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Title of Paper

An Ontological-Based Approach to Support Knowledge Integration and Exploration in the Maintenance of C2 Systems

Topics

Primary: Topic 4 - Information and Knowledge Exploitation
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Abstract

The complexity of command and control information systems (C2IS) is continuously increasing. This, combined with the fact that they are maintained by both military and civilian organisations in physically distributed locations, raise the difficulty of their maintenance. The knowledge relevant for a particular software maintenance task is typically dispersed over a wide range of artefacts in different representational formats and at different abstraction levels, resulting in isolated "information silos". Furthermore, existing software maintenance process models, such as the IEEE Std 14764-2006, do not specify how any available supporting resources should be integrated within the process in a given maintenance context. This results in maintainers being typically left with no guidance on how to use the available information resources to complete a specific maintenance task. In this article, an ontology to support the maintenance of C2IS is presented. It models in a common and uniform representation relevant resources such as source code, version management, and bug tracking information. This ontology, supported by a collaborative environment, can be automatically populated from distributed repositories. Using ontology reasoners, implicit knowledge can be inferred from explicitly represented knowledge. This knowledge provides maintainers with additional insights and guidance during the maintenance of C2IS.