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# FlowSpy: exploring Activity-Execution Patterns from Business Processes

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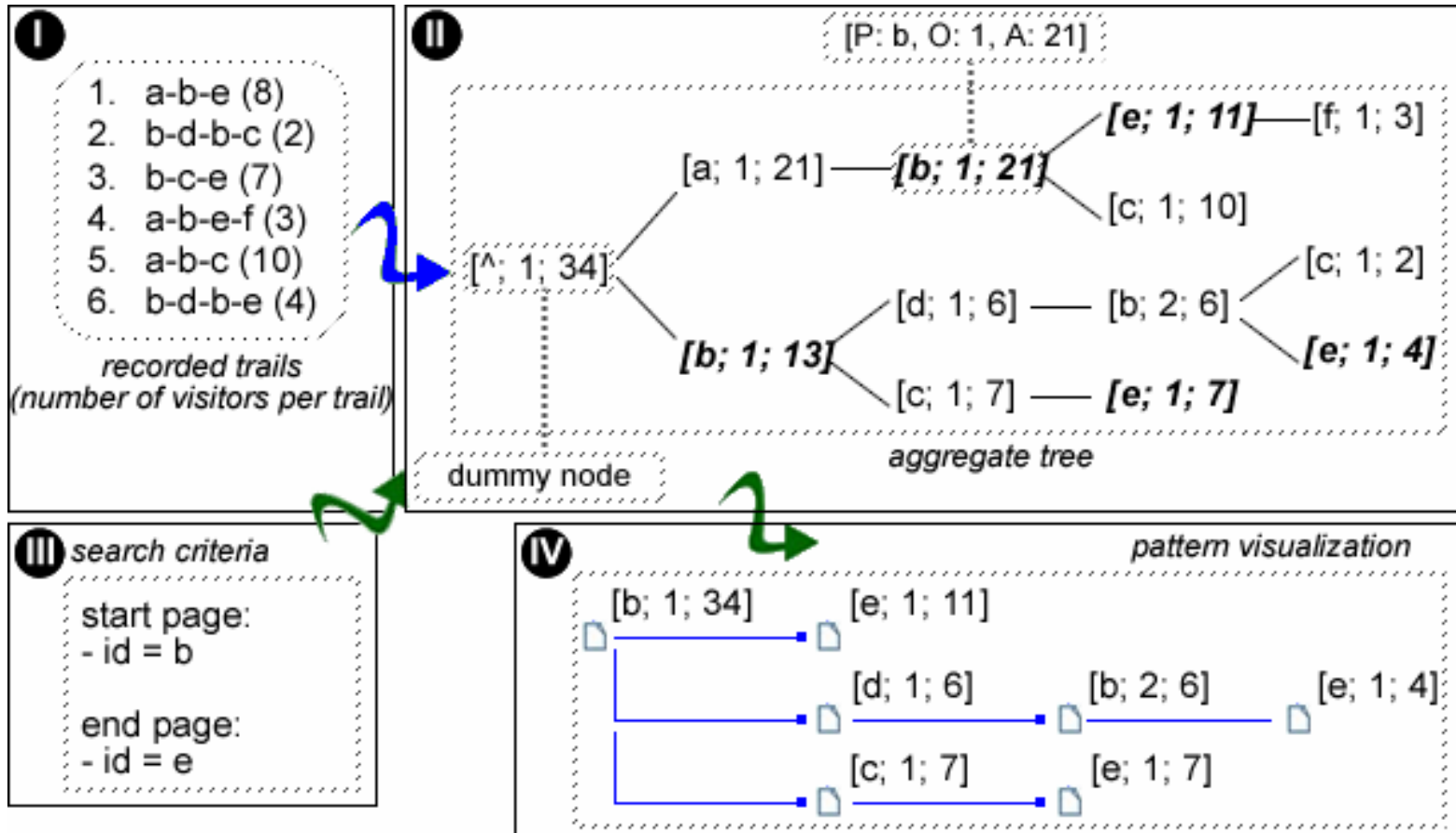
- Introduction;
- FlowSpy;
- Related Work;
- Conclusion and Future Work;
- References.



- Business Process Management (BPM)
  - control, management and automation → WfMS
  - measurement, analysis and monitoring → BPA
- Business Process Analysis (BPA)
  - Data summarization [CAS05] [GOL04] [GRI04]
  - Monitoring through KPIs [CAS05] [GOL04] [GRI04]
  - Rules obtained by mining [AAL05] [AAL03] [GRI04]
- Process Mining (PM)
  - Discovery
  - Comparison
  - Prediction



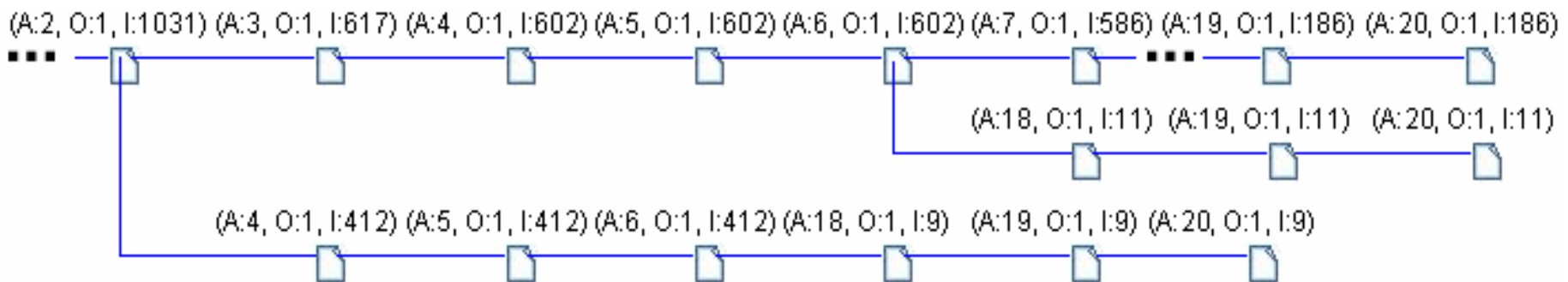
## ■ Web Utilization Miner (WUM) [SPI00]



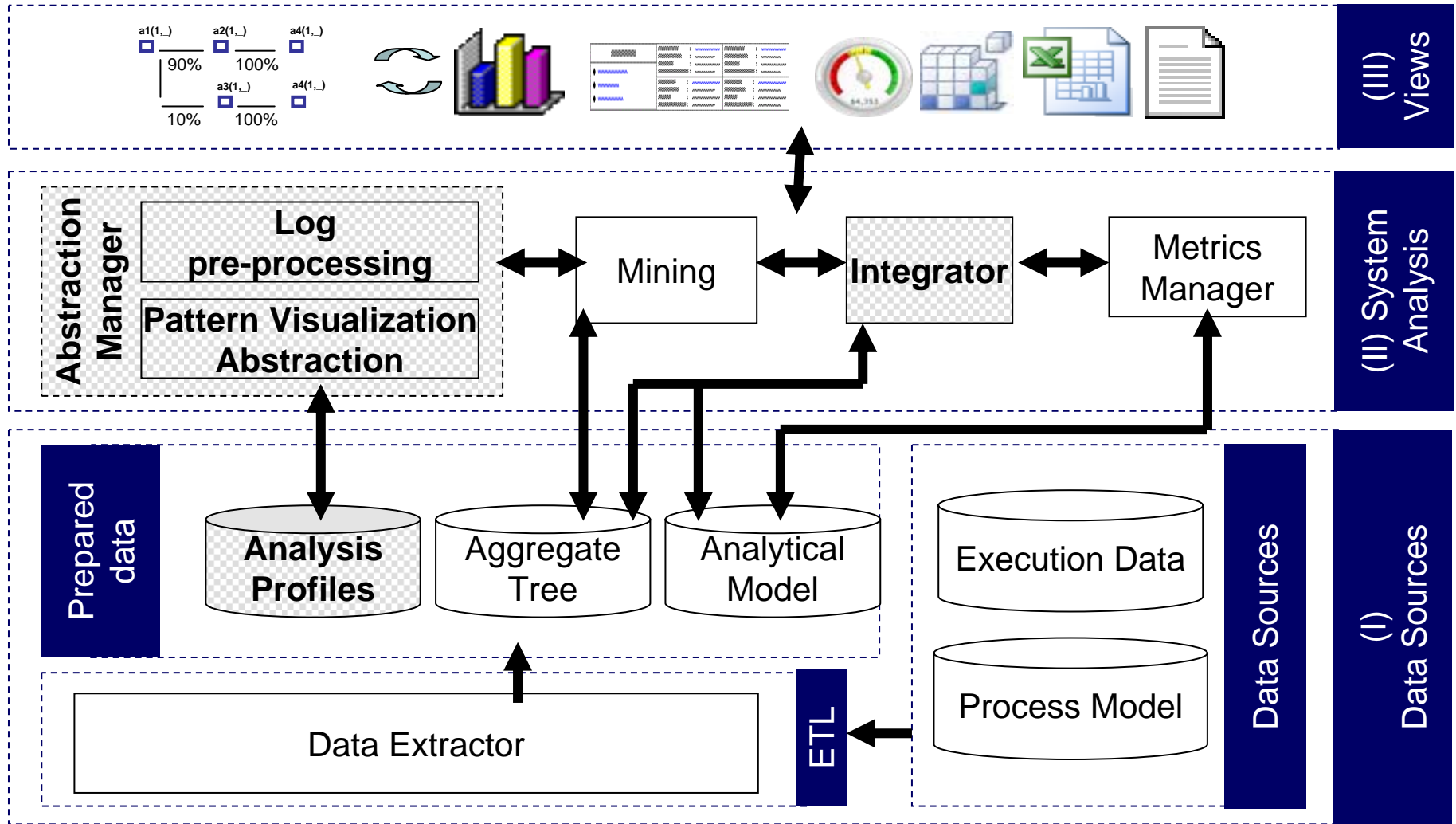


## ■ Case Study

- Exploratory analysis of execution flows and Data Quantification - [A, O, I]
  - Check the most frequent paths, paths occurring more or less than expected, frequency of exceptions above than the expected, identify cycles, etc.



# FlowSpy

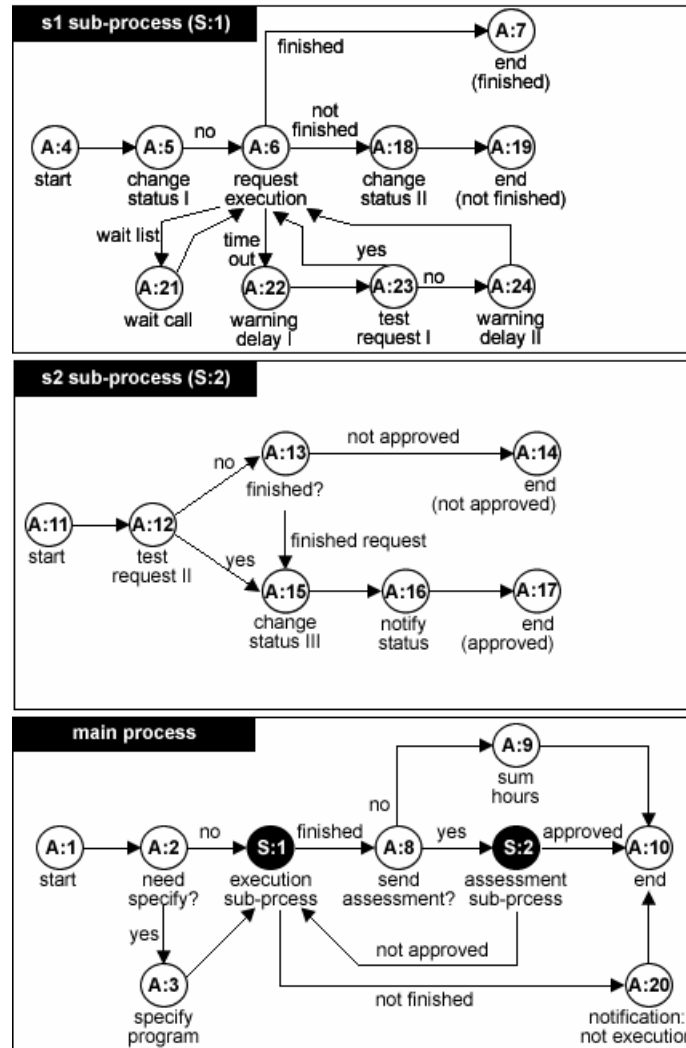


FlowSpy

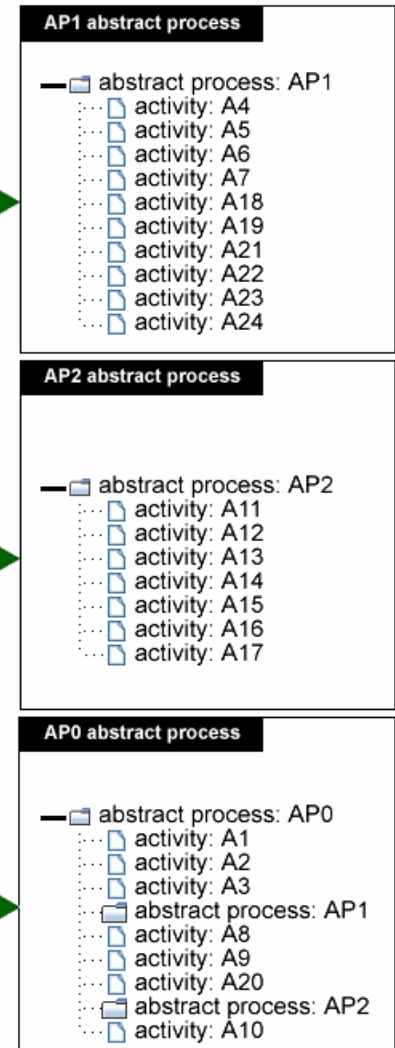


## Process Analysis Profiles

(a) Process Model



(b) Abstract Process

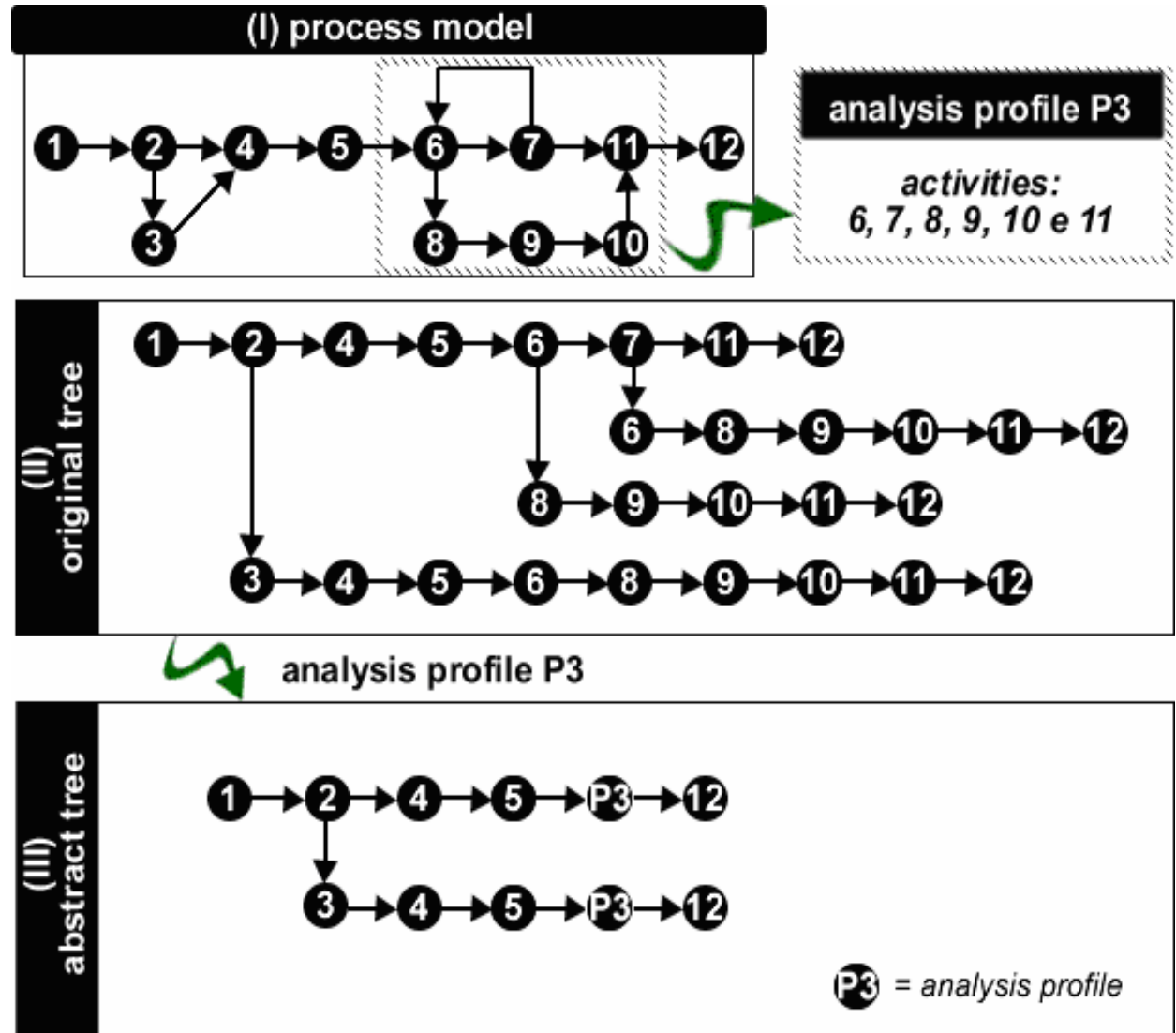




- Log pre-processing
  - generating a shorter aggregate tree, containing only the activities/sub-flows of interest, as represented by a given analysis profile.
  - forms
    - exclusion
    - abstraction



- Log pre-processing

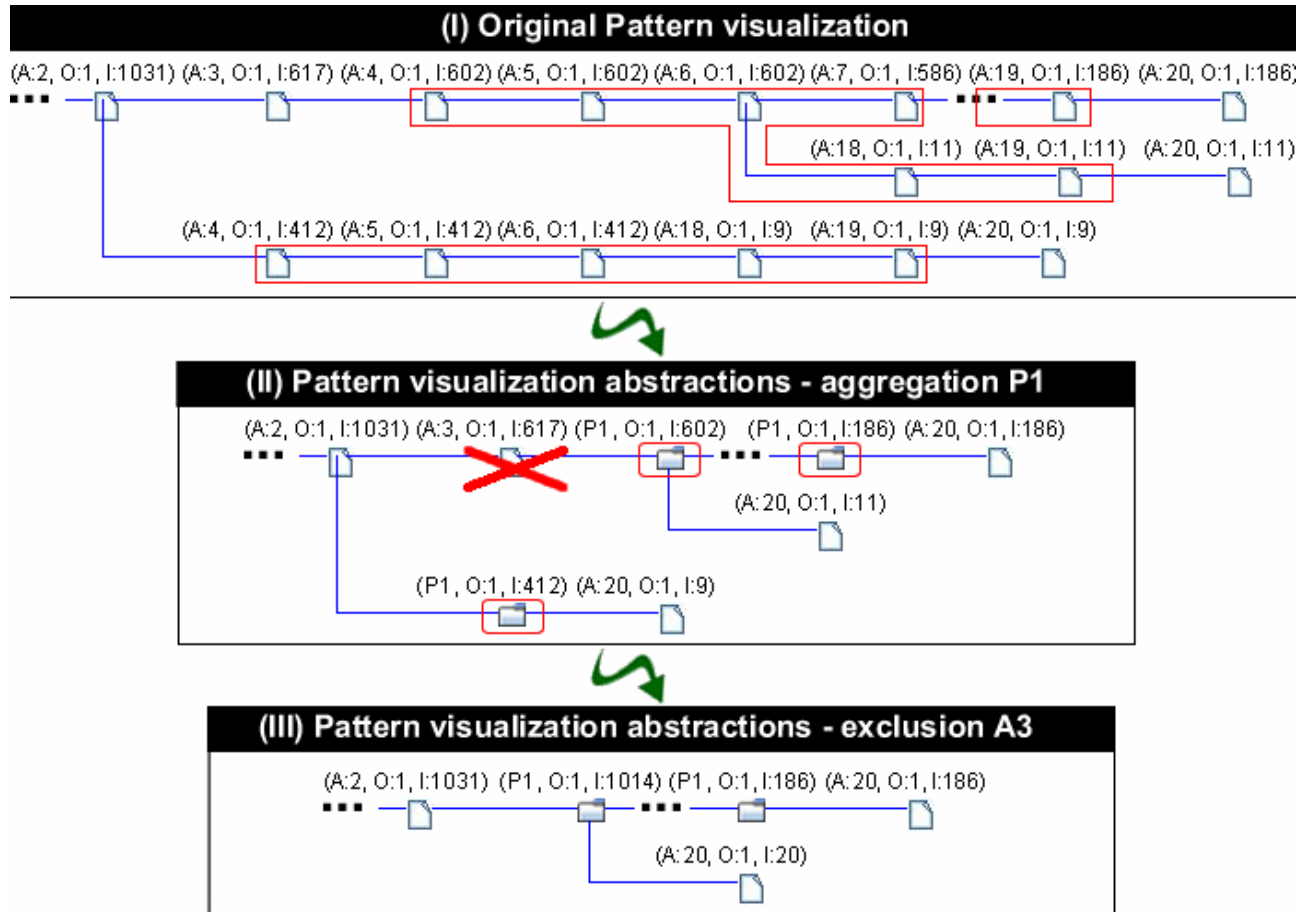




- Pattern Visualization Abstraction
  - simplifying an analysis pattern to improve its interpretation.
  - Increase or decrease the detail level of the flows represented by the pattern.
  - Forms
    - aggregation
    - exclusion.

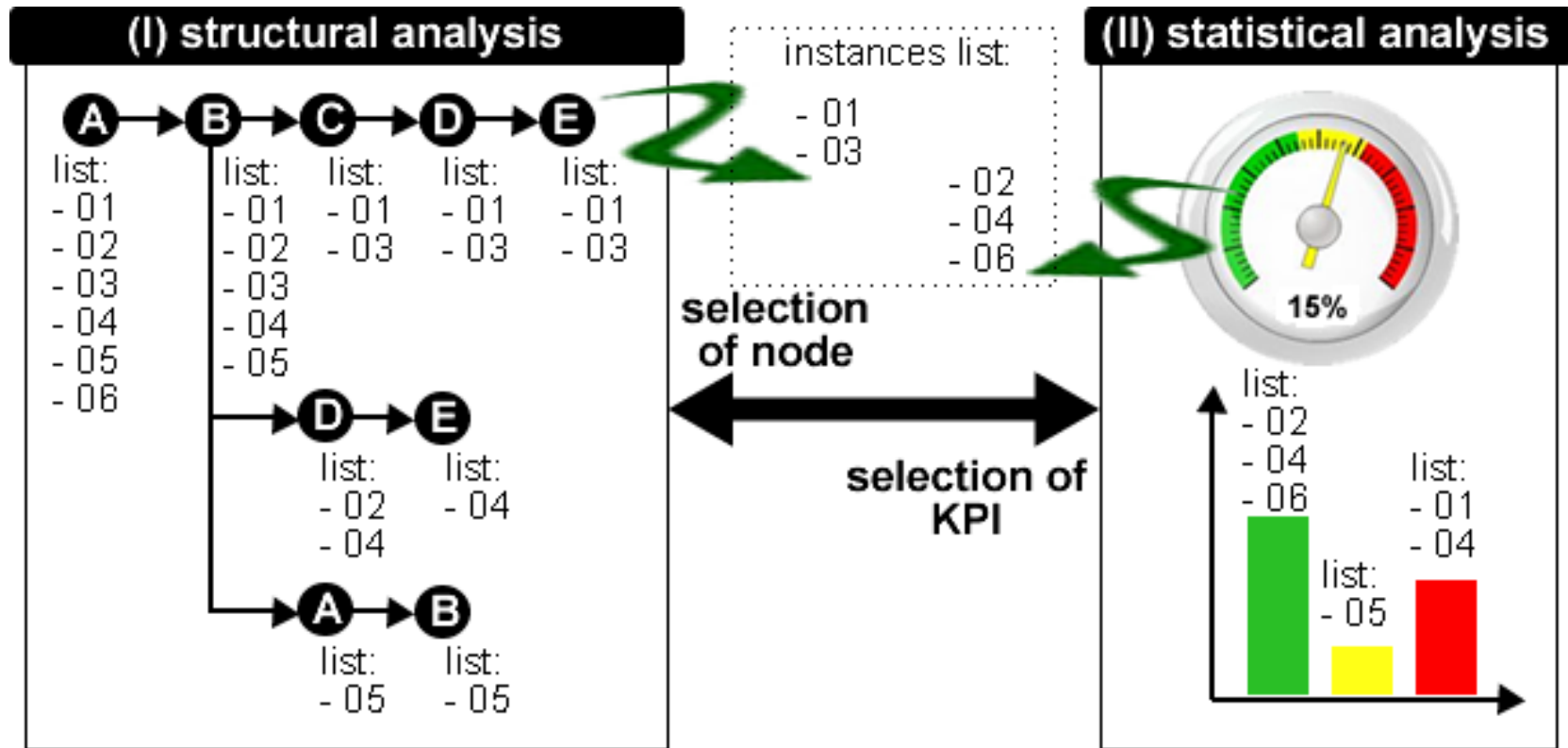


## ■ Pattern Visualization Abstraction





- Integrator





## ■ Integrator

FlowSpy :: Business Process Analysis

File Analysis Tools Help

Home Structural Analysis Quantitative Analysis

Research Visualization

Research Result

Pattern Number	Start Activity	Occurrence	End Activity	Occurrence
1	F_START (ID: 1)	1	N_NOT_DEAL (ID:20)	1

Quantitative Analysis Visualize

Visualization Abstraction

Activities/Profile:

- Activity 23
- Activity 24
- analysis profiles
- ap1
- ap2

Exclude:

Create Apply

Result Visualize

(A:2, O:1, I:1031) (A:3, O:1, I:617) (A:4, O:1, I:602) (A:5, O:1, I:602) (A:6, O:1, I:602) (A:7, O:1, I:586)

(A:4, O:1, I:412) (A:5, O:1, I:412) (A:6, O:1, I:412) (A:18, O:1, I:9) (A:19, O:1, I:9)

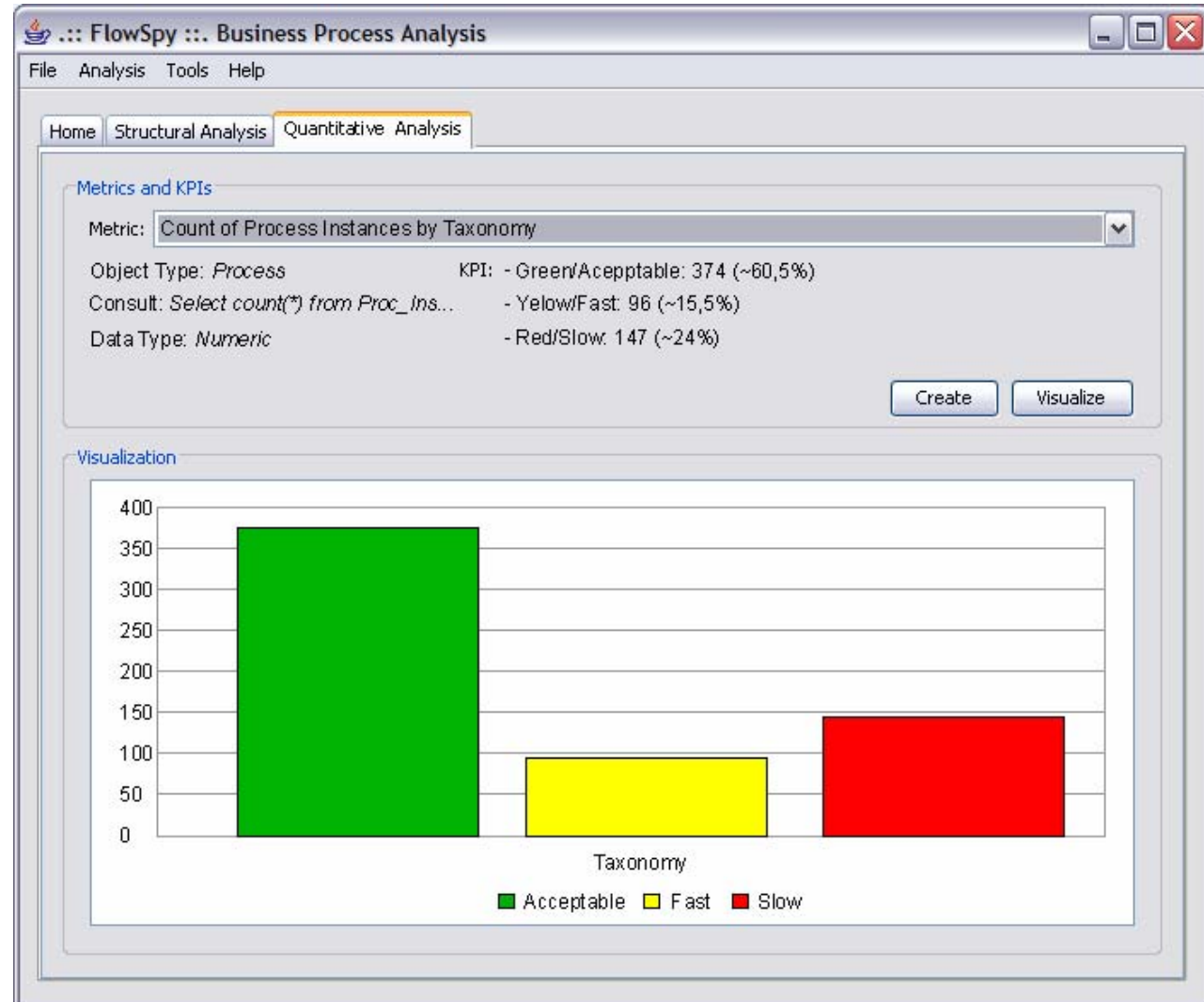
Selected Node

Column: Increase Decrease Show Name

Line: Increase Decrease



## ■ Integrator





- Business Process Intelligence [GRI04]
  - Process Mining Engine - classification algorithms
  - Process Region
- iBOM [CAS05]
  - Abstract Process Monitor
- Delta Analysis e Conformance Testing [AAL05]
  - Process Comparison
  - Business Alignment

# Conclusion and Future Work

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- FlowSpy provides:
  - a detailed analysis of business behavior;
  - quantification of different execution flows;
  - abstraction mechanisms that deal with process complexity and different process views.
- FlowSpy x WUM

# *Conclusion and Future Work*

- how to combine statistical analysis and execution flow of activities in a synergic approach?
- development of a data storage structure (aggregate tree) by means of performance metrics.
  - Execution model to predict results.



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- [AAL03] Aalst, W.M.P. van der, Hofstede, A. H.M. ter and Weske, M. "Business Process Management: A survey". In BPM 2003. LNCS 2678, pp. 1-12, 2003.
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