EXPO: TOWARDS EXPLAINING ONTOLOGY-DRIVEN CONCEPTUAL MODELS

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PROBLEM

Ontology-driven conceptual models play an explanatory role in complex and critical domains. However, since those models may consist of a large number of elements, including concepts, relations and sub-diagrams, their reuse or adaptation requires significant efforts.

BACKGROUND

EXISTING ARTEFACTS

UFO

FAIR Catalog

OntoUML Plugin

Also, there are already existing algorithms for ontology-driven conceptual models **clustering** [1] and **abstracting** [2].

DESIGN GOALS

DG1 **Support different levels of expertise.** For users with less modeling experience the system should remain intuitive.

DG2 **Minimize setup difficulties.** Novice users with little technical background should receive a ready-to-use tool.

DG3 **Enable interactive exploration.** Interaction plays a critical role in providing explanations and reaching understanding.

DG4 **Build on familiar representations.** The system should use standard visual representations of graphs as node-link diagrams.

DG5 **Keep the original layout.** The system should try to keep the original (expert) layout of the model.

"overview first, zoom and filter, then details on demand" [3]

APPROACH: THREE COMPONENTS

EXPOSE

FOCUS Focus on the given node and keep reachable concepts.

CLUSTER Apply relator-centric clustering [1].

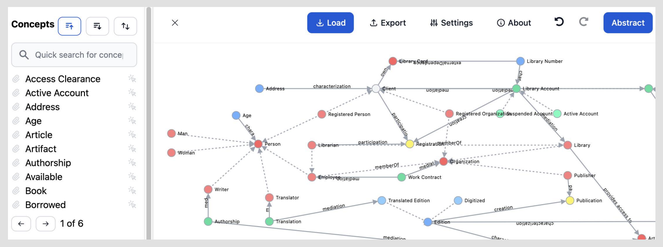
DEFINE Provide several definitions of the concept from a dictionary.

EXPAND Find a similar concept (by name and stereotype) in the FAIR Catalog and extend the model.

ABSTRACT Apply abstraction according to the algorithm [2].

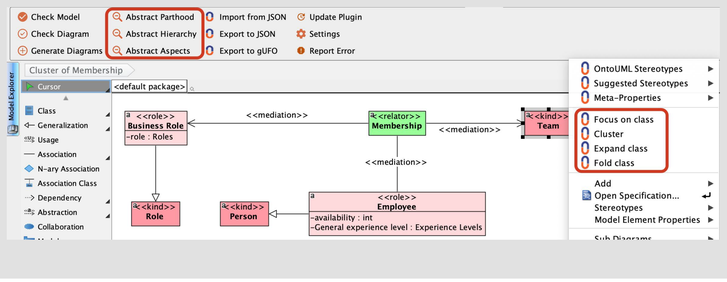
FOLD Collapse all hierarchical and part-whole relations of the node.

EXPO WEB APPLICATION: HTTPS://W3ID.ORG/EXPO



GitHub

ONTOUML & EXPO PLUGIN FOR VISUAL PARADIGM



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FUTURE STEPS

- providing other operations, e.g., showing hierarchy above/below the concept of interest;
- adaptation of the algorithms to seeding concepts - those, that should always be kept after operation application;
- qualitative user study. **WE ARE LOOKING FOR PARTICIPANTS!**

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DEMO

REFERENCES

1. Guizzardi, G., Sales, T.P., Almeida, J.P.A., Poels, G.: Automated conceptual model clustering: A relator-centric approach. Software and Systems Modeling 21, 1363–1387 (2022).
2. Romanenko, E., Calvanese, D., Guizzardi, G.: Abstracting ontology-driven conceptual models: Objects, aspects, events, and their parts. In: Proc. of the 16th Int. Conf. on Research Challenges in Information Science (RCIS). LNBIP, vol. 446, pp. 372–388. Springer (2022).
3. Shneiderman, B.: The eyes have it: a task by data type taxonomy for information visualizations. In: Proc. of the 1996 IEEE Symposium on Visual Languages. pp. 336–343. IEEE Computer Society (1996)
4. Romanenko, E., Calvanese, D., Guizzardi, G.: Towards Pragmatic Explanations for Domain Ontologies. In: Knowledge Engineering and Knowledge Management (EKAW). LNCS, vol 13514, pp. 201–208. Springer (2022).