

Data lakes, AI-ML tools help auto OEMs in production

Automakers are using these models to make informed, strategic, tactical decisions across domains

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From production planning and inventory management to predicting the supply of critical components and deciding on features, colours and variants that customers want — original equipment manufacturers (OEMs) are using data and employing artificial intelligence (AI) and machine learning (ML) tools to manage their operations.

Not just predicting demand patterns, AI-ML tools are being actively used by companies to reduce supplier risk management, according to OEMs.

“The gold standard of planning inventory is now to start tracking from the enquiries itself, and not only from retail sales or invoicing of vehicles. When a customer is logging in his or her query on a search engine, or the OEM website, or is walking into a dealership — it is generating data, and analysing it helps us to predict demand trends,” said Shashank Srivastava, senior executive officer, marketing and sales, Maruti Suzuki India.

“From data on enquiries, we can build what we call a data lake or a data warehouse where data is classified into various cohorts and then we use AI and ML tools to predict demand down the line,” he said. This helps with colour choices — retail data can only reflect what the OEM is producing, and not what the customer is enquiring about. “It should be the other way round, we should be producing what the customer is asking for,” Srivastava said, adding that AI and ML tools help determine patterns, whether regional, demographic-wise, for customer cohorts of ‘look-alike’ people.

In the age of connected cars (where cars can communicate bi-directionally with systems outside the car), it is possible that in the future a car manufacturer will call a customer for an early replacement of a brake pad because it knows the person has a habit of hitting the brakes frequently. Predictive maintenance is just one of the things that OEMs are trying to achieve by using AI-ML tools to inter-



PREDICTING MAINTENANCE USING AI-ML

- Auto OEMs are using AI-ML tools to predict trends from their database
- Data from customer enquiries, dealers, and reported retail sales are fed into databanks and then arranged cohorts
- AI-ML tools then come up with predictive trends based on these cohorts
- Data analytics is also applied for in-bound logistics
- This is used to predict supply disruptions,
- vendor supply planning
- AI-enabled optimisers are used for production planning
- AI-ML tools are also used for predictive maintenance of cars or even plants

pret, analyse and come up with predictive patterns out of the data-bank they have.

With AI-ML models becoming strong collaborative and complementary tools, Tata Motors is increasingly using them to make well-informed and strategic, tactical or operational decisions across a variety of functional and business domains. The company said it is using AI and ML models for lead scoring and re-purchase (which helps to prioritise high potential leads and allocate resources efficiently). Tata Motors also pointed out that it is using AI-ML forecasting algorithms to analyse historical sales data, market trends, and socio-economic factors to predict demand in the industry, as well as their sales, enabling adjustments to production plans to meet shifting demand.

Sources from another major passenger vehicle OEM told *Business Standard* that the company is tracking

cars, colours and variants on a real-time basis based on bookings, and production is planned accordingly. At present, it is mainly being used in maintenance and also on shop floors. The company said that data from smart sensors is able to predict many abnormalities in equipment, resulting in 5 per cent reduction in maintenance downtime.

The early success of AI and ML tools has now led the company to consider the next level of implementation by horizontal and vertical deployment of solutions across the shops. The idea is to opt for demand forecasting using historical data, market trends, and external factors to predict future demand, helping companies to optimise their inventory and reduce the stocks.

Srivastava says, “When the semiconductor crisis happened, we used AI-enabled optimisers for production planning. Depending on the past data

on which a vendor can supply how much and in what timelines, we did forecasting for component supplies and procurement and accordingly did the production planning.”

Tata Motors adds that massively complex models serve as scenario planners — simulate potential disruptions, and manage risks associated with the supply chain (such as shortages of critical components or geopolitical factors affecting availability of raw materials).

Industry experts believe that the trend will revolutionise the entire value chain in the near future.

“This will have a positive impact on the entire value chain, once companies have clarity on demand, ensuring manufacturing and related activities can be streamlined better. Benefits from a manufacturing perspective include predictive maintenance which will reduce the downtime, lesser breakdowns will result in better inventory management, leading to leaner, efficient and cost-effective supply chain, eventually benefiting the customer, thus creating a virtuous cycle,” said Vinnie Mehta, Director General of the Automotive Component Manufacturers Association of India.

Another industry expert highlights that the trend started during the pandemic and it may soon transform booking and customer dealings online.

Dealers, however, pointed out that while things have started moving in this direction, it is still early days. Manish Raj Singhania, president of the Federation of Automobile Dealers Associations (FADA), said that it would be too early to gauge how much of a dramatic transformation can happen in terms of reducing inventory at the dealer end or even reducing waiting periods. “Each OEM has its own dealer management system software where the dealers have to feed the data. At times the data an OEM needs and a dealer needs are slightly different. So, we have now begun talks with software vendors to develop a DMS for dealers which would be uniform across all FADA dealers,” he said.