Process Mining Project

House Building

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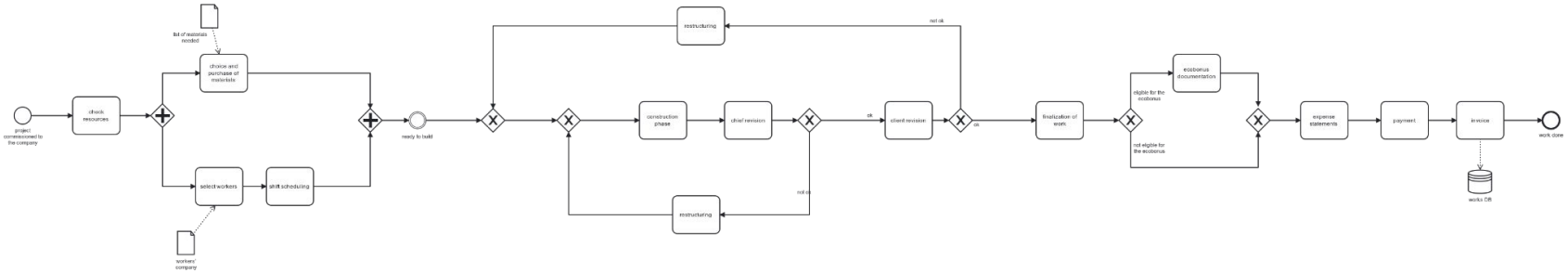
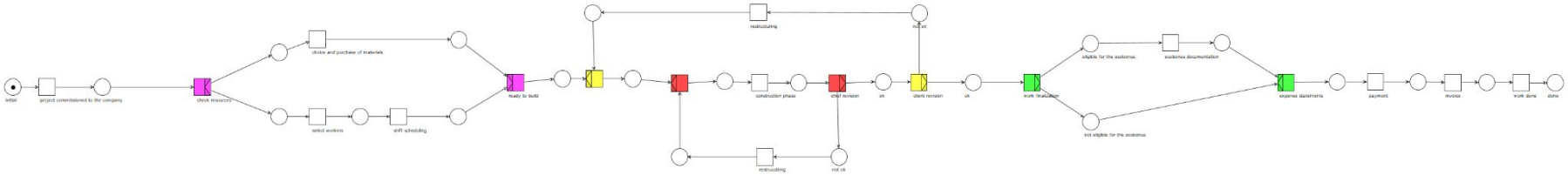
In this report, we will analyse the process of building a house, using process mining techniques. This analysis examines the process from the moment the house project is commissioned to the construction company, and ends when the house is ready. Aspects concerning the procurement of the necessary materials, the manual labour of the workers and the various fiscal practices are analysed, including, where applicable, the use of the ecobonus during payment.

House Building - BPMN Model



Activities : 18
XOR split/join with cycle : 2
XOR split/join without cycle : 1
AND split/join : 1

House Building - Workflow Net (PN-A)



- Qualitative analysis
  - Structural analysis
  - Soundness
    - Workflow net property
    - Initial marking
      - Wrongly marked places: 0
    - Boundedness
      - Unbounded places: 0
    - Liveness
      - Dead transitions: 0
      - Non-live transitions: 0

House Building - BIMP simulation (MXML-A)

Gateways:

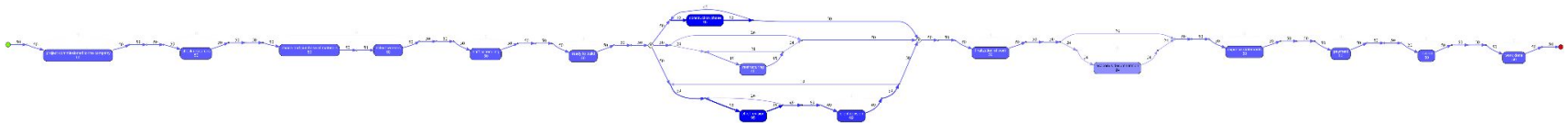
client revision 75%
restructuring 25%

ecobonus documentation 35%
not eligible for the ecobonus 65%

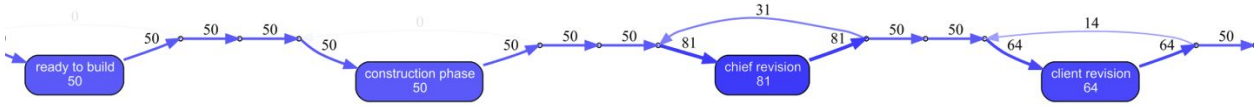
restructuring 25%
finalization of work 75%

House Building - Model mining

Starting from MXML-A, using ProM and the plug-in Mine with Inductive Visual Miner, we obtained **VIM-A**:



House Building - Model mining (VIM-A)



thresholds:

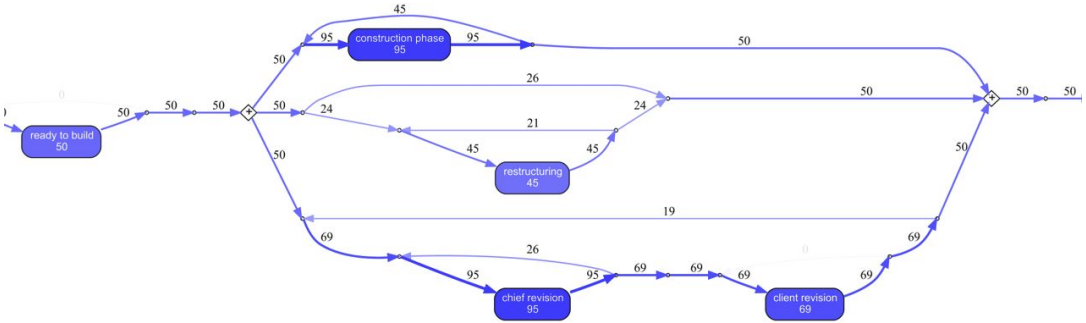
1 - activities

0.8 - paths

thresholds:

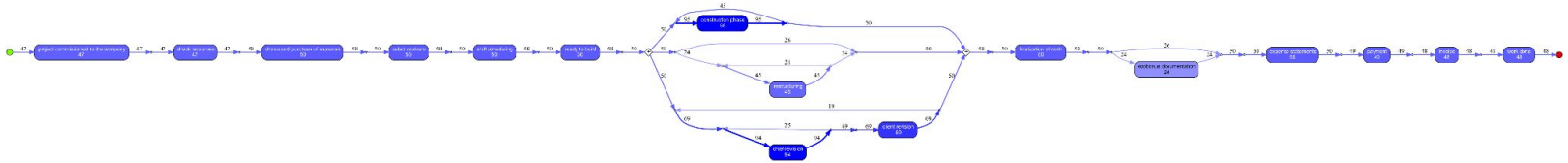
1 - activities

0.9 - paths

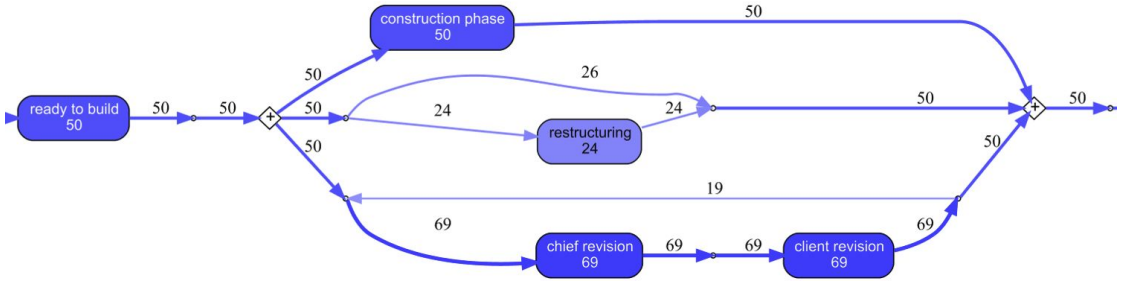


House Building - Model mining

Starting from XES-B, using ProM and the plug-in Mine with Inductive Visual Miner, we obtained **VIM-B**:



House Building - Model mining (VIM-B)



thresholds:

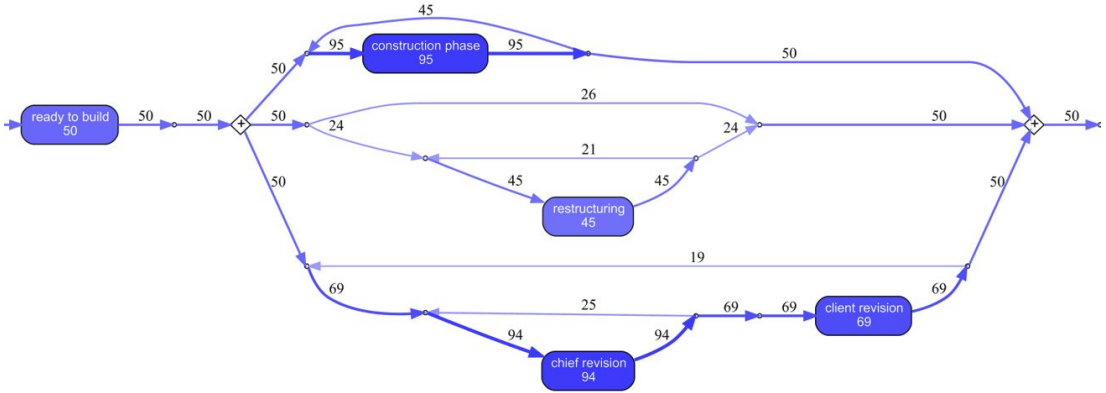
1 - activities

0.8 - paths

thresholds:

1 - activities

≈ 0.93 - paths



House Building - Conformance Checking

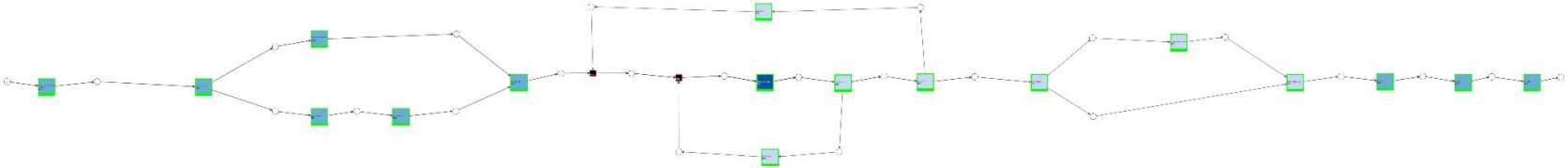
We will use:

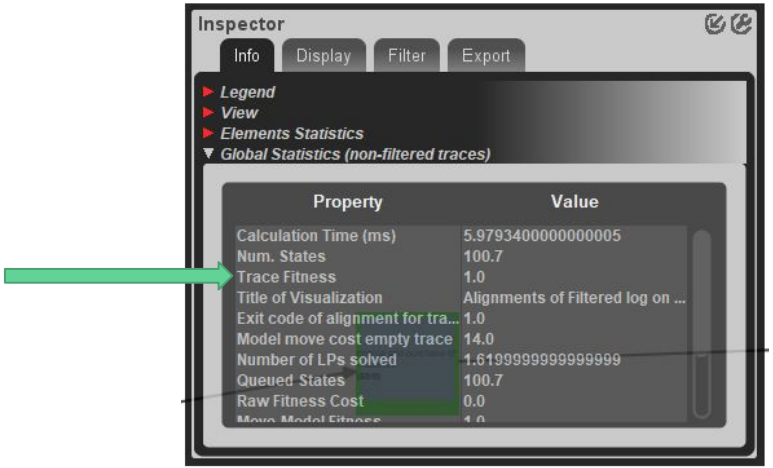
- PN-A, (normative model) is the manually modelled workflow net
- PN-B (descriptive model) is the workflow net obtained from the noisy event log
- XES-B, is the noisy event log
- F-XES-A, is the simulated event log, filtered with the 'Filter Events' plug-in

Using the plug-in Replay a Log on Petri Net for Conformance Analysis, we performed four conformance checks, respectively:

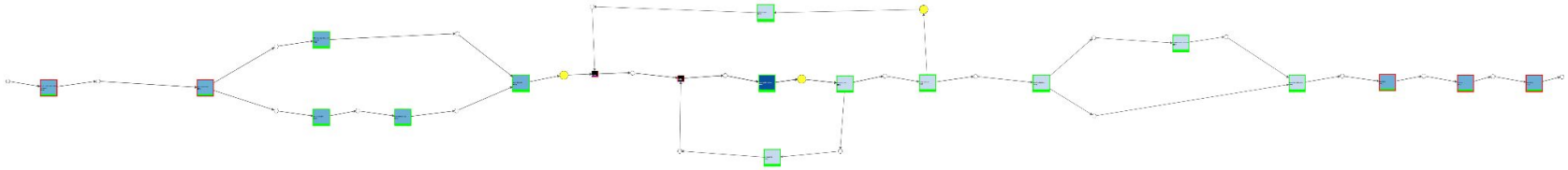
- PN-A with F-XES-A
- PN-A with XES-B
- PN-B with F-XES-A
- PN-B with XES-B

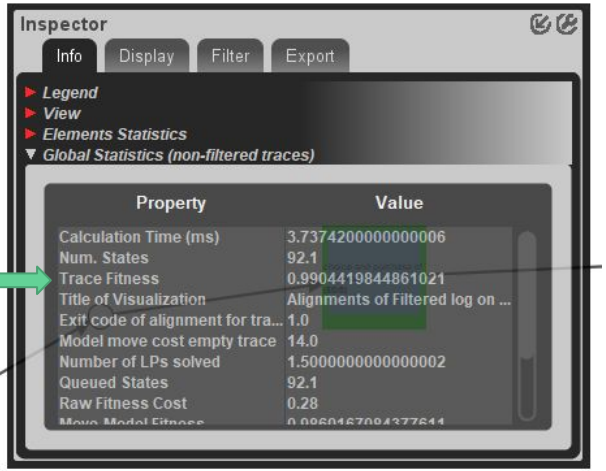
House Building - Conformance Checking (PN-A with F-XES-A)





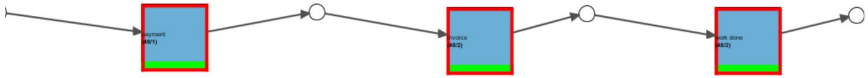
House Building - Conformance Checking (PN-A with XES-B)



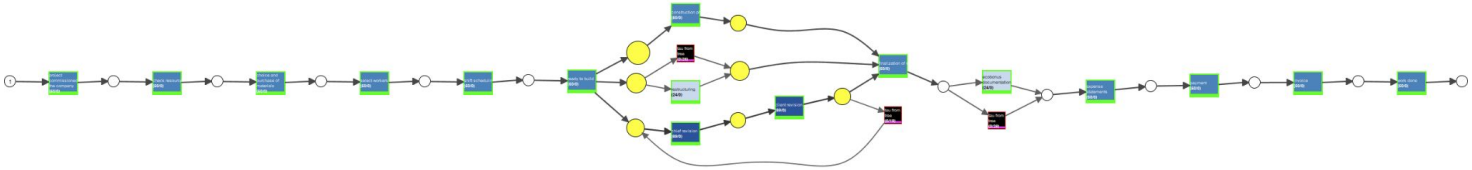


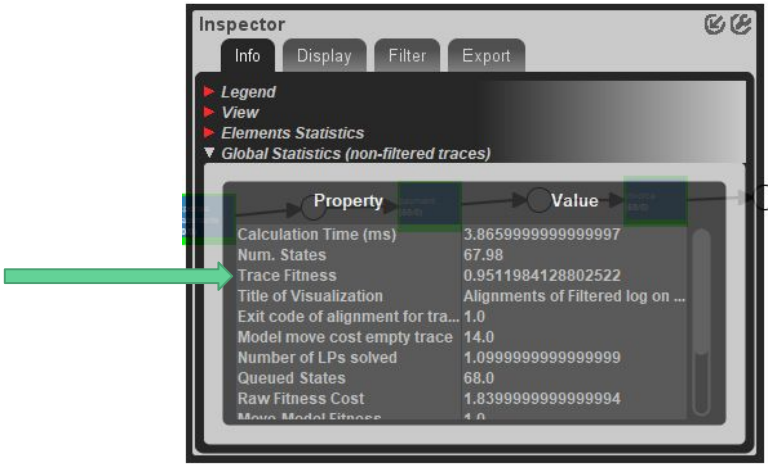
House Building - Conformance Checking (PN-A with XES-B)

issues:



House Building - Conformance Checking (PN-B with F-XES-A)

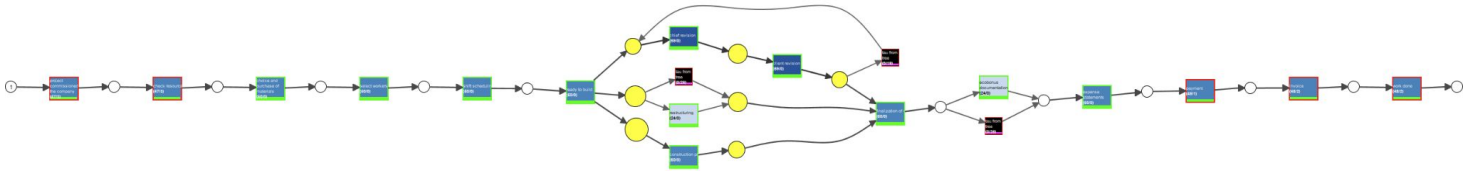


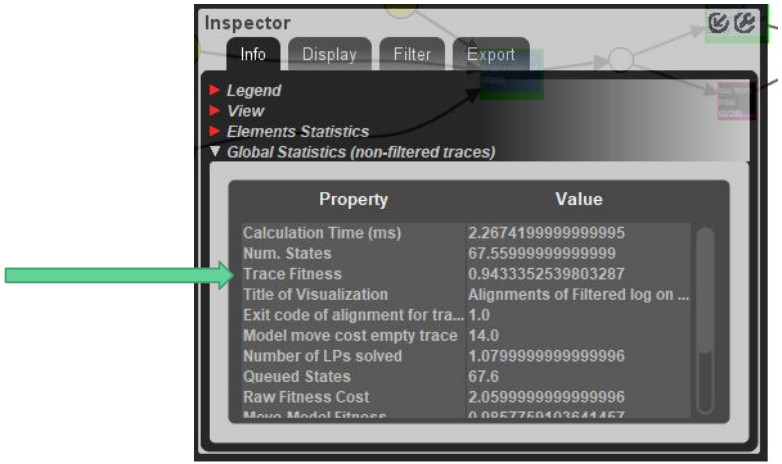


House Building - Conformance Checking (PN-B with F-XES-A)

issues:

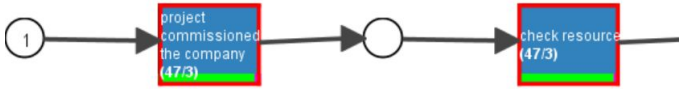
House Building - Conformance Checking (PN-B with XES-B)

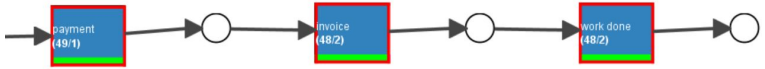


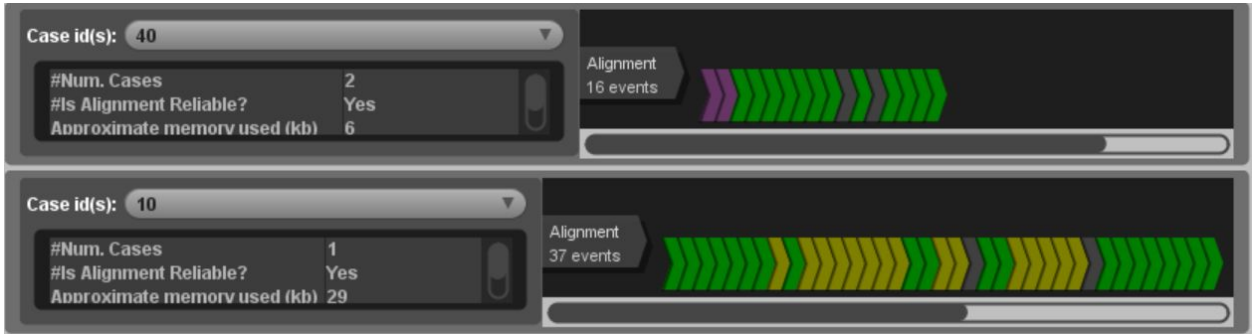


House Building - Conformance Checking (PN-B with XES-B)

issues:







House Building - Conclusions

Petri Net and Event Log	Trace Fitness
PN-A and F-XES-A	1
PN-A and XES-B	0.99
PN-B and F-XES-A	0.95
PN-B and XES-B	0.94

Thank you!