



Understanding and Predicting Project Payment Latency in the Covid-19 Era

Erika Ergart, Rassul Yeshpayev, Sheng Yang Chou, Theo Ginting, Matthew A. Lanham

Purdue University, Krannert School of Management

eergart@purdue.edu; ryeshpay@purdue.edu; chou101@purdue.edu; tginting@purdue.edu; lanhamm@purdue.edu

ABSTRACT

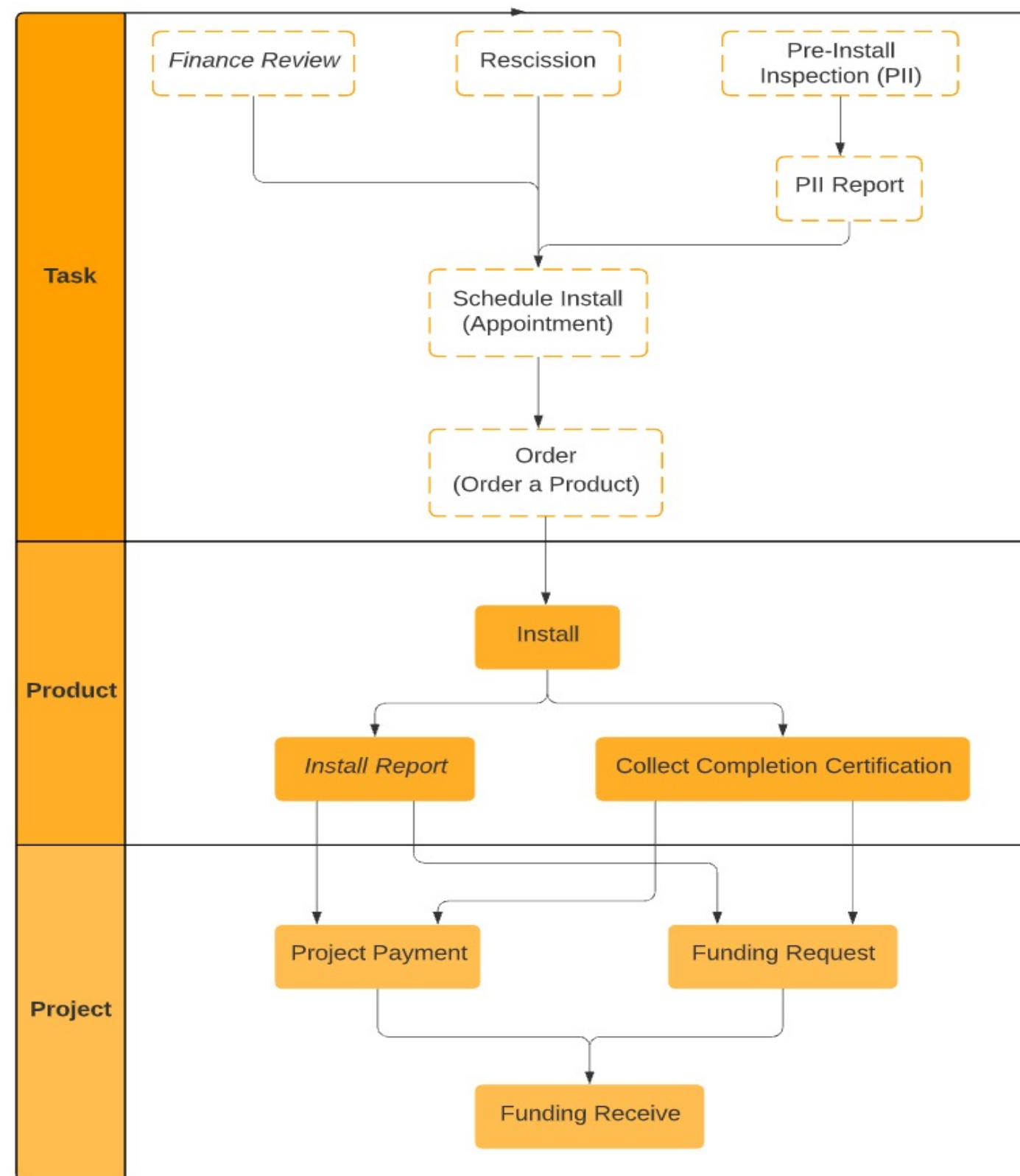
This study develops an order-to-cash process map predictive solution to better understand construction project payment latency pre- and post-covid-19.

The risks of delayed processes and delay customer payments can hurt the company's solvency and financial stability. Especially in the economic condition caused by the pandemic.

Our solution was able to improve predictive accuracy during all time periods in our study. We believe practitioners and scholars alike focused on pre- and post-pandemic forecasting, particularly related to accounts receivable or queuing-based problems would find our work valuable.

INTRODUCTION

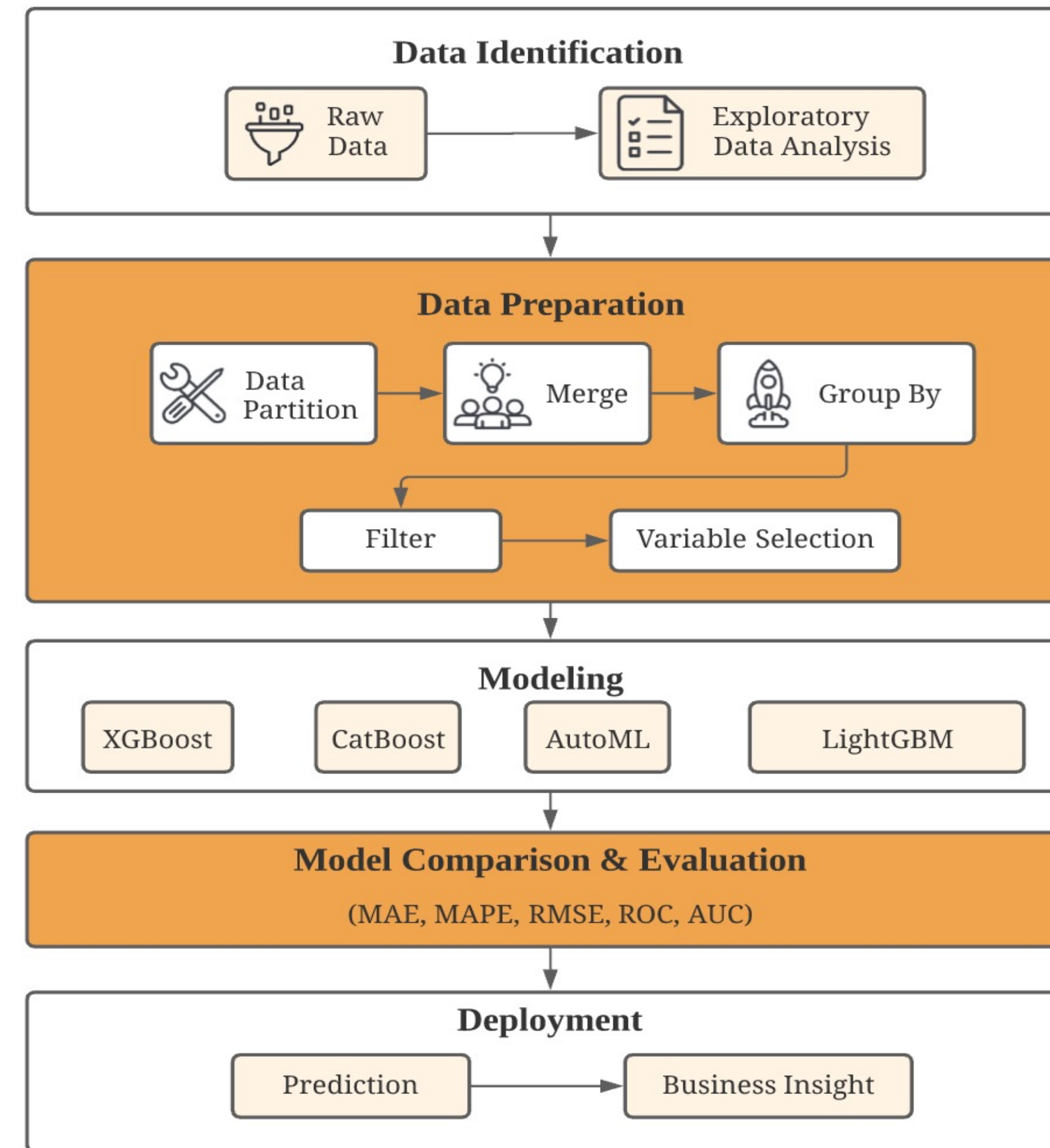
O2C (Order-to-Cash) is the gap between the formalization of a project and the receipt of project payment. It is well known that accurate accounts receivable forecasting allows a business to have better transparency about working capital. If not well-optimized O2C, the inflexibility may lead to negative consequences for a company which would erode valuation of the company and the trust of stakeholders. Having insights to the variability would provide valuable decision-making support tools to decision maker of the company.



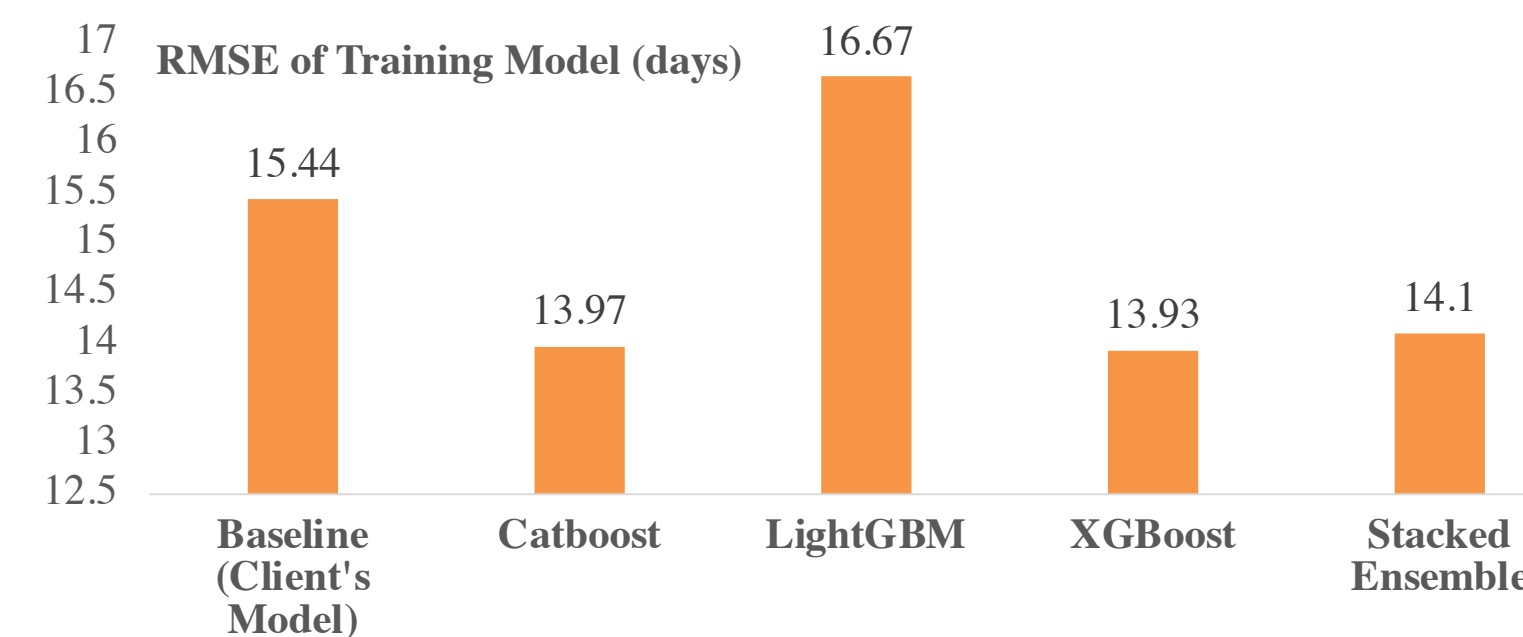
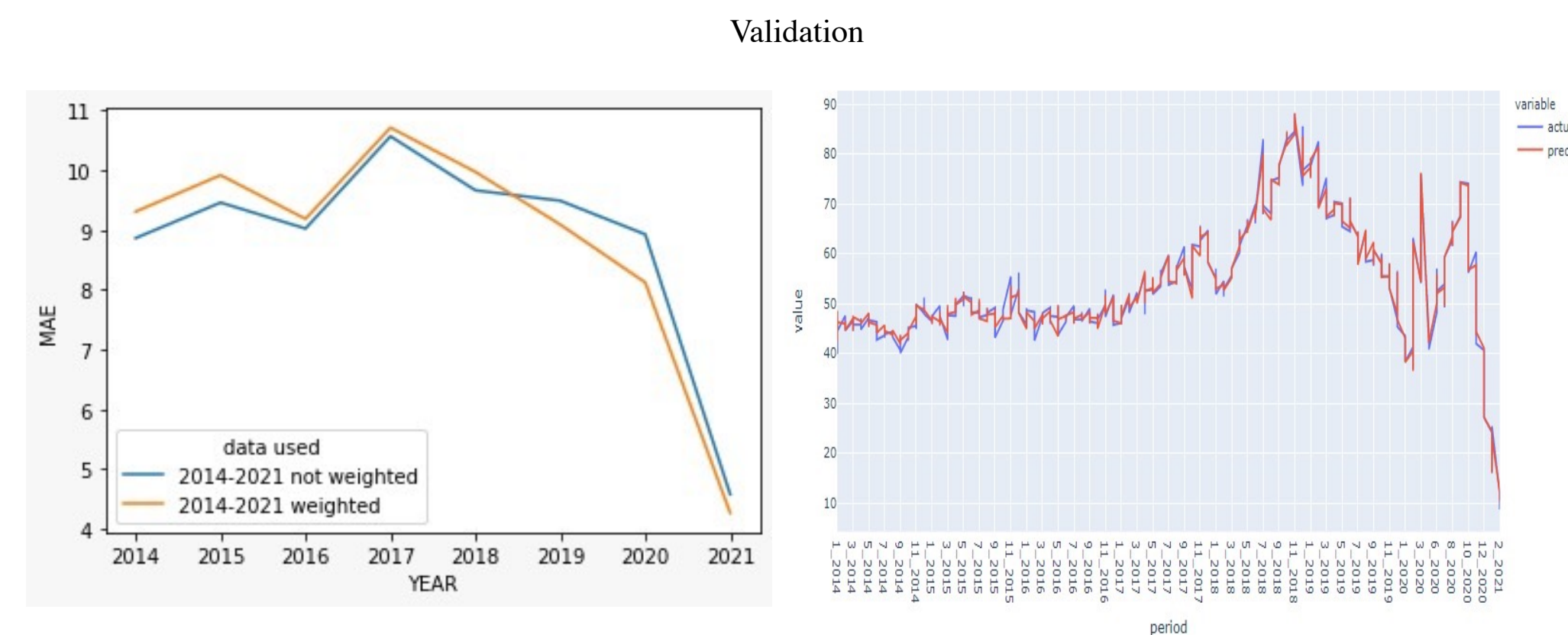
Research questions:

1. What is the best way to merge the datasets to maximize the likelihood of finding the best drivers?
2. What is the process map of Order-to-Cash to identify likely drivers that may be required to construct a useful predictive model for Order-to-Cash?
3. What is the best way to develop the most accurate predictive model for time to cash (with provided prediction intervals)?

METHODOLOGY



STATISTICAL RESULTS



EXPECTED BUSINESS IMPACT

More accurate prediction of duration of a project

- Efficient Human Resources Management
- Deeper understanding of "cost in queue"
- Optimal operational resources allocation
- Improved Customer Satisfaction

Cost Saving from 2 days prediction improvement

- 2 days * \$ cost/day (Labor, Transportation)
- ~ 3% reduction on Operating cost (increase in budgeting accuracy)
- ~ \$500,000 potential savings

How certain variables crucially affect order-to-cash period

- Discovery of what task to "crash" to shorten Order-to-Cash Period
- Start dialogues on how to improve areas directly under control

CONCLUSIONS

Considering pre-, during-, and post-covid in our training and evaluation process. We developed an order-to-cash process map and design an improved CatBoost model to achieve 2 days improvement in Order to Cash, providing significant business impact.

ACKNOWLEDGEMENTS

We would like to thank our partner's analytics team for the continuous and valuable guidance and feedback