Assessing current attitudes and needs of code reviewer recommendation systems

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PARTICIPANT CONSENT FORM
Title of Study: Assessing current attitudes and needs of code reviewer recommendation systems

UofA Ethics ID: Pro00137433

Contact Information:

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You are being invited to take part in a research study. Before you take part, you are free to ask any questions about anything you do not understand.

What is this study about?
You have been invited to participate in a research study conducted by Palak Halvadia, a former graduate student who majored in computer science at the University of Lethbridge, Alberta, Canada. This study is being conducted to better understand how the currently existing `code reviewer recommendation systems/tools' have proven useful, which features are missing and what could be improved in the existing code reviewer systems to make them more accessible and useful.

Who can participate in the study?
You must be 20 years or older and experienced software developers with a minimum of 2 years or more of software development experience and/or prior experience with code reviewer recommendation systems to participate in this study.

What are the benefits of participating in this study?

Through participating in this study, participants will be able to provide information about code reviewer recommendation systems/tools features and use that will help in improving such tools.

What are the risks and benefits of participating?
There are no anticipated risks to the participants by participating in this research study.

What is expected of you?
Your participation in this research study is expected to take a maximum of 20-25 minutes to complete a survey that consists of general demographic questions and questions regarding your experience and expertise in using the code reviewer recommendation systems/tools.

What are the anticipated uses of the data collected?
The data collected from the questionnaire will be used to better understand how current code reviewer recommendation systems/tools have proven useful, which features are missing and what could be improved in these systems to make them more accessible and useful. The data will be presented as a part of the research publication.

How will your confidentiality and anonymity be protected?
All the data will be presented either in aggregated form or by a generic identifier (e.g. "Subject #17"). At no time will personally identifying information be presented in any public work. All data collected for this survey will be deleted 5 years after the completion of the research study.

How can you withdraw?
Participation in this research study is completely voluntary. You can withdraw from the study at any time by not completing the questionnaire. If after completing the questionnaire, you choose to withdraw from the study, your responses cannot be removed as there is no identifying information being asked in the survey that would allow the identification of a specific individual's responses.

Questions regarding your rights as a participant in this research may be addressed to the Research Ethics Office (REO), University of Alberta (Email: reoffice@ualberta.ca). This research project has been reviewed for ethical acceptability and approved by the University of Alberta Human Participant Research Committee.

If you wish to participate in the study, please check the "I agree" checkbox below and click "Next". Submission of your responses will be accepted as implied consent to participate. Thank you in advance for your participation.

○ I Agree (1)

End of Block: Consent Form

Start of Block: Code Completion

Related Definitions:

Code Review: Code review is a methodical assessments of code designed to identify bugs, increase code quality, and help developers learn the source code.

Recommender System: Recommender systems are systems that recommend requested information based on the the available related information pattern and various other inclusion and exclusion criteria.

Code Reviewer Recommendation Systems (CRRS): They are used to suggest code reviewers to review the code pushed by the software development project members.

Q1 How often do you use code completion to fill in keywords, variable names, or method names within a single code statement?

○ More than 75% of the time (1)

○ 50-75% of the time (2)

○ 25-50% of the time (3)

○ Less than 25% of the time (4)

○ Never (5)

Display This Question:

If Q1 = 25-50% of the time

And Q1 = Less than 25% of the time

And Q1 = Never

Q2 Why do you use this feature less than 50%?

○ Generated code is poor quality - requires too much modification (1)

○ Not part of my practice (2)

○ Not available in my IDE (3)

○ Other (Please explain) (4)

_____

Q3 How often do you use Code Structure Suggestion (i.e., recommendation of multiple lines like a loop structure) in your source code development?

○ More than 75% of the time (1)

○ 50-75% of the time (2)

○ 25%-50% of the time (3)

○ Less than 25% of the time (4)

○ Never (5)

Q4 How often do you use Code Block Suggestion (i.e., recommendation of multiple line like implementation of method or a class) in your source code development?

○ More than 75% of the time (1)

○ 50%-75% of the time (2)

○ 25%-50% of the time (3)

○ Less than 25% of the time (4)

○ Never (5)

End of Block: Code Completion

Q5 When pushing a change to the team's branch, do you select a reviewer?

○ Yes, I select who will review the commit (1)

○ No, a system selects the reviewers (2)

○ Reviewers are not selected (3)

Page Break

Q6 Which of the following practices do you and your team follow for code review: (select all that apply)

☐ Review less than 400 Lines of Code (LOC) at a time (1)

☐ Taking your time. Inspection rates should be under 500 LOC/hour (2)

☐ Set goals and capture metrics (3)

☐ Author should annotate source code before the review (4)

☐ Use formal checklists (5)

☐ Follow and establish a process for fixing errors found (6)

☐ Foster a positive code review culture (more like exchanging information and engaging in a learning process) (7)

☐ Little to no discussion of code review recommendations, just follow the recommendations (8)

Q7 Code reviews are expected to be completed within:

◯ 1-3 days (1)

◯ A week (2)

◯ Two weeks (3)

◯ Longer than 2 weeks (4)

End of Block: Code Review Practice

Start of Block: I select who will review the code

Display This Question:

If Q5 = Yes, I select who will review the commit

Q8 When selecting a reviewer for a commit, do you:

○ Select members of the team that I know has the relevant experience (1)

○ Specific individuals that are assigned to review commits (2)

○ Select my whole team (3)

Q9 Why does your team not use a recommendation system for code review?

○ Teams are too small (added complexity not needed) (1)

○ Too hard to change process (institutional inertia) (2)

○ Have not found good tool (bad fit) (3)

End of Block: I select who will review the code

Start of Block: A system selects the reviewers

Q10 What kind of CRRS does your project use?

☐   IDE plugin or an external tool (1)

☐   System with an integration of project tracking software (e.g., Trello, JIRA, etc.) (2)

☐   System with an integration of software-code editor (such as Visual Studio, Atom, etc.) (3)

☐   Presence of a pipeline in the system showing which development stage the project is in (such as test, code review, deployment, etc.) (4)

☐   Code reviewer is selected on the commit (5)

☐   Already existing CRRS such as Gerrit Code Review System, GitHub/GitLab, CodeFlow Review Tool and BitBucket (6)

☐   RevFinder - A CRRS which follows the approach of file location-based code-reviewer recommendation (7)

☐   CoRReCT - A CRRS based on cross-project and technology experience of a code reviewer (8)

☐   TIE - A CRRS that recommends reviewers based on text mining and file location-based approach (9)

☐   Other (11)

Q11 If it does not fit with any of the above described systems, please describe your project's code reviewer recommendation system.

_____

End of Block: A system selects the reviewers

Q12 Please rate the code reviewer recommender capabilities of the tools/IDEs you use according to the following dimensions: (On a Likert scale of Low, Medium, High and Not sure)

	Low (1)	Medium (2)	High (3)	Not Sure (4)
Coverage of the recommendation: How different are the coding scenarios for which the CRRS is able to provide code reviewers' recommendation. (1)	○	○	○	○
Precision of the recommendation: How likely is it that the code reviewer recommended is correct/pretty accurate (2)	○	○	○	○
Ease of use of the recommendation system: How friendly the user interface is (3)	○	○	○	○

Q13 Concerning the previously mentioned three dimensions, what improvements would you like to see in each of those dimensions?

☐ Coverage of the recommendation: How different are the coding scenarios for which the CRRS is able to provide code reviewers' recommendation (1)
_____

☐ Precision of the recommendation: How likely is it that the code reviewer recommended is correct/pretty accurate (2)
_____

☐ Ease of use of the recommendation system: How friendly the user interface is (3) _____

☐ Other (4) _____

Q14 If you do not use a CRRS, which of the following features do you think are important?

☐ Code reviewer's expertise in a specific programming language (1)

☐ Code reviewer's expertise in a domain (such as software engineering, artificial intelligence, machine learning etc) (2)

☐ Role of the code reviewers being recommended (3)

☐ CRRS with a dashboard that shows all the statistical data of all actions performed (such as the number of commits, number of code reviews done by a code reviewer, code reviewer's expertise in different programming languages, etc.,) (4)

☐ Option of having more number of tiny code reviews done or one long code review (5)

☐ Option of having code review done before or after merge conflict (6)

☐ User interface with an option to select a specific 'branch/file' in a project to maintain a systematic workflow and an organized code review procedure (7)

End of Block: Code Reviewer Recommendation Improvements

Start of Block: Demographic Survey

Q15 What is your highest level of education?

○ High School (1)

○ Bachelor's Degree (2)

○ Master's Degree (3)

○ Ph.D. or higher (4)

○ Trade School (5)

○ Prefer not to say (6)

○ Other (7) _____

Q16 What is your most recent functional role you have held?

○ Developer/Programmer/Software Engineer (1)

○ Team Lead (2)

○ DevOps Engineer/Infrastructure Developer (3)

○ Architect (4)

○ Frontend Developer/UI/UX Developer (5)

○ Technical Support (6)

○ Other (7) _____

Q17 What is your age group?

○ 20-29 (1)

○ 30-39 (2)

○ 40-49 (3)

○ 50-59 (4)

○ Above 60 (5)

○ Prefer not to say (6)

Q18 With what gender do you identify?

○ Male (1)

○ Female (2)

○ Non-binary (3)

○ Prefer not to say (4)

○ Other (5) _____

Q19 What is your organization size?

○ Less than 20 employees (1)

○ Between 21-50 employees (2)

○ Between 50-100 employees (3)

○ Between 101-150 employees (4)

○ Between 151-250 employees (5)

○ More than 250 employees (6)

 For any queries/information related to this survey/research you can reach out to us at palak.halvadia@alumni.uleth.ca or john.anvik@uleth.ca.