Internet & World Wide Web: How to Program by Deitel and Deitel

Introduction to the Internet and World Wide Web (in Chapter 1)

- The renaissance of interest in the web that we call Web 2.0 has reached the mainstream.
  - *Tim O'Reilly*
- Billions of queries stream across the servers of these Internet services—the aggregate thoughtstream of humankind, online.
  - *John Battelle, The Search*
- People are using the web to build things they have not built or written or drawn or communicated anywhere else.
  - *Tim Berners-Lee*
- Some people take what we contribute and extend it and contribute it back [to Ruby on Rails]. That's really the basic open source success story.
  - *David Heinemeier Hansson, interviewed by Chris Karr at www.Chicagoist.com*

OBJECTIVES

- In this chapter you will learn about:
  - basic computing concepts.
  - the different types of programming languages.
  - the evolution of the Internet and the World Wide Web.
  - what Web 2.0 is and why it's having such an impact among Internet-based and traditional businesses.
  - what Rich Internet Applications (RIAs) are and the key software technologies used to build RIAs.

Chapter 1 Sections

- 1.5 History of the Internet and World Wide Web
- 1.6 World Wide Web Consortium (W3C)
- 1.7 Web 2.0

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The Internet

- Global network of computers
- Started by DOD to connect computers of research universities
- email was a popular technology on the early text-only internet
  - mostly scientists, researchers

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ARPANET – Internet's Grandpa

- Implemented in late 1960's by ARPA
  - Advanced Research Projects Agency of DOD
- Networked a dozen or so university and research organization computer systems
- Used 56KB communications lines
- Grandparent of today's Internet
- Allow computers to be shared (these were not PCs)
- Key benefit was enabling fast communication between researchers through electronic mail (email)

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ARPA's Accomplishments

- Allowed multiple users to send and receive info at same time
- Network operated with packet switching technique
  - digital data sent in small packages called packets
  - packets contained data, address info, error-control info and sequencing info
  - greatly reduced transmission costs of dedicated communications lines
- Network designed to be operated without centralized control
  - if portion of network fails, remaining portions still able to route packets

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ARPA's Accomplishments (cont.)

- Transmission Control Protocol (TCP)
  - name given to protocols for communicating over ARPAnet
  - ensured that messages were properly routed and that they arrived intact
- Organizations implemented own networks
  - used for intra-organization communication

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ARPANET Evolves As the Internet

- Huge variety of networking hardware and software appeared
- ARPA achieved inter-communication between all platforms with development of the Internetworking Protocol (IP)
  - remains the current architecture of Internet
  - combined set of protocols called TCP/IP
- The Internet at first
  - limited to universities and research institutions
  - military became big user
  - then government for commercial purposes

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Internet Catching On in 1980s

- Internet traffic grew
  - businesses invested heavily to improve Internet
    - better service their clients
  - fierce competition among communications carriers and hardware and software suppliers
  - result
    - bandwidth (info carrying capacity) of Internet increased tremendously
    - costs plummeted

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A New Information System: The World Wide Web in 1990

- Tim Berners-Lee of CERN invents HyperText Markup Language (HTML)
- Also writes communication protocols to form the backbone of a new information system » World Wide Web
  - Hypertext Transfer Protocol (HTTP)—a communications protocol used to send information over the web
- Web use exploding with availability in 1993 of the Mosaic browser
- Marc Andreessen founds Netscape
  - company many credit with initiating the explosive Internet of late 1990s.

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World Wide Web

- Servers connected via the Internet can supply multimedia files to users
- Computing and communication are combined via WWW and the Internet

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World Wide Web Consortium – W3C

- **W3C Goals**
  - devoted to development of nonproprietary, interoperable technologies for the WWW
  - make WWW accessible to everyone regardless of disabilities, language, or culture
  - **standardization**
  - **W3C Recommendations: technologies standardized by W3C**
    - **include the Extensible HyperText Markup Language (XHTML), Cascading Style Sheets (CSS), and the Extensible Markup Language (XML)**
    - **HyperText Markup Language (HTML) — now considered a "legacy" technology**
    - **not an actual software product, but a document that specifies a technology's role, syntax rules and so forth**
- www.w3.org

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Web 2.0

- By 2003
  - noticeable shift in how people and businesses were using the web and developing web-based applications
- Term Web 2.0 was coined by Dale Dougherty of O'Reilly
- Web 2.0 definition: companies use the web as a platform to create collaborative, community-based sites
  - e.g., social networking sites,
  - blogs
  - Wikis

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Web 1.0 versus Web 2.0

- 1990s and early 2000s saw Web 1.0
  - a (relatively) small number of companies and advertisers producing content for users to access
  - "brochure web"
- Web 2.0 involves the users
- If Web 1.0 is as a lecture, then Web 2.0 is a conversation
- Examples of Web 2.0 applications/sites
  - MySpace
  - Facebook
  - Flickr
  - YouTube
  - eBay
  - Wikipedia
  - in all of these, users create the content, companies provide the platforms

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Web 2.0 Requirements

- Architecture of participation
  - open source software
  - collective
  - Rich Internet Applications (RIAs)
  - Software as a Service (SaaS)
- Web services incorporate functionality from existing applications and websites into other web applications

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Web 2.0 Extended

- Future: computers learn to “understand” the meaning of the data on the web
- Semantic Web
- Content on the web is marked up for what it is (using XML) in addition to markup for how it is to be displayed (XHTML, CSS)
- Deitel Web 2.0 Resource Center
  - www.deitel.com/web2.0/

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XML

- Extensible Markup Language
- Separate content from presentation (markup with XHTML)
- XML documents describe the meaning or purpose of data, not how it is supposed to look when you see it
- They are text documents, thus they can be processed by software on any hardware platform

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End of Slides for Chapter 01 Part 02