

Leveraging the past to ease the future

A Case Study of improved Revenue Forecasting

BY
ANALYTICS TEAM,
INTELTYTICS SOLUTIONS

ABSTRACT

The case study is about creating automated revenue forecasting and developing a single framework to be utilized throughout the business for a company in the Event Technology Management domain. It involves drilling into specific data sets to identify the variables impacting the sales and coming up with improved parameters to estimate for the upcoming periods. An accurate forecast can be useful in appropriate demand planning for smooth handling of operations as well as to drive better customer experience.



About client

The client is a global event management company based out of USA with operations spread out across North America, South America, Europe, and Asia. It manages large scale events across multiple locations (~1.5K), having tie-ups with multiple hotel chains and local agencies.



TASK AT HAND

The objective was to automate the forecasting model and update it regularly with the changing dynamics thus removing the need for manual intervention. The complete automation of the task of revenue forecasting was required on all the location levels and to have the maximum granularity on the forecasting time periods. The aim is to get accurate, reliable location-wise forecast numbers that can be utilized for demand planning by the business. Precise forecast numbers will assist in the precise organization of the workforce and tools required to meet the upcoming opportunities. This will in turn lead to better customer experience, as the business will be prepared beforehand to meet the requirements.

ISSUES AT HAND

Now before diving in to figure out solutions, it was necessary to identify the issues that persisted within the processes. There were a few challenges they had with their existing forecasting framework as follows:

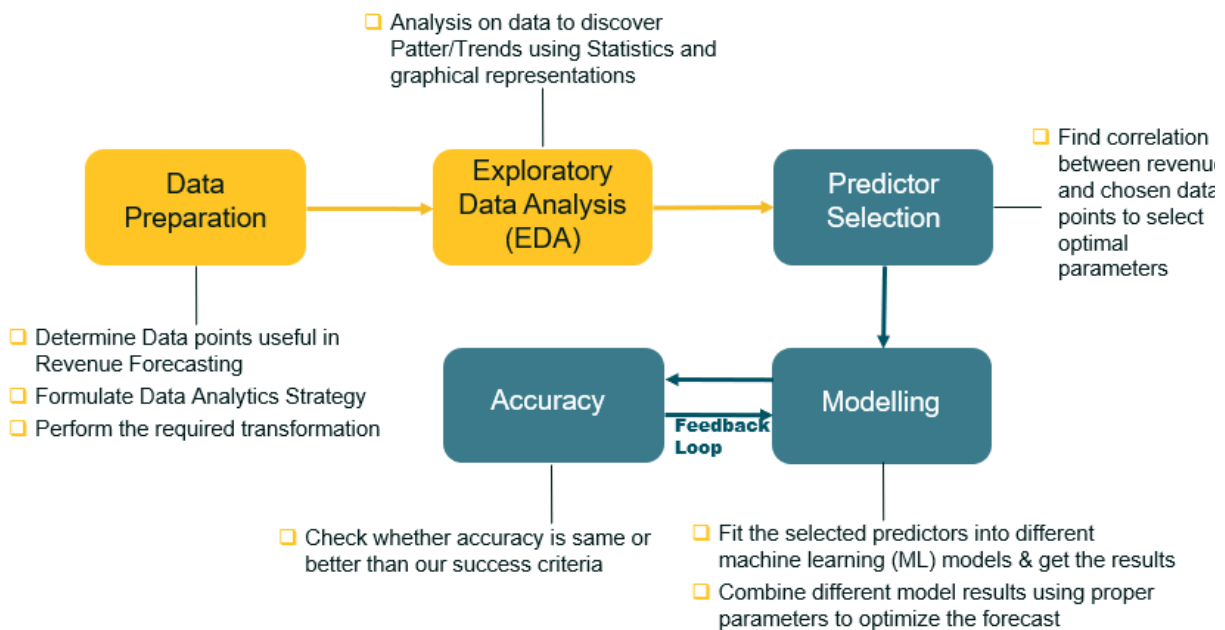
- The forecasting framework used was different for different business units. For example, the AVP in north America utilized an excel for forecasting revenue whereas the AVP in south America looked at the Microsoft dynamics reports for forecasts.
- There was a manual effort required to update the forecasts, the sales team required to add a parameter every month to get the monthly forecasts.
- The data entered by the sales team sometimes did not completely match up with the finance data generated from the invoices.
- The forecasting was done on a monthly basis and did not offer a further drill-down to a weekly level.
- The business operated out of multiple locations, and each location had differing time periods of data. (i.e. some locations were old having more than 5 years of data, relatively some locations that were new having less than 1 or 2 years of data).
- The events spanning across two months did not have proper distribution of the pipeline revenue across both those months



SOLUTION ANALYSIS

- The team worked closely with different project managers to conduct a detailed analysis of all business processes along with the business applications used to support them.
- In addition, the team worked with the finance team to identify the key requirements of the forecasting and recognize the parameters used there.

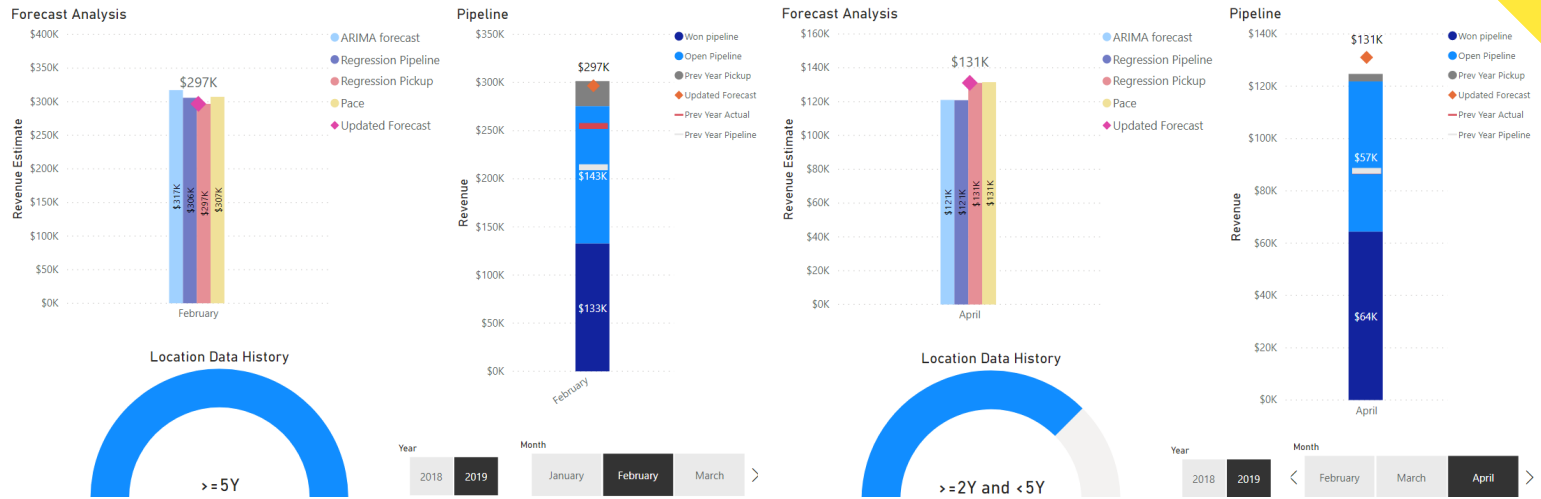
Machine Learning Model Workflow



- All the data was gathered into a data warehouse to properly manage by the team as part of a previous project. Data from that data warehouse was thoroughly analysed and important variables for each department were shortlisted to draw out significant KPIs that can be used for forecasting and telling the business story corresponding to it.
- On top of the internal data sources, we utilized external sources as well, such as the Group Room Nights data, to gauge the market scenario and ensure better accuracy for our forecast models.
- Pipeline data was further refined to showcase the open and won opportunities to analyse revenue generated over time and identify its pace.
- Team incorporated the parameters that were identified and modified into time series machine learning algorithms to predict accurately for the entire year.

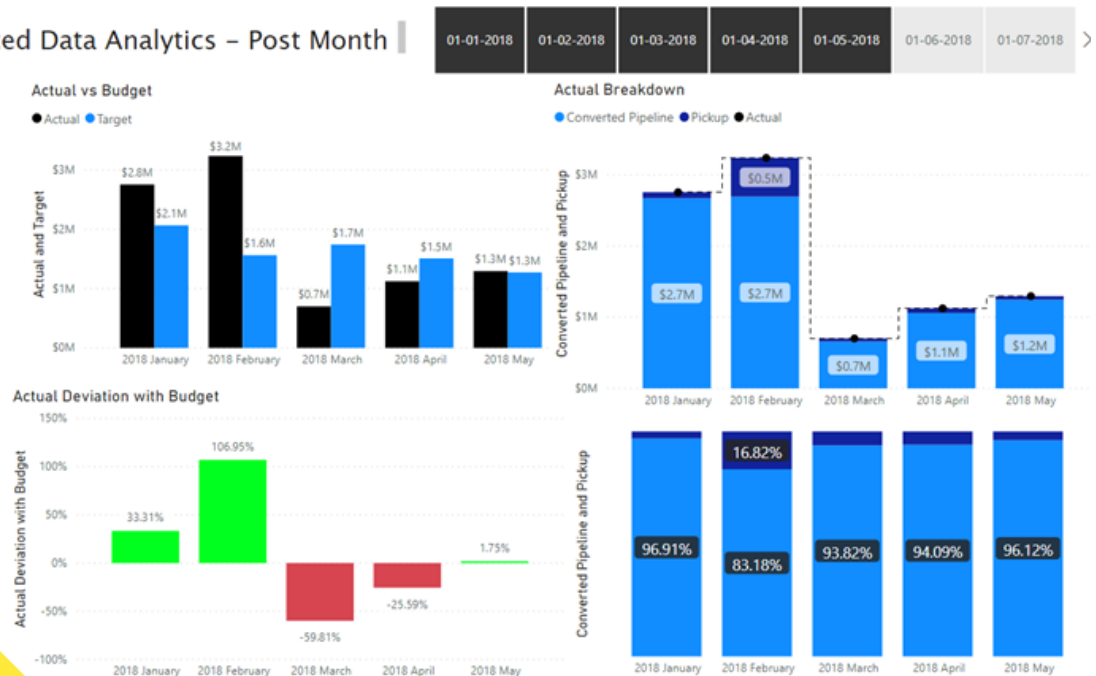
INTELLYTICS SOLUTIONS | CASE STUDY

- We compared the forecast models and deduced that auto-ARIMA models performed better across all the locations with good historical data.



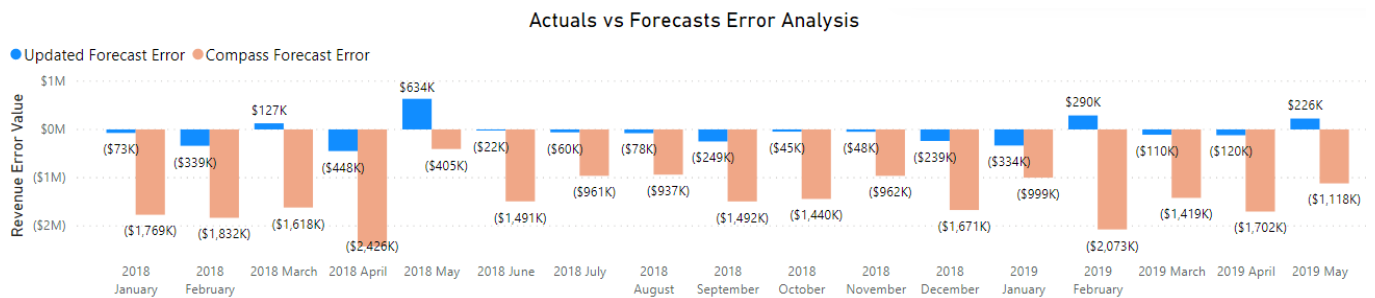
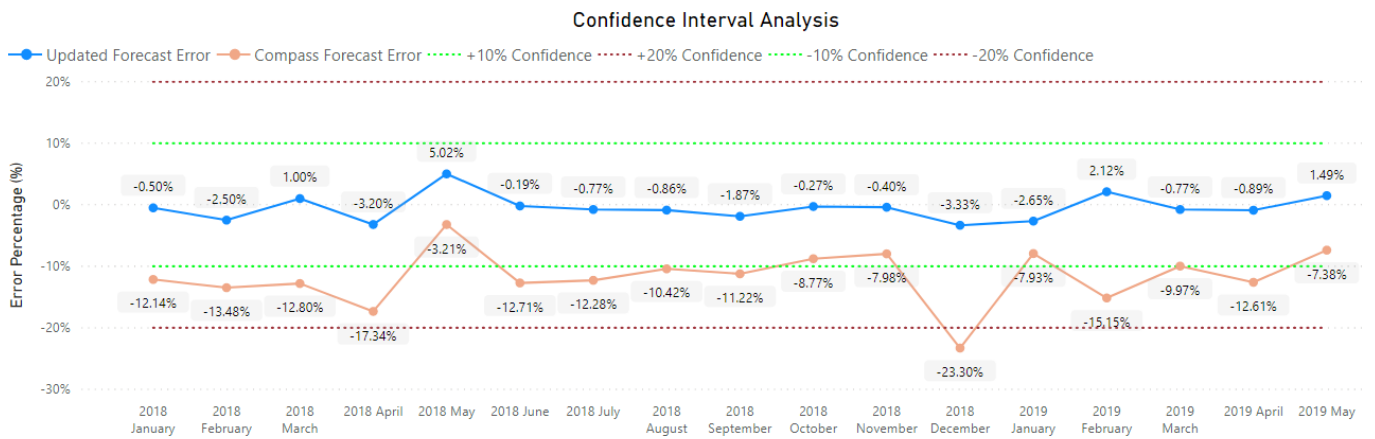
- To fuse new locations and old locations together into the model, regression techniques on top of the ARIMA model were used to achieve precise predictions.
- We investigated the Holiday effect as well for all the locations using the GAM (Generalized Additive Model) Holiday analysis. Followed up the findings with business to check the inferences and their utility, and post-approval from the stakeholders integrated this with the model further improving accuracy.
- Team also identified the possible reasons and features impacting locations with either low revenue or high revenue forecasts. We conveyed these findings to the business through an analysis storyboard.

Advanced Data Analytics – Post Month



OUTCOME

- Team achieved successful integration between multiple data objects and sources providing clarity on multiple indicators and parameters across business processes.
- We delivered a fully automated revenue forecasting framework, that updates with the changing data and time and requires zero manual intervention.
- A forecasting framework as a single point solution throughout all the business units with a detailed drill-down to a specific location level was configured.
- The model provided flexibility to the stakeholders to view the forecasts even on the weekly level on top of the monthly one.
- We improved the forecast precision by 1000% by getting 11 months forecasts of a year under 5 percent confidence interval as compared to the previous 1 month only.



- The analysis storyboard provided real-time monitoring of the key performance indicators in revenue forecasting.
- The analysis storyboard further assisted the sales team in identifying locations with lower performance, figuring out the reasons for the same and potentially improving them by working on the findings.

Business Intelligence | Data Science | Analytics | Data Warehouse