

Welcome, this is the report we created for your project.

We analysed the reviews that have been merged in the last year, focusing on which changes were applied to the code under review.

We found out that you successfully merged **61** reviews!

(please, note that we restricted the scope of our tool only to the Java files in your project)

ID: 17

Text / Instructions

Code changes happening during code review in your project

How does your code change thanks to the work your team puts during the reviews? The code changes that happen during the review process are, substantially, one of the main outcomes of the code review process. We call them *review changes*. How do these review changes look like in your project?

We could classify the review changes that happened during your code review process in two main categories:

- 1. **Functional** changes
- 2. **Evolvability** changes

1. Functional changes impact how the program functions. A reviewer may require a functional change to the code, for instance, to check how the variables or resources are used, as well as to improve an algorithm.

Here an example from your project:

```
112 public final H createStorageHookAndValidateFactoryClass(Generation generation) {
113     H result = createStorageHook(generation);
114     Class<?> factoryClass = getClass();
```

```
119 public final H createStorageHookAndValidateFactoryClass(Generation generation) {
120     H result = createStorageHook(generation);
121     if (result == null) {
122         return result;
123     }
124     Class<?> factoryClass = getClass();
```

[Link to review](#)

2. Evolvability changes do not directly impact the functionality of a program, but make the software more maintainable and easier to evolve.

Examples of evolvability changes are reorganising the code, removing dead lines, and adding a comment.

ID: 19

Text / Instructions

Most of the changes that happen during the reviews in your projects are evolvability changes. For this reason, we further divided the **Evolvability** changes in **3 groups**:

2.1 Documentation: Changes that tackle any issue in the documentation of the code. They include changes to comments and names in the program.

An example from your project:

```
22 /**
23  * Some kind of operation that is performed for each element of a collection. I.e.
24  * <code>x.<operation>(y | <expressions>);</code>
25  */
```

```
22 /**
23  * Some kind of operation that is performed for each element of a collection. I.e.
24  * <code>x.<operation>(y | <expressions>);</code>
25  */
```

[Link to review](#)

2.2 Visual Representation: Changes that modify the layout of the code. In other words, any formatting that does not impact the compilation result.

An example from your project:

```
87 *      ProvUI.getProvisioningEventBus(getProvisioningUI().getSession()).addListener(listener);
88 *      installedIUViewer.getControl().addDisposeListener(
89 *          e -> ProvUI.getProvisioningEventBus(getProvisioningUI().getSession()).remove(
90 *              return installedIUViewer;
91 *      )
```

```
82 *      ProvUI.getProvisioningEventBus(getProvisioningUI().getSession()).addListener(listener);
83 *      installedIUViewer.getControl().addDisposeListener(e -> ProvUI.getProvisioningEventBus(get#
84 *      return installedIUViewer;
85 *      )
```

[Link to review](#)

2.3 Structure: Changes to the organisation of the code itself or how a particular solution is implemented (without having an effect on the functionality of the code).

```
285 *      for (int i = 0; i < checked.length; i++) {
286 *          if (!v.getGrayed(checked[i]) && contentProvider.getChildren(checked[i]).length == 0)
287 *              if (!checkState.contains(checked[i])) {
288 *                  checkState.add(checked[i]);
289 *              }
290 *          }
291 *      }
```

```
285 *      for (Object element : checked) {
286 *          if (!v.getGrayed(element) && contentProvider.getChildren(element).length == 0) {
287 *              if (!checkState.contains(element)) {
288 *                  checkState.add(element);
289 *              }
290 *          }
291 *      }
```

[Link to review](#)

Visualising Review Changes Stats

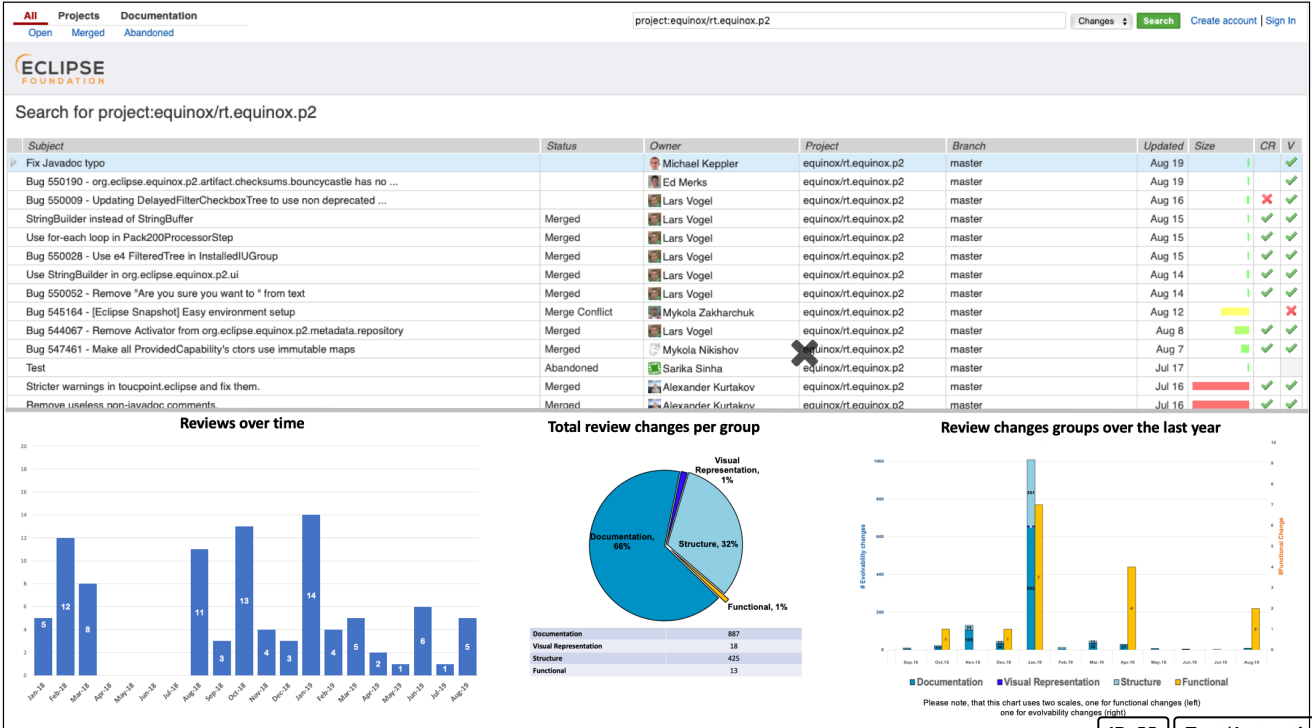
This is a mock-up of our tool interface. Please take into account the space limitation; the following figure is meant to just give a general overview of the data. Our tool interface adds three new visualization on the bottom of the page.

The single graphs will be shown again with more details later in the report.

The graph in the bottom left shows the number of reviews merged per month.

The graph in the middle shows the amount of review changes according to the types we have presented before: Documentation (2.1), Visual representation (2.2), Structure (2.3) and Functional (1).

The graph in the bottom right shows the distribution of the review changes over the last year.



1. After you have looked at this interface for your project, it would be great if you could let us know what you think about it:

| Space Cell | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | No Answer |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The information is clear and easy to understand | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| This summary is useful for my project and contains relevant information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| This information can be useful for a developer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| This information can be useful for a project manager | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| This information reflects my expectations of the code review process of the project | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

ID: 22

Radio Button Grid

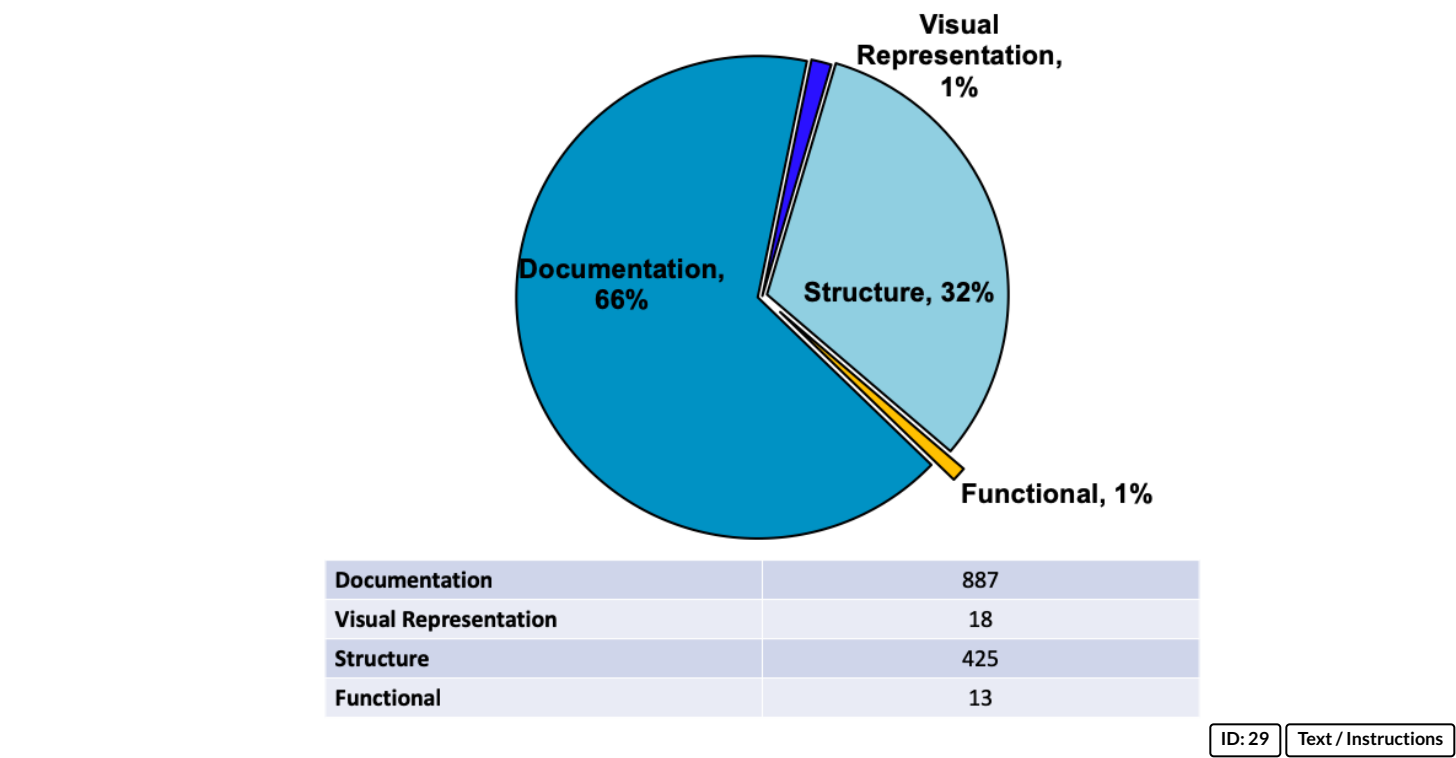
2. Feel free to add any further comments about your answers above or the information:

ID: 70 Essay / Long Answer

Details - Chart 1

This graph shows the amount of changes per group happened in your code review process from August 2019 to September 2018.





3. After you have looked at this visualization, it would be great if you could let us know what you think about it:

Space Cell

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

No Answer

The graph is clear and easy to understand

The graph is clear and easy to understand: Strongly Disagree

The graph is clear and easy to understand: Disagree

The graph is clear and easy to understand: Neutral

The graph is clear and easy to understand: Agree

The graph is clear and easy to understand: Strongly Agree

The graph is clear and easy to understand: No Answer

This summary is useful for my project and contains relevant information

This summary is useful for my project and contains relevant information: Strongly Disagree

This summary is useful for my project and contains relevant information: Disagree

This summary is useful for my project and contains relevant information: Neutral

This summary is useful for my project and contains relevant information: Agree

This summary is useful for my project and contains relevant information: Strongly Agree

This summary is useful for my project and contains relevant information: No Answer

This information cab be useful for a developer

This information cab be useful for a developer: Strongly Disagree

This information cab be useful for a developer: Disagree

This information cab be useful for a developer: Neutral

This information cab be useful for a developer: Agree

This information cab be useful for a developer: Strongly Agree

This information cab be useful for a developer: No Answer

This information can be useful for a project manager

This information can be useful for a project manager: Strongly Disagree

This information can be useful for a project manager: Disagree

This information can be useful for a project manager: Neutral

This information can be useful for a project manager: Agree

This information can be useful for a project manager: Strongly Agree

This information can be useful for a project manager: No Answer

This information reflects my expectations of the code review process of the project

This information reflects my expectations of the code review process of the project: Strongly Disagree

This information reflects my expectations of the code review process of the project: Disagree

This information reflects my expectations of the code review process of the project: Neutral

This information reflects my expectations of the code review process of the project: Agree

This information reflects my expectations of the code review process of the project: Strongly Agree

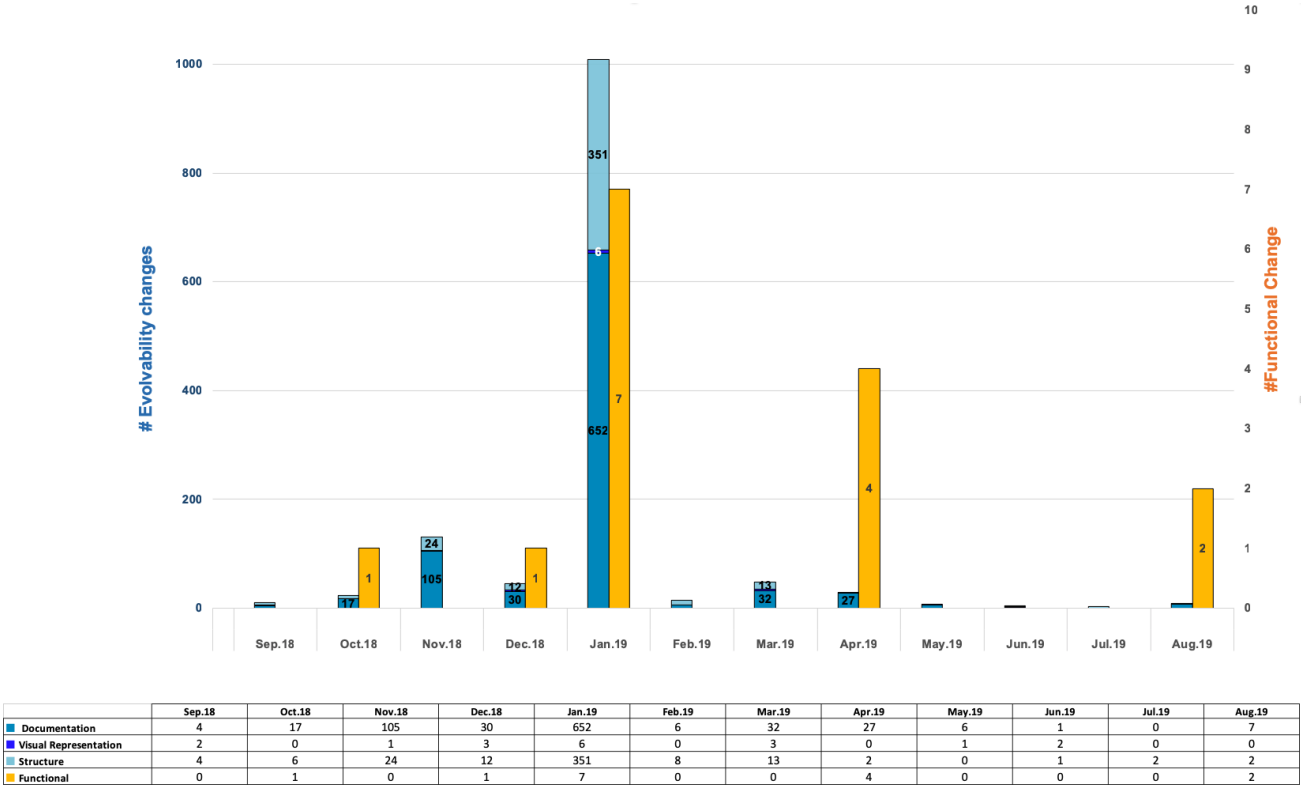
This information reflects my expectations of the code review process of the project: No Answer

ID: 37Radio Button Grid

4. Feel free to add any further comments about your answers above or the visualization:

This visualisation shows the amount of code review changes per group during last year.

Please take note that this chart uses two scales: one for functional changes (right), one for evolvability changes (left).



ID: 36

Text / Instructions

5. After you have looked at this visualization for your project, it would be great if you could let us know what you think about it:

Space Cell

The graph is clear and easy to understand

This summary is useful for my project and contains relevant information

This information can be useful for a developer

This information can be useful for a project manager

This information reflects my idea of the temporary distribution of the changes in our review

| | | | | | |
|--|---|--|--|---|--|
| <div>Strongly Disagree</div> <div><input type="radio"/></div> | <div>Disagree</div> <div><input type="radio"/></div> | <div>Neutral</div> <div><input type="radio"/></div> | <div>Agree</div> <div><input type="radio"/></div> | <div>Strongly Agree</div> <div><input type="radio"/></div> | <div>No Answer</div> <div><input type="radio"/></div> |
| <div>The graph is clear and easy to understand: Strongly Disagree</div> | <div>The graph is clear and easy to understand: Disagree</div> | <div>The graph is clear and easy to understand: Neutral</div> | <div>The graph is clear and easy to understand: Agree</div> | <div>The graph is clear and easy to understand: Strongly Agree</div> | <div>The graph is clear and easy to understand: No Answer</div> |
| <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> |
| <div>This summary is useful for my project and contains relevant information: Strongly Disagree</div> | <div>This summary is useful for my project and contains relevant information: Disagree</div> | <div>This summary is useful for my project and contains relevant information: Neutral</div> | <div>This summary is useful for my project and contains relevant information: Agree</div> | <div>This summary is useful for my project and contains relevant information: Strongly Agree</div> | <div>This summary is useful for my project and contains relevant information: No Answer</div> |
| <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> |
| <div>This information can be useful for a developer: Strongly Disagree</div> | <div>This information can be useful for a developer: Disagree</div> | <div>This information can be useful for a developer: Neutral</div> | <div>This information can be useful for a developer: Agree</div> | <div>This information can be useful for a developer: Strongly Agree</div> | <div>This information can be useful for a developer: No Answer</div> |
| <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input checked="" type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> |
| <div>This information can be useful for a project manager: Strongly Disagree</div> | <div>This information can be useful for a project manager: Disagree</div> | <div>This information can be useful for a project manager: Neutral</div> | <div>This information can be useful for a project manager: Agree</div> | <div>This information can be useful for a project manager: Strongly Agree</div> | <div>This information can be useful for a project manager: No Answer</div> |
| <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> | <div><input type="radio"/></div> |
| <div>This information reflects my idea of the temporary distribution of the changes in our review: Strongly Disagree</div> | <div>This information reflects my idea of the temporary distribution of the changes in our review: Disagree</div> | <div>This information reflects my idea of the temporary distribution of the changes in our review: Neutral</div> | <div>This information reflects my idea of the temporary distribution of the changes in our review: Agree</div> | <div>This information reflects my idea of the temporary distribution of the changes in our review: Strongly Agree</div> | <div>This information reflects my idea of the temporary distribution of the changes in our review: No Answer</div> |

ID: 30

Radio Button Grid

6. Feel free to add any further comments about your answers above or the visualization:

ID: 72Essay / Long Answer

Considering all the information seen so far, it would be great if you could give us some feedback by answering the next few questions:

ID: 50Text / Instructions

7. The whole report is useful for my project and contains relevant information.

Strongly DisagreeDisagreeNeutralAgreeStrongly AgreeNo Answer
☐Strongly Disagree☐Disagree☐Neutral☐Agree☐Strongly Agree☐No Answer

ID: 3Rating (Likert Scale)

This question has display logic

View Conditions ▼

8. Please specify:

ID: 73Essay / Long Answer

9. I have learned something about my project that I have not been aware of before.

Strongly DisagreeDisagreeNeutralAgreeStrongly AgreeNo Answer
☐Strongly Disagree☐Disagree☐Neutral☐Agree☐Strongly Agree☐No Answer

ID: 6Rating (Likert Scale)

This question has display logic

View Conditions ▼

10. Please specify:

ID: 74Essay / Long Answer

11. The results made me curious. I plan to investigate further the code review process of my project.

Strongly DisagreeDisagreeNeutralAgreeStrongly AgreeNo Answer
☐Strongly Disagree☐Disagree☐Neutral☐Agree☐Strongly Agree☐No Answer

ID: 7Rating (Likert Scale)

12. This report provides information that is not available in any other tool I know.

Strongly DisagreeDisagreeNeutralAgreeStrongly AgreeNo Answer
☐Strongly Disagree☐Disagree☐Neutral☐Agree☐Strongly Agree☐No Answer

ID: 15Rating (Likert Scale)

13. Having this kind of information at ready would have a positive influence over the Code Review process of my team.

Strongly DisagreeDisagreeNeutralAgreeStrongly AgreeNo Answer
☐Strongly Disagree☐Disagree☐Neutral☐Agree☐Strongly Agree☐No Answer

ID: 16Rating (Likert Scale)

14. Based on the information you have seen in this report, I would change something in the code review practices of my project:

| | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Space Cell | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | No Answer |
| Code review policies (e.g., mandatory review after each commit) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Use of tools (e.g., static analysis tools like Check style or FINDBUGS) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Reviewers assignment (e.g., by finding specific reviewers for specific defects) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | | | | | | ID: 57 |
| | | | | | | Radio Button Grid |

This question has display logic

View Conditions ▼

15. Please, give us further details on this:

ID: 64

Essay / Long Answer

16. I think that the information of this report might help with ...

| | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Space Cell | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | No Answer |
| To understand how resources are spent on our project | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| To avoid performing the same mistakes again | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | | | | | | ID: 66 |
| | | | | | | Radio Button Grid |

This question has display logic

View Conditions ▼

17. Please, give us further details on this (optional):

ID: 75

Essay / Long Answer

18. If you want, please give further feedback on our report. (Optional)

ID: 8

Essay / Long Answer

Background

To improve the scientific validity of your feedback, It would be great if you could answer to the following demographic questions too.

ID: 53 | Text / Instructions

19. What is your involvement with the development of the project analyzed in this report?

- ☐ I am a core developer
- ☐ I have committing/merging rights
- ☐ I am an external contributor (no merge rights)
- ☐ I am an active user (e.g., I open issue reports, but do not develop any code in it)
- ☐ I am an external user (I am not involved in the development at all)
- ☐ Other - Write In Please enter an 'other' value for this selection.

ID: 81

Radio Buttons

20. What is your current job?

- ☐ Professional Developer
- ☐ Academic Researcher
- ☐ Industrial Researcher
- ☐ Project Manager
- ☐ Spare-time Developer
- ☐ Student
- ☐ Other - Write In Please enter an 'other' value for this selection.

ID: 11

Radio Buttons

21. How many years have you developed software in a professional setting?

I have no experience in software development in a professional setting

☐

I have no experience in software development in a professional setting

1 year or less

☐

2 years

☐

3-5 years

☐

6-10 years

☐

11 years or more

☐

ID: 13

Radio Buttons

22. How often do you currently program software?

Not at all

About once a year

About once a month

About once a week

Daily or more often

☐ Not at all

☐ About once a year

☐ About once a month

☐ About once a week

☐ Daily or more often

ID: 14

Rating (Likert Scale)

23. How many years have you performed code reviews?

I have never done code review

1 year or less

2 years

3-5 years

6-10 years

11 years or more

☐ I have never done code review

☐ 1 year or less

☐ 2 years

☐ 3-5 years

☐ 6-10 years

☐ 11 years or more

ID: 51

Radio Buttons

24. How often do you currently perform code reviews?

Not at all

About once a year

About once a month

About once a week

Daily or more often

☐ Not at all

☐ About once a year

☐ About once a month

☐ About once a week

☐ Daily or more often

ID: 52

Rating (Likert Scale)

In addition to analyzing your data in an anonymous form, can we also share your answers (in an anonymous form) in a publicly available dataset? ***This question is required.**

(Selecting "yes" allows other researchers and the public to benefit from your answers and effort)

-- Please Select -- 

25. If you have any comments on the report or on the topic, please add them here.

ID: 79

Essay / Long Answer

Thank you very much for reading our report. We hope it gave you useful insights!
Also, we thank you for the time you spent giving us feedback.

You are awesome!

If you are interested in the detailed data that we used to create this report, don't
hesitate to contact us at: fregnan@ifi.uzh.ch

ID: 1

Text / Instructions