Web Engineering

Lecture 1
Introduction

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Reference book

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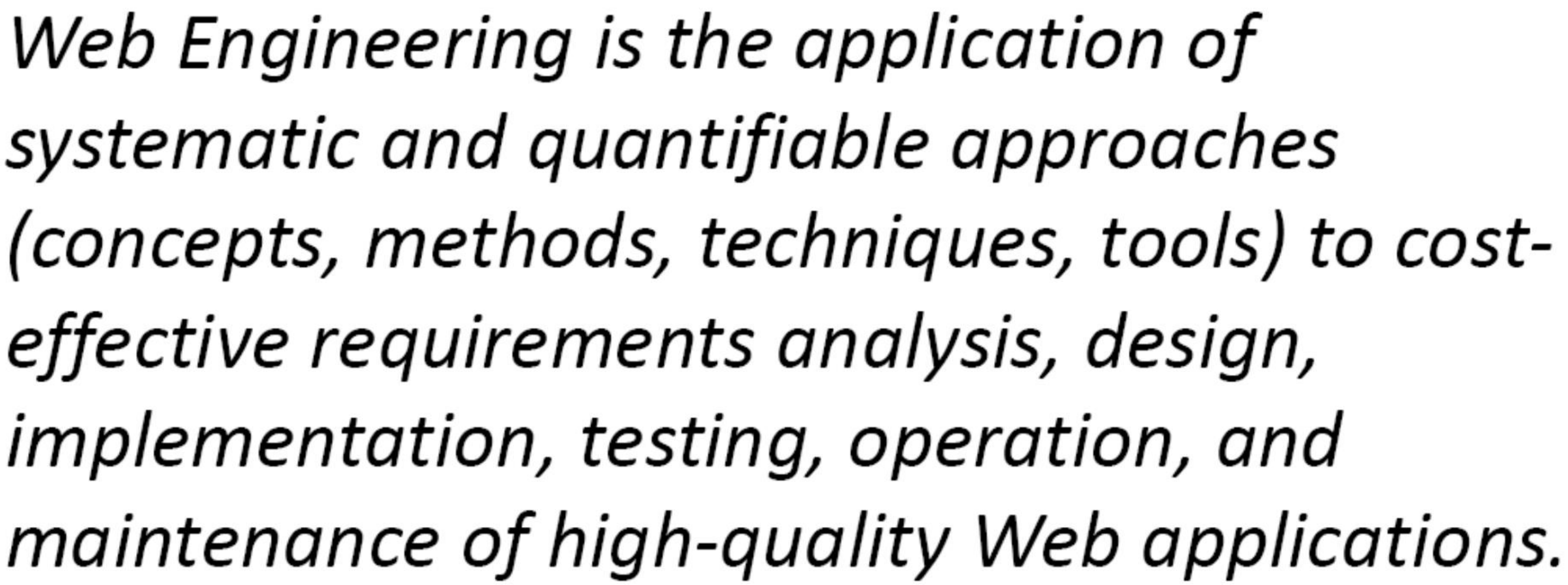
- Web Engineering, Emilia Mendes and Nile Mosley, Springer Verlag, 2010.
- Web Engineering: A Practitioners' Approach, Roger S. Pressman, McGraw Hill, 2008.
- Dynamic HTML: The Definitive Reference: A Comprehensive Resource for XHTML, CSS, DOM, JavaScript 3rd Edition, O'Reilly Media 2007.
- JavaScript: The Definitive Guide, 8th Edition, David Flanagan. O'Reilly Media. 2014
- www.w3schools.com

Web Engineering

- Web Engineering is the process of creating high quality Web-based applications (Web Apps)

OR



Web Engineering is the application of systematic and quantifiable approaches (concepts, methods, techniques, tools) to cost-effective requirements analysis, design, implementation, testing, operation, and maintenance of high-quality Web applications.

The Web

- An indispensable technology
  - In virtually every aspect of modern living
- A transformative technology
  - Changes the way we do things
  - Changes the way we acquire and disseminate information
- An evolving technology
- Bottom line—high impact on everyone in the modern world

WebApps

- The term *Web application* (WebApp) encompasses:
  - everything from a simple Web page that might help a consumer compute an automobile lease payment to a comprehensive website that provides complete travel services for business people and vacationers.
  - Included within this category are complete websites, specialized functionality within websites, and information-processing applications that reside on the Internet or on an Intranet or Extranet.

Web Engineering Process Overview

- Formulation of the problem
- Planning
- WebApp requirements analysis
- Architectural, navigational, and interface design
- System implementation using specialized languages and tools associated with the Web
- Configuration management, quality control, and maintenance mechanisms are established early

WebApp Attributes

- Network intensive
- Content-driven (provide required functionalities)
- Continuous evolution
- Closeness
- Security

Web Engineering Application Categories

- Informational
- Downloads
- Customizable
- Interaction
- User input

- Transaction-oriented
- Service-oriented
- Portal
- Database access
- Data warehousing

WebApp Enabling Technologies

- Component-based development
- Security (encryption, firewalls, etc.)
- Internet standards
- Web programming tools

Web Engineering Process Model: Formulation

- Goals and objectives, scope for first increment
  - What is the motivation for the WebApp?
  - Why is the WebApp needed?
  - Who will use the WebApp?
- Informational goals
  - user's intention for using the content
- Applicative goals
  - ability to perform tasks within the WebApp

Web Engineering Process Model: Planning

- Estimate project cost
- Evaluate risks
- Define ground schedule for first increment
- Define ground schedule for subsequent increments

Web Engineering Process Model: Analysis

- Establishes requirements and identifies content items
- Content analysis
  - content provided by WebApp is identified
- Interaction analysis
  - use-cases developed to describe user interaction
- Functional analysis
  - usage scenarios used to define operations and functions applied to WebApp content
- Configuration analysis
  - WebApp environment described in detail

Web Engineering Process Model: Engineering

- Content design and production tasks are one thread
- Architectural design, navigation design, interface are the other thread

Web Engineering Process Model: Page Generation and Testing

- Content and technical designs are merged to produce executable web pages
- Testing exercises WebApp navigation, attempts to uncover errors in applets/scripts/forms, and checks for environment incompatibilities

Web Engineering Process Model: Customer Evaluation

- Each increment of the WebApp is reviewed
- Changes required by customer are applied to next increment

Web Engineering Best Practices

1. Take time to understand the business needs and product objectives, even if WebApp details are ambiguous.
2. Describe how users will interact with the WebApp using a scenario-based approach.
3. Develop a brief project plan.
4. Spend time modeling what you are going to build.
5. Review models for consistency and quality.
6. Use tools and technology that enable you to construct the system with as many reusable components as possible.
7. Don’t rely on users to debug the WebApp, design comprehensive tests and execute them before releasing the system.