Modern Code Reviews in Open-Source Projects: Which Problems Do They Fix?

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Elmar Juergens,
CQSE GmbH
Modern Code Review Workflow
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Self-motivated + Review-triggered Change

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No Change
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No Change
Does it matter?
>1,400 changes
>245 tasks

single change
**Motivation for Change**

1. **Review-triggered Change**
   ```java
   /** The ui thread for WatchDog registration. */
   public Runnable watchdog = new StartupUIThread();
   ```

   2. **Self-motivated + Review-triggered Change**
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   3. **Self-motivated + Review-triggered Change**
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Review-triggered Change

Self-motivated + Review-triggered Change

Single Change
Motivation for Change

78-90%
Motivation for Change

78-90%

Review-triggered Change

Self-motivated + Review-triggered Change

22-10%
Motivation for Change

Review-triggered Change

78-90%

Self-motivated + Review-triggered Change

22-10%
Motivation for No Change

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Motivation for No Change

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Motivation for No Change

7-35%
Motivation for No Change

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No Change
manual change classification
75

25

ConQAT

Gromacs

Doc
Visual
Structure
Resource
Check
Interface
Logic
Larger
Support
What Influences Code Review?
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What Influences Code Review?

> 2,800 changes
> 970 tasks
What Influences Code Review?

> 2,800 changes
> 970 tasks

Modern Code Review Workflow

number of changes in code under review

single change
What Influences Code Review?

> 2,800 changes
> 970 tasks
What Influences Code Review?

> 2,800 changes
> 970 tasks
What Influences Code Review?

- number of changed files
- code churn

Modern Code Review Workflow

- number of changes in code under review

> 2,800 changes
> 970 tasks
What Influences Code Review?

> 2,800 changes
> 970 tasks
What Influences Code Review?

- number of changed files
- code churn
- task type
- package
- reviewer

Modern Code Review Workflow

> 2,800 changes
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What Influences Code Review?

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Does it matter?

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Does it matter?

<table>
<thead>
<tr>
<th></th>
<th>evolvability changes</th>
<th>functional changes</th>
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</thead>
<tbody>
<tr>
<td>ComQAT</td>
<td>78%</td>
<td>22%</td>
</tr>
<tr>
<td>GROMACS</td>
<td>69%</td>
<td>31%</td>
</tr>
<tr>
<td>industrial reviews</td>
<td>77%</td>
<td>23%</td>
</tr>
<tr>
<td>student reviews</td>
<td>85%</td>
<td>15%</td>
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</tbody>
</table>

In line with prior findings 75:25

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Does it matter?

In line with prior findings: 75:25

What Influences Code Review?

number of changed files
package
author
task type
code churn
number of changes in code under review

> 2,800 changes
> 970 tasks

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