**Code Review in Practice**

Start of Block: Nature of Code Review in Practice

**Code Review in Practice Survey**  Below is the Participant Information Sheet (PIS) for this survey. The University of Auckland takes its obligations to ensure research conducted by members of the University conforms to the highest ethical standards very seriously. This includes providing information to research participants about the goals and nature of the research, which is the purpose of the PIS. If you wish to participate, please read the PIS and indicate you have done so at the bottom of this page. The survey will begin on the next page.

**PARTICIPANT INFORMATION SHEET**

**Project Title:** Understanding Code Review in Practice

**Name of researchers:** Assoc. Prof. Ewan Tempero, Dr. Kelly Blincoe, Mrs. Sanuri Gunawardena

**Researcher Introduction**

Dr Ewan Tempero is an Associate Professor in the Department of Computer Science at the University of Auckland. Dr Kelly Blincoe is a Lecturer of Software Engineering in the Department of Electrical and Computer Engineering at the University of Auckland. Mrs Sanuri D. Gunawardena is a student in the Department of Computer Science at the University of Auckland, working towards her PhD in Computer Science.

**Project description**

Code review is an important part of modern, quality-driven software development. However, the assistance available for the code review activity does not seem to have evolved at the same pace as the assistance for other software development activities. The aim of our project is to identify the gap between the expectations of stakeholders of the code review process and the support that is currently available. We hope to provide a suitable solution to bridge this gap. As a first step, we seek to understand the current state of code review assistance from code review stakeholders' perspective and their attitude towards performing code review using existing assistance.

**What we are asking**

If you have either performed code review or/and managed a code review team at some point in your software-related career, either in industry or OSS, we would like you to answer a short, anonymous, web-based questionnaire about your experience reviewing code, managing a code review team or being involved in a code review process. This questionnaire will form the basis for developing an improved form of assistance for the code reviewers in future. We expect the questionnaire to take less than 15 minutes to complete.

**Storage, use and reporting of data**

The questionnaire data is completely anonymous. Submitting the questionnaire will be taken as consent to use the data for research. The data will be analyzed and the analysis of the data may be presented or published in academic venues such as journals and conferences. The data will be stored on a secure server at the University of Auckland indefinitely. If the data is no longer useful after six years, then it will be destroyed by deleting the digital files.

**Participation and right to withdraw**

Participation in this research is entirely voluntary. If you do not wish to participate, you do not have to give a reason for this. If you choose to participate, you can withdraw at any time during the questionnaire by not submitting your responses without giving a reason. After the questionnaire, you will not be able to withdraw your data since the questionnaire is anonymous. **Anonymity and Confidentiality** The preservation of confidentiality is paramount. The information you provide may be published in a PhD thesis and an academic conference and/or journal. This publication(s) will not identify you as its source. This questionnaire is anonymous and no IP addresses or other identifying information will be gathered. **Results**

If you would like a summary of the results, then there will be an opportunity to add your email address after the survey is complete. If you do this, the email will not be linked to your data in any way. Also, your contact details will not be given to any third-parties. You will be sent a summary of the results within 2 months after survey closes.

**Contact Details**

If you have any questions about the project, please contact the researchers.

Assoc. Prof. Ewan Tempero <e.tempero@auckland.ac.nz> +64 9 923 923 3765

Dr. Kelly Blincoe <k.blincoe@auckland.ac.nz> +64 9 923 4715

Mrs. Sanuri Gunawardena <sgun571@aucklanduni.ac.nz> +64 22 589 3270 For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 x 83711. Email: ro-ethics@auckland.ac.nz APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12 November 2018 for three years, Reference Number 022079.

I am 18 years of age or older and I agree to participate in this survey.

o Yes

o No

Skip To: End of Survey If I am 18 years of age or older and I agree to participate in this survey. = No

End of Block: Nature of Code Review in Practice

Start of Block: Code Review Experience

**Do you have any experience in code review?**

**(EXPERIENCE here refers to performing code review or/and managing a team that performs code review)**

o Yes, I have reviewed code

o Yes, I have managed a team that performs code review

o Yes, I have reviewed code and managed a team that performs code review

o No, I have no experience in code review

Skip To: End of Survey If Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = No, I have no experience in code review

**What are the things you look for while performing code review? (Please select all that apply).** [1]

▢ Logical defects in code

▢ Whether the code is indented properly

▢ Whether the coding conventions are followed

▢ Whether the variable, constant, method, etc. naming is meaningful

▢ Whether the company's or project's design practices are followed

▢ Whether the code comments are clear, meaningful and w [1]ell-placed

▢ If there is a better way of implementing the same functionality/a better design

▢ Whether the functionality specified in requirements is completely covered by the implemented code

▢ Whether the code is free of security vulnerabilities

▢ Whether the test cases are defect free

▢ Whether the test cases cover all program paths of the code

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**When do you usually perform code review? (Please select all that apply).**

▢ In parallel to developing code

▢ Once the development is completed, before performing unit tests

▢ After the unit tests are completed, before committing the changes

▢ After committing the changes

▢ Just before releasing the code to the customer

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Display This Question:

If Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code

Or Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code and managed a team that performs code review

Which activity do you enjoy the most?

o Developing code only

o Mostly developing code, but sometimes reviewing code as well

o Developing and reviewing code equally

o Mostly reviewing code, but sometimes developing code as well

o Reviewing code only

Display This Question:

If Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have managed a team that performs code review

Or Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code and managed a team that performs code review

**Which activity does your team seem to enjoy the most?**

o Developing code only

o Mostly developing code, but sometimes reviewing code as well

o Developing and reviewing code equally

o Mostly reviewing code, but sometimes developing code as well

o Reviewing code only

Display This Question:

If Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code

Or Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code and managed a team that performs code review

**Do you like performing code review?**

o Dislike a great deal

o Dislike somewhat

o Neither like nor dislike

o Like somewhat

o Like a great deal

Display This Question:

If Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have managed a team that performs code review

Or Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code and managed a team that performs code review

**Does your team seem to like performing code review?**

o Dislike a great deal

o Dislike somewhat

o Neither like nor dislike

o Like somewhat

o Like a great deal

Display This Question:

If Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code

Or Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code and managed a team that performs code review

**Please select the statement that applies to your code review experience.** [2][3]

o Finding time to perform code review is always difficult.

o Finding time to perform code review is sometimes difficult.

o Finding time to perform code review is never difficult.

Display This Question:

If Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have managed a team that performs code review

Or Do you have any experience in code review? (EXPERIENCE here refers to performing code review or/... = Yes, I have reviewed code and managed a team that performs code review

**Please select the statement that applies to your management experience.** [2][3]

o Finding human resources to perform code review is always difficult.

o Finding human resources to perform code review is sometimes difficult.

o Finding human resources to perform code review is never difficult.

**Who is currently reviewing code in your company? (Please select all that apply).**

▢ Developers

▢ A separate, dedicated code review team

▢ Non-developers

▢ Whoever is available, developers or non-developers

▢ A management role such as a manager, a team lead or a software architect

▢ Code reviewing is not performed in my current company

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Skip To: Q14 If Who is currently reviewing code in your company? (Please select all that apply). = Code reviewing is not performed in my current company

**Are you happy about this way of reviewing code?**

o Yes

o No

Skip To: Q16 If Are you happy about this way of reviewing code? = Yes

Skip To: Q14 If Are you happy about this way of reviewing code? = No

**Who should ideally perform code review? (Please select all that apply).**

▢ Developers

▢ A separate, dedicated code review team

▢ Non-developers

▢ Whoever is available, developers or non-developers

▢ A management role such as a manager, a team lead or a software architect

▢ Code reviewing is not performed in my current company

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Why? (Please select all that apply).**

**Who should ideally perform code review? (Please select all that apply). = Developers**

▢ Because code reviewing requires programming knowledge

Who should ideally perform code review? (Please select all that apply). = Developers

▢ Because hiring separate staff for reviewing code is not productive

Who should ideally perform code review? (Please select all that apply). = Developers

▢ Because developers are the most efficient at reviewing code

Who should ideally perform code review? (Please select all that apply). = A separate, dedicated code review team

Or Who should ideally perform code review? (Please select all that apply). = Non-developers

Or Who should ideally perform code review? (Please select all that apply). = Whoever is available, developers or non-developers

Or Who should ideally perform code review? (Please select all that apply). = A management role such as a manager, a team lead or a software architect

Or Who should ideally perform code review? (Please select all that apply). = A management role such as a manager, a team lead or a software architect

▢ Because it is difficult for the developers to find time for reviewing code

Who should ideally perform code review? (Please select all that apply). = A separate, dedicated code review team

Or Who should ideally perform code review? (Please select all that apply). = Non-developers

Or Who should ideally perform code review? (Please select all that apply). = A management role such as a manager, a team lead or a software architect

▢ Because developers are mostly not interested in reviewing code

Who should ideally perform code review? (Please select all that apply). = A separate, dedicated code review team

Or Who should ideally perform code review? (Please select all that apply). = Non-developers

Or Who should ideally perform code review? (Please select all that apply). = A management role such as a manager, a team lead or a software architect

▢ Because context switching for developers is difficult and time-wasting

Who should ideally perform code review? (Please select all that apply). = A separate, dedicated code review team

Or Who should ideally perform code review? (Please select all that apply). = Non-developers

Or Who should ideally perform code review? (Please select all that apply). = A management role such as a manager, a team lead or a software architect

▢ Because letting developers concentrate on only development tasks produce better results

Who should ideally perform code review? (Please select all that apply). = A separate, dedicated code review team

Or Who should ideally perform code review? (Please select all that apply). = A management role such as a manager, a team lead or a software architect

▢ Because code reviewing is an important task and should be given its due importance

Who should ideally perform code review? (Please select all that apply). = Developers

Or Who should ideally perform code review? (Please select all that apply). = Whoever is available, developers or non-developers

▢ Because dedicating a set of people for code review is impractical in the highly dynamic software industry

Who should ideally perform code review? (Please select all that apply). = A management role such as a manager, a team lead or a software architect

▢ Because management roles tend to have more experience and knowledge on the process

Who should ideally perform code review? (Please select all that apply). = Code reviewing is not performed in my current company

▢ Because code review is not applicable to my current company

Who should ideally perform code review? (Please select all that apply). = Code reviewing is not performed in my current company

▢ Because my current company had already tried code review and it had not produce any desirable results

Who should ideally perform code review? (Please select all that apply). = Code reviewing is not performed in my current company

▢ Because my current company does not have enough resources to perform code review

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**Are you/your team currently using any tool(s) for reviewing code?**

o Yes

o No

Skip To: Q17 If Are you/your team currently using any tool(s) for reviewing code? = Yes

Skip To: Q26 If Are you/your team currently using any tool(s) for reviewing code? = No

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**What type of tool is it? (If you are using more that one tool, please select all the relevant options.)**

▢ A text editor

▢ A general-purpose IDE

▢ An in-house tool built specifically to support code reviewing activities

▢ An in-house, general-purpose tool which has been tweaked to support code review or contains features that can be used to support code reviewing activities

▢ An external tool built specifically for code reviewing

▢ An external, general-purpose tool which contains features that can be used to support code reviewing activities

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**What is the name of the tool? (If you are using more than one tool, please list all of them.)**

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Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

Carry Forward Selected Choices - Entered Text from "What are the things you look for while performing code review? (Please select all that apply)."

|  |
| --- |
|  |

**Out of the following things you look for while performing code review, what are the types of errors that your tool(s) helps you to check? (Please select all that apply).**

▢ Logical defects in code

▢ Whether the code is indented properly

▢ Whether the coding conventions are followed

▢ Whether the variable, constant, method, etc. naming is meaningful

▢ Whether the company's or project's design practices are followed

▢ Whether the code comments are clear, meaningful and well-placed

▢ If there is a better way of implementing the same functionality/a better design

▢ Whether the functionality specified in requirements is completely covered by the implemented code

▢ Whether the code is free of security vulnerabilities

▢ Whether the test cases are defect free

▢ Whether the test cases cover all program paths of the code

▢ Other (Please specify)

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**How satisfied are you with the usability of your tool(s)?**

**(USABILITY here refers to the ease of learning and use)**

o Extremely dissatisfied

o Somewhat dissatisfied

o Neither satisfied nor dissatisfied

o Somewhat satisfied

o Extremely satisfied

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**Which of these explain your satisfaction level? (Please select all that apply).** [4][5][6][7][8][9][10][11][12]

▢ Too many tool features

▢ Inadequate tool features

▢ Most of the tool features are not useful

▢ Tool results need to be processed manually further, in order to make them useful

▢ The interface is too complex

▢ Time-consuming to use

▢ Tool usage instructions are not clear

▢ Tool usage instructions are hard to access

▢ The interface is simple and easy to learn and use

▢ Features are very useful

▢ Tool usage instructions are clear

▢ Tool usage instructions are easily accessible

▢ Tool results are readily useful

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**Which is the most effective way to review code?**

o Manually reading through the piece of code using a text editor or a common IDE

o Reviewing the code using the tool(s) that I am currently using

o I would like to use a better tool than what I am using now

Skip To: Q23 If Which is the most effective way to review code? = Manually reading through the piece of code using a text editor or a common IDE

Skip To: Q24 If Which is the most effective way to review code? = Reviewing the code using the tool(s) that I am currently using

Skip To: Q23 If Which is the most effective way to review code? = I would like to use a better tool than what I am using now

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**Please comment on your response (Optional).**

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Skip To: Q25 If Please comment on your response (Optional). Is Displayed

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**What are the features of your tool(s) that could help you in this instance? (Please select all that apply).** [13][14][15][16]

▢ Code visualization

▢ Automatic bug detection that does not require understanding of code

▢ Automatic program slicing

▢ Automatic code to functionality mapping

▢ Ability of the tool to perform all operations internally and produce a report which can be directly used for decision making

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Display This Question:

If Who is currently reviewing code in your company? (Please select all that apply). != Code reviewing is not performed in my current company

**What are the drawbacks you have experienced with your tool(s) if any?** [4][5][6][7][8][9][10][11][12]

▢ Difficult to learn

▢ Too complex to use

▢ Produces inaccurate results sometimes

▢ Provides only basic support for the understanding needs of the reviewer

▢ Too lightweight/not rigorous enough

▢ Lacks support for code review related activities like change decomposition

▢ Not able to support different types of inspection processes

▢ Lacks the ability to integrate with other tools

▢ Lacks support for effective collaboration

▢ Does not produce all the necessary information for decision making

▢ High upfront cost

▢ Not general enough/only focuses on solving a single or few of many review issues

▢ Does not make the most effective use of human resources

▢ Other (Please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**In which field(s) have you worked in? Please provide the years of experience in the text box.**

▢ Industry \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

▢ OSS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**How big is the company that you are currently working for?**

o < 50 employees

o 50 - 249 employees

o >= 250 employees

**How big is the software/IT department of the company that you are currently working for?**

o < 50 employees

o 50 - 249 employees

o >= 250 employees

**Please select the most accurate statement about your programming ability.**

o I have no programming ability.

o I have very little confidence on my programming ability.

o I am moderately confident on my programming ability.

o I am extremely confident on my programming ability.

End of Block: Code Review Experience

# References

|  |  |
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