

WP3

Hybrid Monitoring

- **G4. Enrich the KOS infrastructure with the ability of handling incomplete logs (task in WP2 without deliverable)**
- **G5. Provide advanced process monitoring facilities.**

Objective (from DoW)

- definition and development of mechanisms for the hybrid monitoring of processes.
- Hybrid = **combining symbolic** and **statistical** approaches.

Tasks (from DoW)

- **T3.1** Definition of a framework to combine symbolic and statistical approaches for process monitoring. [10 PM]
- **T3.2** Analysis and tuning of existing machine learning techniques for hybrid monitoring approaches. [6 PM]
- **T3.3** Extracting symbolic representations of properties from data. [6 PM]
- **T3.4** Concept drift detection. [6 PM]
- Effort: FBK: 16PM, UniBZ: 8PM, UniINNSBRUCK: 4PM

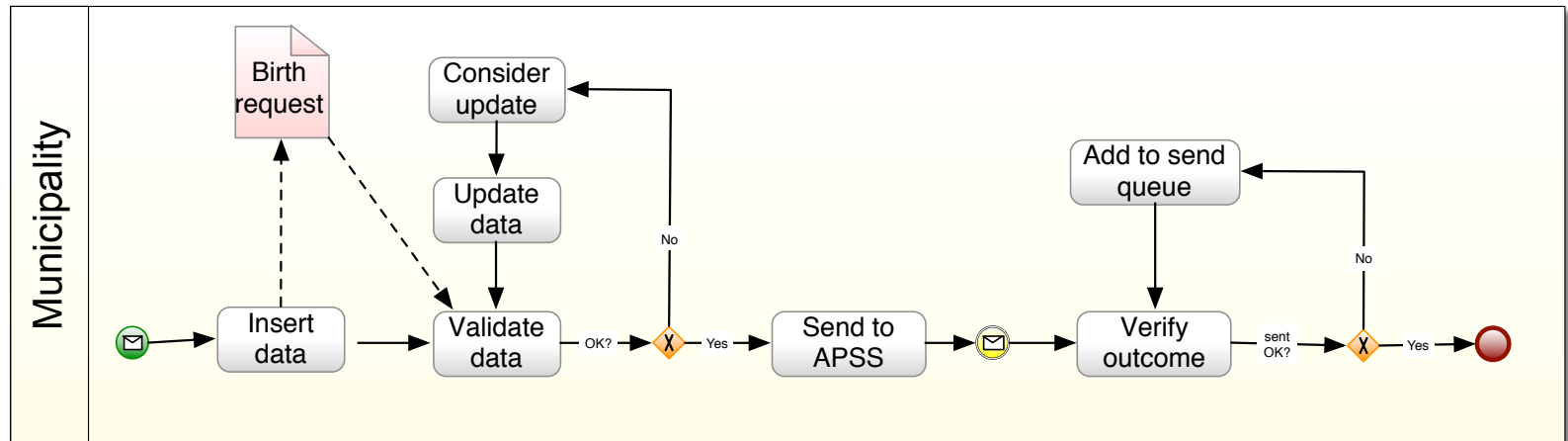
Deliverables

- **D3.1** First hybrid process monitoring framework (Result of T3.1) [Report, M 24]
- **D3.2** Techniques for tuned machine learning (Result of T3.2) [Report, M 30]
- **D3.3** Techniques for extracting symbolic representations from data, and concept drift detection (Result of T3.3, T3.4) [Report, M 36]

Next steps:

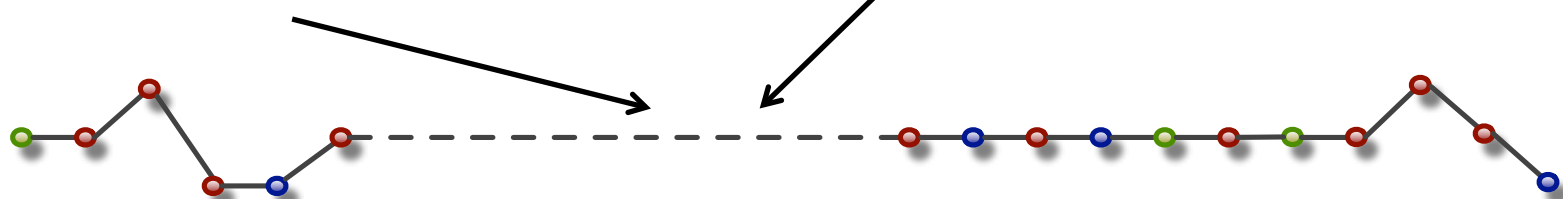
- **T3.1** Definition of a framework to combine symbolic and statistical approaches for process monitoring. [10 PM]
- **T3.2** Analysis and tuning of existing machine learning techniques for hybrid monitoring approaches. [6 PM]
- Extend **abductive** framework for dealing with incomplete event logs with probabilistic abduction.
- FBK and UniBZ

Next steps:



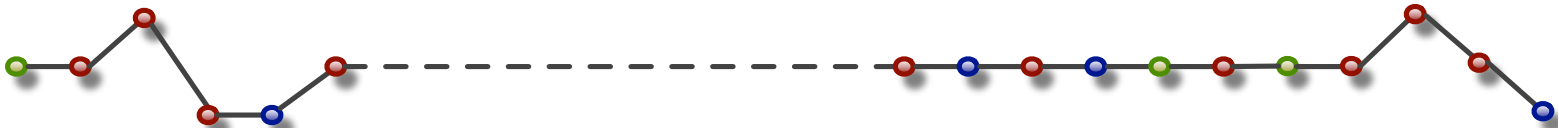
Learning from past traces

Making hypothesis

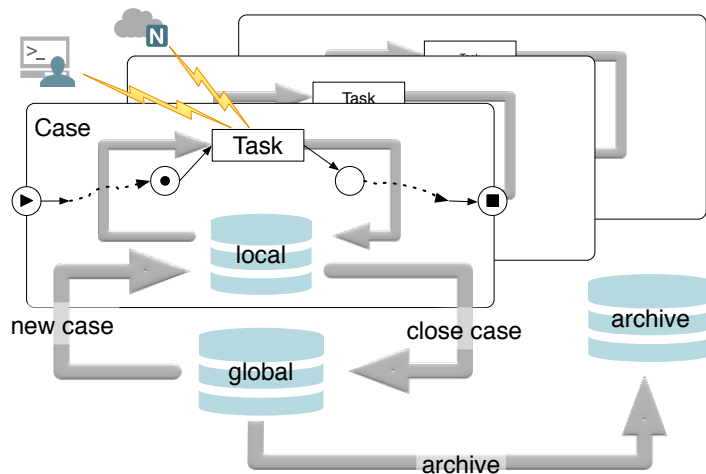
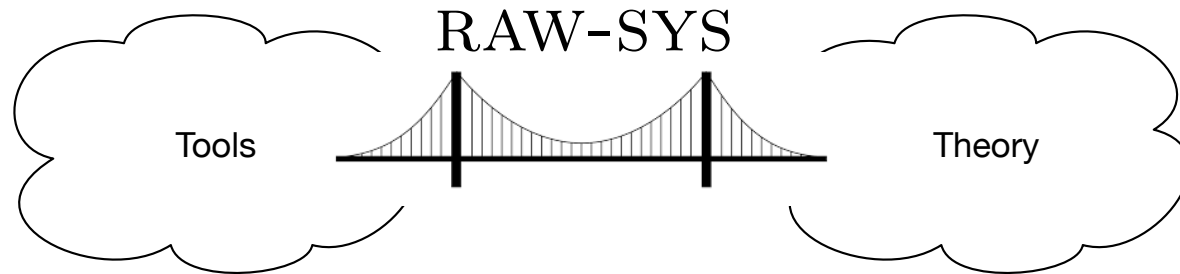


What is the meaning of numbers?

- Frequency,
- Probability
- Next activity rather than the entire path?
-



Effective verification of process+data



- DCDS
- Planning

Next steps:

- **T3.3** Extracting symbolic representations of properties from data. [6 PM]
- *Apriori and Sequence Analysis for Discovering Declarative Process Models*
Taavi Kala, Fabrizio Maria Maggi, Claudio Di Ciccio and Chiara Di Francescomarino. To appear at EDOC 2016
- FBK

Next steps:

- **T3.4** Concept drift detection.

- UniINNSBRUCK

Concept drifts

Types of concept drifts

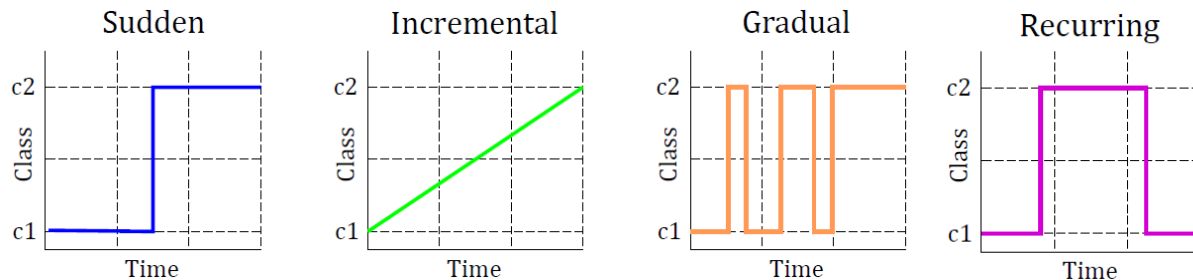


Image: D. Brzezinski thesis

- Object of the drift
 - The process model we are monitoring
 - The stream of events which we are analyzing
- Principle: recent events are more important than old events
- Goal
 - Embed the principle into monitoring approaches
 - Monitor for new classes