Participant P1

Formative Evaluation Round - II
Code Quality Documents

Thank you for participating in our formative evaluation of the Code Quality Documents. Our documents are interactive reports that combine automatically generated text and visualizations to express the code quality of a given project.

This study consists of two parts and would take approximately 30 minutes. Our system is available as a Web application.

Part-I: [25 min] Feedback

No.	Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	The presented information is useful?	☐	☐	☐	☐	☒
2.	The document is self-contained and self-explanatory?	☐	☐	☐	☐	☒
3.	The generated text is very interesting to read?	☐	☐	☒	☐	☐
4.	The generated text and visualizations are well connected?	☐	☐	☐	☐	☒
5.	The visualizations (parallel coordinates and scatter plot) are most suitable for the intended purpose?	☐	☐	☐	☒	☐

Please justify your ratings and answer the following questions. Feel free to write as much as you like.

1. What information do you find most useful?

Highlighting of worst classes.

2. What information do you not find useful?

Click or tap here to enter text.

3. What other information would you like to see in the document?

Click or tap here to enter text.

4. Do you think that the document is self-contained and self-explanatory?

Yes. Even the metrics are explained.

5. What are the most important interactions?
Hovering and clicking on names and icons. I specially like that the plots update when hovering over the text elements.
6. What other interactions would like to see?

Brushing in the scatter plot by selection rectangle.
7. Do the word-sized graphics better connect text and visualizations?

Yes. It is good to see a relative value. That puts the absolute ones into perspective, even for people who don't know the code.

8. Do you find visualizations (Parallel coordinates and scatterplot) appropriate for the intended purpose?

Yes. They are general (not specialized for only this task) and are, therefore, well known. There was no need for special training/learning.

9. Are the text and corresponding visualizations interactively linked in an intuitive way?

Yes.

10. Do you think that the existing vis–text interactions or linking serve the purpose?

Yes.

Part-II: [5 min] Interview

1. How do you compare our system with dashboard tools? Write N/A if you have never used a dashboard tool for source code analysis.

N/A

2. Do you think that the system is improved in comparison to the previous version? How?

Interactivity has improved. The elements seem better connected. I preferred the longer text version from before. Now it feels more like a concatenation of single sentence facts and less like a regular text.

3. Do you think that our system can be used for educational purposes?

Yes. I think it's always good to get feedback on code. Especially for students. I could imagine a scenario where the software project does not only have to work but also meet quality requirements. With this tool they get feedback before submitting their work and they also receive guidance about the specific classes that they should change.

I could also imagine using this tool for the evaluation of students (from an instructor's perspective).

To be more helpful for learning purposes, I guess it would be better to not only have high-level explanations of the metrics and smells, but also examples on how to (not) do it.

Participant P2

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Part-I: [25 min] Feedback

No.	Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	The presented information is useful?	☐	☐	☐	☒	☐
2.	The document is self-contained and self-explanatory?	☐	☐	☐	☒	☐
3.	The generated text is very interesting to read?	☐	☐	☐	☒	☐
4.	The generated text and visualizations are well connected?	☐	☐	☐	☒	☐
5.	The visualizations (parallel coordinates and scatter plot) are most suitable for the intended purpose?	☐	☐	☒	☐	☐

Please justify your ratings and answer the following questions. Feel free to write as much as you like.

1. What information do you find most useful?

The summary of code smell seems useful. It is concise and highlights the main issues, providing a good overview. I also found useful the histograms with the behavior of the groups of software metrics.

2. What information do you not find useful?

I almost did not use scatterplot. Also I used little the parallel coordinates.

3. What other information would you like to see in the document?

More details of the bug history connected to the rest of the presented data. I would be curious to how explore frequent issues relate to common smells.

4. Do you think that the document is self-contained and self-explanatory?

Yes

5. What are the most important interactions?
Details on demand when analyzing the overview of smells, and the coordinated views of the histograms, parallel coordinates, and linked class names.
6. What other interactions would you like to see?

Parallel coordinates and the scatterplot could be re-arranged when interacting with the groups of software metrics, so the involved metrics could be ready for analysis. Also interactions to analyze bug history would be useful.
7. Do the word-sized graphics better connect text and visualizations?

They do it very well. I would also like to see a word-sized view of the histograms, so I could have a quick view of the trend without getting too many details.

8. Do you find visualizations (Parallel coordinates and scatterplot) appropriate for the intended purpose?

I am not sure. Parallel coordinates seems to be more useful to identify correlations among many dimensions, while most of the smells involved at most two metrics. In that sense, the scatterplot seems more appropriate.

9. Are the text and corresponding visualizations interactively linked in an intuitive way?

Yes.

10. Do you think that the existing vis–text interactions or linking serve the purpose?

Yes, to some extent. However, to obtain a deeper understanding of quality issues I would expect to require a more flexible interface that allow users to define queries to the model of the system.

Part-II: [5 min] Interview

1. How do you compare our system with dashboard tools? Write N/A if you have never used a dashboard tool for source code analysis.
Much more insightful. I like the trade-off between brevity of the summary, and the deep understanding that one can get from the detail-on-demand based on the embedded visualizations.

2. Do you think that the system is improved in comparison with the previous version? How?
Sure! The layout is more compact. I can see all the information without having to scroll, which benefits the analysis when highlighting elements of the coordinated views. The interface looks clean, which facilitates to concentrate on the visualizations.

3. Do you think that our system can be used for educational purposes?
Yes.

Participant P3

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Part-I: [25 min] Feedback

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5.	The visualizations (parallel coordinates and scatter plot) are most suitable for the intended purpose?	☐	☐	☐	☒	☐

Please justify your ratings and answer the following questions. Feel free to write as much as you like.

1. What information do you find most useful?

The text calculation of software metrics was very helpful (the i icon). The subheading (line beneath Code Quality Documents) gave a hint of what the text +vis would talk about. I liked the Background segment.

2. What information do you not find useful?

Writing percentage along with the percentage bar was not very useful in my opinion. In some sentences the precise percentage along with the horizontal bar followed the text e.g., "Almost 92 percent 92.2%".

3. What other information would you like to see in the document?

A short text of 3-4 lines stating what this project is about. So something like about page to get a general understanding for a novice user.

4. Do you think that the document is self-contained and self-explanatory?

The document provides many ways to help the user in conveying the confusing or unfamiliar keywords/metrics. But, it needs some more work on explaining the three big blocks/panels in terms of what these blocks contain. Rightmost panel was easy to understand as it displayed either the background or the code of classes. Bottom panel was difficult to understand. I was confused by the computation of metrics: whether it was done at package level, or at class level. The panel showing multiple vertical bars after clicking plus button was confusing to understand: each bar represents a class? the labels written are the packages?.

5. What are the most important interactions?
Clicking interaction was helpful to understand definitions and hovering were useful to see the linking between different panels.
6. What other interactions would like to see?

Maybe, interactions to unselect the existing selections.
7. Do the word-sized graphics better connect text and visualizations?

Sparklines were useful to explore the metrics and see general distribution. Horizontal bars are not very useful in my opinion.

8. Do you find visualizations (Parallel coordinates and scatterplot) appropriate for the intended purpose?

Definitely.

9. Are the text and corresponding visualizations interactively linked in an intuitive way?

Yes, I agree.

10. Do you think that the existing vis–text interactions or linking serve the purpose?

Yes, it feels as a unified and one single document.

Part-II: [5 min] Interview

1. How do you compare our system with other dashboard tools? Write N/A if you have never used a dashboard tool for source code analysis.

No, I haven't used any dashboards. But I can see that your approach would be more self-explanatory than a dashboard

2. Do you think that the system is improved in comparison to the previous version? How?

Layout is better now without any unnecessary scrolling and everything stays in focus. Although information density is much higher but it is not overwhelming and managed in a nice interactive way.

3. Do you think that our system can be used for educational purposes?
Not as is. It would need more educational explanations. E.g., more information why certain metrics are grouped together and what are the background of those. Etc.

Participant P4 (New participant)

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4.	The generated text and visualizations are well connected?	☐	☐	☐	☐	☒
5.	The visualizations (parallel coordinates and scatter plot) are most suitable for the intended purpose?	☐	☐	☐	☒	☐

Please justify your ratings and answer the following questions. Feel free to write as much as you like.

1. What information do you find most useful?

You can easily detect classes that contain problems or should be improved.

2. What information do you not find useful?

-

3. What other information would you like to see in the document?

The actual sections in the classes (in the source code) that need refactoring.

4. Do you think that the document is self-contained and self-explanatory?

Yes, except for showing all data in the parallel coordinates plots after clicking on predefined code smells as I did not notice that this selected ranges on the axis.

5. What are the most important interactions?
Hovering (bar charts) and clicking (code smells) and inspecting results in the other views.
6. What other interactions would like to see?

Hovering in parallel coordinates plots to see to which class a line belongs and highlighting the class in the bar charts.
7. Do the word-sized graphics better connect text and visualizations?

Yes

8. Do you find visualizations (Parallel coordinates and scatterplot) appropriate for the intended purpose?

Yes

9. Are the text and corresponding visualizations interactively linked in an intuitive way?

Yes, I really liked how everything was interactively connected.

10. Do you think that the existing vis–text interactions or linking serve the purpose?

Yes

Part-II: [5 min] Interview

1. How do you compare our system with other dashboard tools? Write N/A if you have never used a dashboard tool for source code analysis.

N/A

2. Do you think that the system is improved in comparison to the previous version? How?

Not applicable because fresh participant.

3. Do you think that our system can be used for educational purposes?
Yes. Students can use the system to learn about issues in the code.