Collaborative Discussion 2: Summary Post

After reading my peer's posts, I revisited my initial understanding of the article by Fortino et al. (2015) and enhanced my perspective on the strengths and weaknesses of metamodels in IoT system design. Initially, I focused on the structured approach provided by metamodels at different abstraction levels to support the analysis, design, and implementation phases. The feedback from peers brought to light additional dimensions of this methodology, particularly the conceptual clarity and compartmentalization that facilitate easier development and understanding of complex systems.

Conceptual Clarity and Standardization: As highlighted by peers, metamodels provide a higher-level abstraction that promotes reusability and standardization across different domains and business use cases. This aligns with my initial understanding and further emphasizes the adaptability of metamodels in various IoT applications (Fortino et al., 2015).

Ease of Development: Metamodels' compartmentalized approach, where implementation and interfaces are defined separately, simplifies the development process. This modularity helps manage large-scale IoT projects.

A significant weakness discussed is the generic nature of metamodels, which may fail to capture detailed entities. This insight led me to consider the importance of domain-specific customisation from domain experts to ensure models are sufficiently detailed.

Another critical point was the risk of incompatibility and challenges in adapting metamodels to evolving requirements. Implementing an iterative development process with continuous feedback can help mitigate these challenges and ensure the models remain relevant to the evolving requirements.

Some of my peers proposed a more comprehensive framework for designing an intelligent model for driverless cars using an object-oriented approach than I initially defined. Their suggestions to include high-level components such as sensor objects, actuator objects, perception modules, decision-making modules, and communication modules enhanced my understanding of the components needed in real life for functioning autonomous vehicles (Savaglio et al., 2020).

References:

Fortino, G., Guerrieri, A., Russo, W., & Savaglio, C. (2015). Towards a development methodology for smart object-oriented IoT systems: A metamodel approach. In 2015 IEEE international conference on systems, man, and cybernetics (1297-1302). IEEE.

Henderson-Sellers, B. (2011). Bridging metamodels and ontologies in software engineering. Journal of Systems and Software, 84(2), 301-313.

Savaglio, C., Ganzha, M., Paprzycki, M., Bădică, C., Ivanović, M., & Fortino, G. (2020). Agent-based Internet of Things: State-of-the-art and research challenges. Future Generation Computer Systems, 102, 1038-1053.