

World Wide Web Consortium: Web 3.0 Emerging

Steve Bratt, <steve@w3.org>



Web 3.0 Emerging

Steve Bratt

Chief Executive Officer

World Wide Web Consortium



January 2006

These slides: <http://www.w3.org/2007/Talks/0123-sb-W3CEmergingTech/>

PDF: <http://www.w3.org/2007/Talks/Talks/0123-sb-W3CEmergingTech/Overviewp.pdf>

Outline

• Web's Success and the Role of Standards

• World Wide Web Consortium

• Web for Everyone

- *Accessibility, Security*

• Web on Everything

- *Rich Web (Web 2.0), Voice, Mobile Web*

• Web of Data and Services

- *Semantic Web (Web 3.0?)*

• Questions

- *Along the way ...*

Web's Success and the Role of Standards

"Over 1 Billion Served"

WORLD INTERNET USAGE AND POPULATION STATISTICS						
World Regions	Population (2006 Est.)	Population % of World	Internet Usage, Latest Data	% Population Penetration	Usage % of World	Usage Growth 2000-2006
Africa	915,210,928	14.1 %	32,765,700	3.6 %	3.0 %	625.8 %
Asia	3,667,774,066	56.4 %	378,593,457	10.3 %	35.2 %	231.2 %
Europe	807,289,020	12.4 %	311,406,751	38.6 %	28.9 %	196.3 %
Middle East	190,084,161	2.9 %	19,028,400	10.0 %	1.8 %	479.3 %
North America	331,473,276	5.1 %	231,001,921	69.7 %	21.5 %	113.7 %
Latin America/Caribbean	553,908,632	8.5 %	85,042,986	15.4 %	7.9 %	370.7 %
Oceania / Australia	33,956,977	0.5 %	18,364,772	54.1 %	1.7 %	141.0 %
WORLD TOTAL	6,499,697,060	100.0 %	1,076,203,987	16.6 %	100.0 %	198.1 %

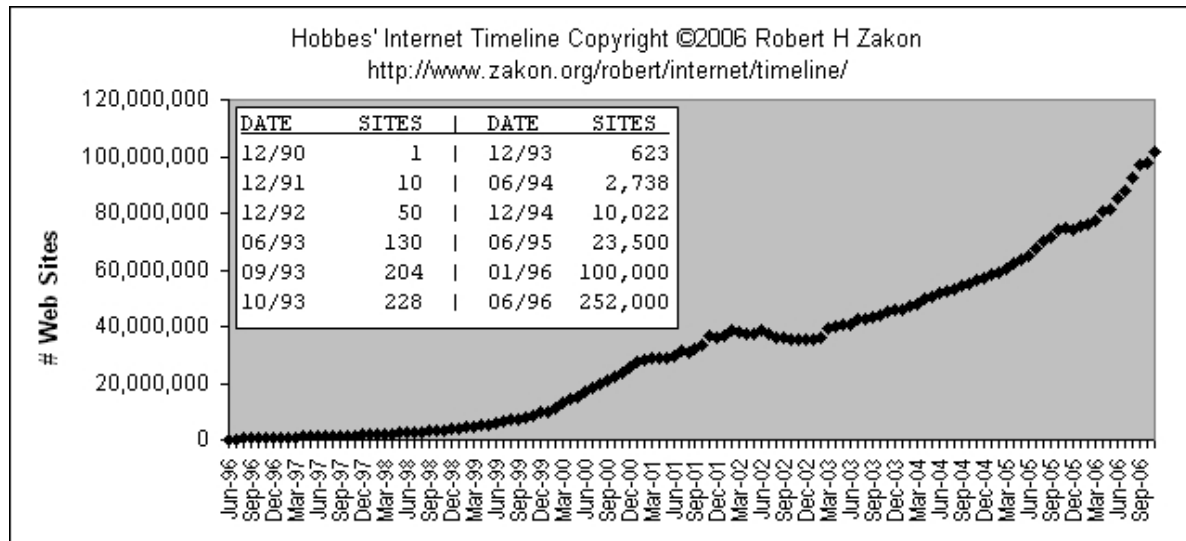
Source: <http://www.internetworldstats.com/stats.htm>

Note: in 1995, there were ~16,000,000 Internet users, or 0.4% of global population

(see also: [Top languages on the Internet \[graphic, link\]](#),
English 30% w/ 135% growth, Chinese 14% w/ 347% growth per year)

"Over 100 Million Serving"

Number of Web Sites (domain names and content)



Source: <http://www.zakon.org/robert/internet/timeline/>, http://news.netcraft.com/archives/2006/11/01/november_2006_web_server_survey.html

(Users:Servers ratio ~ 1996 = 150:1. 2000 = 50:1. 2006 = 10:1)

What Led to the Web's Success?



- Simple architecture - HTML, URI, HTTP
- Networked - value grows with data, services, users
- Extensible - from Web of documents to ...
- Tolerant - even w/ imperfect mark-up, data, links, software
- Universal - independent of systems and people
- Free / cheap - browsers, information, services
- Simple / powerful / fun for users - text, graphics, links
- Open standards ...



Why are Open Standards Important?

- Broad industry agreement (if done right)
- Interoperability ... cross-application, -organization, -data
- Avoids vendor lock-in ... for providers and users
- Open access = no black boxes
- Mandated ... by customers, government
- Open, royalty-free standards = good **business sense**



World Wide Web Consortium

Founded by Tim Berners-Lee in 1994, W3C is:

- Providing the **Vision** to Lead
- **Engineering** the **Open Standards** that Make the Web Work ...



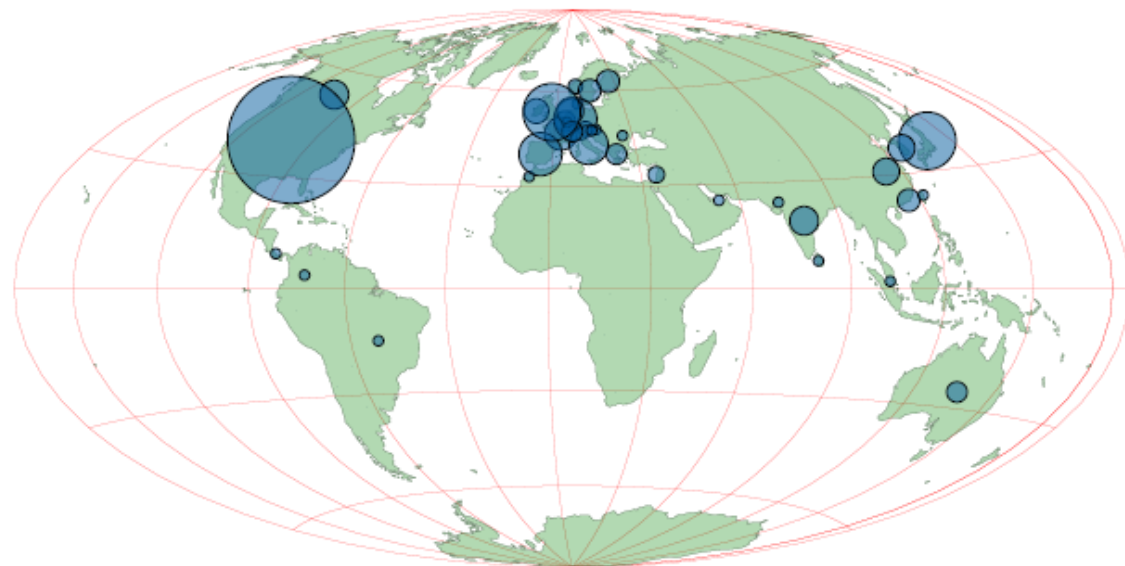
... expanding ...

- From a Web of **Documents** ...
- Toward **One Web** ...
 - ... of **Data and Services**
 - ... on **Everything**
 - ... for **Everyone**
- -- think **Web 3.0**

W3C[®]

A Unique Standards Organization

- 19 **Hosts/Offices**: MIT | ERCIM | Keio | | Australia | Benelux/Bénélux | 中国 | Suomi | Deutschland und Österreich | Ελλ•δα | 香港 | Magyarország | •••• | ••••• | Italia | | •••••• | España | Sverige | United Kingdom and Ireland | (*map*)
- 435 **Members** (*history map, largest*)
- 800 **Technologists** developing standards in 60 **Groups**
- 65 Member-neutral **Technical Staff**
- Accountable to the **Global Public**



(*Membership / Benefits / "At a Glance" brochure*)

Why Participate in W3C?

Saying in China*: *"Third-class companies make products; second-class companies develop technology; first-class companies set standards."*



• Leadership

- Introduce ideas through *submissions, workshops, Incubator Groups*
- Influence standards through *Working Group* participation, review, implementation

• Early insight into market trends

- Access world's foremost Web technologists from *Member & Team*
- Plan for emerging technologies & markets through *Member-confidential access*

• Promoting image as innovator

- Participate in international media activities, *press releases, testimonials* (e.g., *MWI*)
- Display logo on *W3C site* (300K visits/day) and *W3C logo* on your site

(Membership / Benefits / How to join W3C / "At a Glance" brochure)

* from "China's Post-WTO Technology Policy: Standards, Software and the Changing Nature of Techno-Nationalism", by Richard P. Suttmeier and Yao Xiangkui.

Increasing Focus on Needs of Industries

- **Why?**
 - Supports application of standards to real, important problem
 - Improves standards: Use cases, reqs, implementation, testing
- **Health Care and Life Sciences - launched November 2005**
 - "use of Semantic Web technologies ... to improve collaboration, research and development, and innovation adoption"
 - Agfa, AstraZeneca, Cleveland Clinic, HL7, Merck, Partners, Pfizer (66 participants)
- **Financial Services - under consideration**
 - American Express, Citigroup, Dow Jones joined in 2006 (many others considering)



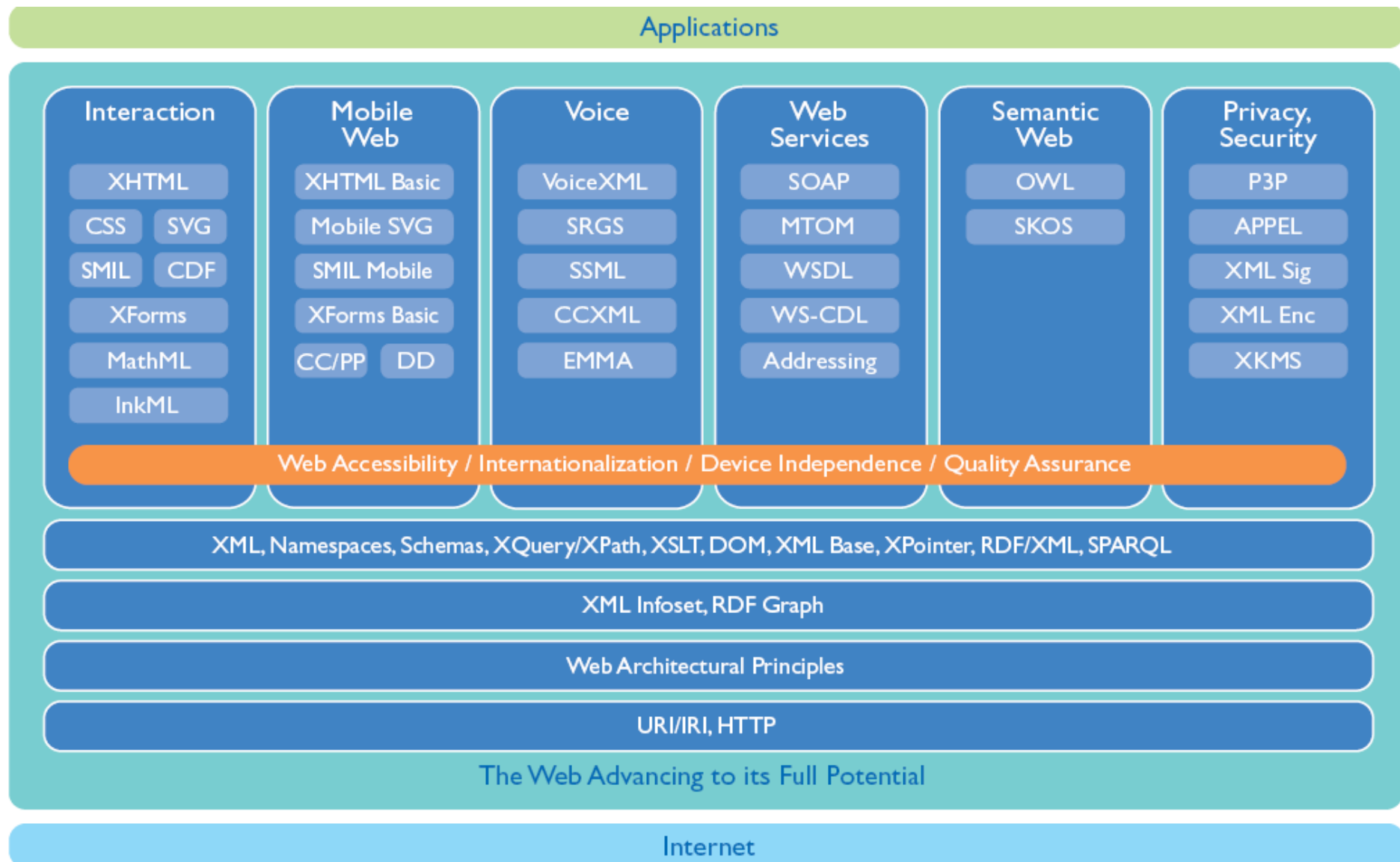
What We Hear from Financial Services

- Customer (+employee) relationship management
- Security
- Legacy systems and data
- Interfacing and interoperability
- Transaction speed and reliability
- Mergers and acquisitions
- Risk management
- Corporate governance
- Competition and efficiency
- Globalization
- Leveraging IT -- a challenge in itself!
 - XML, SOA, WS, mobile, and more ...



Engineering the Web's Interoperable Foundation

- Close to 100 Web Standards to date ([list/svg-by-yr/translations/~60 groups svg](#))
 - Including: *HTML, XML, CSS, SOAP, SVG, Voice XML, RDF* and more



(Description of technologies in the stack)

The Real Question

- Q: Which of these are relevant to you?
- A: All of them... 😊
- ... but let's look at a subset of W3C's *emerging* technologies

Web for Everyone

Web for Everyone



Universal Access ...

- Global participation (Offices, translations, etc.)
- Internationalization Activity (*overview talk*)
- Web Accessibility Initiative
- New Web security work
- Future objective: "Trust"

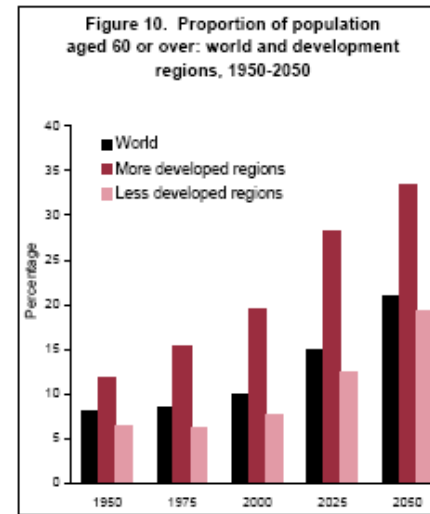
Why is Web Accessibility Important?

Access for people with disabilities and an aging global population ...

- The Web is spreading rapidly into all areas of society
- Barriers exist for many types of disabilities
- Millions have disabilities that hinder Web access
- Aging global population = increasing levels of disabilities
- Some sites must be accessible (e.g., [US regs](#), legal action)
- Web accessibility also has carry-over benefits

Developing a Web Accessibility Business Case

Graphic source: <http://www.un.org/esa/population/publications/worldageing19502050/>



More developed regions have relatively high proportions of older persons



Web Accessibility @ W3C



- **W3C's Web Accessibility Initiative**

- *Multi-stakeholder development of int'l standards*
- *Content, authoring tools, user agents*
- *Education and outreach to organizations, governments*

- **Web Content Accessibility Guidelines 1.0**

- *W3C standard since 5 May 1999 (Quicktips)*

- **Web Content Accessibility Guidelines 2.0**

- *Standard planned for completion in next 6 -12 months*
- *Broader range of Web technologies. More testable.*



"Before and After" demonstration Web sites

Web Security @ W3C

- ● W3C's Security Activity
 - *Seeking practical standards to address most pressing problems*
- ● New Web Security Context Working Group
 - *Planned during [workshop](#) w/ major browser, security, financial services companies*
 - *Usable, mutual authentication*
 - *... e.g., "[secure letterhead](#)", "[petname](#)", padlock use, certificates, etc.*
 - *Forms annotation (in HTML WG) = important complement*
 - *Starting to gather [use cases](#)*
- ● New Maintenance Group?
 - *for core Web security standards for signature, encryption, key management*
- ● More about Web 2.0 security later ...



Web on Everything

Web on Everything



**The* User Interface, everywhere ...*

- Interaction Technologies: HTML, XForms, CSS, MathML, Voice, Graphics, Multimedia, Multimodal
- Web 2.0 = Rich Web Clients: Compound Doc Formats, Web Apps APIs (AJAX) and Formats
- Mobile Web Initiative
- Device Independence
- Ubiquitous Web (*workshop, slides*)

Web 2.0

- HTML, as an application platform
- Finally, the "Read-Write" Web
- Powerful apps emerging, e.g.
 - Compact, interactive, efficient updating
 - Tools: *Gmail, Google Maps, Basecamp*
 - Blogs, wikis, social sites, etc.
 - Dashboards: e.g.
- More scripting, more security concerns
 - Exposure of user and server data and systems
 - Browser safeguards limit potential



W3C Rich Web Clients @ W3C

- Mature W3C standards (plus javascript) enable Web 2.0
 - *HTML WG bringing most important spec up to date*
 - *DOM, CSS, SVG, etc.*
- New *Rich Web Clients Activity*, is standardizing:
 - *AJAX (XMLHttpRequest object), and other JS features, libraries*
 - *Languages to support app development (e.g., *Widget packaging and delivery format*)*
- Coordinating with browser developers to enable more secure application environment
 - e.g., *standard* for site to declare that its data are available to any javascript application (or not)



(little AJAX/SVG-based demos: *XMLHttpRequest playlist, fatcats, cubes*)

Voice @ W3C

• Why?

- Companies provide interactive voice response (IVR)
- Companies use Web technologies (e.g., XML) to manage data
- Similarities between voice- and screen-browsing

• What does the Voice Browser Working Group do?

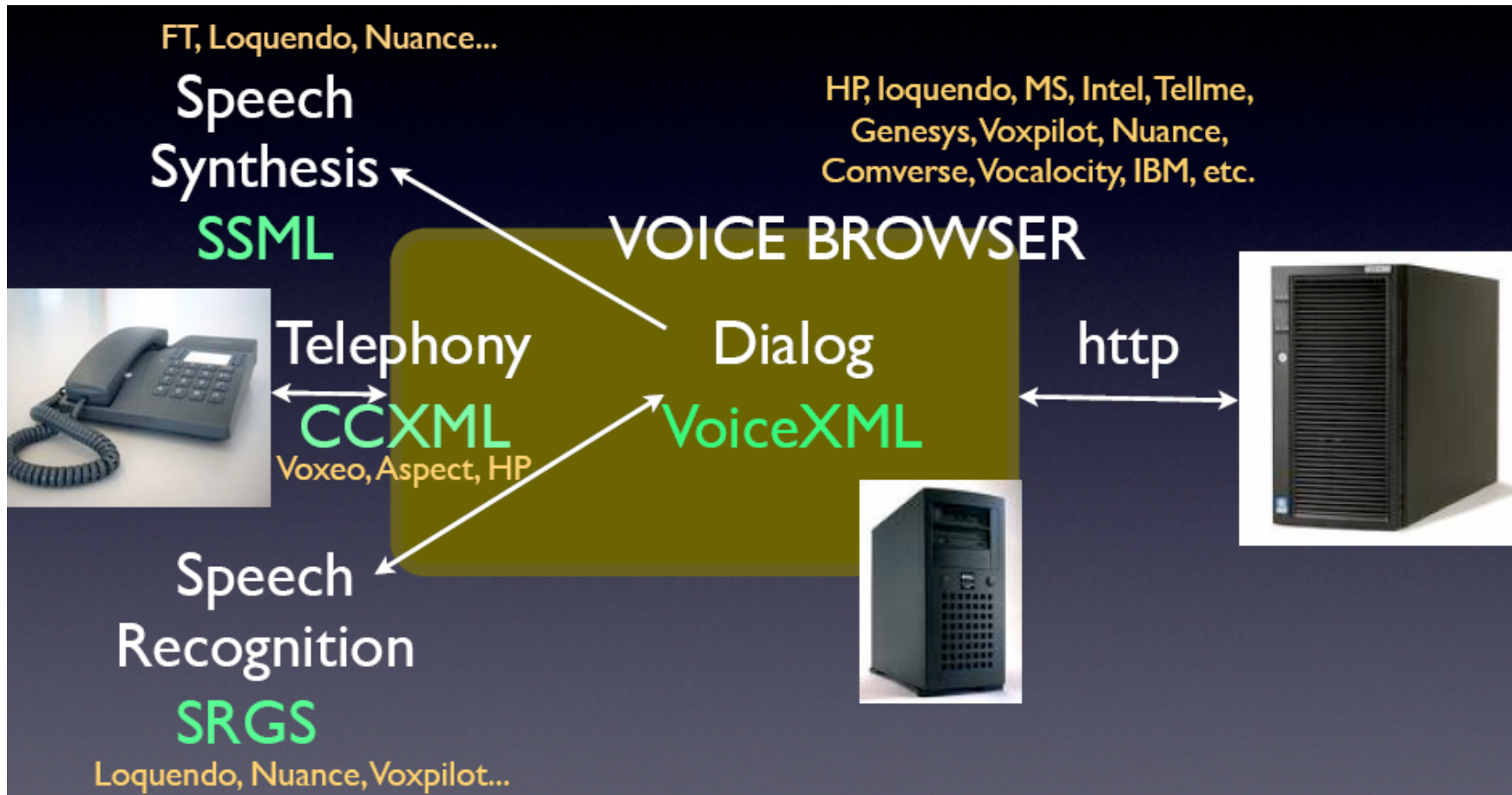
- Standards for vocal interaction with Web applications
- Convergence with other Web technologies

• How important is this?

- One of the largest W3C Working Groups
- VoiceXML leads the voice markup market ... and growing



Voice: Architecture

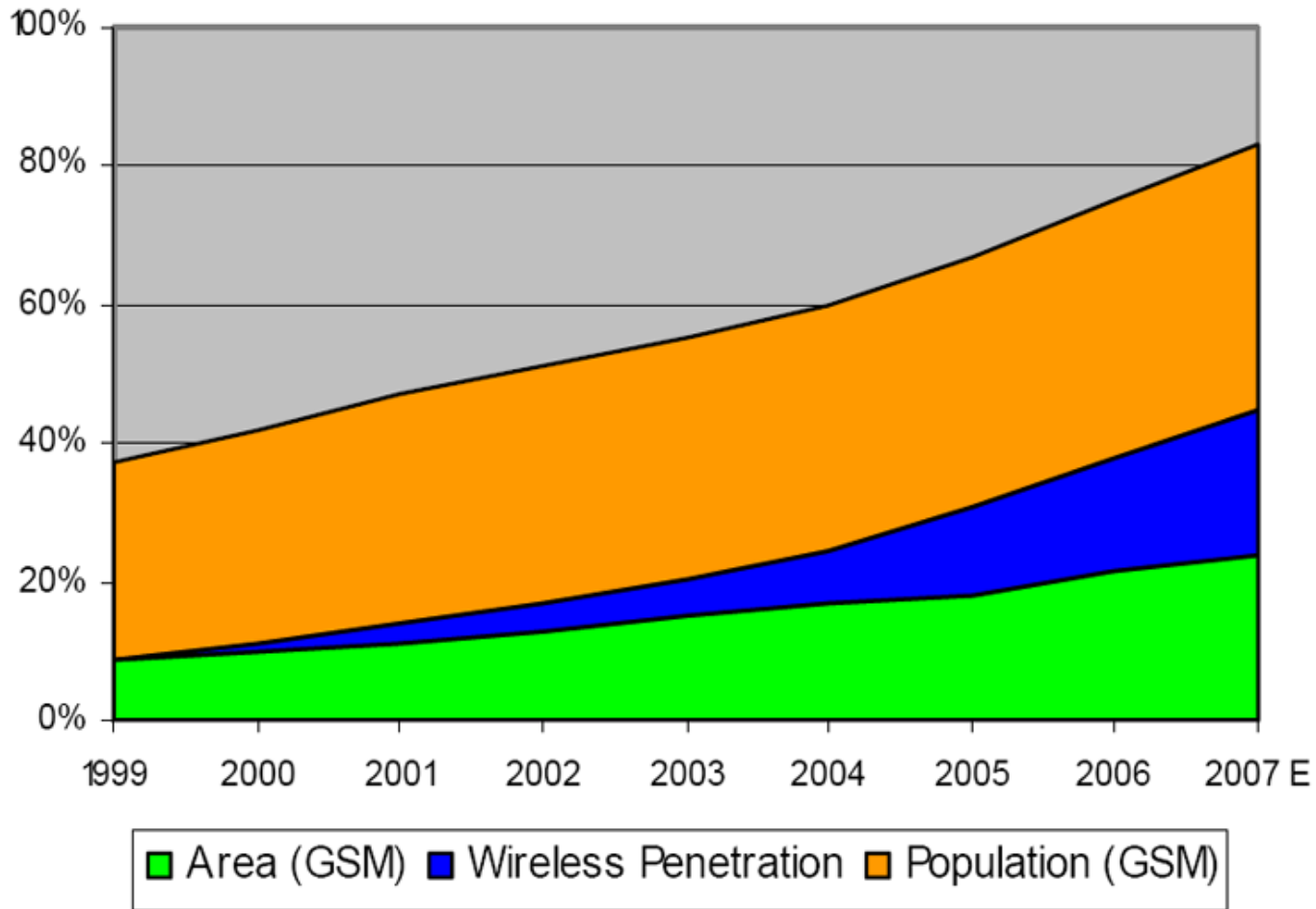


Mobile Web: The Next "Thing"

- 2+ billion connected. ~2/3 Web-capable. +1 million more/day.



Mobile Web: Expanding Coverage



http://www.gsmworld.com/documents/universal_access_full_report.pdf

http://www.gsmworld.com/documents/universal_access_full_report.pdf (2006)

Today, Mobile Web is Inconvenient, Inefficient

- Operators/phones require custom Web authoring for acceptable usability



Mobile Web Initiative @ W3C

Goal: Make Web access on phones as seamless, reliable, cost-effective and useful on on desktops and laptops

- Mobile Web Best Practices

- *How to author content (Guidelines, mobileOK)*
- *Leveraging existing Web standards: HTML, CSS, SVG, etc.*

- Device Description

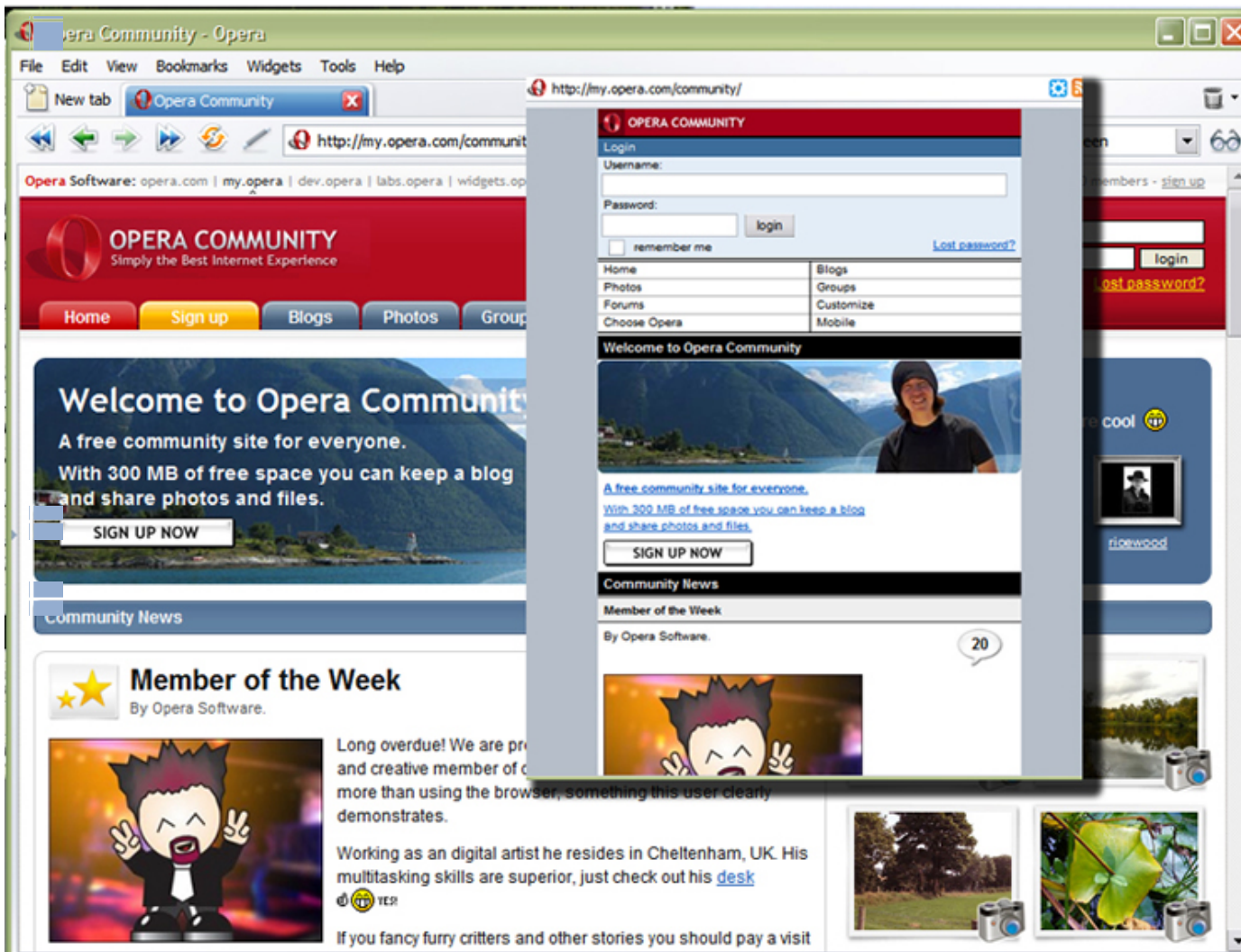
- *Data on devices; repository scheme*

- Test Suites

(MWI Overview slides)



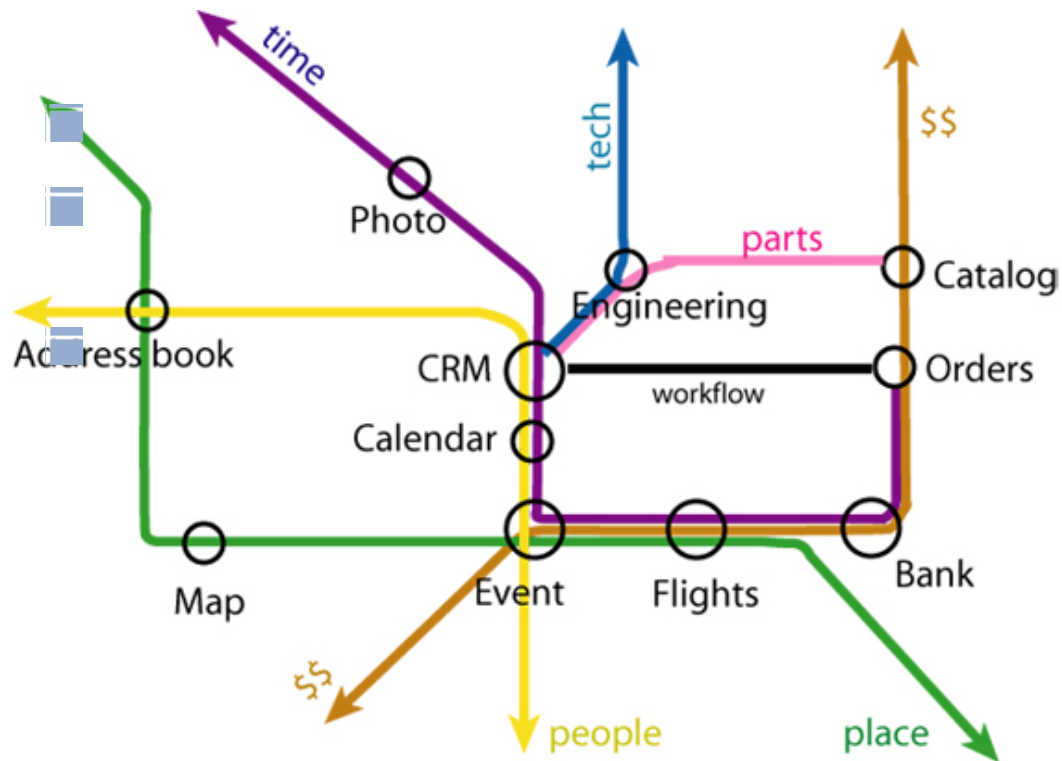
MWI: Best Practices Guidelines Focus on Usability



- 60 Best Practices, ex:
 - Thematic consistency: One Web
 - Layout: Use CSS, no tables or frames
 - Screen-estate: Navigation and important info at top, limit size, small graphics
 - Scrolling: One direction
- Best Practices Checker
- Summary

Web of Data and Services

Web of Data & Services



Interoperable information and programs ...

- XML: Binary, Processing Model
- Web of Services: Performance, Addressing, SemWeb Services, Policy (*overview slides*)
- Web of Data = Semantic Web: Deployment, Query, Rules, Health Care/Life Sciences, Content Labeling, Geospatial, Multimedia Semantics

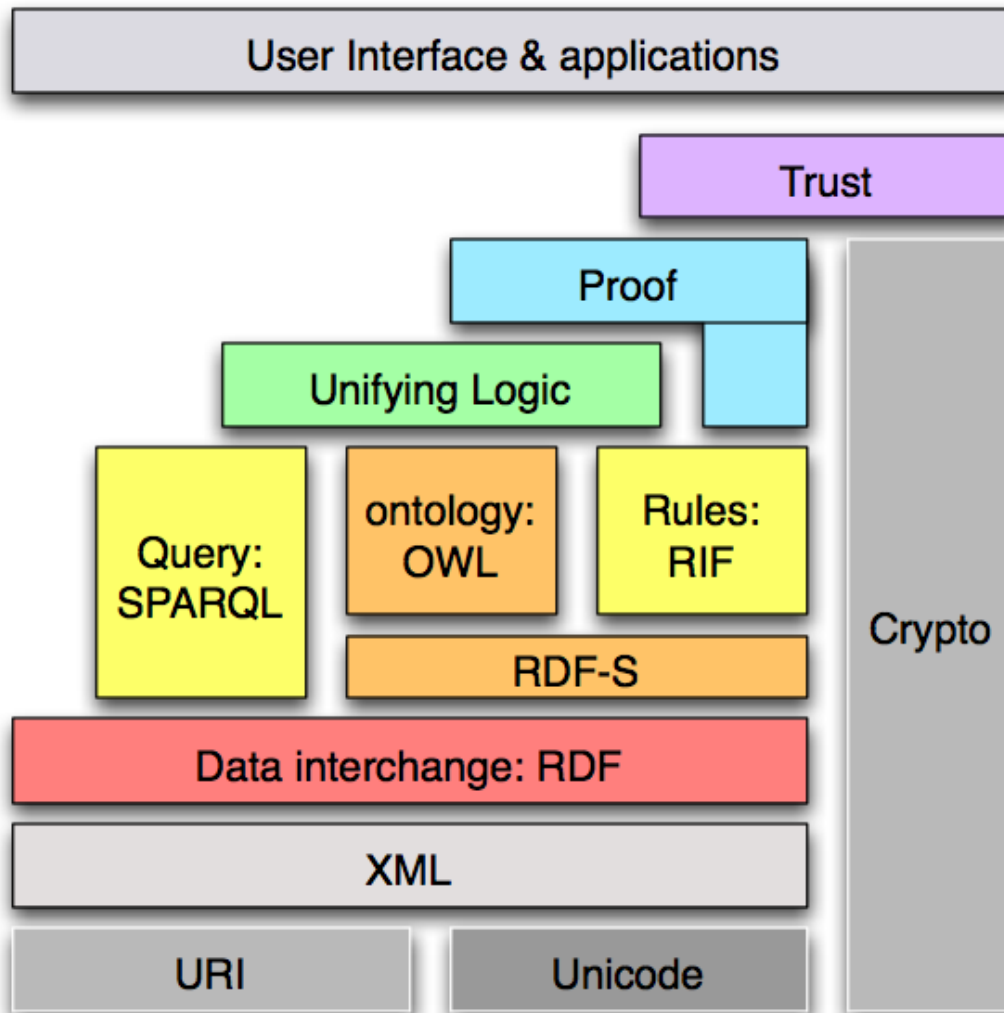
Semantic Web: Why?

- ● Tasks often require *combining* data across the Internet, e.g.:
 - *Integrating data across the enterprise*
 - *Hotel, transport, meeting, personal info come from different sites*
 - *Mining data from biochemical, genetic, pharmaceutical, patient databases*
 - *Cross-referencing disparate digital libraries*

- ● Humans understand how to combine this information ...
 - *Not always easy (different vocabularies, languages, formats)*

- ● Machines aren't smart enough :-)

Semantic Web: Linked Data on the Web



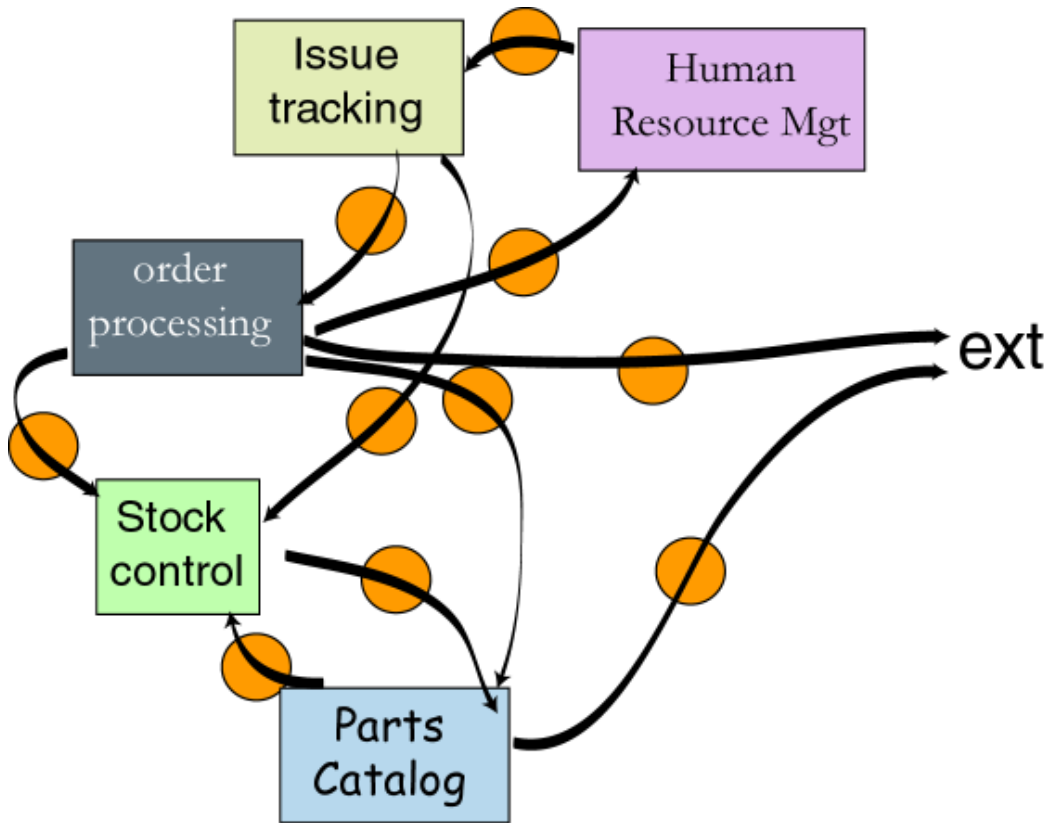
Machine-processable, global **Web** standards:

- Assigning unambiguous names (URI)
- Expressing and linking data, including metadata (RDF)
- Capturing ontologies (OWL)
- Query, rules, transformations, deployment, application spaces (in progress) logic, proofs, trust

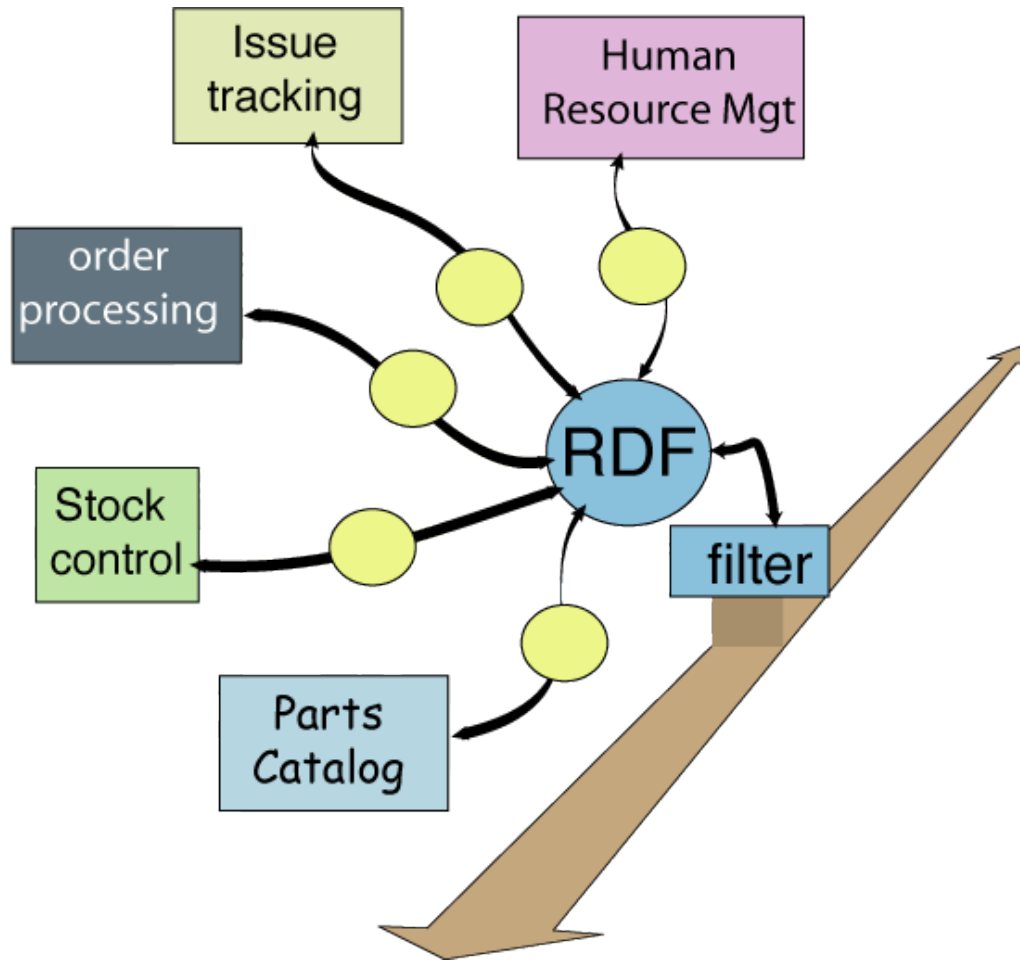
Semantic Web = Web 3.0? (Markoff, NYT, Nov 2006)

(W3C's Semantic Web Activity / Semantic Web overview slides / example)

Enterprise Integration Today



Enterprise Integration on the "Semantic Bus"



Questions?

Summary



- Evolution toward one Web ...
 - *of Data and Services, on Everything, for Everyone*
- Strong business case for
 - *Understanding emerging standards*
 - *Implementing standards as they appear ready*
- ... *Participating in standards orgs supports both*
- A good resource ...<http://www.w3.org/>

