplement(s) to benchmark against. At least one selection is required.

[Read more about this tool](#)

GRI Reporting Framework filters

Report types
 G3 G3.1

Sector Supplements

- Financial Services
- Electric Utilities
- Mining & Metals
- NGO
- Food Processing
- Airport Operators
- Construction & Real Estate
- Event Organizers
- Oil & Gas
- Media

all clear

Organization Filters

You can further refine the search results through Region and Sector filters.

Region

Hide filter options

- Africa
- Asia
- Europe
- Latin America & the Caribbean
- Northern America
- Oceania

all clear

Sector

Show filter options

Benchmark

The benchmark includes reports that have been GRI-checked and for which a correctly formatted GRI Content Index has been submitted.

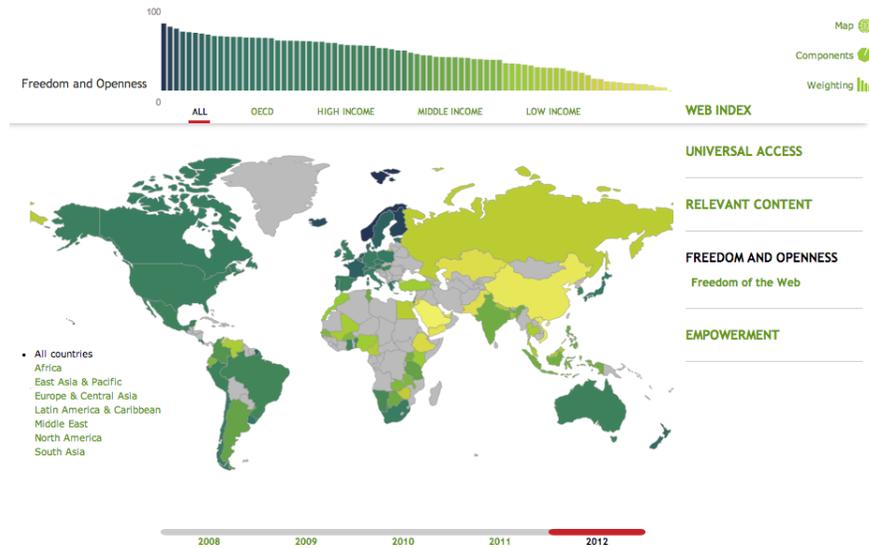
477 reports included in the benchmark

Profile Disclosures	Disclosures on Management Approach		
	Fully	Partially	Not
Economic performance	94% (381)	4% (17)	2% (7)
Market presence	91% (370)	4% (18)	4% (16)
Indirect economic impacts	87% (352)	6% (24)	7% (28)
Materials	88% (358)	6% (26)	5% (21)
Energy	93% (375)	6% (25)	1% (5)
Water	87% (352)	6% (24)	7% (29)
Biodiversity	71% (287)	8% (32)	21% (86)
Emissions, effluents and waste	87% (352)	10% (39)	3% (14)
Products and services	88% (356)	6% (23)	6% (26)
Compliance (EN)	90% (363)	3% (14)	7% (28)
Transport	84% (340)	4% (18)	12% (47)
Overall	88% (347)	4% (18)	10% (40)
Employment	95% (384)	3% (14)	2% (7)
Labor/management relations	93% (375)	4% (18)	3% (14)
Occupational health and safety	92% (374)	6% (24)	2% (7)
Training and education	94% (380)	4% (18)	2% (9)
Diversity and equal opportunity	93% (375)	4% (17)	3% (13)
Equal remuneration for women and men	85% (182)	6% (13)	8% (18)
Investment and procurement practices	84% (339)	9% (36)	7% (28)
Non-discrimination	91% (370)	3% (13)	5% (22)
Freedom of association and collective bargaining	89% (381)	2% (8)	9% (36)
Child labor	81% (330)	4% (18)	15% (59)
Forced and compulsory labor	82% (331)	4% (17)	14% (57)
Security practices	71% (288)	3% (14)	25% (103)
Indigenous rights	65% (262)	4% (15)	32% (128)
Assessment	73% (155)	5% (10)	23% (48)
Remediation	75% (180)	2% (5)	23% (48)
Community	91% (370)	3% (14)	5% (21)
Corruption	91% (370)	3% (14)	5% (21)
Public policy	88% (349)	5% (19)	9% (37)
Anti-competitive behavior	86% (348)	2% (7)	12% (50)
Compliance (SO)	92% (373)	1% (4)	7% (28)
Customer health and safety	82% (333)	6% (25)	12% (47)
Product and service labelling	85% (345)	7% (27)	8% (33)
Marketing communications	82% (334)	5% (21)	12% (50)
Customer privacy	83% (337)	4% (18)	12% (50)
Compliance (PR)	89% (360)	2% (9)	9% (36)
Product Portfolio	65% (47)	10% (7)	25% (18)
Audits	71% (51)	3% (2)	26% (19)
Active Ownership	71% (51)	6% (4)	24% (17)

Sample Benchmark (Europe only) from the GRI Sustainability Disclosure Database⁵⁷

© Global Solution Networks 2014

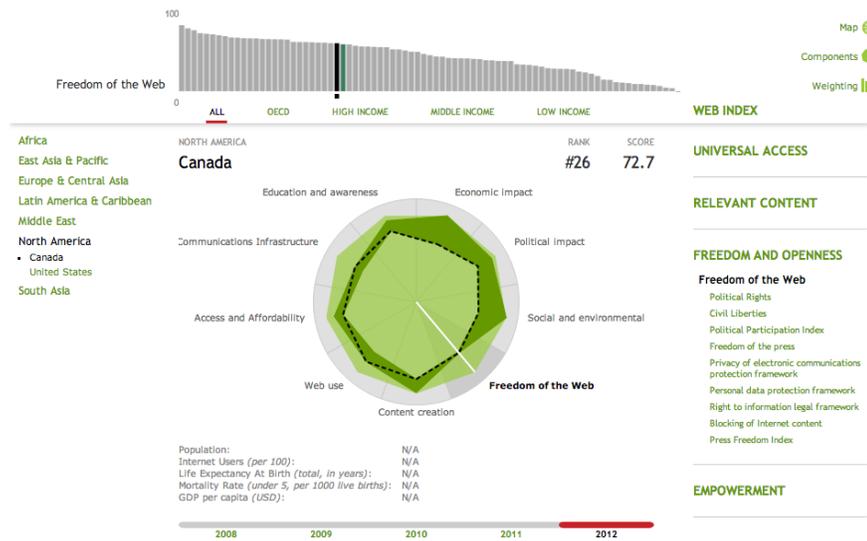
Surveys provide another means to measure Global Standards Network performance globally and, perhaps more importantly, to identify new domains where standards could add value to the end-user experience. For example, the Internet Society commissioned the Global Internet User Survey in 2012,⁵⁸ sampling 10,000 people in 20 countries, with a focus on the Internet and human rights; Internet censorship; online privacy and identity; economic and societal issues; attitudes towards the Internet; and general usage.



Web Index on Freedom and Openness of the Web (Source: Web Foundation)⁹

The W3C’s sister organization, the World Wide Web Foundation, launched the Web Index in 2012 to measure the Web’s growth in overall development in nations worldwide. In particular, it focuses on a per-nation-level view of (a) universality of access and investment in infrastructure; (b) freedom and openness for citizens information rights; (c) relevant content available to the citizenry; and (d) empowerment of society, economy, politics and environment.⁶⁰ It also offers countries a self-diagnosis tool to compare against other nations.



Web Index: Canada focus⁶¹

Implications for Network Leaders

The Global Standards Networks studied here share a number of common characteristics and strategies that change in focus as they evolve across stages of formation, growth and maturity. The principles, processes and strategies that make sense at the initial formation of a network, for example, become less effective as the organization broadens and adopts a global purview. Conversely, strategies required at maturity would burden a nascent standards organization with too much overhead or require too much time commitment from founders. The implications for network leaders highlight appropriate strategies and lessons in each stage of growth and maturity.

Formation

During the formation stages, successful Global Standards Networks follow similar criteria to determine whether the market is ready for standardization. Some of the typical “market tests” include the following conditions:

- A **shared interest for uniformity or interoperability** among stakeholders
- A **defined need and value to potential implementers** of the proposed standards
- A compelling **value proposition for end-customers**

- **Practical usable implementations**—e.g., Web browsers, Internet protocol stacks, sustainability reports or eco-centric construction methods
- **Viral potential of implementations**—the potential for implementations to spread rapidly
- **Support from influential groups**—e.g., DARPA for the Internet; academic institutions for the Web; or the American Institute of Architects for LEED
- A **potentially large market**—identified by interested vendors, academic researchers and institutions (e.g., CERN, University of Illinois and MIT for the Web, Natural Resources Defense Council advocating LEED) or analyst groups in a related field (e.g., Gartner and Forrester Research in the technology fields)

Global Standards Networks share a common set of principles for guiding their operations in the formative stages of development. These include:

- **Start the standardization process with a small and dedicated core group** with deep expertise in the field, as well as influential relationships. While networks may grow organically—forming multiple workgroups and functionary bodies to guide the standards—all the cases featured in this report started with a small group of dedicated leaders.
- **Create a transparent standards development process** with consensus-based decision-making, open voluntary participation by multiple stakeholders and low barriers of entry to allow early innovators and startups, as well as large businesses and institutions.
- **Clearly define the ownership of intellectual property of submissions** by participants, particularly vendors or significant institutions.
- **Define rules for self-conformance and validation by the implementers**, off-loading the complex tasks of a centralized validation and testing process from the Global Standards Network to other parties.

Standards networks rely on voluntary adoption by the implementers, not mandatory compliance. Voluntary adoption is successful where there is strong demand or pull by organizations, rather than a push from government regulations. This demand can be driven by the needs of constituencies within the network (e.g., companies within the GRI requiring standards to guide reporting) or, as has often been the case in our Lighthouse Case Study examples, by the end consumers or customers of an organization's products and services. In either case, transformative changes in standards are typically driven by the needs of participating organizations and their customers, as opposed to mandatory regulations that require enforcement through extra-organizational forces.



“ *Global Standards Networks typically create one or more multi-stakeholder standards development workgroups or committees to facilitate the work of the network and keep key stakeholders engaged in the process.* ”

Voluntary adoption also keeps the topic of standardization closer to the market pace for innovation, assuming that there is a sufficient level of competition from multiple vendors or standards implementers.

While the work of Global Standards Networks is sometimes accepted and adopted at the national level, such adoption usually comes after tested implementations, broad adoption and a self-sustaining market are already in existence. In situations where there is simultaneous existence of competing state-sponsored standards activity and Global Standards Networks (e.g., BREEAM versus LEED; or OSI versus the Internet Protocols), the market driven approach has eventually taken the lead.

Growth

Once the Global Standards Network has had some successes, the focus shifts toward “professionalizing” the activities, maintaining momentum and measuring success. During the growth stage, Global Standards Networks acquire some degree of administrative overhead for managing collaborations across multiple participants, locations, time zones and national or regional boundaries. To maintain efficiency and longer-term continuity, they usually operate with a relatively small permanent staff to coordinate workgroups, communications and establish a supporting technology infrastructure. Aside from the administrative arm, Global Standards Networks typically create one or more multi-stakeholder standards development workgroups or committees to facilitate the work of the network and keep key stakeholders engaged in the process. The processes for operating both the core administrative hierarchy and the standards development bodies tend to be well documented, although they may evolve over time to maintain flexibility.

All the networks studied held regular in-person meetings and workshops to concentrate the focus of the participants. However, most of the cases eventually moved to balancing live meetings with more frequent remote collaboration through conference calls and online communities. The frequency of attention is a key indicator, particularly differentiating between people who mostly listen from those who actively contribute to the discussions.

During growth, Global Standards Networks develop layers of success metrics to guide the work of the network and assess its effectiveness. The metrics map to the different entity roles involved:

- Operational metrics of the administrative body
- Development progress & lifecycle of a standard (affecting the developers)
- Participation metrics of developers and implementers
- Overall adoption by implementers and usage by end-customers



The units for measurement are similar in concept across networks. The administration is interested in activities, budgets, employee tenure and general organizational management of the core hierarchy. From the high-level view of, say, the GRI Technical Advisory Committee or the Internet Engineering Steering Group, they can determine the state and progress of the standards activities, as well as focus at a per-standard or sub-category level. Participation metrics are the key measures of multi-stakeholder engagement in different forms in person or online, often collected electronically or through records management. Finally, Global Standards Networks have a keen interest in the overall global growth and adoption of the standards by implementers and, even more, the benefit to end-customers, which are usually determined through managed professional surveys.

The growth stage of a Global Standards Network typically presents a number of key balancing acts wherein network leaders must be careful to manage diverging stakeholder interests. The first tensions usually arise between the interests of participating vendors (voluntary implementers) and the collective shared interests of the overall group. The W3C, for example, is careful to record and weigh dissenting opinions in the consensus process. In both the GRI and W3C, there is a separate party or unit in the Global Standards Network that acts as the final arbiter when disagreement proves intractable, although such arbitration measures are typically applied with some hesitation.

The second balancing point exists between the interests of small innovators that want to push the state of the art, and the large institutions with incumbent end-customers and portfolios. When larger organizations join, they often sign up for broad involvement across a group or whole family of standards for completeness and to justify their investment in the area; smaller organizations, on the other hand, tend to focus their energies in specific areas.

Larger organizations benefit when new entrants or smaller companies have a small or zero legacy customer base that allows them to explore and innovate more freely. For example, companies like Opera Software helped to bring new focus to the mobile device market for Web browsers early on, even before the current broad spread of Web-enabled smartphones.

Maturity

While it is difficult to pinpoint exactly when a Global Standards Network reaches a mature, stable state, they share some common characteristics:

- Multiple versions or generations of the standards produced through the network (e.g., the core LEED, GRI, Internet and Web protocols) all have evolved through at least two or three generations.
- They have continued to thrive despite changes of the leadership over time.



- They maintain a growing body of 3rd party informational resources, tools or service providers.
- They enjoy popular use in multiple regions or countries despite difference of culture, local regulations or market sizes.
- The ability to continue to get funding and financial support over a number of years is established—each of the cases studied has survived over a decade.
- While state institutions have become involved in some Global Standards Networks and/or become proponents of their work, state participation is not a required element of maturity.

The cases in this study have all employed a number of different strategies that continue to foster research, support and future growth of the standards in their purview:

- **Standards lifecycle management**—With the expectation of multiple generations, Global Standards Networks give guidance to implementers on what qualifies as standards conformance, and are careful to assist implementers to manage the transition to newer versions. All four studied standards groups explicitly declare what has been replaced or obviated with new versions.
- **Encourage pre-standards discussions**—W3C, IETF and LEED create forums or paths to allow discussion of new topics or future possibilities for standards. The IETF has a detailed process with several rounds of submission and review before they can become part of the official standards track.
- **Foster multi-stakeholder advocacy networks to help encourage adoption**—Examples include the Internet Society’s local chapters and the GRI’s Local Networks and Ambassadors.
- **Hold or participate actively in education events and knowledge networks**—Examples include the Interop technology conference, the International World Wide Web Conference, GRI Global Conference on Sustainability and Reporting and the USGBC Greenbuild conference.
- **Hold Certification or testing events or partner through service organizations**—Examples include GRI technology partners, LEED certified professionals and organizations, and “bake-offs” for Internet and Web technology implementations.
- **Offer platforms for standards performance data**—Examples include GRI Sustainability Disclosure Database, the Web Index and the LEED building registries.



“...standards fuel the development and implementation of technologies that influence and transform the way we live, work and communicate.”

Conclusion

The GSNs described in this report are the driving force behind the development of important standards, providing technical expertise and innovation, driving global participation and pursuing the ongoing advancement and promotion of new concepts. While unique in origin, each of these Global Standards Networks has successfully navigated similar paths to success. A consistent focus on implementations, inclusion, transparency and consensus helps to draw a multi-stakeholder audience, evolve the network over the long-term and succeed by persevering with proof over politics.

In a globalizing economy, such Global Standards Networks will only grow in importance. After all, it is only through the use of standards that the requirements of interconnectivity and interoperability can be assured. It is only through the application of standards that the credibility of new products and new markets can be verified. In summary, standards fuel the development, and implementation of technologies that influence and transform the way we live, work and communicate.



Endnotes

- 1 Don Tapscott, "Introducing Global Solution Networks," Global Solution Networks, 2013. <http://gsnetworks.org/introducing-global-solution-networks/>
- 2 E.M. Rogers, *Diffusion of innovations* (5th edition), New York, NY: Free Press, 2003.
- 3 Ibid.
- 4 International Telecommunications Unions (ITU), "Key ICT indicators for developed and developing countries and the world (totals and penetration rates)," Geneva, 27 February 2013. http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2012/ITU_Key_2006-2013_ICT_data.xls
- 5 GRI, Sustainability Disclosure Database. <http://database.globalreporting.org>
- 6 "Key ICT indicators for developed and developing countries and the world (totals and penetration rates)," International Telecommunications Unions (ITU), Geneva, 27 February 2013.
- 7 Analyst firm IDC tracks Internet-related technology as a number of different multi-billion dollar markets (Broadband, Connected Home, Cloud Computing, Datacenter, Security, Storage, Infrastructure software, Telecom devices, Enterprise Communications infrastructure, etc.) each comparing leading vendors from across the landscape. <http://www.idc.com/prodserv/prodserv.jsp>
- 8 IETF, "Mission Statement." <http://www.ietf.org/about/mission.html>
- 9 Internet Society, "Premier Internet Standards Body Celebrates 25th Anniversary," Internet Society Newsletter, Vol 10 Issue 1. <http://www.internetsociety.org/articles/premier-internet-standards-body-celebrates-25th-anniversary>
- 10 Wikipedia, "The History of the Internet." http://en.wikipedia.org/wiki/History_of_the_Internet
- 11 IETF, "Getting Started in the IETF." <http://www.ietf.org/newcomers.html>
- 12 Internet Society, "Our Members,," <http://www.internetsociety.org/who-we-are/our-members>
- 13 "Internet Users in the World," Internet World Stats, 30 June 2012. <http://www.internetworldstats.com/stats.htm>
- 14 Jonah Force Hill, "A Balkanized Internet? The Uncertain Future of Global Internet Standards," *Georgetown Journal of International Affairs*, Special Issue 2012. <http://ecir.mit.edu/index.php/publications/publications-index/450-a-balkanized-internet-the-uncertain-future-of-global-internet-standards>
- 15 IETF, "Distribution of RFCs According to the Countries of their Authors," 5 January 2012. <http://www.arkko.com/tools/rfcstats/d-countrydistr.html>



- 16 Internet Governance Forum, “India’s Proposal for a UN Committee for Internet Related Policies (CIRP),” *IGFWatch News*, 29 October 2011. <http://igfwatch.org/discussion-board/indias-proposal-for-a-un-committee-for-internet-related-policies-cirp>
- 17 Wikipedia, “Tim Berners-Lee.” http://en.wikipedia.org/wiki/Tim_Berners-Lee
- 18 K. G. Coffman and A. M. Odlyzko, “Growth of the Internet,” AT&T Labs Research, 6 July 2001. <https://courses.cs.washington.edu/courses/cse590s/03au/coffman01growth.pdf>
- 19 <http://www.w3.org/Consortium/mission>
- 20 Mary Meeker, Liang Wu, “Internet Trends 2013,” Kleiner, Perkins, Caufield, Byers, 29 May 2013. <http://www.slideshare.net/kleinerperkins/kpcb-internet-trends-2013>
- 21 Halina Szejnwald Brown, Martin de Jong and Teodorina Lessidrenska, “The Rise of the Global Reporting Initiative (GRI) as a Case of Institutional Entrepreneurship,” Corporate Social Responsibility Initiative, Working Paper No. 36. Cambridge, MA: John F. Kennedy School of Government, Harvard University, 2007, pg 1.
- 22 GRI, “What is GRI: History.” <https://www.globalreporting.org/information/about-gri/what-is-GRI/Pages/default.aspx>
- 23 Brown *et al.*, *ibid*, p. 13.
- 24 The current GRI Government Advisory Group members are delegates from: Brazil, Colombia, Denmark, Finland, France, Germany, India, Japan, Netherlands, Norway, South Africa, Spain, Sweden, United Kingdom and international governmental organizations, such as OECD and UNEP; according to the GRI. <https://www.globalreporting.org/network/network-structure/governmental-advisory-group/Pages/default.aspx>
- 25 Brown *et al.*, *ibid*.
- 26 The GRI has received formal recognition from nations including Brazil, Finland, South Africa, Spain, and Sweden that explicitly require or recommend companies report using the GRI guidelines. Other governments that consider the GRI guidelines as an important part of their sustainable development policy include Norway, the Netherlands, and Germany. At the June 2012, United Nations Conference on Sustainable Development (named Rio+20), Brazil, Denmark, France and South Africa (collectively known as the *Friends of Paragraph 47*) reaffirmed their intention to contribute towards corporate transparency and accountability, supported by the UN Environment Programme and the GRI as the secretariat.
- 27 KPMG International, “The KPMG Survey of Corporate Responsibility Reporting 2013” (This report covers 4,100 companies mapped across 41 countries), pg. 30. <https://www.kpmg.com/dutchcaribbean/en/Documents/Publications/CorporateResponsibilityReportingSurvey2013.pdf>



- 28 USGBC, "USGBC History." <http://www.usgbc.org/about/history>
- 29 Jennie Richards, "Green Building: A Retrospective History of LEED Certification," Institute for Environmental Entrepreneurship, November 2012. <http://enviroinstitute.org/wp-content/uploads/2012/09/GREEN-BUILDING-A-Retrospective-History-of-LEED-Certification-November-2012.pdf>
- 30 "Leadership in Energy and Environmental Design (LEED)," Wiser.org wiki, updated 17 May 2013
- 31 Laura Mark, "LEED outstrips BREEAM across the globe - including Europe," Architects Journal (UK), 28 February 2013. <http://www.architectsjournal.co.uk/news/leed-outstrips-breeam-across-the-globe-including-europe/8643464.article>
- 32 Andy Pearson, "Essential Guides: BREEAM, LEED, Green Star & Estidama," Building.co.uk, 3 March 2014. <http://www.building.co.uk/essential-guides-breeam-leed-green-star-and-estidama/5002213.article>
- 33 USGBC, "US Green Building Council 2012 Annual Report," June 2013. http://www.usgbc.org/sites/default/files/USGBC_AR_2012.pdf
- 34 USGBC, "Directory: Projects." <http://www.usgbc.org/projects> as accessed 15 January 2014.
- 35 USGBC, "Infographic: LEED in the World." <http://www.usgbc.org/articles/infographic-leed-world>, 3 May 2013.
- 36 Mikhail Davis, Melissa Vernon, "4 ways LEED v4 will change business," GreenBiz.com, 18 October 2013. <http://www.greenbiz.com/blog/2013/10/18/4-ways-leed-v4-will-change-business>
- 37 Andrew L. Russell, "OSI: The Internet That Wasn't," IEEE Spectrum magazine, 30 July 2013. <http://spectrum.ieee.org/computing/networks/osi-the-internet-that-wasnt>
- 38 GRI, "GRI Secretariat." <https://www.globalreporting.org/network/network-structure/secretariat/Pages/default.aspx>
- 39 GRI, "How is GRI Governed." <https://www.globalreporting.org/network/network-structure/governance-bodies/Pages/default.aspx> accessed on 7 January 2014.
- 40 GRI, "Governance Bodies", *ibid.*
- 41 W3C, "Organizational Structure." <http://www.w3.org/Consortium/facts#history>
- 42 GRI, "Who Funds GRI?" <https://www.globalreporting.org/information/about-gri/Pages/Funding.aspx>
- 43 GRI, "GRI's Data Partners." http://database.globalreporting.org/data_partners/
- 44 GRI, "Report Services," <https://www.globalreporting.org/reporting/report-services/Pages/default.aspx>
- 45 Analysis of W3C, "Current Members," (as of 15 January 2014.) <http://www.w3.org/Consortium/Member/List>



- 46 GRI, "Meet GRI's Stakeholder Council." <https://www.globalreporting.org/network/network-structure/stakeholder-council/Pages/default.aspx>
- 47 US Green Building Council, "Policy Priorities." <http://www.usgbc.org/advocacy/priorities>
- 48 US Green Building Council, "Campaigns." <http://www.usgbc.org/advocacy/campaigns>
- 49 US Green Building Council, "Green building has many proponents." <http://www.usgbc.org/advocacy/coalitions>
- 50 Brown *et al.*, *ibid*, pp. 15-16.
- 51 Brown *et al.*, *ibid*.
- 52 WHATWG, "FAQ," WHATWG Wiki. <http://wiki.whatwg.org/wiki/FAQ>
- 53 Wikipedia, "HTML5." <http://en.wikipedia.org/wiki/HTML5> accessed on 7 January 2014.
- 54 <http://www.ietf.org/rfc/rfc2026.txt>
- 55 GRI, "Sustainability Disclosure Database." <https://www.globalreporting.org/reporting/report-services/sustainability-disclosure-database/> <http://database.globalreporting.org/Pages/default.aspx>
- 56 GRI, *ibid*.
- 57 <http://database.globalreporting.org/benchmark>
- 58 Internet Society, "Global Internet User Survey 2012," November 2012. http://www.internetsociety.org/surveyexplorer/key_findings
- 59 <http://thewebindex.org/visualisations/#!year=2012&idx=Freedom%20and%20Openness&handler=map>
- 60 World Wide Web Foundation, "About the Web Index." <http://thewebindex.org/about/the-web-index/>
- 61 <http://thewebindex.org/visualisations/#!year=2012&idx=Freedom%20and%20Openness&country=CAN®ion=North%20America&handler=country>



About the Author



Rawn Shah is Chief Strategy Officer of Alynd, Inc., an author, and a business-technology journalist. He is actively involved in the World Wide Web Consortium's standards activities on Social Business. He writes regularly for Forbes.com on the future of work and the transformation of business models, and has authored seven books, most recently on new collaboration models in *Social Networking for Business* (Pearson/Wharton School Publishing, 2010). His insight and work has been featured on Management Innovation Exchange, IBM Institute for Business Value, GigaOm, LinkedIn, JavaWorld, LinuxWorld and InformationWeek.



About Global Solution Networks

Global Solution Networks is a landmark study of the potential of global web-based and mobile networks for cooperation, problem solving and governance. This research project is a deliverable of the GSN program, offered through the Martin Prosperity Institute at the Rotman School of Management, University of Toronto.

Program Management

Don Tapscott, Executive Director
Dr. Joan Bigham, Managing Director
Anthony Williams, Executive Editor

GSN Program Membership

Membership in the Global Solution Networks program offers unlimited access to gsnetworks.org program deliverables including project plans, research publications and multi-media presentations, all posted for member use, review and feedback. Webinars on current research are held quarterly. Please visit our web site at www.gsnetworks.org or contact info@gsnetworks.org for information on participation.



Ten Types of Global Solution Networks