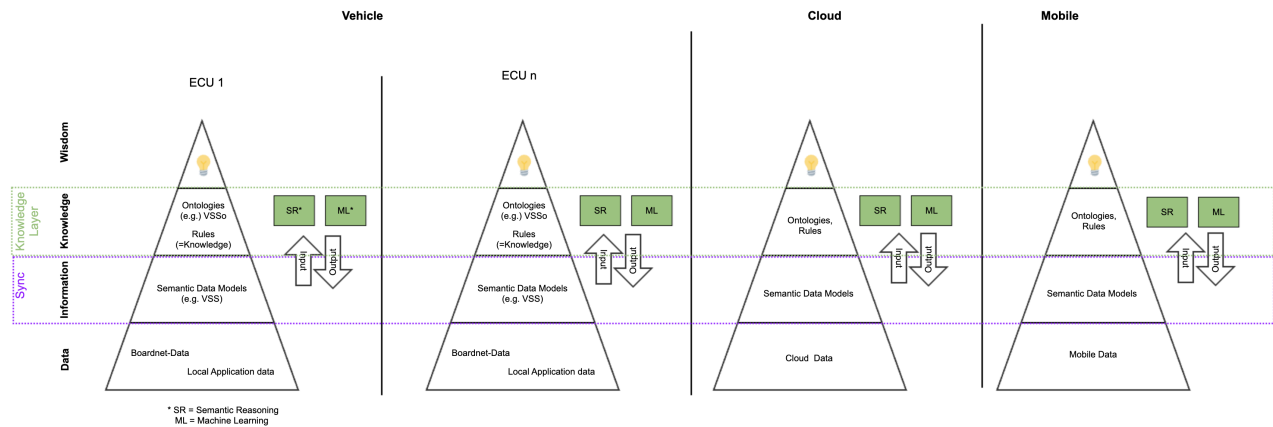# Proposal for the elaboration of a Data Architecture framework including a Knowledge Layer.

Proposal for Developing an Official Guideline on Data Architecture Standardization: Integration and Communication of (Generated) Knowledge in a Knowledge Layer of a Data-Centric Architecture

Title:

Guideline for Integrating and Communicating (Generated) Knowledge in the Knowledge Layer of a Data-Centric Architecture

Introduction:

The automotive industry, along with many other sectors, is currently undergoing a significant shift from application-centric to data-centric architectures. In this context, the need for a Knowledge Layer as part of the architecture becomes increasingly evident. A Knowledge Layer enables the effective integration and communication of generated knowledge - for example with the help of Machine Learning (ML) or Semantic Reasoning (SR) -, or knowledge which is explicitly or implicitly hidden in data models or logic like rules. However, it is necessary to outline how such a Knowledge Layer can be defined and implemented in a data-centric architecture and the impact it has on architecture decisions.

Challenges:

When developing a data-centric architecture with a Knowledge Layer, the following aspects are of particular importance and should be considered in the guideline:

- How can the Knowledge Layer be defined and designed in a data-centric architecture?
- What role does the Knowledge Layer play in handling and communicating generated knowledge?
- In what form and based on which methodology can knowledge be shared with other stakeholders in the Knowledge Layer?
- What are the implications of the Knowledge Layer on architecture decisions?
- What is the interaction of a Knowledge Layer, as found in the DIKW pyramid, with the other layers of the pyramid (Data, Information and Wisdom)?

Proposal:

As part of our initiative for data architecture standardization, we propose developing a comprehensive guideline that addresses the integration and communication of generated knowledge in the Knowledge Layer of a data-centric architecture. This guideline aims to provide practical guidelines and cover the following aspects:

1. Definition and design of the Knowledge Layer:

    - Examination of the concepts and principles that constitute an effective Knowledge Layer in a data-centric architecture.
    - Identification of the necessary components and functions to successfully implement the Knowledge Layer.
2. Handling and communication of knowledge:

    - Development of methods for detecting and evaluating generated knowledge in the Knowledge Layer.
    - Best practices and techniques for effective communication and dissemination of knowledge to other stakeholders in the Knowledge Layer.
3. Implications on architecture decisions:

- Analysis of how the Knowledge Layer influences decision-making and architecture development.
- Consideration of the DIKW pyramid perspective to identify and prioritize relevant data and knowledge flows across different layers of the architecture.

Goal:

Through this guideline, we aim to provide architects, data experts, and industry decision-makers with a comprehensive foundation to enhance the handling of generated knowledge in the Knowledge Layer of a data-centric architecture and understand its impact on architecture decisions.

Follow-up

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- Presentation to the VSSo group 29th August 2023