

# An Empirical Study to Review and Revise Job Responsibilities of Software Testers

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## Outline

- Motivation
  - Studying impact of human factors on software testing - “what makes a good tester?”
  - Performance evaluation, personality influence, team dynamics / culture etc
  - Need to know - what do software testers DO?
- Study
- Outcome
- Where to from here...



## Introduction

- Software testing refers to...
  - Finding faults
  - Checking fitness for purpose
  - Ensuring certain level of correctness / fitness
  
- The job includes....
  - Preparing test plans
  - Executing tests
  - Reporting test results
  - And.....so on



## Introduction

- However, a definitive list of unit job responsibilities is unavailable....
- Research Question:
  - What unit tasks does software testing include?



## Research Design

- Methodology
  - Case studies of software testers' work – extract from set of worklogs
  - Analysis of software testing job advertisements – extracted from on-line job ads
  - Analysis of bug descriptions in bug repositories – extract and key phrase analyse / taxonomise
- Form a unified set of software tester job responsibilities



## Data Collection

- Worklog of software testers
  - A customized tool – software testers could create account and submit worklog
  - Allows for deep analysis of tasks including complexity, duration etc
- Job advertisements
  - An automated script to collect job responsibilities from sites
  - Provides really broad-brush survey
- Bug repositories
  - An automated script to get “steps to reproduce” from bug reports
  - Minutae as well as relate to other tasks



## Analysis

- Qualitative and quantitative data
- Content analysis to analyze qualitative data
  - Unit tasks identified and listed
  - Frequency of unit tasks was counted
  - Identified unit tasks were analyzed and similar ones grouped together



## Results – Software testers' worklog

- Total 6 cases
- From Australia, New Zealand, Germany and Bangladesh
- Main job responsibilities:
  - Test modules/programs developed by others --- 3 cases
  - Managing testers --- 2 cases
  - Testing and managing --- 1 case
- Worklog submitted from 2 to 37 working days
- 44 unit tasks identified
- 12 distinct categories found





## Results – Software testers' worklog

<b>Category of tasks</b>	<b>Number of unit tasks in this category</b>
Planning	3
Research and Development	6
Review	4
Testing	4
Retesting	2
Reporting	3
Debugging	1
Maintenance	2
Managerial	1
Administrative	5
Meeting	5
Help and Support	4
Miscellaneous	4



## Results – Software testing job advertisements

- Total 47 job advertisements over 5 days from monster.com
- 39 unique unit tasks
- 10 distinct categories



## Results – Software testing job advertisements

<b>Category of tasks</b>	<b>Number of unit tasks in this category</b>
Testing	7
Research and Development	9
Writing and reporting	4
Debugging	2
Assessment and evaluation	2
Planning	2
Managerial	2
Supervision	2
Administrative	6
Collaboration	3



## Results – Bug repositories

- Eclipse Java Development Tool (JDT) and Firefox Testopia
- 24 unique unit tasks
- Most unit tasks were related to “testing”
- “testing” related tasks were subdivided into small groups
- 4 distinct categories



## Results – Bug repositories

Category of tasks	Groups	Number of unit tasks in this category
Testing	Preparation	1
	Test plan management	5
	Test case management	4
	Test run management	4
	Association of components	2
	Test execution	3
	Other	2
Reporting		1
Research and development		1
Planning		1



## Summary

- A unified list of unit tasks extracted from all sources can be found at:  
<http://testingsurveys.org/Worklog/UnifiedTaskList.pdf>
- Key findings:
  - “Test” specific responsibilities divided into many sub tasks
  - Software testers often need to explain test results after reporting
  - They perform good amount of writing and reporting tasks – good communication skill is key!
  - R&D works
- To do
  - Replicate, replicate, replicate...

Questions?

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## References

- Kanij, T., Merkel, R., Grundy, J.C. Performance Appraisal of Software Testers, Information and Software Technology, Elsevier, vol. 56, no. 5, May 2014, Pages 495–505.
- Kanij, T., Merkel, R. and Grundy, J.C., An Empirical Study to Review and Revise Job Responsibilities of Software Testers, 2014 IEEE Symposium on Visual Languages and Human-Centric Computing, Melbourne, Australia, July 27-1 Aug 2014, IEEE CPS.
- Kanij, T., Merkel, R. and Grundy, J.C. A Preliminary Survey of Factors Affecting Software Testers, 2014 Australasian Conference on Software Engineering (ASWEC 2014), Sydney, Australia, April 2014, IEEE CS Press.
- Kanij, T., Merkel, R., and Grundy, J.C., An Empirical Study of the Effects of Personality on Software Testing, 2013 International Conference on Software Engineering – Education and Training (CSEET2013), San Francisco, USA, May 19-21, 2013, IEEE CS Press.
- Kanij, T., Merkel, R., Grundy, J.C. Some lessons learned from conducting industry surveys in software testing, ICSE2013 Workshop on Conducting Empirical Studies in Industry, San Francisco, USA, 20th May 2013.
- Kaniji, T., Merkel, R. and Grundy, J.C. Assessing the Performance of Software Testers, in 3rd ICSE workshop on Collaborative and Human Aspects of Software Engineering, Zurich, Switzerland, 2nd June 2012.