



# Web Consortium

*"The way of the world is meeting people through other people."*

**-Robert Kerrigan**

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# 1. Introduction

The origin and history of internet is well known in the world. ARPA ( current DARPA) has pioneered the concept inter-networking for defense activities. However, later the concept of internetworking or INTERNET spread across the globe in all countries in government and commercial activities.

Internet is widely spread and loads of information is transported every moment. This powerful and important network has to be governed appropriately to get most benefits out of it.

World Wide Web Consortium (W3C) is one such establishment that develops interoperable technologies (specifications, guidelines, software, and tools) to lead the Web to its full potential. W3C is a forum for information, commerce, communication, and collective understanding. In this term paper, History of W3C, Vision, Activities and its role in governing the internet across the globe are briefly discussed. All the information presented in this term paper is collected from the W3C web pages

## 2. History

World Wide Web (WWW) was invented by Tim Berners-Lee in 1989<sup>1</sup>. In 1994, an organization was formed to design web standards for wide spread (spreading) internet. This was World Wide Web Consortium (W3C), an international consortium.

Organizations located all over the world and involved in many different fields have joined W3C to participate in forum for the creation of Web standards. W3C develops interoperable technologies (specifications, guidelines, software, and tools) to lead the Web to its full potential.

Tim Berners-Lee is the director of W3C. He is a graduate of Oxford University. He is the 3COM founders professor of engineering in the School of Engineering with a joint appointment in the department of Electrical Engineering and computer science at the laboratory for computer science and artificial intelligence (CSAIL) at the Massachusetts Institute of Technology (MIT) where he also heads the

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<sup>1</sup> W3C History: <http://www.w3.org/Consortium/history>

Decentralized Information Group (DIG). He is also a Professor in the Computer Science Department at the University of Southampton, UK. He is co-Director of the Web Science Research Initiative (WSRI) started in 2006 to help create the first multidisciplinary research body to examine the World Wide Web and offer the practical solutions needed to help guide its future use and design. He is also a Director of the World Wide Web Foundation, started in 2008 to fund and coordinate efforts to further the potential of the Web to benefit humanity

### **3. W3C, an International Consortium:**

The W3C Team includes 64 people<sup>2</sup> working from locations across the globe. W3C is hosted by the Massachusetts Institute of Technology Laboratory for Computer Science [MIT/CSAIL] in the United States, at the European Research Consortium for Informatics and Mathematics [ERCIM] in Sophia-Antipolis in France, and at the Keio University Shonan Fujisawa Campus in Japan. With a truly international flavor, the team includes engineers from more than 10 different countries.

The W3C members ensure the strength and direction of the Consortium through investment and active participation in W3C activities. W3C has over 400 Member organizations from more than 40 countries with a broad range of interests. W3C members include vendors of technology products and services, content providers, corporate users, research laboratories, standards bodies, and governments, all of whom work to reach consensus on a direction for the Web

W3C coordinates particularly closely with other organizations that are developing standards for the Web or Internet in order to enable clear progress. W3C members, staff, and invited experts work together to design technologies to ensure that the Web will continue to thrive in the future, accommodating the growing diversity of people, hardware, and software.

W3C operations are supported by a combination of Member dues, research grants, and other sources of public and private funding, and the Supporters Program. W3C operations are jointly administered by the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL) in the USA, the European Research Consortium for Informatics and Mathematics (ERCIM) headquartered in France and Keio University in Japan. W3C also has World Offices in many regions around the

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<sup>2</sup> W3C, International Consortium: <http://www.w3.org/Consortium>

world. The W3C Offices work with their regional Web communities to promote W3C technologies in local languages, broaden W3C's geographical base, and encourage international participation in W3C Activities

## 4. Activities:

W3C Activities<sup>3</sup> are generally organized into groups: Working Groups (for technical developments), Interest Groups (for more general work), and Coordination Groups (for communication among related groups). These groups are made up of participants from member organizations, the team, and Invited Experts, produce the bulk of W3C's results: technical reports, including Web standards, open source software, and services (e.g., validation services).

These groups also ensure coordination with other standards bodies and technical communities.

W3C conducts work in the following areas. Each is called a W3C Activity.

1. Extensible Markup Language (XML)
2. Graphics
3. HTML
4. Internationalization
5. Math
6. Mobile Web Initiative
7. Multimodal Interaction
8. Patent Policy
9. Privacy
10. Rich Web Client
11. Security
12. Semantic Web
13. Style
14. Synchronized Multimedia
15. Ubiquitous Web Applications
16. Video in the Web
17. Voice Browser
18. WAI International Program Office
19. WAI Technical
20. Web Services

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<sup>3</sup> W3C Activities: <http://www.w3.org/Consortium/activities>

## 21.XForms

## 22.eGovernment

### 1. Extensible Markup Language (XML):

There are 10 groups in this activity (part of the Ubiquitous Web Domain):

Efficient XML Interchange Working Group, Service Modeling Language Working Group, XML Coordination Group, XML Core Working Group, XML Plenary Interest Group, XML Processing Model Working Group, XML Query Working Group, XML Schema Interest Group, XML Schema Working Group, XSL Working Group

### 2. Graphics:

There are 3 groups in this Activity (part of the Interaction Domain):

SVG Working Group, SVG Interest Group, WebCGM Working Group

### 3. HTML:

There are 3 groups in this Activity (part of the Interaction Domain):

HTML Working Group, Hypertext Coordination Group, XHTML2 Working Group

### 4. Internationalization:

The goal of the Internationalization Activity is to ensure that W3C's formats and protocols are open to all of the world's languages, writing systems, character codes and local conventions. There are 3 groups in this Activity (part of the Interaction Domain):

Internationalization Core Working Group, Internationalization (I18n) Interest Group, Internationalization Tag Set (ITS) Interest Group

### 5. Math:

Mathematics is an essential aspect of science and education. So, to realize the potential of the Web for science, it must be possible to use mathematics on the Web. Mathematical expressions must move seamlessly between the Web and a wide range of environments including authoring tools, content management systems, XML-based work flows, e-learning environments, and scientific computing software. There is 1 group in this Activity (part of the Interaction Domain):

Math Working Group

### 6. Mobile Web Initiative:

While becoming increasingly popular, mobile Web access today still suffers from interoperability and usability problems. W3C's Mobile Web Initiative (W3C

MWI) addresses these issues through a concerted effort of key players in the mobile production chain, including authoring tool vendors, content providers, handset manufacturers, browser vendors and mobile operators. There are 3 groups in this Activity (part of the Ubiquitous Web Domain):  
Mobile Web Best Practices Working Group, Mobile Web Initiative Test Suites Working Group, Mobile Web for Social Development (MW4D) Interest Group

#### 7. Multimodal Interaction:

The Multimodal Interaction Activity seeks to extend the Web to allow users to dynamically select the most appropriate mode of interaction for their current needs including any disabilities in order to enable Web application developers to provide an effective user interface for whichever modes the user selects. With multimodal Web applications, users can provide input via speech, handwriting and keystrokes, with output presented via displays, pre-recorded and synthetic speech, audio, and tactile mechanisms such as mobile phone vibrators and Braille strips. There is 1 group in this Activity (part of the Ubiquitous Web Domain):  
Multimodal Interaction Working Group

#### 8. Patent Policy:

The Patent Policy Activity's goal is to enable W3C to implement and successfully operate the W3C Patent Policy. The policy was put into place in February 2004, and the work of developing and implementing it is complete. It is important that the W3C community have an organized way to monitor application of the policy as well as remain informed about relevant developments in the legal and standards environment. There is 1 group in this Activity (part of the Technology and Society Domain):  
Patents and Standards Interest Group

#### 9. Privacy:

For the past 9 years, the Platform for Privacy Preferences (P3P) was the very center of the W3C Privacy Activity. The P3P Specification Working Group has now completed its work on P3P 1.1 by delivering a Last Call Working Draft. Following the change in the privacy landscape following the 9/11 events, the group found there is insufficient momentum for implementations at this point in time. Although the group believes that P3P 1.1 is ready for implementation, it decided not to enter Candidate Recommendation, published the current specification as a Working Group Note, and has thus completed its last deliverable. The P3P Specification Working Group was closed on 21 November 2006. There is 1 group in this Activity (part of the Technology and Society Domain):  
Policy Languages Interest Group

#### 10. Rich Web Client:

With the ubiquity of Web browsers and Web document formats across a range of platforms and devices, many developers are using the Web as an application environment. Examples of applications built on rich Web clients include reservation systems, online shopping or auction sites, games, multimedia applications, calendars, maps, chat applications, weather displays, clocks, interactive design applications, stock tickers, office document and spreadsheet applications, currency converters, and data entry/display systems. There are 2 groups in this Activity (part of the Interaction Domain):

Compound Document Formats Working Group, Web Applications Working Group

#### 11. Security:

There are 2 groups in this Activity (part of the Technology and Society Domain):

Web Security Context Working Group, XML Security Working Group

#### 12. Semantic Web:

The goal of the Semantic Web initiative is as broad as that of the Web: to create a universal medium for the exchange of data. It is envisaged to smoothly interconnect personal information management, enterprise application integration, and the global sharing of commercial, scientific and cultural data. Facilities to put machine-understandable data on the Web are quickly becoming a high priority for many organizations, individuals and communities. There are 8 groups in this Activity (part of the Technology and Society Domain):

OWL Working Group, Protocol for Web Description Resources (POWDER) Working Group, SPARQL Working Group, Rule Interchange Format Working Group, Semantic Web Coordination Group, Semantic Web Deployment Working Group, Semantic Web Health Care and Life Sciences Interest Group, Semantic Web Interest Group

#### 13. Style:

Many people are accustomed to style sheets in word-processing. W3C's style sheets offer extensive control over the presentation of Web pages. The Cascading Style Sheets (CSS) language is widely implemented. It is playing an important role in styling not just HTML, but also many kinds of XML documents: XHTML, SVG (Scalable Vector Graphics) and SMIL (the Synchronized Multimedia Integration Language), to name a few. It is also an important means of adapting pages to different devices, such as mobile phones or printers. There is 1 group in this Activity (part of the Interaction Domain):

Cascading Style Sheets (CSS) Working Group

#### 14.Synchronized Multimedia:

The Synchronized Multimedia Activity designed the Synchronized Multimedia Integration Language (SMIL, pronounced "smile") for choreographing multimedia presentations where audio, video, text and graphics are combined in real time. SMIL is a W3C Recommendation that enables authors to specify and control the precise time a sentence is spoken and make it coincide with the display of a given image. There is 1 group in this Activity (part of the Interaction Domain):

SYMM Working Group

#### 15.Ubiquitous Web Applications:

The Ubiquitous Web Applications Activity was launched on 30 March 2007 with the vision of enabling value-added services and business models for ubiquitous networked devices, based upon W3C's strengths in declarative representations. The Activity includes the Geolocation Working Group and the Ubiquitous Web Applications Working Group. There are 2 groups in this Activity (part of the Ubiquitous Web Domain):

Geolocation Working Group, Ubiquitous Web Applications Working Group

#### 16.Video in the Web:

The goal of this activity is to make video a first class citizen of the Web. Video on the Web (and this includes audio, as the two are typically used together) has seen explosive growth, improving the richness of the user experience but leading to challenges in content discovery, searching, indexing and accessibility. Enabling users (from individuals to large organizations) to put video in the Web requires that we build a solid architectural foundation that enables people to create, navigate, search, link and distribute video, effectively making video part of the Web instead of an extension that doesn't take full advantage of the Web architecture. There are 3 groups in this Activity (part of the Interaction Domain):

Media Annotations Working Group, Media Fragments Working Group, Timed Text Working Group

#### 17.Voice Browser:

The convergence of telecommunications and the Web is now bringing the benefits of Web technology to the telephone, enabling Web developers to create applications that can be accessed via any telephone, and allowing people to interact with these applications via speech and telephone keypads. The W3C Speech Interface Framework is a suite of markup specifications aimed at realizing this goal. It covers voice dialogs (VoiceXML), speech synthesis (SSML), speech recognition (SRGS, SISR), pronunciation lexicon (PLS), call control (CCXML,

SCXML) and other requirements for interactive voice response applications, including use by people with hearing or speaking impairments. There is 1 group in this Activity (part of the Ubiquitous Web Domain):

Voice Browser Working Group

#### 18. WAI International Program Office:

Given the vital role that the Web plays throughout society, it is essential to ensure that the Web is accessible to people with disabilities. Access to the Web can affect people with visual, auditory, physical, cognitive, and neurological disabilities. The solutions developed for Web accessibility also benefit non-disabled people. The Web Content Accessibility Initiative (WAI) International Program Office helps create a forum where representatives of industry, the disability community, research, and government work together to identify accessibility requirements and develop solutions under W3C Process. There are 4 groups in this Activity (part of the Web Accessibility Initiative):

Education and Outreach Working Group, Research and Development Interest Group, WAI Coordination Group, WAI Interest Group

#### 19. WAI Technical:

There are 5 groups in this Activity (part of the Web Accessibility Initiative):

Authoring Tool Accessibility Guidelines Working Group, Evaluation and Repair Tools Working Group, Protocols and Formats Working Group, User Agent Accessibility Guidelines Working Group, Web Content Accessibility Guidelines Working Group

#### 20. Web Services:

Web services provide a standard means of interoperating between different software applications, running on a variety of platforms and/or frameworks. Web services are characterized by their great interoperability and extensibility, as well as their machine-processable descriptions thanks to the use of XML. They can be combined in a loosely coupled way in order to achieve complex operations. Programs providing simple services can interact with each other in order to deliver sophisticated added-value services. There are 7 groups in this Activity (part of the Technology and Society Domain):

Web Services Coordination Group, SOAP-JMS Binding Working Group, Web Services Choreography Working Group, Web Services Policy Working Group, XML Schema Patterns for Data binding Working Group, XML Protocol Working Group, Web Services Resource Access Working Group

#### 21. XForms:

XForms is a markup language that addresses the modern needs of electronic forms. It is based on XML and can deliver the collected values as an XML document. It addresses questions of authorability, usability, accessibility, device independence, internationalization, integration into different host languages, and reducing the need for scripting. There is 1 group in this Activity (part of the Interaction Domain):

Forms Working Group

#### 22. eGovernment:

eGovernment refers to the use of the Web or other information technologies by governing bodies to interact with their citizenry, between departments and divisions, and between governments themselves. There is 1 group in this Activity (part of the Technology and Society Domain):

eGovernment Interest Group

## 5. W3C Future:

W3C continues to expand the reach of the Web to:

Everyone<sup>4</sup> (regardless of culture, abilities, etc.), Everything (applications and data stores, and on devices ranging from power computers with high-definition displays to mobile devices to appliances), Everywhere (from high to low bandwidth environments), Diverse mode of interaction (touch, pen, mouse, voice, assistive technologies, computer to computer), Enable computers to do more useful work (through advanced data searching and sharing).

#### 1. Richer User Experience:

Many developers rely on the Web as a platform-independent application environment. Familiar Web applications include Web mail, reservation systems, online shopping and auction sites, games, and multimedia applications. Recent W3C Recommendations such as XForms will soon begin to influence the usability of such applications. New W3C work in areas such as compound documents targets further improvements in content diversity and overall usability. For more information on developing platform-independent Web applications, please refer to the work of the W3C Compounds Document Formats Activity.

#### 2. Browse With Eyes, Ears, Voice and Touch:

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<sup>4</sup> W3C Future: <http://www.w3.org/Consortium/future>

W3C is developing standards that support multiple, simultaneous modes of Web interaction: through eyes, ears, voice, and touch. In addition to the familiar keyboard, mouse, stylus, and audio/visual output, new interaction modes are becoming more and more commonplace. Indeed, so common that people may not even realize that they are interacting with a Web application such as a reservation system that is telephone-enabled.

Call center applications are just the beginning. W3C is enabling diversity of interaction so that people can choose the solution that best suits their needs in any given environment. W3C is carrying out this work in the W3C Multimodal Interaction Activity, the Voice Browser Activity, and the Device Independence Activity. These new technologies will improve access to the Web through mobile devices such as telephones and handheld organizers, but also other systems such as automotive telematics, home entertainment systems, and other multimodal applications.

### 3. Web for Everyone:

W3C's Web Accessibility Initiative (WAI) continues to promote implementation of existing accessibility guidelines in advanced authoring tools, together with improved evaluation tools. Increased implementation of accessibility guidelines for authoring tools, browsers, and media players, combined with personalized accessibility profiles, and use of metadata and proxy services to support accessibility, will enable people with disabilities to more readily create and interact with Web content. This progress will enable more automated support for development and repair of accessible Web sites. In this way, accessible Web design will become "business as usual."

W3C's vision of the Web is one of a truly integrated environment that allows for the expression of cultural nuances and language differences across distributed systems and geographies. W3C's Internationalization Activity has started work on guidelines that explain to developers how to ensure that their XML formats support internationalization and efficient localization. Other internationalization work will focus on common locale identifiers and negotiation for the World Wide Web and Web services in particular.

### 4. Web on Everything:

One of W3C's goals is to design technology that will work independent of a particular hardware platform. Increasingly, people are seeking access from a range of devices that extend beyond the familiar desktop computer, including mobile telephones, kiosks in airports, kitchen appliances, and automobiles. Access from

these devices (whether by human or machine) should be as simple, easy and convenient as Web access from a home computer. W3C is designing technologies (including those cited in the previous section, but also Cascading Style Sheets (CSS), Scalable Vector Graphics (SVG), XForms, Synchronized Multimedia (SMIL), and more) that will lower obstacles to authoring for, and browsing with, devices having a broad range of input and output capabilities. In the handheld device world, as part of the Mobile Web Initiative, W3C is building a database of device descriptions and developing best practices for the creation of mobile-friendly Web sites.

We look forward to the continued creativity of the Web community and to novel ways to add to and read from the Web. W3C has begun discussions about the "Ubiquitous Web," in which new Web applications requiring coordination among multiple devices will enable increasingly sophisticated Web experiences. Scenarios envisioned include connecting a camera phone to a nearby printer, using a cell phone to give a business presentation with a wireless projector, and viewing and listening to your electronic mail at the same time.

#### 5. Advanced Data Searching and Sharing:

As the Web grows into a even richer storehouse of human knowledge, we need ever more powerful tools to search and interpret the tremendous amount of available data; this applies to intranets as well as the global Web. Two models have emerged to help manage this data on a global scale: the Semantic Web and Web services.

The Semantic Web provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries. It is an extension of the current Web in which information is given well-defined meaning, better enabling computers and people to work in cooperation. The Semantic Web is data-centric.

Web services provide a standard means of interoperating between different software applications, running on a variety of platforms and/or frameworks. Web services are message-centric.

Both models are important to networked and distributed systems, so W3C is working to ensure their proper integration, both together and with the existing Web infrastructure. For instance, Web services benefit from the ability to share common vocabularies, unambiguous names, and a common data model, all of which are readily expressed with Semantic Web technologies.

## 6. Trust and Confidence:

The Web has transformed the way we communicate with each other. In doing so, it has also modified the nature of our social relationships. People now "meet on the Web" and carry out commercial and personal relationships, in some cases without ever meeting in person. W3C recognizes the importance of designing technologies that foster trust and confidence and thus enable increasingly complex interactions among parties around the globe.

What does it mean for a technology to foster trust? W3C's Platform for Privacy Preferences (P3P) was an important first step in building confidence by enabling people to become more aware about how they choose to share or not share information about themselves over the Web. Based on this experience with P3P, W3C is proceeding to tackle questions raised by service providers about how to implement privacy practices associated with those services. Organizations want to keep their promises. W3C is therefore exploring how privacy metadata can be used to help manage user data in a trustworthy fashion on the server side.

Traditionally, one way of establishing trust is to show some trusted form of identification, such as a driving license or a passport. Analogous authentication protocols are not yet widely available on the Web. Furthermore, today's approaches to online authentication often focus on authenticating the user and neglect the importance of mutual authentication. W3C is exploring ways to provide users and service providers more confidence in their transactions and easier identity management. The traditional public key infrastructure will also need to be augmented to accommodate the richness of different ways of life on the Web.

The Semantic Web will also play a role in trustworthy transactions. Semantic Web technologies enable people to write software that, on our behalf, can find and analyze information that will help build trust.

## **6. W3C Membership:**

W3C Members<sup>5</sup> take a leadership role in the future of the Web, promote their image as an innovator participating in a standards body international in mission and impact, and gain early insight into market trends (thus reducing the risk of missing them).

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<sup>5</sup> W3C- Membership, Benefits : <http://www.w3.org/Consortium/membership>

### Membership benefits:

- The opportunity to interact and work directly with the leading companies, organizations, and individuals in the Web world;
- A seat on the W3C Advisory Committee (AC), including an invitation to semi-annual Advisory Committee meetings;
- Right to create Incubator Groups, part of a lightweight process for rapidly developing, on a time scale of a year or less, new Web-related concepts;
- Right to submit proposals ("Member Submissions") to be considered for future Consortium work;
- The ability to provide strategic direction to the Consortium through review of W3C Activity proposals and operational policies;
- Participation in W3C Working Groups, where specifications and guidelines are developed, and in W3C Interest Groups, where discussions are conducted;
- Access to a full-time staff of experts in Web technology, who contribute to W3C's technical work and help coordinate discussions across the Consortium.
- Participation in W3C Workshops, frequently the catalyst for new technical work within the Consortium;
- Sponsorship and marketing opportunities such as those for W3C10;
- Access to the Member Web site (Member-only link) containing early information on emerging Web technologies, software, events, forums, news and announcements;
- Access to Member-only mailing lists, hosting discussions on work underway in the Consortium;
- Access to the W3C news service. Updates on W3C Activities, announcements for meetings, workshops and conferences, the calendar of events, and Team information are sent directly via email to AC Representatives and posted on the Member site;
- The right to use the W3C Member logo on your Web site and to participate in press releases, often through testimonials.
- Discounts for W3C Member employees at select conferences.