

A Methodology to Integrate Data in the Company Based on the Semantic Standard in the Context of Industry 4.0

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Abstract : Nowadays, companies are facing lots of challenges in the process of digital transformation, which can be a complex and costly undertaking. Digital transformation involves the collection and analysis of large amounts of data, which can create challenges around data management and governance. Furthermore, it is also challenged to integrate data from multiple systems and technologies. Although with these pains, companies are still pursuing digitalization because by embracing advanced technologies, companies can improve efficiency, quality, decision-making, and customer experience while also creating different business models and revenue streams. In this paper, the issue that data is stored in data silos with different schema and structures is focused. The conventional approaches to addressing this issue involve utilizing data warehousing, data integration tools, data standardization, and business intelligence tools. However, these approaches primarily focus on the grammar and structure of the data and neglect the importance of semantic modeling and semantic standardization, which are essential for achieving data interoperability. In this session, the challenge of data silos in Industry 4.0 is addressed by developing a semantic modeling approach compliant with Asset Administration Shell (AAS) models as an efficient standard for communication in Industry 4.0. The paper highlights how our approach can facilitate the data mapping process and semantic lifting according to existing industry standards such as ECLASS and other industrial dictionaries. It also incorporates the Asset Administration Shell technology to model and map the company's data and utilize a knowledge graph for data storage and exploration.

Keywords : data interoperability in industry 4.0, digital integration, industrial dictionary, semantic modeling

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