ProM 6 framework as a tool for importing / exporting BPMN models

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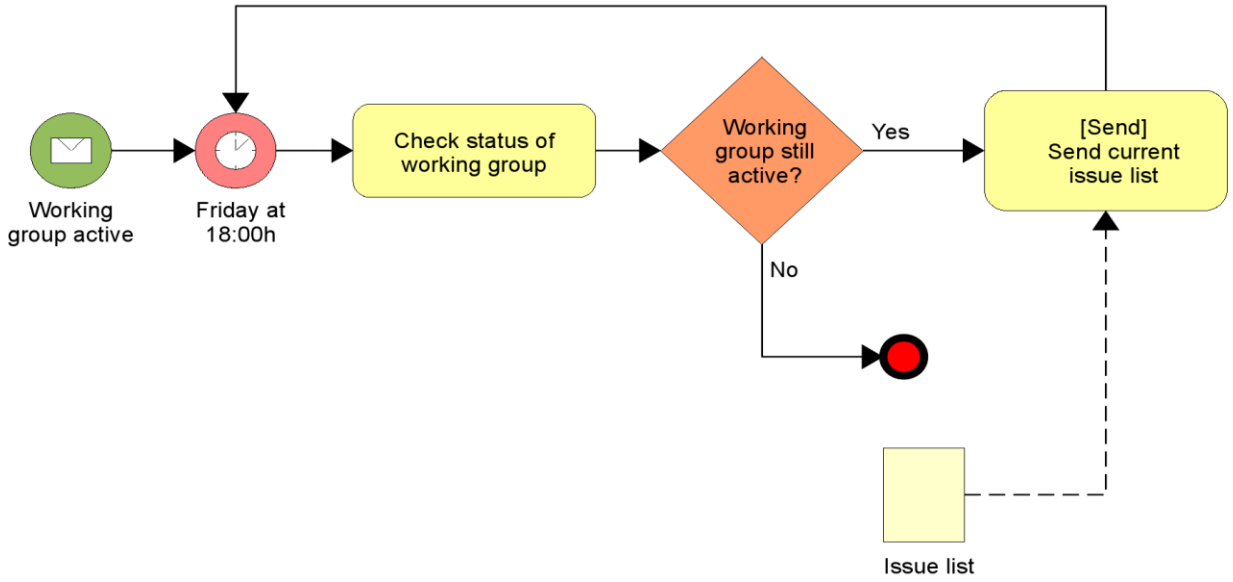
Outline

- *BPMN*
- *Convert BPMN JSON models to BPMN XML models*
- *ProM 6.3*
- *Main goal*
- *First bug in ProM*
- *Compare income and outcome BPMN models*
- *The next step is …*

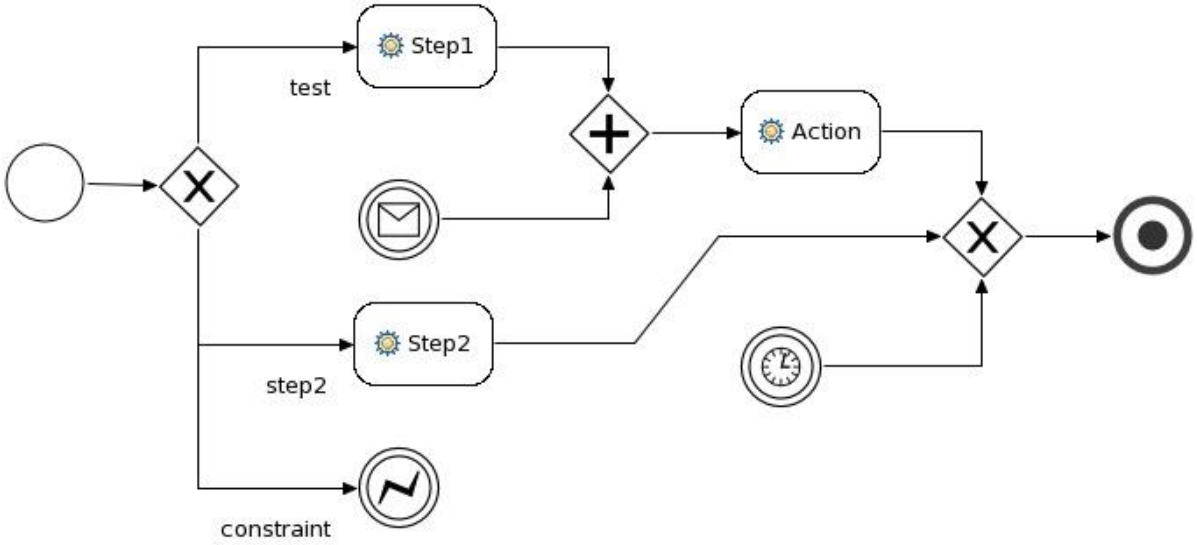
BPMN (1)

Business Process Model and Notation (BPMN) is a graphical representation for specifying business processes in a business process model.



BPMN (2)

The primary goal of BPMN is to provide a *standard notation* readily understandable by *all business stakeholders*. These include the business analysts who create and refine the processes, the technical developers responsible for implementing them, and the business managers who monitor and manage them.



BPMN (3)

Elements:

- Flow objects
  - Events, activities, gateways
- Connecting objects
  - Sequence flow, message flow, association
- Swim lanes
  - Pool, lane
- Artifacts
  - Data object, group, annotation

JSON

JSON (JavaScript Object Notation) is a lightweight data-interchange format.

- ✓ It is easy for humans to read and write.
- ✓ It is easy for machines to parse and generate.

```
{
   "firstName": "John",
   "lastName": "Smith",
   "age": 25,
   "address": {
      "streetAddress": "21 2nd
Street",
      "city": "New York",
      "state": "NY",
      "postalCode": "10021"
   },
   "phoneNumber": [
      {
         "type": "home",
         "number": "212 555-1234"
      },
      {
         "type": "fax",
         "number": "646 555-4567"
      }
   ],
   "gender":{
      "type":"male"
   }
}
```

XML

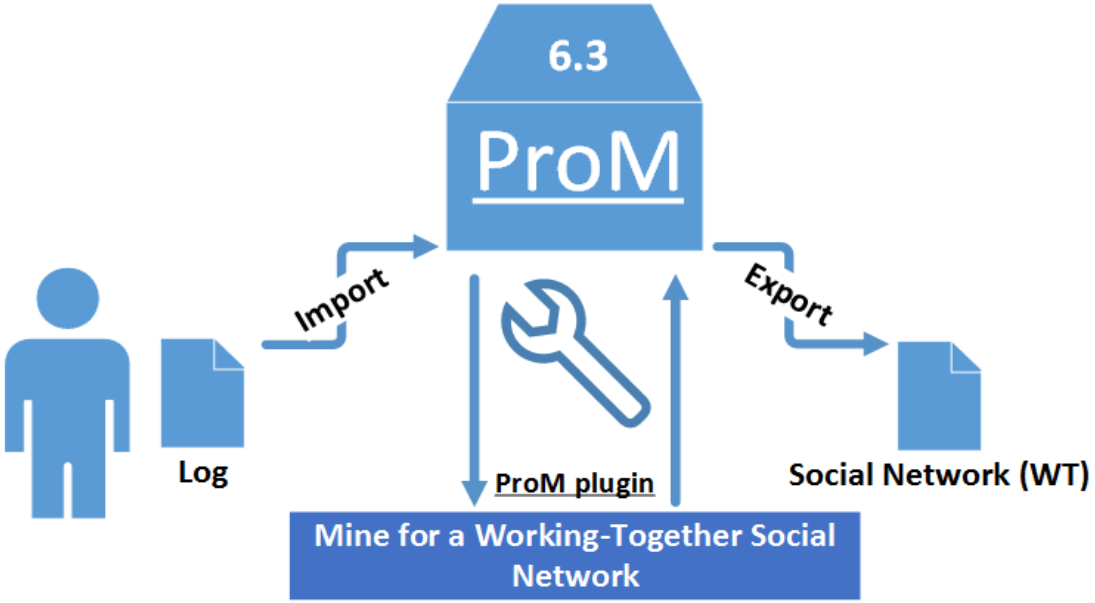
Extensible Markup Language (XML) is a simple, very flexible text format. Originally designed to meet the challenges of large-scale electronic publishing, XML is also playing an increasingly important role in the exchange of a wide variety of data on the Web and elsewhere.


```
<person>
  <firstName>John</firstName>
  <lastName>Smith</lastName>
  <age>25</age>
  <address>
    <streetAddress>21 2nd Street</streetAddress>
    <city>New York</city>
    <state>NY</state>
    <postalCode>10021</postalCode>
  </address>
  <phoneNumbers>
    <phoneNumber type="home">212 555-
1234</phoneNumber>
    <phoneNumber type="fax">646 555-4567</phoneNumber>
  </phoneNumbers>
  <gender>
    <type>male</type>
  </gender>
</person>
```

ProM 6.3

ProM is an extensible *framework* that supports a wide variety of process mining techniques *in the form of plugins*.

It is platform independent as it is implemented in Java, and can be downloaded *free of charge*.



Task

The main goal:

- Compare export BPMN models from ProM with the original data
- Find bugs in ProM

At the beginning:

- 6000 real BPMN models in JSON format

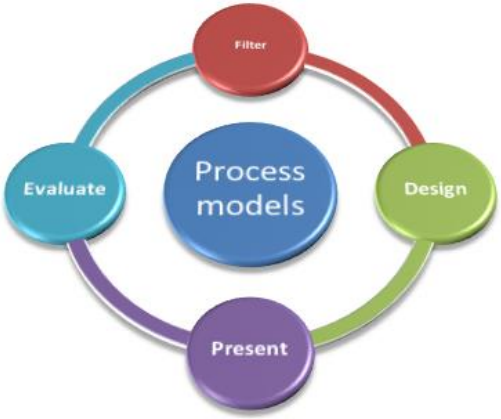
Now:

- 2000 real BPMN models in XML format
- 10 ProM plugins
- Find some bugs in ProM

Convertor (1)

BPMN JSON to BPMN XML Convertor

Apromore



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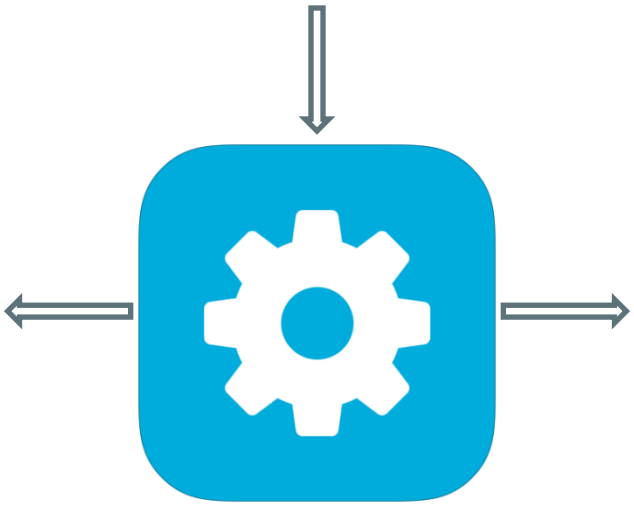
Convertor (2)

6000 BPMN models in JSON format



2000 valid BPMN models in XML format

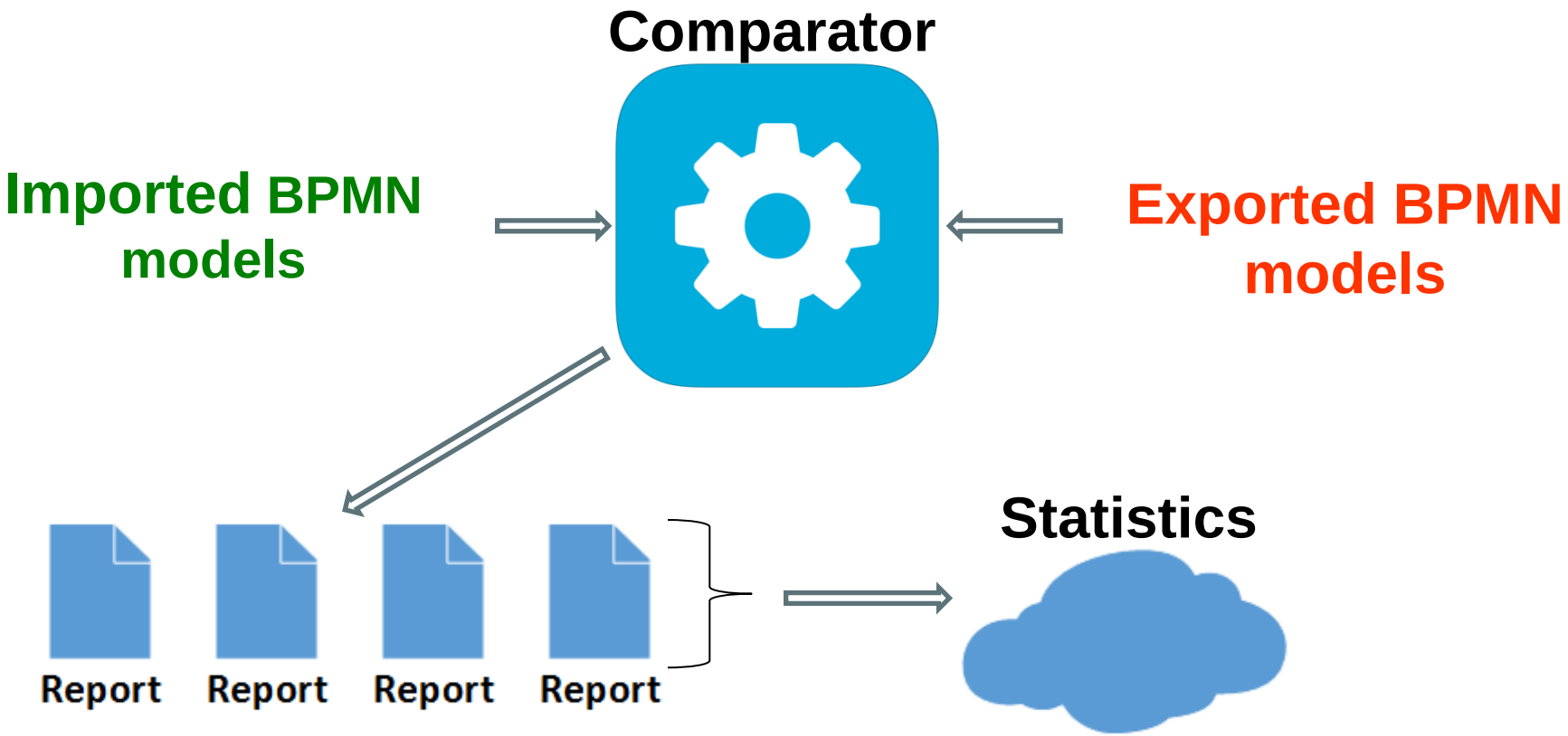
4000 not valid BPMN models in XML format

Convertor

The next step

- Import all 2000 BPMN models in XML format to the ProM
- Take one model
- Select BPMN diagram
- Export diagram out of the ProM in XML format
- Compare imported and exported model
- Collect statistics about all models

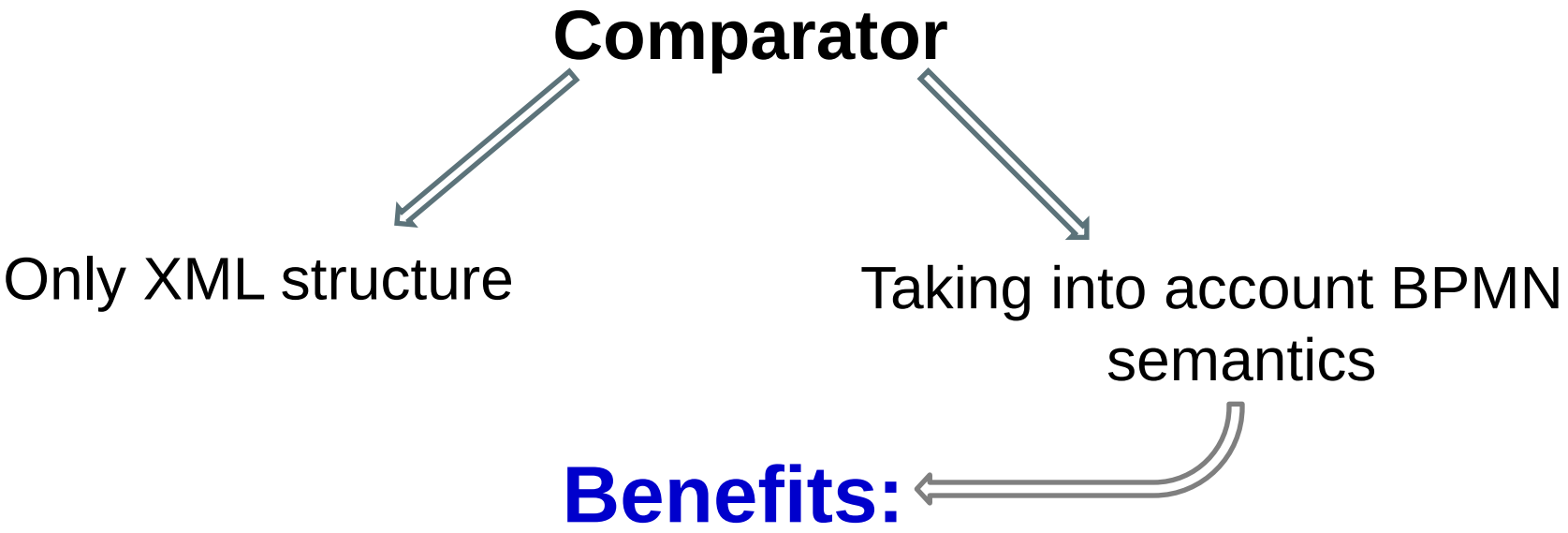
Comparator


Comparator
Imported BPMN models
Exported BPMN models
Report
Report
Report
Report
Statistics

Principles of XML document comparison

- Line comparison
- Ignore whitespaces
- Ignore comments
- Ignore queue
- Clear result of the comparison
- Comparison based on the scheme (xsd)

Comparator and BPMN semantics (1)



Benefits:

- **Better** file comparison
- **Better** BPMN support in ProM

Comparator and BPMN semantics (2)

Demonstration

Results of the work

Number of files on the start ⟹ 6000

Number of files at the end ⟹ 2341

Number of similar files ⟹ **0**

Number of dissimilar files ⟹ 2254

Number of files with errors ⟹ **87**

It is time to show how it works

Thank you!