Lessons learnt from using DSLs for Automated Software Testing
TAIC-PART 2015

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Product Owner

Tester / QA

Project Manager

Developer
Isn’t this already being done?

**Given** I am a premium user

**When** I place a bet on a football match

**And** I win the bet

**Then** I will win 10% more than the advertised odds for the match
Domain Specific Languages (DSLs)

“A computer programming language of limited expressiveness focused on a particular domain”

Martin Fowler

Internal vs External DSLs
Can we utilise DSLs in Software Testing?
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Can we utilise DSLs in Software Testing?
Challenges

- Language Design
- Engineering Challenge
Three Case Studies

- Android GUI Applications
- E-Commerce Applications
- Graphical Games

Well-Defined Domains

Undefined Domains
Challenge 1: Language Design
Characteristics of a good DSL

1. Domain Specific
2. Simple
3. Reusable
4. General
5. Extensible
6. Similarity to other familiar languages
7. Complete
8. Orthogonal
Common Language Elements

- Testing domain remains constant across case studies
- Typical notions:
  - Test Suites
  - Tests
  - Test life cycle
    - Test Setup
    - Exercising the SUT
    - Verification of expected behaviour
    - Test Tear Down
  - Reusable procedure-type mechanisms
Common Language Elements

DEFINE Test Suite "Calculator Test Suite"

  DEFINE Setup
        ...
  END

  DEFINE Test "Simple Addition"
        ...
  END

  DEFINE Test "Divide by zero"
        ...
  END

  DEFINE Teardown
        ...
  END

END
Engineering Challenges

- Interacting with the system under test
- Readability/Maintainability of generated code
Conclusions

- The use of DSLs for specifying and executing test has promise
- Different criteria of language design gain prominence depending on characteristics of games
- Engineering challenges are surmountable, especially if there is good cooperation with developers
- Questions
  - Who curates/owns the language?
  - What effect will a change on the language have on existing scripts?
  - How is that process controlled?
  - Who maintains code generators and how?
Future Work

- Gauge industry opinion
- Carry out more industry case studies
- Look at improving the current state-of-the-art in the industry