Assawamekin, N.\textsuperscript{a}, Sunetnanta, T.\textsuperscript{b}, Pluempliwiriyawej, C.\textsuperscript{b}

Deriving traceability relationships of multiperspective software artifacts from ontology matching

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\textsuperscript{a} School of Science, University of the Thai Chamber of Commerce, Bangkok 10400, Thailand
\textsuperscript{b} Department of Computer Science, Faculty of Science, Mahidol University, Bangkok 10400, Thailand

Abstract
Requirements traceability and change management in multiperspective software artifacts is a major challenge due to the heterogeneity of the artifacts themselves. Our previous attempt in resolving such problem results in a multiperspective requirements traceability framework, namely MUPRET. The key idea of MUPRET is to use ontology, so-called requirements ontology, as a common representation of mutual understanding of semantics of words in the requirements sentences. By doing so, the traceability relationships can be automatically generated when a match is found in the requirements ontologies. Although the MUPRET was originally proposed for the textual requirements, this paper presents the extension of MUPRET to cover different representations of software artifacts, together with an illustrative example of the extended applications. © 2009 IEEE.

Author Keywords
Interoperability; Knowledge management; Multiperspective software development; Ontology; Requirements traceability

References
\begin{itemize}
  \item Gotel, O.C.Z., Finkelstein, A.C.W.
  An Analysis of the Requirements Traceability Problem

  \item Gruber, T.R.
  A Translation Approach to Portable Ontology Specifications

  \item Borst, W.N.
  (1997) Construction of Engineering Ontologies for Knowledge Sharing and Reuse,
  Doctoral Dissertation, Enschede, NL-Centre for Telematics and Information Technology, University of Twente

  \item Studer, R., Benjamins, V.R., Fensel, D.
  Knowledge Engineering: Principles and Methods

  \item Denny, M.
  Ontology Building: A Survey of Editing Tools,
  Available at, November 6, 2002

  \item Mena, E.
  OBSERVER: An Approach for Query Processing in Global Information Systems Based on Interoperation Across Pre-Existing Ontologies
  April

  \item de Bruijn, J.
  Semantic Integration of Disparate Data Sources in the COG Project
\end{itemize}
Porto, Portugal

- Fowler, J.  
  **Agent-Based Semantic Interoperability in InfoSleuth**  
  March


- Noy, N.F., Musen, M.A.  
  **SMART: Automated Support for Ontology Merging and Alignment**  
  (1999) *Twelfth Banff Workshop on Knowledge Acquisition, Modeling, and Management*, Banff, Alberta, Canada

- McGuinness, D.L.  
  **An Environment for Merging and Testing Large Ontologies**  

- Preece, A.  
  **KRAFT: An Agent Architecture for Knowledge Fusion**  

- Kaiya, H., Saeki, M.  
  **Ontology Based Requirements Analysis: Lightweight Semantic Processing Approach**  
  September 19-20

- Hamdan, K., Khatib, H.E.  
  **A Software Cost Ontology System for Assisting Estimation of Software Project Effort for Use with Case-Based Reasoning**  
  November

- Yang, H., Cui, Z., O’Brien, P.  
  **Extracting Ontologies from Legacy Systems for Understanding and Re-Engineering**  
  October 27-29

- Wongthongtham, P., Chang, E., Cheah, C.  
  **Software Engineering Sub-Ontology for Specific Software Development**  
  April 6-7

- Zhang, Y.  
  **An Ontology-Based Approach for Traceability Recovery**  
  Genoa, October 1

- Noll, R.P., Ribeiro, M.B.  
  **Enhancing Traceability using Ontologies**  
  Seoul, Korea, March 11-15
Noll, R.P., Ribeiro, M.B.
**Ontological Traceability over the Unified Process**
March 26-29

Caralt, J.C., Kim, J.W.
**Ontology Driven Requirements Query**

Assawamekin, N., Sunetnanta, T., Pluempptiwiriyawej, C.
**Automated Multiperspective Requirements Traceability Using Ontology Matching Technique**
U.S.A, July 1-3

Assawamekin, N., Sunetnanta, T., Pluempptiwiriyawej, C.
**Resolving Multiperspective Requirements Traceability Through Ontology Integration**
U.S.A, August 4-7

Harmain, H.M., Gaizauskas, R.
**CM-Builder: A Natural Language-Based CASE Tool for Object-Oriented Analysis**
April


Guide to the Software Requirements Definition Phase, ESA PSS-05-03, European Space Agency (ESA), Issue 1, Revision 1, March, 1995.

Noy, N.F., McGuinness, D.L.
**Ontology Development 101: A Guide to Creating Your First Ontology**

Giunchiglia, F., Yatskevich, M., Shvaiko, P.
**Semantic Matching: Algorithms and Implementation**

Miller, G.A.
**WordNet: A Lexical Database for English**
November

Berre, D.L.
**A Satisfiability Library for Java,**
Available at, June 15, 2006

Spanoudakis, G., Finkelstein, A., Till, D.
**Overlaps in Requirements Engineering**
April

**Document Type:** Conference Paper