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An automated tool support for managing implicit requirements using Analogy-based Reasoning

3

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Abstract:

Systems requirements are crucial to the proper functioning of a software and must be met for a project to be successful. Hence the need for its effective management. Implicit Requirements (IMRs) however are difficult to manage as a result of their nature-vague, unclear, and ambiguous amongst other characteristics. The process of requirement management is a continuous cycle as change in requirements and emergence of new requirements occur in a system. Hence the need for a tool/approach which identifies and manages requirements (implicit and explicit) effectively. However, most systems do not manage implicit requirements as a lot of attention is focused on explicit requirements. This research presents an approach for identification and management of IMRs using Analogy-based Reasoning in combination with two other core technologies (Ontology and Natural Language Processing). The approach is supported by a prototype tool, which was assessed by conducting a preliminary evaluation. The results indicate that the approach enables for early identification of IMRs when used with a good domain ontology and is potentially suitable for application in practice by experts.

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I. Introduction

Irrespective of its intended function, software production has a three-constrain-set which includes quality standards, time-to-market, and requirements. These requirements are specified implementations of the software and the constraints within which the system must operate. Developed software must satisfactorily meet the set quality standards, be timely (in this fast paced technological era) and also meet a set of requirements. A systems inability to meet these requirements will risk its acceptance and functionality and also bring about a loss to the developers [9], [24].

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Keywords

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Ontologies, Cognition, Software, Natural language processing, Semantics, Requirements management

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systems analysis, inference mechanisms, ontologies (artificial intelligence), software tools

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domain ontology, automated tool support, analogy-based reasoning, systems requirements, software, implicit requirements, IMR, requirement management, explicit requirements, natural language processing, prototype tool

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natural language processing, implicit requirement, requirement engineering, analogy-based reasoning, ontology

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