

Lecture 1

Introduction to Web Engineering

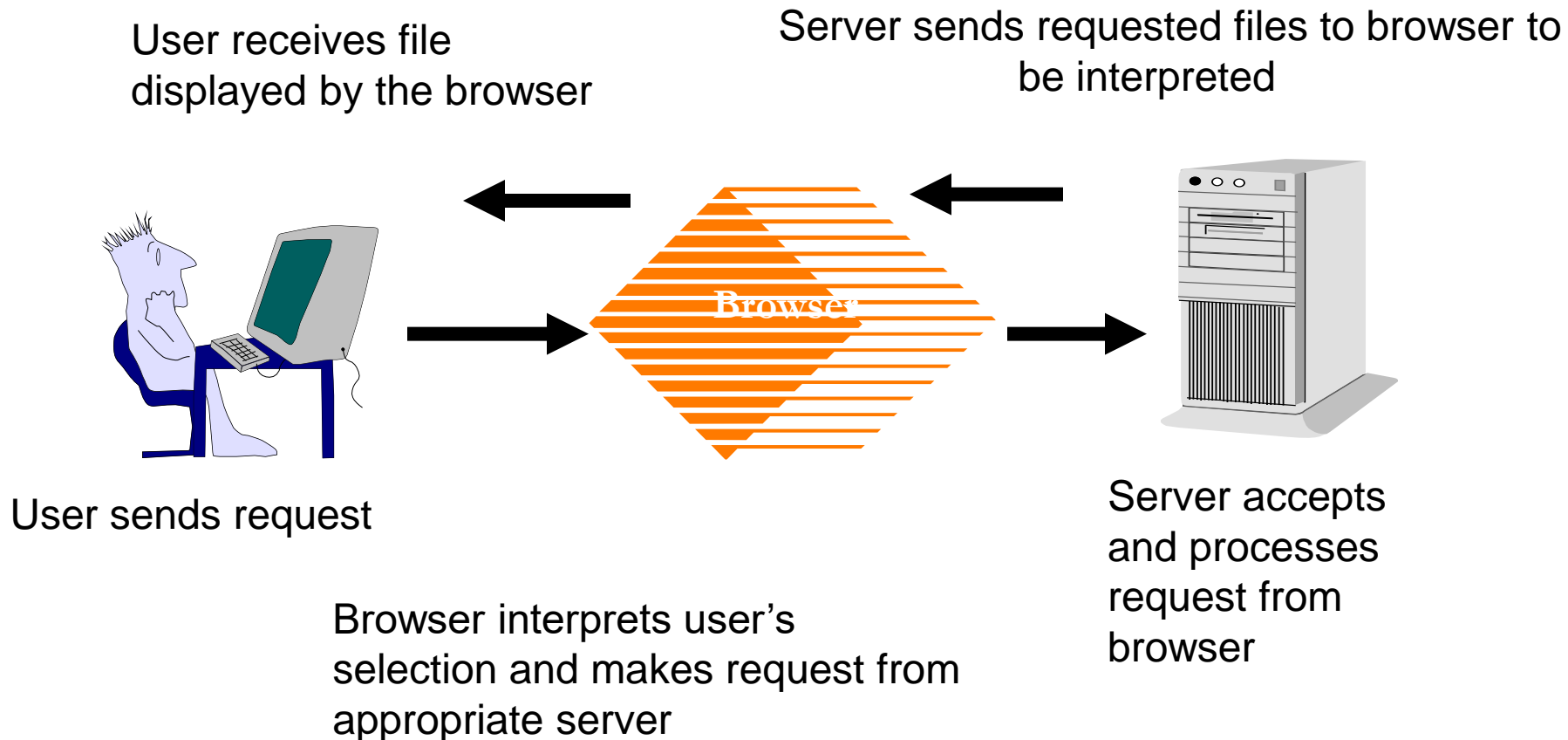
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1. Introduction to the Course

In this course we will cover:

- The basic ideas, challenges and technologies related to developing and deploying high quality web based systems and applications.
- Web Security issues, architecture, operation and maintenance, client side and server side technologies, Web Services, Web Frameworks.

1.1 Web application development



1.2 Web application development...

- **Front end Basics**: Hyper-text Markup Language (HTML), Cascading Style-sheets (CSS)
- **Client-side Scripting Languages** (JavaScript)
- **Serve-side Scripting Languages** (PHP, Node.js)
- **Database Languages** (MySQL)
- **Middleware**
- **Web Frameworks** (Laravel, Symfony, Ruby on Rails)

2. Web engineering

- Software engineering is an engineering discipline that is concerned with all aspects of software production.
- Software Engineering is the science and art of building significant software systems that are:
 - on time
 - on budget
 - with acceptable performance
 - with correct operation

2. Web engineering...

- Web engineering is the study of the process, used to create high quality Web-based applications.
- Web engineering draws heavily on the principles and management activities found in software engineering processes.
- Web engineering extends Software Engineering to Web applications.

2. Web engineering...

- The application of systematic and quantifiable approaches to cost-effective analysis, design, implementation, testing, operation, and maintenance of high-quality web based systems and applications.

Basic principles of Web Engineering

- Clearly defined goals and requirements
- Systematic development of a Web application in phases
- Careful planning of these phases
- Continuous audit of the entire development process.

3. Web applications

- **WWW** has massive and permanent influence on our lives
 - Economy, Industry, education, healthcare, entertainment
- **Why?**
 - global and permanent
 - Comfortable and uniform access

3. Web applications...

- The web started as an informational medium
- Evolved into application medium
 - Interactive, data intensive services
- Distinguishing factors
 - How it is used?
 - Technologies and standards for development

3. Web applications...

- A Web application is a system that utilizes W3C standards & technologies to deliver web-specific resources to clients (typically) through a browser.

4. The case for web engineering...

- Top project drawbacks (Cutter, 2000)
 - 84% - Failure to meet business objectives
 - 79% - Project schedule delays
 - 63% - Budget overrun
 - 53% - Lack of functionality

5. Categories of Web based Systems

- Document-centric web based systems
- Interactive and transactional web applications
- Workflow-based web systems
- Collaborative and social web based systems
- Portal-oriented web based systems
- Ubiquitous web based systems

5. Categories of Web based Systems

- **Document-centric web:** Static html documents stored on web server that is sent directly to the client on request.
- **Interactive and transactional web applications:**
 - It includes radio buttons, selection menus, forms etc.
 - These applications are simple and fast.
 - These kind of web applications have facility of modification by user.

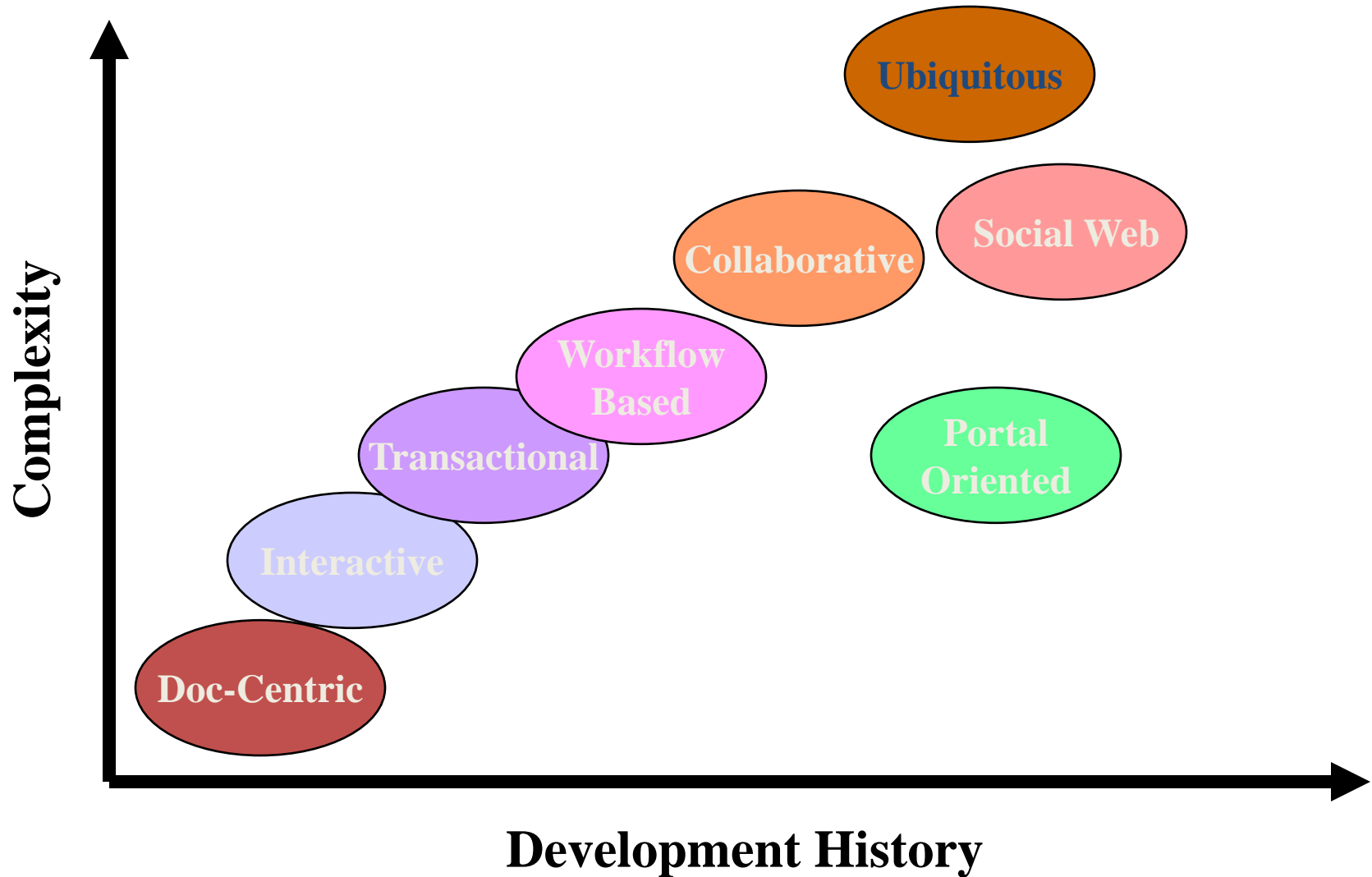
5. Categories of Web based Systems

- **Workflow-based web applications:**
- Capable of handling the workflow among companies, private authorities or public authorities.
- Web services are included for interoperability.
- **Collaborative and social web applications:**
- Used as group applications where group communications are important part. Examples are chat rooms, online forums.

5. Categories of Web based Systems

- **Portal-oriented web applications:**
- Single access point is there to separate different sources of information and services.
- Search engines, community portals etc. are best examples of portal oriented application.
- **Ubiquitous web applications:**
- Provides customized facilities for any device from anywhere at any time.
- Services based on location is an example of such web application.

(Development history vs complexity)



Class Task

- Write 3-5 examples of each category of web applications?

Summary

- Web engineering extends *Software Engineering* to Web applications
- Why web engineering?
- Web applications
- Categories of web applications

References

- Web Engineering, The Discipline of Systematic Development of Web Applications, Chapter 1, G. Kappel, B. Proll, S. Reich. & W. Retschitzegger.