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EMPLOYER INFORMATION SHEET

Requirements Technical Debt Quantification

Name of Principal Investigator/Supervisor (PI): Assoc. Prof. Kelly Blincoe

Name of Co-investigator(s): Assoc. Prof. Ewan Tempero, Dr. Yu-Cheng Tu, Professor Matthias Galster

PhD Researcher(s): Judith Perera

Research Assistant: Faith Culas

Researcher Introduction

We, Judith Perera, AP Kelly Blincoe, AP Ewan Tempero, Dr Yu-Cheng Tu, and Faith Culas from the School of Computer Science and the Department of Electrical, Computer and Software Engineering, University of Auckland, and Professor Matthias Galster from the Department of Computer Science and Software Engineering, College of Engineering, University of Canterbury, are an inter-disciplinary research team located in New Zealand.

We would like to invite employees in your organization to take part in our **semi-structured interviews**. Before consenting us to access your employees you need to understand the purpose of this study and how your employee will be involved as a participant. Please take time to read the following information carefully. Reach out to us if you need further clarifications (see contact details at the bottom).

Purpose of the study: Software Requirements are crucial in developing a software product. Software practitioners can make sub-optimal decisions (either intentionally or unintentionally) when dealing with software requirements while performing their tasks. For example, requirements engineers or business systems analysts might not capture essential user needs or specify software requirements ambiguously during Requirements Engineering (RE) activities. Software architects may make sub-optimal design decisions with respect to satisfying the requirements when designing the software architecture. Software engineers and developers may implement software features inadequately

(partially or incorrectly) without satisfying all the requirements. **Requirements Technical Debt (RTD) captures the consequences of such decisions.**

Unless managed, RTD can cause a software project to deviate from customer expectations or take longer than expected to meet them, causing large cost overruns. Therefore, RTD must be reduced and managed. We hypothesize that quantifying (or measuring or estimating) RTD can help in the decision-making for managing RTD.

The goal of this series of **semi-structured interviews** is to have in-depth conversations with software practitioners to **understand their perceptions on quantifying RTD for software requirements in general and for software requirements concerning veracity**. *Veracity requirements are a specific type of requirements related to truth, trust, authenticity, provenance, integrity and demonstrability of data and human interactions in software and AI systems.*

Supporting this research and your employee's participation in this study

- Your organization can support this research by giving the research team the consent to access your employees and assist us in recruiting participants from your organization to participate in our study by forwarding them the invitation to participate.
- Participation in this study is voluntary and can be declined without giving a reason. You cannot give permission on behalf of the employee to participate. The employee is free to choose to participate.
- The employee has assurances that participation or non-participation will not affect the participant's relationship with the organization, their employment status or access to its services.
- If you choose to support this research, we will send you an invitation mail, a Participant Information Sheet (PIS) and Participant Consent Forms to be forwarded to potential participants.
- You can withdraw your organization's participation in the research (i.e., the ability to invite employees to participate) at any time without giving a reason. Please note, however, if withdrawal is requested after recruitment has started, withdrawal of your organization's participation will not affect the contributions of participants who have already consented or their submitted data, both of which can only be withdrawn by individual participants.

Risks and Benefits to your organization and employees from this study:

- **Risks:** There is no risk or harm to participants (or your organization) from this study. Participant's names or your organization name or identities will not be gathered or recorded. The interview transcripts will be de-identified immediately after transcribing (e.g., all personal identifiers, including the participant's name, organization's name, will be deleted) so that there will be no ramifications to participants and their companies by their participation in our study. Any recordings will be deleted as soon as the transcript is finalized. The transcripts will be kept strictly confidential, only accessed by the research team, and will not be disclosed or

shared with external parties.

- **Benefits:** Awareness of RTD management can lead to cost savings that could be made via quantifying and managing RTD for software requirements in general and for software requirements concerning veracity.

Participant involvement

- Employees in your organization are invited to take part in this study because they are a practitioner involved in requirements engineering (RE), software architecture design, or software implementation activities. They will answer interview questions based on their experience working in their role.
- If they choose to participate, they will attend an online meeting scheduled for 90 minutes, with the interview itself expected to take 60 minutes. The additional time is allocated to account for any potential technical issues or extended discussions.
- The interviews will be recorded and transcribed. The recording cannot be stopped since the interview transcript is necessary for data analysis. The transcript will be sent to them for review upon request.
- The interview will inquire participants about sub-optimal decisions made concerning requirements during requirements gathering, design, and implementation of software, and whether and **how the quantification of RTD could support decision-making for better managing RTD.**
- In the second half of the interview, we will focus on **veracity requirements** to understand what concepts (e.g., costs, benefits, consequences) and metrics could be helpful for quantifying veracity-related RTD.
- We will also inquire about **cultural veracity requirements**. If the participant is a New Zealander, we may gather their perceptions about cultural veracity requirements in the New Zealand context.

Informed consent and right to withdraw

- **Participants will need to sign a consent form.**
- Participation in this research is entirely voluntary. All questions are optional, and they may choose not to answer them. Participants may choose to leave the interview at any time without giving a reason.
- Participants can request an opportunity to review the transcript, we will send them the de-identified transcript upon request, and they can edit or delete any information from the transcripts within a period of two weeks and email back to the PI.

Minimization of harm

- There is no risk or harm to participants (or your organization) from this study. The contact information of the Research Team is provided in the Participant Information Sheet (PIS) if participants would like to ask questions or have any concerns before participating in this study.

Confidentiality and anonymity

- Participant's personal identification information, such as their name, company name, email address, or IP address, will be de-identified from the interview responses immediately after transcribing the data.
- Their responses will be analyzed separately from their contact information to keep their identity confidential.
- However, some demographic data may be collected, but only related to their current role, country of work, application domain, and their years of experience in the role. This is for researchers to interpret the findings. e.g., to understand what findings may be more relevant to New Zealand.

Data storage and management

- **We will record the interview.** Recordings are deleted as soon as the transcripts are produced and reviewed. Any personal data will be deleted from the transcripts immediately.
- The responses gathered during the interview will be strictly confidential and not disclosed or shared with external parties. The **data will be de-identified** (e.g., all personal identifiers, including your organization's name, will be deleted) immediately after transcribing and stored securely in the PhD researcher's university-approved storage for the duration of the study and will be accessible only to the research team.
- Upon completion of the research, electronic data will be permanently erased from the PhD researcher's university-approved storage. The data will be moved securely to the PI's university-approved storage and retained for six years to maintain the integrity of the research. After 6 years, the data will be securely erased from the PI's university-managed data storage.
- Study results may be shared through the PhD researcher's presentations, reports, scholarly articles, and thesis. These reports and publication(s) will not identify participants as its source.
- **Access to consent forms** will be restricted to the research team. Consent forms will be stored separately from the research data and deleted after six years.

Applying for a summary of findings

- If participants or their organization wishes to receive a summary of findings or an invitation for a presentation or webinar, they can enter the email address in the consent form. We will not be able to trace them back to their interview responses using the details they provide in the consent form. Consent forms will be separated from the research data.

Funding and third-party involvement

- This research is funded by the New Zealand Ministry of Business, Innovation, and Employment via the Science for Technological Innovation (SfTI) National Science Challenge Program's Veracity Technology Spearhead research project (<https://veracity.wgtn.ac.nz/>) hosted by Callaghan Innovation.
- The data will be shared with the Veracity Technology Spearhead main research project for reporting purposes.

Contact the research team

If you have any questions prior to consenting us to access your employees, please feel free to contact us directly.

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UAHPEC Chair

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, Office of Research Strategy and Integrity, The University of Auckland, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 ext. 83711. Email:

humanethics@auckland.ac.nz.

Approved by the University of Auckland Human Participants Ethics Committee on 14/06/2024 for three years. Reference Number: UAHPEC27696.