

Semantic Management of Middleware

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Semantics provide the cognitive base for the modern information system. The semantics play the important role on building middleware. Middleware can largely ease the heterogeneity and increasing complexity of the distributed information systems. The information system researchers try to address the challenges in framing middleware applications for developers and administrators. Modern middleware development depends on the efficient use of several distributed applications for which newer conceptual models are required. While it is true that certain procedures such as 'remote procedures calls' are required for the modern middleware applications, most of the newer techniques are generated and developed in this area. Realising this central issue, this book deals with the semantic aspect of middleware where middleware improvement largely depends on formalization of many aspects of ontologies.

The ten textual chapters in this current book address the different but comprehensive views on ontology for middleware.

The chapter two, besides the chapter one deals not just the conceptual aspect of middleware but it contains a well-built text on development of middleware since the period of the creation of conventional middleware. It presents the types of middleware and the historical view of the middleware including a focus on how to construct the distributed middleware from scratch. Besides, an outline of middleware for enterprise application integration and B2B application integration and application servers are given.

Ontology comes from the classical philosophy. The real understanding of the concept is essential for the successful weaving of semantic information system. Hence, the chapter three begins with a clear conceptual explanation and discussion of the notion of ontology. Classification of ontologies in different perception such as according to purpose, expressiveness and specificity are described as the central part of this chapter. The constraints and possible applications of the ontology that motivate the use of ontology for varied applications are presented as the base for the proper exploitation of ontology.

The semantic management of software components and web services for the administrators and developers are addressed in the chapter four. Understanding the different layers of semantic web is needed to properly employ in applications. The application of semantic web for mobile broadband communication is discussed in this chapter.

The chapter five discusses the existing ontologies and the scope and potential so that the developers and administrators can properly exploit the middleware application. The basic effort to build the prominent web service application is the OWL; its modules such as serviceprofile, servicemodel and servicegrounding are discussed in the chapter.

The author highlighted the need for the building of management ontology for an appropriate fundamental ontology. The chapter six presents a description of the methodologies for the fundamental ontologies such as BFO, DOLCE, OCHRE, OpenCyc and SUMO.

In an exclusive chapter on DOLCE, the author has discussed the modeling basis for building a sound ontology. As DOLCE provides the required theories for modeling contexts, plans and information aspects a wider orientation on it is given in the specific chapter.

The complete design of an ontology-base application server has been presented in the chapter eight. The design issues including the platforms, semantic descriptions and the integration of inference engine are addressed this chapter. This chapter is concluded with the description of semantic management of web services.

In the ninth chapter the author has described the architecture of an ontology-based application server for the effective semantic management of components and services. The implementation elements of the application server and integration of ontology infrastructure such as inference engine, ontology store, ontology editor and other components are detailed in the chapter.

The adaptation of the axiomatization to the KAON language is required for applying the management ontology. The issues relating to the re-use of ontology are extensively addressed in the chapter ten. Moving from core to domain is the key to reuse of management ontology. As the KAON server is based on J2EE, the analysis of the typical concepts prevailing in the KAON server is required.

In a different view, the author has presented a well descriptive section on related work on this topic. The uniqueness in this book is the presentation of taxonomies of various ontologies that include the ontology of plants, information objects, core software ontology, core ontology of web services and KAON server ontology. Besides, the author has enumerated a long list of references on the semantic management of middleware.

The book has addressed the important issues on weaving semantic web. This reader is useful to students, researchers and teachers to understand ontologies for middleware and to developers and administrators who like to apply semantics to middleware.

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