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Everything You Wanted to Know About Test Automation...

November 9, 2005

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Overview

❖ **Test Automation Truths or Myths**

❖ **Frequently Asked Questions About Test Automation**

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Truth or Myth?

❖ **Recorders make test automation easier**

- Myth

- The Truth:
  - They make recording easy …
  - But they also make it easy to create automation that is difficult and expensive to maintain
  - A recorder can serve as a training device to help you learn a scripting language

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Truth or Myth?

❖ **You can't develop test automation for an application until it is stable**

- Myth
- The Truth:
  - You should develop test plans as soon as the Requirements are documented
  - You can also develop automated tests from wire-frames, mock-ups and prototypes
  - In the case of wire-frames, you can even test some of your methods
  - If tests are structured properly, only a small portion of your work will have to be maintained when GUI changes are made to an application that has not yet stabilized.

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Truth or Myth?

❖ **Test automation is most effective for regression testing**

- Part Truth:
  - Test automation is very effective for regression testing
  - It is also effective for first pass testing when a data driven approach is used
  - Automated tests should be designed to find bugs not just verify that regression tests don't break

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Truth or Myth?

❖ **It is difficult to automate a dynamic application where data changes constantly**

- Myth

- The Truth:
  - Data can be separated from test code so that only the data needs to be changed
  - Better yet, in some cases input data can be captured at runtime to meet the criteria required for a test
  - Or a database query can be executed to get data at runtime
  - Verification data can also be captured at runtime so that tests remain flexible in a dynamic environment

Truth or Myth?

❖ **Test automation is a software development task**

- Truth:
  - Automated tests should be designed, developed and tested
  - Automated test components are assets that should be treated like application source code
  - Test automation standards should be developed
  - Test automation should be subject to peer reviews

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Truth or Myth?

❖ **Productivity gains will be realized from test tools right away**

- Myth:
  - Test automation is an investment
  - Quality gains will be realized right away
  - Productivity gains will be realized over time as skills develop and manual testing tasks are offset by completed automation

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Truth or Myth?

❖ **Automated tests are difficult to maintain**

- Myth

- The Truth:
  - Separate business rules, test methods and data to promote maintainability
  - If properly structured, automated tests can be maintained across many releases of a target application
  - It's important to run automated tests on every build and make incremental changes as needed

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Questions

❖ **What are the most important components to have in place before implementing test automation?**

- Management support
- Goals and objectives (expected investment and return)
- Good test plans
- Adequate skills and training
- Strong automation architecture and methodology
- The right tools

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Questions

❖ **What are the most common problems with test automation?**

- Lack of vision and experience with test automation
- Testing tool not a good fit for the project
- Test automation architecture is lacking or insufficient
- Test plans are not adequate
- Poor choices in what to automate
- Lack of management support
- Incorrect expectations (too low or too high)

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Questions

❖ **What are the most important aspects to consider when evaluating testing tools?**

- Does the test tool support all of the required platforms?
- Does the test tool recognize application objects?
- Is the learning curve of the testing tool and approach appropriate for staff skill set?
- Has the ease of script maintenance be weighted at least as high as ease of developing scripts
- Does the test tool provide a recovery mechanism?
- Is there a powerful scripting language?

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Questions

❖ **How can an application be made friendly to testing tools?**

- Expose application data
- Choose automation-friendly third-party controls
- Uniquely name application pages and objects
- Add "hidden" controls
- Use standard objects
- Modify custom controls
- Externalize functions in an API

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Questions

❖ **When in the project should the test automation effort begin?**

- Automation should begin during the design phase
- Test plans can be written from requirements documents
- Wire frames or mock ups can be used to capture application objects and write basic methods

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Questions

❖ **What test plan format is best for test automation?**

- Outline based test plans work best
  - Emphasize the 'what' over the 'how'
  - Result in tests that have a clear objective
  - Contain tests that are concise and independent

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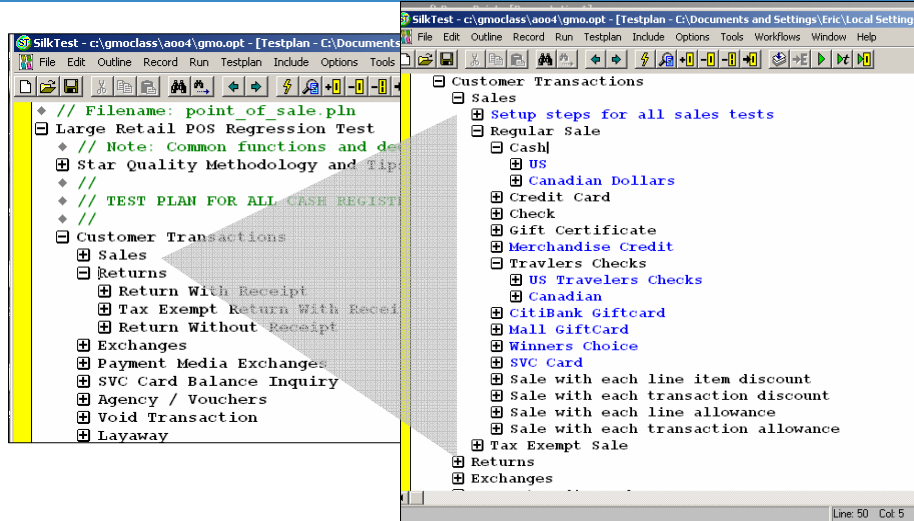

Alternative Approaches for Building Test Plans

Scenario Based	Outline Based
Strengths	*Strengths*
❖ Provides detail and context to test tasks ❖ Replicates how system is used in production ❖ Provides a script to follow to execute the test	❖ Can start immediately (before product) ❖ Provides a summary of coverage without reading and understanding entire document ❖ Spans multiple platforms / multiple releases ❖ Results in a more comprehensive set of tests ❖ Allows for priority driven test coverage
Weaknesses	*Weaknesses*
❖ No structured view of test requirements (difficult to determine test coverage) ❖ Often delayed until late in the dev cycle ❖ Generally limited to 1 platform, 1 release	❖ Requires better understanding of requirements ❖ Requires earlier internal communications

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Expanded to Show Various Types of Sales

Questions

❖ **How do you decide what to automate?**
❖ **Consider the balance between effort, risk and benefit**

Easy to automate	More difficult to automate
▪ Short or simple transactions	▪ Long or complex transactions
▪ Many data combinations	▪ One-offs
▪ Expected results are stable or easy to generate at runtime	▪ Difficult to predict results
▪ Tests that are executed regularly	▪ Tests that cross many applications
▪ Tasks that are difficult to do manually	
▪ Highest priority features	

Questions

❖ **What techniques should be used when the test environment changes rapidly?**
  - Write flexible test methods that respond to changes in the test environment and context
  - Separate test data from test methods
  - Capture input data from application data sources
  - Where possible, capture expected results at runtime

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Thank you

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Building In Testability

- ❖ **Proper naming of application pages and objects**
- ❖ **Addition of "hidden" controls**
- ❖ **Use of standard objects**
- ❖ **Build custom objects and choose third- party controls that are automation-friendly**

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Provide Unique Page Names

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Name Arrays of Similar Controls

Compare Items in the All Cameras Category

Let us help you find the item that best fits your needs.

Click the box next to the products you want to compare. Then click the Compare button to see the results.

Item Name	Item No.	Price	Select
Concord EyeQ Go2000 Digital Camera	578012	$79.99	☐
DXG 308 Digital Camera	566754	$89.99	☐
Fujifilm FinePix A205 Digital Camera	515573	$99.98	☐
DXG 321 Digital Camera	566755	$119.99	☐
Kodak Easyshare CX7300 Digital Camera	568420	$129.99	☐
HP Photosmart 435 Digital Camera	573965	$129.99	☐
Concord Eye-Q 3341 Digital Camera	582126	$129.99	☐
Olympus D-395 Digital Camera	564918	$149.98	☐
DXG 328 Digital Camera	578086	$149.99	☐
Fujifilm FinePix A330 Digital Camera	561920	$179.98	☐
Canon Powershot A400 Digital Camera	578635	$179.98	☐
Canon A60 digital camera	504728	$179.99	☐
Concord Eye-Q 4360z Digital Camera	582127	$179.99	☐
Toshiba PDR-4300 refurbished digital camera	569334	$189.99	☐

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Adding Hidden Html Objects

❖ **Add a hidden html object for each control that returns the value of the control**

```
<input type="hidden" name="qa_headerpage"
value="qa_username=Tester,,qa_itemsincart=1
item,,qa_cart_total=$13.79" />
```

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Custom/Third Party Objects

- ❖ **Publish useful methods (e.g. SelectCell)**
- ❖ **Publish properties (e.g. sClip)**
- ❖ **Add new properties for test verification**
- ❖ **Provide an hWin for each application control**
- ❖ **Copy-enable text fields**
- ❖ **Add hidden control (same color as background) to reflect value of rendered text**

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Custom/Third Party Objects
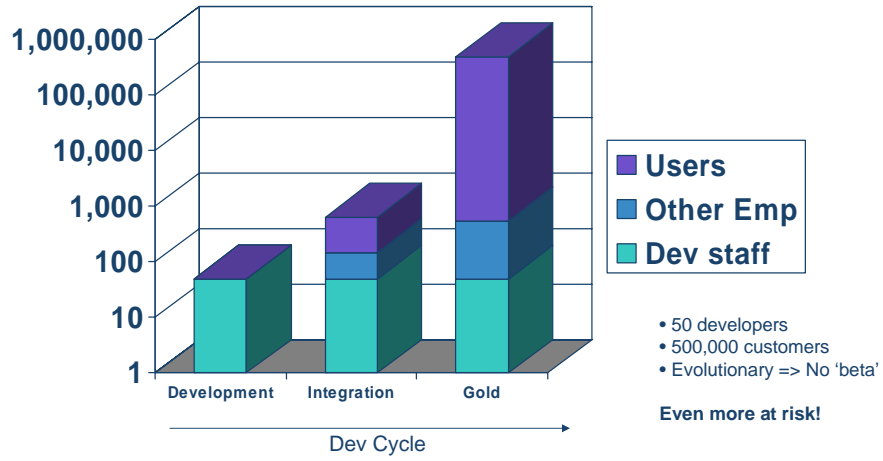
- ❖ **Implement keyboard short-cuts and accelerators**
- ❖ **Follow platform standards for keyboard commands, e.g. <HOME>, <END>, <CTRL-HOME>, <SPACE>, etc.**
- ❖ **Use test applets from third-party vendors to verify compatibility before purchasing**

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Late Defect Discovery has Exponential Impact on Number of People Affected – Small eTailer

- 50 developers
- 500,000 customers
- Evolutionary => No 'beta'

Even more at risk!

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