Software Testing Trends in Australia and Beyond

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Abstract

This presentation looks at trends in software testing within the Australian context and compares them to broader global software testing practices by means of case studies from within global software development firms. Using the 2012 Australian Software Testing Industry Benchmark to provide a thorough analysis of current and emerging testing approaches and investigate general perceptions of the role of software testing, the presentation examines practices from research and development (R&D) companies as a point of comparison.

The benchmark survey is structured to allow organisations to:

- Compare themselves with the benchmarks achieved by other organisations in their sector
- Identify areas of strength and weakness
- Use this information to drive decisions regarding resource and budget allocation
- Compare how their efforts in testing are contributing to project success
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Presentation Overview

- Key findings of the 2012 Australian Software Testing Industry Benchmark
- Comparison to experience in R&D software engineering organisations
Project Success?

Software Testing Industry Benchmark 2009/10
- Successful: 64%
- Challenged: 32%
- Cancelled: 4%

Software Testing Industry Benchmark 2012
- Successful: 41%
- Challenged: 53%
- Cancelled: 6%

Challenged projects
- Over Time: 45%
- Over Budget: 37%
- Customer Requirements not met at deployment: 18%

Team Structure

Proportion of effort

Test Role

- 2 years ago
- Now
- 2 years ahead

Test Director, Test Manager, Test Lead/Coordinator, Test Analyst, Tester, Test Automation Specialist, Lead Test Specialist, Other
Team Structure & Size

R&D Industry Experience
• Depends on the nature of the software project
• Mission critical software project requires larger team size
  – 18-20 test analysts
  – Large complex software with different interdependent technologies
• Anecdotal evidence for dev & test roles merging
  – Microsoft, eBay and Google all shifting to using engineers with a common skill set of both dev and test

Resourcing Mix

Test Resourcing

- Outsource / Vendors – Offshore
- Outsource / Vendors – Onshore
- Contractors
- In-house

2 years ago | Now | 2 years on
---|---|---
58.8% | 60.0% | 61.9%
5.7% | 5.7% | 11.3%
14.9% | 14.9% | 16.0%
8.7% | 9.7% | 9.7%
11.9% | 11.9% | 11.9%
Resourcing Mix

R&D Industry experience

– Outsourcing highly technical testing of R&D products has proven difficult
– Preferred strategy of in-sourcing as a better way of managing complexity, and IP

Preferred Lifecycle

![Lifecycle Chart]

- Waterfall
- V-Model
- Iterative
- RAD
- Agile
- None
- Other

Legend:
- Always used
- Often used
- Used occasionally
- Thinking of using
- Not used
More organisations are right-sizing their methodology
   – Agile for small projects, waterfall/v-model for large

Time Factor vs Stability

R&D Industry Experience
   • Waterfall and V-model approaches dominate
   • Slower than agile or ad-hoc testing timeframe
   • Complex architectures too difficult for agile

Preferred Lifecycle

Automation

What percentage of test cases are currently automated?
Automation

What proportion of automated test cases are re-executed regularly during regression testing?

Percent

- 2 years ago: 12.8%
- Now: 24.4%
- 2 years ahead: 50.3%

Automation Investment

Do you feel that automation can deliver real value and return on investment?

- Yes, strongly: 50%
- Yes, marginally: 42%
- No: 8%

In the next few years, we intend to invest further in test automation tools?

- Yes, we will significantly increase investment: 11%
- No, we will significantly decrease investment: 4%
- No, we will decrease investment: 35%
- Yes, we will increase investment: 50%
- Investment will stay the same, or undecided: 35%
Automation Tools

R&D Industry experience

- Tool selection depends on project technology fit
  - Overriding factor tends can be cultural (dev vs. test)

- Open source vs licensed test tools
  - Open source cost effective and easier to extend for organisations with highly skilled staff
  - Licensed tools beneficial for specific integrations
    - E.g. specific protocol or application support

Early Error Detection

Cost

Current Detection
Ideal Detection
Injection

Reqs  Design  Code  Test  Prod
Defect Detection

R&D Industry experience:
• Similar pattern
  – Late detection during test execution
  – Requirements frequently changing, causing difficulty with early static testing
• Unit testing more commonly practiced compared to general industry
  – Relatively stronger internal development culture
  – Product focus

Certification & Training

Proportion of Staff with Certification

Average Annual Training Allocation
Certification & Training

R&D Industry Experience

– Certification recognised for career progression
– Knowledge gained frequently not applied to practical situations in the workplace
  • However common QA vocabulary is beneficial
    – Example: test basis, functional test, non functional test, confirmation test etc
– Budgets and time constraints impact ability to engage in formal technical training

Action Points for Industry

• Benchmarking your testing process helps identify points of strength and weakness in your SDLC
  – Variance from the industry trend isn’t necessarily bad
  – It’s important to understand why the variance is there
• Early defect detection / requirements quality assessment is poorly practiced industry wide, despite being highly cost effective
  – Agile has been one approach to solving the problem
  – Complex architectures remain a challenge to agile
• Embedding QA skills and functions across the lifecycle is an emerging approach, especially in larger development organisations
Research Questions

• Where do we go from here?
  – The dev & test roles appear to be converging (in agile)
    • Will be a independent test function still be needed in future?
    • What process need to change in order to embed QA across the whole lifecycle?
  – What additional value can be delivered by improving testing capability?
    • E.g. ING Direct’s test environment improvement has enabled increased agility across the whole organisation
  – Training requirements:
    • What changes are needed to train future dev-test resources?
    • Can industry certification and tertiary curriculum’s merge or become more complementary?

Questions

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