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A Causality Space Model of the Web Service Quality Based on Fuzzy Theory

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The quality of Web Services (QoS) is an essential characteristic in selecting a web service (WS) and achieving appropriate results regarding end-user expectations and satisfaction. In the scientific literature, authors have proposed various QoS attributes, like throughput, latency, response time, etc., that allow us to determine the WS QoS at different software systems development layers, such as business service layer, business process layer, WS layer, component layer, infrastructure service layer, and network layer. All these layers directly and indirectly influence each other. Therefore, we need an approach describing and allowing us to determine the causality relationships among QoS attributes in different layers. Understanding and modelling those causality relationships allows us to improve the WS QoS, its internal validity, and the robustness of WS. In this research, we present the causality space model that identifies QoS attribute relationships at different layers and models them using a Fuzzy Set Theory. The proposed WS QoS causality space model allows the researchers and practitioners to view and deeper understand the WS development peculiarities and the end-users to select the most suitable WS.