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ABSTRACT

Misuse cases are currently used to identify safety and security threats and subsequently capture safety and security requirements. There is limited consensus to the precise meaning of the basic terminology used for use/misuse case concepts. This paper delves into the use of ontology for the formal representation of the use-misuse case domain knowledge for eliciting safety and security requirements. We classify misuse cases into different category to reflect different type of misusers. This will allow participants during the requirement engineering stage to have a common understanding of the problem domain. We enhanced the misuse case domain to include abusive misuse case and vulnerable use case in order to boost the elicitation of safety requirements. The proposed ontological approach will allow developer to share and reuse the knowledge represented in the ontology thereby avoiding ambiguity and inconsistency in capturing safety and security requirements. OWL protégé 3.3.1 editor was used for the ontology coding. An illustration of the use of the ontology is given with examples from the health care information system.

Keywords

- reuse,
- requirement management,
- use-misuse case,
- ontology,
- safety,
- security,
- sharing

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KEYWORDS reuse, requirement management, use-misuse case, ontology, safety, security, sharing

1. INTRODUCTION

The term "ontology" is derived from its usage in philosophy where it means the study of being or existence as well as the basic categories (Witmer, 2004). Ontology is often used by philosophers as a synonym for metaphysics. The term ontology, or ontologia, was conceived as far back as 1613, independently by philosophers Rudolf Gockel (Goclenius) in his lexicon philosophicum and Jacob Lorhard (Lorhardus) in his theatrum philosophicum. Ontology in the area of computer science represents the effort to formulate an exhaustive and rigorous conceptual schema within a given domain, typically a hierarchical data structure containing all the relevant elements and their relationships and rules within the domain (Gruber, 1993). Ontology, in the artificial intelligence (AI) field, is an explicit specification of a conceptualization used to help programs

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