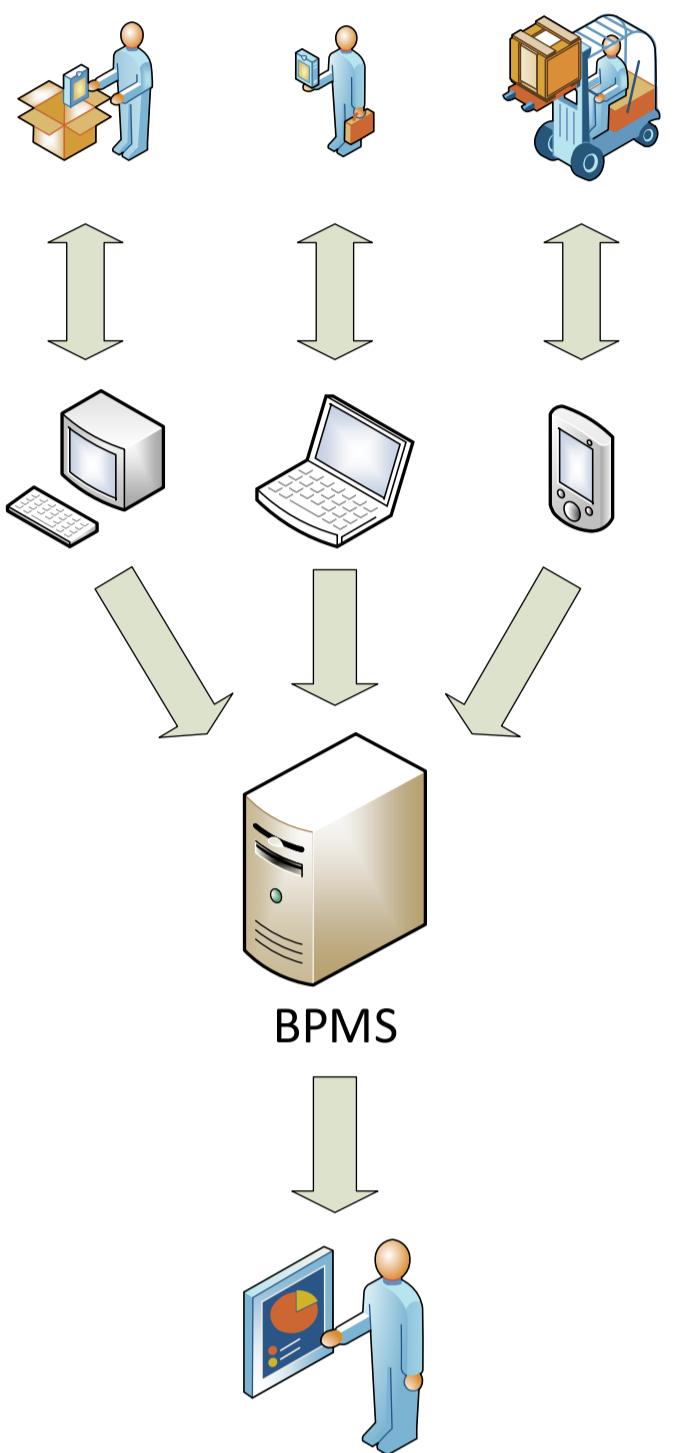




Artifact-driven Process Monitoring

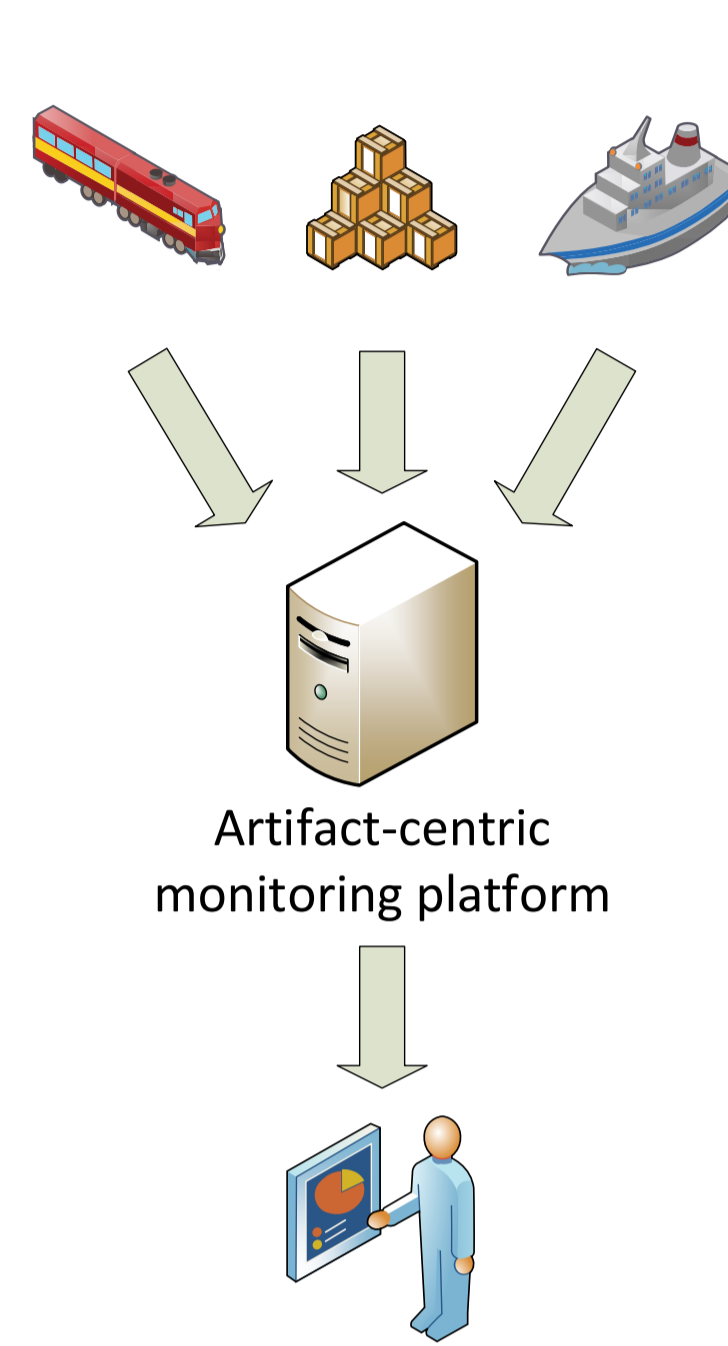
Dynamically Binding Real-world Objects to Running Processes

Limitations of traditional process monitoring



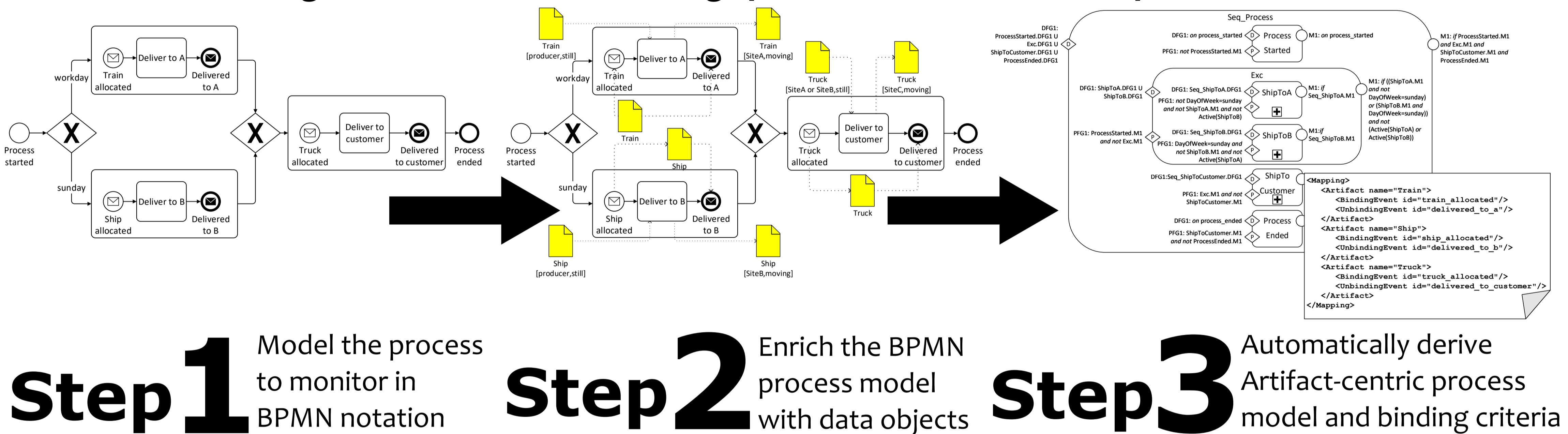
- Human interaction is required to notify when manual tasks are performed
 - › Operators must **interrupt their work to send notifications** to a BPMS
 - › Operators may **forget** to send, postpone, or intentionally **fake** notifications
- The process is expected to always be executed according to the model
- **Manual intervention** is required when the **execution deviates** from the model
 - › By default, a BPMS throws an exception
 - › **Monitoring is halted** until the exception is addressed by someone
 - › The exception could be ignored and the **execution continue without monitoring**

Exploiting artifacts to monitor a process



- Processes interact with artifacts (physical or virtual objects)
 - › Activities start when some artifacts have specific characteristics
 - › Activities end after altering some artifacts
- **Artifacts** can be used to **determine when activities are executed**
- **Artifact-centric** process engines can **monitor the process without human intervention**
 - › Changes in the characteristics of the artifacts can trigger the activation/termination of activities
 - › Monitoring can continue even after a violation in the execution flow occurs

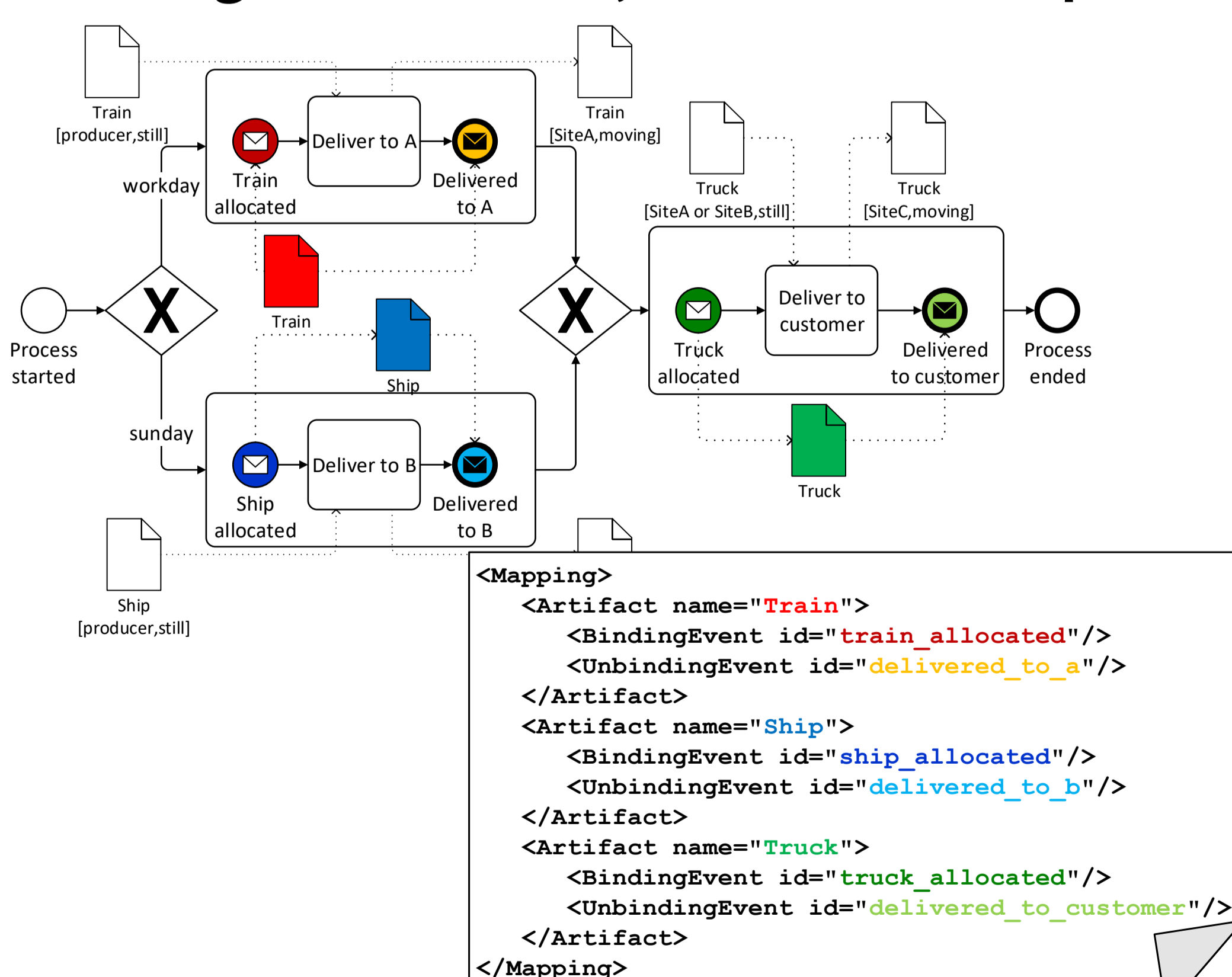
Deriving artifact-driven monitoring specifications from BPMN process models



Problem

- Artifacts are instantiated by real-world objects when the process is started
- Sometimes, the identity of the objects is known after the process started
- Objects may participate only during some parts of the process
- Information from an object not participating to the process is irrelevant and negatively affects the reliability of the monitoring

Binding real-world objects to business processes



Approach

- Rely on message events and data objects
- Message start event connected to data object:
 - › Object specified in the body of the message starts interacting with the process
 - › Object instantiates the artifact represented by the data object
 - › When the characteristics of the object change, the artifact is updated
- Data object connected to message end event:
 - › The artifact is no longer instantiated