

Ontology-Driven Approach for KPI Meta-modelling, Selection and Reasoning

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Resumen(Abstract). A key challenge in current Business Analytics (BA) is the selection of suitable indicators for business objectives. This requires the exploration of business data through data-driven approaches, while modelling business strategies together with domain experts in order to represent domain knowledge. In particular, Key Performance Indicators (KPIs) allow human experts to properly model ambiguous enterprise goals by means of quantitative variables with numeric ranges and clear thresholds. Besides business-related domains, the usefulness of KPIs has been shown in multiple domains, such as: Education, Healthcare and Agriculture. However, finding accurate KPIs for a given strategic goal still remains a complex task, specially due to the discrepancy between domain assumptions and data facts. In this regard, the semantic web emerges as a powerful technology for knowledge representation and data modeling through explicit representation formats and standards such as RDF(S) and OWL. By using this technology, the semantic annotation of indicators of business objectives would enrich the strategic model obtained. With this motivation, an ontology-driven approach is proposed to formally conceptualize essential elements of indicators, covering: performance, results, measures, goals and relationships of a given business strategy. In this way, all the data involved in the selection and analysis of KPIs are then integrated and stored in common repositories, hence enabling sophisticated querying and reasoning for semantic validation. The proposed semantic model is evaluated on a real-world case study on water management. A series of data analysis and reasoning tasks are conducted to show how the ontological model is able to detect semantic conflicts in actual correlations of selected indicators.