**eFORM VERSION**

Version 4.2B 18-Jul-2015 Revised 04-Jul-2018

**PROTOCOL**

**Protocol No:** 022079

**Title:** Efficacy of the support available for a software practitioner to review an unfamiliar software code

**GENERAL**

Prior to completing your application:

- Read the Guiding Principles for conducting research with human participants.
- Go through the Applicants' Reference Manual.
- Check if an exemption applies (see Guiding Principles section 6.1 and Applicants' Reference Manual Section 3.8).
- Check if the matter needs to be referred to a Health and Disability Ethics Committee (HDEC) (see Guiding Principles section 3.1 and 6.1 and Applicants' Reference Manual Section 4.5).

For creating and submitting your application refer to the Human Ethics Module Quick Guide.

All documentation to support your application is on the UAHPEC web page.

For any queries please log a call with the Staff Service Centre at ext. 86000 or staffservice@auckland.ac.nz and it will be referred to the relevant team in the Research Office or ITS.

Please Note: Internet Explorer should not be used when working in InfoEd as many functions are not compatible with this browser. We recommend using the following browsers: Google Chrome, Mozilla Firefox, or Safari (for Mac).

**SECTION A: PERSONNEL**

***Is this a student project to be completed as part of an honours, masters, or doctoral qualification?**

Yes ☑ No ☐

***Please add the degree you are studying towards.**

Doctor of Philosophy in Computer Science

If the PI listed below is not your supervisor, please use the 'Change Project Information' button on the protocol screen to change the PI to your supervisor before continuing with the rest of the form. You should also change the department to your PI's department. Instructions on how to do this can be found here.

**PI:** Tempero, Ewan D*

☑ ***I confirm that the PI listed above is my supervisor**

**Department:** Computer Science*

☑ ***I confirm that the department listed above is my supervisor's department**

1. List all University of Auckland personnel, including the PI, co-investigators, students and ethics advisors, by selecting their name from the UNIVERSITY PERSONNEL page and add their Role from the dropdown list. ?☐
2. If you are a University of Auckland student, you must add your own name to the UNIVERSITY PERSONNEL section to have access after

closing the form.

3. To change the Principal Investigator, tick the 'PI' checkbox to the left of the relevant person's name.

   Note: A student cannot be a PI. See Applicants' Reference Manual Section 5.0 that states: "For Doctoral, Masters and Honours research, applications should be submitted by the primary supervisor who will be the Principal Investigator (PI)".

**UNIVERSITY PERSONNEL**

(Add )

Tempero, Ewan D

| PI | N/A | N/A | *Role |
|---|---|---|---|
| ☑ | 28-Aug-2018 | | PI |

Blincoe, Kelly C

| PI | N/A | N/A | *Role |
|---|---|---|---|
| ☐ | | | Co-Inv |

Gunawardena, Sanuri D

| PI | N/A | N/A | *Role |
|---|---|---|---|
| ☐ | | | Student |

**List below any personnel that cannot be found in the lookup list above. University of Auckland students who are not in the lookup list must include a UoA ID number.**

| Full Name (and ID) | Institution / Department | Project Role | Email address | |
|---|---|---|---|---|
| | | | | |

*Is this a Research Project or Coursework Application? ?

Research

Note: Because you are a student, please select Research

*A Research Project Application is to be used for all research, including Masters and Doctoral theses and staff research projects.*

*A Coursework Application is the research exercise that contributes directly to the course content material and its objectives, and the data or information gathered from such exercises is expressly not for wider dissemination. This category includes research where students are research participants and/or researchers on others. (See Guiding Principles Section 6.5, Applicants' Reference Manual Section 3.5 and Applicants' Reference Manual Section 13.1).*

## SECTION B: RESEARCH PROCEDURES

**B:1 Title.**
Efficacy of the support available for a software practitioner to review an unfamiliar software code

***B:2 Aims/objectives of the project.** ?

Code review is one of the most effective quality management techniques existing today. Researchers are continuously trying to provide better forms of assistance for code reviewers to make code review more effective and feasible. However, by its very nature, code review is challenging to perform and with new advances in code review process as well as the software development process in general, new challenges are introduced constantly. As a result, it is essential for the researchers to understand the latest status of code review assistance and the gap between this assistance and the actual needs of the code reviewers, if they wish to come up with a more effective solution.

This project was initiated by Mrs. Sanuri D Gunawardena in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Computer Science at The University of Auckland, under the supervision of Associate Professor Ewan Tempero and the co-supervision of Dr. Kelly Blincoe. We have already completed a "Systematic Mapping Study", a form of Systematic Literature Review (SLR) to understand the gap between the code reviewers' needs and the support that is being provided by the existing assistance. Since we were able to identify a significant gap through SLR, in order to further understand this gap from code review stakeholders' perspective and to understand code reviewers' attitude towards performing code review with the assistance they are currently provided, we are expecting to conduct a survey for which we are hereby seeking the approval.

We are only interested in voluntary participants who have either performed code review or managed a code review team during their software-related career and have experience in the software industry, Open-source or both. We do not collect any sensitive data related to the participants or their organisations in the main survey. However, at the end of the survey, participants can provide their email address if they wish to receive a summary of the survey results and this information will not be linked to their data in any way.

Please note: all acronyms must be written out in full the first time they appear in the application, recruiting materials, Participant Information Sheet (PIS) and Consent Form (CF).

*Describe in plain language the purpose, hypothesis/research questions and objectives that are comprehensible and free from jargon.*

***B:3 Summary of the project.** ?

Software Inspection is an important task of modern, quality-driven software development. Being first formally introduced by Michael Fagan[1], the software inspection process has changed over time from a heavy-weight, manual process to a light-weight, tool-assisted process in order to keep up with the modern software development that requires a faster delivery of software products. However, due to its qualitative nature, code review requires a high human involvement and difficult to fully automate. As a result, assistance for code reviews such as tools, techniques, and processes have not evolved at the same pace as the assistance for other software development activities. There is enough evidence in the literature suggesting that a significant gap exists between code reviewers' needs and the support that is being provided by the existing assistance[2,3,4,5,6,7]. The goal of this survey is to further understand the gap from code review stakeholders' perspective.

In summary, we are seeking permission to invite code review stakeholders i.e. those who have either performed code review of managed a code review team, to take part in an online survey and to publish data that is collected through this survey. This data will effectively capture their voluntary participation. The responses will be aggregated and anonymized in any report.

[1] M. Fagan, "Design and Code Inspections to Reduce Errors in Program Development," in Software Pioneers, Berlin, Heidelberg: Springer Berlin Heidelberg, 2002, pp. 575-607.
[2] A. Bacchelli and C. Bird, "Expectations, outcomes, and challenges of modern code review," Proc. - Int. Conf. Softw. Eng., pp. 712-721, 2013.
[3] J. Wang, P. C. Shih, and J. M. Carroll, "Revisiting Linus's law: Benefits and challenges of open source software peer review," Int. J. Hum. Comput. Stud., vol. 77, no. C, pp. 52-65, May 2015.
[4] T. Baum, O. Liskin, K. Niklas, and K. Schneider, "Factors influencing code review processes in industry," in Proceedings of the 2016 24th ACM SIGSOFT International Symposium on Foundations of Software Engineering - FSE 2016, 2016, pp. 85-96.
[5] A. Bosu, J. C. Carver, C. Bird, J. Orbeck, and C. Chockley, "Process Aspects and Social Dynamics of Contemporary Code Review: Insights from Open Source Development and Industrial Practice at Microsoft," IEEE Trans. Softw. Eng., vol. 43, no. 1, pp. 56-75, Jan. 2017.
[6] L. MacLeod, M. Greiler, M. A. Storey, C. Bird, and J. Czerwonka, "Code Reviewing in the Trenches: Challenges and Best Practices," IEEE Softw., vol. 35, no.

4, pp. 34-42, Jul. 2018.
[7] C. Sadowski, E. Söderberg, L. Church, M. Sipko, and A. Bacchelli, "Modern code review," in Proceedings of the 40th International Conference on Software Engineering Software Engineering in Practice - ICSE-SEIP '18, 2018, pp. 181-190.

*Provide a summary to place the project in perspective and to allow the significance of the project to be assessed. Please do not cut and paste directly from the research proposal and avoid jargon or technical terms if possible.*
*If jargon or technical terms must be used, please include the definitions.*

***B:4 Project duration (in months).** ?☑

6

Note: The start date is when the proposal is approved

*The duration of the project is an estimate of how long you expect data collection will take and can be extended by an Amendment Request application.*

***B:5 Describe the study design.** ?☑

This anonymous, online survey contains a set of questions inquiring about the current state of code review assistance from participant's perspective and his or her attitude towards performing code review using the existing assistance. The participants can voluntarily complete the survey. The survey will take no more than 15 minutes to complete. The aim of the survey is to find answers to the following questions:

1. What is the current state of code review assistance from its stakeholders' perspective?
2. What is their attitude towards performing code review using the existing assistance?

The survey questions consist of 16 multiple choice-single answer questions, 10 multiple choice-multiple answer questions, 1 mandatory free-form text and optional free-form text in its longest form. Additionally, 10 of the multiple choice questions contain the "Other" option with a free-form text. We expect that the multiple-choice questions will encourage participation and the free-form texts will provide the participant the opportunity to freely express their thoughts. A copy of the survey questionnaire is attached to this application (Please see ATTACHMENT 1).

Potential participants for this survey are those who have either performed code review or managed a code review team during their software-related career and have experience in the software industry, Open-source or both. They will be invited to complete the survey, through personal networks such as email lists, LinkedIn, Twitter and Facebook and online software communities such as Stack Overflow and GitHub. Also, we are expecting to distribute the survey through snowballing. Those who are directly contacted(friends, colleagues, and acquaintances of the researchers) by the researchers will be informed that their participation is not expected, but is welcome. This survey will take no more than 15 minutes. Please see ATTACHMENT 4 for the message that will be used as the survey invitation, at all the mentioned venues. Participation in this survey is voluntary. The expected participation is at least 200 individuals.

As the survey is anonymous we have no way of knowing who has, or has not, completed the survey, so there is no issue of conflict of interest or possibility of coercion.

The raw data for the questionnaires will only be available to the researchers. However, if the participant wishes to receive a summary of the final results, the participant can acknowledge the researchers by providing his or her email address at the end of the survey (Please see ATTACHMENT 2). This information will not be linked to the participant's data in any way. We will ensure that the participants will not be able to be identified in any way in any publications resulting from this research.

*Describe what will happen during the study. Include a description of any manipulations/interventions, measures taken, the time required, and so forth.*

***B:6 List all the methods used for obtaining information.**

***Interviews** ?☑
Yes ☐ No☑

*An interview is where the researcher sits down with the participants and administers a set of questions. See Applicants' Reference Manual Section 6.7 for explanation.*
*An interview schedule is an outline of the topics to be discussed at an interview.*

***Focus groups** ?☑
Yes ☐ No☑

*See Applicants' Reference Manual Section 9.6 for research involving focus groups or small interview samples.*

***Questionnaires** Please attach the questionnaire(s) in the 'Attachment' section at the end of the form. ?☑
Yes ☑ No☐

*A questionnaire is a written or electronic list of questions to be answered by participants. See Applicants' Reference Manual Section 6.6 for explanation.*

*Observations
Yes ☐ No☑

*Other
Yes ☐ No☑

*B:7 Does the research involve processes that involve EEG, ECG, MRI, TMS, FMRI, EMG, radiation, invasive or surface recordings? ?☑
Yes ☐ No☑

- *Electroencephalography (EEG)*
- *Electrocardiograph (ECG)*
- *Magnetic resonance imaging (MRI)*
- *Transcranial magnetic stimulation (TMS)*
- *Functional magnetic resonance imaging (fMRI)*
- *Electromyography (EMG)*

*B:8 Does the research involve processes that are potentially disadvantageous to a person or group (for example, the collection of information which may expose the person/group to discrimination)?
Yes ☐ No☑

*B:9 Who will carry out the research procedures?
The student named on this form, Mrs. Sanuri D Gunawardena will conduct the survey under the supervision of Associate Professor Ewan Tempero and Dr. Kelly Blincoe. The data gathering and analysis will be handled by the student, supported by the supervisors.

If necessary, please provide more details of the role(s) of each member of the research team. If the research procedures will be carried out by a third party other than the researcher or co-investigators, please attach a copy of the confidentiality agreement to the "Attachment" section at the end of this form.

* B:10a Where will the research procedures take place? ?☑
*Please use a maximum of 100 characters (including spaces)*
Participants will complete an anonymous online questionnaire.

*Please indicate the physical location/setting where the research will be carried out.*

If permission is required to conduct the study at a specific location, please attach an appropriate PIS and Consent form, or a support letter, in the "Attachment" section at the end of the form.

*B:10b Will the researcher be travelling overseas to conduct this research?
Yes ☐ No☑

*B:11a Is the questionnaire web-based? ?☑
Yes ☑ No☐

*See Applicants' Reference Manual Sections 6.6 and 13.2 for explanation.*

*B:11b Is it an anonymous questionnaire? ?☑
Yes ☑ No☐

*Explain and indicate on the PIS how anonymity will be preserved:
This is an anonymous survey designed using the Qualtrics under The University of Auckland Qualtrics Licence. No IP addresses will be collected from the participants. No personal or organisational information that could expose the identity of the respondent or his organisation will be collected in the survey. If the participant wishes to receive a summary of the final results, there will be an opportunity to add his or her email address after the survey is complete. If the participant does this, the email address will not be linked to his or her data in any way. Participant contact details will not be given to any third-parties.

*See Applicants' Reference Manual Section 9.11.*

*B:12 How much time will participants need to give to the research? ?☑
The survey will take no more than 15 minutes.

*Include how many minutes/hours over how many weeks/months the participants will be asked to be involved in the project. Indicate this on the PIS.*

*B:13 Will information on the participants be obtained from third parties? ?☑
Yes ☐ No☑

*For organisational research, see Applicants' Reference Manual Section 13.4. for an explanation.*
*For research in schools, see Applicants' Reference Manual Section 13.11 for an explanation.*
*For research on or about professions, see Applicants' Reference Manual Sections 4.3 and 9.8 for an explanation.*

*B:14 Will any identifiable information on the participants be given to third parties? ?☑
Yes ☐ No☑

*Normally identifiable information or recorded interviews cannot be shared with third parties. If this is intended it must be clearly documented in the PIS for all concerned.*

*B:15 Does the research involve evaluation of the University of Auckland services or organisational practices where information of a personal nature may be collected and where participants may be identified?
Yes ☐ No☑

*B:16 Does the research involve a conflict of interest or the appearance of a conflict of interest for the researcher, particularly in a power relationship? Please see the help box for examples. ?☑
Yes ☐ No☑

*Examples include but are not limited to the following:*

- *Researchers recruiting their own students*
- *Healthcare providers recruiting their own patients/clients*
- *Business owners or managers recruiting their own employees*
- *Researchers recruiting their own family members or friends*
- *Researchers recruiting their own colleagues where there is a power imbalance*
- *Anyone that may be, or perceive themselves to be, dependent on the researcher*

*B:17 Does the research involve matters of commercial sensitivity?
Yes ☐ No☑

*B:18 Has the study design or the use of the data been influenced by an organisation outside the University of Auckland (excluding questionnaires developed at other research institutions)? ?☑
Yes ☐ No☑

*See Applicants' Reference Manual Section 4.4.*

*B:19 Are you intending to conduct the research in the University of Auckland class time? ?☑
Yes ☐ No☑

*See Guiding Principles Section 6.5(ii) and Applicants' Reference Manual Section 6.4.*

*B:20 Does the research involve deception of the participants, including concealment or covert observations? ?☑
Yes ☐ No☑

*See Guiding Principles Section 5.6 and Applicants' Reference Manual Section 9.14.*

*B:21 Is there any koha, compensation or reimbursement of expenses to be made to participants? ?☑
Yes ☐ No☑

*If compensation or financial inducements are offered the terms and conditions should be stated. The absolute right of participants to withdraw at any time, irrespective of whether or not inducements are involved should be made clear. See Applicants' Reference Manual Section 9.16.*

*B:22a Is this an intervention study? ?☑
Yes ☐ No☑

*An intervention study is where a researcher instigates a change in actions or processes for the purpose of studying the results. Please note that all medical and health interventions must be submitted to the Health and Disability Ethics Committee. Please also note that the term "intervention study" is often used interchangeably with the term "clinical trial" (see sections 2.4 and 2.5 of the NEAC Ethical Guidelines for Intervention Studies for the definition of intervention study and intervention). Non-health related interventions include, but are not limited to, changes to educational practices.*
*See Applicants' Reference Manual Glossary.*

*B:22b Does this research involve potentially hazardous substances? ?☑
Yes ☐ No☑

*Example of hazardous substances: radioactive materials. See Applicants' Reference Manual Section 9.19.*

## SECTION C: PARTICIPANTS

***C:1 Who are the participants in the research?** ?☑

*In general, researchers need to be sensitive to the potential conflicts of interest that arise when including their students as participants, and those who may perceive themselves as in a dependent relationship with the researcher, their family, or their friends.*

*If students in the department of the researcher (or PI) are prospective participants, there must be an explicit statement in the PIS and CF that neither grades nor academic relationships with the department or members of staff will be affected by either refusal or agreement to participate. It should be made clear that participation is voluntary.*

*To avoid conflicts of interest, or the appearance of conflicts of interests, researchers may not use their own children aged less than 16 as participants, except in exceptional circumstance that must be explained to UAHPEC. See Applicants' Reference Manual Section 9.7 for participants under 16 years of age and Applicants' Reference Manual Section 13.4 for organisational research.*

***Adults**
Yes ☑ No ☐

***Own colleagues**
Yes ☐ No ☑

***Own students**
Yes ☐ No ☑

***Persons whose capacity to give informed consent (other than children) is compromised**
Yes ☐ No ☑

***Persons who are in a dependent situation, such as people with a disability, residents of a hospital, nursing home or prison, or patients highly dependent on medical care**
Yes ☐ No ☑

***Persons aged less than 16 years old where parental consent is NOT being sought**
Yes ☐ No ☑

***Persons aged less than 16 years old where parental consent is sought**
Yes ☐ No ☑

***Other**
Yes ☐ No ☑

***C:2 How many organisations and departments within the organisations will participate in your project?**
None.

If you have letters of support, please attach these in the 'Attachment' section at the end of the form.

***C:3 How many individual participants (research participants) will participate in your project?**
The expected participation is at least 200 individuals.

***C:4 How will you identify potential participants and by which method are participants invited to take part in the research?** ?☑
Potential participants for this survey are those who have either performed code review or managed a code review team during their software-related career and have experience in the software industry, Open-source or both. They will be invited through personal networks such as email lists, LinkedIn, Twitter and Facebook and online software communities such as Stack Overflow and GitHub. Also, we are expecting to distribute the survey through snowballing. Those who are directly contacted by the researchers will be informed that their participation is not expected, but is welcome. Please see ATTACHMENT 4 for the message that will be used as the survey invitation, at all mentioned venues.

*Describe in detail how you will identify potential participants and the method by which participants are invited to take part in the research.*

*For recruitment through the following methods, see Applicants' Reference Manual Section 9.1:*
*- Private records of names and addresses*
*- Student records*
*- Family and friends.*

*For snowballing, see Applicants' Reference Manual Section 9.2.*

*For research on or about professions, see Applicants' Reference Manual Sections 4.3 and 9.8.*

*If you intend to use an advertisement, media release, notice, etc for recruiting participants, a copy in which it will be presented or displayed to prospective participants must be submitted along with the application. See Applicants' Reference Manual Section 6.2.*

Using a direct approach to recruit potential participants is not recommended.

Please attach the advertisement, media release, or notice, etc. and the letter of permission from the agency supplying them (if applicable) in the 'Attachment' section at the end of the form.

***C:5 Who will make the initial approach to potential participants?** ?☑
Researcher(s)

*For example: will the owner of the database send out letters?*

***C:6 Will access to participants be gained with consent of any organisation?** ?☑

Yes ☐ No☑

*If the research is to be conducted in any organisation, such as a business, non-governmental organisation or school, a separate PIS and consent form needs to be provided for the Chief Executive Officer, Principal or the owner of the business (i.e. the effective employer) seeking permission to access the employees as participants. See Applicants' Reference Manual Sections 13.4.*

***C:7 Is there any special relationship between participants and researchers?** ?☑

Yes ☐ No☑

*It will not be appropriate, usually, for researcher to recruit members of their own family and friends as participants. See Applicants' Reference Manual Sections 6.4, 9.1 and 9.12 for further explanation.*

***C:8 Does the research involve participants in the same organisation as the researcher, where information of a personal nature may be collected and where participants may be identified?**

Yes ☐ No☑

***C:9 Does the research involve participants who are being asked to comment on employers?**

Yes ☐ No☑

***C:10 Are there any potential participants who will be excluded?**

Yes ☐ No☑

## SECTION D: INFORMATION AND CONSENT

***D:1 By whom and how will information about the research be given to participants?** ?☑

A link to the survey will be included in the personal network invitations and online software community posts. On the first page of the survey, participants are presented with information related to what they are consenting to by choosing to participate in the survey. A statement about the purpose of the study is also present on the first page, so that participants understand the intended use of the data. Please see ATTACHMENT 1.

*For example: A copy of information to be given to prospective participants in the form of a PIS must be attached to this application, whether this is to be given verbally or in writing.*

***D:2a Will the participants have difficulty giving informed consent on their own behalf?** ?☑

Yes ☐ No☑

*Consider physical or mental condition, age, language, legal status, or other barriers.*

***D:3a If a questionnaire is used, will the participants have difficulty completing the questionnaire on their own behalf?** ?☑

Yes ☐ No☑

*Consider physical or mental condition, age, language, legal status, or other barriers.*

***D:4 Does the research involve participants giving oral consent rather than written consent?** ?☑

Yes ☐ No☑

*Ethical research requires the informed consent of participants. To be informed, consent must be based on an understanding of the objectives, procedures, and materials involved, and of the rights of participants. Normally, full details about these will be provided in a written PIS and agreed by the participant in a signed CF. See Applicants' Reference Manual Section 6.5 for information to be included in the CF.*

***D:5 Does the research use previously collected information or biological samples for which there was no explicit consent (excluding already de-identified or anonymous data)?**

Yes ☐ No☑

***D:6 Is access to the Consent Forms restricted to the Principal Investigator and/or the researcher?** ?☑

n/a

*Explain, justify and indicate in the PIS:

It is completely optional for participants to take part in the survey and so their voluntary participation will be taken as consent.

*In general, the CF can be only be accessed by the PI and the researcher.*

***D:7 Will Consent Forms be stored by the Principal Investigator, in a secure manner?** ?☑

n/a

*Explain, justify and indicate in the PIS:

It is completely optional for participants to take part in the survey and so their voluntary participation will be taken as consent.

*In general, the CF has to be stored in a locked cabinet on university premises.*

***D:8 Are Consent Forms stored separately from data and kept for six years?** ?☑

n/a

*Explain, justify and indicate in the PIS:

It is completely optional for participants to take part in the survey and so their voluntary participation will be taken as consent.

*In general, the CF has to be stored for six years, and separately from other data.*

## SECTION E: STORAGE AND USE OF RESULTS

*E:1 Will the participants be audio-recorded, video-recorded, or recorded by any other electronic means such as Digital Voice Recorders? ?☑

Yes ☐ No☑

*If recording is essential to the research, it should be indicated as such in all relevant PISs. The CF should state, 'I understand that I will be recorded'.*

*If recording is optional, this should be explained in the PIS. The CF should state "I agree / do not agree to be recorded". It should also state that, 'Even if you agree to being recorded, you may choose to have the recorder turned off at any time'. The PIS to Chief Executive Officers, Principals, and Board of Trustees should state recordings will be made only with the agreement of those recorded.*

*E:3 For the questionnaire, is any coding scheme used to identify the respondent? ?☑

Yes ☐ No☑

*Explain the coding procedure in the PIS. For example: Questionnaires are numbered 1-999 and a list is maintained to link participants with the questionnaire.*

*E:4a Explain how and how long the data (including audio-recordings, video-recordings and electronic data) will be stored. ?☑

Data collected will be stored electronically for an indefinite duration of time.
Electronic data will be backed up and stored on the University of Auckland server.

*The University of Auckland Research Code of Conduct requires that research data be kept at least 6 years, but longer and even indefinitely could be appropriate. Explain in the PIS and CF in what format the data will be stored, the period that data is to be kept and how security and privacy of data will be maintained. See Applicants' Reference Manual Sections 11 and 6.4.*

*E:4b Explain how data will be used. (For example, in a thesis/dissertation, publications, and/or conference presentations etc.) ?☑

The data may be used in the PhD thesis of the student listed on the application and in publications and presentations in academic venues such as journals and conferences.

*Indicate this in the PIS.*

*E:4c Explain how data will be destroyed. ?☑

If the data is no longer useful after six years, then it will be destroyed by deleting the digital files.

*Explain in the PIS and CF how data will be subsequently destroyed. (See Applicants' Reference Manual Sections 11 and 6.4.)*

*E:5 Describe any arrangements to make results available to participants. ?☑

At the end of the survey, the participant will be redirected to a separate form where he/she can provide their contact details if and only if they wish to receive the survey results. This will not cause any identification of the participant since the responses of the two forms are collected separately.

*Researchers should be aware that there is an ethical dimension to the formulation and publication of results and loss of copyright. The researcher must remain sensitive to the uses to which the research findings may be put. Wherever possible, the findings should be conveyed in a comprehensible form to those who participated in the research. Explain this in the PIS.*

*E:6a Are you going to identify the research participants in any publication or report about the research?

Yes ☐ No☑

*E:6b Is there any possibility that individuals or groups could be identified in the final publication or report? ?☑

Yes ☐ No☑

*This is a problem either when one is dealing with a small group of participants known to a wider public or when there is to be a report back to participants likely to know each other.*

## SECTION F: TREATY OF WAITANGI

*F:1 Does the proposed research have impact on Māori persons as Māori? ?☑

Yes ☐ No☑

*Please ensure the Pro Vice-Chancellor (Māori) or Nominee within your Faculty has been consulted. See Applicants' Reference Manual Section 13.13.*

## SECTION G: OTHER CULTURAL ISSUES

*G:1 Are there any aspects of the research that might raise any specific cultural issues? ?☑

Yes ☐ No☑

*See Guiding Principles Section 5.9.*

## SECTION H: RISKS & BENEFITS

***H:1 What are the possible benefits to research participants of taking part in the research?** ?☑

The participants are provided with the opportunity to receive a summary of the survey results by providing their email address at the end of the survey. We emphasize again that this information will not be connected to the participant's data in any way.

Also, as explained in research aims/objectives, the information collected from the participants are to be used to identify the current state of code review assistance from its stakeholders' perspective and their attitudes towards performing code review using the existing assistance. By understanding these components, we are expecting to find out what code reviewers actually need when it comes to code review assistance. Thereby, we are expecting to build an innovative form of assistance that could bridge the gap between the code reviewer needs and the support they receive from existing assistance. If successful, this form of assistance will benefit the code review stakeholder community including the survey participants, by making the code review process more feasible and effective.

In addition, the research participants receive the opportunity to express their attitude towards a process that they have to go through often and that directly affects them.

*Specify the benefits to the participants. If specific benefits cannot be assured, state explicitly that the participants may or may not benefit from participation in the study.*

***H:2 Is the research likely to place the researcher at risk of harm?**

Yes ☐ No☑

***H:3 Is the research likely to cause any possible harm to the participants, such as physical pain beyond mild discomfort, embarrassment, psychological or spiritual harm?** ?☑

Yes ☐ No☑

*Explain if participants are likely to experience discomfort (physical, psychological, social or incapacity) as a result of the procedures.*

***H:4 Does the research involve collection of information about illegal behaviour(s) which could place the research or participants at risk of criminal or civil liability or be damaging to their financial standing, employability, professional or personal relationships?**

Yes ☐ No☑

***H:5 Is the research likely to give rise to incidental findings?** ?☑

Yes ☐ No☑

*Research occasionally gives rise to findings that are unexpected and unrelated to the original purpose of the research but may have significance for research participants' health or wellbeing. These are referred to as incidental findings.*

*Provide information of any incidental findings (See Guiding Principles Section 5.13) or known side effects which may results from taking part in the research.*

*Make sure that you have clearly identified/explained these risks in the PIS and CF.*

**SECTION I: HUMAN REMAINS, TISSUE AND BODY FLUIDS**

***I:1 Does the research involve the use, collection or storage of human tissue, as defined by the Human Tissue Act 2008?** ?☑

Yes ☐ No☑

*Section 7 of the Act includes as examples of human tissue the following: body parts, stem cells or other human cells, blood, bone marrow, hair, nails, skin, lung washouts, body fluids, such as mucus, sputum or urine. If the human tissue was or will be collected, used or stored without full consent or is not de-identified, the application will have to be submitted to a Health and Disability Ethics Committee.*
*See Guiding Principles Section 5.12 and Applicants' Reference Manual Section 9.18 for explanation.*

## SECTION J: CLINICAL TRIALS

***J:1 Is this project a Clinical Trial?** ?☑

Yes ☐ No☑

*UAHPEC adopts the definition of a clinical trial of the World Health Organisation and New Zealand Ministry of Health: 'a clinical trial is any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes'.*
*Please note that most clinical trials must be submitted to the Health and Disability Ethics Committee for approval. Consult an HDEC Ethics Advisor to determine whether HDEC approval is necessary. Please also note that the term "intervention study" is often used interchangeably with the term "clinical trial" (see sections 2.4 and 2.5 of the NEAC Ethical Guidelines for Intervention Studies for the definition of intervention study and intervention).*
*See Applicants' Reference Manual Section 13.8 for the wording to be used in the PIS.*

## SECTION K: FUNDING

***K:1 Have you applied for, or received funding for this project?** ?☑

Yes ☐ No☑

*This includes funding from the University of Auckland, UniServices, government, industry, and non-profit organisation that is providing the funds needed to undertake this project.*

## SECTION L: ETHICAL SUMMARY

***L:1 Have you made any other related applications?**

Yes ☐ No ☑

***L:2 Is there any relevant information from past applications or interaction with UAHPEC?**

Yes ☐ No ☑

***L:3 Please provide a summary of all the ethical issues arising from this project and explain how they are to be resolved:** ? ☑

Participant's Consent:
We are requesting informed consent from the participant before proceeding with the survey. Since this survey is anonymous, it is impossible to determine if the participants are adults who can provide their own consent. However, we have informed the participants at the beginning of the survey that, by participating in this survey, they automatically consent and agree that they are 18 years of age or older i.e. eligible to provide their own informed consent.

participants' right to withdraw:
Participation in this survey is entirely voluntary. If the participant does not wish to participate, he or she does not have to give a reason for this. If the participant chooses to participate, he or she can withdraw at any time during the questionnaire by not submitting the responses, without giving a reason. After the questionnaire, the participant will not be able to withdraw his or her data since the questionnaire is anonymous.

Privacy, Anonymity, and Confidentiality:
This survey is anonymous and does not collect any IP addresses. The information the participant provides may be published in a PhD thesis, academic conference and/or journal. This publication(s) will not identify the participant as its source. A copy of the research findings will be made available to the participant, if the participant wishes, by providing his or her email address on the questionnaire. Participant contact details will not be given to any third-parties. Also, we have not included any questions that could be used to identify either the participant or his or her organisation, in the questionnaire.

Conflict of Interest:
As the survey is anonymous we have no way of knowing who has, or has not, completed the survey, so there is no issue of conflict of interest or possibility of coercion.

Possible offenses:
This survey includes a question inquiring about the group of people that are currently performing code review in the organisation that the participant is working for, followed by a question which is enquiring about participant's opinion on who should ideally perform code review. The second question could be interpreted as criticism to the employer of the participant. We have mitigated this risk by making the survey anonymous and not collecting any information that could be used to identify the participant or the organisation.

UAHPEC expects applicants to identify the ethical issues in the project and explain in the documentation how they have been resolved. The application will not be considered if this is not answered adequately. A 'Not applicable' response is not acceptable.

- *For anonymity and confidentiality, see Applicants' Reference Manual Section 9.11.*
- *For conflict of interest, see Applicants' Reference Manual Section 9.12.*
- *For incidental findings, see Guiding Principles Section 5.13.*
- *For informed consent, see Guiding Principles Section 5.4.*
- *For participant's rights to withdraw, see Applicants' Reference Manual Section 10.*
- *For privacy, see Applicants' Reference Manual Section 9.10.*
- *For minimisation of harm, see Guiding Principles Section 5.7 and Applicants' Reference Manual Section 9.13.*
- *For social and cultural sensitivity, see Guiding Principles Section 5.9.*
- *For Treaty of Waitangi, see Applicants' Reference Manual Section 13.13.*

## SECTION M: ETHICS ADVISOR REVIEW

***M:1 Will this Application be reviewed by an Ethics Advisor after you submit it?**

Yes ☐ No ☑

***M:2 Has an Ethics Advisor been consulted in the preparation of this Application?**

Yes ☐ No ☑

## ATTACHMENTS

**Files of the following formats can be uploaded: .doc, .docx, .xls, .xlsx, .pdf, .gif and .jpg**

| Document title | Upload | |
|---|---|---|
| ATTACHMENT 1 - Main Survey | | |
| ATTACHMENT 2 - Post Survey | | |
| ATTACHMENT 3 - PIS | | |
| ATTACHMENT 4 - Invitation | | |

## SECTION N: APPLICATION CHECKLIST

Please tick below to confirm that you have considered whether the following documents are required for your application and that you have attached them in the attachments section where necessary:

N:1 Participant Information Sheet ☑
(see Applicants' Reference Manual Sections 6.3 and 6.4 for explanation and sample)

N:2 Consent Form ☐
(see Applicants' Reference Manual Section 6.5 for explanation and sample)

**N:3 Advertisement** ☑

**N:4 Questionnaire** ☑

**N:5 List of Interview Questions** ☐

N:6 Confidentiality Agreement ☐
(see Applicants' Reference Manual Sections 6.8 for explanation and sample.)

**N:7 Observation Schedule** ☐

**N:8 Any other supporting documents (for example: approval from Course Coordinator, debriefing sheet)** ☐

**FEEDBACK/COMMENTS**

If you wish to provide feedback on the usability of this e-form, please do so here.

Please do not use this section to make any comments related to the application itself, as the comments made here will not be included in the application.

**WHEN YOU ARE FINISHED AND HAVE ANSWERED ALL QUESTIONS, TICK THE 'COMPLETE' BOX AT THE TOP OF THE FORM.**

**The University of Auckland**
Research Office
Level 10, Building 620, 49 Symonds Street, Auckland

# Appendix 1

**EForm Name**: HE Application Form - v4.2B

**Page**:

**ATTACHMENTS**

**Section**:

**Files of the following formats can be uploaded: .doc, .docx, .xls, .xlsx, .pdf, .gif and .jpg**

**Question**: Upload

**File Name**: Survey.pdf

**Nature of Code Review in Practice**

*Welcome.*

## 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.

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

- ○ Yes
- ○ No

## Code Review Experience

*Q1.* Do you have any experience in code review?
(EXPERIENCE here refers to performing code review or/and managing a team that performs code review)

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

- ○ No, I have no experience in code review

*Q2.* What are the things you look for while performing code review? (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)

*Q3.* 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)

*Q4.* Which activity do you enjoy the most?

- Developing code only
- Mostly developing code, but sometimes reviewing code as well
- Developing and reviewing code equally
- Mostly reviewing code, but sometimes developing code as well
- Reviewing code only

*Q5.* Which activity does your team seem to enjoy the most?

- Developing code only
- Mostly developing code, but sometimes reviewing code as well
- Developing and reviewing code equally
- Mostly reviewing code, but sometimes developing code as well
- Reviewing code only

*Q6.* Do you like performing code review?

- Dislike a great deal
- Dislike somewhat
- Neither like nor dislike
- Like somewhat
- Like a great deal

*Q7.* Does your team seem to like performing code review?

- Dislike a great deal
- Dislike somewhat
- Neither like nor dislike
- Like somewhat
- Like a great deal

*Q8.* Please select the statement that applies to your code review experience.

- ○ Finding time to perform code review is always difficult.
- ○ Finding time to perform code review is sometimes difficult.
- ○ Finding time to perform code review is never difficult.

*Q9.* Please select the statement that applies to your management experience.

- ○ Finding human resources to perform code review is always difficult.
- ○ Finding human resources to perform code review is sometimes difficult.
- ○ Finding human resources to perform code review is never difficult.

*Q10.* 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)

*Q11.* Are you happy about this way of reviewing code?

- ○ Yes
- ○ No

*Q12.* 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)

*Q13.* Why? (Please select all that apply).

- [ ] Because code reviewing requires programming knowledge
- [ ] Because hiring separate staff for reviewing code is not productive
- [ ] Because developers are the most efficient at reviewing code
- [ ] Because it is difficult for the developers to find time for reviewing code
- [ ] Because developers are mostly not interested in reviewing code
- [ ] Because context switching for developers is difficult and time-wasting
- [ ] Because letting developers concentrate on only development tasks produce better results
- [ ] Because code reviewing is an important task and should be given its due importance
- [ ] Because dedicating a set of people for code review is impractical in the highly dynamic software industry
- [ ] Because management roles tend to have more experience and knowledge on the process
- [ ] Because code review is not applicable to my current company
- [ ] Because my current company had already tried code review and it had not produce any desirable results
- [ ] Because my current company does not have enough resources to perform code review
- [ ] Other (Please specify)

*Q14.* Are you/your team currently using any tool(s) for reviewing code?

- ○ Yes
- ○ No

*Q15.* 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)

*Q16.* What is the name of the tool? (If you are using more than one tool, please list all of them.)

*Q17.* 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
- ☐ » 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 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
- [ ] » 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)

*Q18.* How satisfied are you with the usability of your tool(s)?
(USABILITY here refers to the ease of learning and use)

| Extremely dissatisfied | Somewhat dissatisfied | Neither satisfied nor dissatisfied | Somewhat satisfied | Extremely satisfied |
|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ |

*Q19.* Which of these explain your satisfaction level? (Please select all that apply).

- [ ] 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)

*Q20.* Which is the most effective way to review code?

- ○ Manually reading through the piece of code using a text editor or a common IDE
- ○ Reviewing the code using the tool(s) that I am currently using
- ○ I would like to use a better tool than what I am using now

*Q21.* Please comment on your response (Optional).

*Q22.* What are the features of your tool(s) that could help you in this instance? (Please select all that apply).

- ☐ 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)

*Q23.* What are the drawbacks you have experienced with your tool(s) if any?

- [ ] 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)

*Q24.* In which field(s) have you worked in? Please provide the years of experience in the text box.

- [ ] Industry
- [ ] OSS

*Q25.* How big is the company that you are currently working for?

- ○ < 50 employees
- ○ 50 - 249 employees

- >= 250 employees

*Q26.* How big is the software/IT department of the company that you are currently working for?

- < 50 employees
- 50 - 249 employees
- >= 250 employees

*Q27.* Please select the most accurate statement about your programming ability.

- I have no programming ability.
- I have very little confidence on my programming ability.
- I am moderately confident on my programming ability.
- I am extremely confident on my programming ability.

# Appendix 2

**EForm Name**: HE Application Form - v4.2B

**Page**:

**ATTACHMENTS**

**Section**:

**Files of the following formats can be uploaded: .doc, .docx, .xls, .xlsx, .pdf, .gif and .jpg**

**Question**: Upload

**File Name**: Post_Survey.pdf

## Information

We thank you for your time spent taking this survey.
Your response has been recorded.

If you would like to have the results of this survey or would like to participate in our future studies, please click "Next". Your contact information will be collected and recorded separately from your survey responses and thus you will not be identified as its source.

If you do not need the results of the survey or are not willing to take part in our future studies, you may leave this survey by closing this window.

## Participant Information

I would like to,

- [ ] Receive the results.
- [ ] Participate in future studies of this research.

Email:

# Appendix 3

**EForm Name**: HE Application Form - v4.2B

**Page**:

**ATTACHMENTS**

**Section**:

**Files of the following formats can be uploaded: .doc, .docx, .xls, .xlsx, .pdf, .gif and .jpg**

**Question**: Upload

**File Name**: PIS.pdf

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The University of Auckland
Private Bag 92019
Auckland, 1142 New Zealand

# PARTICIPANT INFORMATION SHEET
# Understanding Code Review in Practice

**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 of the completion of the survey.

**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 <d> <m> 2018 for three years, Reference Number 022079.

# Appendix 4

**EForm Name**: HE Application Form - v4.2B

**Page**:

**ATTACHMENTS**

**Section**:

**Files of the following formats can be uploaded: .doc, .docx, .xls, .xlsx, .pdf, .gif and .jpg**

**Question**: Upload

**File Name**: Invitation.pdf

Hello,

We are conducting a survey to identify if the efficacy of the existing assistance for reviewing code meets code review stakeholders' expectations.

This survey is completely anonymous and will take no more than 15 minutes. If you know anyone who has either performed code review or managed a code review team in software development, please forward this message requesting them to participate. You are also welcome to participate. The participation in this survey is voluntary.

For more information, including details regarding our motivation and goals and, to participate in the survey, please visit:

<Once the survey is published, a link will be provided here>

Please note that this survey is conducted by Mrs. Sanuri D. Gunawardena in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Computer Science, supported by the supervisors Associate Professor Ewan Tempero and Dr. Kelly Blincoe. This survey is not conducted by The University of Auckland.

Best Regards,

Mrs.Sanuri D. Gunawardena

Associate Professor Ewan Tempero

Dr. Kelly Blincoe

The University of Auckland

Contact:

Mrs. Sanuri D. Gunawardena sgun571@aucklanduni.ac.nz

Associate Professor Ewan Tempero e.tempero@auckland.ac.nz

Dr. Kelly Blincoe k.blincoe@auckland.ac.nz

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON <d> <m> 2018 for three years, Reference Number 022079.