Case Study

How an aviation manufacturer increased their market forecast accuracy by 40%

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CHALLENGES

The aviation manufacturer's primary concern was to ensure that they could quickly adapt and optimize production capacity to meet market trend shifts.

To do so, they required accurate forecasts of their sales volumes. However, this was not the case.

Their current method of forecasting, not unlike other aviation manufacturers, is built primarily in Excel. The absence of statistical methods when identifying leading indicators resulted in irrelevant indicators being selected, which translated to poor forecast accuracy.

WHAT THE MANUFACTURER WANTED TO ACHIEVE

01

Minimize forecast error margin.

02

Ability to identify the relevant leading indicators that matter.

03

Detect market trend shifts, evaluate new policies, and their impact on the aviation market.

Increase in
forecast accuracy

+ 40.4%

Mean accuracy
percentage error

4.68%
Indicio accuracy error

7.86%
Internal accuracy error

RESULTS

Improved forecast accuracy

By implementing best practices through all stages of the forecast process, the manufacturer achieved a double-digit MAPE forecast accuracy improvement.

Gained the ability to detect market shifts

With Indicio, they were able to detect trend shifts on the market months earlier than before. This gave the manufacturer enough time to adjust production before a trend shift, resulting in significant savings when the market went down and the ability to meet demand when the market went up.

Aligned across management to production

Successfully established a structured process across all markets and management support was significantly improved.

HOW WAS THIS DONE?

Identified their seasonal patterns

Built benchmark forecasts (univariate)

Identified the manufacturer-specific leading indicators

Built multivariate forecasts

Weighted all models according to accuracy

IDENTIFIED THEIR SEASONAL PATTERNS

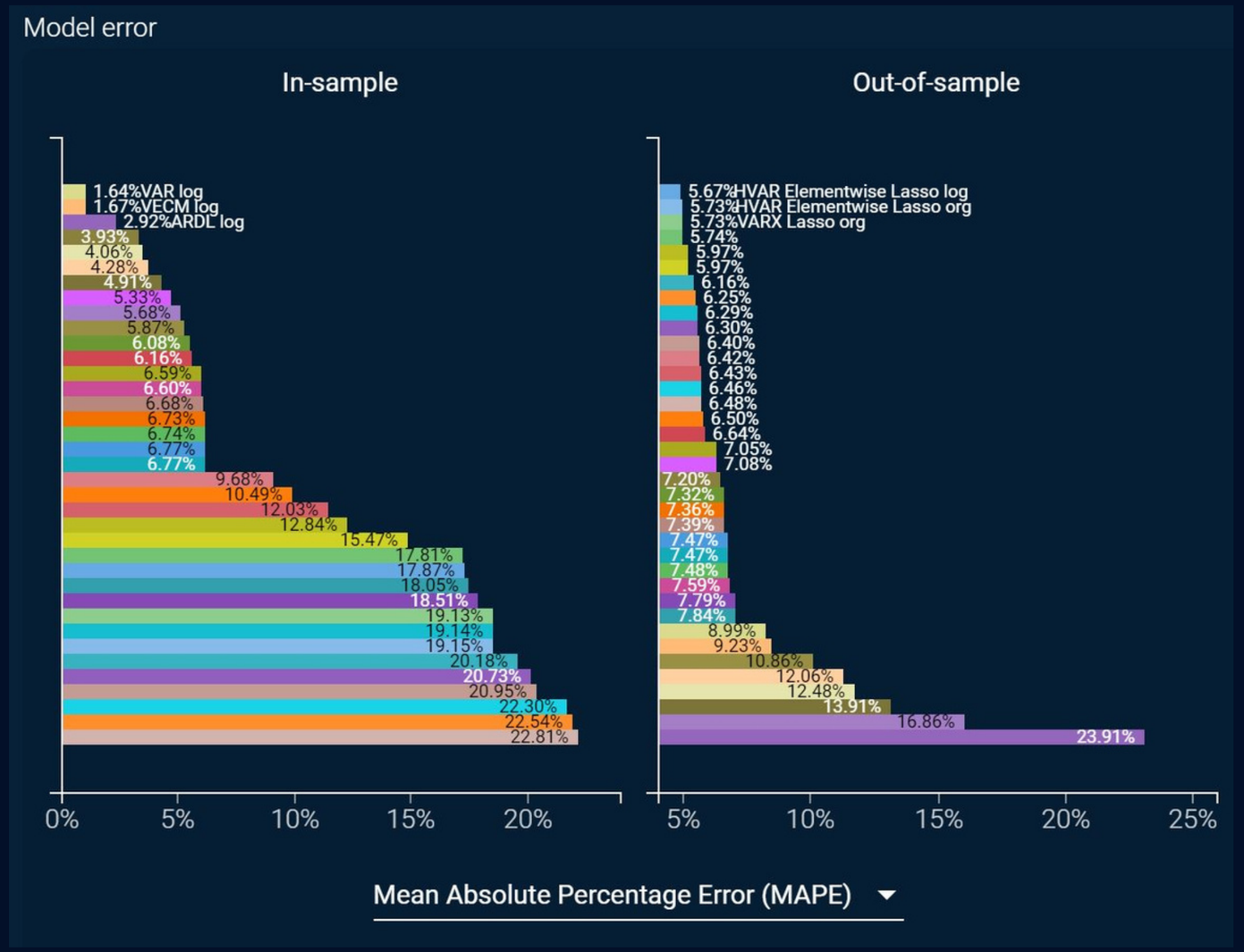
To begin with, we started with data cleaning.
Next, we proceeded to identify their seasonal patterns.

After a seasonal pattern was identified, the seasonality was removed before building forecast models. **After the forecast models had been applied, the seasonality was added back to the forecast**.

BUILT BENCHMARK FORECASTS

Initially, Indicio built several univariate models that were based solely on historical sales.

This acted as a first benchmark to judge the quality of the more advanced models applied at a later stage.



**These figures do not represent actual company data due to confidentiality reasons.*

IDENTIFIED THE MANUFACTURER-SPECIFIC LEADING INDICATORS

Main variable	Influence	Time range
Manufacturers' New Orders: Nondefense Aircraft and Parts SA	-	1992-02 - 2023-06
Indicator variables (4/83 active)		
United States, Air Traffic : International Revenue Departures Performed - Non-Scheduled SA N	★★	1996-01 - 2023-06
United States, Air Traffic : Domestic Revenue Aircraft Miles Flown - Non-Scheduled SA N	★★	1996-01 - 2023-06
United States, Exports, Capital Goods, Civilian Aircraft, SA, USD SA N	★	1989-01 - 2023-06
Producer Price Index, United States, Aircraft Repair and Maintenance, Index, 2009M4 = 100 SA N	★	2009-04 - 2023-06

*Indicio captures the group effect of the leading indicators, and the relevance ranking of each indicator changes over time, depending on market movement.

Historically, the manufacturer was identifying leading indicators through correlations identified in Excel. The problem was that many of the indicators identified did not have a causal effect on the main variable.

Indicio uses a Lasso model to test for all the potential combinations of indicators that are determined as most valuable towards predicting future sales, and suggests the optimal group of indicators to use as a basis for forecasting.

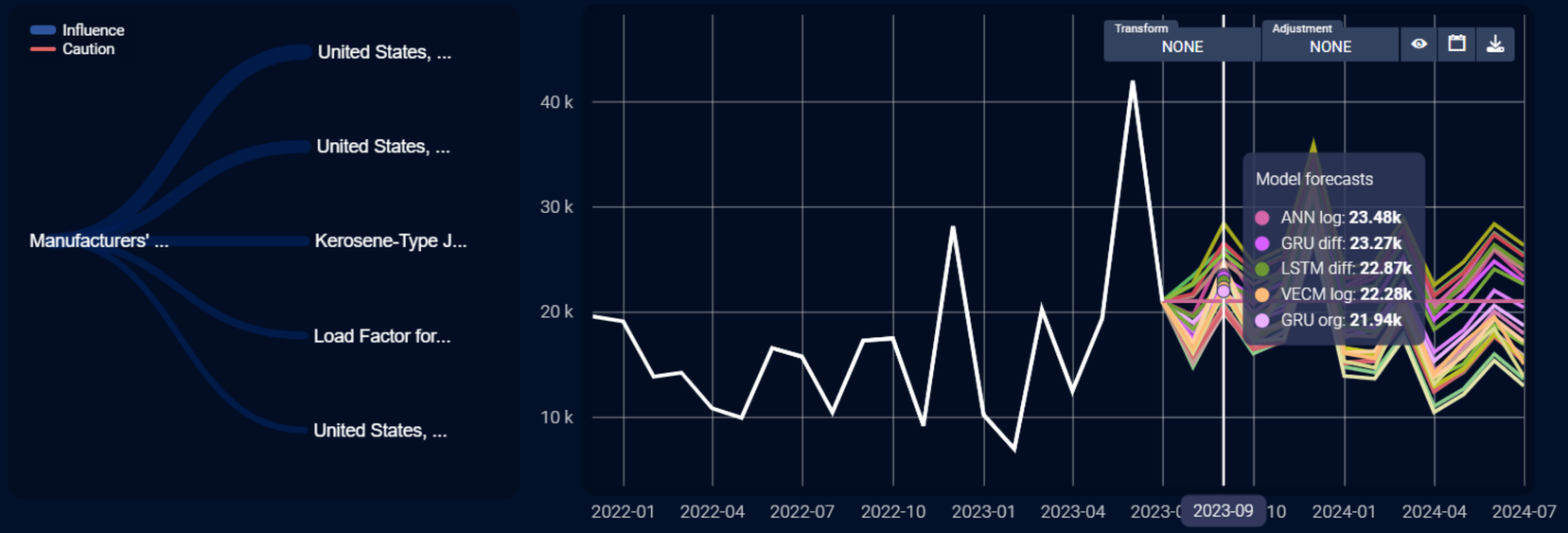
>> **[Learn more about how this is done]**

In the analysis, they found that the combination of these indicators (seen in the left diagram) had the highest impact on forecasted orders.

BUILT MULTIVARIATE FORECASTS

After the relevant leading indicators had been identified, we applied multivariate forecast models on the indicators identified to forecast their data.

Indicio applied a large number of econometric forecast models and weighted them according to accuracy.



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Why not just one good model?

All forecast models have their advantages. By weighting a large set of models, we capture the strengths of each individual models. According to the latest forecast research, this has been proven to be more accurate.

Read more about the platform.

GENERATED A WEIGHTED RESULT

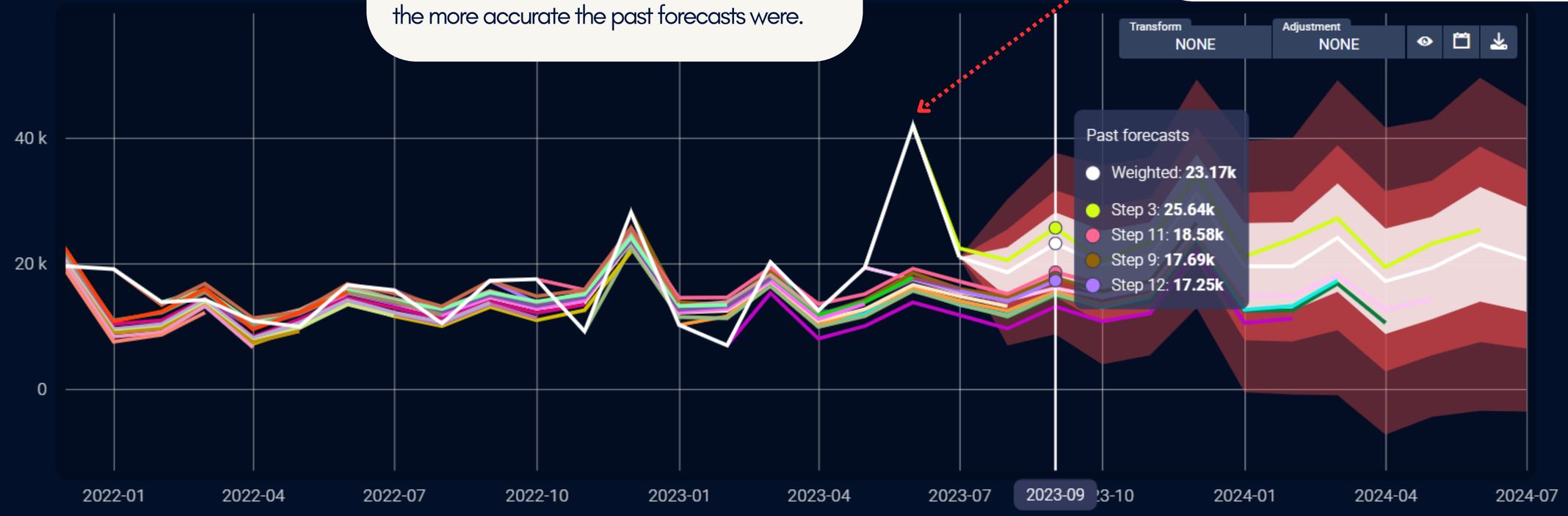
The white line represents the actuals and the colored lines represent the forecasted values.

The closer the forecasted value is to the actuals, the more accurate the past forecasts were.

What happened here?

In this instance, we included the 'Paris Air Show' as a known event.

Incorporate the impact of known future events
By factoring in the occurrence of an upcoming regulatory policy, one that is of similar nature that has already been implemented earlier, this informs the models to factor in the effects associated with the policy.



HIGH-LEVEL RESULTS

01 Successfully identified their leading indicators, improving their forecast accuracy by 40.4%

02 Ability to detect market trends one to two months earlier, and pivot accordingly.

03 Better aligned forecasting process for all markets.

Built for domain experts, not data scientists

Indicio puts the domain expert in the driver's seat. No need for advanced statistical knowledge.

Automated forecasting

From identifying the relevant leading indicators to building models, your forecasts are built in a few clicks, and easy to update.

Factor in higher-frequency data when forecasting your monthly or yearly data.

Ensure that you are factoring up-to-the-minute insight, to ensure you stay prepared for any market trend shifts.

Gain improved forecasting performance

40-60%

Average forecast accuracy improvement

Detect market trend shifts in advance.

Identify your leading indicators.

Regardless where you are in the business cycle.

Want to see how you can gain a strong forecast process?

Identify your relevant leading indicators and anticipate shifts in your market months ahead. Through improved forecast accuracy.

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