

# Towards quantifying technical debt for veracity requirements



OpenAI. (2023). *ChatGPT* [Large language model]. <https://chat.openai.com>

## RESEARCH

‘Towards quantifying technical debt for veracity requirements’

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### Background

Software requirements concerning veracity (i.e. veracity requirements) are related to the trustworthiness, truthfulness, authenticity, provenance, integrity, and demonstrability of data and human interactions. These requirements can be either functional, e.g. implemented as a software feature such as a checklist, or non-functional, e.g. a quality attribute of a software system such as ‘the trustworthiness of the software system,’ depending on the software system being developed and its context.

Software professionals can make suboptimal decisions while performing requirements-related tasks, such as gathering, documenting, and implementing requirements as features or design decisions in a software system. Examples include missing essential user needs, introducing ambiguities, or inadequately implementing software requirements.

Consequences of suboptimal decisions related to requirements are captured by the concept of ‘Requirements Technical Debt (RTD)’. We applied this concept to veracity software requirements, introducing ‘Veracity Requirements Technical Debt (VRTD)’.

The research aims to conceptualize the quantification of VRTD. Doing so provides a foundation to better manage VRTD in software projects.

### Main research findings

In our initial work [1], we developed a conceptual model based on existing literature to understand the concepts and relationships necessary for quantifying both functional and non-functional RTD. We intend to adapt this model for quantifying VRTD by including dimensions and properties related to veracity.

In previous engagements with stakeholders in the New Zealand Organic Certification domain, we learned that ‘veracity’ can have multiple dimensions, such as regulatory, data, financial data, cultural, and process. Compliance with regulations and organic standards may require specific software functionalities to be implemented in software systems that support the certification e.g. the functionality to verify soil test results.

Veracity can also be treated similarly to other non-functional requirements, such as reliability, availability, and performance of software systems. When prioritized requirements or design decisions fail to meet the desired level of veracity for the software system, it results in the incurrance of VRTD. Evaluating whether a software system meets the desired level of veracity to meet customer satisfaction can follow a similar approach to assessing quality attributes such as performance, availability, or reliability, typically at the system architecture or data infrastructure level.

This assessment can encompass various aspects. For example, data veracity can include data storage, access, maintenance, and sharing. The conceptualization of quantification of VRTD in our work can support the decision-making to reduce and manage VRTD in software projects.

### Relevance of findings to Aotearoa New Zealand

Our work introduces a new research direction, recognizing the growing importance of veracity requirements in contemporary and future software systems. This research can benefit software professionals both in Aotearoa New Zealand and globally. By considering VRTD and developing ‘veracity-aware software systems’, software practitioners can minimize costs and deliver software products that align with customer expectations related to veracity.

1. Perera, J., Tempero, E., Tu, Y. C., & Blincoe, K. (2023, September). Quantifying Requirements Technical Debt: A Systematic Mapping Study and a Conceptual Model. In *2023 IEEE 31st International Requirements Engineering Conference (RE)* (pp. 123-133). IEEE.



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