Web technologies - past, present, future

or

The Web @ 25
From 25 years of history ... into the future

or

Why am I standing here?

or

Why are *you* here?

Olle Olsson
Swedish W3C Office
Swedish Institute of Computer Science (SICS)
"Monday talks", SICS, Stockholm, May 2015

W3C WORLD WIDE WEB consortium   SWEDISH ICT SICS
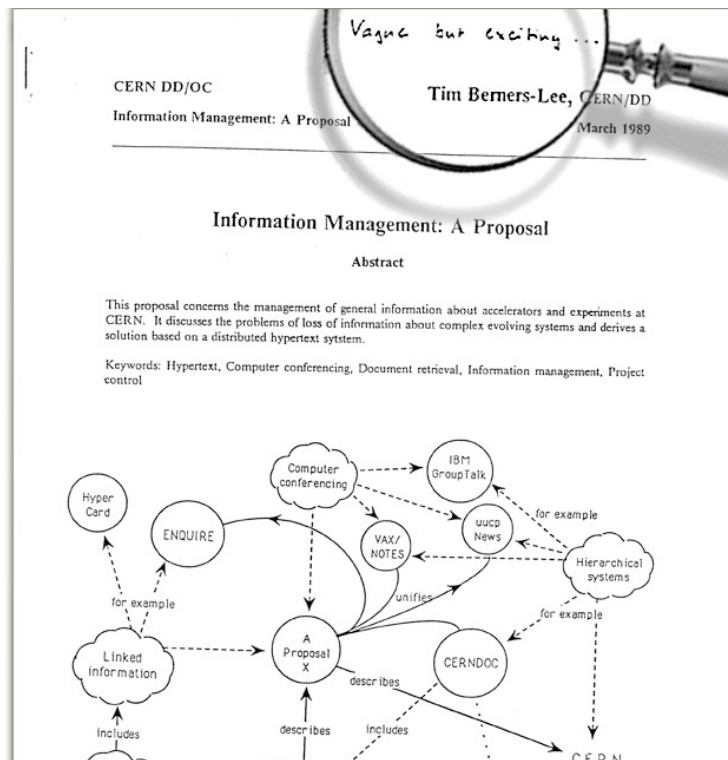

Contents

- The web – a quick history
- Commercial attention
- Technology success drivers
- Competition and threats
- The future
- Some observations

The web – a quick history
(History at breakneck speed)

Olle Olsson: "Web Technologies"
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History at breakneck speed

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- March 1989:
  - Tim Berners-Lee: "*Information Management: A Proposal*"
  - While at CERN (European Nuclear Research Center)
- Primary audience ("use case"):
  - Researchers (high energy physics) sharing and authoring documents
- Precondition:
  - Internet technology fairly wide-spread
- 1989-1991: The baby years; prototyping (web server, web browser); internal deployment

---

History at breakneck speed

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- October 1969:
  - Internet technologies
  - Test SRI ↔ UCLA
  - Two characters transferred … then crash

History at breakneck speed

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World Wide Web

The WorldWideWeb (W3) is a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an executive summary of the project, Mailing lists , Policy , November's W3 news , Frequently Asked Questions .

What's out there?
    Pointers to the world's online information, subjects , W3 servers, etc.
Help
    on the browser you are using
Software Products
    A list of W3 project components and their current state. (e.g. Line Mode ,X11 Viola , NeXTStep , Servers , Tools , Mail robot , Library)
Technical
    Details of protocols, formats, program internals etc
Bibliography
    Paper documentation on W3 and references.
People
    A list of some people involved in the project.
History
    A summary of the history of the project.
How can I help ?
    If you would like to support the web..
Getting code
    Getting the code by anonymous FTP , etc.

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History at breakneck speed

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YAHOO!
New   Cool   Today's News   More Yahoos

YAHOO! CELEBRATE AND WIN. HOLIDAY EXTRAVAGANZA CLICK HERE.
Get Local   Weekly Picks

[Search] Options

Yellow Pages - People Search - City Maps -- Stock Quotes -- Sports Scores

- **Arts and Humanities** - Architecture, Photography, Literature...
- **Business and Economy [Xtra!]** - Companies, Investments, Classifieds...
- **Computers and Internet [Xtra!]** - Internet, WWW, Software, Multimedia...
- **Education** - Universities, K-12, College Entrance...
- **Entertainment [Xtra!]** - Cool Links, Movies, Music, Humor...
- **Government** - 96 Elections, Politics [Xtra!], Agencies, Law, Military...
- **Health [Xtra!]** - Medicine, Drugs, Diseases, Fitness...
- **News and Media [Xtra!]** - Current Events, Magazines, TV, Newspapers...
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- **Reference** - Libraries, Dictionaries, Phone Numbers...
- **Regional** - Countries, Regions, U.S. States...

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History at breakneck speed

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History at breakneck speed

Auction Web

[Menu] [Listings] [Buyers] [Sellers] [Search] [Contact/Help] [Site Map]

Welcome to today's online marketplace...

...the market that brings buyers and sellers together in an honest and open environment...

Welcome to eBay's AuctionWeb.

Welcome to our community. I'm glad you found us. AuctionWeb is dedicated to bringing together buyers and sellers in an honest and open marketplace. Here, thanks to our auction format, merchandise will always fetch its market value. And there are plenty of great deals to be found!

Take a look at the listings. There are always several hundred auctions underway, so you're bound to find something interesting.

If you don't find what you like, take a look at our **Personal Shopper**. It can help you search all the listings. Or, it can keep an eye on new items as they are posted and let you know when something you want appears. If you want to let everyone know what you want, post something on our wanted page.

If you have something to **sell**, start your auction instantly.

Join our community. Become a registered user. Registered users receive additional benefits such as daily updates and the right to participate in our user feedback forum and the bulletin board.

Please **read on** about the AuctionWeb vision...

History at breakneck speed
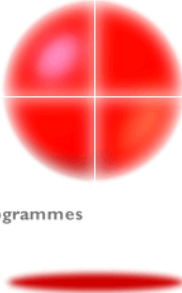
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Crowds Looking for Food in Zaire

LATE NEWS UPDATE

Two Aircraft Collide In Air Near Delhi, Killing About 350

IN CYBERTIMES

Europe Betting on Self-Regulation to Control the Internet

Help Center | Low Graphics

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Google! BETA

Search the web using Google!

[Google Search] [I'm feeling lucky]

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New User? Sign up now!

PayPal™ lets you beam money to anyone with a Palm™ Organizer.

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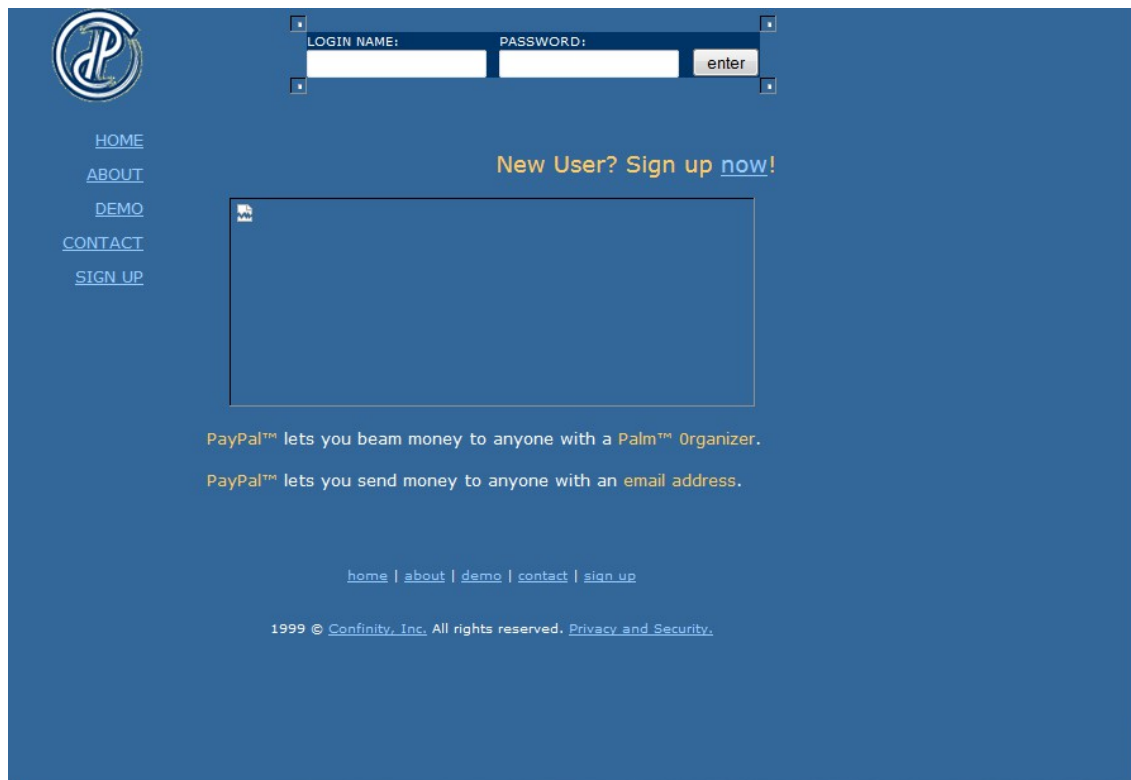
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HomePage

HomePage | Recent Changes | Preferences | Receive an article a day!

Welcome to Wikipedia, a collaborative project to produce a complete encyclopedia from scratch. We started in January 2001 and already have **over 13,000 articles**. We want to make over 100,000, so let's get to work--*anyone* can edit any page-- copyedit, expand an article, write a little, write a lot. See the Wikipedia FAQ for information on how to edit pages and other questions.

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History at breakneck speed

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[thefacebook]

login   register   about

Email:
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Welcome to Thefacebook!

[Welcome to Thefacebook]

Thefacebook is an online directory that connects people through social networks at colleges.

We have opened up Thefacebook for popular consumption at **Harvard University**.

You can use Thefacebook to:
- Search for people at your school
- Find out who are in your classes
- Look up your friends' friends
- See a visualization of your social network

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Register   Login

about   contact   faq   terms   privacy
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Commercial attention – Ups and downs

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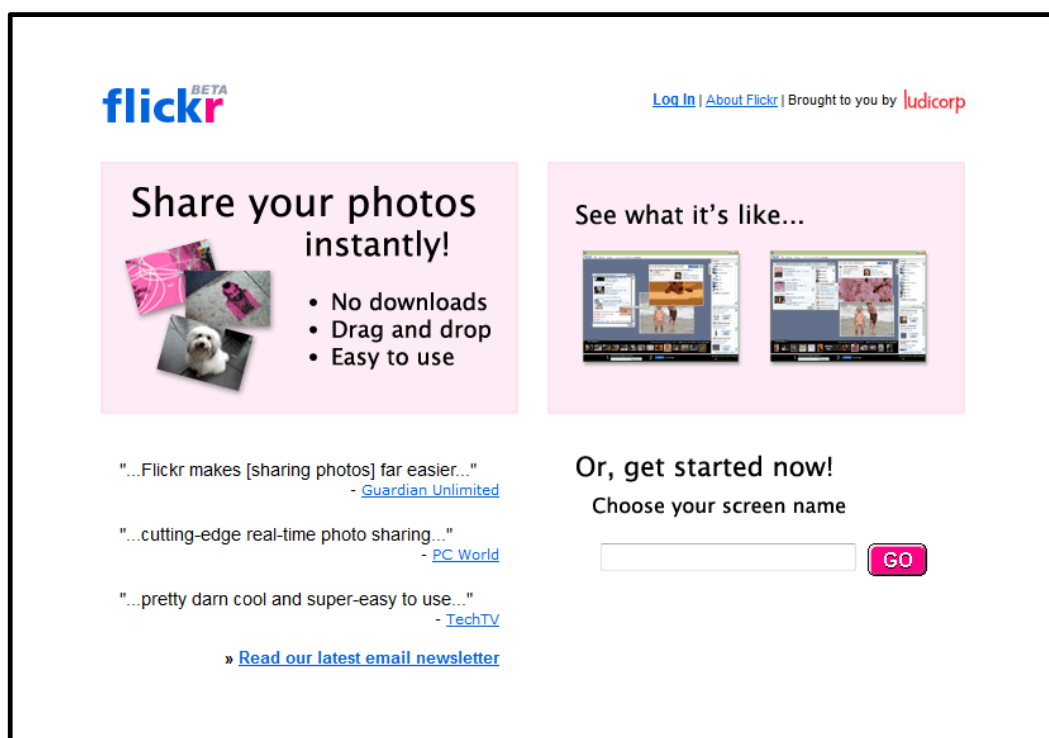"SICS" 2015   (23)
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Netscape IPO

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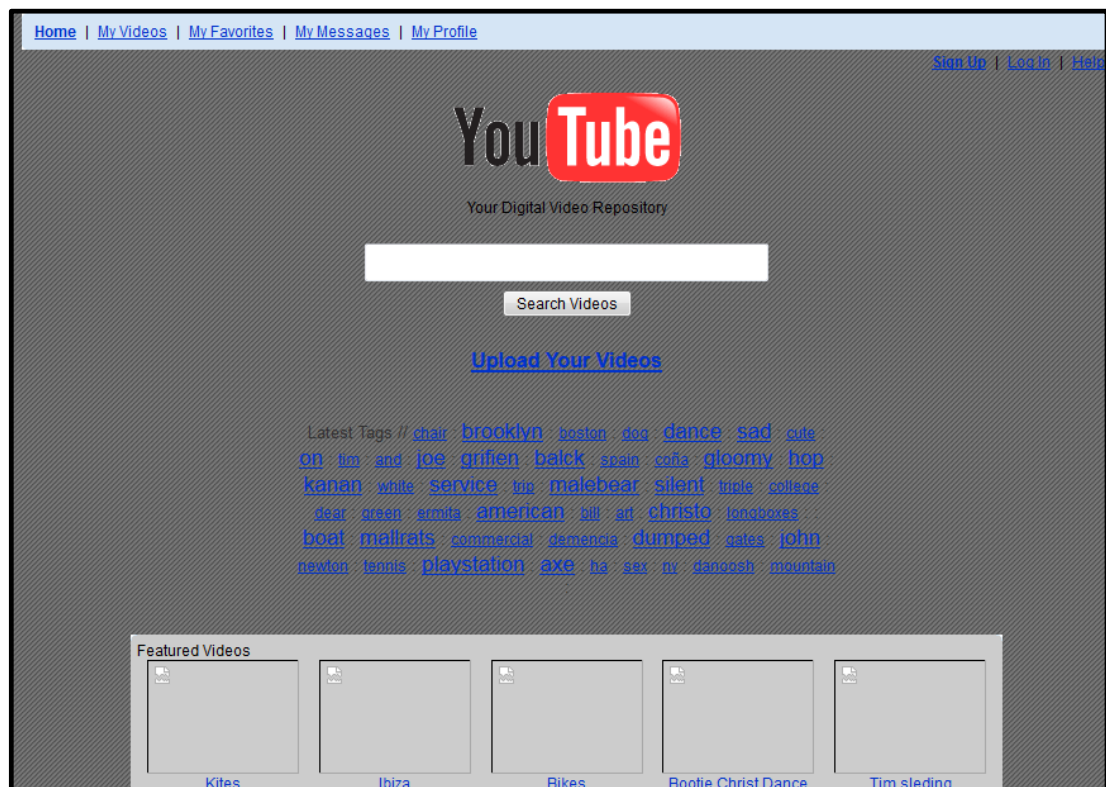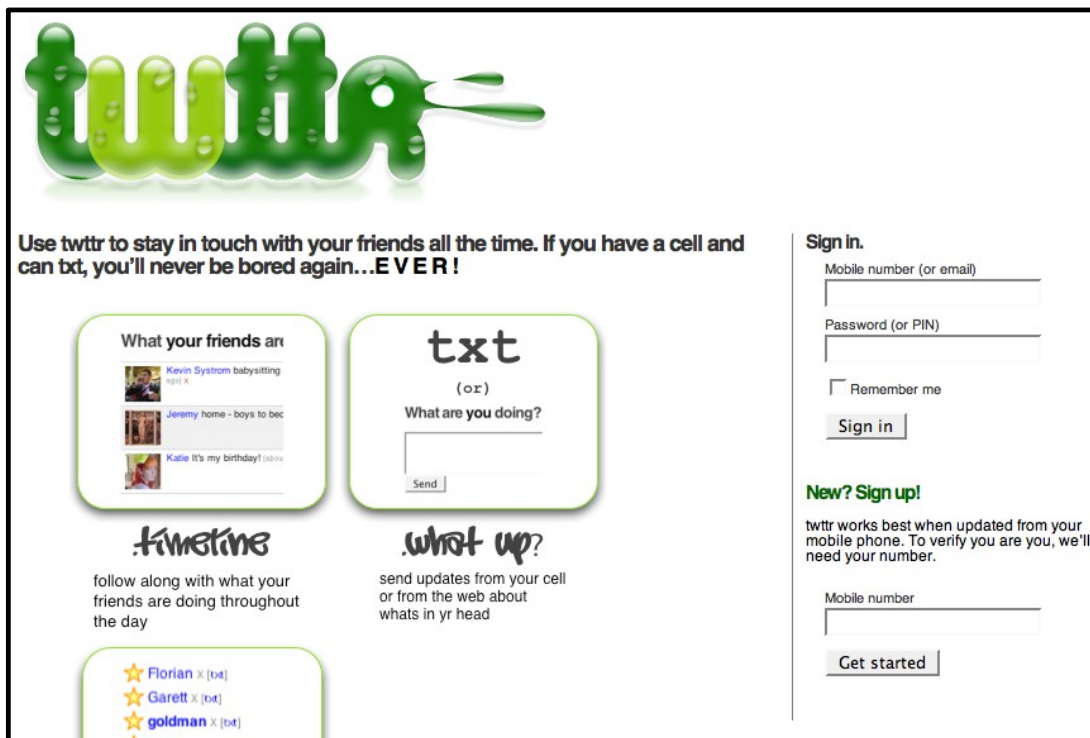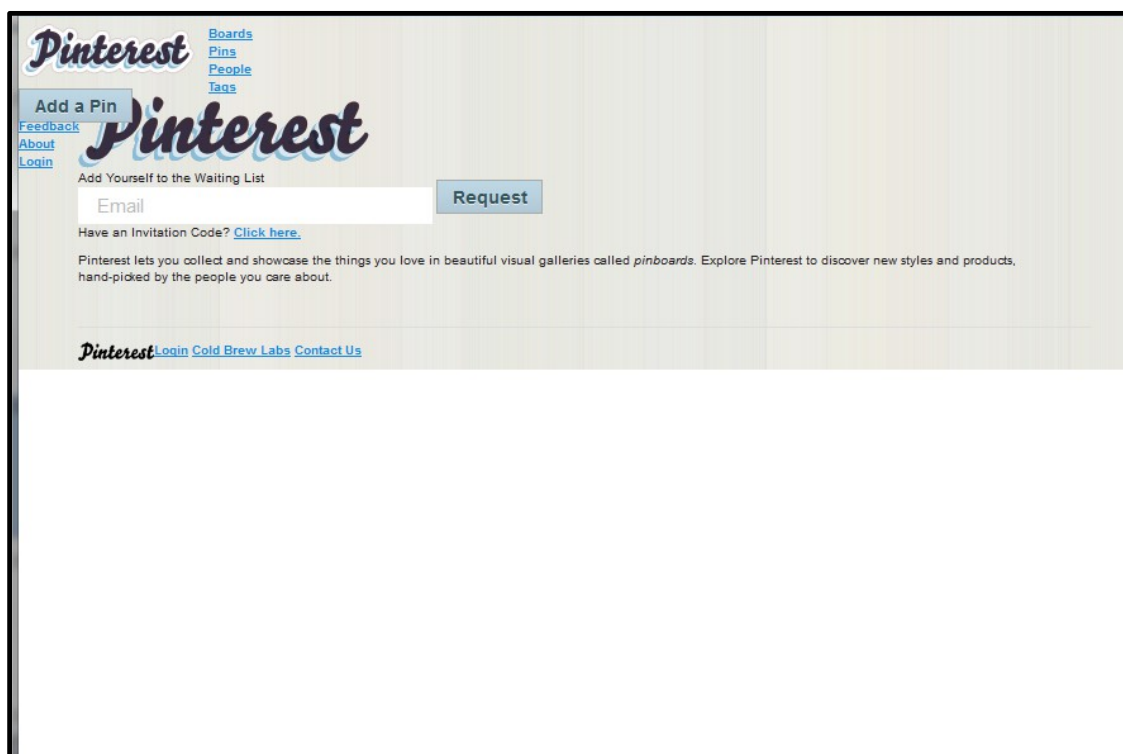- 2009
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Netscape unveiled a new line of intranet solutions for an expanding market of rich, open email and groupware. Using Netscape Communicator client software and Netscape SuiteSpot 3.0, corporate customers can build and manage full-service intranets.

Recent independent studies by Zona Research and Forrester Research estimate Netscape's share of the Web server market at 80 percent. Analysts attribute Netscape's lead to its wide range of server solutions and cross-platform architecture.

IDC Netscape intranet customers are already realizing a 1000 percent return on investment in less than three months,

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Check out Navigator 3.0 - all platforms. Perfect for fall: Weekender sweatshirts - now only $34 (save $5).

THE MAIN THING: MANY HAPPY RETURNS
Jim Barksdale, President and CEO

In previous columns I've talked about the benefits intranets offer to businesses. Well, now I'm happy to report just how valuable these intranets

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Dotcom bubble

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NASDAQ
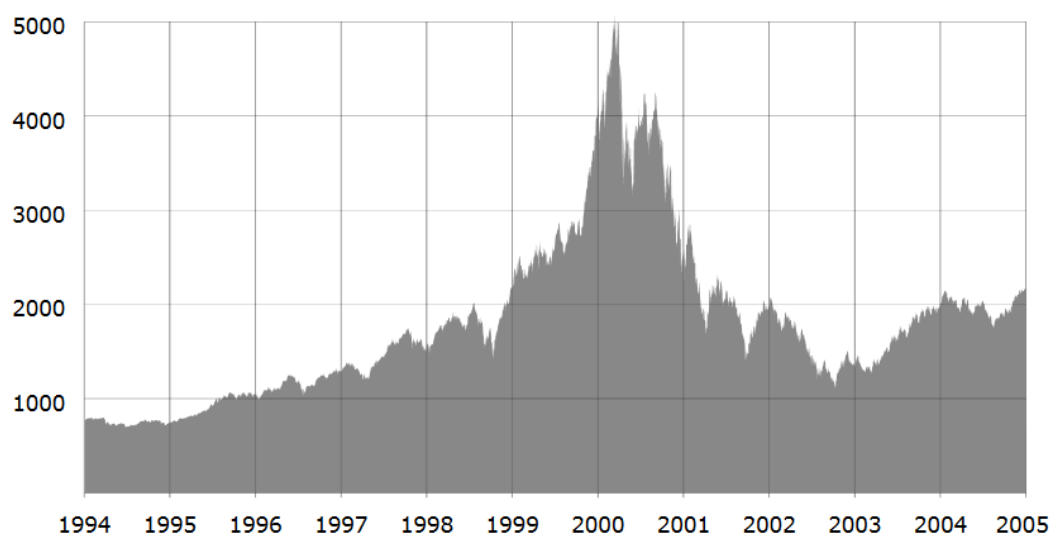
Technologies ...
Success drivers?

Technologies initially

- HTML
  - 18 element types
- HTTP
- URL

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Research community reaction

TBL submitted paper to "Hypertext 91" … rejected.

- "Links in hypertext must be bidirectional. WWW's are one way only."
- "WWW servers aren't aware of each other and there is no inter-server communication."
- "All WWW servers are equal. There should be a concept of hubs."
- "WWW servers don't keep state. They are completely unaware of their previous interactions."
- "It's obvious that whoever wrote the hypertext engine doesn't understand SGML. This HTML is done all wrong."
- "Finally, he's giving this away for free. That means it has no value at all. We have our own version and a strong licensing partner."

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Technologies initially

- HTML
  - 18 element types
- HTTP
- URL

Uptake – socio-technical drivers

(1) Piggyback on known technologies:

- HTML	- SGML
- 18 element types	- simplified
- HTTP	- FTP
- URL	- Domain name addresses + Unix folder structure

(2) Open source

(3) Content not compiled – "view source"

Was success inevitable? Obvious?

- Soundclip
  - David Goodman, IBM:s "identity strategist"
  - Interview at theconference "Digital ID World 2004".
  - Worked with X.500 technologies (think "telco")
  - 05:11 - 06:49

Was success inevitable? Obvious?

At the time that that wrapped up would be the time when the web really took off, and perhaps the bubble and the all of the mania around that, sort of swept aside all of the requirements, and in the early days we didn't have a lot of bad guys on the net.

So now we are coming back to a point where we were right before all that happened.

Was success inevitable? Obvious?

It's an amusing and a painful anecdote about that.

We had a meeting with our research community constituents in Zürich in Switzerland.

It was a meeting between the user group and the X.500 group. We had joint meetings.

This was at the peak of ... we were really growing considerably, quarter on quarter,in terms of the number of organizations plugging into our network that we were coordinating.

Was success inevitable? Obvious?

A young Englishman who was working at CERN came along to talk to the user group, a guy called Tim Berners-Lee, who wanted to talk about something that he had created, called the World Wide Web.

This was back in 1991.

He gave a very interesting and charming exposé of what the web was about.

And at the end of it ... we listened, we sat respectfully.

Was success inevitable? Obvious?

And one of our guys got up and said:

> *"Well that was really interesting, it sounds like great technology, but do you really think you'll ever get critical mass."*

And I squirm on my feet when I think about that, because we really believed that we were going to get critical mass, and this was just a charming academic exercise that was going to go nowhere.

And in terms of lessons learnt, personally, that was a tremendous one.

Web technologies now

- Accessibility
- Amaya
- CC/PP
- Compound Document Formats (CDF)
- CSS
- CSS Validator
- Device APIs (DAP)
- Databinding
- Digital Publishing
- DOM
- Efficient XML Interchange (EXI)
- Geolocation
- eGovernment

Web technologies now

- GRDDL
- Health Care and Life Sciences
- HTML
- HTML Tidy
- HTML Validator
- HTTP
- InkML
- Internationalization
- Jigsaw
- Libwww
- MathML
- Media Annotations
- Media Fragments

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Web technologies now

- Mobile Web Initiative (W3C-MWI)
- Multimodal Interaction
- Open Web Platform
- OWL
- Patent Policy
- PICS
- PNG
- POWDER
- Privacy and P3P
- RDF
- Rules
- Security
- Semantic Web

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Web technologies now

- Service Modeling Language (SML)
- SKOS
- SMIL
- SOAP/XMLP
- SOAP-JMS
- SPARQL
- Style
- SVG
- TAG
- Timed Text
- Tracking Protection
- Ubiquitous Web Applications
- URI/URL

Web technologies now

- Video
- Voice
- WAI
- Web Applications
- Web Architecture (TAG)
- WebCGM
- Web Services
- Widgets
- WS-Addressing
- WS-CDL
- WSDL
- WS-Policy
- WS-Resource Access

Web technologies now

- XForms
- XHTML
- XHTML2
- XLink
- XML
- XML Base
- XML Key Management
- XML Processing
- XML Query
- XML Schema
- XML Signature and Encryption
- XPath
- XPointer
- XSL and XSLT

Technologies now – big bag of things, or …?

?

HTML5 is the most visible technology.

Often regarded as "the web".

Success drivers:

- Standardized
- Real stakeholders drive standardisation
- Unencumbered by patents
- Recognized standardisation forum

Developing technologies – historical phases

1. Document structure and linking
2. Document styling … CSS
3. Rebuild foundation … XML
4. Rebuild markup … XHTML
5. Programmable web … DHTML, JavaScript, Web 2.0
6. Mobile web … device characteristics, platform functionality
7. Diversify … other domains/sectors

Technologies – Open Web Platform
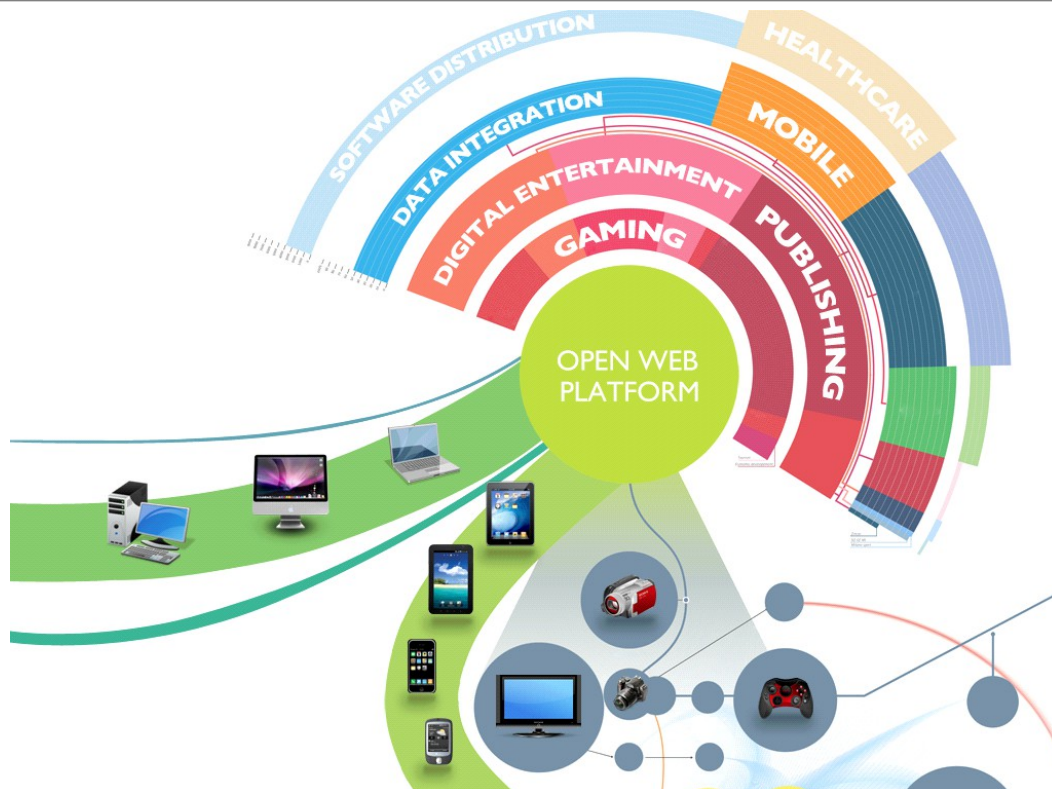
Competition and threats

Competition

- At birth of the web
  - Gopher
  - WAIS
  - ....

Threat

- Browser wars: late 1990s
  - Netscape vs MS Internet Explorer
  - Fragmentation of the web?

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Competition

- Animation & video
  - Macromedia Flash (1996) → Adobe Flash
    - Once popular, now shrinking
  - MS Silverlight (2007)
    - Never took off
  - HTML5 platform is taking over

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Competition

- Mobile web access
  - WAP Forum (2002) ("Wireless access Protocol")
    - WML
    - WAP
  - Handset Internet browsers now support HTML, CSS, ...
    - WAP/WML has evaporated

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Threat

- WHATWG: "new HTML"
  - Founders (2004): Apple, Mozilla, Opera
  - Smoothly evolved HTML, after HTML 4.01 (1999)
  - W3C focus on XHTML
  - Fragmentation risk?
  - W3C
    - terminates XHTML work
    - Adopts WHATWG's HTML as basis for HTML5
    - HTML5 standard published 2014.

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Competition

- Mobile apps
  - Native vs web
  - Web technology usage growing

Competition ?

- Entering into new business sectors
  - TV
  - Automotive
  - Publishing
  - Etc.
- Sector-specific innovation initiatives: compete vs. cooperate

What about failures ?

- Competitors to standardized web technologies:
  - Ultimately failed
- W3C failures?
  - Wrong direction
    - XHTML: disruptive for content providers
  - No big uptake
    - P3P: sites declaring privacy policies
    - Web services: lightweight HTTP-based service popular

Olle Olsson: "Web Technologies"
"SICS" 2015   (53)
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Web technologies – general trend

Olle Olsson: "Web Technologies"
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From static to dynamic

- Originally: declarative
    - HTML: document structure
    - CSS: styling
    - Links: user acts
- Web 2.0: procedural processing
    - JavaScript
    - Document structure: DOM
    - APIs (XMLHttpRequest; ...)
- Recently: the extensible web
    - Procedural extension/redefinition of core functionality
    - Hooks
    - Polyfills

Example technology standards

Small size specifications ("toolbox"):

- CSS Transitions
- File API
- Quota Management API
- Encrypted Media Extensions
- WebRTC
- IndieUI Events
- Device Orientation Events
- Ambient Light Events
- WebSocket API
- Page Visibility

… and what's in the future ?

Predictions ?

?

We just use it.

In many domains.

General observations

Lessons?

- Innovation occurs:
  - In gap between disciplines
  - When combining technologies
- How to leverage on existing knowledge/skills?
- Patenting vs huge uptake?

And that's all for now, folks!

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