

4th International Workshop on Ontologies and Conceptual Modeling (Onto.Com)

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Abstract. The theme of the 4th International Workshop on Ontologies and Conceptual Modeling is *foundational ontologies and their meta-ontological choices*. Expert representatives of major foundational ontologies have been invited to discuss and compare their meta-ontological choices within the context of a common case study. The workshop is aimed at exploring the ways in which different meta-ontological choices impact conceptual modelling in information systems.

Keywords. Ontology, meta-ontology, conceptual modeling, foundational ontology, open datasets.

1. Theme

The theme of the 4th International Workshop on Ontologies and Conceptual Modeling is *foundational ontologies and their meta-ontological choices*. This theme recognizes the importance of the commitments made by foundational ontologies; commitments that are underpinned by so-called meta-ontological choices aimed at answering fundamental and interrelated questions, such as what there is, what categories of things exist, how something extends across space and time, when are two things the same, and so on. Meta-ontology was introduced by van Inwagen [5] and it draws upon the extensive literature in metaphysics to the extent that the boundary between meta-ontology and metaphysics can at times be somewhat blurred [1]. For this reason, the terms meta-ontological and metaphysical choices will be used interchangeably within the workshop.

In the context of ontology-driven conceptual modeling different sets of meta-ontological choices produce different types of conceptual models. The effects of these differences resonate further into the overall information systems (IS) development lifecycle, with potentially significant economic impact on the evolution and integration of information systems. Sound knowledge of a foundational ontology's metaphysical choices better enables the IS modeler and practitioner to assess the consequences of

selecting one foundational ontology over another, including the effects on the quality of the conceptual models underpinning the requirements and design of information systems.

Examples of meta-ontological choices include [2, 3, 4]:

- Realism vs idealism: there exists an objective reality (realism) or reality is individually constructed by one's own concepts (or ideas) resulting from one's subjective interpretation (idealism).
- Endurantism vs perdurantism: individual objects are fully present at any given time and do not extend temporally (endurantism) or individual objects extend spatially and temporally, therefore, an individual is never wholly present at a specific instant in time (perdurantism).
- Physical vs abstract objects: all individual objects are physical and no abstract objects exist (physical objects) or not all objects are physical therefore some objects are abstract (abstract objects).
- Higher order types: types can instantiate other types.
- Possible worlds: Our actual world is one of many possible worlds.

The application of meta-ontology to conceptual modeling and IS development is still relatively underexplored and the literature is scarce. Furthermore, in the field of formal ontology while much has been published on foundational ontologies, the literature tends to focus on the theory or application of an individual foundational ontology rather than conduct comparative analyses of two or more foundational ontologies in order to, for example, make explicit their theoretical differences, understand the different effects on the domain ontologies produced and investigate the implications of such differences on conceptual modelling within information systems development.

For these reasons Onto.Com 2016 aims to bring together expert representatives of different foundational ontologies to discuss the meta-ontological choices made and compare such choices in a practical manner via models produced for the same domain.

2. Case Study

The workshop adopts a common case study based on an open dataset made available by Companies House, the official registrar of companies in the United Kingdom (U.K.). A dataset of 10,000 companies is made available via the Onto.Com Web site. Further information on the selected domain of U.K. companies is also made available via forms at the Companies House Web site as well as a search facility with which it is possible to search for individual companies and company officers (for example, directors and secretaries).

The case study is the means by which invited participants can explain the meta-ontological choices of their respective foundational ontologies and demonstrate these choices with models of the U.K. company domain.

The workshop organizers have identified a set of features from the dataset that have the potential of being underpinned by different meta-ontological choices and therefore be modelled differently by the chosen foundational ontologies. These features include:

- Company (for example) as a socially constructed object. There are many other examples of socially constructed objects in the case study.
- Roles such as directors of companies.
- A legal person (for example, a company) can be a director.
- Events such as a company's incorporation and dissolution.

- Change such as change of name, change of business activity (or change of Standard Industry Classification (SIC) code) for companies or change of details for directors.
- Change such as the stages of a company; for example, dormant and non-dormant or active. A dormant company is a company that is not trading.
- Classification and multi-level modelling: for example, the Standard Industry Classification (SIC).
- Naming: for example, names of companies and SIC codes which name types of business activities.
- Parthood: for example, addresses and companies that are subsidiaries of another company.
- Relations: for example, between companies and directors, companies and addresses, directors and addresses.

3. Structure of the Workshop

After a brief introduction the workshop will have six one-hour presentations on the following foundational ontologies (here in alphabetical order):

- Basic Formal Ontology (BFO presented by Pierre Grenon)
- Business Object Reference Ontology (BORO presented by Chris Partridge)
- Descriptive Ontology for Linguistic and Cognitive Engineering (DOLCE presented by Nicola Guarino)
- General Formal Ontology (GFO presented by Heinrich Herre and Frank Loebe)
- Unified Foundational Ontology (UFO presented by Giancarlo Guizzardi)

There will also be a presentation by Mike Bennett on the Financial Industry Business Ontology (FIBO) in which the meta-ontological choices underpinning this domain ontology will be explained in relation to the case study.

The presenters will be invited to introduce the foundational ontology, summarize its meta-ontological choices, discuss the process/method used to derive the ontological models from the raw dataset and finally show the models that were semantically reinterpreted or reengineered from the data and how the meta-ontological choices informed the model.

References

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