Eventifier: Extracting Process Execution Logs from Operational Databases

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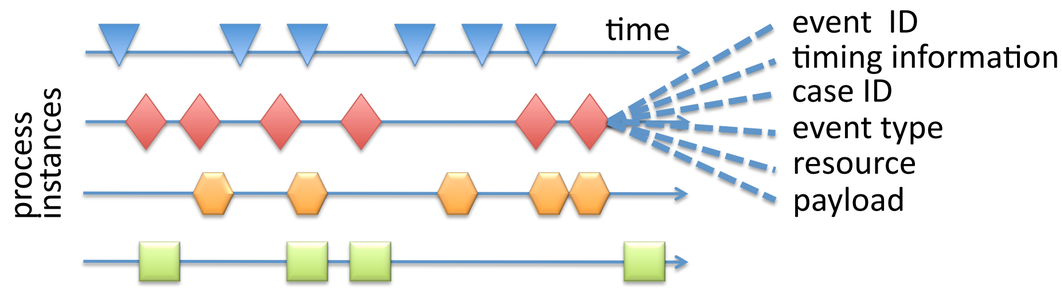
I. Goal

Reconstruct process execution event logs from operational databases to enable process discovery in cases where no event log is given.

II. Motivation



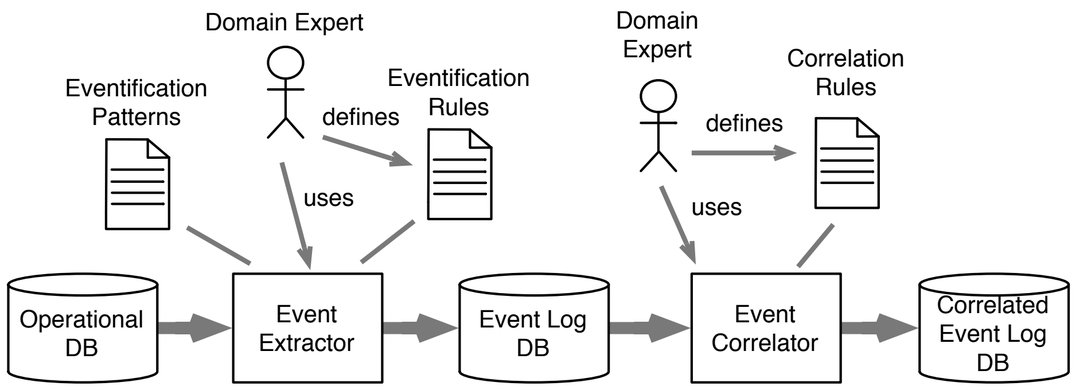
- Most process discovery approaches assume the existence of information-complete and correlated event logs
- In practice, most company infrastructures do not generate such nice logs

III. Challenges

- Identification of **the existence of process execution events** in operational databases
- **Extraction of the identified events** from the operational database
- **Mapping of events** to an existing event log format
- Identification of the **ordering criteria** for events
- **Correlation of events** into process instances (cases)

IV. Approach

The tool consists of two parts: (i) the **event extractor**, where events are identified, extracted and ordered, and (ii) the **event correlator**, where events are correlated into process instances.



V. Event model

An **event log** can be seen as a sequence of events

$$E = [e_1, e_2, e_3, \dots, e_n]$$

where each **event** is of the form

$$e_i = \langle id, tname, piid, ts, pl \rangle$$

id is the identifier of the event, **tname** is the task name associated to the event, **piid** is the process instance identifier, **ts** is its timestamp and **pl** the payload

VI. Eventification patterns

Event identification

A_1	orderID	⋯	A_n	
xx	xx		xx	e_1
xx	xx		xx	e_2
xx	xx		xx	e_3

Single row, single event

A_1	dispatched	delivered	⋯	A_n	
xx	yes	no		xx	e_1[dispatch]
xx	yes	yes		xx	e_2[dispatch]
xx	no	no		xx	e_3[deliver]

Single row, multiple events

A_1	orderID	itemID	⋯	A_n	
xx	1	1		xx	e_1[invoice]
xx	1	2		xx	
xx	1	3		xx	
xx	3	1		xx	

Multiple rows, single event

Data mapping

time	orderID	activity	⋯	A_n
xx	1	xx		xx
xx	1	xx		xx
xx	1	xx		xx
xx	3	xx		xx

e = <id, tname, piid, ts, pl>

Event ordering

ordering attribute

A_1	time	⋯	A_n
xx	xx	⋯	xx
xx	xx	⋯	xx
xx	xx	⋯	xx

Event correlation

Atomic rule:
(Ax = Ay)

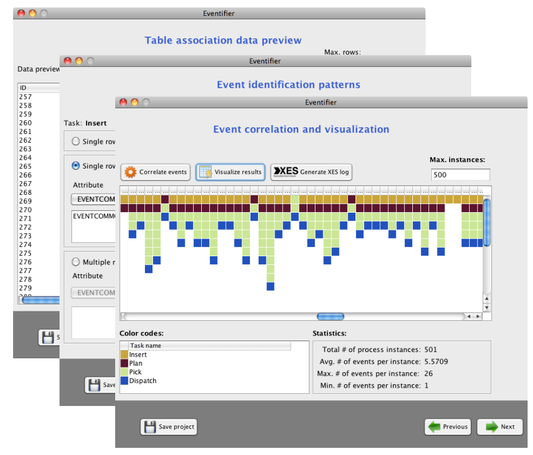
Disjunctive rule:
(Ax = Ay) ∨ (Aw = Az). . .

Conjunctive rule:
(Ax = Ay) ∧ (Aw = Az). . .

VII. The Eventifier

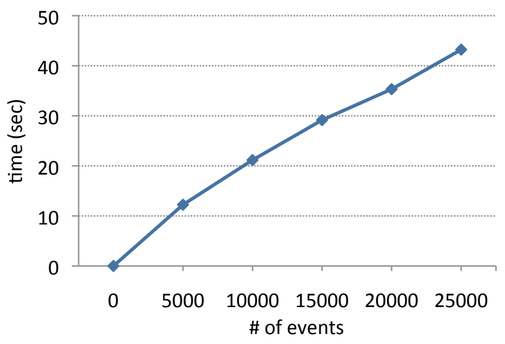
Features:

- Helps users step-by-step in setting up an eventification project
- Provides feedback to users by showing the results and statistics immediately after each step
- Generates event logs in the XES format

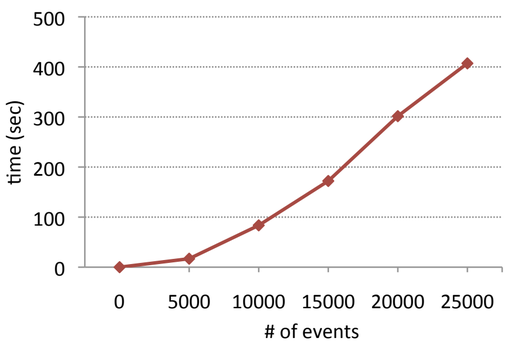


- Provides useful visual metaphors to plot the obtained event log after event generation and correlation

Performance:



Event log generation



Event correlation