一种基于广义决策逻辑的面向终端用户的服务组合形式化模型①

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A Generalized Decision Logic-Based End User-Oriented Service Composition Formal Model

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Abstract: Service Oriented Architecture (SOA) and Service Oriented Computing (SOC) are prevailing technologies for sharing and reusing resources. Service composition is an envisioned methodology used in SOA and SOC to build value-added services. The existed service composition models are mostly information technology expert-oriented and there is few considering the requirement from the point of view of end-users. Different with the IT experts, who can express their requirements using precise and well-formed formal language and understand the formal description of web service, the end-users are unnecessarily to be sophisticated on the complicated knowledge of computer science and are prone to consider the service composition in fuzzy and rough fashions. There's seldom work carried on considering the contradiction between the vague and uncertain requirements of end-user and the precise and deterministic process of service composition. Granular computing is a kind of promising methodology for solving the fuzzy and rough problems in artificial intelligence, interval theory, rough set theory and cluster analysis, etc. The basic idea of granular computing is problem solving with different granularities, which can be used in service composition to solve the aforementioned contradiction intuitively, that is, it can be used to create a multi-grain model for service composition and make users and service composition agent work in different information granule level separately. A multi-grain formal model for service composition is proposed in this paper. This model considers the requirement of customers in service composition in the end-user view and we give a formal specification on mapping the web service description to the generalized decision logic language (GDL) for construction of multi-grain service composition view. GDL is a formal logic language proposed in granular computing research community as an expecting specification for definition of granular models. The proposed model is expected to provide a more understandable view for an end-user than traditional service composition model and conforms to the human cognition mode.

Key words: SOA; SOC; service composition; granular computing; generalized decision logic

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