Implementing and testing web applications

11th and 12th Lecture

Dr. Iqbal Ahmed
Professor
Dept. of Computer Science and Engg.
University of Chittagong.

Outline

- **Technologies for web applications**
- **Testing web applications**

1. Technologies for web applications

- **When we have decided the 'What' of the web application i.e.**
  - **requirements are defined**
  - **system architecture is decided**
  - **system model and design is ready**
- **We are ready for 'how' i.e. to implementation phase**

1. Technologies for web applications…

- The implementation phase begins with deciding the technologies for development
- Technologies for web application development concerns within three ‘views’
  - request (client)
  - response (server)
  - rules for communication between them(protocols)

2. Testing web applications

- Testing is an activity conducted to evaluate the quality of a product and to improve it by identifying defects and problems
- If we run a program with the intent to find errors, then we talk about testing
- By testing we determine the quality state of the system
  - which provides a basis for improvement

2. Testing web applications…

- We say that an error is present if the actual result from a test run does not comply with the expected result
  - each deviation from the requirements definition is an error

2. Testing web applications…

- **Objectives:**

 # Finding error instead of showing their absence (defect testing)

- **if no error is found it does not mean that there is no error**
- **a test run is successful if errors are detected**

 # To demonstrate to the developer and the customer that the software meets its requirements (validation testing)

2. Testing web applications…

- **Testing Levels:**

 # Unit tests: test the smallest testable units (Web pages, etc.), independently of one another

 # Unit testing is done by the developer during implementation

2. Testing web applications…

- **Testing Levels:**

 # Integration tests: evaluate the interaction between distinct and separately tested units once they have been integrated

 # Integration tests are performed by a tester, a developer, or both jointly

2. Testing web applications…

- **Testing Levels:**

 # System tests: test the complete, integrated system

 # System tests are typically performed by a specialized test team

2. Testing web applications…

- **Testing Levels:**

 # Acceptance tests: evaluate the system in cooperation with the client

-- Acceptance tests use real conditions and real data

 # Beta tests: let users work with early versions of a product with the goal to provide early feedback

2. Testing web applications…

- **Web application testing:**
- **Link testing**
- **Browser testing**
- **Usability testing**
- **Load, stress and continuous testing**
- **Security testing**
- **Content testing**

2. Testing web applications…

- **Link testing:**

Goals:

  - **broken links (linked document does not exist)**
  - **orphan pages (page does not link any other page)**

Strategy:

- **All links are systematically visited**

2. Testing web applications…

- **Browser testing:**

Goals:

Try to find errors in web application due to incompatibilities between different Web browsers

Strategy:

Test application on all popular combinations (browser, version, operating system)

2. Testing web applications…

- **Usability testing:**

Goals:

Evaluate ease-of-use, lay-out and navigation structure

Strategy:

- By a set of representative users

- By one or more HCI specialists

2. Testing web applications…

- **Load testing:**

Goals:

system meets response time requirements

Strategy:

-Identify load profile

-Identify response time

-Perform the test

2. Testing web applications…

- **Stress testing:**

Goals:

System reaches the required response times and the required throughput under stress

- **Continuous testing:**

Goals:

Testing system behavior over a period of time

2. Testing web applications…

- **Security testing:**

Goals:

Regulate access to information, to verify user identities, and to encrypt confidential information

Strategy:

A systematic test scheme

2. Testing web applications…

- **Content testing:**

Goals:

Test the quality of contents

Strategy:

Proofreading

2. Testing web applications…

Challenges in web testing:

- **Content testing requires costly manual measures**
- **Usability is difficult to measure**
- **Divers platforms (devices, operating environment)**
- **Globality (understanding cultural differences)**
- **Dominance of change makes is more challenging**

References

- **Chapter 6,7, Kappel, G., Proll, B. Reich, S. & Retschitzegger, W. (2006). Web Engineering, Hoboken, NJ: Wiley & Son**

End of Today's Lecture
Thank You