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CZECH TECHNICAL UNIVERSITY IN PRAGUE

SAPIENZA
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# Functional modeling in safety by means of foundational ontologies

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# Object-based modeling

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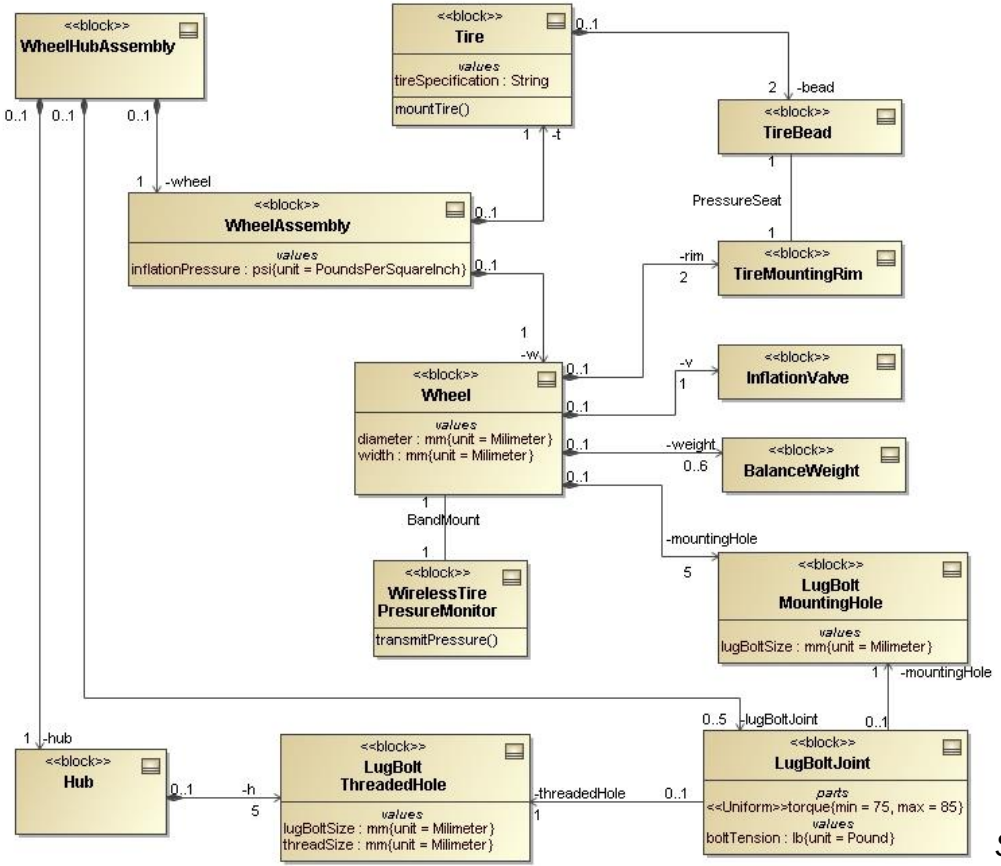
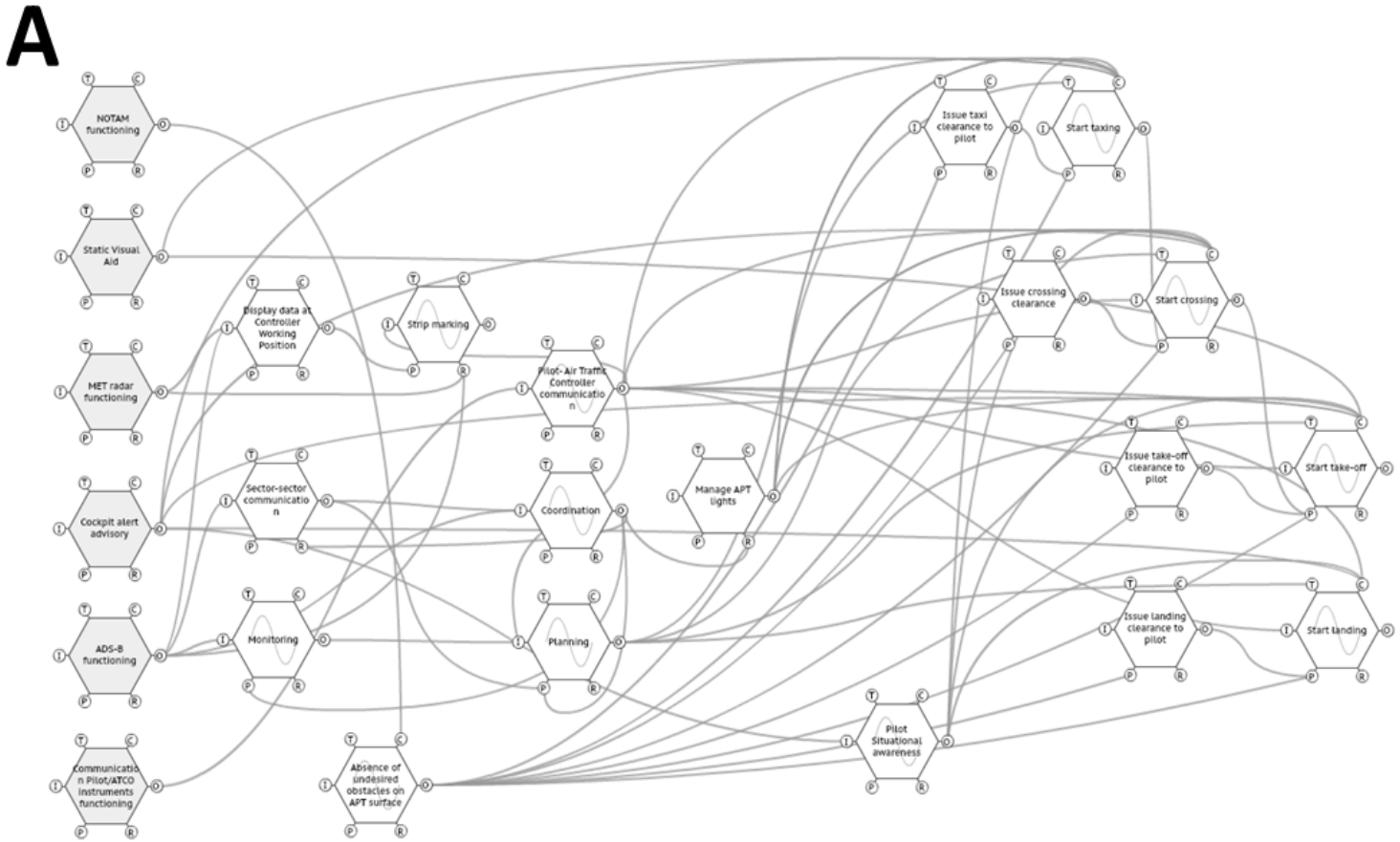
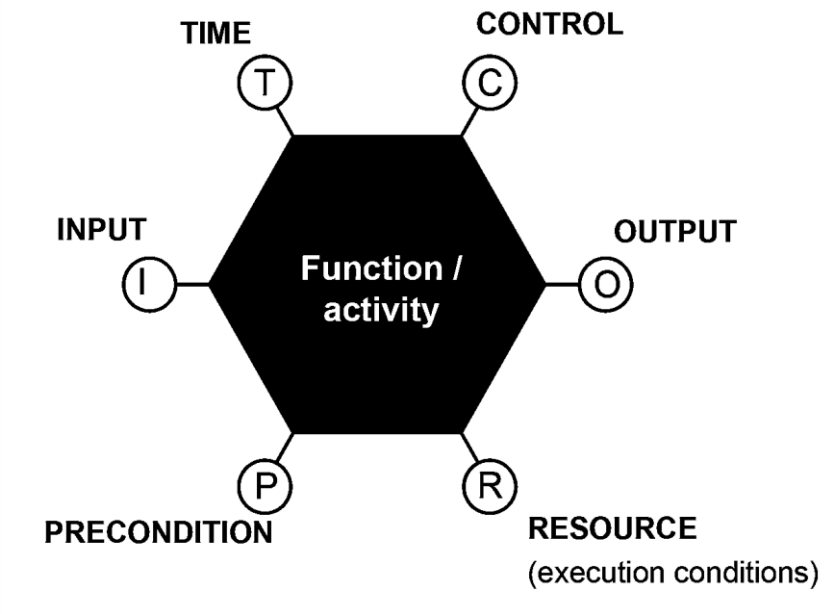



*Source: http://docs.oasis-open.org/*

# Functional modeling



# Functional modeling



# FRAM method

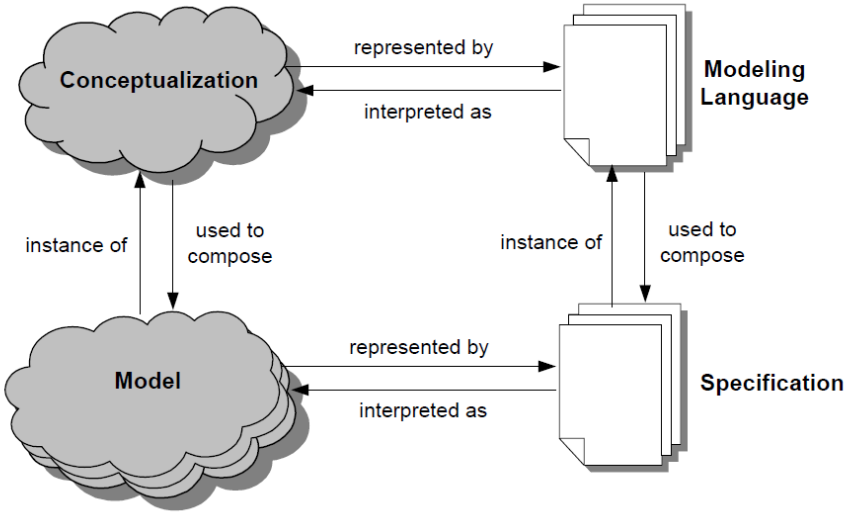
- Functional Resonance Analysis Method (Hollnagel, 2012)
- Industrial applications can produce different models of the same system
- IT and computer science sensitive to precise semantics
- What is actually a function in FRAM?

# Methodology

- Development of domain ontology representing FRAM function
- Model an instance of a function from previous studies
- Evaluation of the proposed ontology

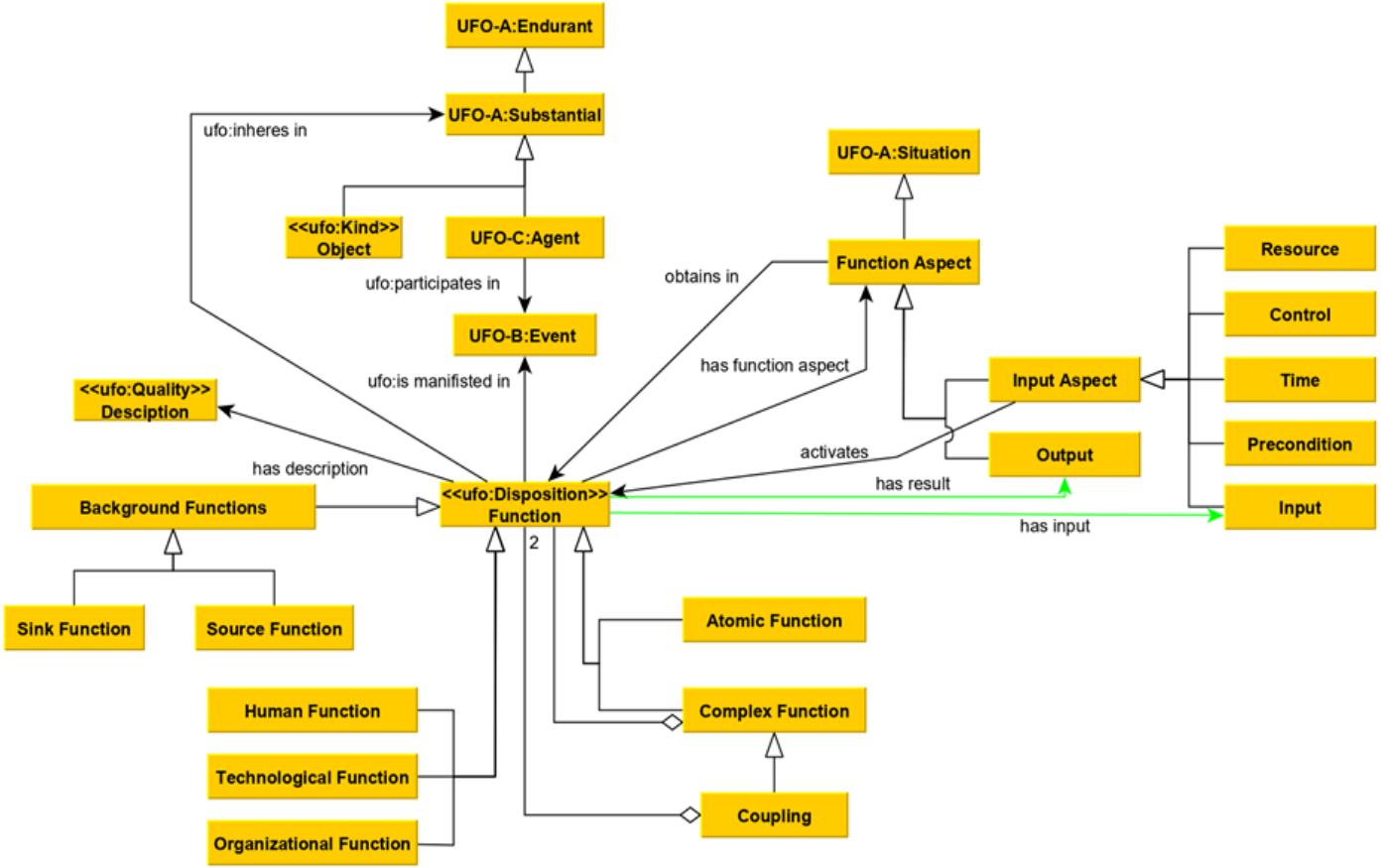
# Domain ontology

- Produced by the conceptualization of Unified Foundational Ontology
- Domain independent conceptualization to model the domain

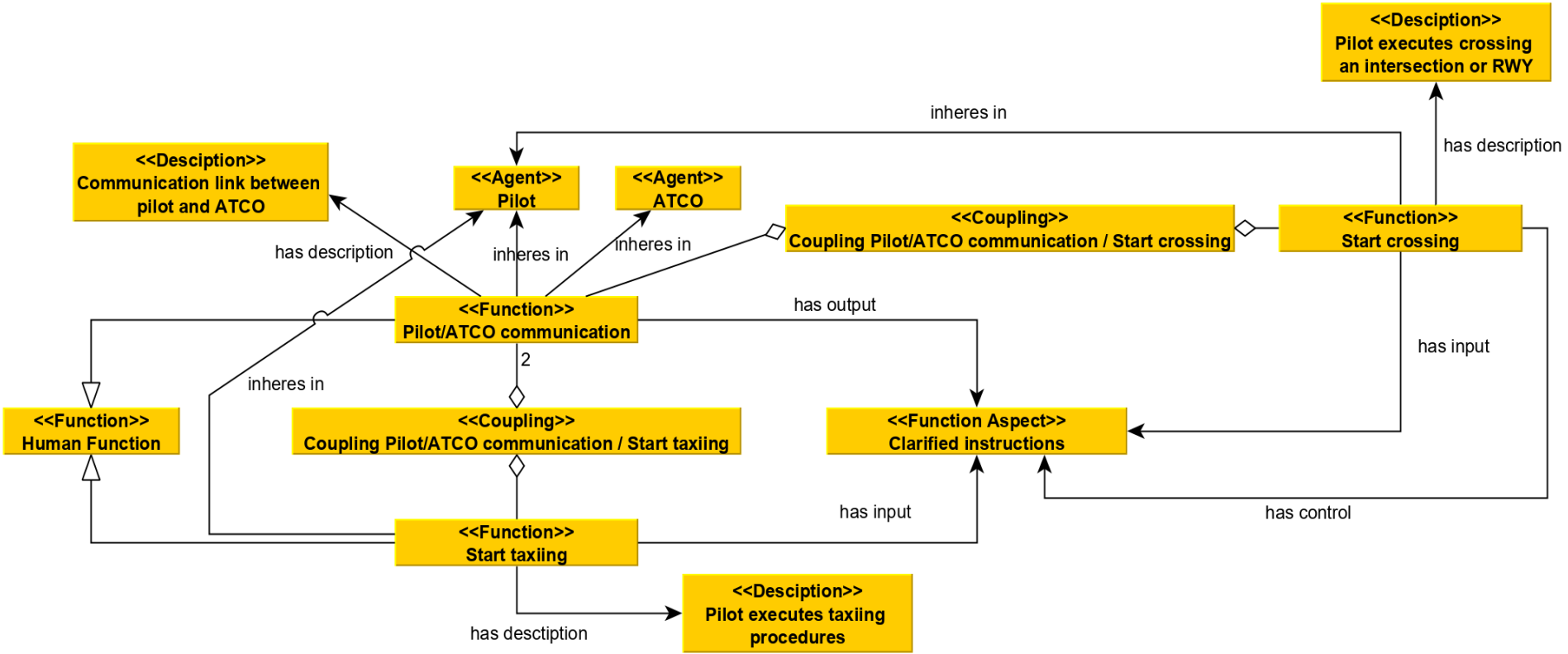



*Source: Guizzardi (2005)*

# Domain ontology



# Instance of a function



# Conclusion

- Precise, computer-readable definition of a function was achieved
- Disambiguation of a *Function*, *Function Aspect* and *Coupling*
- Enabled conceptual integration with other safety models and methods
- Faster, simpler but more precise FRAM modeling

# References

Guizzardi, G. (2005). *Ontological Foundations For Structural Conceptual Models*. Ph.D. thesis. Telematics Instituut, Entschede, Netherlands.

Hollnagel, E. (2012). *FRAM: The Functional Resonance Analysis Method. Modelling Complex Socio-technical Systems*. Burlington, VT: Ashgate.