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

User receives file displayed by the browser

Server sends requested files to browser to be interpreted

User sends request

Server accepts and processes request from browser

Browser interprets user's selection and makes request from appropriate server

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.

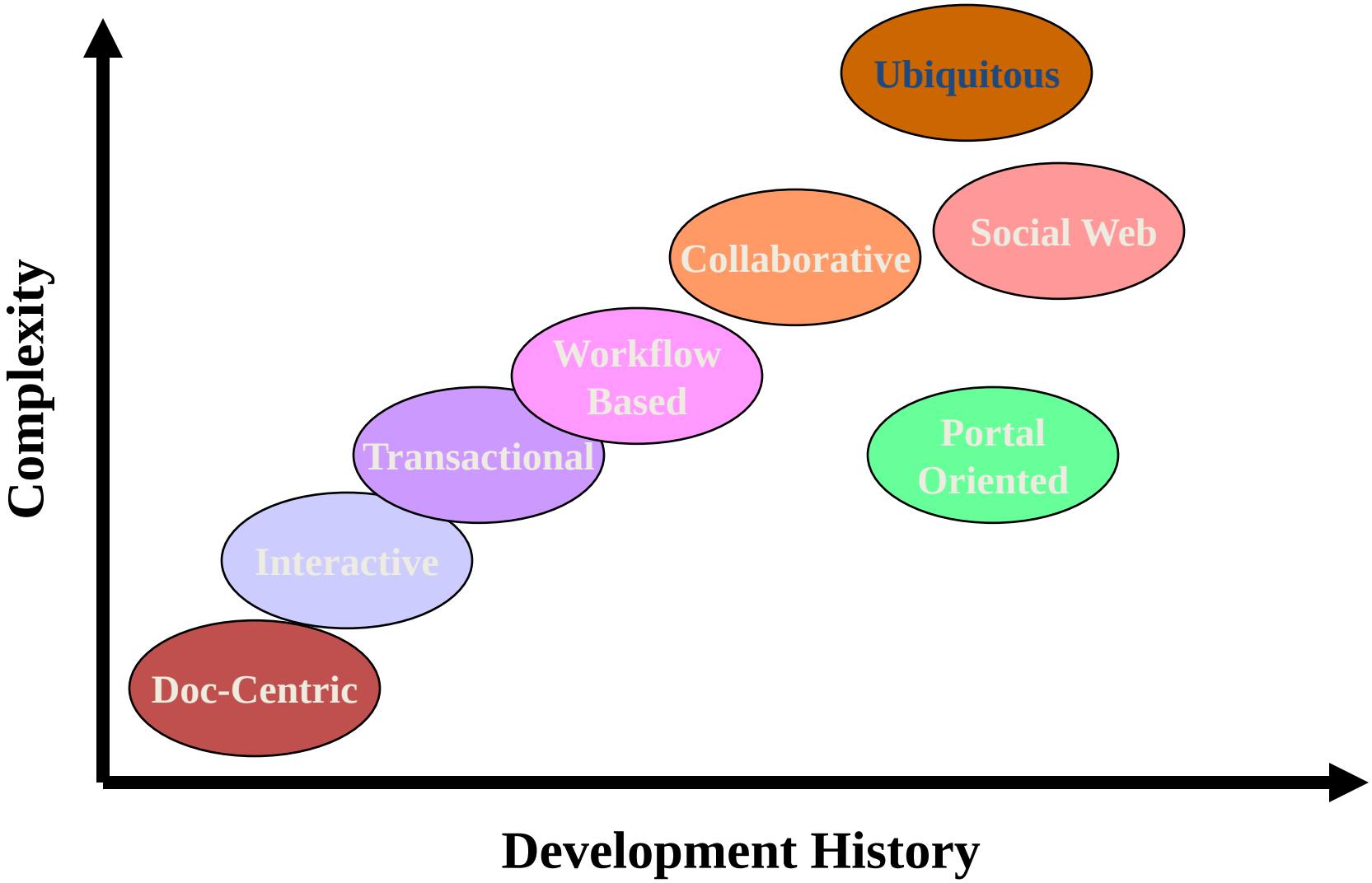
5. Categories of Web based Systems

- **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.