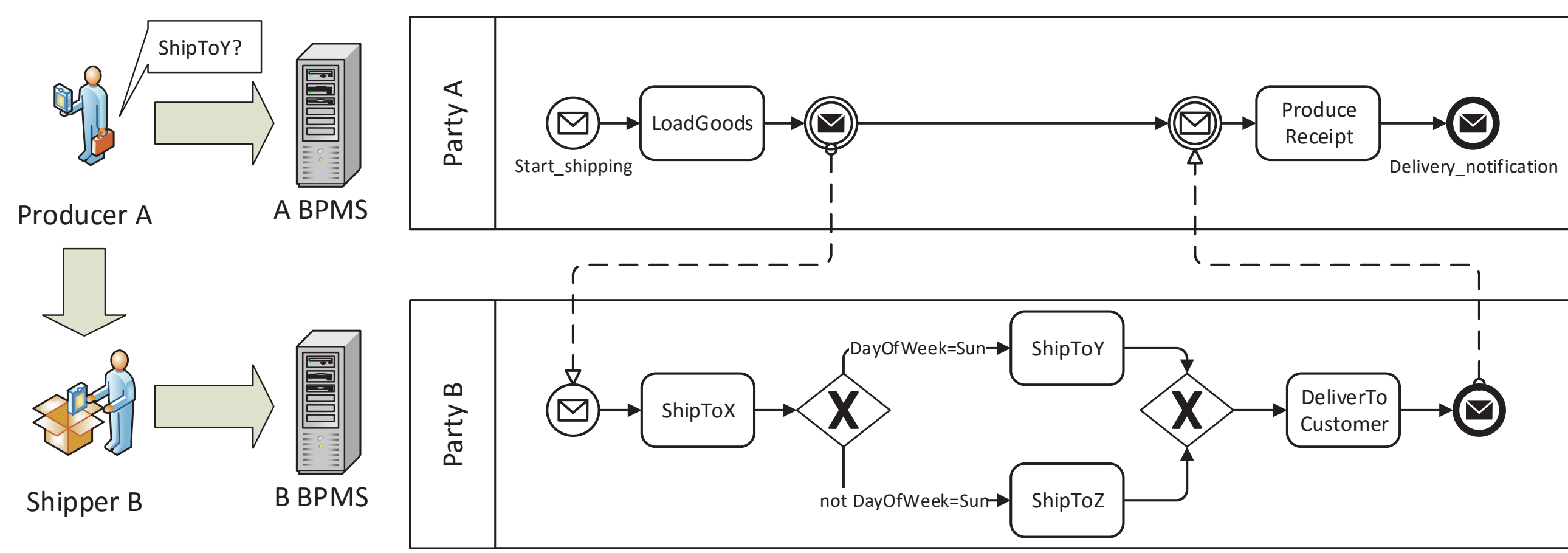


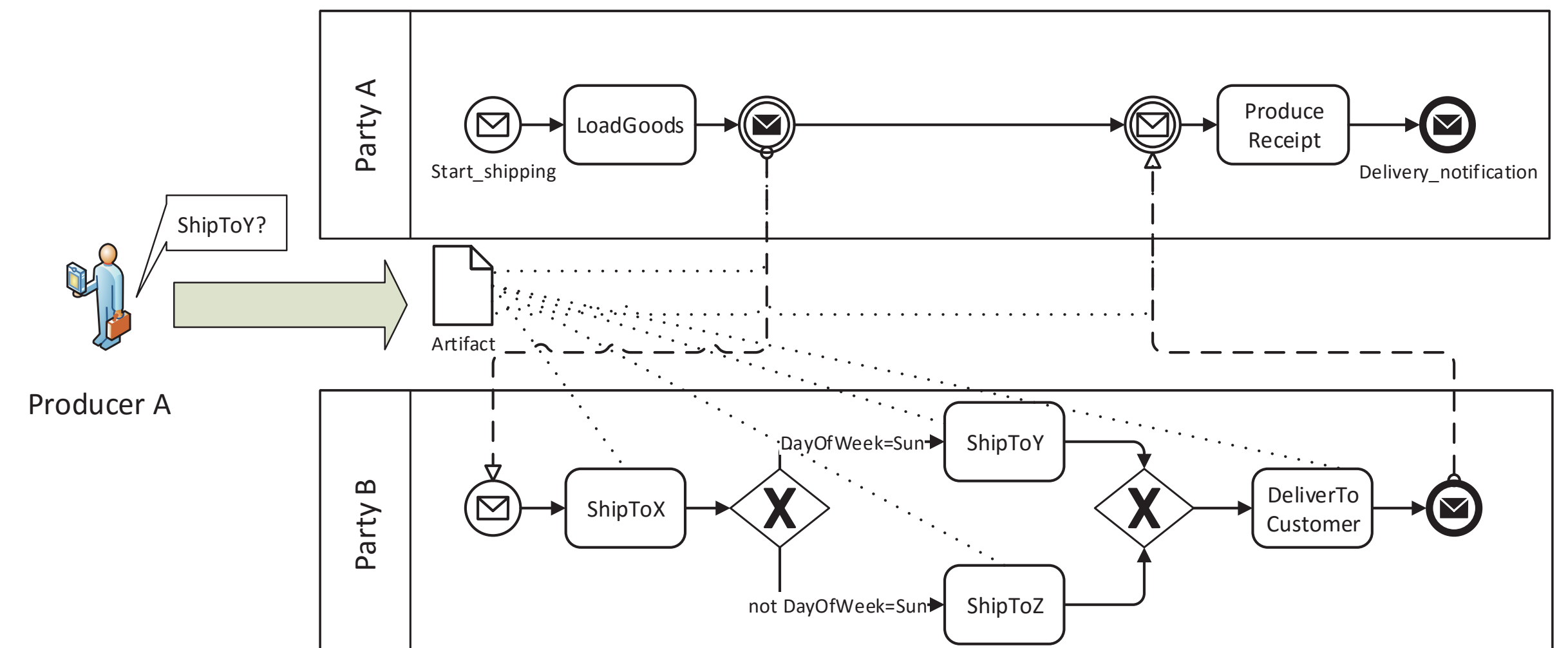
# On Handling Business Process Anomalies through Artifact-based Modeling

## Monitoring multi-party processes: usual solutions



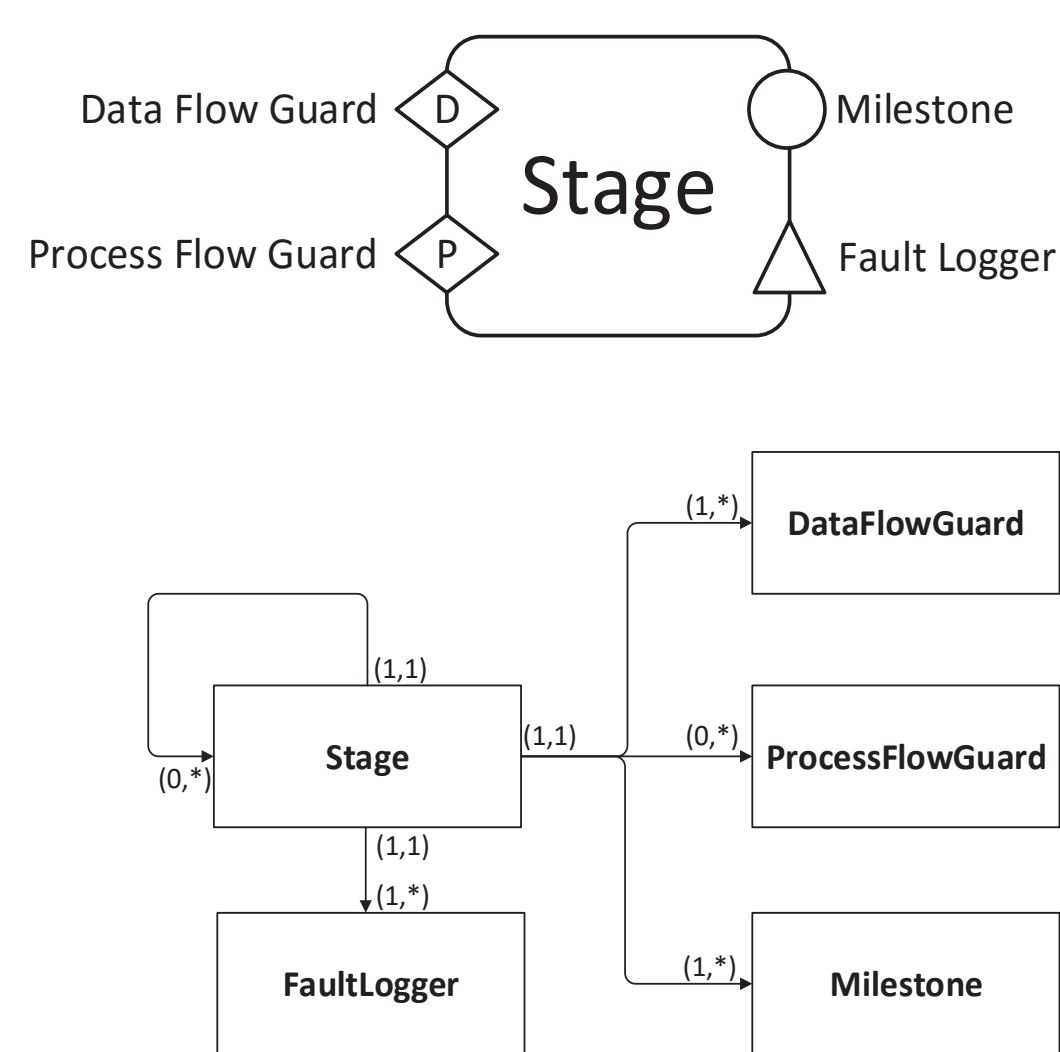
- Each organization has full control only on the portion of the process under their responsibility
- Getting information on how the process behaves outside a pool means querying external monitoring systems
- Organizations can know the execution of the whole process only if they all exchange monitoring information

## Introducing artifacts to monitor process



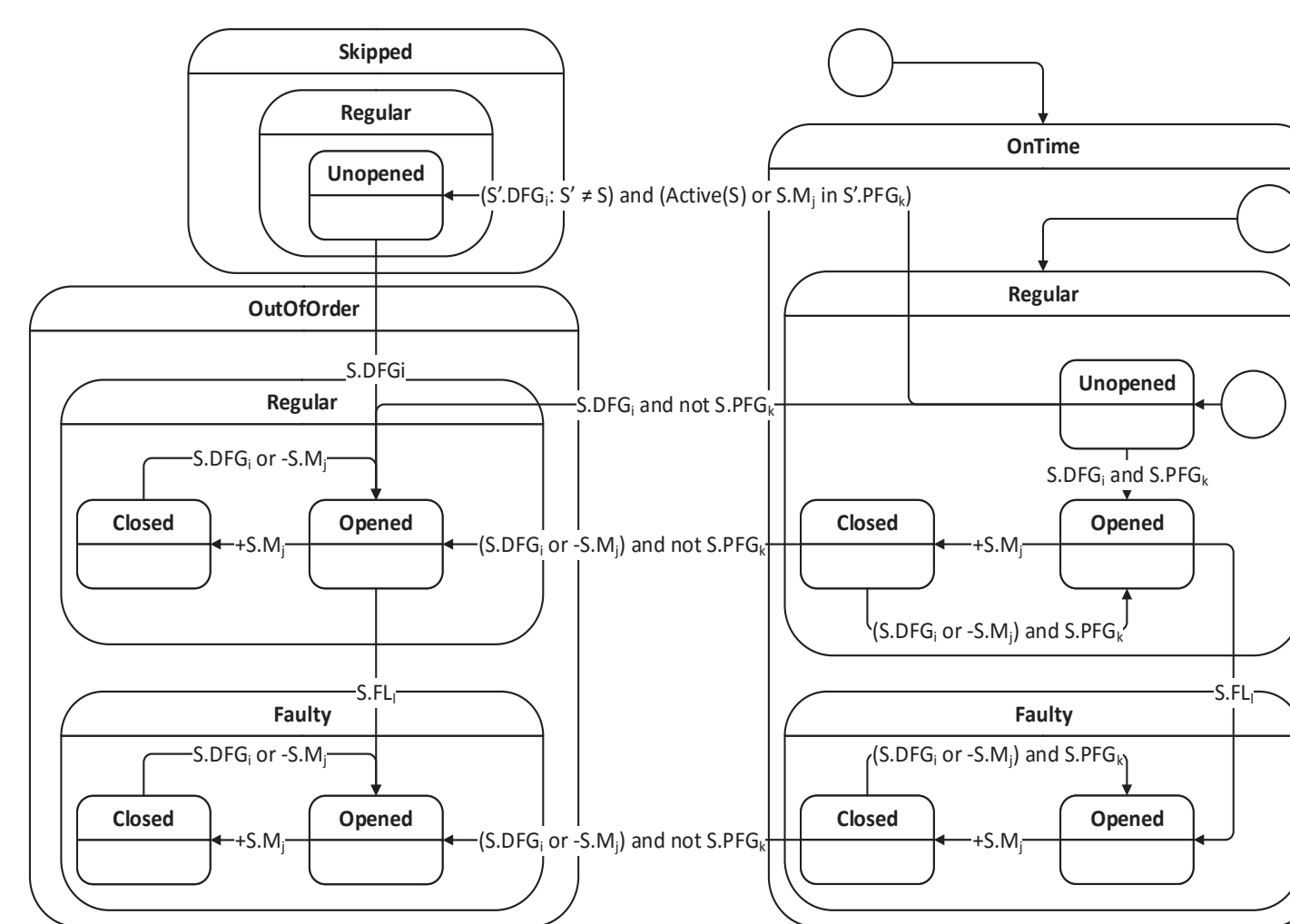
- In multi-party processes lots of data, i.e., artifacts, are exchanged among pools and transformed inside these pools
- We exploit these artifacts by piggybacking on them the monitoring instructions defined using **E-GSM: an extension of GSM to declare admissible process statuses**
- If an activity uses the artifact, it can be monitored, otherwise not

## E-GSM: a GSM extension for monitoring processes



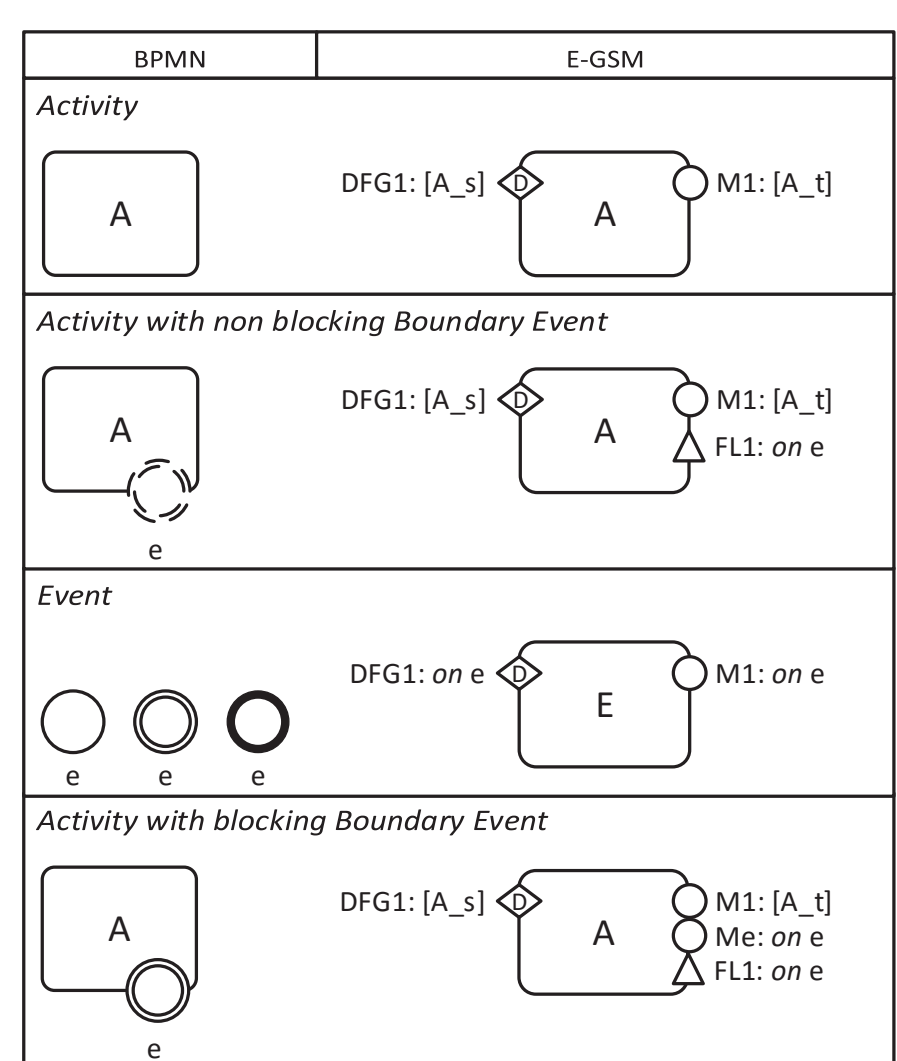
- Guards are distinguished in:
  - **Data Flow Guards** responsible for opening stages
  - **Process Flow Guards** to check if stages comply with the execution
- **Fault Loggers** are added to identify if something went wrong during the execution of stages
- Milestones (as defined in GSM) are responsible for closing stages

- This way, we can monitor the execution of a process along with three dimensions:

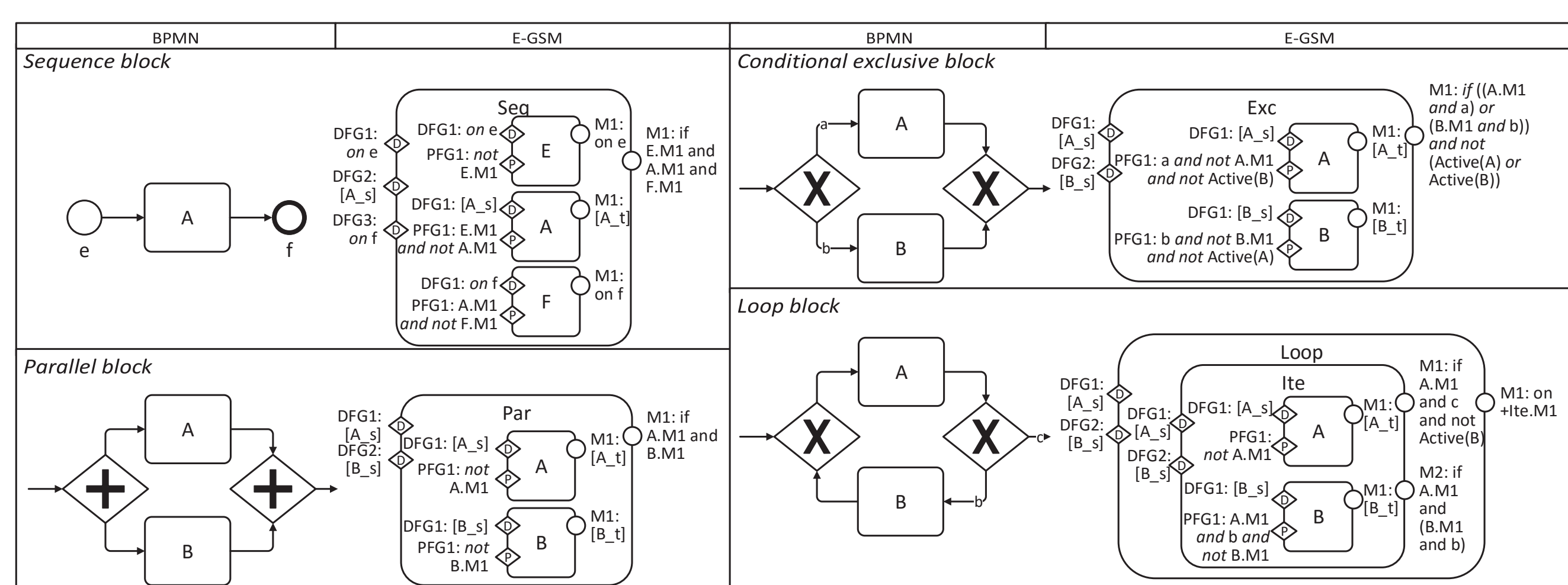


- **Status:** a stage is unopened, opened or closed
- **Outcome:** a stage is regular or faulty
- **Compliance:** a stage is onTime, skipped or outOfOrder

## From BPMN to E-GSM

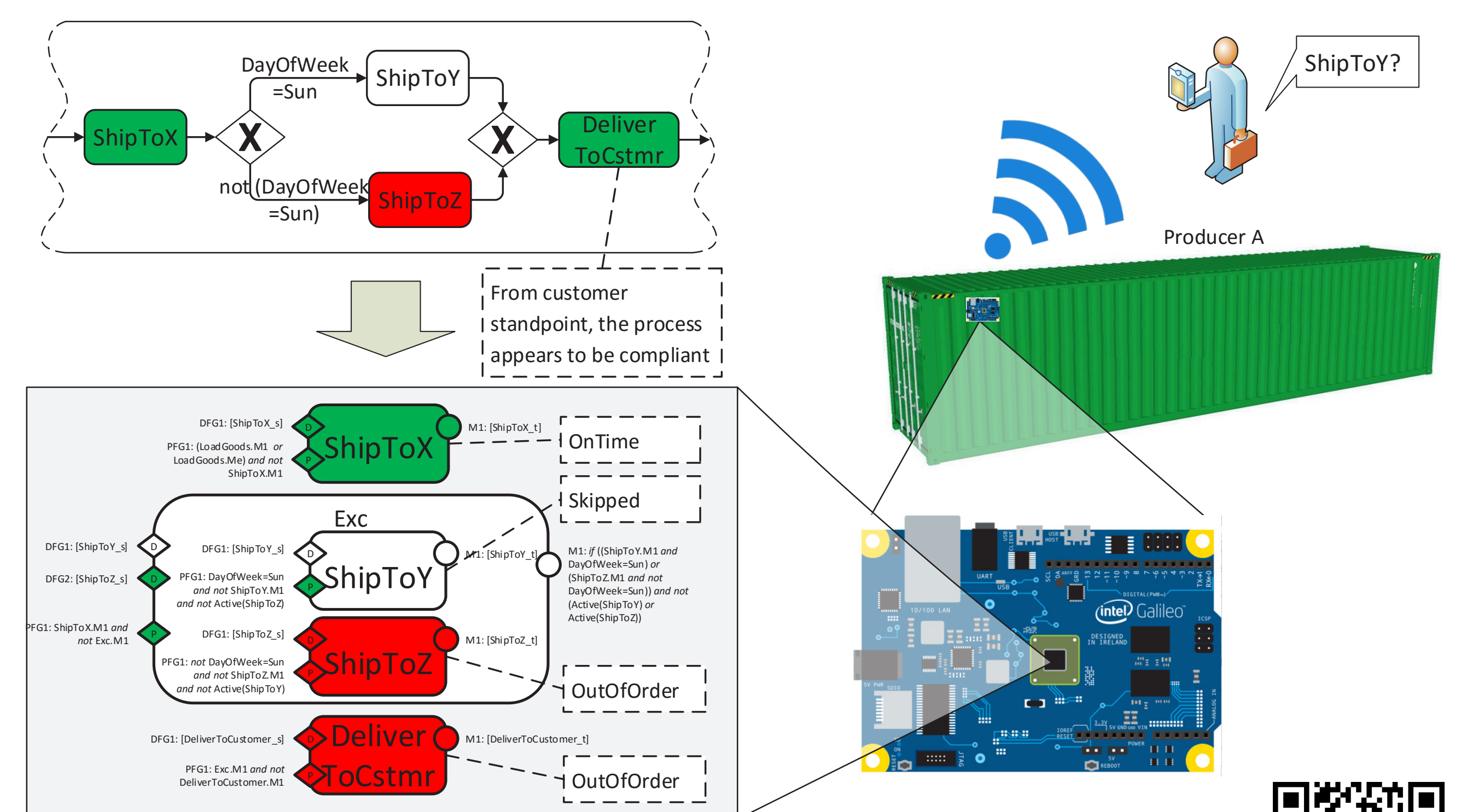


- BPMN is used to model multi-party processes
- **E-GSM can be automatically derived from well-structured BPMN process**
- Proposed transformation rules cover most of the control-flow and exception handling patterns
- More details on transformation rules at <http://hdl.handle.net/11311/976678>



## Enabling monitoring using smart devices

- When the exchanged artifacts are physical objects these objects can become smart
- Equipped with sensors, comm interfaces, smart objects can autonomously monitor the evolution of the artifact they represent and, as such, the multi-party process



BPMN2EGSM translator and E-GSM engine are available at <https://bitbucket.org/account/user/polimiisgroup/projects/MARTIFACT>