Interpretable Process Mining opportunities and challenges

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Abstract

Process mining is an area that seeks to extract insights from event logs obtained from work performed by infomation systems. Although there has already been significant improvement over techniques developed for predictive process mining, the trend is towards interpreting the details of the business process to make better decisions. Recent studies point to the need to interpret the results obtained with such techniques. This poster aims to show research opportunities and challenges encountered in an exploratory review conducted as part of the author's doctoral project.

Current approaches

Predictive Process Monitoring (PPM), which aims to predict the behavior, performance and results of business process at runtime [2].
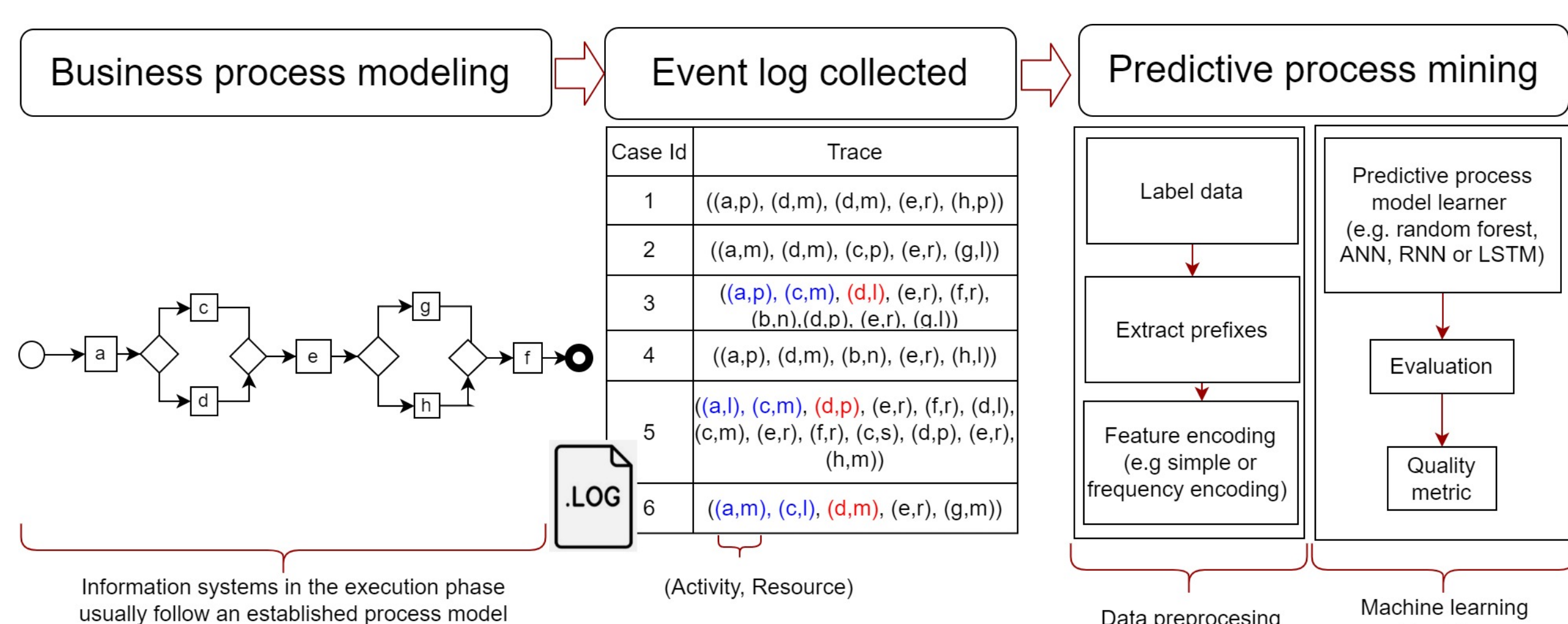

Figure 1. Traditional approaches in predictive process mining.

Opportunities

- Understanding prediction in business process.
- Monitoring business process execution
- Minimize time for outcome process.
- Enhance completition time and KPIs metrics.
- Support reallocation resources.
- Identify bottle neck before they occur.
- Predict and alter the result of a running case.
- Allow examine the reasons for the results in a case.

Process mining in our research group

We are part of a group of researchers interested in the development of the Process Mining field, in Brazil [1]. Our goal is to work on three fronts: *(i)* research in process mining, discovering process models, trace clustering and online process mining; *(ii)* use of computational intelligence tools to improve strategies for performing process mining tasks; and, *(iii)* development of human resources to promote the culture of process mining in Brazilian organizations.

Figure 2. Process mining research group [URL: http://processmining.each.webhostusp.sti.usp.br/]

Challenges in the area

Involving interpretability and explainability in the area of process mining is very important because it enriches the information available to business specialists, specially in critical domains. They are really interested to know why such a prediction was made [3].
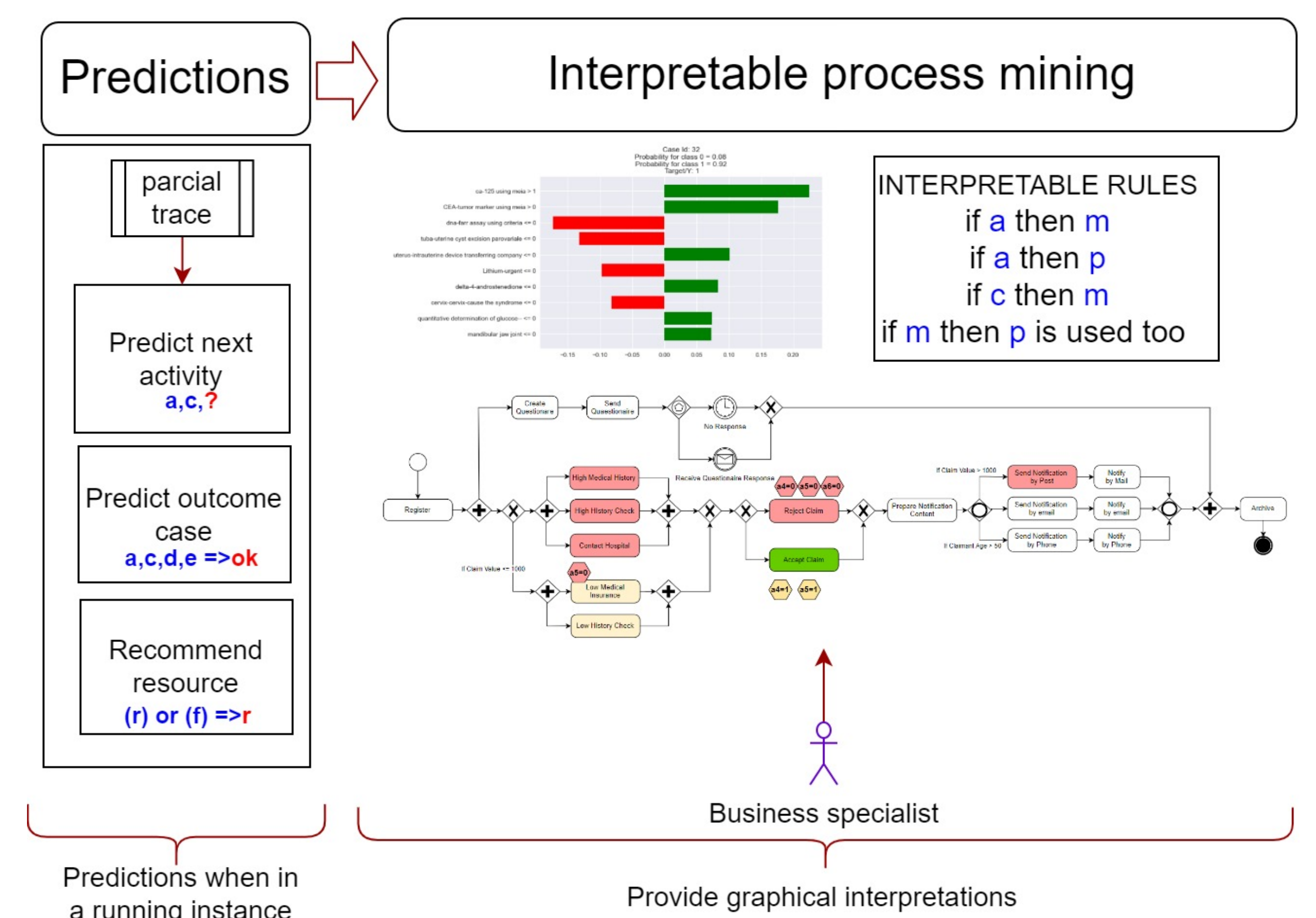

Figure 3. New challenges in process mining seek to show interpretable results.

Work in progress

This work is part of the presenting author's doctoral thesis, the biggest challenge of this project is to use the potential of existing algorithms in the recent field of XAI to give meaning to the results of predictive algorithms in the area of process mining with in order to deliver more readable results for the business specialist. The problem addressed in this project has great application potential since it is a context that requires interdisciplinary work between specialists in machine learning and business.

References

[1] Process Mining Research Group, 2022.

[2] M. Dumas, M. La Rosa, J. Mendling, and H. Reijers. *Fundamentals of Business Process Management*. Springer, 2018.

[3] I. Teinemaa, M. Dumas, M. La Rosa, and F. Maggi. Outcome-oriented predictive process monitoring: review and benchmark. *ACM Transactions on Knowledge Discovery from Data (TKDD)*, 13(2):1–57, 2019.