

Support for Domain Model Authoring

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We live in times when people use information technology through which they produce many information. This fact is powered by using the Internet as a universal tool for communication. Due to this fact, a need for an intelligent and quick search, visualization and last but not least navigation across the digital space created from the data arises. An approach to the problem area appears to be semantics. Ontologies, as representatives of semantics, are often seen as a response to the need for an interoperable semantics in modern information systems. In many cases, they act as an important tool for the organization and representation of knowledge in context, particularly in scientific research and organizations with specific requirements. The aim of our work is to promote the creation of domain model and help to facilitate many other processes of everyday life.

Complexity of our method leads to numerous approaches to solve particular parts of method such as navigation, layouting, marking, model basal hierarchy formation and creation of graphs in general. During the last two decades, there were many surveys [1,2] and case studies [3] in field of domain model creation focusing on general techniques of ontologies creation.

With respect to our point of interest, there were also made more specific works focused on domain model creation and administration.

Given the existing publicly available tools, which were the subject of our analysis, we consider the current status as insufficient. The only potentially suitable instrument is Protégé, which is, thanks to broad awareness and interest from researchers is an ecosystem, composed in addition to the system itself also of a set of expansion modules that offer advanced features.

Based on the analysis of recent surveys, case studies and even more our customer product survey, we identified two key scenarios necessary to involve in design of our method:

creation of new model: our goal is to support authoring of a new model without any pre-generated entities,

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modification and verification of existing model: our goal is to support user during further stages of model development.

Identified scenarios seem to be almost identical but their meaning is different with respect to the sub-tasks. They involve different amount of workload for different actions based on the different state of model completeness. Creation of a new model rely heavily on the features supporting the creation of new concepts and relationships. On the other hand, modification and verification of an existing model primarily rely on modification of relationships, marking significant parts of the model, searching concepts and identification of issues such as circular dependency between concepts.

Along with identifying the abovementioned scenarios, we get a list of key features that put customers on the interface: creation of the model hierarchy, bulk addition of concepts, model tagging, search over model concepts, model segmentation.

In our work we focus on solving the problem of intelligent information processing by supporting the domain model creation. During analysis of the problem area we gained a clear conviction and the need to think about the problem, particularly in view of the very process of creation. Domain model authoring is constantly faced with certain challenges that have not yet been resolved in terms of tools for creating domain models. An important step in our work was the user's study that helped us gather together the key issues and proposed solutions directly from users dealing with creation of domain models. Given the analysis and our study we defined elementary functions of our interface that we developed to functional tool. During development, we made a number of iterations in which partial results of development were presented to the end users, thus we acquired the continuous feedback on our tool. By implementing a pilot experiment, we verified the functionality and accuracy of our features together with proposals for major experiment. The main benefits of our work are user elaborate study of the basic steps of creating domain model and unified tool for supporting domain model authoring. According to our ongoing experiments with real users, we support creation of domain model, especially in terms of faster creation of model concepts hierarchy, tagging and segmentation.

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References

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