



CASE STUDY

Predicting KPIs using Time Series Data

Executive summary

Businesses rely on Key Performance Indicators (KPIs) to track business health, value, and success. This project uses time series data to predict KPIs in order to give businesses insight into whether they are on track to meeting their objectives for the year.

The challenge

▶ Incorporating Ground Truth Data

Ground truth data is important in order to easily detect model drift. Time series data presented new challenges when incorporating ground truth data.

▶ Feature Importance

The datasets being used were smaller than other datasets which limited the number of features available. Feature engineering was useful to create additional important features,

▶ Determining Billable Tasks

The determination of billable tasks was not always easy. This was important in order to make the model accurate.

Why choose AWS for your machine learning (ML) needs?

With high-performance compute options powered by machine learning, Amazon Web Services (AWS) enables organizations to undergo broad digital transformations with modern, cloud-native solutions. Offering a broad set of ML services and supporting cloud infrastructure, AWS enables organizations to tailor their ML solution to meet the unique needs of their business.



About actiTIME

actiTIME is a Canadian-based company that focuses on time and project tracking software. They help their users stay productive and effectively track to stay on budget.

" By the end of 2024, 75% of Enterprises will shift from piloting to operationalizing AI." - Gartner



"ML isn't the future anymore. ML is critical to innovation today." -Dr. Bratin Saha, VP AI & ML, AWS, 2021

Why Source Allies?

Founded in 2002, Source Allies is a premier, team-based, technical consultancy in Des Moines, Iowa. We provide high-performing coaches and teams who work alongside our partners to cultivate a shared ownership environment. We are dedicated to our partner's longterm success and focus on continuous value delivery while remaining flexible to our partners' dynamic business needs. Our mission is to combine the skills of data science/data analytics/statistics with software development skills and best practices (TDD, data engineering, MLOps, cloud architecture) in order to incorporate the right skills into product teams so that we can answer tomorrow's questions without redesign.

The solution

Business KPI data is landed at regular intervals within an S3 bucket. From here, data is directly ingested into Amazon SageMaker. Scripts are set up in this pipeline to take care of the cleaning and normalizing of this data before training occurs. An Amazon SageMaker endpoint is hosted to allow for easy use of model interaction and prediction. Predictive results are deployed via a real-time endpoint, which can be queried by a web application. These are also landed in S3 for use with quality monitoring processes. This project used the DeepAR model along with RMSE and loss to evaluate the model performance.



Results

This new feature results in a reduction in the amount of time spent in estimating key performance indicators. Gone are the days of spreadsheets and manual calculations. Individuals making business decisions can now easily see what is predicted. totranspire over the rest of the year based on past years' and the current year's data. This results in being able to make better decisions and become more proactive rather than reactive.

Benefits

This project showcases several benefits to those who decide to take advantage of the feature. Business can plan more effectively, helping projects to stay on track financially. This feature helps remove manual processes that customers may be using. Instead of manually forecasting billable time, they are now freed up to work on other more important tasks. Additionally, this project has allowed for a pattern to be created with time series modeling with monitoring. This pattern can be applied to other time series data with little tweaking.

" The cost to train a neural network equivalent in size to the human brain (\$2.5B) is likely to drop to \$600K by 2030." -ARK Investments

Next steps

Now with a tested and documented approach, we are looking forward to finding other projects that would benefit from time series modeling with monitoring. We also plan on modeling several other KPIs in order to provide a more holistic forecasting approach to business success.

Benefits

➤ Reduction in Uncertainty

This feature allows businesses to plan more effectively allowing projects to stay on track financially.

➤ Time Savings

We have been able to replace manual processes that save time and free up individuals to work on other things.

➤ Tested, Documented, and Repeatable Approach

This project allowed us to create an approach to time series modeling that has been tested and documented. We look forward to implementing this in other areas.

About Source Allies

We partner with privately owned small businesses to fortune 100 organizations. We have received the Migration & Modernization Competency and applied for the Machine Learning Competency in 2022. Our teammates are certified in: Data Analyst Specialist, Professional Solutions Architect, Professional DevOps, SysOps Administrator, Machine Learning Specialty.



• Migration Services Competency