Introducing Web Application Development

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Introduction: Internet vs. World Wide Web

- **Internet** is an interconnected *network* of thousands of networks and millions of computers (sometimes called host computers or just hosts) linking businesses, educational institutions, government agencies, and individuals together.

- The **World Wide Web**, or **Web** for short, is one of the Internet's most popular *services*, providing access to over one billion Web pages, which are documents contain text, graphics, audio, video, and other objects, as well as "hyperlinks" that permit a user to jump easily from one page to another.

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The Growth of the Internet, Measured by the Number of Users

**Internet Users in the World**
Growth 1995 - 2010

Source: www.internetworldstats.com - January, 2008
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How Internet Infrastructure Works

- The Internet, then known as ARPANET (Advanced Research Projects Agency Network), began in 1969 from four major computers at universities in the southwestern US (UCLA, Stanford Research Institute, UCSB, and the University of Utah).

- Nobody owns the Internet. The Internet Society, a non-profit group established in 1992, oversees the formation of the policies and protocols that define how we use and interact with the Internet.

Network Access Points

Point of Presence
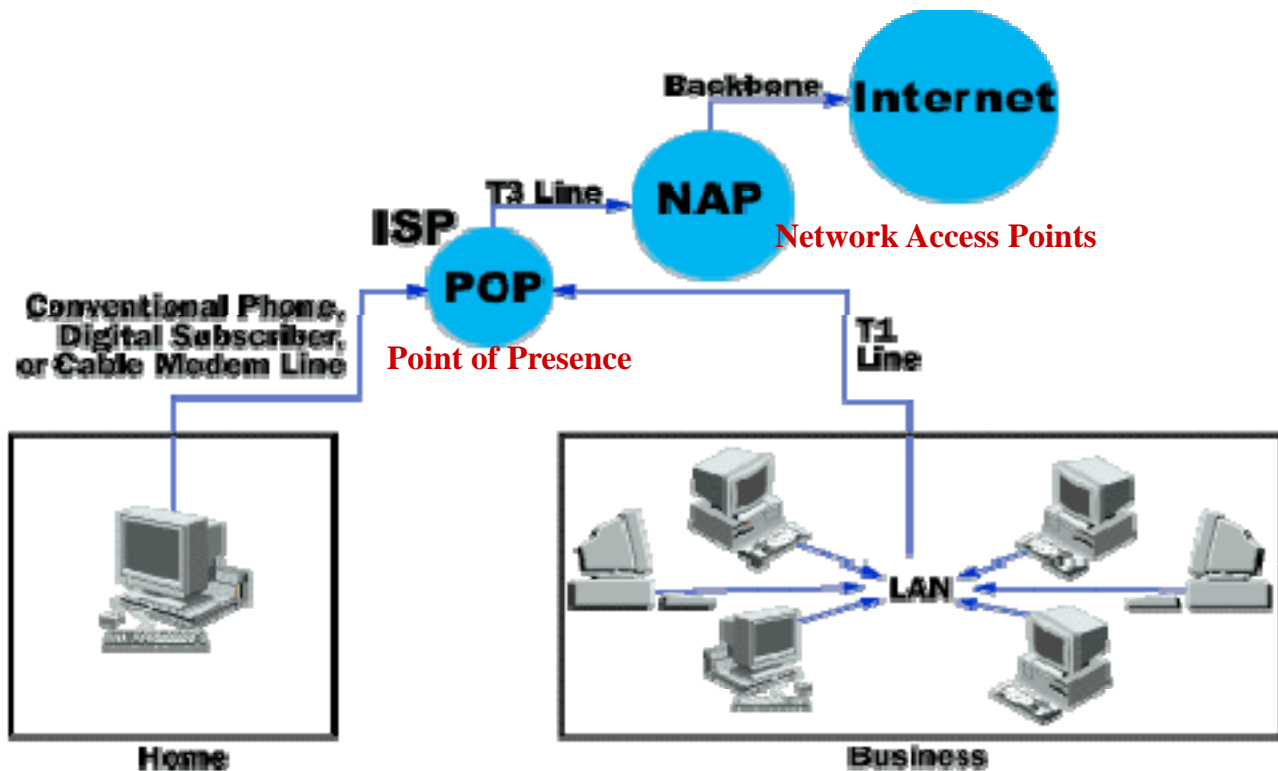
5   CS 437/637 Database-Backed Web Sites and Web Services

A Hierarchy of Networks

- Every computer that is connected to the Internet is part of a network.

- You may use a modem and dial a local number to connect to an **Internet Service Provider (ISP)**. At work, you may be part of a **local area network (LAN)** using an ISP that your company has contracted with.

- When you connect to your ISP, you become part of their network. The ISP may then connect to a larger network and become part of their network. The Internet is simply a *network of networks*.

Uniform Resource Locator (URL)

- A URL has the following format:

<protocol> :// <hostname or IP address> / <pathname>

- http is one of the protocol used in the URL, while www is the part of the hostname.

- URL http://www.cs.umb.edu/~ding contains the domain name cs.umb.edu. So does the e-mail address ding@cs.umb.edu. Every time you use a domain name, you use the Internet's Domain Naming Service servers to translate the human-readable domain name into the machine-readable IP address.

Web Application Technology History

- HTTP & HTML
- CGI (Perl)
- JavaScript & VBScript, CSS
- Classic ASP
- Java Servlet & JSP
- .NET Framework & J2EE

Web Site History - First Generation Web Sites

- The first web sites were not well designed at all.
- First-generation web sites took text and simply reproduced it on the screen.

Backgrounds were default gray and type was black with colored, underlined text to indicate hyperlinks.

Note: the examples of the Web site history are from Glenna Underhill, P&D Web Team, Vanderbilt University

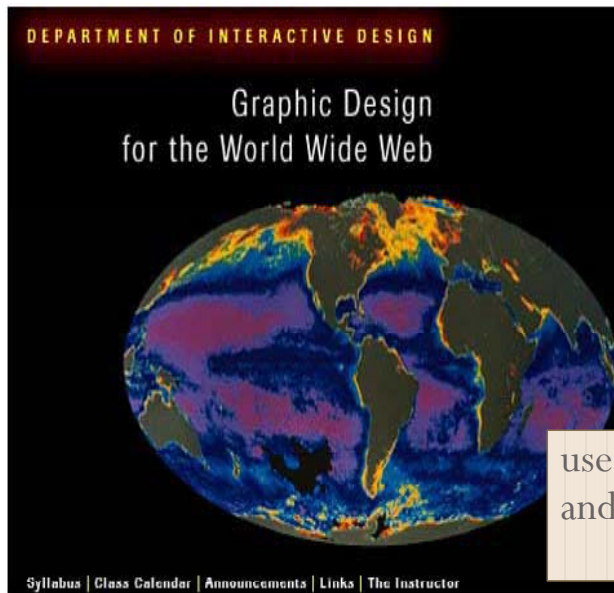# Web Site History: Second Generation Web Sites

- Second-generation sites are first-generation sites with icons replacing words, tiled images replacing the gray background, and banners replacing headlines.

A simple graphic replaces the text from the first-generation site.

Web Site History: Third Generation Web Sites

- Birth of the E-commerce.
- With clear typography and clever design, third-generation sites are easy to navigate and form a complete experience from entry to exit.

use metaphor and theme to entice and guide views through the screen.

Web Site History : Fourth Generation Web Sites

- Design of fourth-generation Web Sites focuses on **Web Usability**: Usability rules the Web.
- Server-Side Software Centered: Multi-Tier support at the server side.

Web Usability and Accessibility

What is Web 2.0?

- A term popularized by Tim O'Reilly in a sequence of conferences started in 10/2004.

- Generally referring to a new phase of Web architectures, techniques and applications.

- New business models.

- No consensus on its meaning.

- A buzzword for whatever is newly popular.

The Web 2.0 Slides (Slides 13-16) are cited from Dr. Kwok-Bun Yue's Talk, Web 2.0, Research and You, http://dcm.cl.uh.edu/yue/presentations/Web2_0_Research.ppt

An old adage for software project

- Only 2 out of the 3 options listed below are possible:
  - The project is done cheap.
  - The project is done well.
  - The project is done on time.

Web 2.0 Spin

- The project is done relatively cheaply (lightweight development model).
- The project only needs to be done well enough (perpetual beta).
- The project will be improved incrementally in time (perpetual beta).
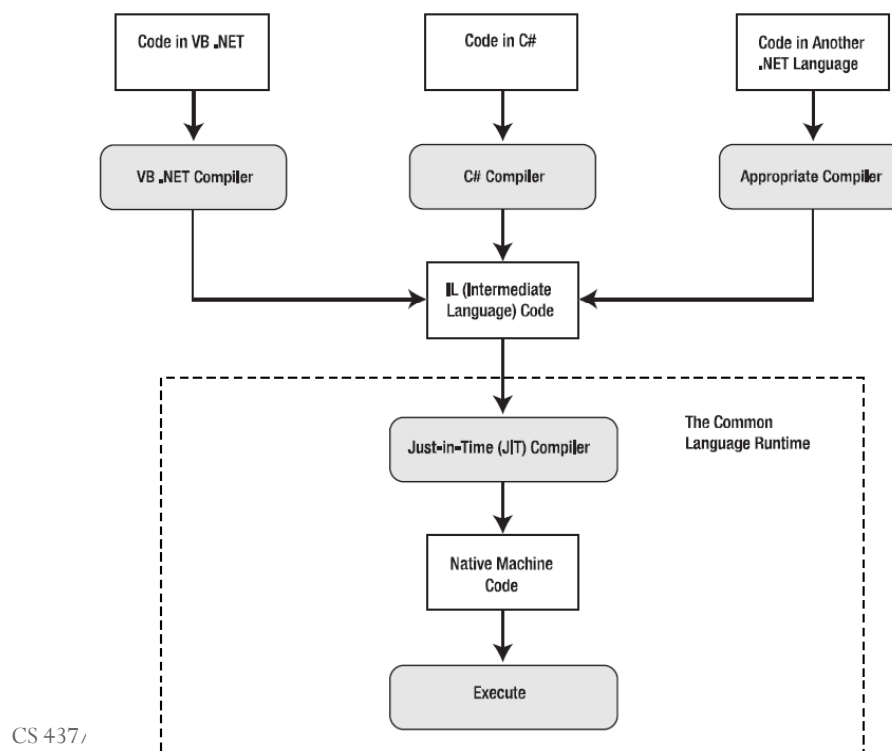
Don't Be It

Introducing ASP.NET

Chapter 1

Seven Important Factors

1. ASP.NET is integrated with the .NET Framework.
   - Classes in the .NET framework is grouped into namespace.
   - .NET gives the same tools to web developers that it gives to rich client developers.
2. ASP.NET is compiled, not interpreted.
   - In the first stage, the C# or VB code is compiled into an intermediate language called Microsoft Intermediate Language (MSIL), or just IL
   - In the second stage, the IL code is compiled into low-level native machine code.

Compilation in an ASP.NET web page

| Code in VB .NET | Code in C# | Code in Another .NET Language |

VB .NET Compiler → C# Compiler → Appropriate Compiler

IL (Intermediate Language) Code

The Common Language Runtime

Just-in-Time (JIT) Compiler

Native Machine Code

Execute

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Seven Important Factors (contd.)

3. ASP.NET is multilanguage

    - No matter what language you use, the code is compiled into IL.

4. ASP.NET is hosted by the Common Language Runtime

5. ASP.NET is object-oriented

6. ASP.NET is multidevice and mutibrowser

7. ASP.NET is easy to deploy and configure
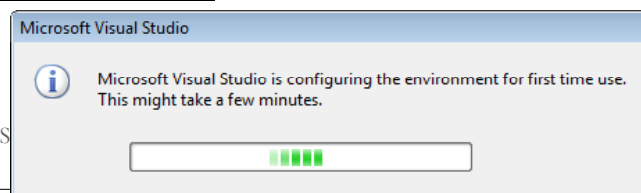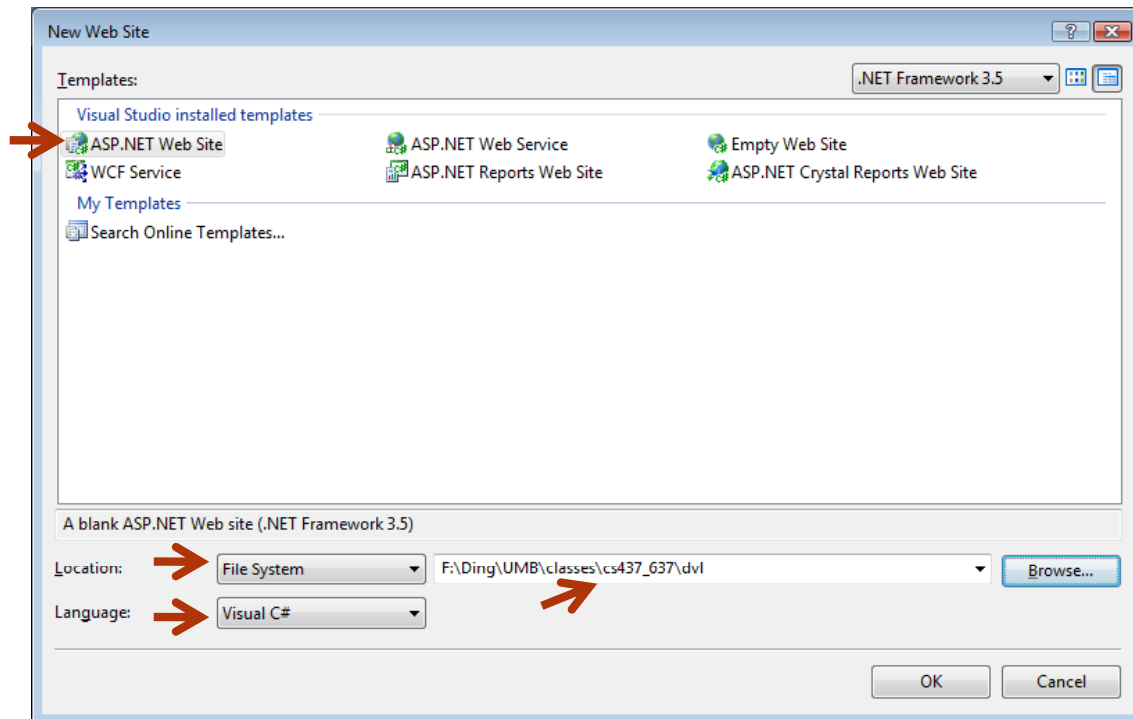
Visual Studio

Chapter 2

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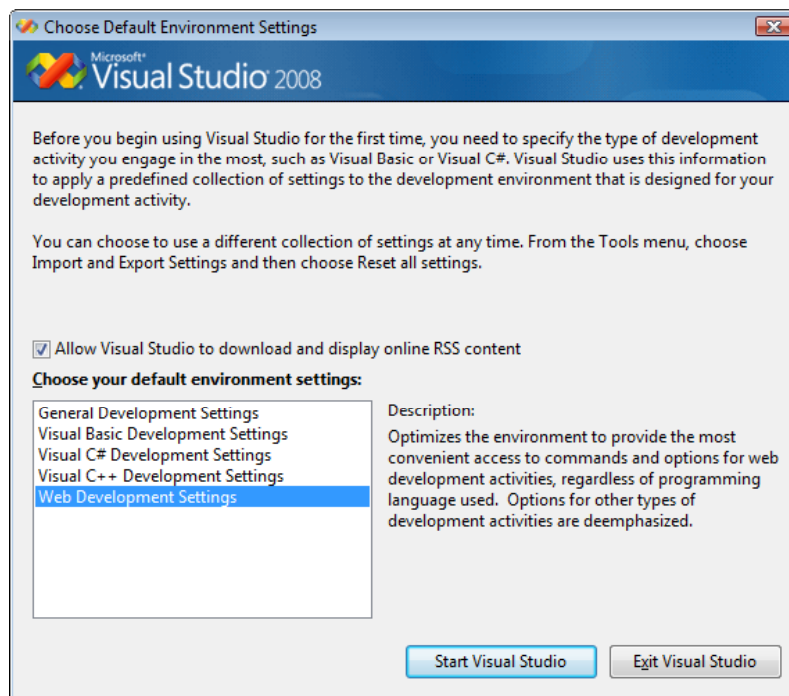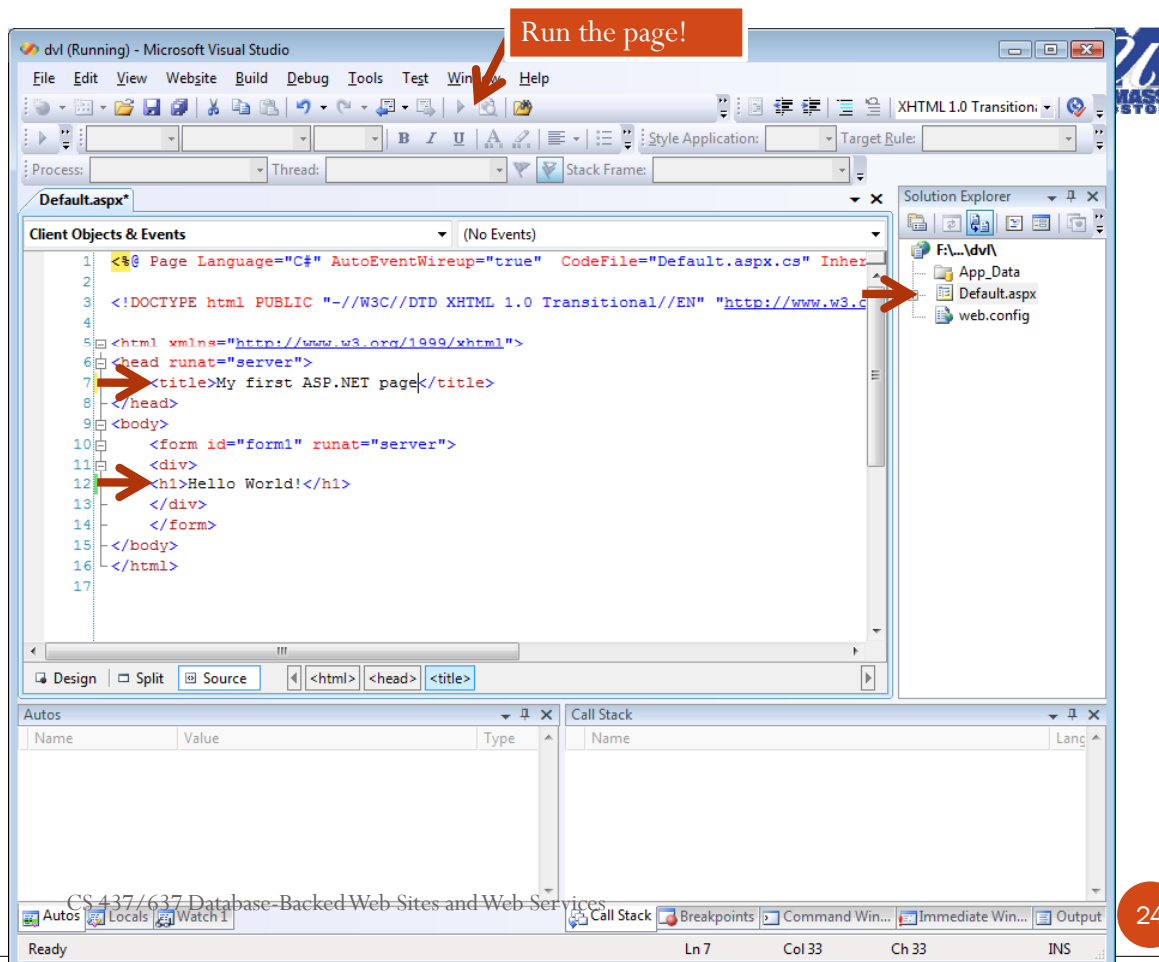

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- Choose File➔New➔Web Site

Run the page!