Basic Process Modeling for Semantic Web Services

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Process Modeling Requirements

1. Sequential composition
2. Parallel composition
3. Alternative executions
4. Transition pre-conditions/post-condition

   —— Supported by many formalisms with more or less same semantics ——

5. Subroutine mechanism (process definition)

   ———————— Required minimum ————————

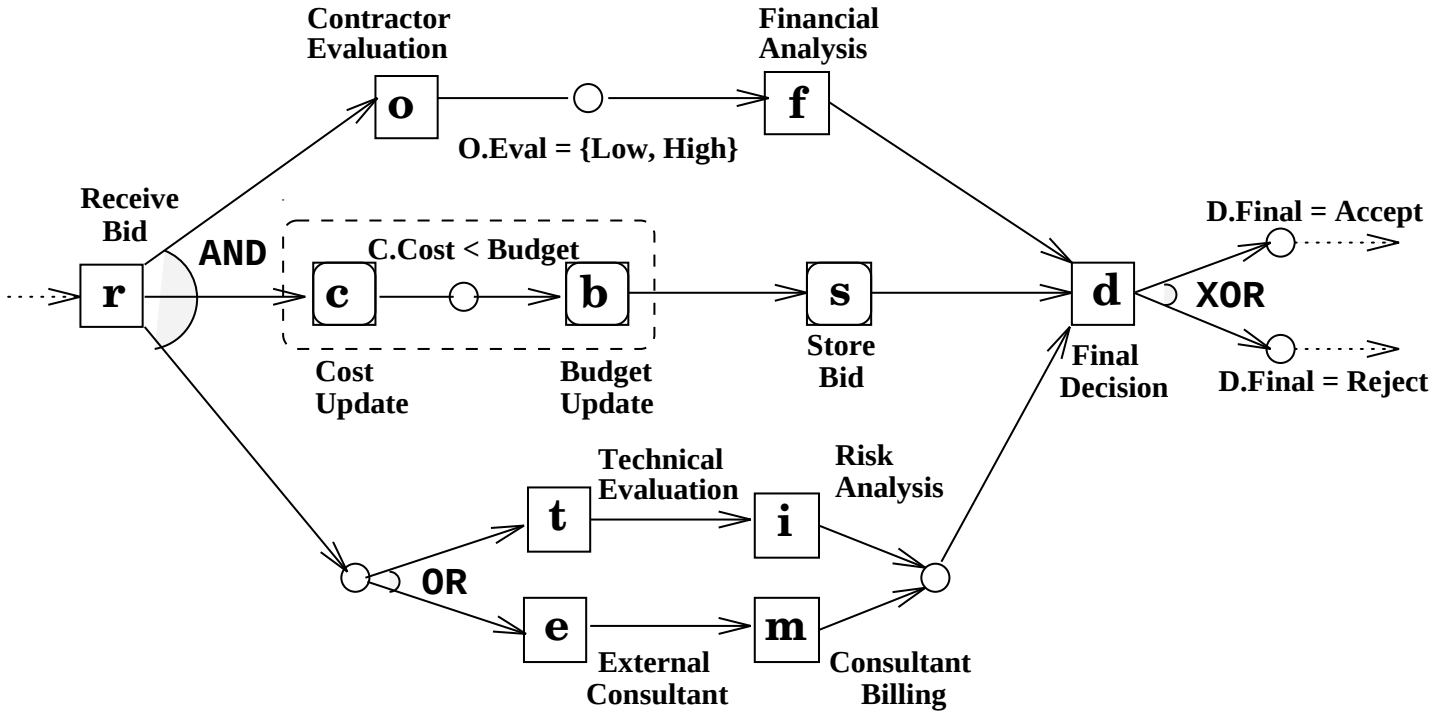
6. Constraints – probably also required
7. Exceptions
8. Planning
9. Constraint solving
10. Non-cooperative actors

Process Modeling Requirements (contd.)

1. Executable?
2. Specification only?
3. Both?

Bid Evaluation Example

❑ **Control Flow Graph:**



❑ **Global Coordination Dependencies:**

1. **IF o.eval = low THEN not e**
2. **IF occurs (e) THEN o before e**
3. **IF occurs (t) AND occurs (e) THEN e before i**
4. **c before f**

Capturing Bid Evaluation Example

- **Control-flow graphs** translates straightforwardly into logic programming style rules (in Concurrent Transaction Logic). Here $\otimes$ - sequential composition, $|$ - parallel composition, $\vee$ - alternatives, $\odot$ - isolated (non-interleaved) execution.

$$
\begin{array}{lcl}
bid\_eval & \leftarrow & \mathbf{r} \otimes (financial \mid db\_updates \mid technical) \otimes rest \\
financial & \leftarrow & \mathbf{o} \otimes ([o.eval = \text{“}high\text{”}] \otimes \mathbf{f}) \vee (low \otimes \mathbf{f}) \\
db\_updates & \leftarrow & \odot(\mathbf{c} \otimes [c.cost < budget] \otimes \mathbf{b}) \otimes \mathbf{s} \\
technical & \leftarrow & (\mathbf{t} \otimes \mathbf{i}) \vee (\mathbf{e} \otimes \mathbf{m}) \vee (\mathbf{t} \otimes \mathbf{i} \mid \mathbf{e} \otimes \mathbf{m}) \\
\ldots .
\end{array}
$$

- **Global Coordination Dependencies** can be specified as well.