

Overall Winner

Best Cash Flow Forecasting Solution

Amazon.com, Inc.

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Amazon.com, Inc. is an American multinational technology company focusing on e-commerce, cloud computing, online advertising, digital streaming and artificial intelligence.

## Amazon 'Thinks Big' with machine learning forecasting solution

### The challenge

Think Big is a key leadership principle at Amazon, and the team knows how important it is to manage its capital structure efficiently at scale. While always a focus, this became even more critical as the Covid pandemic swept the globe and shoppers around the world rushed to e-commerce retailers, including Amazon, to purchase everyday goods.

As the volume of transactions multiplied, so too did the complexities of forecasting cash flows across Amazon's numerous business lines, currencies and countries. Using historical data and quarterly forecasts would no longer work. It was time to innovate the cash forecast.

### The solution

Amazon paired its treasury team with in-house software engineers and data scientists to build an improved machine learning based forecasting model. The partnership began with treasury identifying key variables across multiple business lines. The data scientists explored the data, identified the most suitable algorithms, and trained and tested the machine learning models. Software engineers created a data lake, and implemented the machine learning pipeline, deploying machine learning algorithms to drive better insights into patterns that were not perceptible to humans. What began as a daily US cash positioning tool quickly evolved into a 60-day forecast that outperforms traditional methods of cash flow forecasting, across the globe.

The machine learning model had an immediate impact on Amazon's global treasury management. Amazon is now able to establish dynamic cash target balances across international operating entities and improve working capital. Additionally, Amazon has seen significant process improvements.

Previous cash positioning took up to eight hours to perform, but it now takes less than 30 minutes, freeing up the team for strategic priorities. The machine learning model's effectiveness also means treasury is no longer reliant on multiple upstream systems across the company

to make time-sensitive decisions. Treasury can allocate work more appropriately while also bringing more insights when meeting with its bankers.

Amazon continues to make improvements to the overall process. This solution demonstrates Amazon's focus to deliver on its four guiding principles: customer obsession, passion for invention, operational excellence and long-term thinking.

### Best practice and innovation

Amazon's new forecasting model is a best practice innovation in many ways. As a strategic business partner, treasury provides real-time, data-driven guidance on capital structure optimisation.

The most visible innovation is the deployment of machine learning directly into treasury, which can be difficult to implement effectively, and this has had an immediate impact. The benefit of the machine learning model is that it improves over time as it constantly retrains itself with more data.

Another best practice is the partnership between the treasury organisation and Amazon's in-house software engineers and data scientists. This project included team members with diverse skill sets and backgrounds across internationally based teams.

By aligning multiple organisations to a common vision and clear goals, Amazon has delivered results that would have been challenging for any of these organisations to achieve alone. In this case, the whole is greater than the sum of the individual parts.

### Key benefits

- Improved liquidity management efficiency.
- Cost savings.
- Time savings.
- Process efficiencies.

- Increased automation.
- Risk mitigation.
- Improved visibility.
- Error reduction.
- Manual intervention reduction.
- Increased system connectivity.
- Future-proof solution.

*In addition to Abhi Misra and Sean Patterson, the following individuals are also recognised for their key contributions: Colleen Ramsay, Tim Smallow and Tony Masone in Amazon Treasury, alongside Jenhau Chen and Stephen Lau in Amazon Fintech.*

Kyriba would like to congratulate Amazon.com Inc. on their impressive achievements in intelligent cash flow forecasting and liquidity planning. Working with this talented team in their continual pursuit to elevate treasury has created a valued partnership between our companies. For this solution Amazon.com utilised Kyriba's treasury management, bank connectivity, as a service with 100+ banks worldwide, and unparalleled data streaming solution, in partnership with AWS and Bank of America. Amazon.com will continue to drive results that set the best-in-class standard for cash flow forecasting intelligence and accuracy.

**Greg Person CTP, SVP Sales & Account Management, Kyriba**