

Building Large Knowledge-Based Systems: Representation and Inference in the Cyc Project

J Med Syst (2014) 38:67
DOI 10.1007/s10916-014-0067-4

SYSTEMS-LEVEL QUALITY IMPROVEMENT

An Ontological Case Base Engineering Methodology for Diabetes Management

Shaker H. El-Sappagh · Samir El-Masri · Mohammed Elmogy · A. M. Riad · Basema Saddik

Received: 23 October 2013 / Accepted: 28 May 2014
© Springer Science+Business Media New York 2014

Abstract Ontology engineering covers issues related to ontology development and use. In Case Based Reasoning (CBR) system, ontology plays two main roles, the first as case base and the second as domain ontology. However, the ontology engineering literature does not provide adequate guidance on how to build, evaluate, and maintain ontologies. This paper proposes an ontology engineering methodology to generate case bases in the medical domain. It mainly focuses on the research of case representation in the form of ontology to support the case semantic retrieval and enhance all knowledge intensive CBR processes. A case study on diabetes diagnosis case base will be provided to evaluate the proposed methodology.

Keywords Case based reasoning · Ontology engineering · Case representation · Knowledge management and clinical decision support system

This article is part of the Topical Collection on *Systems-Level Quality Improvement*

S. H. El-Sappagh
Department of Mathematics, College of Science, King Saud University, Riyadh, KSA, Saudi Arabia

S. El-Masri (✉)
Department of Information Systems, College of Computer and Information Sciences, King Saud University, Riyadh, Saudi Arabia
e-mail: selmasri@ksu.edu.sa

S. H. El-Sappagh · M. Elmogy · A. M. Riad
Faculty of Computers & Information, Mansoura University, Mansoura, Egypt

B. Saddik
College of Public Health and Health Informatics, University of King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

Published online: 24 June 2014

Springer

Introduction

Ontology is a formal and explicit specification of a shared conceptualization [1]. Ontology defines a common vocabulary for researchers who need to share information in a domain. It includes machine-interpretable definitions of basic concepts (classes) in the domain, properties of each concept describing various features and attributes of the concept (slots, relationships) and restrictions on slots (facets or role restrictions) [2]. Ontology together with a set of individual instances of classes constitutes a knowledge base. Ontology engineering methodology may be understood as an organized set of procedures and guidelines aiding and guiding the development of ontology during its lifecycle, or parts of it [3] and development can be top-down, bottom-up or middle-out.

A number of approaches have been reported for developing ontologies. Some of which describe how to build ontology from scratch or by reusing other ontologies [2–10]. All these methodologies are considered incomplete compared to the complete life cycle methodology in software engineering. Moreover, each methodology is specialized in a specific domain or for a specific purpose. In CBR field, case representation and case retrieval are the most important and completely related steps. Case representation defines the case base conceptual model, which can be physically stored in any format (i.e. XML, database, or even text file). There are many formats for case base such as feature vector and object oriented which shorten case retrieval process. In this paper, we will present how cases can be represented and stored in ontology. We will develop an ontology engineering methodology specialized in CBR case base creation. This case base can be instantiated in the medical domain. The combination of ontologies for domain and case base will achieve the Knowledge Intensive K₂-CBR [11]. As shown in Fig. 1, case retrieval has enough semantic understanding ability, which can accurately understand query intention and retrieve the desired case. The figure main steps are concept standardization with domain ontology, and case retrieval from case base ontology. Ontology has not

The Cyc project, started by Doug Lenat at MCC in , is the most ambitious knowledge representation project ever undertaken. It embodies Lenat's current ideas for a system intended to encode all of commonsense knowledge. The book by Lenat and Guha is a report on the project as it was in The book under review here, Building Large Knowledge-Based Systems: Representation and Inference in the Cyc Project, describes progress so far in an attempt to build a system that is intended to exhibit general common-sense reasoning ability. Building large knowledge-based systems: Representation and inference in the cyc project: D.B. Lenat and R.V. Guha? D.B. Lenat, M. Prakash, M. ShepherdCYC: using common sense knowledge to overcome brittleness and knowledge. Building large knowledge-based systems: Representation and inference in the cyc project: D.B. Lenat and R.V. Guha? J. Allen, R. Fikes, E. Sandewall (Eds.), Principles of Knowledge Representation and Reasoning: Proceedings Second. Building Large Knowledge-Based Systems; Representation and Inference in the . Douglas B. Lenat, R. V. Guha, The evolution of CycL, the Cyc representation .. Model and Manage Enterprise Projects, International Journal of Web Portals, Authors - Cited By. Building Large Knowledge-Based Systems: Representation and Inference in the Cyc Project [Douglas B. Lenat, R. V. Guha] on aceacademysports.com *FREE* shipping. Request PDF on ResearchGate Building large knowledge-based systems: Representation and inference in the cyc project: D.B. Lenat and R.V. Guha The . Building large knowledge-based systems: representation and inference in the Cyc project. Front Cover. Douglas B. Lenat, R. V. Guha. Addison-Wesley Pub. D. Lenat and R. Guha () Building Large Knowledge Based Systems: Representation and Inference in the Cyc Project. Addison-Wesley. Cyc is the world's longest-lived artificial intelligence project, attempting to assemble a . Typical pieces of knowledge represented in the Cyc knowledge base are "Every tree is a plant" and "Plants die eventually". When asked .. Building Large Knowledge-Based Systems: Representation and Inference in the Cyc Project. Building Large Knowledge-Based Systems has 2 ratings and 0 reviews: Large Knowledge-Based Systems: Representation and Inference in the Cyc Project., English, Book edition: Building large knowledge-based systems: representation and inference in the Cyc project / Douglas B. Lenat, R.V. Guha. The Cyc project, under the leadership of Douglas Lenat and R. V. Guha, is an Large Knowledge-Based Systems: Representation and Inference in the CYC. Building Large Knowledge-Based Systems: Representation and Inference in the Cyc Project by Douglas B. Lenat; R. V. Guha and a great selection of similar. building CYC, a universal schema of roughly gener- assumptions of doing such a large-scale project, reviews the technical lessons learned by the. The book by Lenat and Guha is a report on the project as it was in Large Knowledge-Based Systems: Representation and Inference in the Cyc Project. aceacademysports.com: Building Large Knowledge-Based Systems: Representation and Inference in the Cyc Project. This article lays the groundwork for the probabilistic multi-knowledge-base system (PMKBS), a new decision aid

specifically tailored to the needs of a. Building large knowledge-based systems: representation and inference in the Cyc project / Douglas B. Lenat, R.V. Guha. Other title(s):: CYC project.

[\[PDF\] Atti \(Italian Edition\)](#)

[\[PDF\] Mercruiser Stern Drives 1964 - 1991 \(Seloc Marine Tune-Up and Repair Manuals\)](#)

[\[PDF\] Southern Haunts \(Max Porter Mysteries Book 5\)](#)

[\[PDF\] Selected Papers: Field Theory and Symmetry Principles \(Contemporary Physicists\)](#)

[\[PDF\] Encyclopedia of Historians and Historical Writers, 2 Volume Set](#)

[\[PDF\] The Black Arts Handbook](#)

[\[PDF\] e-Study Guide for: Legal and Ethical Aspects of Health Information Management: Medicine, Healthcare](#)