How Google Tests Software: Organizational Structure

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BOUN SWE-550 course

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Who is Serdar DALGIÇ?

- Pardus GNU/Linux Developer since 2007.
- TUBITAK BILGEM/UEKAE Employee since 2009 November.
- Turkish Linux Users Society Member since 2005.
- Boğaziçi University SWE student since 2009.

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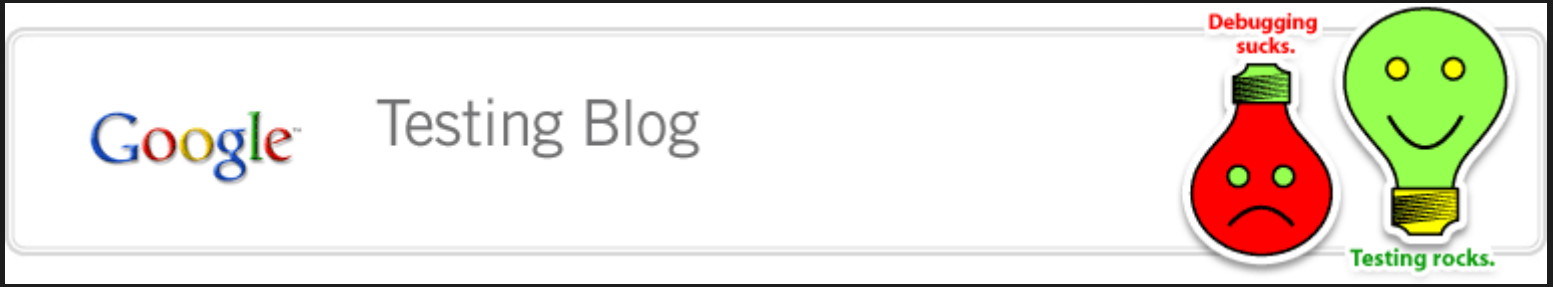
- Adapted from James Whittaker's (Engineering Director, Google Inc.) blog posts to Google Testing Blog[1] from Jan. 25 2011 to May 04 2011.
- 6 Posts - How Google Tests Software - Part[1-6] (25 Jan – 2 May)
- How Google Tests Software - A Brief Interlude (22 Feb)
- How Google Tests Software - A Break for Q&A (4 May)



[1] http://googletesting.blogspot.com/

Google

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Focus Areas ----> Problem Domain

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Organizational Structure

- Not an actual test organization!
- Tests within Engineering Productivity (Eng. Prod. is a F.A.)
- Eng. Prod. owns horizontal and vertical eng. disciplines.
- Test is the biggest!

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Engineering Productivity

- Eng. Prod. is made of:
  1. Product Team
  2. Services Team
  3. Embedded Engineers

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Product Team

- produces internal and open source productivity tools that are consumed by all walks of engineers across the company.
- They build and maintain code analyzers, IDEs, test case mgmt. systems, automated testing tools, build systems, source control systems, code review schedulers, bug databases....
- Tools that increase productivity!

Services Team

- provides expertise to Google product teams on a wide array of topics including tools, documentation, testing, release management, training and so forth.
- Every other F.A. has access to Eng. Prod. expertise.

Embedded Engineers

- effectively loaned out to Google product teams on an as-needed basis.
- Some might sit with the same product teams for years
- Others cycle through teams wherever they are needed most. Google encourages all its engineers to change product teams often to stay fresh, engaged and objective.

So Testers..

- ..report to Eng. Prod. Mngrs. but identify themselves as a part of the Product Team (like Search, Gmail or Chrome..)

- This seperation of project and reporting structures have some advantages and disadvantages.

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Advantages of the seperation:

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- To provide a pool for testers to share information
- Good ideas spread easily
- Whittaker says: "*I like this strategy, 'cause it puts developers and testers on equal footing..*"
  - *"..it allows us a many-to-one dev-to-test ratio.."*
  - *"..Developers outnumber testers.."*
  - *"..The better they are at testing the more they outnumber us. Product teams should be proud of a high ratio!"*

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Disadvantages of the seperation:

- ✗ Testers are external source
- ✗ Product teams can't place too big a bet on them and must keep their quality house in order. (Yes, that's right: at Google it's the product teams that own quality, not testers.)
  - Every developer is expected to do their own testing.
  - The job of the tester is to make sure they have the automation infrastructure and enabling processes that support this self reliance.
  - Testers enable developers to test.

The Problem - *cliché*

- *"Developers can't test!!"*
- Google's answer is to split the role:
- They solve this problem by having two types of testing roles at Google to solve two very different testing problems.

To Solve the Problem(*cliché*)

- Engineering roles that enable developers to do testing efficiently and effectively have to exist.

- Roles in which some engineers are responsible for making others more productive.

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What are these roles?

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- The SWE or Software Engineer
- The SET or Software Engineer in Test
- The TE or Test Engineer

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The SWE or Software Eng.

- The Traditional Developer Role:
  - write functional code that ships to users.
  - create design documentation.
  - design data structures and overall architecture.
  - spend the vast majority of their time writing and reviewing code.
  - write a lot of test code for test driven design
  - SWEs own quality for everything they touch whether they wrote it, fixed it or modified it.

The SET or Software Eng. in Test

- Also a developer role except their focus is on testability.
  - review designs and look closely at code quality and risk.
  - refactor code to make it more testable.
  - write unit testing frameworks and automation.
- They are a partner in the SWE code base but are more concerned with increasing quality and test coverage than adding new features or increasing performance.

The TE or Test Eng.

- exact reverse of the SET. It is a a role that puts testing first and development second:
  - spend a good deal of their time writing code in the form of automation scripts and code that drives usage scenarios and even mimics a user.
  - organize the testing work of SWEs and SETs,
  - interpret test results and drive test execution, particular in the late stages of a project as the push toward release intensifies.
- They are the product experts, quality advisers and analyzers of risk.

Interaction btw SWE and SET

- SWEs own features and the quality of those features in isolation.
- SETs write code that allows SWEs to test their features. ***Testing is done by SWEs***.
- SETs are there to ensure that features are testable and that the SWEs are actively involved in writing test cases.
- SETs primary focus is on the ***developer***.

And then what does TE do?

- ***User focused testing*** is the job of the Google TE.
- TEs act as a double-check on the diligence of the devs.
  - Any obvious bugs are an indication that early cycle developer testing was inadequate or sloppy.
  - When such bugs are rare, TEs can turn to their primary task of ensuring that the software:
    - runs common user scenarios,
    - is performant and secure,
    - is internationalized and so forth...

Quality

Quality

- **QUALITY** is not **Test!**
- While it is true that quality cannot be tested in, it is equally evident that without testing it is impossible to develop anything of quality.
- Quality is achieved by putting development and testing into a blender and mixing them until one is indistinguishable from the other.
- Quality is a development issue, not a testing issue.

Quality

- Google's aim: merge development and testing so that you cannot do one without the other.

- *"..Build a little and then test it. Build some more and test some more.."*

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A. Q. ?

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