SIX Payment Transaction Volumes Forecasting

DISCLAIMER_FROM_SIX

Data has been anonymised

No conclusion needs to be derived out of it

SIX_PACK_TEAM

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}

SIX Company

```
SIX_Banking_Services = ['ATM transactions',
                        'Debit card transactions',
                        'Point-of-sale transactions',
                        'Interbank payments']
```

BUSINESS_UNITS

Stock Exchanges
Switzeland & Spain

Securities services
Financial instruments

Banking services
Payment processing

Financial information
Data provider

Why is forecasting transaction volumes important?

TRANSACTION FEE REVENUE MODEL

Fee earned for each payment transaction processed

DIRECT TRANSACTIONS FEE

i.e. contactless card payment in a shop

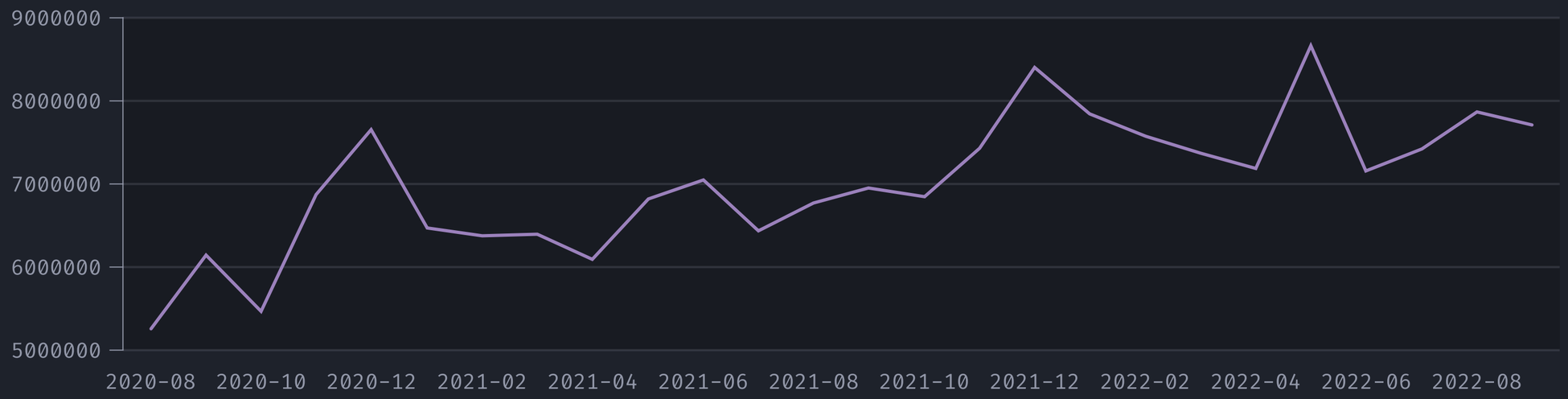
ADDITIONAL SERVICES (ADD-ONS)

i.e. 3-D secure and fraud check

What is time series data?

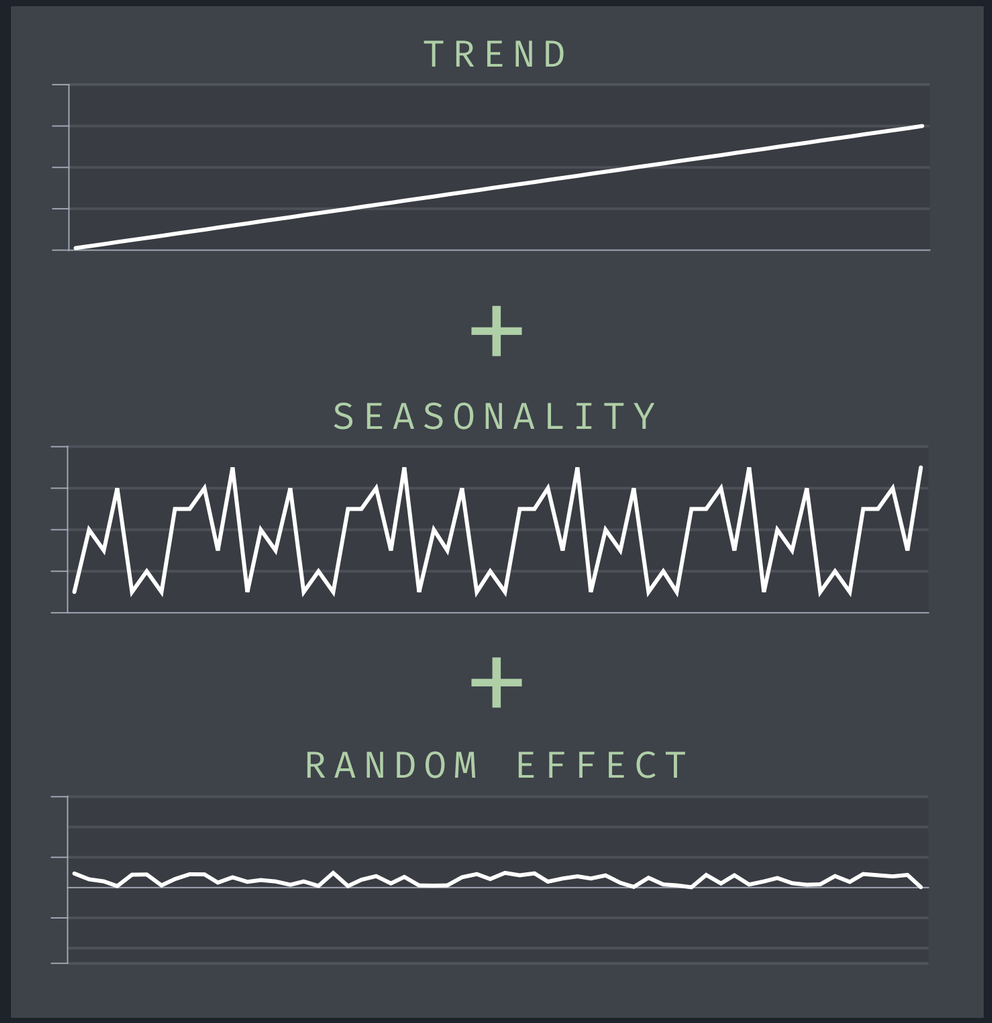
MEASUREMENTS OVER TIME

Month	08-2020	09-2020	10-2020	11-2020	12-2020	...	09-2022
Number of transactions	5'256'987	6'143'986	5'467'321	6'872'328	7'654'293	...	7'784'154



Time series decomposition

BREAKDOWN INTO SIMPLE SIGNALS



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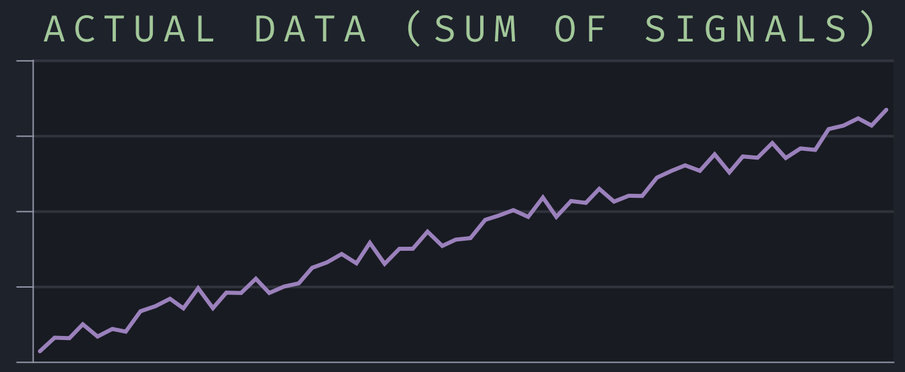


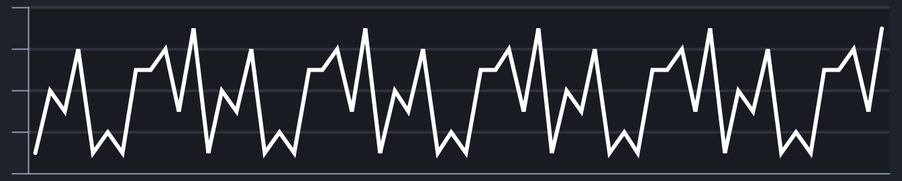
Time series decomposition

BREAKDOWN INTO SIMPLE SIGNALS

TREND

+

SEASONALITY



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RANDOM EFFECT

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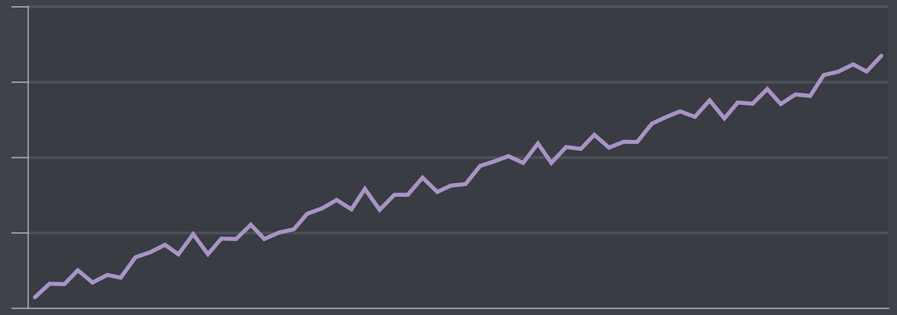
ACTUAL DATA (SUM OF SIGNALS)



How does understanding simple signals help us?

FORECAST EACH SIGNAL INDIVIDUALLY AND SUM THEM TO PREDICT DATA

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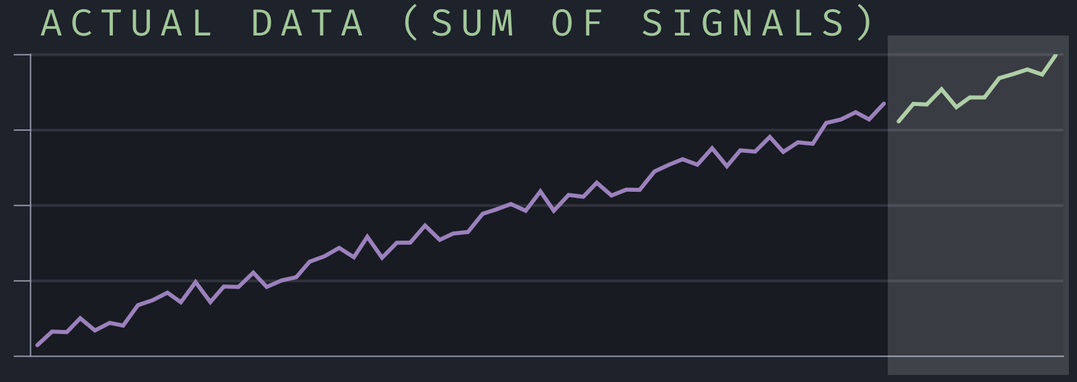


Time series models to estimate weights

- Special type of regression models
- For each "simple" signal, weights ("importance") are assigned to past values to predict the future
- Each model assigns weights in its own way

S(ARIMA): SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE

- Uses linear weights

ETS: EXPONENTIAL TRIPLE SMOOTHING

- Uses exponential weights

PROPHET

- Uses machine learning techniques to determine weights

What makes a good model?

- Predicted data should try to predict actual data as close as possible

Actual

Predicted

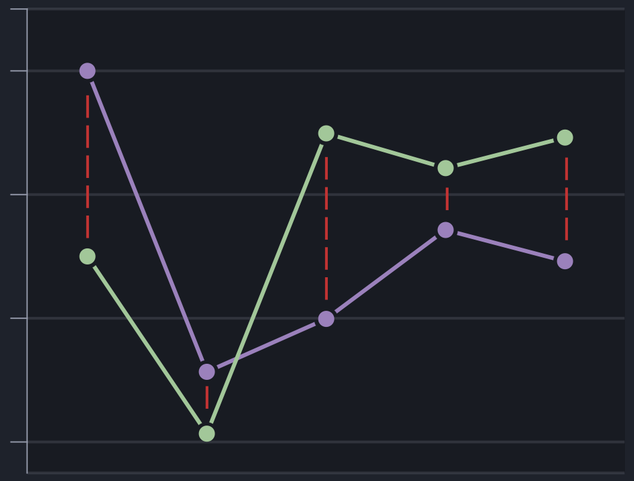
Difference

The Error calculates average % difference of the predictions from the real data

Better = lower error

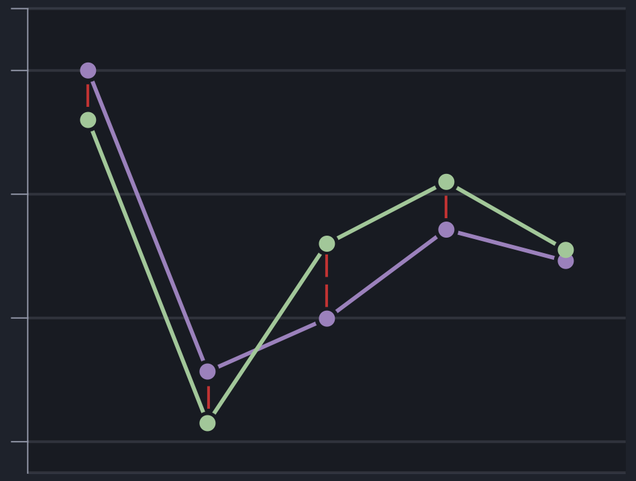
Example 1

5%



Example 2

1%



PIPELINE_APPROACH

STEP_1

Transactions for 1913 merchants (26 months)

Merchant name	08-2020	09-2020	...	09-2022
Merchant 1	0	11	...	12
Merchant 2	915'976	1'002'153	...	978'198
...	...	...	...	...
Merchant 1913	57'282	70'174	...	62'109

STEP_2

Sum of all transactions per month (26 months)

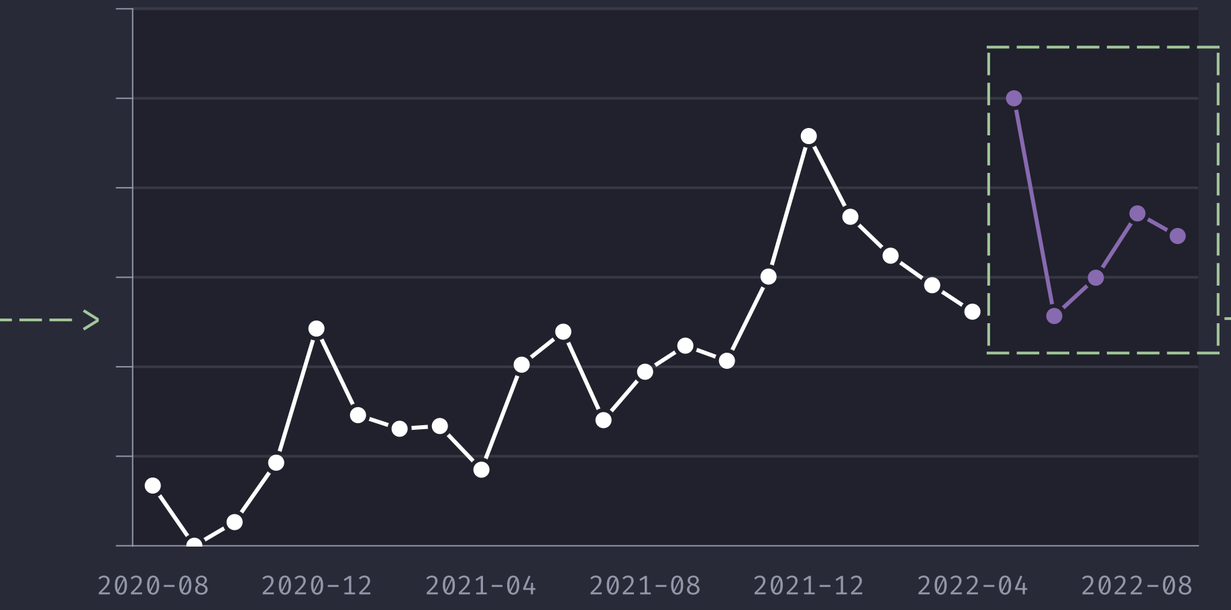
Merchant name	08-2020	09-2020	...	09-2022
SUM	5'256'987	6'143'986	...	7'784'154

PIPELINE_APPROACH_NEXT

STEP_3

Model selection based on 21 months

Evaluation based on last 5 months



Which model would you choose?

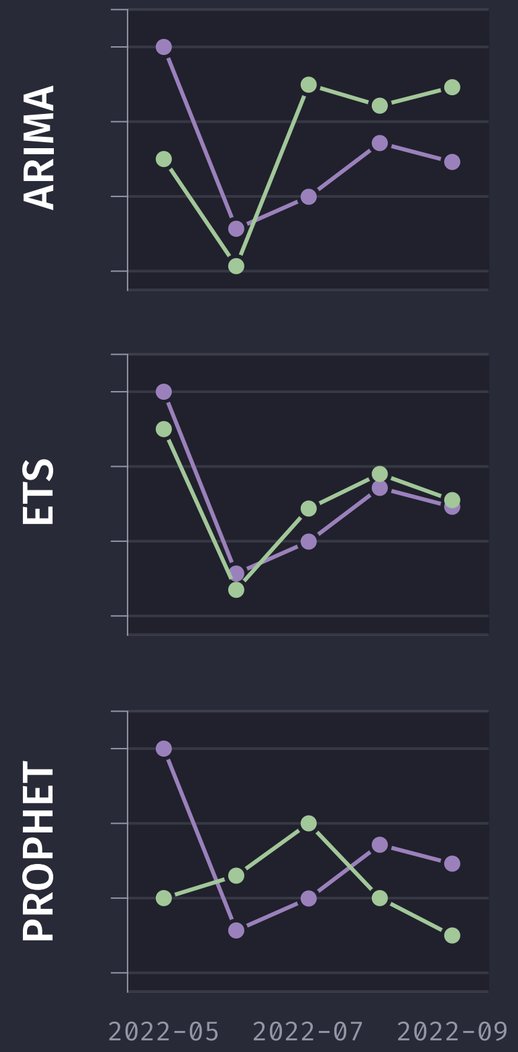
Actual

Predicted

ARIMA

ETS

PROPHET



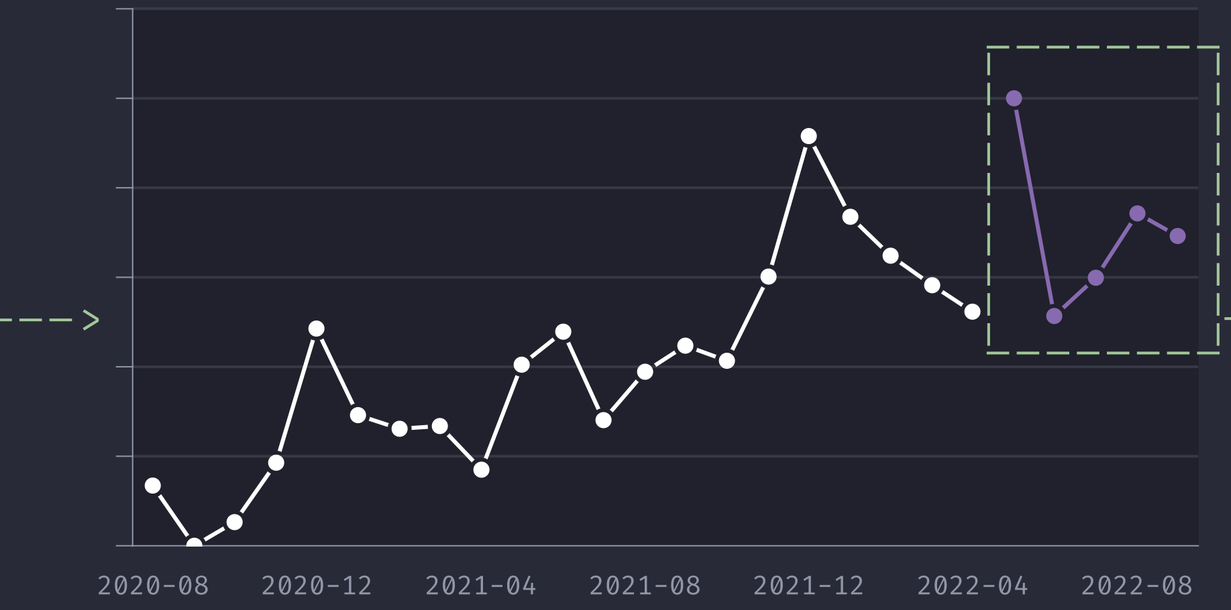
Pitch

PIPELINE_APPROACH_NEXT

STEP_3

Model selection based on 21 months

Evaluation based on last 5 months



Which model would you choose?

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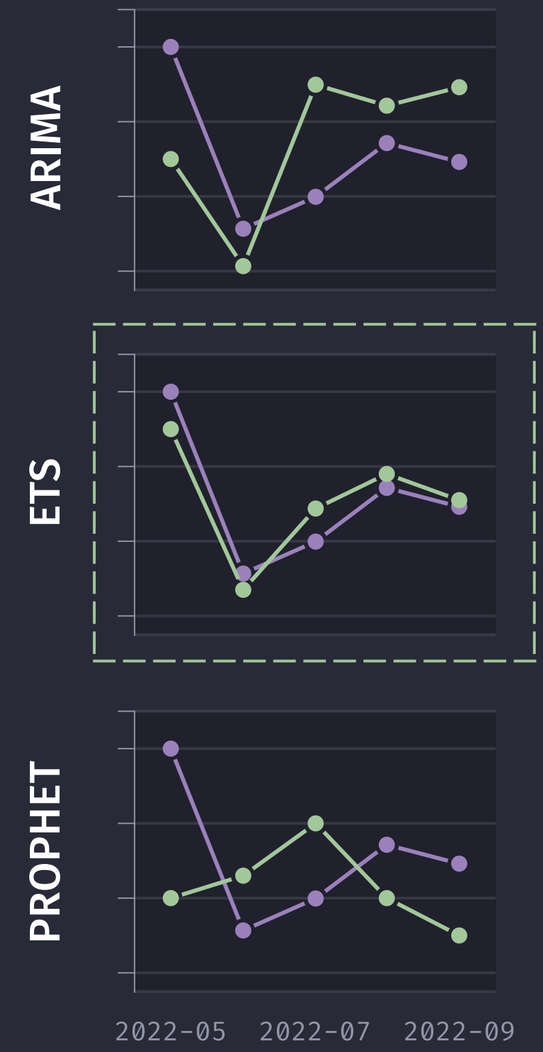
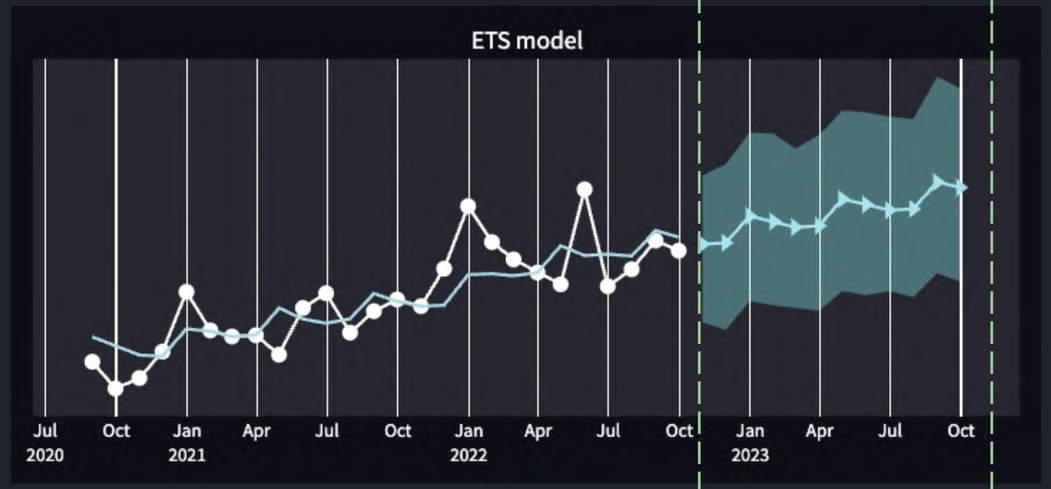


Pitch

PIPELINE_APPROACH_END

STEP_4

Using the best model selected in step 3 we predict the next 12 months



HISTORY (26 MONTHS)

12M PREDICTION (FUTURE)

STEP_5

Automatic monitoring of model errors given new data

Model	10-2022	11-2022	12-2022	...
2022_09_best	0.75%	1.2%	2.4%	...
2022_10_best		1%	3.5%	...
2022_11_best			2.7%	...
...				...

ERROR = % DIFFERENCE (PREDICTED VS ACTUAL FOR NEW MONTHS)

Pitch

<TITLE> PIPELINE IN ACTION </TITLE>

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Let's see our work in action

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HTTPS://MIKJF-TIME-SERIES-TRANSACTION-VOLUMES-PREDICTION.STREAMLIT.APP/

Project conclusions

FORECASTING TRANSACTION VOLUMES => FORECASTING REVENUE

- Thanks to our pipeline SIX will be able to forecast transaction volumes more precisely

IDENTIFY MERCHANTS WITH HIGH VOLUME OF TRANSACTIONS

- SIX will be able to plan tailored solutions

<TITLE> ALMOST_THE_END </TITLE>

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Thank you very much
for your time and consideration

SIX_PACK TEAM

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Mukund Pondkule

Michael Flury