

Using DEMO to Analyse the Consistency of Business Process Models

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Problem

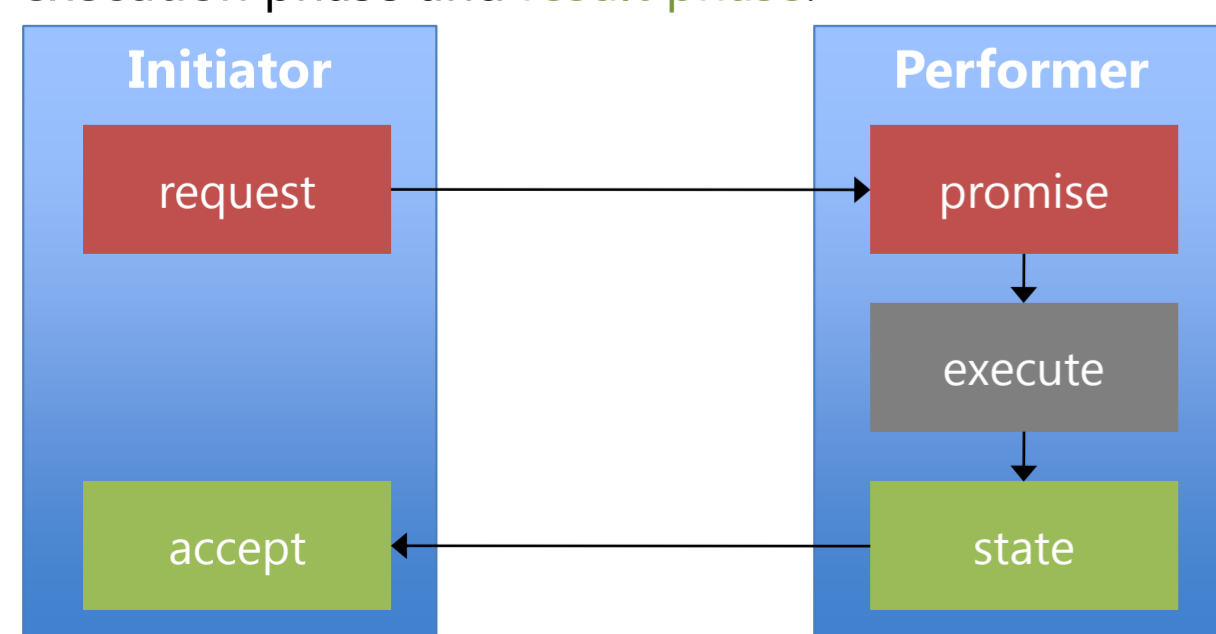
- Business processes are often modelled using transformational (input – process – output) techniques.
- Transformational process modelling languages, such as BPMN, UML-AD, EPC, IDEF-3, are method-independent.
- As such, they do not define mechanisms to assess the consistency of a business process.
- A consistent process fully specifies the end-to-end collaboration pattern between a service requester and a service performer.
- The problem is how to define a method that facilitates the analysis of the consistency of a process.

Approach

- Use a conversation-based technique (DEMO) to assess the consistency of a business process modelled using a transformational technique (BPMN).
- Conversation-based techniques focus on specifying the collaboration patterns that occur between business actors while negotiating and producing results.

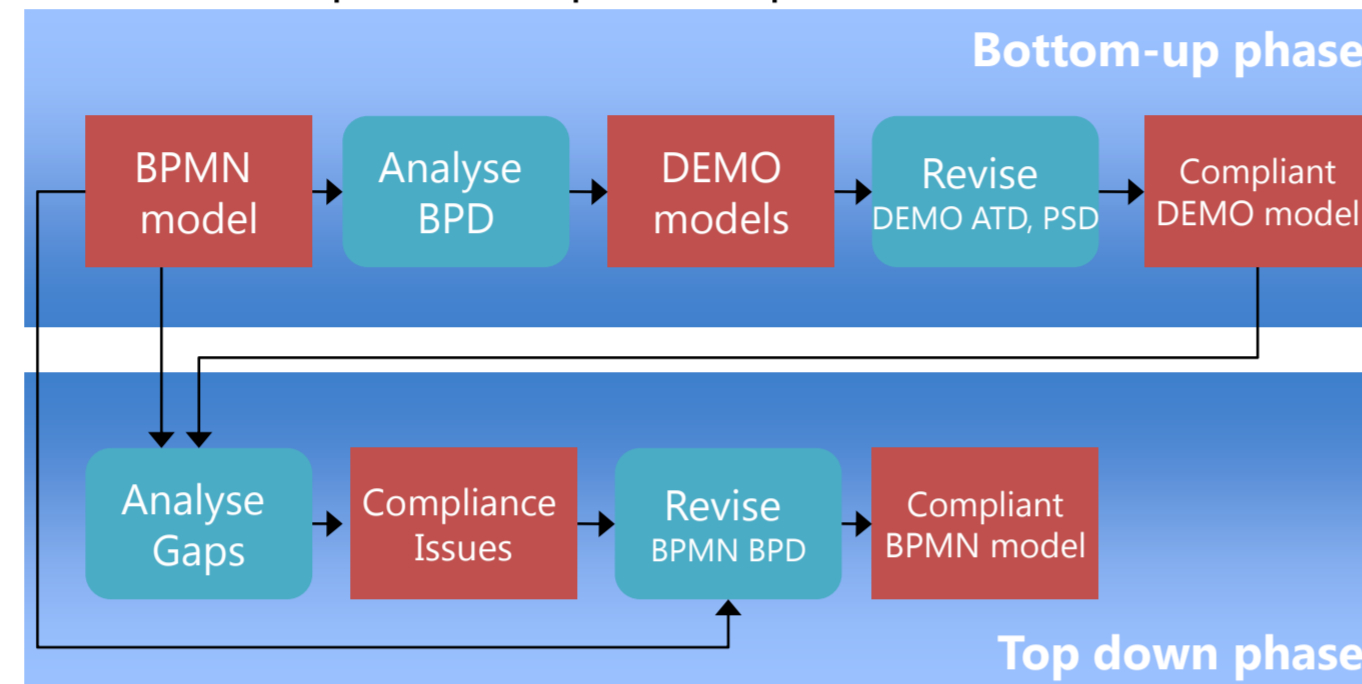
DEMO

- Design & Engineering Methodology for Organizations
 - Jan Dietz, "Enterprise Ontology", Springer, 2006.
 - <http://www.demo.nl/>
- DEMO is a conversation-based technique for the design, engineering, and implementation of organizations.
- Grounded on the four core axioms of the Ψ -theory: Operation, Transaction, Composition, Distinction.
- A (basic) transaction defines the pattern of collaboration between two actors when requesting and producing a result. It implies an **order phase**, **execution phase** and **result phase**.



Method

- Iterative method for business process analysis with a bottom-up and a top-down phase.



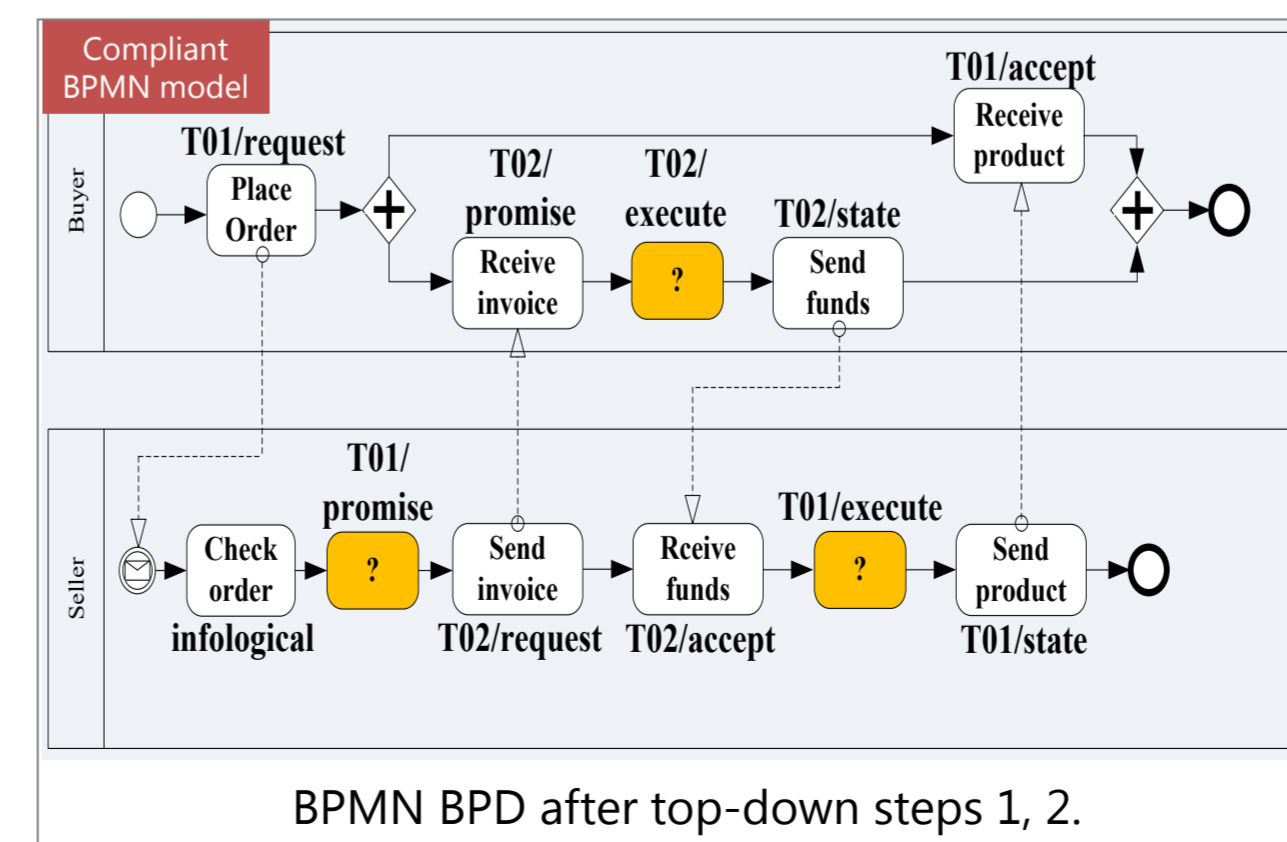
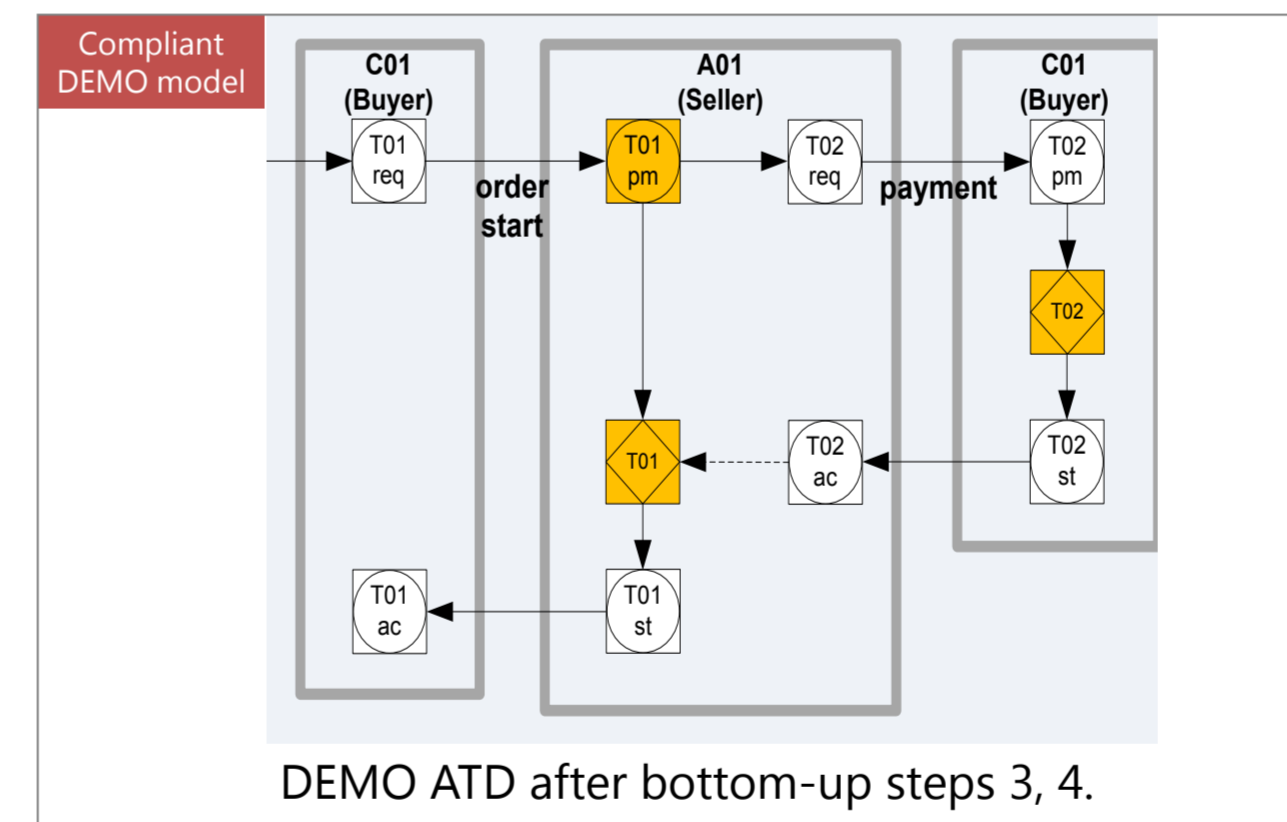
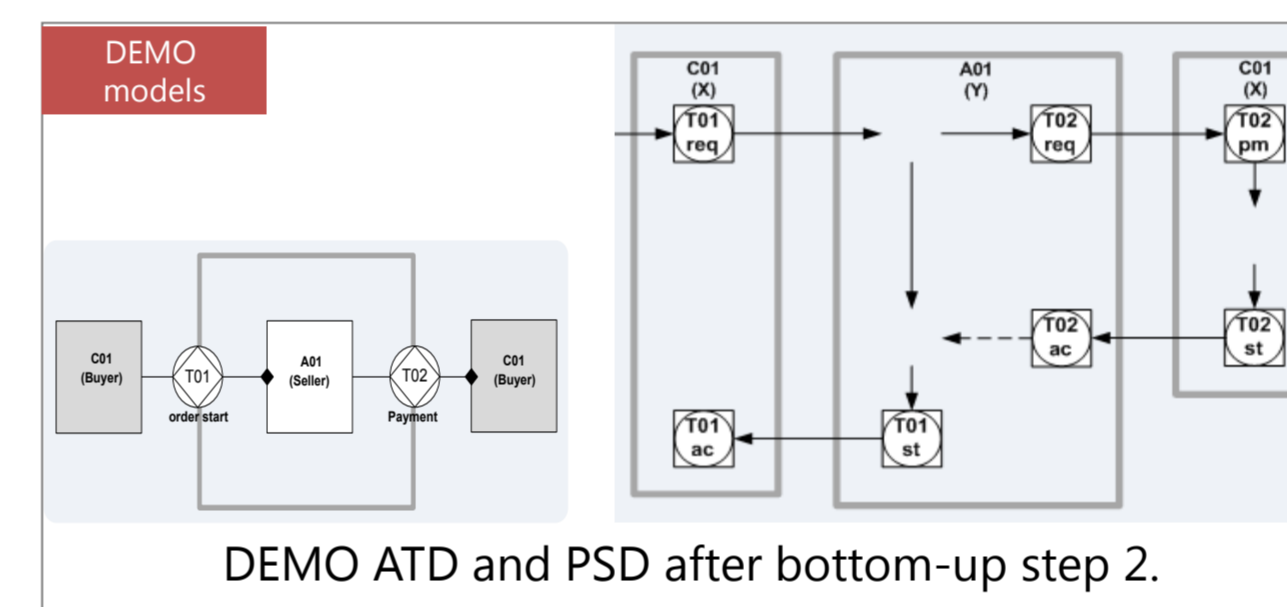
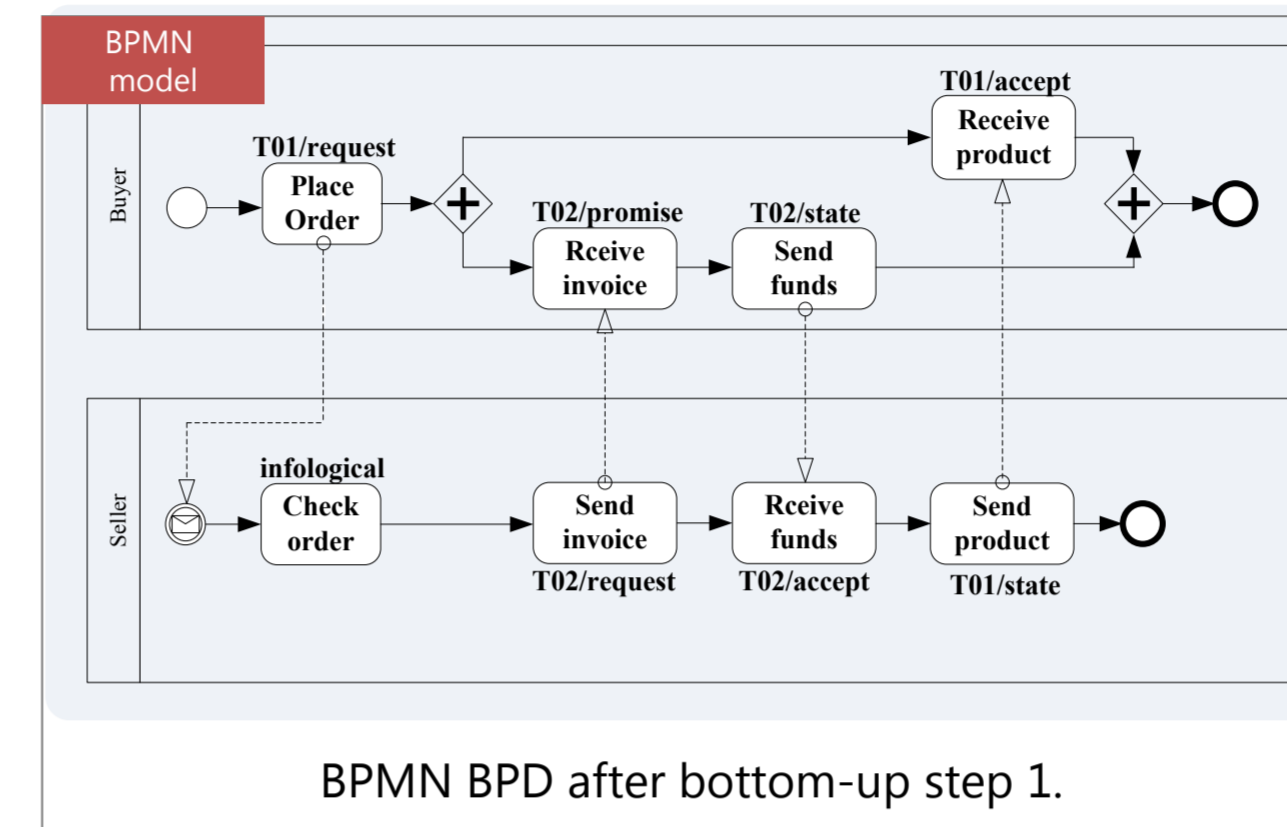
Bottom-up phase

- Input:** BPMN process model (BPD).
 - Output:** DEMO models (ATD, PSD).
 - Goal:** capture the conversations between actors and the results that are produced.
- Analyse the process model:
 - Identify actors.
 - Build vocabulary (identify business verbs and nouns).
 - Identify collaboration and production acts. Collaboration acts entail coordination between actors. Production acts entail creation of new facts or results.
 - Classify acts as ontological, infological and datalogical.
 - Build DEMO models (actor transaction diagram and process structure diagram) based on the ontological collaboration and production acts.
 - Identify results of production acts.
 - Identify business transactions between actors.
 - Analyse the DEMO models.
 - Identify missing information, such as results and acts.
 - Revise the DEMO models so that they comply with the axioms of the Ψ -theory.

Top-down phase

- Input:** DEMO models from bottom-up phase, BPMN process model.
 - Output:** revised BPMN models.
 - Goal:** Check the compliance of the input BPMN model with the DEMO models and revise the input BPMN model.
- Perform gap analysis between the DEMO and BPMN models.
 - Identify placeholders for missing actors, activities, and business objects in the BPMN model.
 - Identify missing or implicit control and data flows.
 - Revise the BPMN model so that the process complies with the DEMO model.

Example



Case study and results

- The method was applied to two primary business processes of a large organization:
 - Processes contained ~500 activities and ~60 actor roles.
 - Crossed ~10 organizational boundaries.
- Analysis took 20 days with a team of three process modelling experts who met six times with groups of representative stakeholders.

Observed results

- Missing coordination acts:
 - 25% of *request* – results are being produced without an explicit request. It is not possible to identify an accountable service initiator.
 - 50% of *promise* – requests are implicitly confirmed, often without governing contract or SLA. The service performer starts producing a result without agreeing a contract with the initiator and thus it is not formally accountable for the production.
 - 25% of *state* – production results are not explicitly communicated. It is not clear whether the responsibility of checking the completion of a result lies on the initiator or performer.
 - 40% of *accept* – production results are not being explicitly accepted by the initiator. There is no formal acceptance of the result according to the original request
- Missing 25% of productions acts - the underlying business transaction is not explicitly producing results.

Conclusions

- The consistency of BPMN process models can be assessed using DEMO.
- The revised BPMN models are not a silver-bullet solution. They serve as means to discuss design issues and optimization opportunities with the stakeholders.

Acknowledgments and contacts

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