Automation using XML Enhancing DoDAF use for DEVS Based T&E

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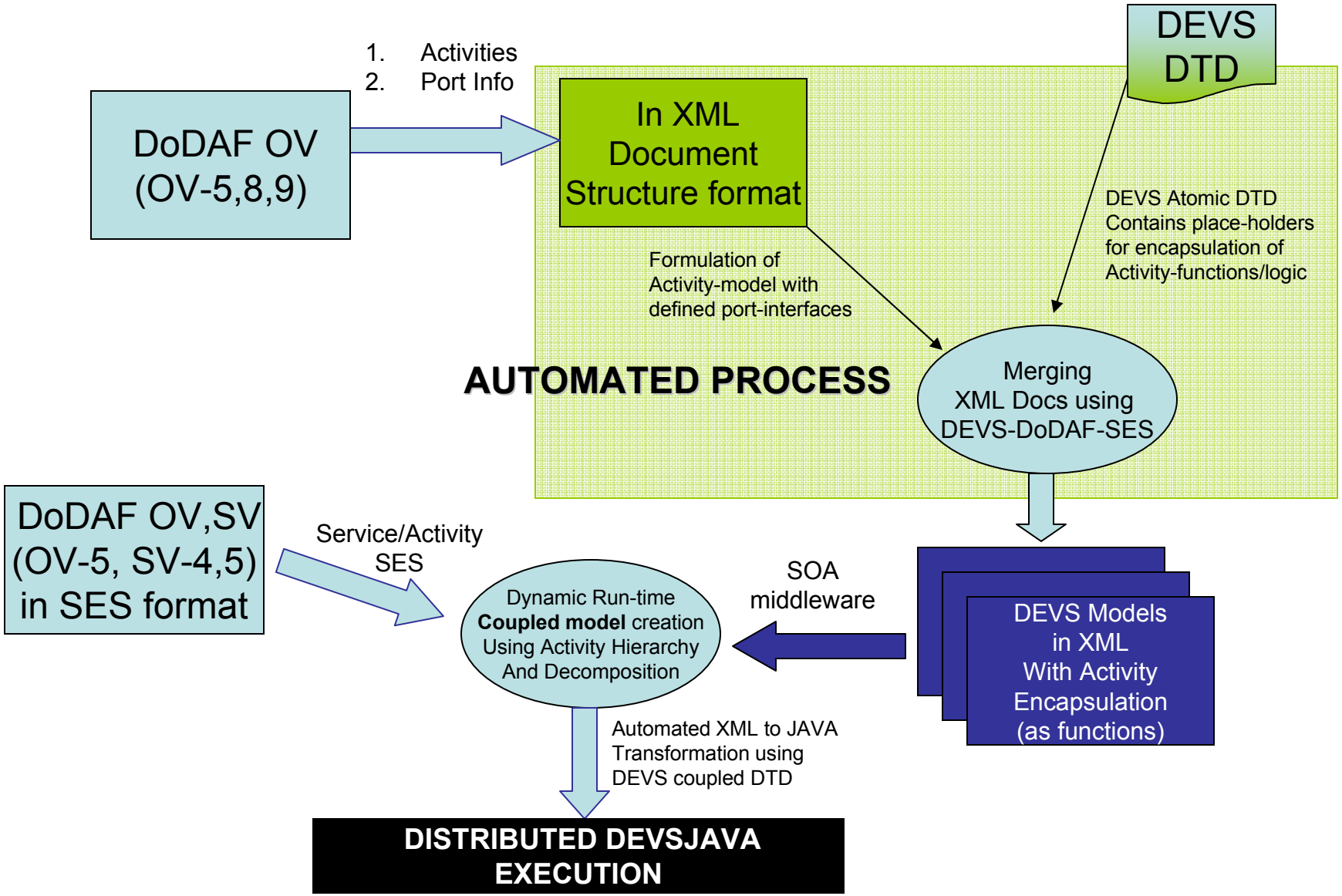
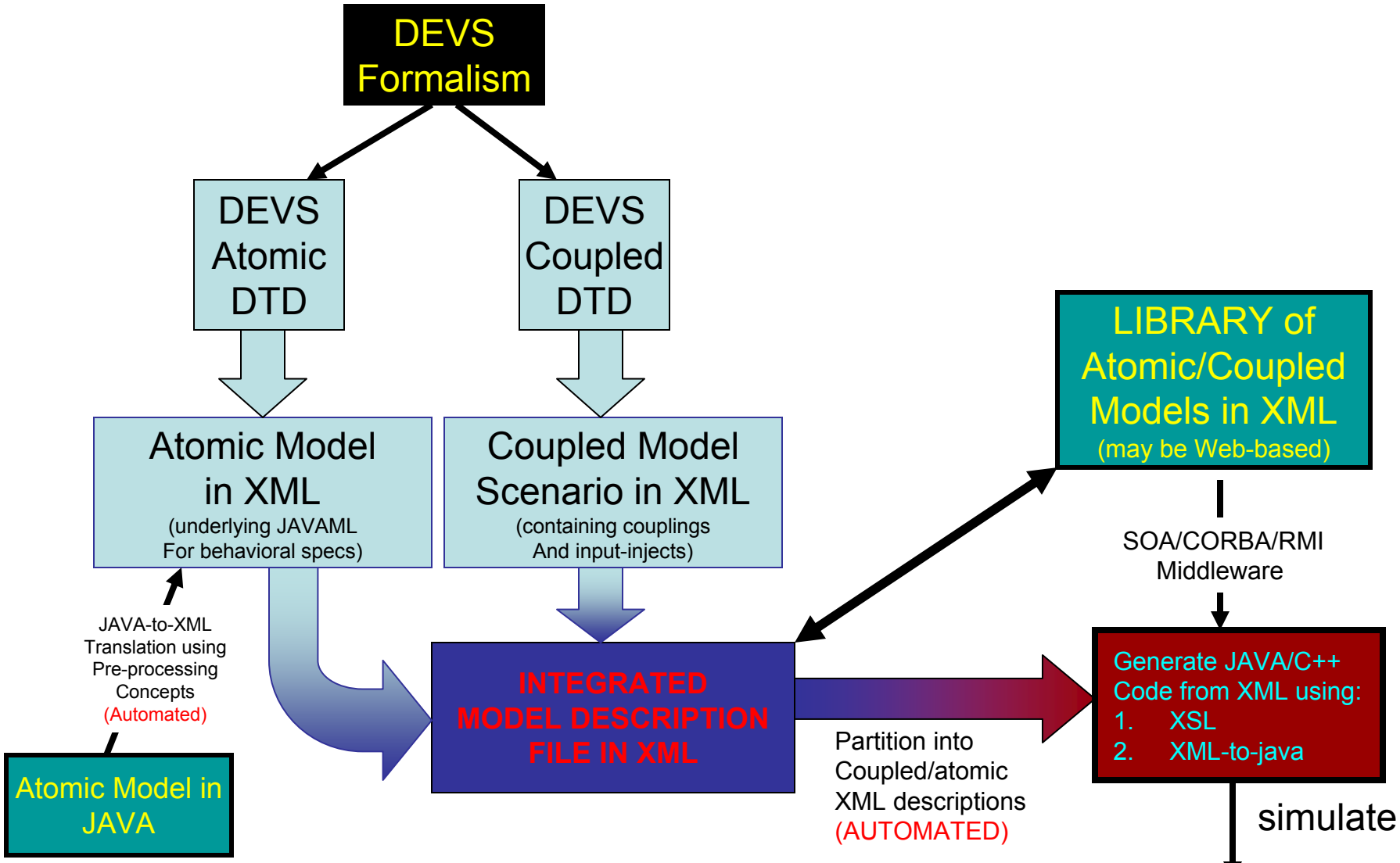
Basic Concept



DEVS DTDs and their Automated Execution



Implementation

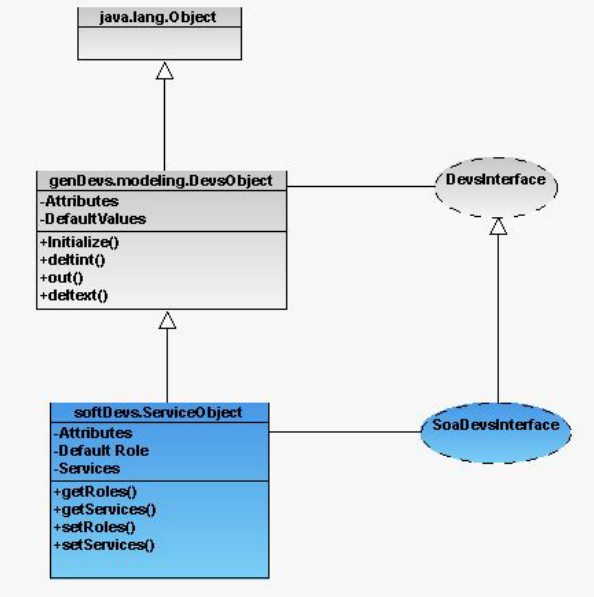


Figure 16: an SOA object capable of DEVS modeling

```
<?xml version="1.0" encoding="UTF-8"?>
<xml-body>
  <model>
    <atomic>
      <name>Hello</name>
      <params>  </params>

    <construct>
      <args> </args>
        <ports>
        <inports>
      <inport>in</inport>
        </inports>
        <outports>
      <outport>out</outport>
        </outports>
      </ports>
    </construct>

    <initialize>
    </initialize>

      . . .
    <services>

        <function>
      <access> public </access>
    <return> int        </return>
  <inport> in </inport>
<outport> out </outport>
      <fname> decrement() </fname>
   <logic>   </logic>
        </function>
</services>

    </atomic>
    </model>
  </xml-body>
```

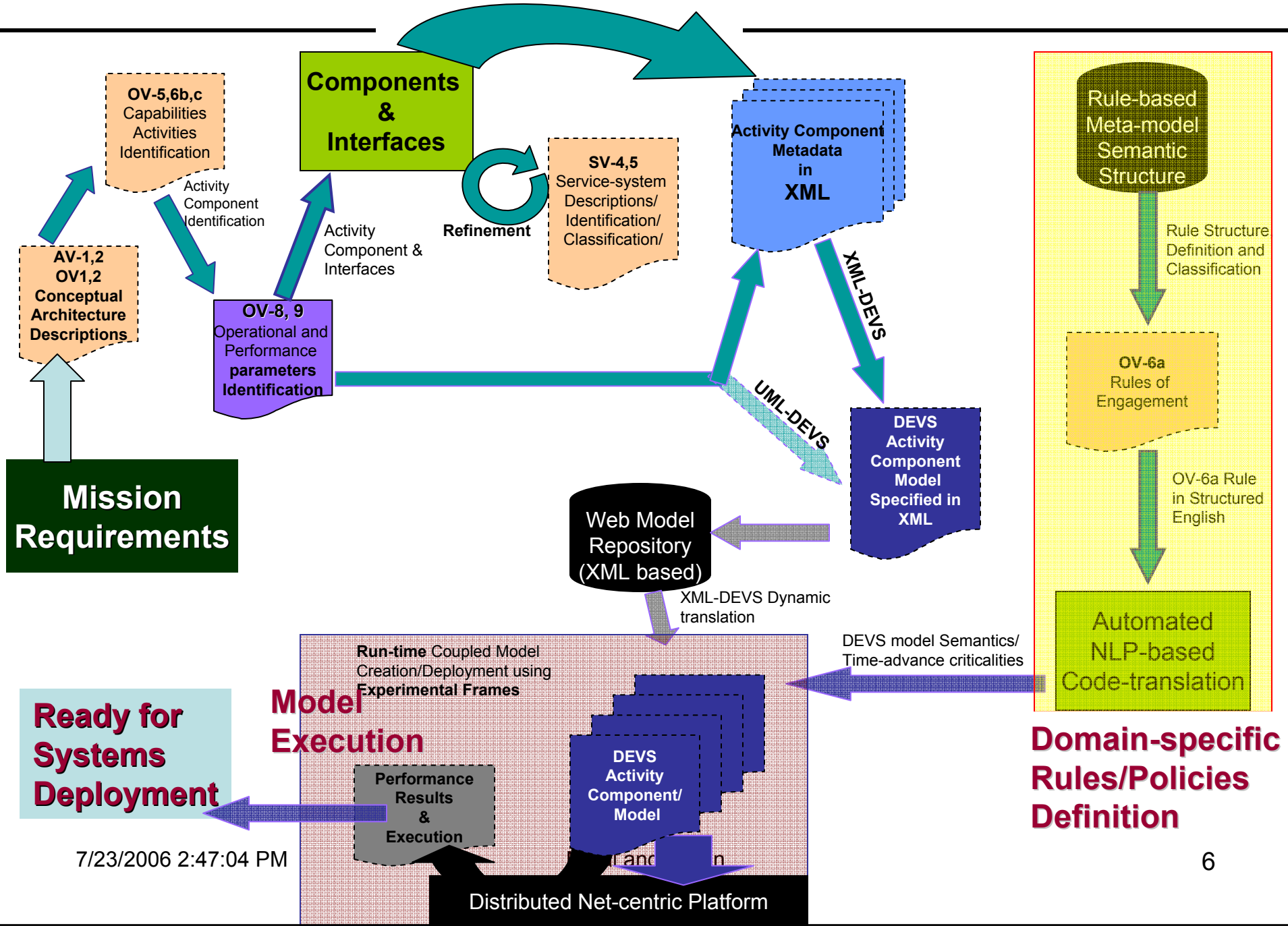
Figure 17: Automated XML snippet for an Activity Component created with OV-8 (port definitions). Logic is added later or exchanged through SOA implementation.

We now have…

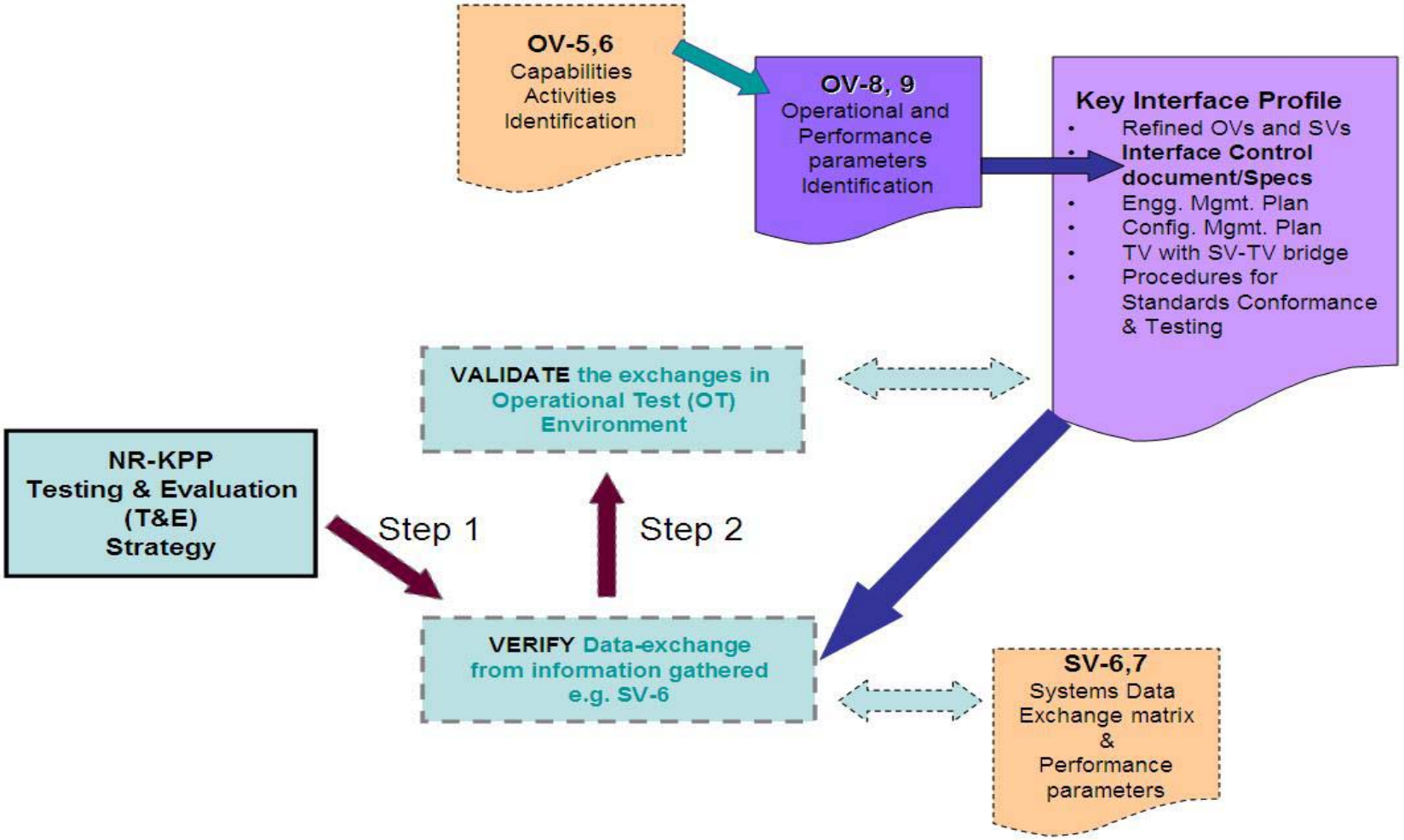
…the Capability to :

1. Transform any DEVS java to XML description and vice- versa
2. Validate any atomic or coupled DEVS model through XML DTDs (i.e. moving towards standardization of code…)
3. Write in pure XML (both atomic and coupled DEVS) and run the simulation on the web OR on machine
4. Collaborate with any XML atomic models ‘remotely’ and create dynamic Coupled models
5. Run the simulation and provide ‘integration’ as a Service in SOA implementation
6. Run in distributed manner using RMI (feature to be included in DTDs)

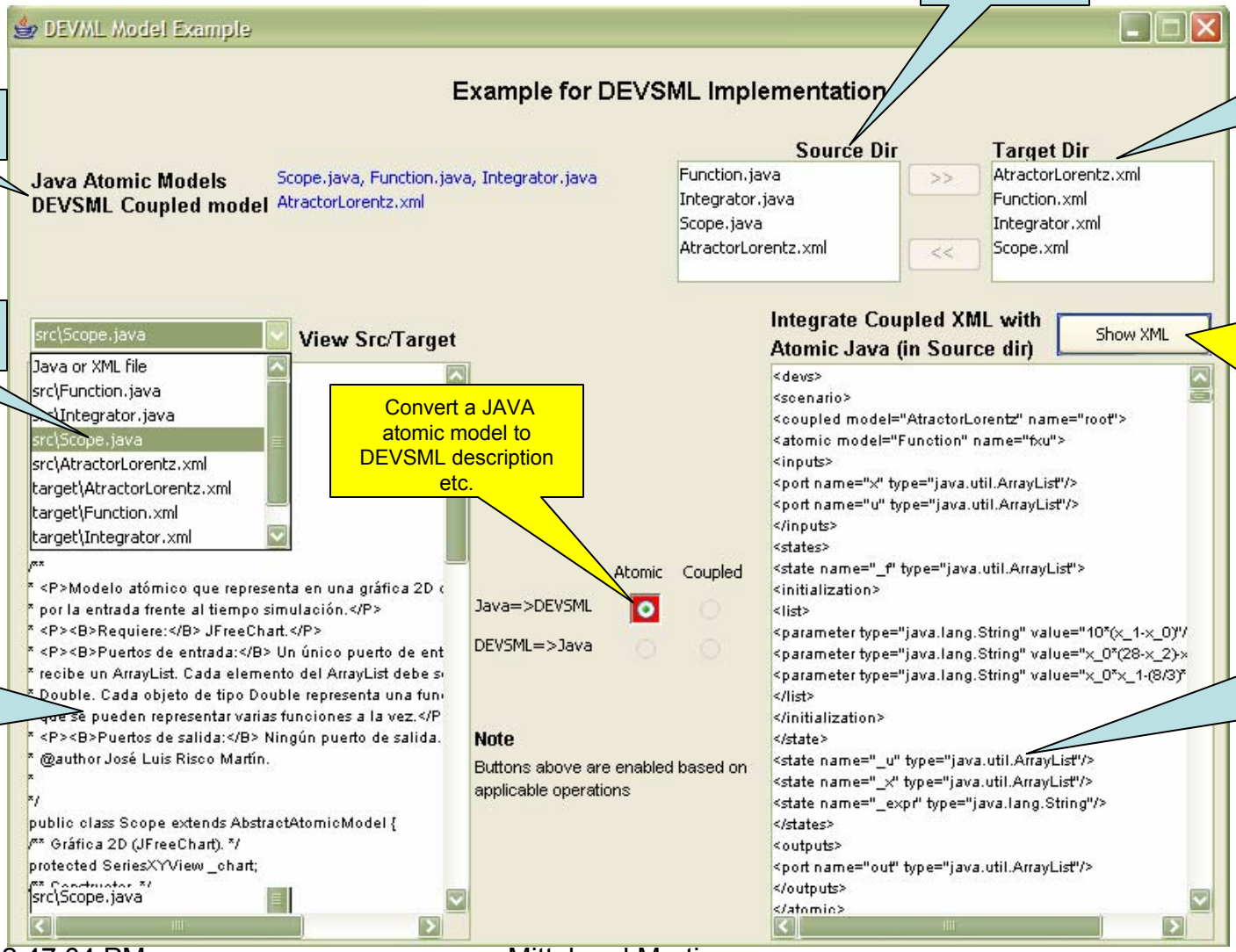
DEVS/DoDAF as Basis for Life Cycle Development with integrated Net-based T&E



DoDAF and T&E Strategy



Application Snapshot



References

Working Papers

- **Jose Luis Risco Martin, Saurabh Mittal, et.al,** *A W3C XML Schema for DEVS Scenarios*
- **Saurabh Mittal, Jose Luis Risco Martin,** *DEVSML: Automating M&S with JAVAML*
- **Saurabh Mittal, Jose Luis Risco Martin, Bernard P. Zeigler,** *Automating DEVS-DODAF Test & Evaluation Methodology using DEVSML*

Referenced Papers

- Vladimir Janousek, Petr Polasek, Pavel Slavicek, *Towards DEVS Meta Language*
- **Saurabh Mittal**, Amit Mitra, Amar Gupta, Bernard P. Zeigler, *Strengthening OV-6a Semantics with Rule-based Meta-models in DEVS/DoDAF Based Life-cycle Archictectures Development*, IEEE-Information Reuse and Integration (IRI06) Conference, special section on DoDAF, Hawaii, September 2006 (pdf)
- **Saurabh Mittal,** *Extending DoDAF to Allow Integrated DEVS-based Modeling and Simulation*, (under review) submitted to Journal of Defense Modeling and Simulation JDMS, 2005 (pdf)
- **Saurabh Mittal,** Eddie Mak, James J. Nutaro, *DEVS-Based Dynamic Model Reconfiguration and Simulation Control in the Enhanced DoDAF Design Process*,(under review) submitted to Journal of Defense Modeling and Simulation JDMS, 2005 (pdf)
- Bernard P. Zeigler, **Saurabh Mittal**, *Enhancing DoDAF with a DEVS-based System Lifecycle Development Process*, In Proceedings of IEEE International Conference on Systems, Man and Cybernetics, SMC05, Hawaii 2005 (pdf)

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