How Caterpillar is using technology on its journey to improve financial forecasting

Artificial intelligence helps Caterpillar expand its analytics-based forecasting capabilities for greater accuracy and efficiency.

■ The better the question

How can AI predict an unpredictable future?

Advanced analytics and artificial intelligence changed a two-lane road into an information superhighway.

Throughout its nearly 100-year history, the Caterpillar finance function has always had a strong role in the company's success. From pricing machines, engines and services to identifying profitable business opportunities, the finance organization has provided insights that have helped Caterpillar become a leading global manufacturer of construction and mining equipment, off-highway diesel and natural gas engines, industrial gas turbines, and diesel-electric locomotives.

In 2019, the Global Finance Services Division at Caterpillar began a journey to become a more insightful, empowered, inclusive and efficient organization. One of the initial projects with the biggest opportunity was to improve financial forecasting.

"The goal was to equip our teams with better tools and technologies to reduce team time, waste, and improve accuracy. We had very little time to provide strategic insights to our business partners because we were relying on decades-old processes, requiring data from hundreds of sources and countless spreadsheets to produce our financial forecasts," said Kyle Epley, Senior Vice President Finance Services Division, Caterpillar Inc.

"My eyes were opened to new possibilities based on advances that were happening with robotic process automation, machine learning and artificial intelligence. If we utilized these technologies, we could transform our approach, allowing us to simultaneously improve our team's engagement and better serve our business partners," Epley added.

Epley reached out to Ernst & Young LLP (EY) professionals to help channel these leading-edge technologies.

"Digital and advanced computing techniques can unlock value, improve operational efficiencies and empower employees to better leverage data — helping organizations better predict trends and respond to changing market conditions," said Steve Patton, EY Americas Mobility Sector Leader.

Financial forecasting provides Chief Financial Officers (CFOs) and key business leaders with a view of the future that can be leveraged to make key business decisions and shared with external stakeholders to increase market engagement. Highly accurate and quickly produced forecasts can provide companies with a level of insight and agility that enables competitive advantage. Emerging technologies like artificial intelligence (AI), machine learning (ML) and generative AI (GenAI) are vital to improve forecast accuracy and create new scenarios in a fraction of the time.

"Data-driven insights are critical to make informed business decisions and can provide organizations with a robust roadmap for success," noted Traci Gusher, EY Americas Data and Analytics Leader. "Our goal is to help clients transform into analytic-powered businesses by enabling data-driven decisions - improving accessibility and data quality and applying advanced analytics and AI (AAAI) techniques."

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I have no doubt that we will be able to improve our approach in forecasting as new advances are being made in ML and AI.

Kyle Epley
Senior Vice President Finance Services Division,
Caterpillar Inc.

■ The better the answer

Modeling tools demonstrate improved forecast accuracy

AI- and ML-enabled systems generate planning scenarios and offer a repository for critical data.

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Caterpillar's finance organization worked with the EY team to develop an initial proof of concept.

"For businesses like Caterpillar the importance of financial acumen and sound planning cannot be overestimated," said Deirdre Ryan, EY Global Finance Transformation Leader.

EY professionals worked with targeted stakeholders to understand the opportunities within current processes and to identify the requirements for the future AI-enabled systems. The group gained executive-level support by identifying where emerging technologies could provide the most improvement to existing approaches either by producing new information or just increasing efficiency in the process in order to free up time for employees to focus on strategic insights.

The EY team's goal was to visibly demonstrate the speed, accuracy and forecasting capabilities offered with digital and advanced technologies by developing modeling tools. These modeling tools used a shadow copy of Caterpillar's own data, along with selected external sources, to run forecasting models — validating and proving the functionality of the solution. Big differentiators for these tools included the EY Data Fabric solution and EY Intelligent Forecasting and Scenario Modeling.

These solutions, coupled with a humans at the center transformation approach, provided a path for Caterpillar to scale new capabilities quickly while offering leaders new insights throughout the process. Caterpillar's finance organization established an advanced analytics team and EY professionals worked alongside the team to build their initial capabilities.

Those insights also sparked inspiration for the EY teams – including a bold, experimental way of sourcing and querying finance data using a program originally created for other business uses.

"To help Caterpillar see the possibilities using their own data, we tried a completely new approach for finance," said Kevin Tollison, EY Data and AI Partner, Ernst & Young LLP. "While the forecasting tool was being developed, we had discussions with Caterpillar about data sources, data management and lineage. Because the forecasting techniques were data-driven, the client's data needed to be digestible."

Once the EY team had demonstrated the modeling tool's capabilities, a pilot was created connecting forecasting accuracy and insights to business operations within one of Caterpillar's business units. This process showcased how improved accuracy and understanding could be gleaned from the new system. The pilot ran in parallel with Caterpillar's current process, allowing the team to test the new technology without disrupting current operations. Next, statistical models were developed and deployed to better support the forecast and a scenario planning process was created.

A newly designed custom user interface allowed the team to execute more planning scenarios and establish a global repository capturing the critical data. The interface was able to demonstrate multiple finance scenarios and allow for overrides to the predictive models when new information was available that was not yet reflected in the system.

"This is a great example of a global manufacturer encouraging innovation across its finance organization and pointing the way forward for other Finance teams," said, David Herbert, Americas Finance Transformation, Vision and Strategy Leader, Ernst & Young LLP.

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Senior Vice President Finance Services Division,
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The journey to transform forecasting continues

Improved financial planning and forecasting accelerate responses to evolving demands.

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The Caterpillar team is continuing to find ways to expand their analytics-based forecasting capabilities. Having a methodology in place has allowed the team to expand the scope of the initial project to provide more insights and detailed scenario planning. For example, colleagues that manage specific product lines, seeing the initial potential of the tools, are asking the finance team to help them understand the potential impact of unforeseen events and respond to evolving market demands for specific product lines.

"Encouraged by the progress we have made, the team is expanding our focus to include cash forecasting and we see potential of ML and AI tools in other areas such as corporate consolidations, invoice to pay, and more. I have no doubt that we will be able to improve our approach in forecasting as new advances are being made in ML and AI," noted Epley.

He added, "The most rewarding part of this journey is seeing the benefits experienced by our finance teams from adding new skills to simplifying their workflow or just making their day-to-day work more engaging – not to mention the satisfaction of helping our business partners grow profitably."

The combination of human business knowledge and proficiency with digital tools can supercharge the ability to provide business insights, run more efficient operations and enhance customer service. As organizations like Caterpillar look for ways to channel information and insights, the right amalgam of people, data and technology can be the differentiator needed to define a realistic growth strategy, anticipate demand and supply fluctuations, and prepare the business for future uncertainty.

"Financial planning in large business organizations is undergoing a sea change as technologies evolve. COVID-19 and the disruptions to supply chain highlighted two important requirements that organizations need going forward - robust scenario planning capabilities and the ability to incorporate industry and macroeconomic variables," said Dennis Sparacino, Principal, US Consulting Finance Technology, Ernst & Young LLP. Sparacino, who served as the engagement Partner, went on to note, "It's an exceptional opportunity to bring our broad perspective and experience to clients, like Caterpillar, that need the right combination of data, tech and talent to stay ahead of the game."

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