



The Open University



A Core Ontology for Business Process Analysis

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Outline

- Introduction and Motivation
- Core Ontology for Business pRocess Analysis
- Extensions
- Conclusions and Future Work



Introduction

- Business Process Management (BPM) intends to support
“business processes using methods, techniques, and software to design, enact, control, and analyze operational processes involving humans, organizations, applications, documents and other sources of information”
[van der Aalst]



- Aims at Monitoring, Diagnosing, Simulating, Mining Business Processes
- In order to support humans in the analysis and enhancement of Business Processes
 - Which are the Processes and Activities currently running?
 - Which Actor was responsible for Activity X?
 - Which item are we selling the most?
 - How many orders were processed by the Sales Department?
 - Is the Process “going OK”?



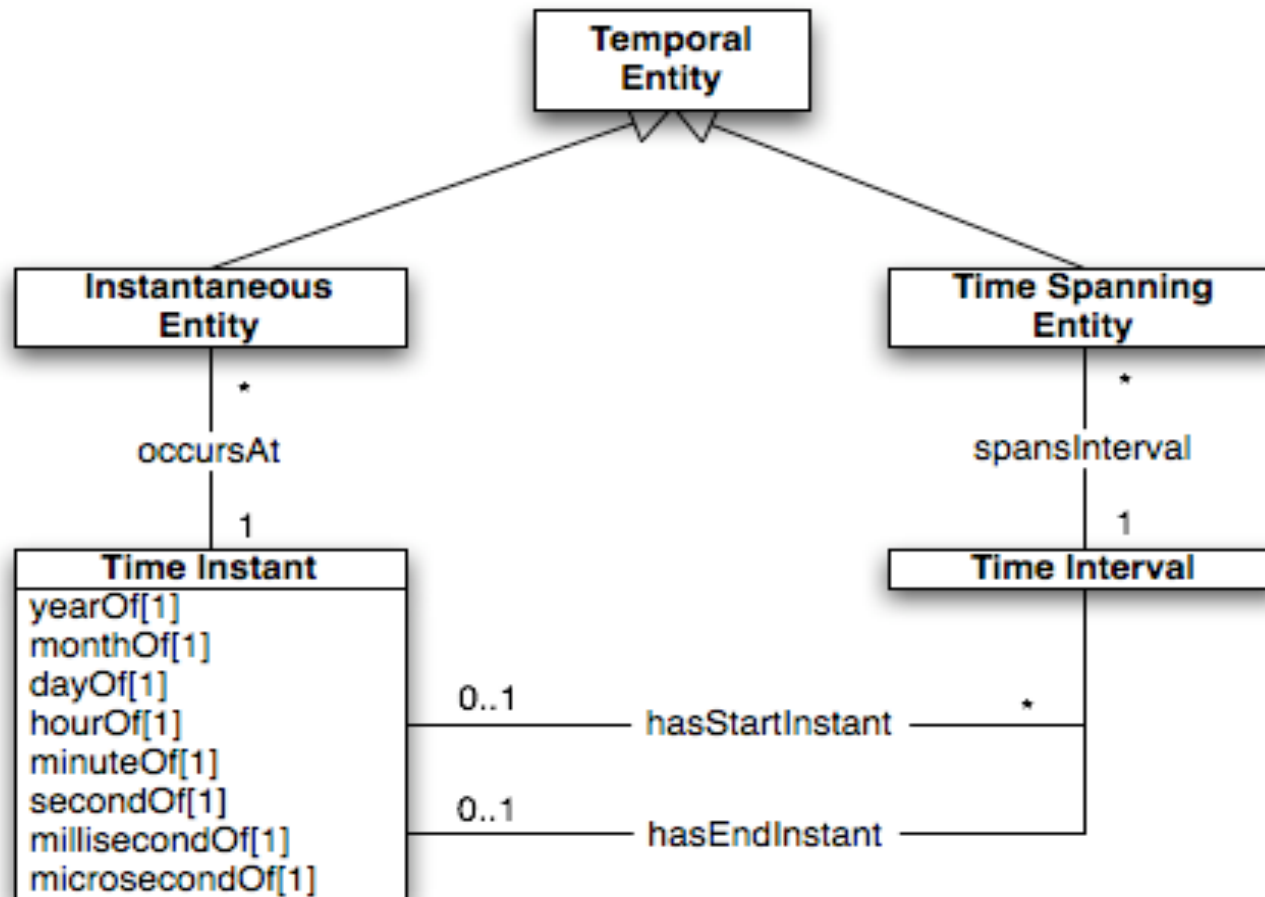
- Based on heterogeneous and distributed logs generated by a plethora of systems
- Low-level formats
- Typically approached using batch processes
 - Extract-Transform-Load data
 - Create Data Warehouses
 - Create Data Marts
- Most often requires the development of expensive customized solutions which are difficult to maintain and hardly reusable



- Core ontology for supporting BPA where analysts can map domain-specific knowledge to carry out their analyses
- It is a pluggable framework that defines the core concepts for BPA and provides hooks for further extensions
- Informed by DOLCE, CIDOC, Enterprise Ontology and TOVE

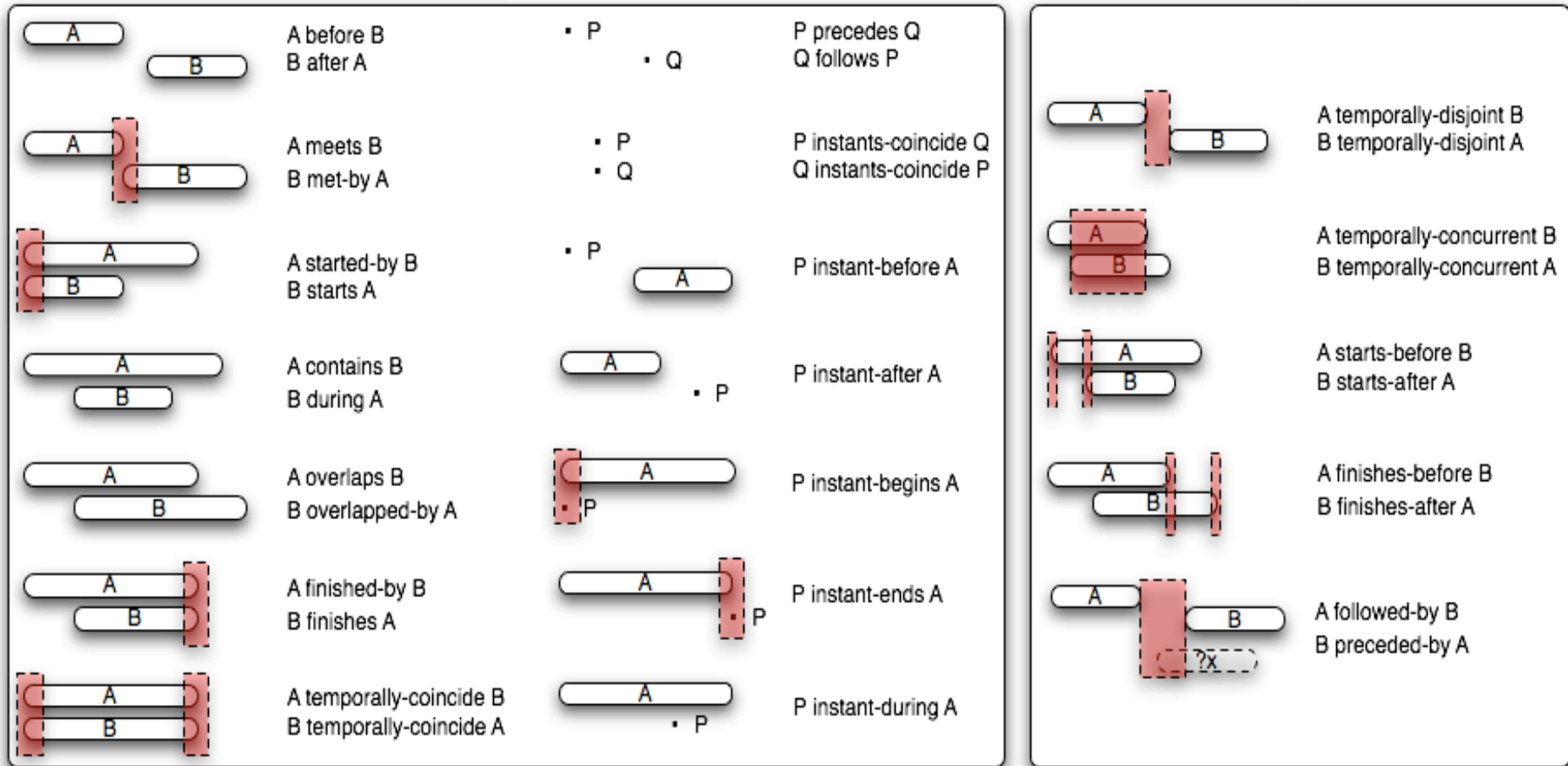


- Uses a Time Ontology to support asserting temporal relations between elements and reasoning about them



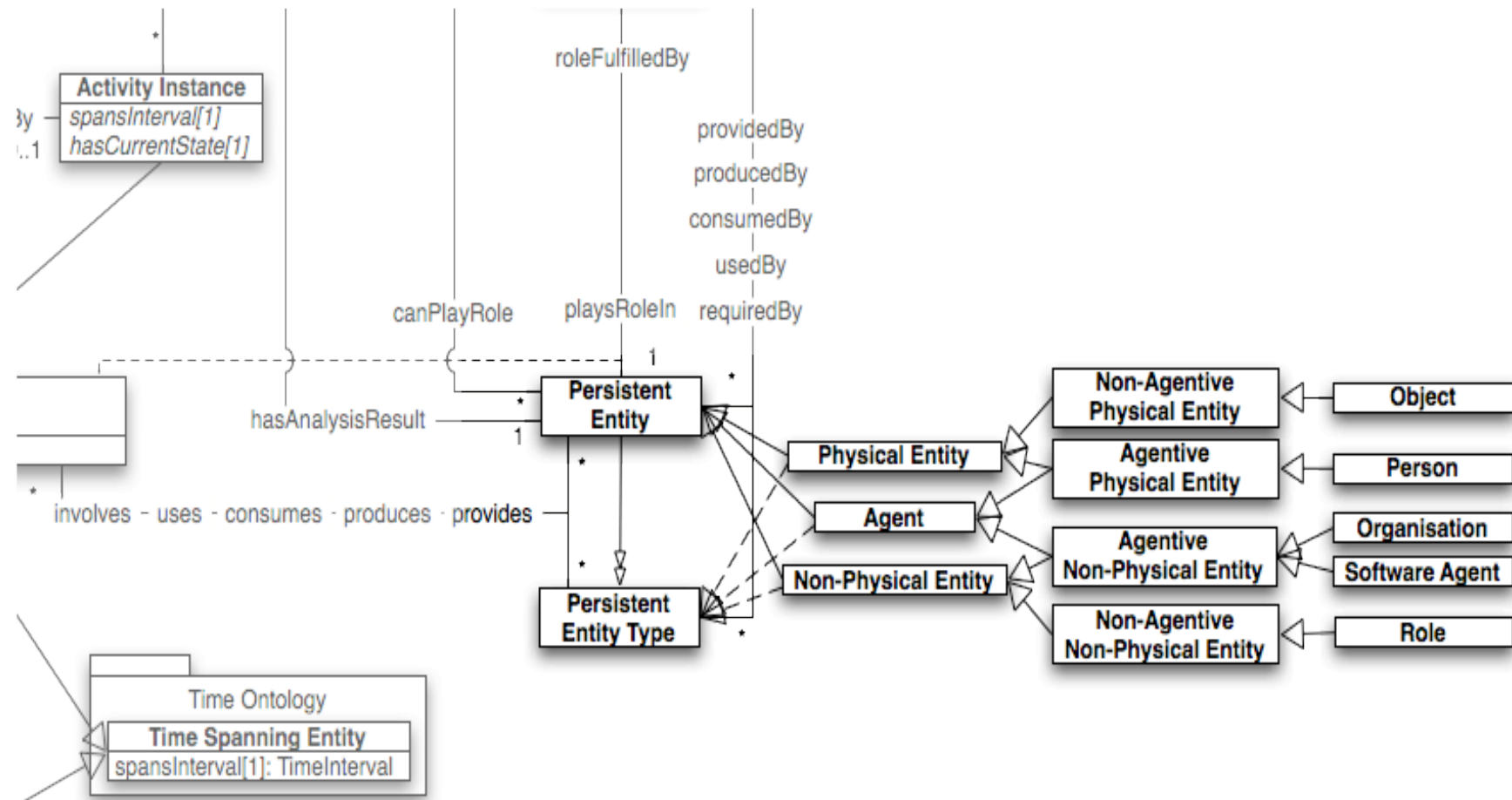


Time Ontology





- Uses a Time Ontology to support asserting temporal relations between entities and reasoning about them
- Given the wide scope of the ontology COBRA provides a light-weight foundational basis

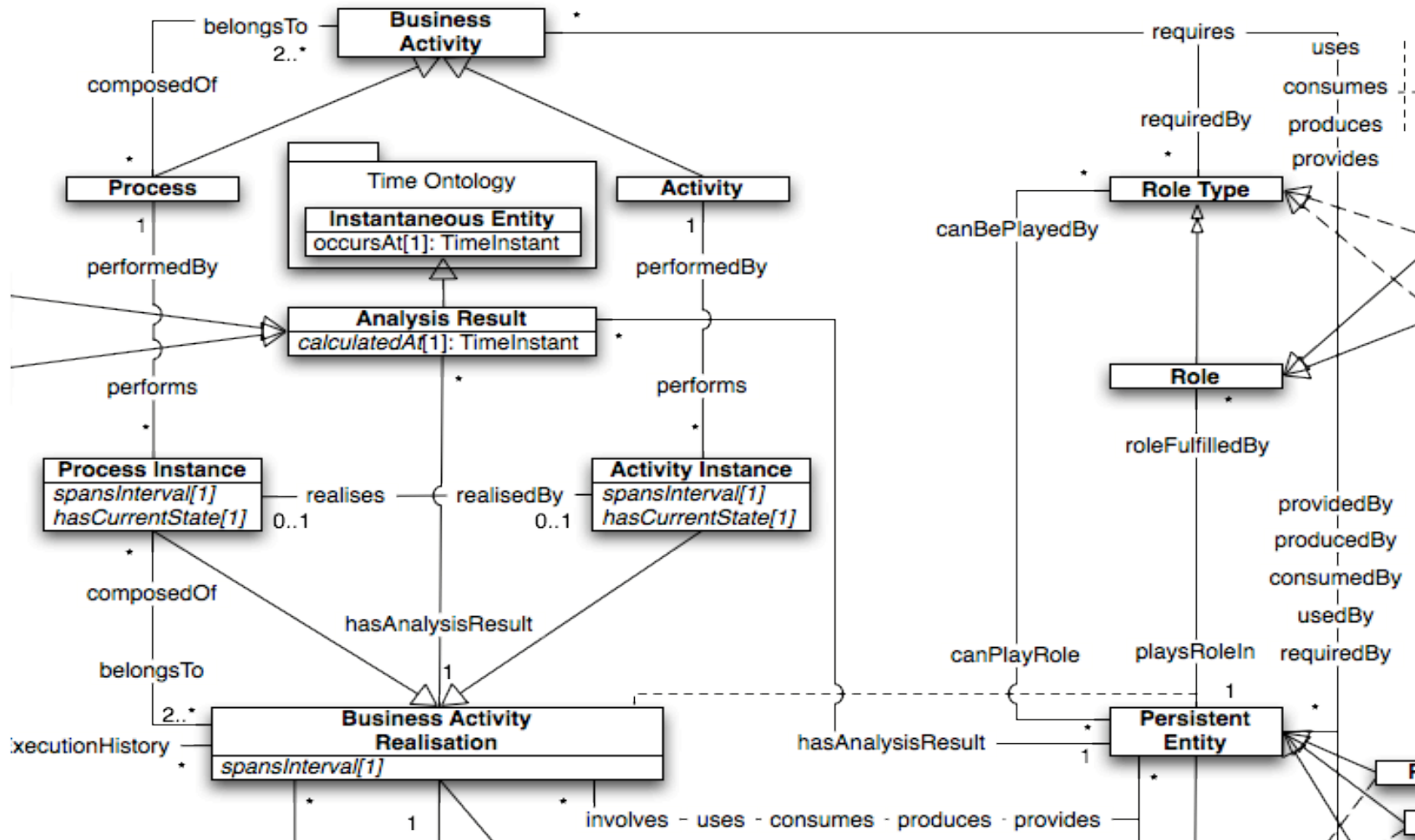




- Uses a Time Ontology to support asserting temporal relations between entities and reasoning about them
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- It is structured around the Process View, the Object View and the Resource View as commonly adopted in BPA

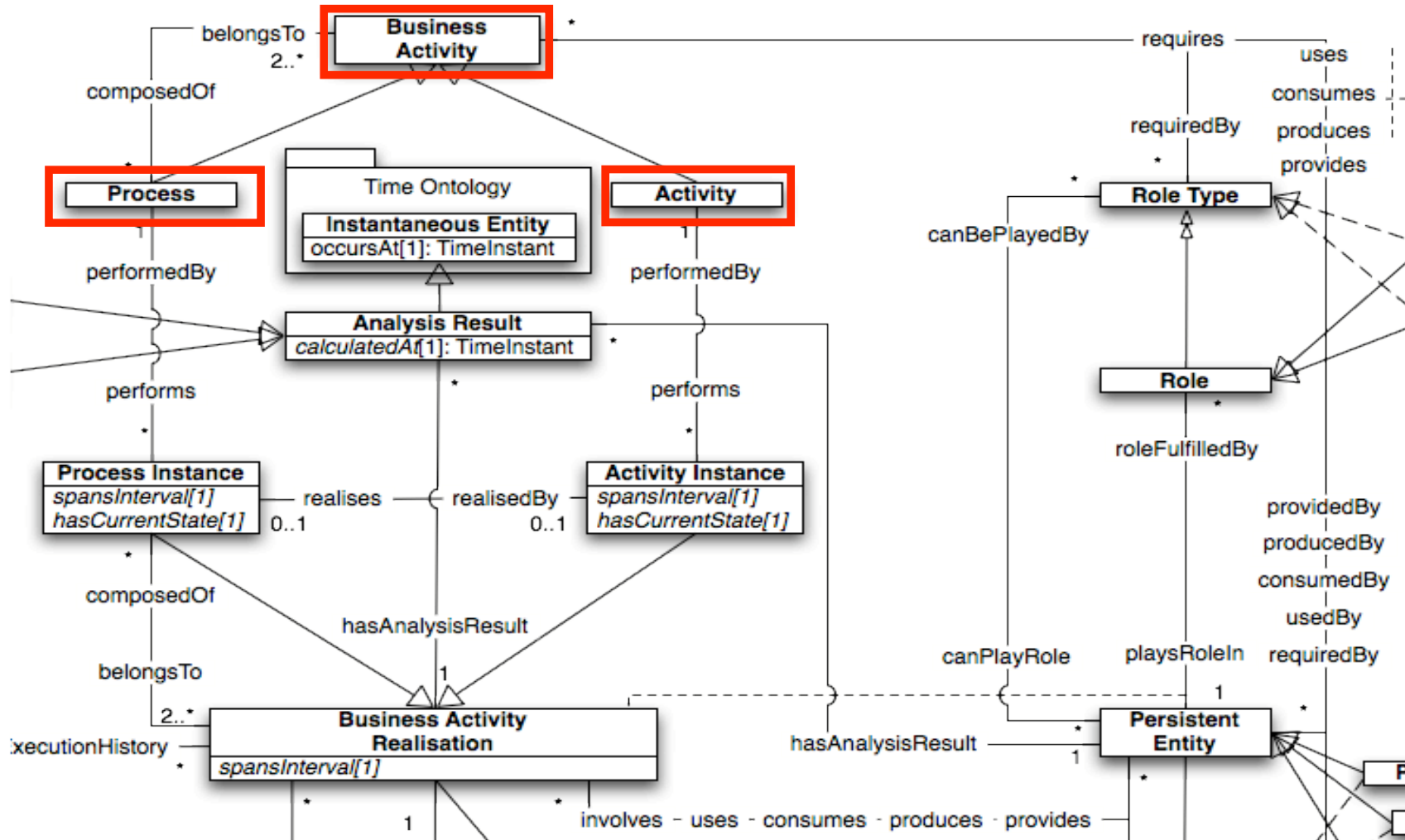


COBRA



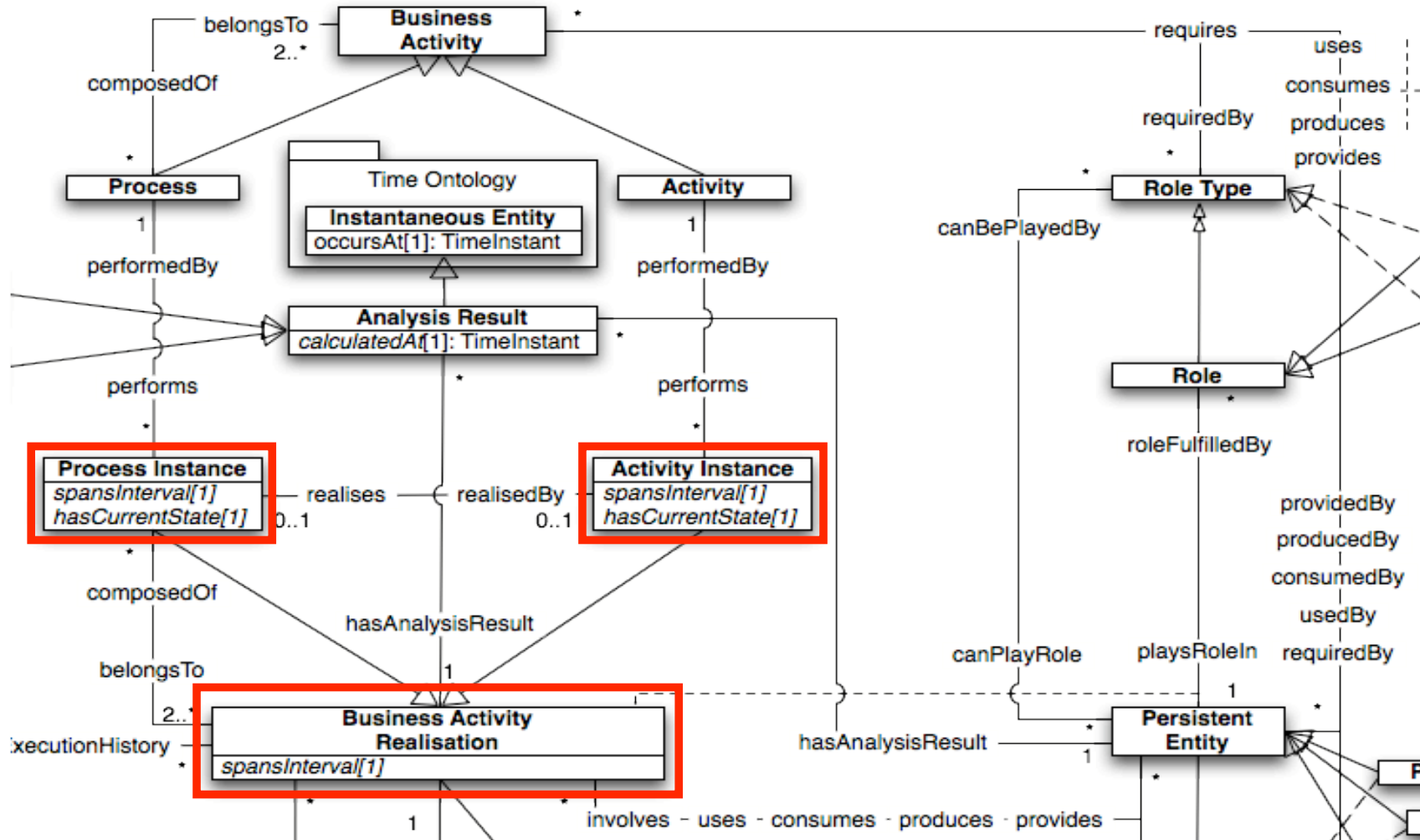


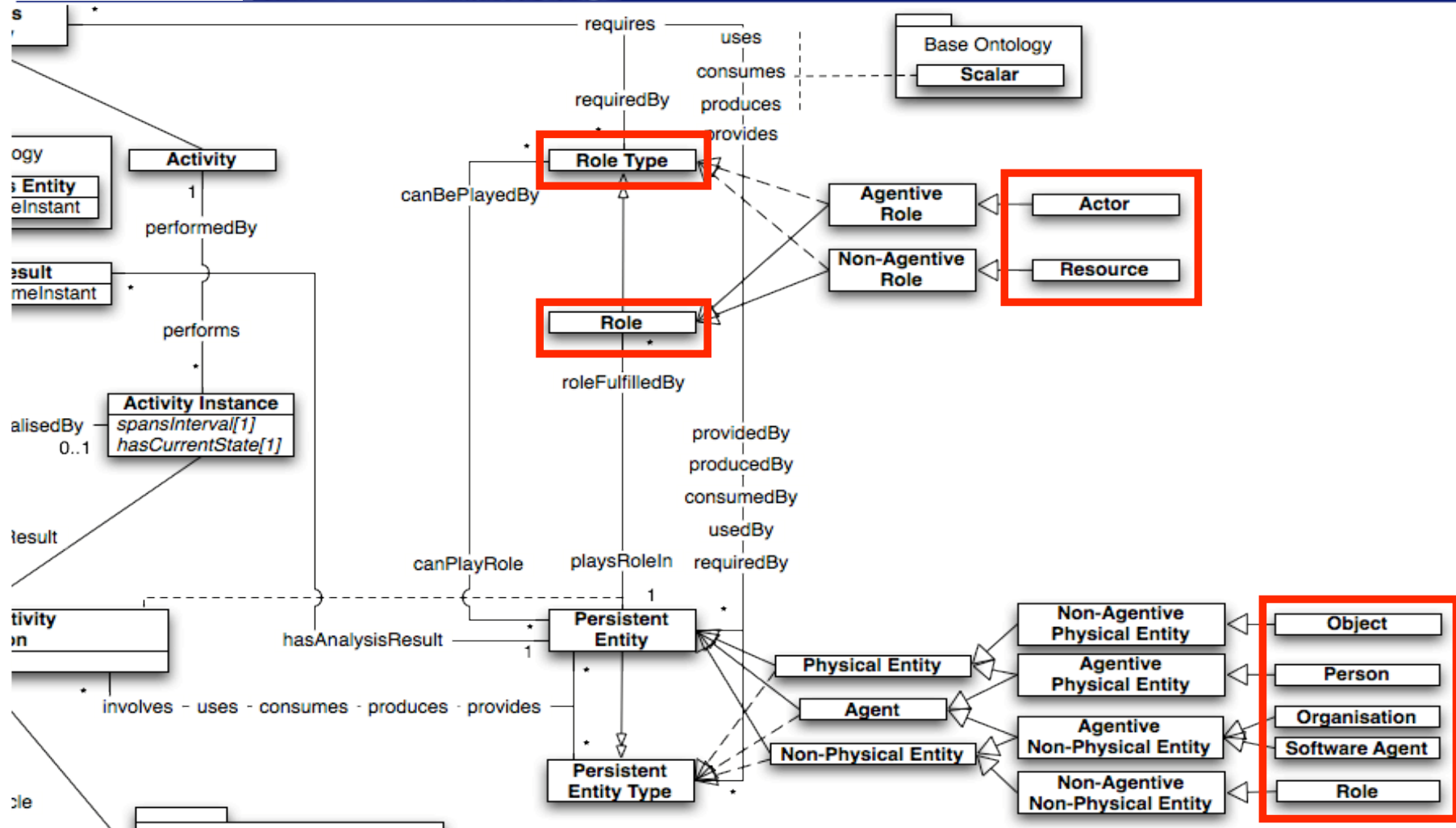
COBRA

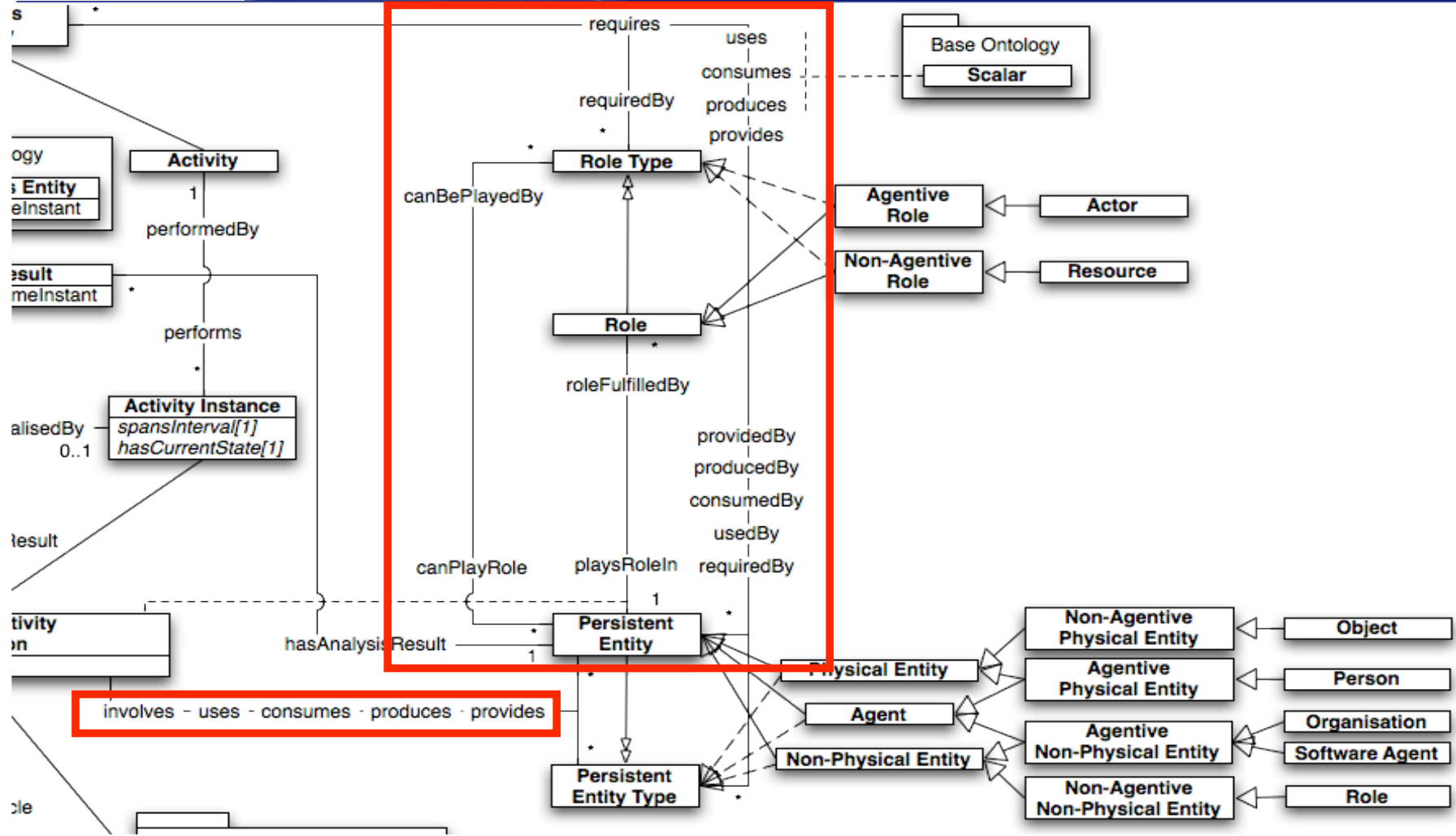




COBRA

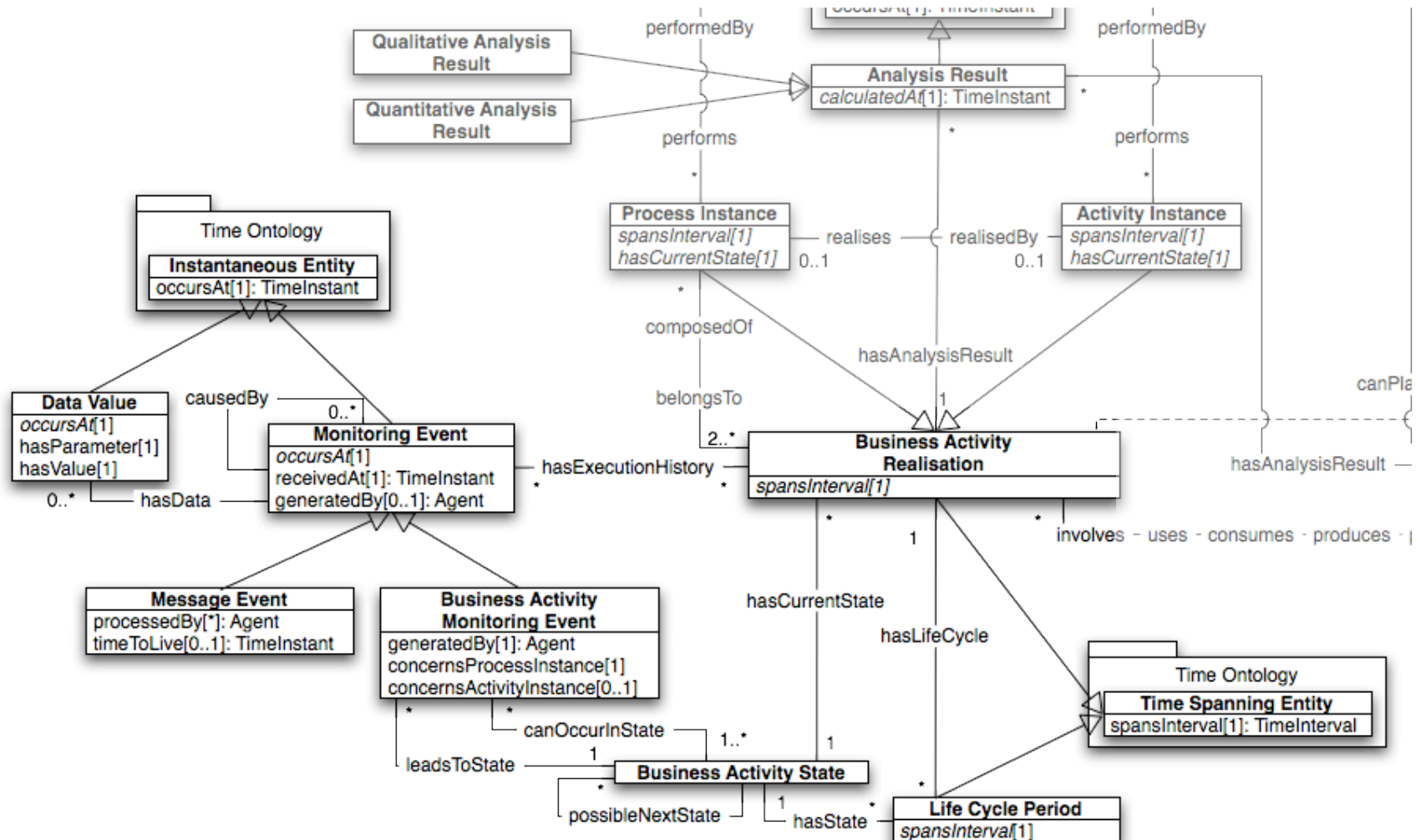






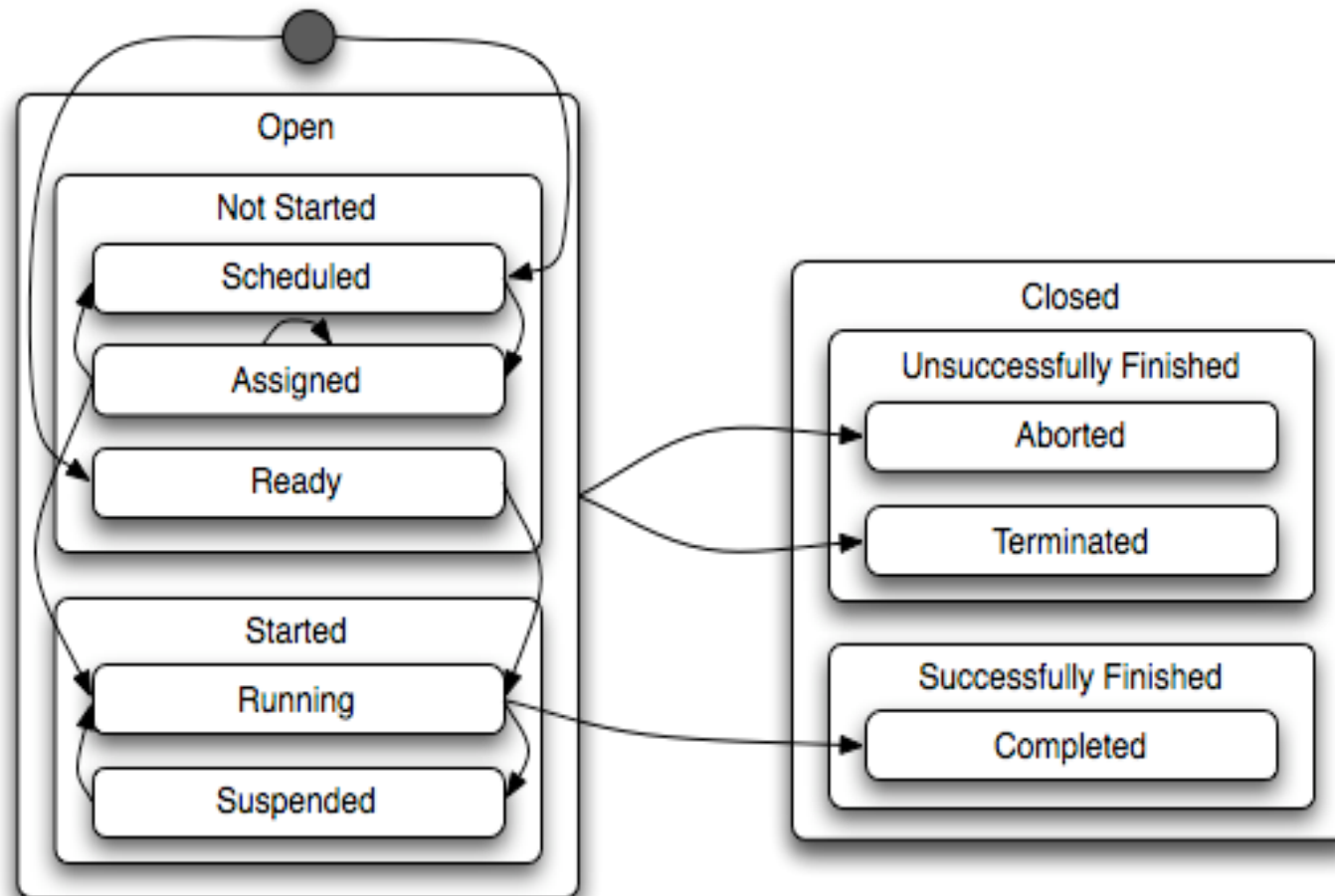


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- Connects low-level monitoring details with higher-level concepts in order to support analysts in the analysis of processes at different levels of abstraction
- **COBRA has been extended with support for capturing logs from a wide-range of systems**





- COBRA has also been extended with generic forward-chaining rules for automatically processing monitoring events and deriving additional knowledge
 - Derive and validate the life-cycle of Business Activity Realisations
 - Update execution history
 - Track Process Instance - Activity Instance relations
 - Track Agents involved



- COBRA provides a core model for supporting Business Process Analysis
- It has been extended for supporting a wide-range of systems' logs
- Currently being applied within two use-cases for a more thorough evaluation
- It has been extended with support for defining and computing metrics
- It will be integrated with a Classification PSM for detecting and diagnosing deviations