Lexical Semantic Analysis to Support Ontology Modeling of Maintenance Activities– Case Study of Offshore Riser Integrity

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Abstract : Word representation and context meaning of text-based documents play an essential role in knowledge modeling. Business procedures written in natural language are meant to store technical and engineering information, management decision and operation experience during the production system life cycle. Context meaning representation is highly dependent upon word sense, lexical relativity, and sematic features of the argument. This paper proposes a method for lexical semantic analysis and context meaning representation of maintenance activity in a mass production system. Our approach constructs a straightforward lexical semantic approach to analyze facilitates semantic and syntactic features of context structure of maintenance report to facilitate translation, interpretation, and conversion of human-readable interpretation into computer-readable representation and understandable with less heterogeneity and ambiguity. The methodology will enable users to obtain a representation format that maximizes shareability and accessibility for multi-purpose usage. It provides a contextualized structure to obtain a generic context model that can be utilized during the system life cycle. At first, it employs a co-occurrence-based clustering framework to recognize a group of highly frequent contextual features that correspond to a maintenance report text. Then the keywords are identified for syntactic and semantic extraction analysis. The analysis exercises causality-driven logic of keywords' senses to divulge the structural and meaning dependency relationships between the words in a context. The output is a word contextualized representation of maintenance activity accommodating computer-based representation and inference using OWL/RDF.

Keywords : lexical semantic analysis, metadata modeling, contextual meaning extraction, ontology modeling, knowledge representation

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