Efficient and effective exploratory testing of large-scale software systems

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- This paper declare results from interviews and workshops with participants from six case study companies, that can give an improved understanding how exploratory testing is used .

- it give out a new model (the ExET model) that can be used by testers in industry to identify improvement areas, which can be used to optimize exploratory testing.

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This paper aims to find a systematic and reliable approach to improving exploratory testing. This is by answering three questions.

1- How has the literature described the key factors that enable efficient and effective heuristic testing of large-scale software systems?

2- What are the key factors that enable efficient and effective heuristic testing of large-scale software systems?

3- How can a model be built to improve exploratory testing?

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- ## Methods used:

Interviews, group interviews and workshops :

The interviews included 20 individuals from four of the case study companies.

All of the interviewees had experiences from exploratory testing as testers, and in some cases also as test leaders

Reviewing literature

To investigate whether the solutions for the questions have been presented in published literature. literature review, covering 52 publications.

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Research solution to this problem

The research introduced a new model to solve the problem of this model called (ExEt) (Excellence in Exploratory Testing) .
 The ExET model represents strengths and areas for improvement, which can be used to improve exploratory testing in each case. The model is represented by a set of data

Efficient and effective exploratory testing of large-scale software systems

According to the search: " Statements representing the ideal situation in the ExET model.

1. The testers know how the system is built, and the correct behaviour of the system

2. The testers know how the product is used by the end-user (or the end user is represented in the test team)

3. The testers are curious and want to learn about the system

4. We have a well-defined purpose and scope for the tests (system functions ready to be tested) which the testers can transform into e.g. scenarios or focus areas

5. We have regression testing to secure basic stability and integrity in the system (before exploratory testing)

6a. We have a structured way of working, e.g. planning meetings, preparations, test strategies

6b. Our way of working (e.g. planning meetings, preparations, test strategies) provide sufficient freedom for the tester

- 7 Testers with different experiences and competences work together as a team, helping each other with new ideas and knowledge about different parts of the system

-8 We have test environments that support debugging and recording

-9. We have a well-defined way to report the test results, including a description of areas covered by the tests and a list of identified problem"

Efficient and effective exploratory testing of large-scale software systems

Validity of the result :

To evaluate if the ExET model was considered effective and
useful in practice they used the following methods .

- Validation interviews and workshops : The interviewees and workshop participants used the ExET model to evaluate the status in their organization to identify improvement areas. the validation cases did not involve any of the individuals or organizations involved in thestudied to develop the ExET model

- Validation cross-company workshop: A cross-company workshop with participants from all six companies in the study. The workshop participants discussed the results from the validation cases.

- Comparison with literature review: Comparison of the ExET model and related work found in literature, primarily to discuss the novelty of the ExET model.

Efficient and effective exploratory testing of large-scale software systems

Threats to validity

- The fact that only one search engine was used for the literature review could be seen as a threat to validity.

- Other threats to construct validity are related to the two series of interviews : It is possible that a- different set of questions   for the interviews can lead to a different focus in the interviewees .
But the authors' response is that" the interview guides were designed with open-ended questions".

Efficient and effective exploratory testing of large-scale software systems

Criticism :

The research provides a description of the factors that achieve an ideal test case and uses interviews with the testers as the main source of information and the main source of validation. Despite , I agree with all 9 points but Of course I have some doubts about validation methods. validation should not be done through interviews with random testers. It will be with the most popular and most experienced testers. Because they have the confidence to disagree with other people's ideas. The junior testers will be influenced by other's ideas because they feel they are inexperienced to reject others' ideas.

 - At the same time I think it would be better if the research identified the factors that lead to a bad exploratory test. For example, in my opinion:

- The huge number of exploratory tests negatively affects the testing system because it takes too long.

- Using team testing with only junior testers negatively effects testing because testing depends on the tester's skill and experience.