

Towards Standards for Modelling and Executing CBPs

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 - BPMN
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- 3 Conclusions and Future Works**
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Characteristics

- Web Services provide a loosely-coupled integration of Business Processes.
- Standardisation communities (OMG/W3C/OASIS) focus on providing languages for Business Processes *modelling* and *enactment* following MDA abstract layers stack.
- PAISs (Process Aware Information Systems) - *tightly relation* between modelling languages (i.e. BPMN) and execution languages (i.e. BPEL).
- *High-level modelling* of the languages using UML/MOF for providing appropriate *semantics*.

Business Process Management (BPM)

- Set of techniques that simplify the modelling, design, monitoring and enactment of complex Business Processes based on decision making.
- BPM techniques model, compose and treat Web Services as Business Processes of an enterprise.
- BPM suite is process-oriented, theoretically with no need for programming (i.e. involves code generation based on a graphical business model) and therefore suitable for business analysts.
- The business model is not only a business process documentation, but a design created as a source for executable process implementations.

Motivation

- Ensuring *consistency* and *rigor* on modelling Business Processes.
- Providing *inter-operability* and *standardisation* on the field - an unique way of understanding the description of business processes both at the design and at the implementation/enactment levels.
- OMG's MDA standards i.e. UML and Meta Object Facility (MOF) provide meta-models that claim to define the standard, but they only focus on the abstract syntax (i.e. the vocabulary).
- UML modelling can NOT provide an executable model.
- UML is used to define a rigorous and precise specification to which any software solution must conform.

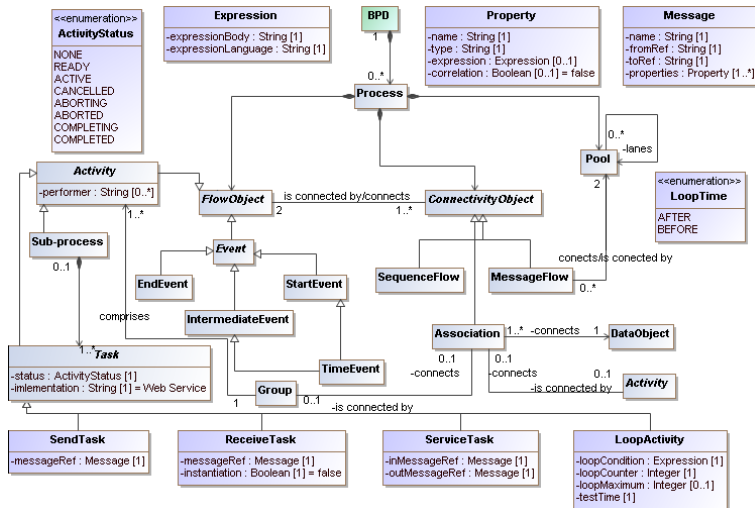
Business Process Modelling Notation (BPMN)

- OMG standardised and released BPMN (now at version 1.1)
- Is recognised as de-facto standard in the area of Business Process Modelling
- BPMN claims to provide a notation that is easily understandable by all business users.
- Visual but, non-formalised language => lack of a formal behavioural semantics
- Non-executable, is defined as a "documentation" for business processes
- Lack of a meta-model => no XML - interchange language
- Offers support only for business processes orchestrations.
- Evolving language: two BPMN 2.0 proposal compete for standardisation.
- Related Works: YAWL, Let's Dance, UML AD.

Business Process Definition Metamodel (BPDM)

- OMG's recognised meta-model for capturing general purpose business processes. Actual version is 1.0.
- Initially without a notation, and later aligned with BPMN 1.1.
- Allows tools inter-operability through a common process serialisation mechanism.
- Claims to be a meta-model for BPMN Specification - to enable a semantics for BPMN.
- Claims to provide support for SOA and to enable business rules integration within business processes.
- Related Works: we provide a meta-model for BPMN 1.1 (see next slide).

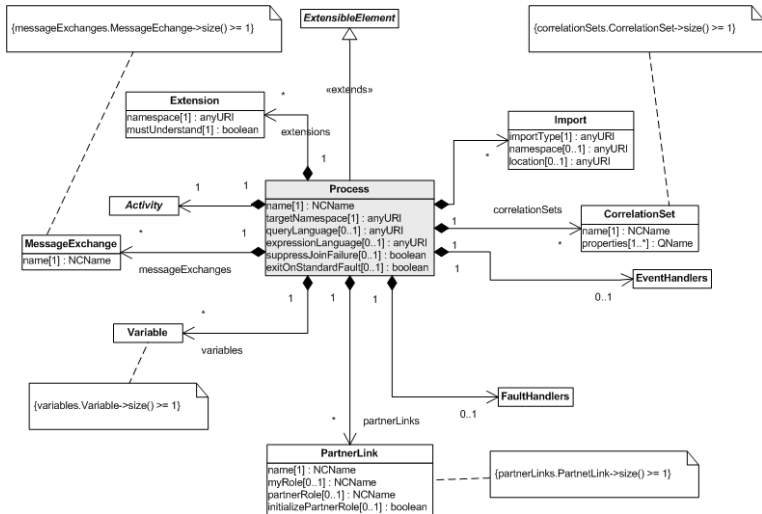
BPMN 1.1 Core Concepts



Business Process Execution Language (BPEL)

- OASIS's standard language for business processes execution. Actual version 2.0.
- Well accepted by both industry and academia.
- It defines a model and grammar for describing the behaviour of a business process based on interactions between the process and its partners.
- Complex and expressive language providing an unique, rich support for communication and workflow patterns.
- Its complexity conducts to many overlapping BPEL constructs => the semantics of the language is sometimes unclear and leads to misunderstandings.
- A BPEL file is an XML document that conforms to the BPEL XML Schema.
- A BPEL file is interpreted at runtime by a BPEL processor (i.e. BPEL engine).
- Is layered on top of several XML specifications: WSDL 1.1, XML Schema 1.0, XPath 1.0, XSLT 1.0, WS-Addressing.
- Offers support for orchestration technique.
- Related Works: BPML, XPD.L.

BPEL 2.0 Core Concepts



Web Service Choreography Description Language (WS-CDL)

- W3C community's Standard for enabling Business Processes choreographies. Actual version is 1.0.
- Describes automated P2P collaborations, within or across organisations trusted domains, by clearly defining the rules of participation that are jointly agreed.
- It is not an executable language, it do not depend on any specific business process implementation.
- A WS-CDL file is represented by an XML-based document describing a multi-participant composition engagement.
- Each participant to the choreography can be implemented independent of the supporting platform, using different mechanisms such as: business process languages (i.e. BPEL, BPML), programming languages (i.e. Java) or human controlled software agents.
- WS-CDL is also layered on top of the following XML specifications: XML 1.0 (Namespaces, Schema), XPath 1.0, WSDL 1.1/WSDL 2.0.

Orchestration vs. Choreography

- **Orchestration** - A central process takes control over the involved Web Services and coordinates the execution of different operations on the Web Services involved in the operation. The involved Web Services do not need to know that they are involved into a composition and that they are a part of a higher business process. Only the central coordinator of the orchestration (i.e. BPEL process) knows these details.
- **Choreography** - A collaborative effort focused on exchanging messages. All participants of the choreography need to be aware of: the business process, the operations to execute, the messages to exchange, and the timing of message exchanges.

Conclusions and Future Works

- Business Processes are becoming some valuable assets for the actual industry landscape.
- Web Services based on SOA framework make Business Processes accessible within and across enterprises and assure the independence of tools and infrastructure.
- BPM techniques and SOA enable dynamic Business Processes.
- The main standardisation communities, [OMG](#), [OASIS](#) and [W3C](#) provide languages for all MDA layers of models in order to obtain Business Processes inter-operability.
- [UML models](#) are the appropriate way to model a software solution and, in our case, to provide a semantics for an unique and common understanding of the concepts.
- Our future works cover a technical report on BPEL 2.0 Specification and a complete meta-model for WS-CDL 1.0.