PROCESS MINING IN A BANK

KUVEYTTÜRK
Sabancı Universitesi — FACULTY OF ENGINEERING AND NATURAL SCIENCES

Student(s)	Faculty Member(s)	Company Advisor(s)
Aytuğ Selen Çakırcalı Işınsu Taştan Merve Üre Zeynep Çınar	Kemal Kılıç	Rafet Maltaş

ABSTRACT

This poster introduces a process mining project that will be conducted in Kuveyt Turk. The project aims to eliminate the bottlenecks and minimize the business problems such as risks ,delays ,cost in the "letter of guarantee processes" of the bank. Some process mining tools, data analytics methods and statistical computing software will be used to analyze and improve the current process flow. The process flow consists of business transactions among different stations, activities and resources. At the end of the project, the functioning of the letter of guarantee processes is expected to be optimized, and the bank will be provided a more efficient model of the process flow to interpret the data gathered from the letter of the guarantee process.
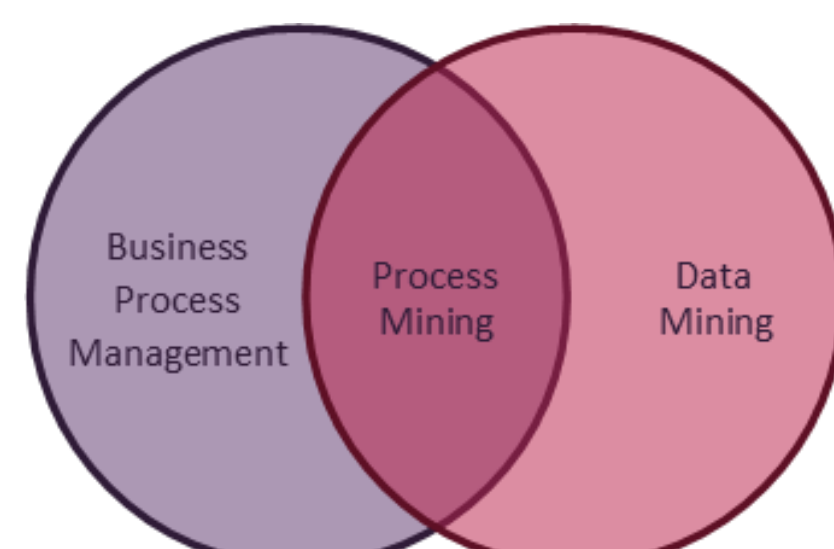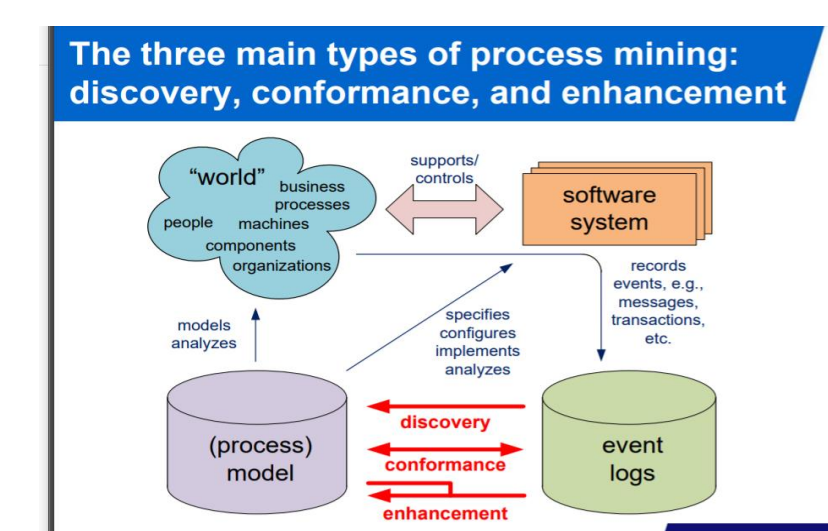
Process mining aims to bridge the gap between BI and BPM. The combination of both process models and event data allows for new forms of process-centric analytics.

OBJECTIVES

- Determining the optimal time-cost balance
- Reducing the risks
- Eliminating resource and activity bottlenecks
- Identifying faults and frauds, offering solutions to prevent
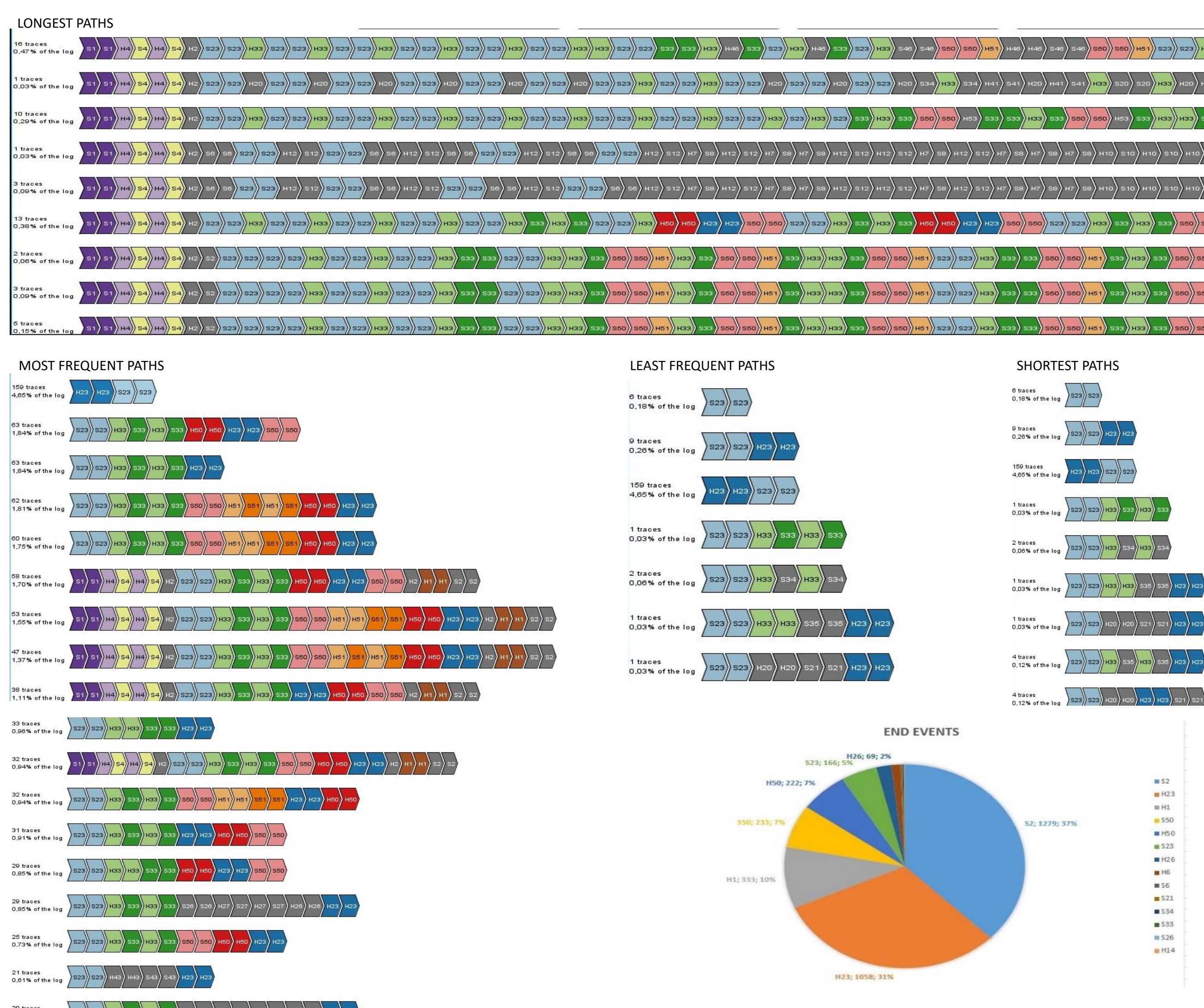
PROJECT DETAILS

- Initial log data which has **2.125.619** data points are extracted.
- The data provides **2017-2018** event log of letter of the guarantee process.
- During this period **140.036** letter applications are made
- The process has distinct parts such as **workflow, maturity extension and rebate**.
- **Workflow** section is chosen as project focus.
- In addition to that, the log period is shortened from 2 years to 3 months.
- After the filtering dataset had **55.529 activities**.
- The data is also filtered with respect to customer type and **corporate customers** are extracted.
- In the end the data **with 584 resources** and **3421 cases** left. The number of the customer is found as **3621**.
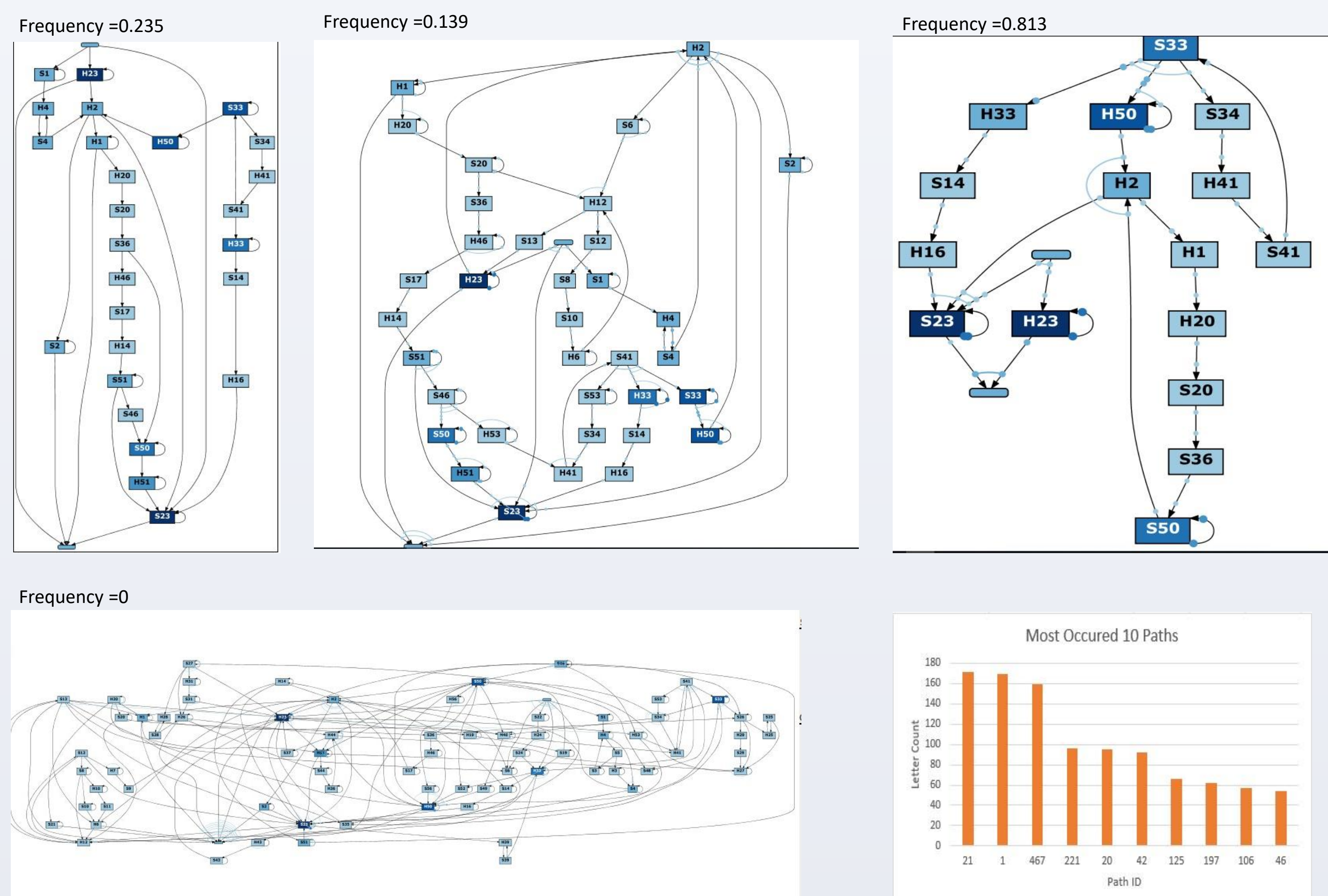
1. INITIAL ANALYSIS

- 5 types of different currencies other than Turkish Lira for the offered amount of the letters
- All currencies are converted into Turkish Lira with according to daily exchange rates

- Letter amounts are compared and 29 letters are taken to understand the relation between the letter amount and commission rates

- From the analysis of data, building and engineering are the most of the reason for giving the letter of guarantees
- The length of these are extracted and compared

- Minimum standard deviations are compared and they are matched with the different product types

- Duration of the process contains of definite and indefinite time (indefinite time generates most of the duration)

- In the Letter of Guarantee process, 97% of letters are approved and 3% rejected

- From the comparison in the data, the highest paths are obtained and standard deviations with average durations are extracted
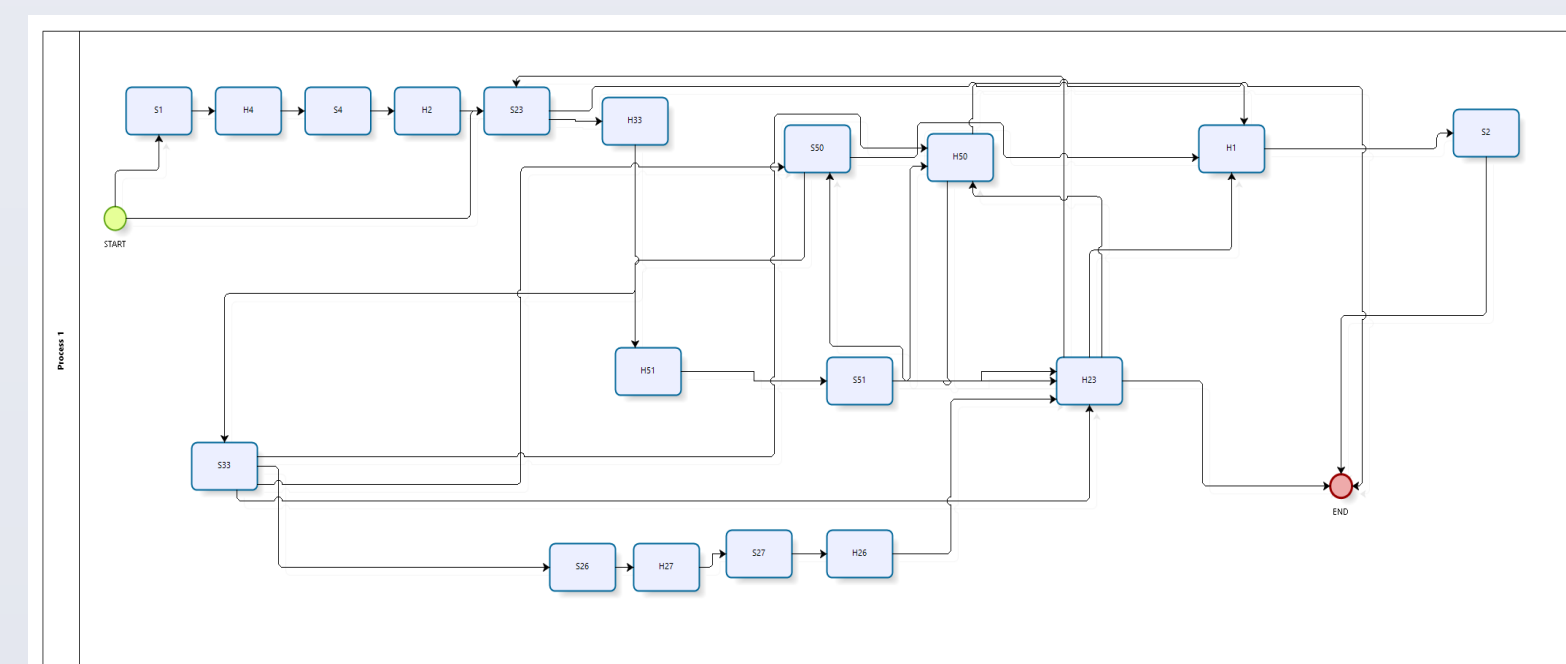
2. TRACE ANALYSIS

3. FLOW ANALYSIS

BPMN by Bizagi Modeler

- The iDHM enables quick interactive exploration of the parameter space and several heuristics. It uses data attributes to improve the discovery procedure and provides built-in conformance checking to get direct feedback on the quality of the model. It is the first tool that visualizes models using the concise Causal Net (C-Net) notation
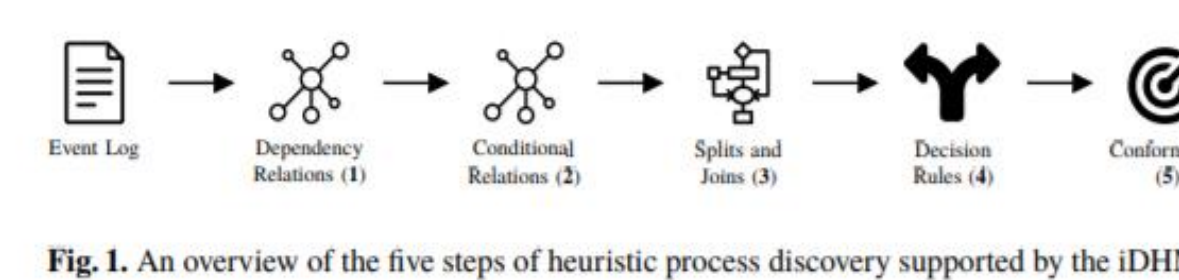
Fig. 1. An overview of the five steps of heuristic process discovery supported by the iDHM.

Interactive Data-aware Heuristics Miner (iDHM), a modular tool that attempts to address those five issues
(1) a large parameter space needs to be explored,
(2) several of the many available heuristics can be chosen from,
(3) data attributes are not used for discovery,
(4) discovered models are not visualized as described in literature, and
(5) existing tools do not give reliable quality diagnostics for discovered models.

	STATION X
count	143
prop_count	0.103
prop_time	0.287
mean	9962.83
std	21694.1814
median	1588
1st quartile	478
2nd quartile	6839.5
5 percent	96.6
95 percent	54080.84
range	54080.84
interquart	6742.5

- Station X is chosen as a problematic station since it has high standard deviation and high proportion of time within the stations.
- It is decided that the mean duration of the station should be reduced to at least 7000 seconds.

RECOMMENDATIONS

- Additionally, it is revealed that, giving a warning signal to the employee at specified times will be a useful application for shortening the processing times.
- Robotic Process Automation and Robotic Desktop Automation systems can be used to reduce the deviations.
- Training sessions for the employees could be applied to standardize the activity inner flow.
- Intraday schedules can be set in order to increase efficiency of specific activities.
- Pool Y has the greatest mean time with a high standard deviation. If financial resources allow, an additional user might be added to the corresponding station to reduce the average waiting time for a customer.

Task To Be Completed Before The Final Report:
- Linear Regression
- Business Rule Compliance
- Risk Analysis

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