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BY ALVAREZ & MARSAL

Demand Sensing: Leveraging Artificial Intelligence and Machine Learning to Improve Demand Forecasting

Demand forecasting is a crucial aspect of business operations. It enables organizations to predict customer demand for their products or services and optimize inventory, production and supply chain management. In recent years, artificial intelligence (AI) and machine learning (ML) have gained tremendous popularity and have been used extensively in demand forecasting. Organizations that integrate this technology into their operations can improve efficiency, achieve better accuracy and improve costs.

The Benefits of AI and ML in Demand Forecasting

Accurate Predictions

Traditional forecasting methods rely on statistical models that may not account for all the variables that affect demand. ML algorithms can analyze vast amounts of data and identify complex patterns that may not be visible to humans. This analysis can provide more accurate predictions, allowing businesses to make more informed decisions about inventory management, production planning and supply chain management.

Real-time Forecasting

AI and ML can enable real-time forecasting by analyzing data in real-time and updating the forecast as new data becomes available. This approach can be particularly useful in industries with volatile demand patterns, such as e-commerce and retail, where demand can change rapidly due to various factors such as seasonality, promotions and customer behavior.

Cost Savings

AI and ML can help organizations reduce costs associated with overproduction, underproduction and excess inventory. Accurate demand forecasting can help businesses optimize their production schedules and reduce waste, leading to significant cost savings. Moreover, real-time forecasting can help businesses avoid stockouts and lost sales, which can have a considerable impact on the bottom line.

Challenges Associated With AI and ML in Demand Forecasting

Data Quality

The accuracy of AI and ML models is heavily dependent on the quality of the data used to train them. Inaccurate or incomplete data can lead to inaccurate predictions according to an article from Gartner, which can be detrimental to business operations. Therefore, organizations need to ensure that they have access to high-quality data that is relevant to their forecasting needs.

AMPLIFY by Alvarez and Marsal utilizes a proprietary Data Ingestion Service to assess and measure data quality. Data ingestion allows for rapid and automatic correction[1] of data errors. The service can also enrich data with additional data elements. This type of service can help organizations establish data quality, standards and data validation rules.

[1]"The Impact of Data Quality on Demand Forecasting Accuracy" by Gartner,
https://www.gartner.com/en/documents/386634]

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Complexity

AI and ML models can be complex and require specialized skills to develop and implement. Organizations may need to hire data scientists, ML engineers and other specialists to implement these models effectively. Furthermore, these models require significant computational resources, which can be expensive to acquire and maintain.

Interpretability

ML and AI models are often referred to as black boxes because they can be challenging to interpret. The models can identify complex patterns that may not be visible to humans, making it difficult to understand how they arrived at their predictions. This lack of interpretability can be a significant barrier to adoption, especially in industries with strict regulatory requirements.

Get Expert Help with Demand Sensing by A&MPLIFY

A&MPLIFY offers a demand sensing solution for organizations to easily implement and minimize challenges. The solution allows organizations to utilize AI and ML modeling to quickly measure and improve forecasts. As opposed to traditional forecasting, demand sensing includes additional data, factoring key information like weather patterns or events and promotions, and can provide near real-time demand to aid more accurate and timely decision making. It's a simple solution to a complex problem that allows planners to quickly take advantage of this technology to improve demand forecasting.

Traditional Forecasting

- Primary driver of the forecast is historical actuals. Limited demand signals are considered in the model, e.g., seasonality and trends
- Does not include other variables that impact forecasts, e.g., promotions, events
- Focused on longer term forecasts, e.g., weeks, months

Demand Sensing

- Starts with historical actuals and adds other factors including promotions, events, weather, etc.
- Can include near real-time data to adjust demand in near-time
- Forecasts at the day, or sub- day level when required

A Case Study: Demand Sensing Improves Prediction Accuracy by 11 Percent and 21 Percent For Different Product Groups

A&MPLIFY's demand sensing solution improved prediction accuracy 20.95 percent for an international industrial manufacturing company and one of the world's largest oil field equipment services companies with revenues exceeding $10 billion. Demand sensing does not apply one forecasting method to fit all products. Rather, it utilizes machine learning to apply many forecasting methods and then chooses the most accurate forecasting method by product, increasing the accuracy of each run.

Business Challenges

Demand Patterns

- Different materials are used at different factories in different quantities across the year
- Accurately forecasting demand of materials

Our Approach

- Segment the materials based on volatility of demand (Coefficient of Variance) into four groups
- Used ML to forecast demand for materials with low and medium volatility, using one month, three months and six months rollover
- Instead of one size fits all approach, different forecast techniques suggested based on the demand patterns


Outcome

- Improved prediction accuracy by 11.6% and 20.95% for low and medium volatility materials as compared to moving average method
- Accurate forecast of demand helps in stabilizing production and preparing budget

Conclusion

The future of demand forecasting using ML and AI looks promising. It can enable accurate, real-time forecasting and help organizations optimize their inventory, production and supply chain management. However, there are also challenges associated, such as data quality, complexity and interpretability. Organizations must carefully consider these factors before implementing any new technology or solution in their demand forecasting processes. Despite the challenges, integrating AI and ML can provide significant benefits and help organizations stay ahead of the competition.

A&MPLIFY can help you identify the right approach for your organization. Reach out to our team for personalized guidance and a comprehensive AI assessment. Let us help you navigate this transformative technology landscape and position your organization for success in the era of AI.

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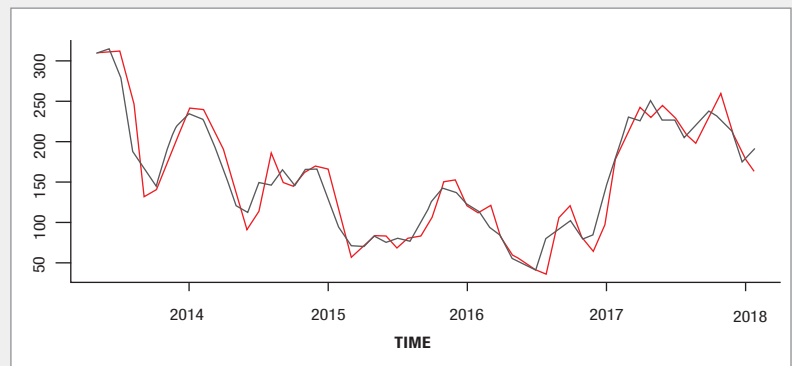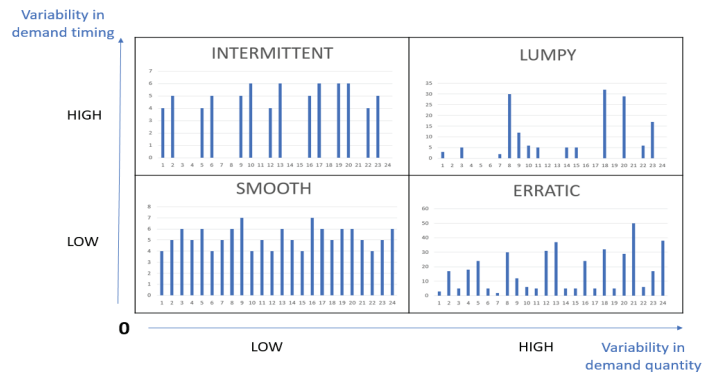
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Companies, investors and government entities around the world turn to Alvarez & Marsal (A&M) for leadership, action and results. Privately held since its founding in 1983, A&M is a leading global professional services firm that provides advisory, business performance improvement and turnaround management services. When conventional approaches are not enough to create transformation and drive change, clients seek our deep expertise and ability to deliver practical solutions to their unique problems.

With over 8000 people providing services across six continents, we deliver tangible results for corporates, boards, private equity firms, law firms and government agencies facing complex challenges. Our senior leaders, and their teams, leverage A&M's restructuring heritage to help companies act decisively, catapult growth and accelerate results. We are experienced operators, world-class consultants, former regulators and industry authorities with a shared commitment to telling clients what's really needed for turning change into a strategic business asset, managing risk and unlocking value at every stage of growth.

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