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Bug Taxonomies: Use Them to Generate Better Tests

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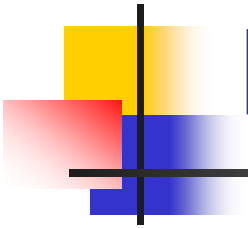


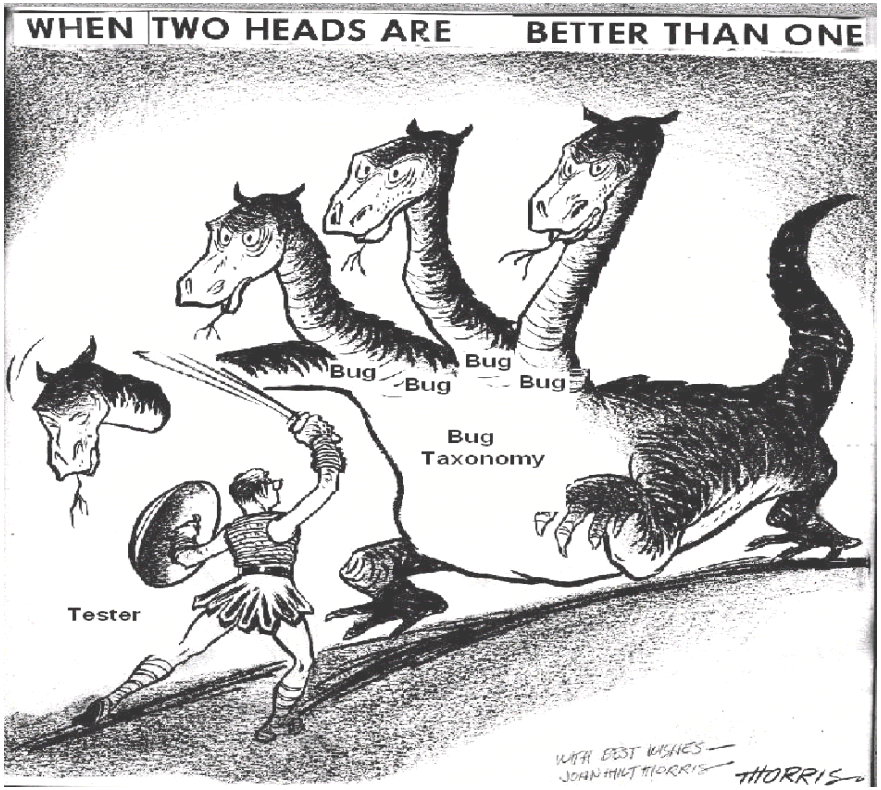
Brainstorming Test Ideas

- Challenges!
  - Lack of focus
  - Lack of clarity
  - Losing time
  - Lack of structured framework
  - Redundant ideas
  - Unable to eliminate ideas that do not fit.
  - Unable to locate a central idea
  - Idea train stops
  - Unable to inspire creativity
  - Unable to identify the challenge
  - Unable to define the issue
  - Unable to induce lateral thinking
  - Lack of paradigms
  - Ideas: Large quantity and of low quality
  - Lots of depth but no breadth in the ideas

Bug Taxonomies

An outline that categorizes and lists a large number of potential bugs.

- The tester who uses the taxonomy can sample from the list, selecting a potential problem for analysis.
  - The tester's question is whether the software under test could have a bug analogous to the one from the list.
  - If so, the next question is what type of test would expose this type of bug.



Using a Bug Taxonomy- Who? and How?

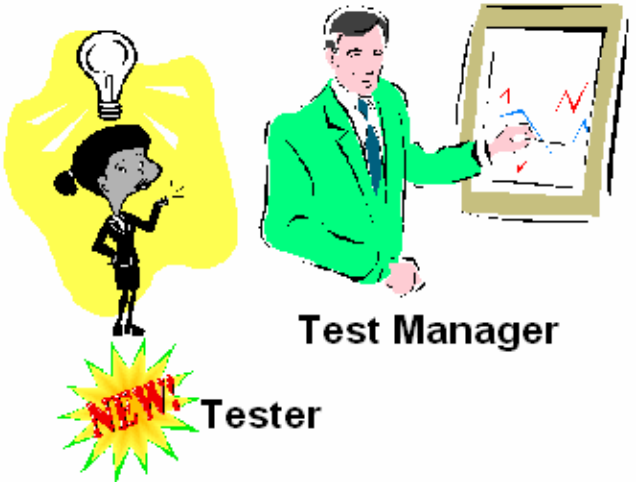
- Tester who has run out of good test ideas looks for plausible failure modes in the risk list, then creates tests looking for those types of failures

- Tester unfamiliar with an aspect of the program looks for potential failure modes in the risk list, then explores the program looking for those types of failures.

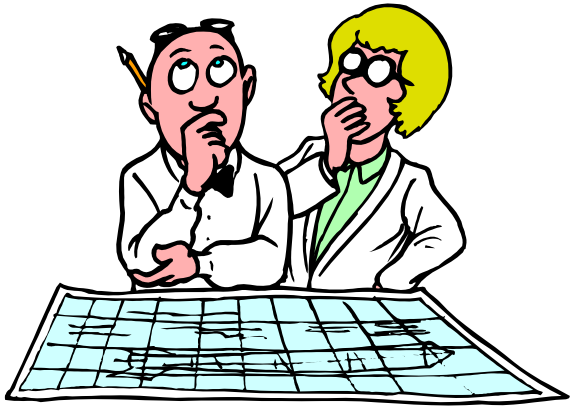
Unfamiliar with an aspect of the program

Using a Bug Taxonomy- Who? and How? (Contd.)

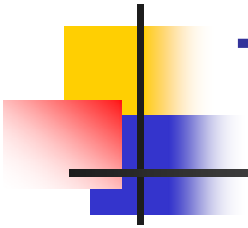
- Test manager, training new testers, walks with the group through selected examples from the risk list in order to convey to the trainees the breadth of their work



- Tester, auditing a test plan, samples from the taxonomy, selects plausible failures, then checks the test plan to determine what tests (if any) could have detected the failure. If none, the test plan has a hole

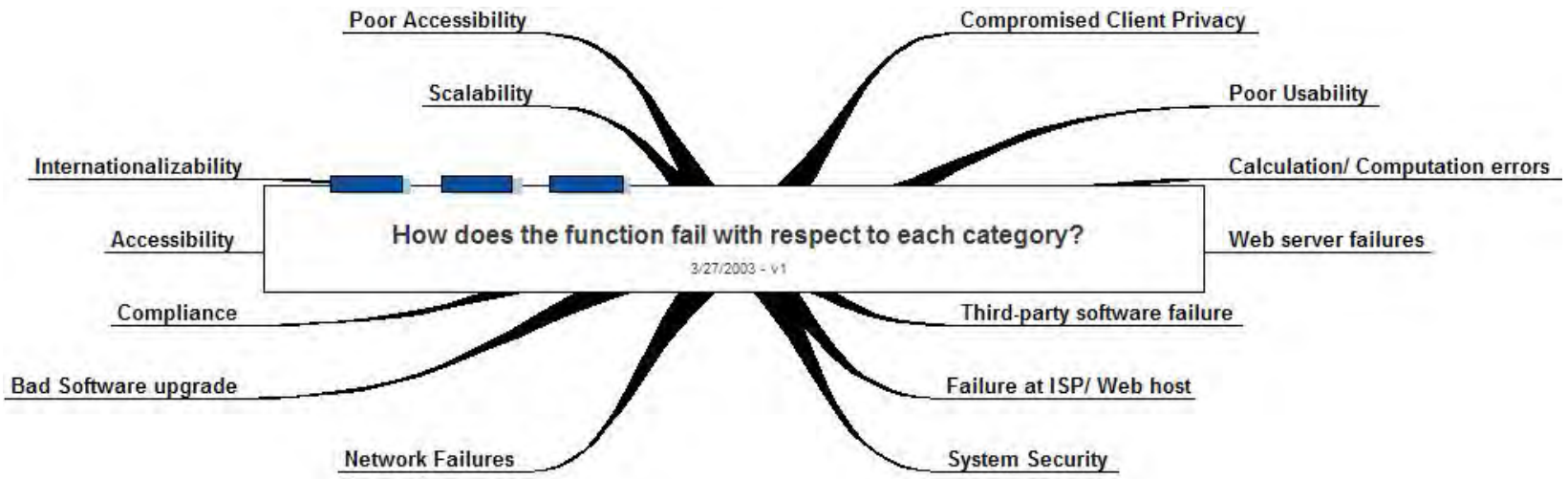


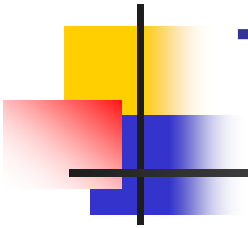
Mock Brainstorming, Without a Taxonomy (10 Mins, 3 Testers)



- Shopping cart does not load.(2)
- Unable to add item.
- Unable to remove item.
- Unable to modify order.
- Correct item not added.
- Shopping cart incompatible with browser and browser crashes.
- Hidden functionality, not able to find checkout button.
- Oops! Clicked the wrong button.
- Broken URLs.(2)
- Missing URLs.(3)
- Shopping cart fails to populate the images in the shopping catalogs.
- Able to hack the cart and change prices from client side.(2)
- Customer credit card numbers compromised due to security glitch.
- Get “Page not found” error on clicking checkout button.

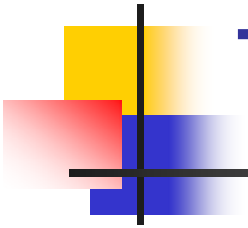
Mock Brainstorming, With a Taxonomy (10 Mins, 3 Testers)





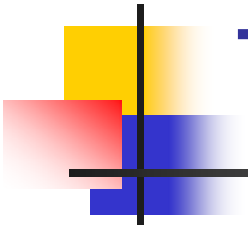
Test Ideas…

- **Poor usability**
  - The user cannot add an item directly from the search result page.
  - The user does not know at every single point in time how many items are in the cart and the total price.
  - User has to go through too many pages to complete an order.
  - Difficult to use the system: difficult to add, remove and update.
  - Cannot to see the final value or estimate the checkout price.
  - Hard to use the “Search” function and hard to locate the “Search” field.
  - Unable to find “Help” menu
  - Customer feedback forms unavailable



Test Ideas…

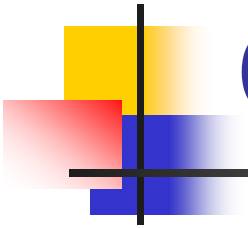
- **Calculation/computation errors**
  - Removing/adding an item from the cart does not update the total.
  - Negative number of items will discount from the total price.
  - Shopping cart doesn't update/refresh price when adding new items.
  - Discounts are not computed correctly.
  - Postage fees or state taxes are not computed correctly.
  - Recalculate function fails.



Test Ideas

- **Internationalizability**
  - The registration fields do not accept extended/international characters.
  - If extended/international characters are entered into the registration, the database gets corrupted.
  - Unable handle upgrades to a multi-lingual website.
  - Unable to handle non-domestic orders and unable to integrate shipping costs for different countries.

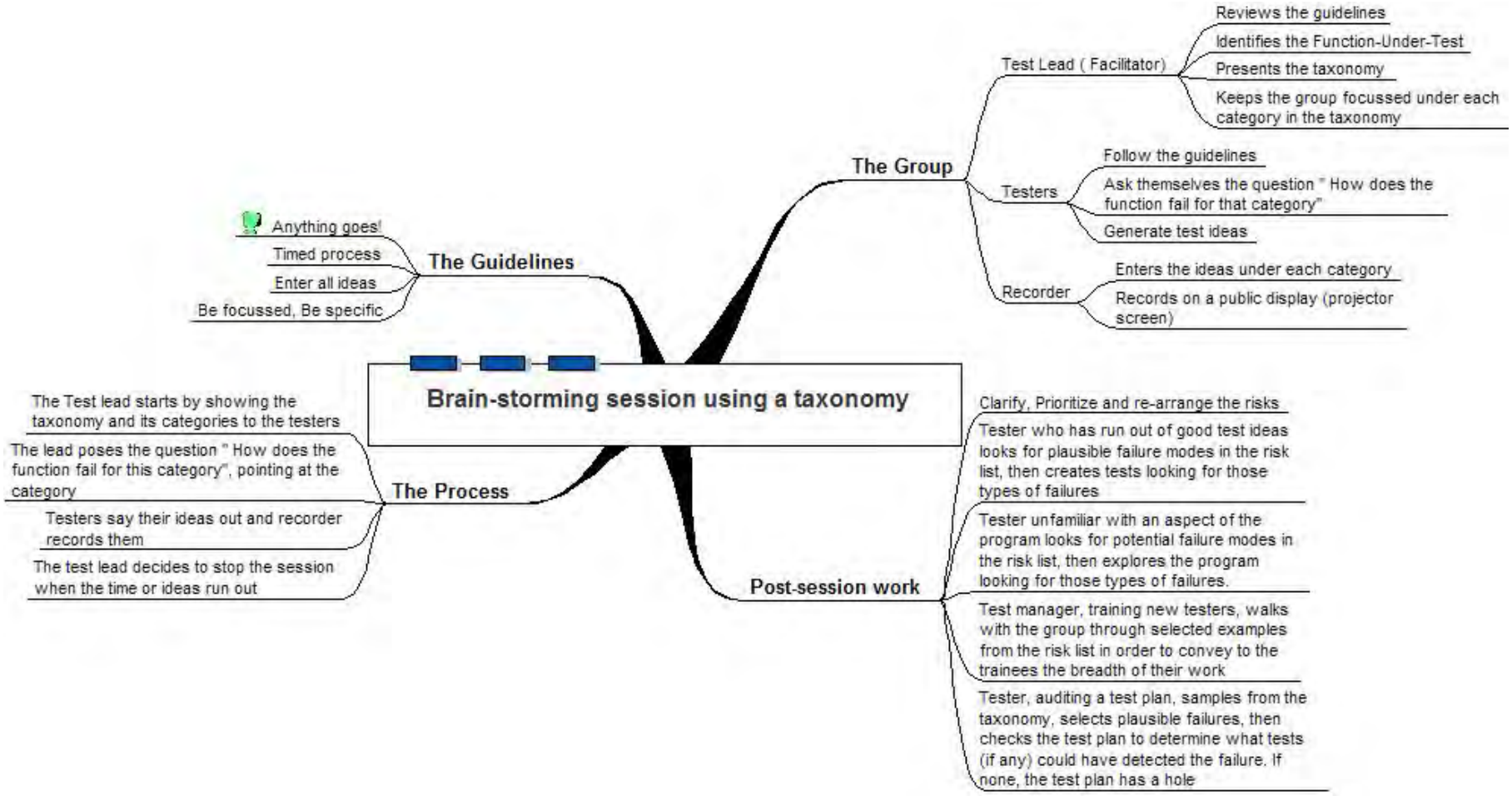
And the "Idea train" chugged on…



Observations…

- Under the given time, we see an increased number of good and more focused test ideas.
- Very structured and organized approach and the presentation tend to provide a sense of confidence and better coverage.
- Able to focus the tester's idea train to areas that have been identified to need more attention. Hence we now have a collection of test ideas which is more comprehensive and detailed.
- A few well known types of security attacks, Popular flaws were addressed when the testers were specifically prompted.
- It was agreed by the participants that the taxonomy helped them think more focused and the scope of the test idea generation session could be better understood.
- Also observed was that the taxonomy aided a smooth and organized facilitation of the entire session.
- We wasted less time and the whole exercise was more interesting than a traditional, unstructured test idea generation meet.

Using "Mind-Maps"



Why use them?

- Taxonomies, by nature are highly branched with non-linear and associative collection of categories and sub-categories
- Taxonomy creation generally involves lots of revisions. Hence mind maps serve well when you are developing a branched taxonomy with a body of test ideas with many dangling tentacles that require constant addition/removal/modification of branches.
- The “birds-eye" or a top-level aerial view of the entire taxonomy is useful
- Some of the commercial mind-mapping software comes with a brain storming mode that is easy to use in brain storming sessions

How the e-commerce bug taxonomy was developed?

- **Brainstormed** a first draft top-level list

- **Searched electronic bug databases** (such as bugnet.com and cnet.com) for examples.

How the taxonomy was developed? (Contd.)

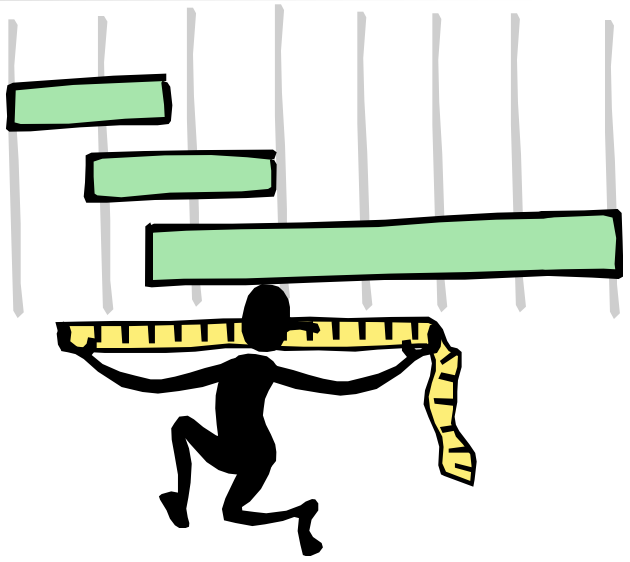
- Searched **open source software for bug databases** for specific products. These gave us examples and indications of the types of bugs possible

- Brainstormed additional types of problems.

How the taxonomy was developed? (Contd.)

- Circulated the list and the outline for expert review

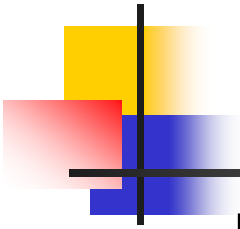
Conformance of the e-commerce taxonomy to the "Definition and Requirements of a Taxonomy"



- Mutually Exclusive?, Unambiguous ? Exhaustive?
- The e-commerce taxonomy is appropriate, comprehensible, specific, and most importantly useful for the purpose it was created. It will possibly be accepted as a good beginning by the testing community and with possible customizations for individual needs, it may end up meeting its objectives

Function-under-test: The shopping-cart

- Rich functionality
- Types
  - Third party built and hosted shopping carts
  - Out-of-the-box shopping carts
  - free shopping cart scripts in CGI/ASP
- Other Functions : User-authentication, Search, Registration.
- List includes generalized failures.



Final thoughts…

E-commerce Bug Taxonomy

"45 Categories, 700+ risks and 300+ Examples"

Also you may also want to download the presentation and paper from…

WWW.TestingEducation.org

Q&A