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3.5.3 Comparison of Methodologies; 3.6 Role of Data Requirements in DQM; 3.6.1 Generic Data Requirement Types; 3.6.2 Challenges Related to Requirements Satisfaction; 4 Semantic Technologies; 4.1 Characteristics of an Ontology; 4.2 Knowledge Representation in the Semantic Web; 4.2.1 Resources and Uniform Resource Identifiers (URIs); 4.2.2 Core RDF Syntax: Triples, Literal Triples, and RDF Links; 4.2.3 Constructing an Ontology with RDF, RDFS, and OWL 4.2.4 Language Profiles of OWL and OWL 24.3 SPARQL Query Language for RDF; 4.4 Reasoning and Inferencing; 4.5 Ontologies and Relational Databases; 5 Data Quality in the Semantic Web; 5.1 Data Sources of the Semantic Web; 5.2 Semantic Web-specific Quality Problems; 5.2.1 Document Content Problems; 5.2.2 Data Format Problems; 5.2.3 Problems of Data Definitions and Semantics; 5.2.4 Problems of Data Classification; 5.2.5 Problems of Hyperlinks; 5.3 Distinct Characteristics of Data Quality in the Semantic Web; PART III - Development and Evaluation of the Semantic Data Quality Management Framework 6 Specification of Initial Requirements 6.1 Motivating Scenario; 6.2 Initial Requirements for SDQM; 6.2.1 Task Requirements; 6.2.2 Functional Requirements; 6.2.3 Conditional Requirements; 6.2.4 Research Requirements; 6.3 Summary of SDQM's Requirements ; 7 Architecture of the Semantic Data Quality Management Framework (SDQM); 7.1 Data Acquisition Layer; 7.1.1 Reusable Artifacts for the Data Acquisition Layer; 7.1.2 Data Acquisition for SDQM; 7.2 Data Storage Layer; 7.2.1 Reusable Artifacts for Data Storage in SDQM; 7.2.2 The Data Storage Layer of SDQM; 7.3 Data Quality Management Vocabulary 7.3.1 Reuse of Existing Ontologies

Sommario/riassunto

Christian Fürber investigates the useful application of semantic technologies for the area of data quality management. Based on a literature analysis of typical data quality problems and typical activities of data quality management processes, he develops the Semantic Data Quality Management framework as the major contribution of this thesis. The SDQM framework consists of three components that are evaluated in two different use cases. Moreover, this thesis compares the framework to conventional data quality software. Besides the framework, this thesis delivers important theoretical findings, namely a comprehensive typology of data quality problems, ten generic data requirement types, a requirement-centric data quality management process, and an analysis of related work. Contents Data Quality and Semantic Technology Basics Data Quality in the Semantic Web Architecture and Evaluation of the Semantic Data Quality Management Framework Target Groups Researchers and students in the fields of economics, information systems and computer science Practitioners in the areas of data management, process management and business intelligence The Author Dr. Christian Fürber completed his doctoral study under the supervision of Prof. Dr. Martin Hepp at the E-Business and Web Science Research Group of the Universität der Bundeswehr München. He is founder and CEO of the Information Quality Institute GmbH, a company that consults organizations of any size to improve the quality of their data.
