OMG Production Rule Representation - an Overview

Presentation to W3C
Rule Interoperability Workshop
April 2005

Ruleml.org

Agenda

Background to OMG, PRR & PRR Team

PRR Definition & Status

Potential Role in Rule Interoperability

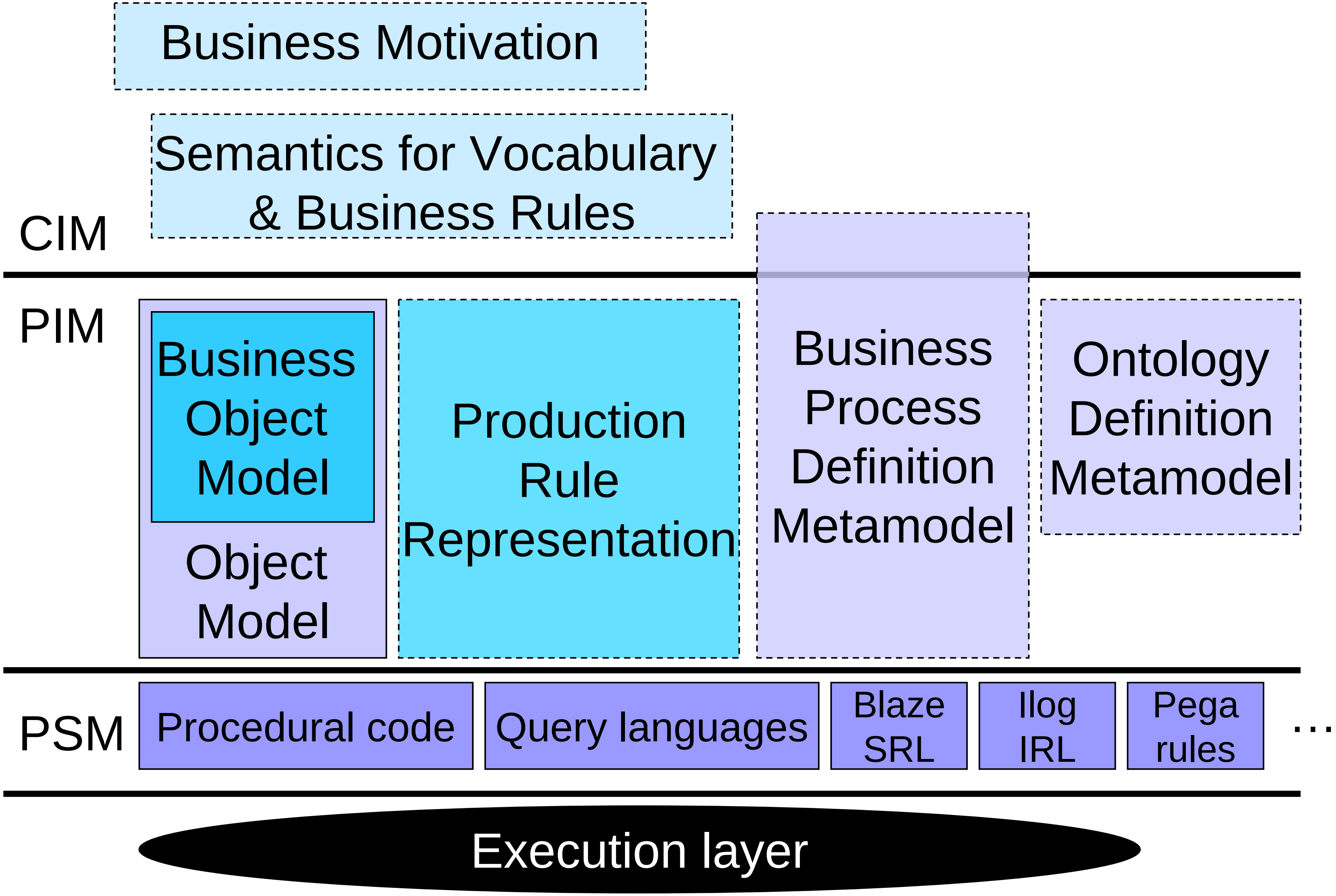
What is OMG?

- Standards body most known for UML and CORBA
- Vendor + domain organization membership
  - Task Forces & Special Interest Groups
- Current emphasis:
  - Framework of MDA (CIM, PIM, PSM)
  - Technologies of UML2 (xUML), MOF, XMI, …
  - Domains: Finance, Space, Telco, Defense, …
  - Rule-specific: BEI (BSBR, PRR)
  - Rule-related: BPDM, ODM, OCL

What is PRR?

- Metamodel + associated representation for the class of rules typically used in production rule engines & others
  - If <*Conditions*> then <*Actions*>
  - Organized by ruleset
  - 2 subtypes considered (for 1st PRR version):
    - Sequentially processed procedural rules
    - Forward chaining inference rules (Rete-model)
  - Often used to represent business rules of various types in BRMS
- Interchange for rule modeling via XMI
- Make production rules 1st class citizens in UML

PRR positioning in MDA



Business Motivation

Semantics for Vocabulary & Business Rules

CIM

PIM

Business Object Model

Object Model

Production Rule Representation

Business Process Definition Metamodel

Ontology Definition Metamodel

PSM

Procedural code

Query languages

Blaze SRL

Ilog IRL

Pega rules

…

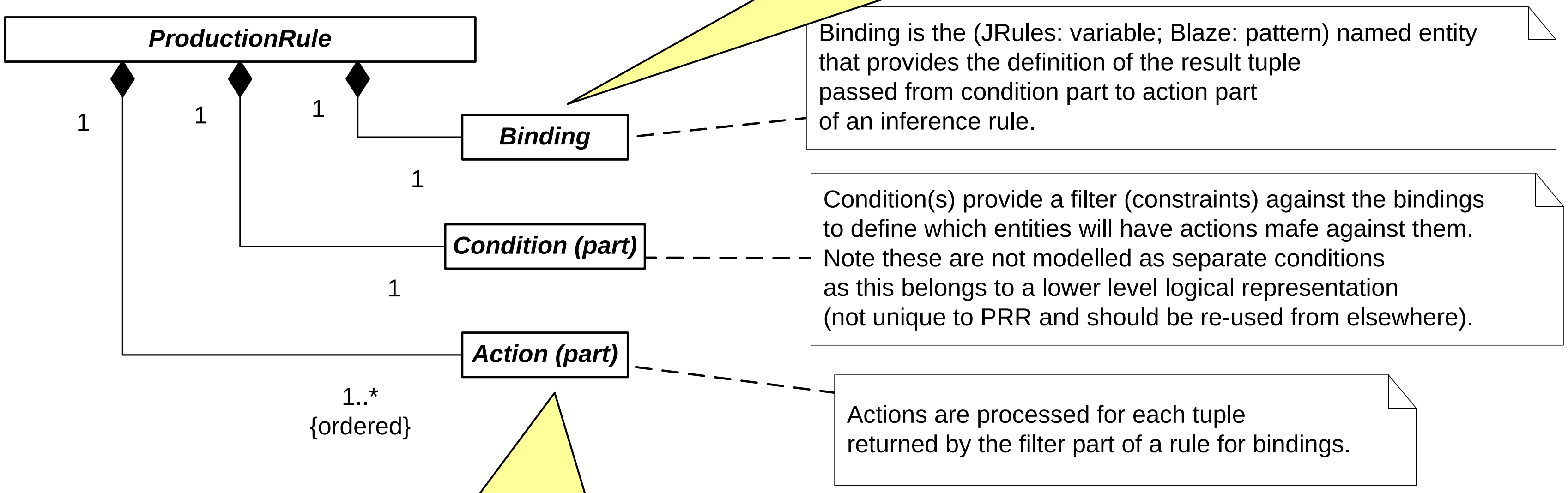
Execution layer

Why is a PRR standard required?

- Multiple representations used by industry for the same concept
  - Production Rules in rule engines / BRMS (eg Fair Isaac, ILOG, CA, Pegasystems…)
  - Production Rules in process engines / CASE tools (eg IBM, Fujitsu…)
  - Supporting technologies (eg LibRT)
- Industry need to align the “business rules approach” with UML-based OO software development best practices
- Co-development with proposed PRRuleML

Rule Model

Variables in rules can map to collections / classes



Binding is the (JRules: variable; Blaze: pattern) named entity that provides the definition of the result tuple passed from condition part to action part of an inference rule.

Condition(s) provide a filter (constraints) against the bindings to define which entities will have actions mafe against them. Note these are not modelled as separate conditions as this belongs to a lower level logical representation (not unique to PRR and should be re-used from elsewhere).

Actions are processed for each tuple returned by the filter part of a rule for bindings.

OCL expressions for conditions, actions

State of PRR

- Basic metamodel defined (rulesets + rules):
  - Generic: structure compatible with
    - Multiple rule types:
      fwd / bwd chaining, sequential…
    - Multiple expression representations:
      XPath / Java / ECMAScript / …
  - Core: OMG modeling specific model
    - OCL-based expressions for fwd chaining / Rete and sequential rules
- Examples library
- Examination of OCL / OCLExpressions
  to define bindings + conditions + actions

PRR vs
Rule Interchange candidates

Proposition: an equivalent to PRR,
possibly a concrete syntax for PRR,
is required for run-time rule interchange

1. PRR is for rule modeling
   - Context: OMG UML / commercial BRMS
   - Aligns with current commercial software development practices / technologies
2. PRR only loosely “related” to formal logic
   - Rule execution results in state changes
   - No backtracking semantics
   - Defines behavior, NOT a generic KRL
3. PRR works beyond web