Rule-enabled Process Modeling

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Rules and Processes

- **Goals:**
  - Check whether process definitions are consistent with rules *before* the deploying processes to the business.
  - Check whether currently performing / executing / enacted processes are following the rules (monitoring).
- **Need a process modeling semantics compatible with rules.**
Overview

- Models and rules: Examples from structure models and rules.

- Extend to process models:
  - Operative (execution) rules
  - Process models = operative rules.
  - Consistency of process models and rules.

- Process modeling that includes operation (execution).
Structural Rules

- (Most) Structural rules provide criteria for when something is or is not an instance of a concept.
- Example: Gold customers place more than twelve orders per year.

* Ross, R., Business Rule Concepts, 2005. SBVR has a broader definition.
Structural Rules

- Rule tells which customers are gold customers.

A gold customer places more than twelve orders per year.
Structural Rules : Categorization
(Generalization)

- Example: Gold customers are customers.

- All instances of special concept are instances of general ("gold customers are customers").

- Rules for general concept apply to (instances of) subconcept.
Structural Rules: Categorization

- All gold customers are customers.
Operative Rules

- Operative rules govern conduct of business activity.*
- Example: Gold customers must be given access to the warehouse.
- Applies to all processes of the business that give access to the warehouse.
- Might be violated during course of business.*

Operative Rules

Gold customers must be given access to the warehouse.

- Some occurrences (executions / performance / enactments) of processes in the business satisfy the rule, others don’t.
Operative Rules

Gold customers must be given access to the warehouse.

- Some occurrences follow the rule, some don’t.
Operative Rules : Categorization

- All occurrences of processes following special rule should follow general rule.

Gold customers must be given access to the warehouse.

Customers can only have access to warehouse during business hours.

Follow special rule

Follow general rule
Rules and Processes

- Process definitions and operative rules both:
  - specify what should happen in the business.
  - might be violated during course of business.

- Correspond to the original goals:
  - Check consistency before deployment.
  - Monitor after deployment.
Process Definitions

Control Warehouse Access

Evaluate Request → Grant / Deny Access

For every occurrence of Control Warehouse Access, there are occurrences of Evaluate and Grant / Deny Access, the first before the second.

Could be expressed as operative rule:

- Could write entire process model as operative rules, just a matter of ergonomics.
Process Definitions

Some occurrences follow the process definition, some don’t.

Control Warehouse Access

Evaluate Request → Grant / Deny Access

For every occurrence of Control Warehouse Access, there are occurrences of Evaluate and Grant / Deny Access, the first before the second.

Follow the process

Occurrence of process in the business
Rule / Process Consistency

Control Warehouse Access
- Evaluate Request
- Grant / Deny Access

Gold customers must be given access to the warehouse.

- All occurrences following process definition should follow the rule.
- Check before or after deployment.
Modeling Without Occurrences

- Cannot instantiate and specialize process models (they are individuals, not classes).
- Unrelated to occurrences (M0).
M1 process models and rules are classes, can be specialized in M1 and instantiated at M0.

- **Occurrence** = Class of all occurrences.
  - Superclass of all process models. Introduces runtime attributes.
  - In BPDM model library: Universal Behavior.

- Extend the modeling language.
M1 process models and rules are classes, can be specialized in M1 and instantiated at M0.

M1 process and rules apply to M0 occurrences.
Summary

- The semantics of operative rules and process definitions are in occurrences (performance / enactment / execution) of processes.
- Enables consistency checking before deployment and monitoring afterwards.