

# Survey Questionnaire for Validating Test Smells and Flaky Tests Findings

\* Indicates required question

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## Section 1: Background Information (Demographics)

(Information will not be shared)

1. 01. Years of industry experience? \*

*Mark only one oval.*

- ☐ 0–2 years
- ☐ 3–5 years
- ☐ 6–10 years
- ☐ 10+ years

2. 02. Current job role/title? \*

*Mark only one oval.*

- ☐ Software Engineer
- ☐ QA/Test Engineer
- ☐ DevOps Engineer
- ☐ Other: \_\_\_\_\_

## 3. 03. Domain of work you've explored till now? \*

*Check all that apply.*

- ☐ Web development
- ☐ Mobile app development
- ☐ Embedded systems
- ☐ Data/ML engineering
- ☐ Game development
- ☐ Other: \_\_\_\_\_

**Section 2: Testing Practices**

## 4. 01. How often do you write or maintain test code? \*

*Mark only one oval.*

- ☐ Daily
- ☐ Weekly
- ☐ Occasionally
- ☐ Rarely
- ☐ Never

## 5. 02. Test coverage goals in your team/project? \*

*Mark only one oval.*

- ☐ No explicit goals
- ☐ <50%
- ☐ 50–75%
- ☐ 75–90%
- ☐ 90%+
- ☐ Don't know

## 6. 03. Does your team perform code reviews on test code? \*

*Mark only one oval.*

- ☐ Yes, same rigor as production code
- ☐ Yes, but less strict
- ☐ No, test code is rarely reviewed
- ☐ Not applicable

### Section 3: Experience with Test Smells

Test smells refer to patterns in test code that indicate poor design or implementation practices.

## 7. 01. Are you familiar with the concept of test smells? \*

*Mark only one oval.*

- ☐ Yes
- ☐ No

## 8. 02. In your experience, how often do you encounter test smells in your projects?

*Mark only one oval.*

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ Always

### Section 4: Experience with Flaky Tests

Flaky tests are those tests that produce inconsistent results across different executions, failing or passing unpredictably.

9. 01. Are you familiar with the concept of flaky tests? \*

*Mark only one oval.*

☐ Yes

☐ No

10. 02. How often do you encounter flaky tests in your projects?

*Mark only one oval.*

☐ Never

☐ Rarely

☐ Sometimes

☐ Often

☐ Always

## Section 5: Perceptions of Test Smells and Flaky Tests

## Definition of Test Smells

### Assertion Roulette

A test with multiple assertions but no messages, making it hard to know which one failed.

### Conditional Test Logic

The test uses control statements (if, switch, loop) that make it harder to understand and maintain.

### Constructor Initialization

The test class defines a constructor instead of using setup methods.

### Default Test

The test class has a generic default name like `ExampleUnitTest` or `ExampleInstrumentedTest`.

### Dependent Test

A test that relies on the outcome or side effects of other tests.

### Duplicate Assert

A test method repeats the same assertion with identical parameters.

### Eager Test

The test calls multiple methods of the production class, testing too much at once.

### Empty Test

The test method is empty or contains no executable code.

### Exception Catching or Throwing

The test method includes throw or catch statements instead of using proper exception testing.

### General Fixture

The setup method initializes more objects or fields than a test method actually needs.

### Ignored Test

The test or class is marked with `@Ignore` and doesn't get executed.

### Lazy Test

Multiple test methods test the same production method with slight variations.

### Magic Number Test

The test uses hardcoded numeric values instead of named constants or variables.

### Mystery Guest

The test uses external resources like files or databases without making them visible or obvious.

### Print Statement

The test includes `System.out.print`, `println`, `printf`, or similar statements.

### Redundant Assertion

An assertion where the expected and actual values are the same, making it pointless.

**Resource Optimism**

The test assumes external resources like files will always be present, without checking.

**Sensitive Equality**

The test relies on `toString()` or string comparisons that may break easily.

**Sleepy Test**

The test uses `Thread.sleep()` which can slow down the test suite unnecessarily.

**Verbose Test**

The test method is excessively long and does too many things.

**Unknown Test**

The test method has no assertions and doesn't test any behavior directly.

**Definition of Flaky Tests****Implementation Dependent (ID)**

Tests exhibiting flaky behavior due to dependencies on specific implementations of libraries, platforms, or external systems. Their outcomes may vary across different environments or versions of dependencies.

**Non-Order Dependent (NOD)**

Tests that show inconsistent outcomes regardless of execution order, typically due to factors such as asynchronous waits, concurrency issues, randomness, or platform dependencies.

**Order Dependent (OD)**

Tests whose outcomes depend on the execution order of the test suite, influenced by shared state or resources modified by other tests.

**Order Dependent - Victim (OD-Vic)**

A subtype of OD tests that pass in isolation but fail when executed after certain "pollute" tests that modify shared state or resources.

11. Do you believe there is a connection between test smells and flaky tests?

*Mark only one oval.*

- ☐ Yes
- ☐ No
- ☐ Not sure

## Measuring Co-occurrence of Test Smells and Flaky Tests

In this section, we aim to assess participants' perceptions regarding the co-occurrence of test smells and flaky tests using a 5-point Likert scale, where the scale points represent the following:

- 1 - Highly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Highly Agree

12. **Co-occurrence 1**

\*

Do you believe there is a co-occurrence between

**1. Assertion Roulette**

**2. Implementation Dependent (ID) ?**

*Mark only one oval.*

	1	2	3	4	5	
High	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Highly Agree

13. **Co-occurrence 2**

\*

Do you believe there is a co-occurrence between

**1. Assertion Roulette**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

14. **Co-occurrence 3**

\*

Do you believe there is a co-occurrence between

**1. Conditional Test Logic**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

15. **Co-occurrence 4**

\*

Do you believe there is a co-occurrence between

**1. Conditional Test Logic**

**2. Order Dependent (OD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree



16. **Co-occurrence 5**

\*

Do you believe there is a co-occurrence between

**1. Constructor Initialization**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

17. **Co-occurrence 6**

\*

Do you believe there is a co-occurrence between

**1. Eager Test**

**2. Implementation Dependent (ID) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

18. **Co-occurrence 7**

\*

Do you believe there is a co-occurrence between

**1. Eager Test**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

19. **Co-occurrence 8**

\*

Do you believe there is a co-occurrence between

**1. Empty Test**

**2. Order Dependent - Victim (OD-Vic) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

20. **Co-occurrence 9**

\*

Do you believe there is a co-occurrence between

**1. Exception Catching or Throwing**

**2. Order Dependent (OD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

21. **Co-occurrence 10**

\*

Do you believe there is a co-occurrence between

**1. General Fixture**

**2. Implementation Dependent (ID) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

22. **Co-occurrence 11**

\*

Do you believe there is a co-occurrence between

**1. Lazy Test**

**2. Implementation Dependent (ID) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

23. **Co-occurrence 12**

\*

Do you believe there is a co-occurrence between

**1. Magic Number**

**2. Implementation Dependent (ID) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

24. **Co-occurrence 13**

\*

Do you believe there is a co-occurrence between

**1. Magic Number**

**2. Order Dependent (OD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

25. **Co-occurrence 14**

\*

Do you believe there is a co-occurrence between

**1. Magic Number**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

26. **Co-occurrence 15**

\*

Do you believe there is a co-occurrence between

**1. Print Statement**

**2. Order Dependent (OD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

27. **Co-occurrence 16**

\*

Do you believe there is a co-occurrence between

**1. Redundant Assertion**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

28. **Co-occurrence 17**

\*

Do you believe there is a co-occurrence between

**1. Redundant Assertion**

**2. Order Dependent (OD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

29. **Co-occurrence 18**

\*

Do you believe there is a co-occurrence between

**1. Sensitive Equality**

**2. Implementation Dependent (ID) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

30. **Co-occurrence 19**

\*

Do you believe there is a co-occurrence between

**1. Sensitive Equality**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

31. **Co-occurrence 20**

\*

Do you believe there is a co-occurrence between

**1. Sensitive Equality**

**2. Order Dependent (OD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

32. **Co-occurrence 21**

\*

Do you believe there is a co-occurrence between

**1. Sleepy Test**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

33. **Co-occurrence 22**

\*

Do you believe there is a co-occurrence between

**1. Sleepy Test**

**2. Order Dependent (OD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

34. **Co-occurrence 23**

\*

Do you believe there is a co-occurrence between

**1. Unknown Test**

**2. Implementation Dependent (ID) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

35. **Co-occurrence 24**

\*

Do you believe there is a co-occurrence between

**1. Verbose Test**

**2. Non-Order Dependent (NOD) ?**

*Mark only one oval.*

1   2   3   4   5

High ☐ ☐ ☐ ☐ ☐ Highly Agree

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