

From Storylines to Ontologies

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Stakeholders Elicitation

Ontological models

Ontological models are effective for sharing an ontological commitment among stakeholders in an organization to achieve several key goals. These include: (1) developing a deeper understanding of a specific domain; (2) establishing a formal communication channel between stakeholders with disparate perspectives; and (3) inferring other knowledge using a formal set of inference rules.

The Challenge

Creating ontological models in a heterogeneous organizational setting, where different perspectives are involved is a challenge.

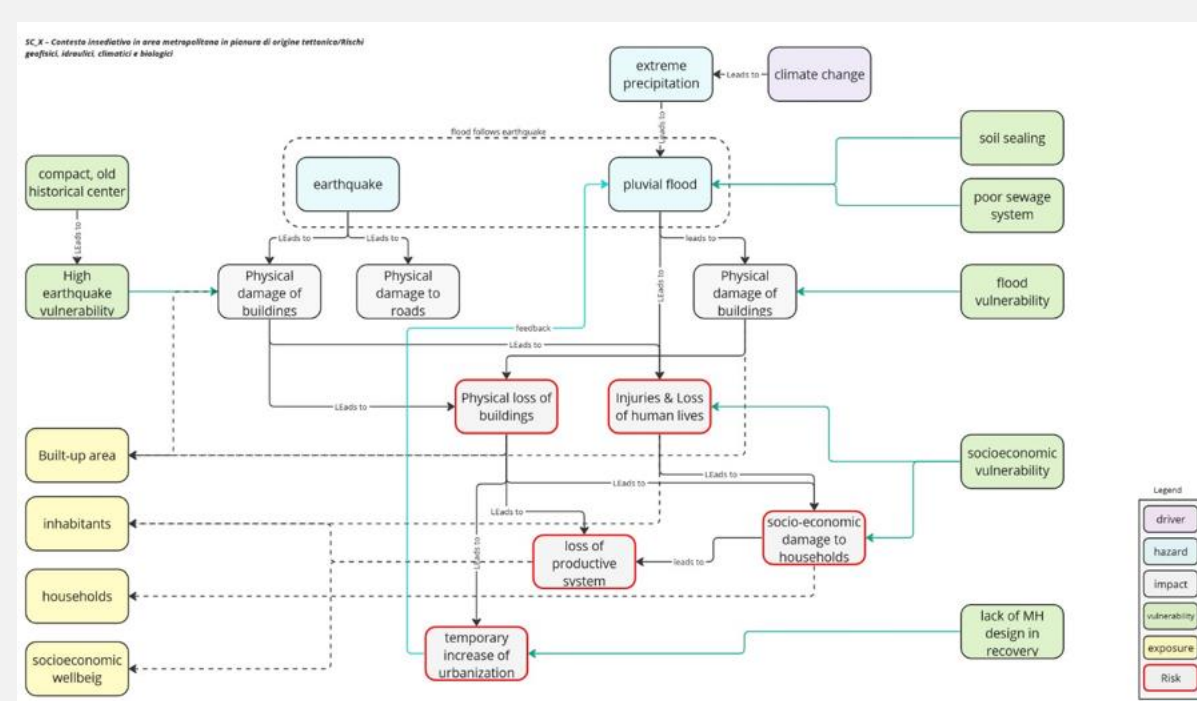
RQ: How can a “near-universal conceptualization, or ontology, be adopted to ensure interoperability of data produced by stakeholders”?

Our Contribution

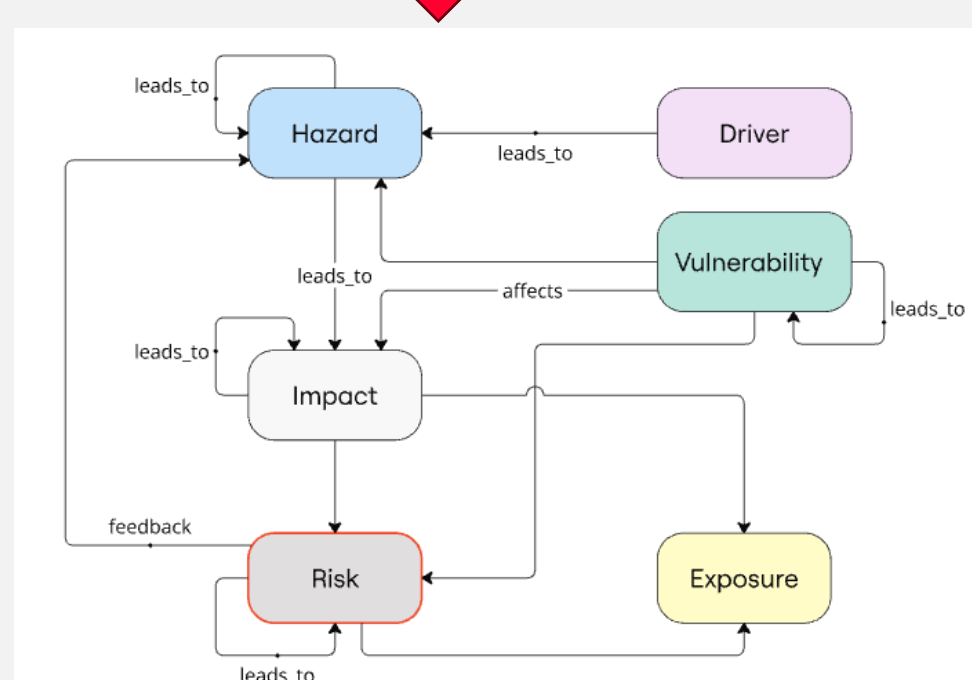
Storylines can facilitate the integration of multiple perspectives when considering distinct narratives of a past or potential future scenario. In the Return project, we have employed risk storylines and ontologies in the conceptual modeling of urban systems, utilizing both top-down and bottom-up approaches. The bottom-up ontology engineering was based on risk storylines, whereas the top-down approach was founded on theories and technical documents on risks and urban systems.

Results

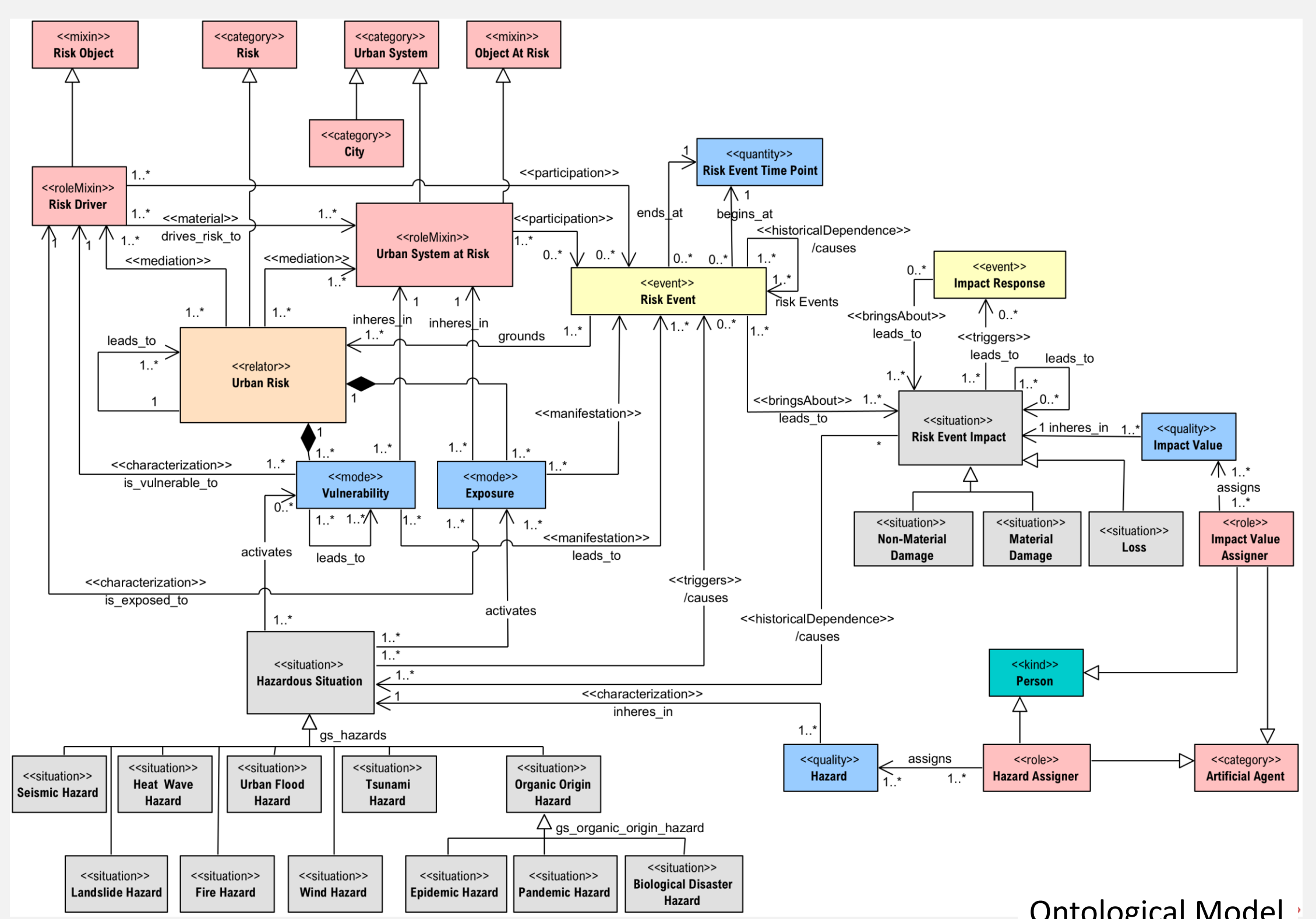
A comparison of the results indicated the presence of concepts at increasingly specialized levels in the bottom-up approach. In contrast, the top-down approach yielded significant abstract concepts derived from risk theories that were not observed in the risk storylines. Subsequently, the resulting models were integrated into a unified model to create a more comprehensive representation that aligns more closely with the perceived reality of the domain under consideration. The risk-driven ontology of urban systems provides a realistic representation of events and processes that unfold over time, based on the various elaborated storylines. This enables the analysis of a range of potential scenarios, including those with the most favorable outcome (upward counterfactuals) and those with the least favorable outcome (downward counterfactuals). Such a hybrid approach could be useful in predictive scenarios where risk drivers coexist in a given city.



Storylines



Conceptual Model



Ontological Model

