

Specifications in the Operational Context - Behavior and Capabilities

10.5 | Guideword-based ODD tailoring: Towards making ODD descriptions processable for different stakeholders

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Motivation: One scope of the ODD description cannot equally satisfy the concerns of all stakeholders

The Operational Design Domain (ODD) encompasses various stakeholders, each with distinct challenges necessitating tailored support in this complex environment.

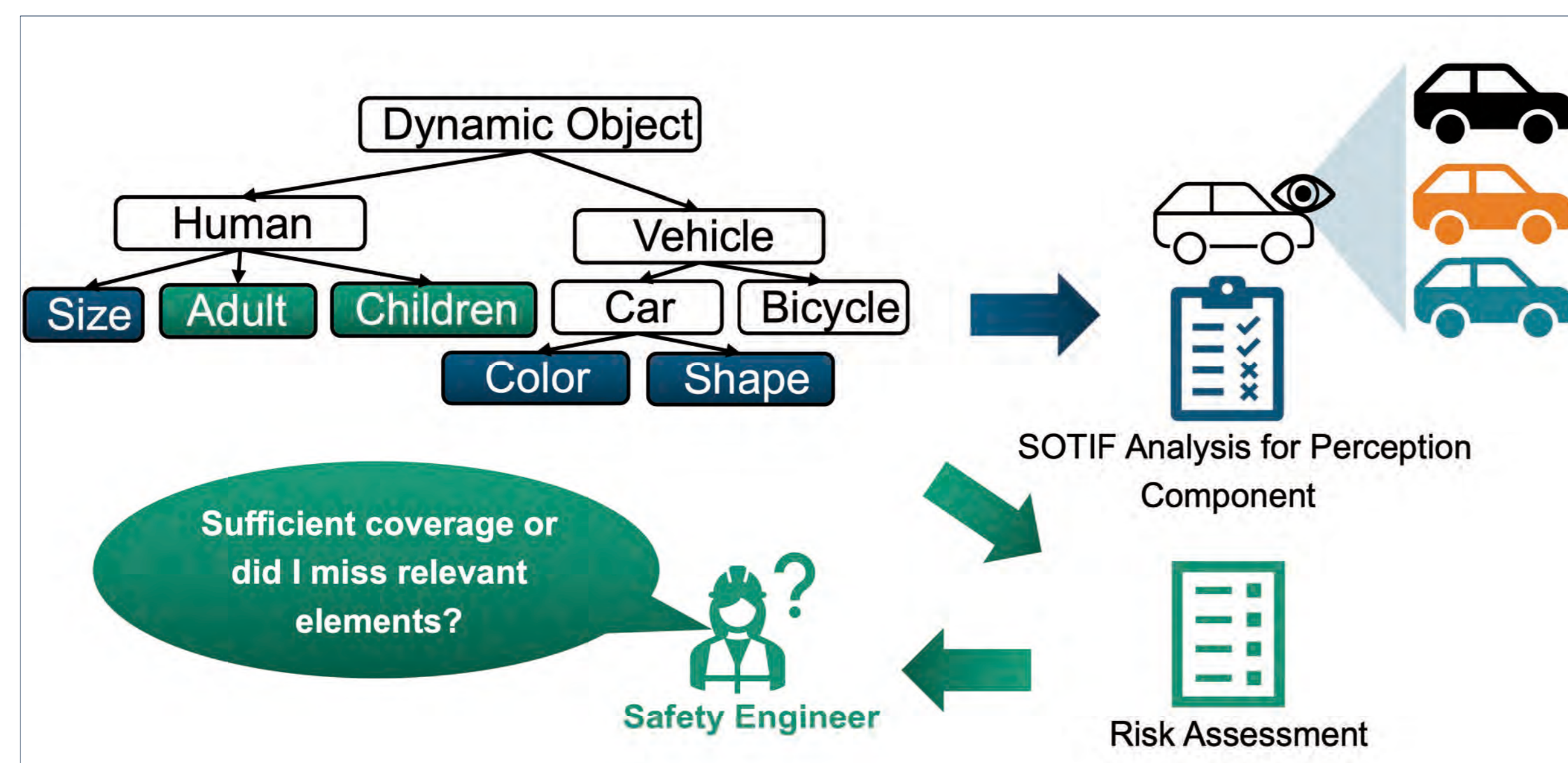


Figure 1: Different stakeholder require different elements in their ontology which are reflected in the ODD description

For example:

- Safety engineers, while assessing the Safety of the Intended Functionality (SOTIF) for a perception component, may consider factors like the size of humans or the color of vehicles.
- However, when safety engineers analyze the target behavior, their focus shifts to distinguishing between adults and children, rather than simply considering the general size of humans, because their behaviors may require different actions.

→ **One degree of abstraction is not sufficient to equally support the concerns of all stakeholders.** Tailoring the ontology ad-hoc leads to an ontology where engineers have low confidence in its quality. They may question:

- Are there sufficiently many elements described that are relevant to my tasks?
- Which elements are irrelevant for my activity?

Problem: How can engineers tailor an ODD description towards their activities?

Define a systematic process to increase the trustworthiness and the coverage of the refined ontology with respect to the targeted activity.

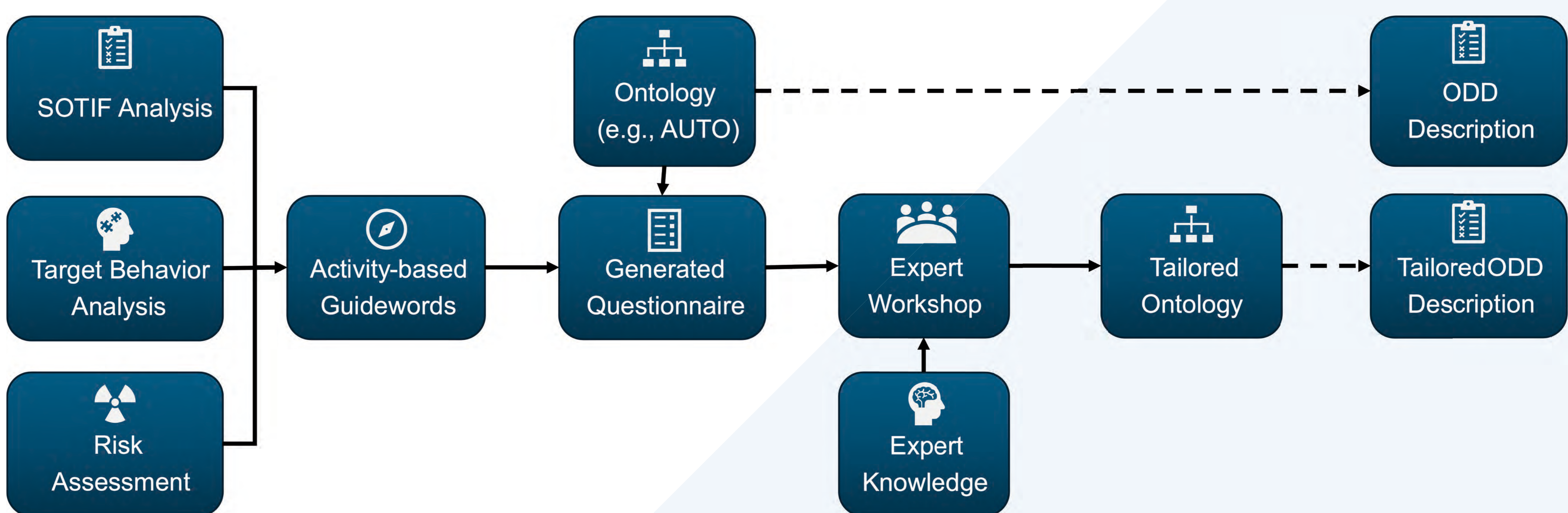
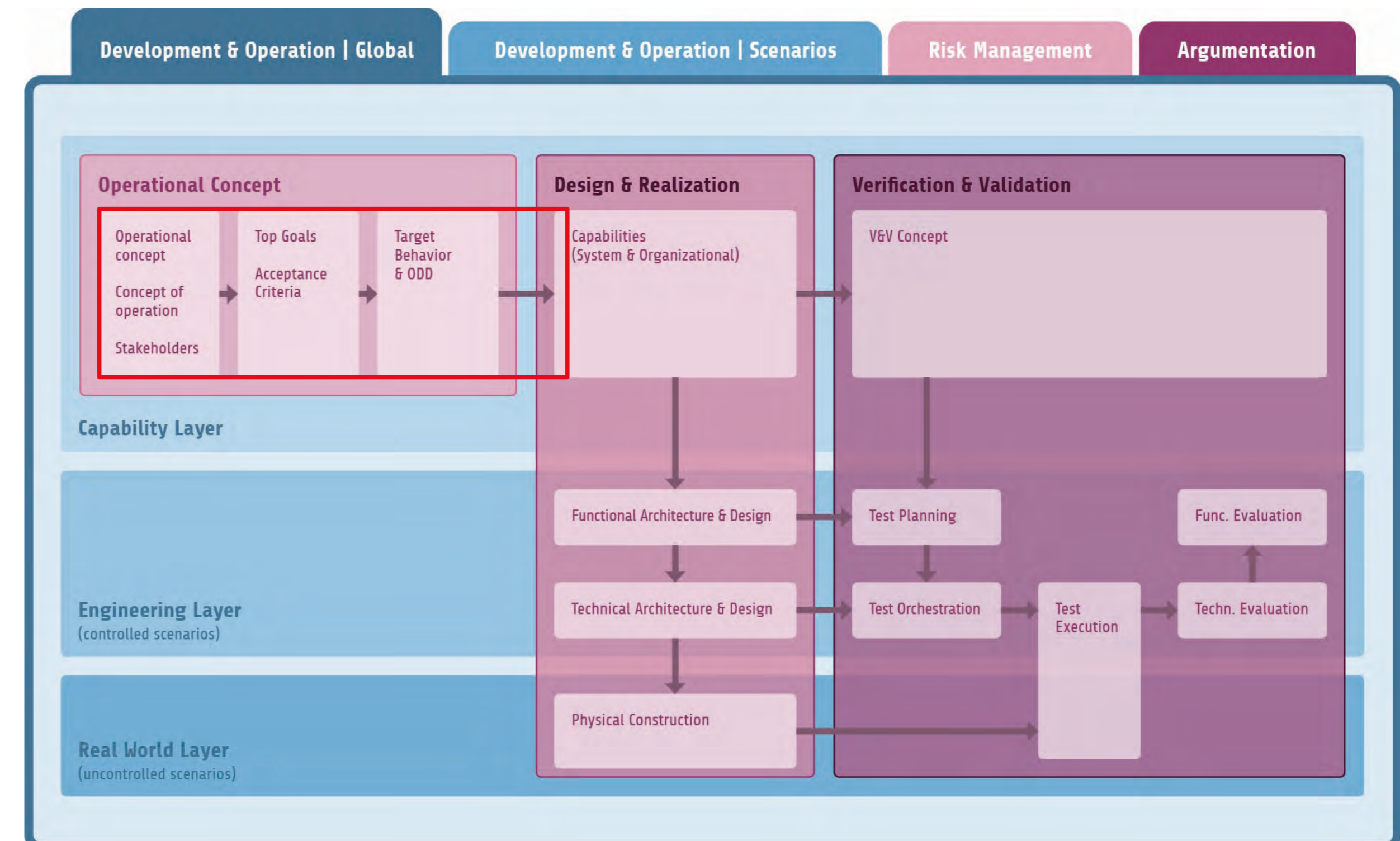


Figure 2: Overview of the guideword-based ODD tailoring method



Solution: Guideword-based ODD tailoring method

The method consists of 3 major steps:

1. Identifying feasible guidewords
2. Generate questionnaire with guidewords
3. Answer the questionnaire and refine the base ontology

1. Identifying Guidewords

- Guidewords are contingent on the activity
- Improve the quality, e.g. coverage
- Refined through criteria
- Supporting questions to inspire experts

2. Generate Questionnaire

- Generate questions by combining base ontology elements with guidewords, criteria and supporting questions

3. Answer the questionnaire

- Individually or via expert workshop
- Support of large language models (e.g., ChatGPT) to increase coverage of the results of the expert round
- Expand and refine the base ontology

Conclusion

The guideword-based approach can improve the quality of the ontology and the respective ODD description by systematically tailoring it to the needs of the stakeholders. It further serves as a foundation for supporting various engineers with their activities.

Key Artefacts

Partners



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