Introduction: the Web

Course Details

- **Course Name:** Web Engineering
- **Course Lecturers :** Dr. Nour Eldeen Mahmoud.
- **Google Enroll Code :** qiytui7

Course Details

- Grades Distribution for Year Work.
  - 20 => Mid-term exam.
  - 15 => Lab.
  - 5 => Presentation.

Presentation

You are required to prepare

1) a PowerPoint presentation maximum 20 slider (10 minutes)
2) a live coding example simple demo (10 minutes) - no screenshots

Maximum number from 4-5, not less than 4 and not more than 5

Topics to be covered

Express.js, Node.js, Templating engines (e.g., EJS or Pug)
Password hashing and JWT (JSON Web Tokens)
Understanding and using Content Delivery Networks (CDNs)
Progressive Web Apps
Basic web security threats: XSS, CSRF, SQL injection
React, Vue, Angular
Serverless architecture
WebAssembly
Jest, Mocha - testing
Load balancing and database replication

Presentation

Caching strategies
State management solutions like Redux
CMS - WordPress, Joomla
Regular coding practice: LeetCode, CodeWars, freeCodeCamp
Debugging JavaScript: breakpoints, watchers, and call stacks
Tools to measure web performance: Google Lighthouse, WebPageTest
Basic performance optimization strategies: minification, compression, lazy loading
Microservices Architecture
GraphQL
WebSockets and real-time communication (Socket.io)
OAuth2 and OpenID Connect
DevOps and CI/CD Pipelines (Jenkins, CircleCI, GitHub Actions)
API Rate Limiting and Throttling
Containerization with Docker and Docker Compose
NoSQL Databases (MongoDB)
Graph Databases (Neo4j)
Headless CMS (Strapi, Contentful)
Service Workers and Advanced Caching
Message Queues (RabbitMQ, Kafka)
Web Accessibility (WCAG)
Multi-threading in JavaScript (Web Workers)

Learning

I hear and I forget.

I see and I remember

I do and I understand. {this course is about doing}

Confucius

Chinese philosopher & reformer (551 BC - 479 BC)

Agenda

- **World Wide Web (Web 1.0)**
- Social Web (Web 2.0)
- Semantic Web (Web 3.0)
- Web Science

World Wide Web

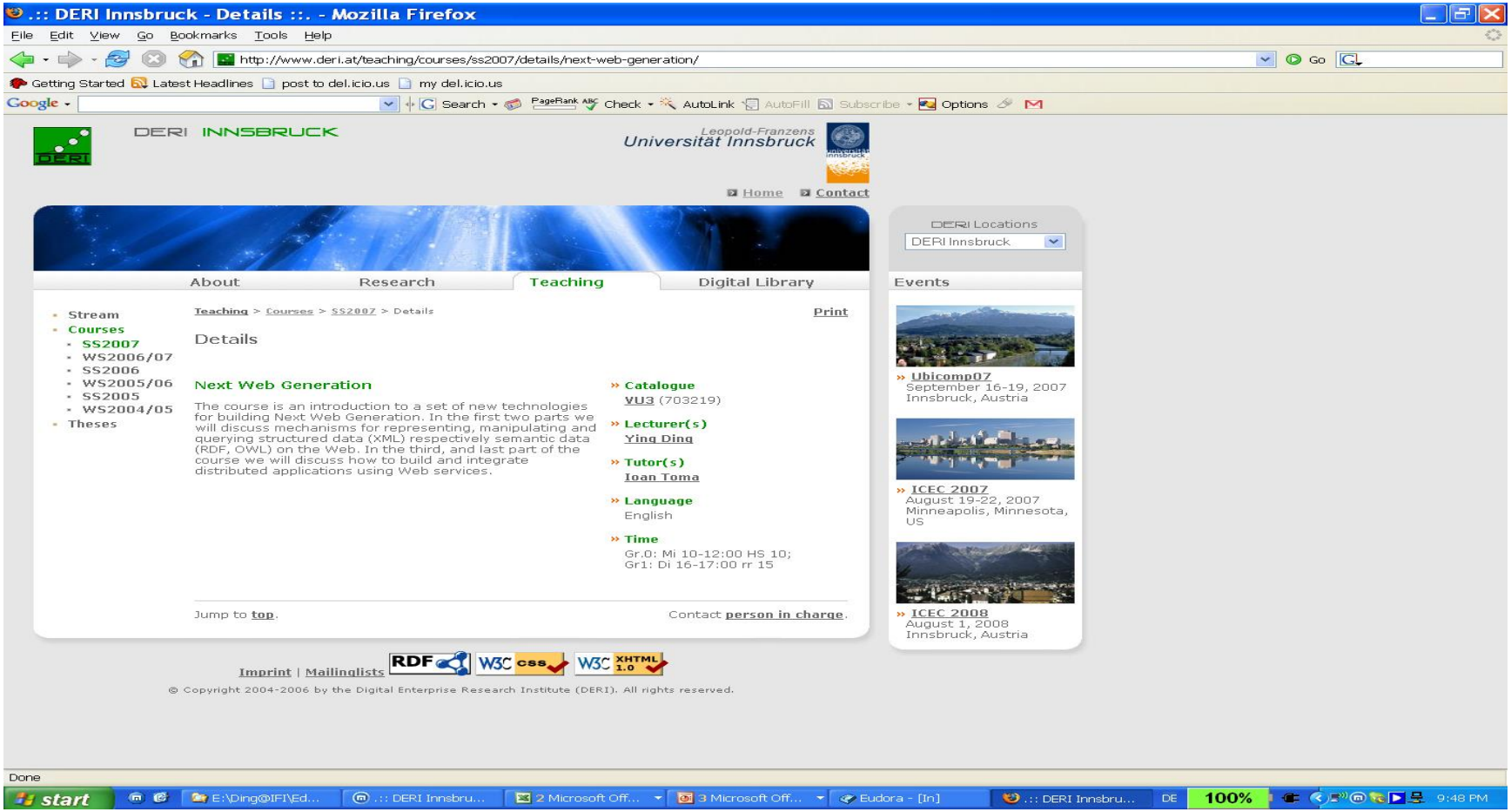
- The **World Wide Web** ("**WWW**" or simply the "**Web**") is a system of interlinked, hypertext documents that runs over the Internet. With a Web browser, a user views Web pages that may contain text, images, and other multimedia and navigates between them using hyperlinks.

- The Web was created around 1990 by Tim Berners-Lee and Robert Cailliau working at CERN in Geneva, Switzerland.

WWW: Basic Ideas

- Hypertext/hyperlink:
- Resource Identifiers
  - unique identifiers used to locate a particular resource (computer file, document or other resource) on the network
  - URI (Uniform Resource Identifier)/URL (Uniform Resource Locator): http or ftp
    - http://somehost/absolute/URI/with/absolute/path/to/resource.txt
    - ftp://somehost/resource.txt
- Markup language:
  - characters or codes embedded in text which indicate structure, semantic meaning, or advice on presentation

WWW – Web 1.0


.:: DERI Innsbruck - Details ::. - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://www.deri.at/teaching/courses/ss2007/details/next-web-generation/
Getting Started Latest Headlines post to del.icio.us my del.icio.us
DERI INNSBRUCK
Leopold-Franzens Universität Innsbruck
Home Contact
About Research Teaching Digital Library
Stream
Courses
SS2007
WS2006/07
SS2006
WS2005/06
SS2005
WS2004/05
Theses
Teaching > Courses > SS2007 > Details
Print
Details
Next Web Generation
The course is an introduction to a set of new technologies for building Next Web Generation. In the first two parts we will discuss mechanisms for representing, manipulating and querying structured data (XML) respectively semantic data (RDF, OWL) on the Web. In the third, and last part of the course we will discuss how to build and integrate distributed applications using Web services.
Catalogue
VU3 (703219)
Lecturer(s)
Ying Ding
Tutor(s)
Ioan Toma
Language
English
Time
Gr.0: Mi 10-12:00 HS 10;
Gr1: Di 16-17:00 rr 15
Jump to top.
Contact person in charge.
DERI Locations
DERI Innsbruck
Events
Ubicomp07
September 16-19, 2007
Innsbruck, Austria
ICEC 2007
August 19-22, 2007
Minneapolis, Minnesota, US
ICEC 2008
August 1, 2008
Innsbruck, Austria
Imprint | Mailinglists
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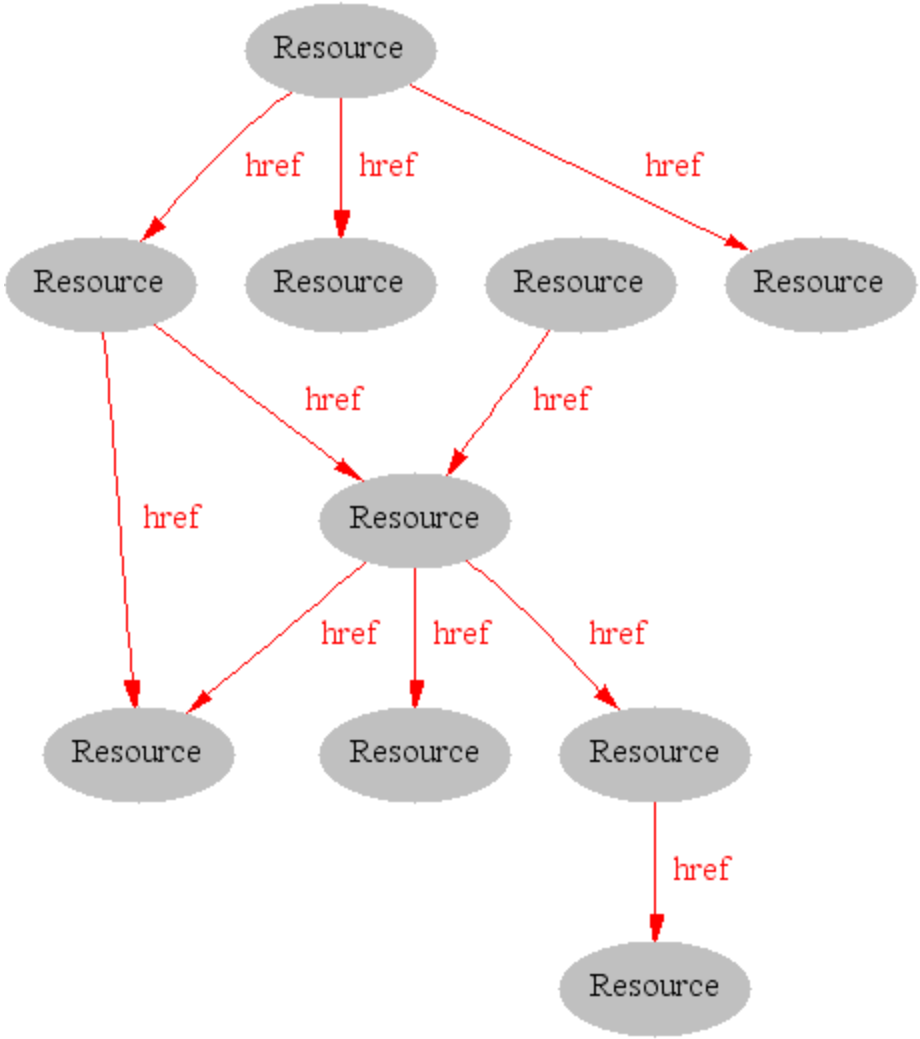
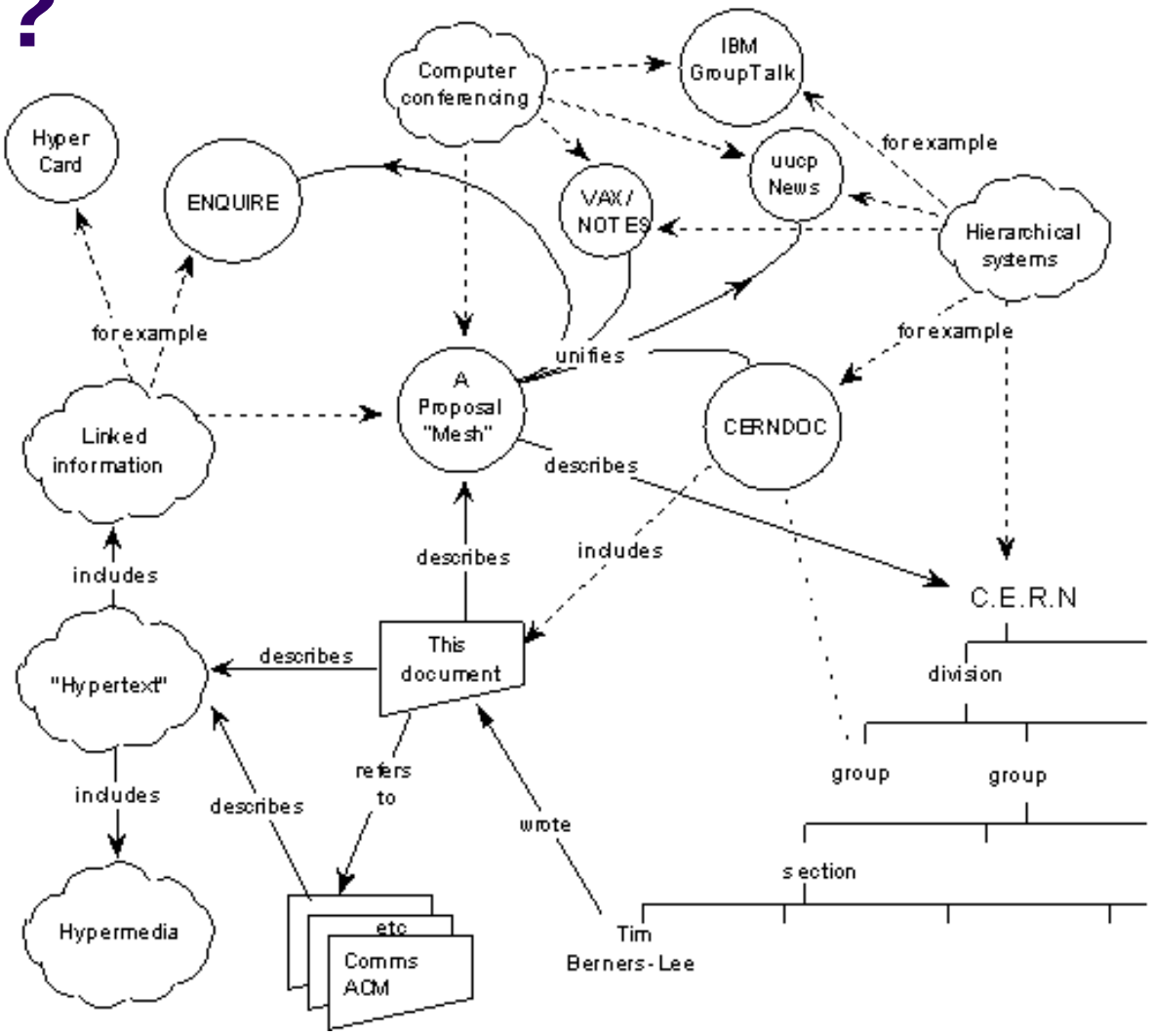
Done
start

The current (syntactic / structural) Web



Was the Web meant to be more?



Overview

- World Wide Web (Web 1.0)
- **Social Web (Web 2.0)**
- Semantic Web (Web 3.0)
- Web Science

Social Web – Web 2.0

- The term *Web 2.0* was made popular by Tim O'Reilly:
  - http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html
- http://en.wikipedia.org/wiki/Web_2.0
  - *"Web 2.0 … has … come to refer to what some people describe as a second phase of architecture and application development for the World Wide Web."*
- The Web where "ordinary" users can meet, collaborate, and share using **social software** applications on the Web (tagged content, social bookmarking, AJAX, etc.)
- Popular examples include:
  - Bebo, del.icio.us, digg, Flickr, Google Maps, Skype, Technorati, orkut, 43 Things, Wikipedia…

DSCF0831

Uploaded on July 23, 2005
by Cloudie

Cloudie's photostream

This photo also belongs to:

2005_0721Yosemite (Set)

yosemite (Pool)

Tags

yosemite

Additional Information

© All rights reserved

- Taken with a Fujifilm FinePix A210.
  More properties
- Taken on July 21, 2005
- Viewed **228** times

This photo is **public**

Comments

mtnjohn pro ys:

Great capture.
Posted 18 months ago. (permalink)

Cloudie pro ys:

Thanks!
Posted 18 months ago. (permalink)

Campin' Guy pro ys:

Nice shot! I see a lot of Yosemite picture and I can honestly say, "THIS is a nice

YouTube

YouTube - "You Tube" (A Love Song) - Original Song - Acoustic Version - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://www.youtube.com/watch?v=FWPzxVMQU8g
Getting Started Latest Headlines post to del.icio.us my del.icio.us
Search Check AutoLink AutoFill Subscribe Options
YouTube
Broadcast Yourself™
Hello, fidoding (0) | My Account | History | QuickList (0) | Help | Log Out
Search
Videos Categories Channels Community Upload Videos
Pssst! Go to the "Channels" tab if you want to see YouTube's hottest stars!
"You Tube" (A Love Song) - Original Song - Acoustic Version
Added December 30, 2006
From davidchoimusic
SUBSCRIBE to davidchoimusic
MUSICIAN
Provided By: davidchoimusic
Thanks for the feature YouTube (slips... (more)
Category Music
Tags You Tube (A Love (more)
URL http://www.youtube.com/watch?v=FWPzxVMQ
Embed <object width="425" height="350"><param name
00:40 / 02:57
Rate this video:
6860 ratings
Save to Favorites
Add to Groups
Share Video
Post Video
Flag as Inappropriate
Views: 821,232 | Comments: 5029 | Favorited: 5326 times
Honors: 3 Links: 5 Responses: 20+
Comments & Responses
Video Responses (view all 20+ responses)
Post a Video Response
Related
More from this user
Playlists
Showing 1-20 of 79
See All Videos
Re: "You Tube" (A Love Song) - Original Song - Acoustic Version
03:00
From: mike02kr
Views: 16031
Re: "You Tube" (A Love Song) - Original Song - Acoustic Version
00:30
From: FashionistaGen
Views: 140078
Re: "You Tube" (A Love Song) - Original Song - Acoustic Version
00:30
From: amyceltic
Views: 34476
Re: "You Tube" (A Love Song) - Original Song -
Director Videos
ATHF Movie Ending!
07:19
From: acklawoue
Happy New Year YouTubers from DiGiTiLsOuL
01:06
From: DiGiTiLsOuL
VOD Cars: Episode 03
08:42
From: VODcars
The Last of the Hipsters: Valentine's Day
02:36
Transferring data from youtube-587.vo.llnwd.net...
start
E:\Ding@IF...
YouTube - ...
2 Microso...
3 Microso...
Eudora - [...
YouTube - ...
Kingsoft Po...
DE
100%
10:50 PM

Features / principles of Web 2.0

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

1. The Web as platform
2. Data is the next “Intel Inside”
3. End of the software release cycle
4. Lightweight programming models
5. Software above the level of a single device
6. Rich user experiences

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- Social Web (Web 2.0)
- **Semantic Web (Web 3.0)**
- Web Science

Semantic Web – Web 3.0

- Tim Berners-Lee has a vision of a Semantic Web which
  - has machine-understandable semantics of information, and
  - millions of small specialized reasoning services that provide support in automated task achievement based on the accessible information

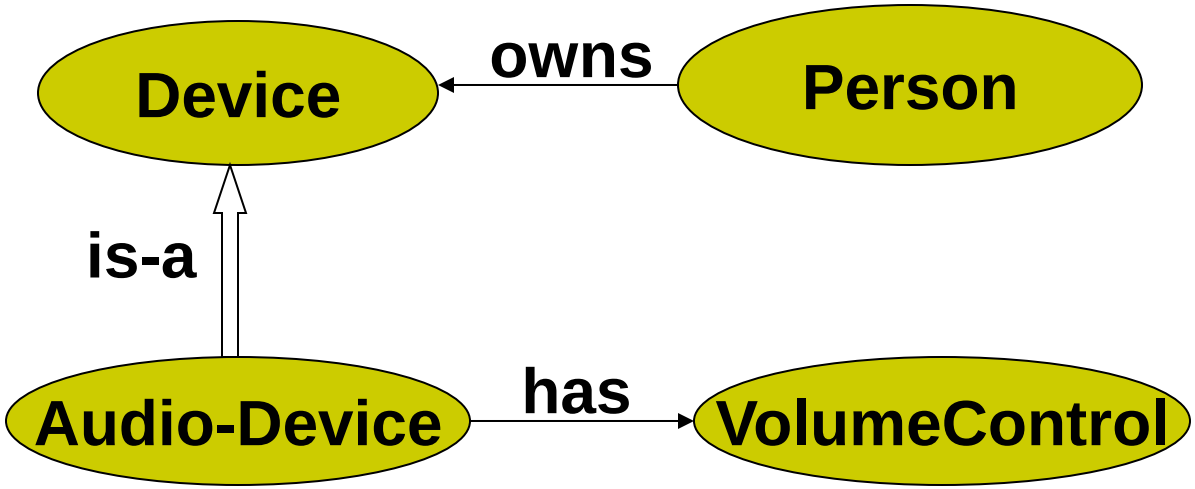
What is the Semantic Web?

- *"An extension of the current Web in which information is given well-defined meaning, better enabling computers and people to work in cooperation."*
  - Sir Tim Berners-Lee et al., Scientific American, 2001: tinyurl.com/i59p
- *"…allowing the Web to reach its full potential…"* with far-reaching consequences
- *"The next generation of the Web"*

Ontology

- The semantic Web is essentially based on ontologies
  - ***ontologies*** are ***formal*** and ***consensual*** specifications of conceptualizations…
    (e.g. by OO Models, or Entity Relationship model)
  - providing a ***shared and common*** understanding of a domain that can be communicated across people and application systems
    (not application specific, but consensual for a domain)

A very simple Ontology

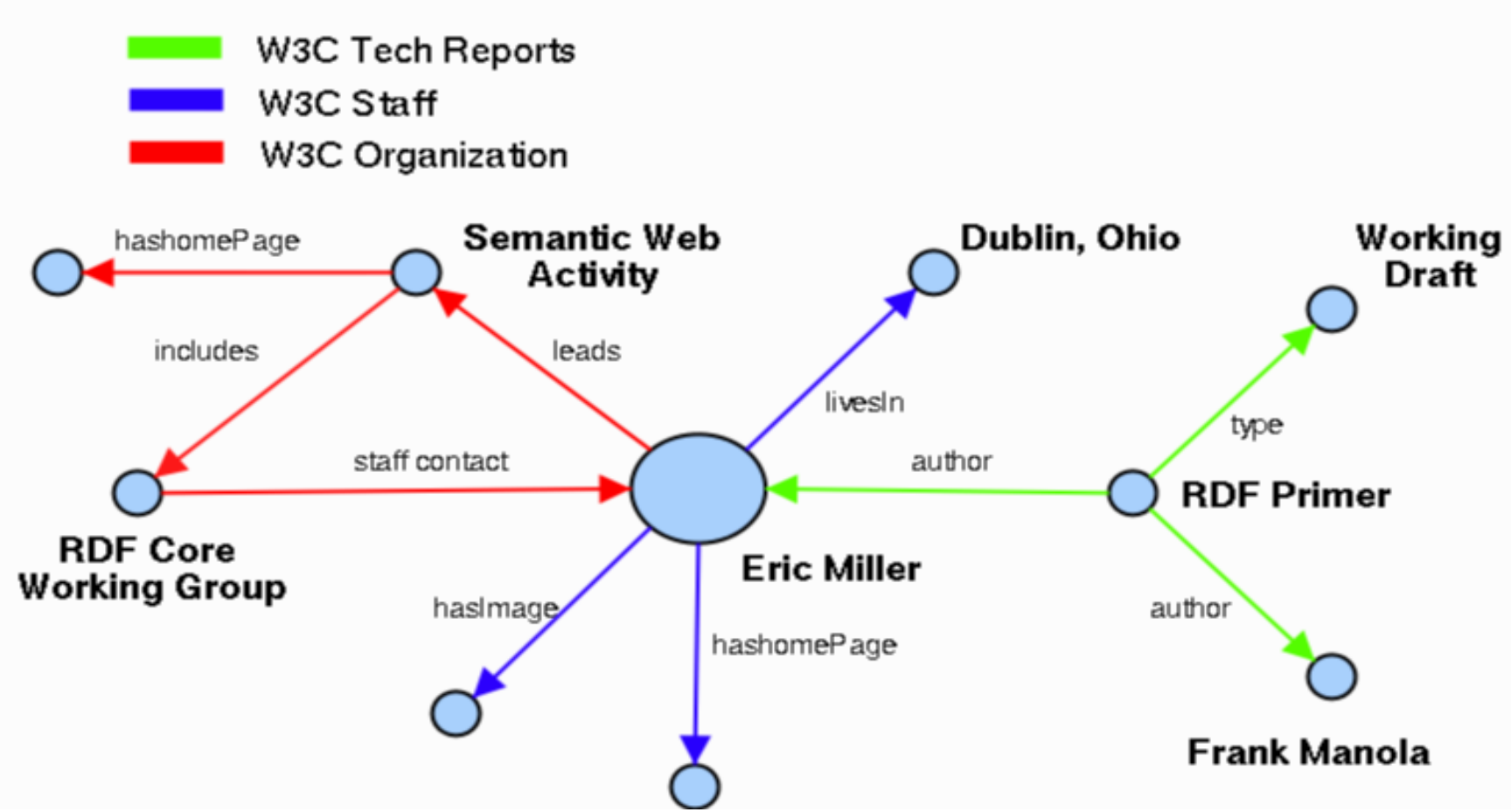


Ontologies describe *concepts* and their *Relations.*

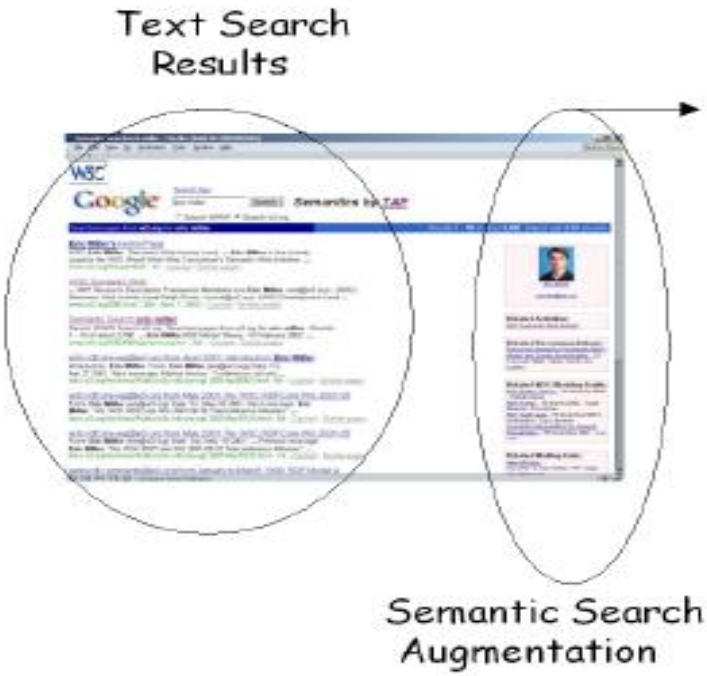
What is Semantic Web for?

- Integrating - trying to solve the problem of data and service integration
- Searching - Providing better communication between human and computers by adding machine-processable semantics to data.

Semantic Searching



Semantic Searching



Eric Miller

emiller@w3.org

Related Activities:
W3C Semantic Web Activity

Related Recommendations:
Resource Description Framework (RDF) Model and Syntax Specification , 22 February 1999 , Ralph Swick, Ora Lassila

Related W3C Working Drafts:
RDF Model Theory , 14 February 2002 , Patrick Hayes
RDF Primer , 19 March 2002 , Frank Manola , Eric Miller
RDF Test Cases , 15 November 2001 , Art Barstow , Dave Beckett
Semantic Interpretation for Speech Recognition , 16 November 2001 , Luc Van

Related Mailing Lists:
www-rdf-rules
Sep 2001 to April 2002 (197 msgs)

Information from AllMusic

Top Albums:
Soul of the Tango
Appalachia Waltz
Simply Baroque
Transcriptions
Portrait of Yo-Yo Ma

Biography:
Yo-Yo Ma was the cello's foremost contemporary proponent; while primarily a classical performer, he also made a number of highly successful crossover recordings. Born October 7, 1955 to Chinese parents living in Paris, he began playing ...
See full bio.

Shop@AOL
800 Com Music - Soul Of The Tango - ...
Appalachia Waltz / Yo-Yo Ma, Edgar ...
Yo-Yo Ma: Made In America: $11.97
800 Com Music - Brahms: Sonatas For...
Grappelli Stephane/Yo Yo Ma: Anythi...
More Shopping@AOL

Concert tickets from TicketMaster
Silk Road Project With Yo Yo Ma-Cello
On 5/12/02 at Seattle, WA
Silk Road Project With Yo Yo Ma-Cello
On 5/13/02 at Seattle, WA
Seattle Symphony Silk Road Project ...
On 5/14/02 at Seattle, WA
Silk Road Project With Yo Yo Ma-Cello
On 5/15/02 at Seattle, WA
Seattle Symphony Silk Road Project ...
On 5/16/02 at Seattle, WA
More TicketMaster concerts

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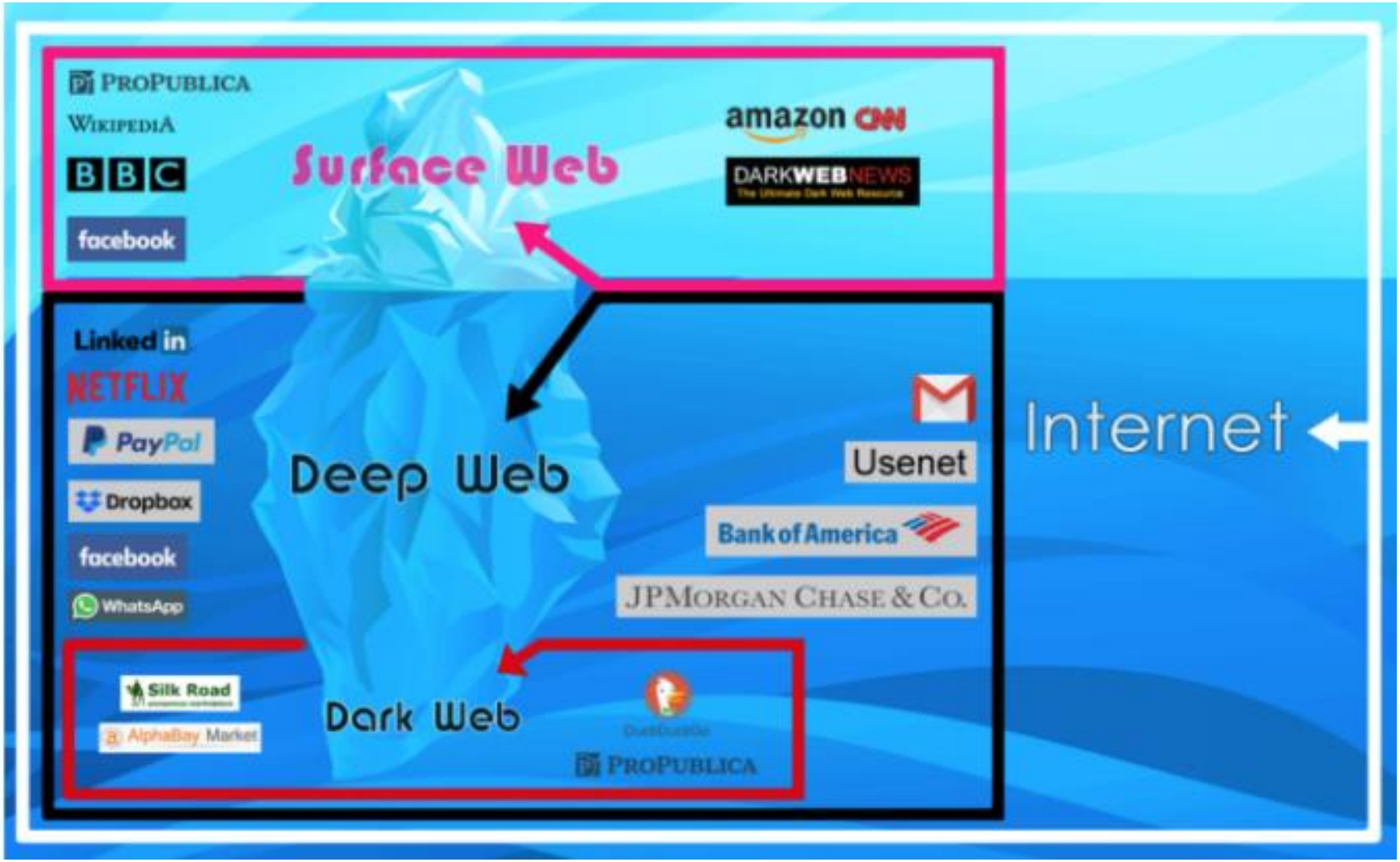
The World Wide Web as a social Phenomenon

- On the order of 10^8 users
  - Used in ***every*** country on Earth
    - On ***every*** continent (incl. Antarctica), **Mars link is in transit!**
  - A tiny percentage is “trained” in any way
- On the order of 10^{10} indexed web resources (text) in Google etc
  - 500x bigger when including the “hidden Web”
- Massively distributed and open
  - ***Anyone*** can play -- To someone on the Web, *you’re* the nut
- A set of protocols and languages driven by a strong standards approach
  - Implementation and platform independence crucial
  - World Wide Web Consortium the most prominent

Adapted from a slide from Jim Hendler


ProPublica
Wikipedia
BBC
facebook
Surface Web
amazon
CNN
DARKWEBNEWS
Linked in
NETFLIX
PayPal
Dropbox
facebook
WhatsApp
Deep Web
Usenet
Bank of America
JPMorgan Chase & Co.
Internet
Silk Road
AlphaBay Market
Dark Web
ProPublica

From Web 1.0 to Web 3.0

Web 1.0 / 2.0 / 3.0 Summary

Crawl	Walk	Run
Web 1.0	Web 2.0	Web 3.0
Mostly Read-Only	Wildly Read-Write	Portable & Personal
Company Focus	Community Focus	Individual Focus
Home Pages	Blogs / Wikis	Lifestreams / Waves
Owning Content	Sharing Content	Consolidating Content
Web Forms	Web Applications	Smart Applications
Directories	Tagging	User Behavior
Page Views	Cost Per Click	User Engagement
Banner Advertising	Interactive Advertising	Behavioral Advertising
Britannica Online	Wikipedia	The Semantic Web
HTML / Portals	XML / RSS	RDF / RDFS / OWL

Some videos to share

- http://www.youtube.com/watch?v=6gmP4nk0EOE