Abstract:
Accounting Information Systems (AIS) are essential for companies not only to record and track what events are happening or what events have happened in the past, they are also one of the most important tools for management to predict the financial future of a firm and take according actions. To enable an AIS to precisely record economic data and apply reasoning on them, it is crucial that the data structure of an AIS is built upon the economic phenomenas of a company's business. Accordingly, it is already important to have a detailed understanding of the company's economic actions at the design time of an AIS.

Like in most software development projects, the dilemma during design time of an IT product is the language barrier between the domain expert, providing vital input for defining the requirements, and the IT professional, designing and developing the IT product. In most cases the domain expert is not capable of understanding IT specific terms, and the IT professional is not capable of completely understanding the specific area of the domain expert. Nevertheless, to successfully complete an IT product, these two groups still need to unambiguously communicate with each other by using a common language.

When designing an AIS, the domain at hand is the accounting/business domain. Thus, a business modeling language describing economic phenomenas of a company can be used as such a common language to define requirements. One powerful business modeling language today is the Resource-Event-Agent ontology (REA). It not only allows describing events of the present and the past, it also allows specification of commitments made for future events. Consequently, it perfectly fits our requirement to capture the economic phenomenas of an AIS. However, REA is somewhat vague in the definition of its concepts and the current representation is merely IT related, which makes it hard to be understood by business experts. Accordingly, REA still cannot be used as a common communication language for the AIS design phase.

Given these limitations, in this thesis we have taken upon the challenge to develop an unambiguous and intuitive graphical domain-specific representation for the REA ontology called the REA-DSL. First, we formalize the REA ontology by providing a REA-DSL meta-model incorporating the REA concepts resources, events, agents, commitments, and types as well as concepts known from database modeling. Subsequently, we create a graphical notation for the REA-DSL using different shapes for different REA concepts. Additionally, to reduce the complexity of the models, we split the REA-DSL into five interlinked views. A serialization format for the REA-DSL is provided by the REA-XML language. Furthermore, we specify a mapping between the conceptual REA-DSL and a database description language. This enables the semi-automatic generation of database structures for an AIS.

The presented REA-DSL serves as an unambiguous and powerful business modeling language which can be used by IT and business experts for faster designing a robust AIS.