Testing Complex Web Surveys Using Automated Test Tools

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RTI International

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Software Testing

- What is software testing?
  The process used to identify the correctness, completeness, and quality of developed computer software

- Goals of testing
  - software works as per the specs/requirements
  - finding faults in the software
  - fit for use

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Test automation

- Software that 'automates' any aspect of testing

  - Generating test inputs and expected results
  - Running test suites without manual intervention
  - Evaluating pass/no pass

Uses of Automated Testing

- **Sanity tests**

  - Run after every new system build to check for any problems.

- **Stability tests**
  - Run the system extended period to ensure it performs well.

- **Regression tests**
  - Retest after bug fix to check that changes have not caused errors.

- **Performance tests**
  - Test system continuously or with large number of users accessing the system simultaneously.
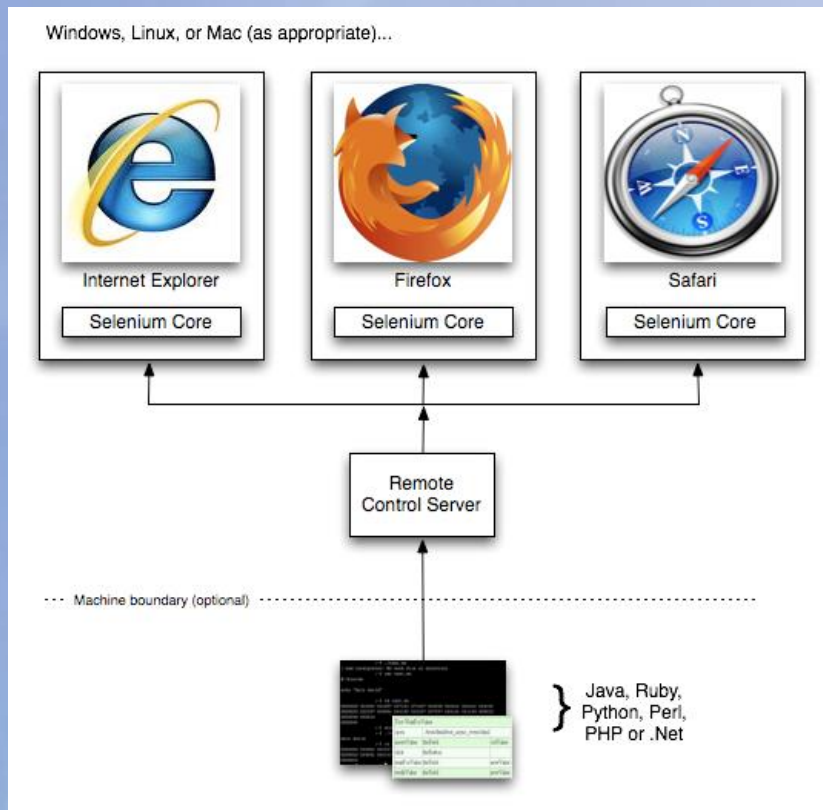
Some popular automation tools

Company	Tool
HP	Quick Test Professional (WinRunner)
IBM	Rational Functional Tester
SMARTBEAR	TestComplete
MICRO FOCUS	SilkTest, TestPartner
Se	Selenium

Tools - Open Source Software
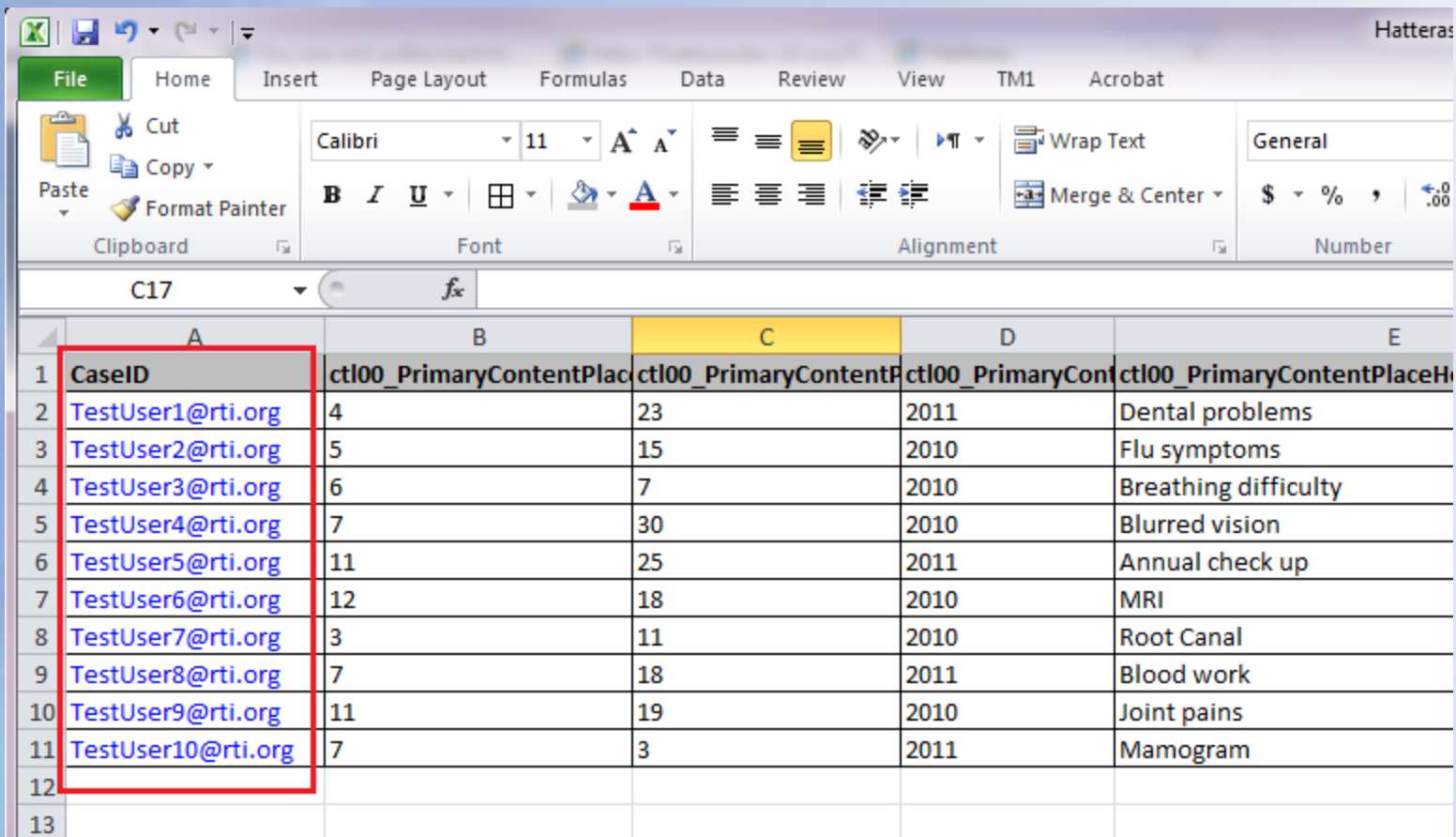
Tool		Source
	Selenium	**http://seleniumhq. org**
	Java	**www.java.com/en**
	JUnit	**www.junit.org**
	Eclipse	**www.eclipse.org**

Selenium

- Automate Selenium tests from Java/.NET/Ruby etc

- Execute in multiple browsers, on remote machines

- Integrate into wider business tests and CI tools

- Data Parameterization (using Microsoft XL, Oracle, SQL Server etc)

Data Parameterization using XL

Demo - Hatteras CAI

- **Hatteras** is a web-based computer-assisted interviewing system that allow development and administering of web-based surveys.

- **SurveyEditor** is the interactive instrument development portion of Hatteras. It provides the user interface to edit all aspects of a survey instrument, including forms, items, comments, program logic etc.

- **SurveyEngine** takes the specifications created in SurveyEditor and renders those specifications into Web pages. All specifications are stored in database tables and SurveyEngine reads the tables to produce the web pages.

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Demo - Hatteras CAI

- This is the development site.

- Some of the questions are from the "shootout" session of IFDTC a few years ago.

- Others are 'test' questions.

Hatteras demo

- Demo will

  - Start and complete survey, including all sections
  - Show sample checkpoints
  - Capture/Save screen shots of errors

Sample Survey

Scenario #1: Start and complete full Survey

| Start Survey | → | Section A | → | Section B | → | Section C | → | Section D | → | End Survey |
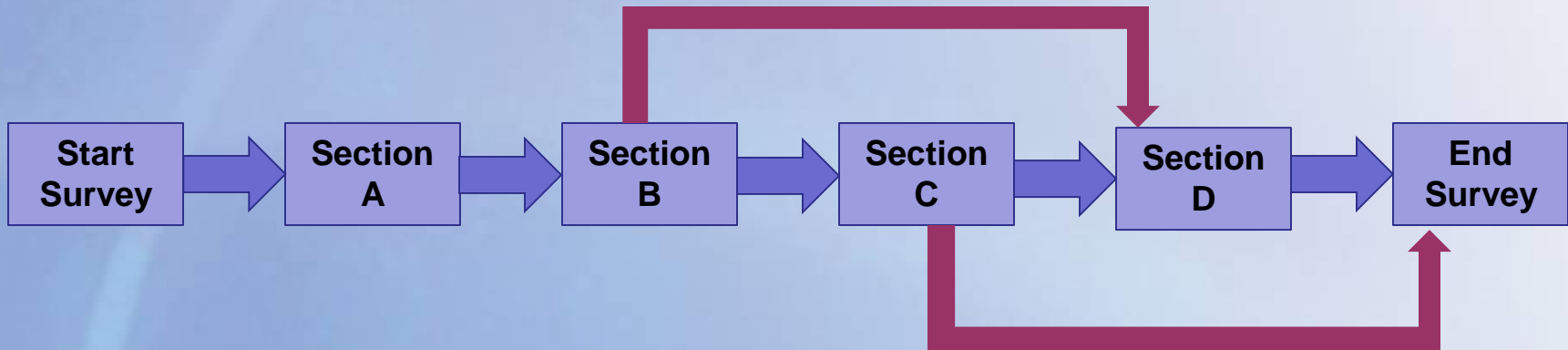
Scenario #2: Start and complete Survey (skip section C)

Scenario #3: Start and complete Survey (skip section D)

Why Automate?

- **Cost Reduction:**
Resources needed for regression test are reduced.

- **Fast:**
Automated scripts run tests significantly faster compared to manual tests.

- **Reusable:**
Can reuse tests on different versions, even when the UI changes.

- **Reliable:**
Tests perform the same operations each time they are run, eliminating human error

Why Automate?

- **Repeatable :**

  Can test how the software reacts under repeated execution of the same operations.

- **Programmable:**

  Can program sophisticated tests that have logic included
  (e.g. features that should be available based on role assigned).

- **Comprehensive:**

  Can build a suite of tests that covers every feature in the application.

- **Better Quality:**

  Can run more tests in less time with fewer resources

When not to Automate?

- Few testing cycles/rounds
- Constantly changing UI
- Limited test budget
- Automation skills not available

Questions

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Questions ?