



**INTELLIGENT SALES
FORECASTING WITH
MACHINE LEARNING**



Overview

eCommerce retailers need to be able to predict the volume of products to be purchased during a defined future period. It is imperative to their overall business success.

2020 proved to be a period of extreme demand variation and volatility, that has compounded the typical challenges that eCommerce retailers face.

Sales forecasting is an important lever for key business processes including demand planning, order fulfillment, replenishment, supply chain and inventory management.

This whitepaper looks at some of the challenges that eCommerce retailers have from a sales forecasting standpoint, and how machine learning can help.

Intelligent sales forecasting with machine learning





Success Factors for eCommerce Merchants



More accurate
sales forecasting



Optimum product
availability



Satisfactory order
fulfillment



Customer retention
and loyalty



Common sales forecasting and demand planning challenges

- Poor forecast accuracy
- Fast forecast availability
- Future forecast horizons
- Impact of promotions
- Decision making
- Demand variance
- Demand uncertainty
- New product demand
- Limited visibility of demand drivers
- Incomplete data
- External variables
- Seasonality
- Sales anomalies
- Pricing strategies
- Conventional forecasting methods
- Increasing consumer needs
- Missed sales opportunities
- Unsuccessful order fulfilment
- Poor customer service levels
- Sales and marketing plans & budgets
- Highly competitive environment
- Loss of revenue
- Financial risk
- Fast access to information
- Supply chain resilience
- Optimum inventory levels
- Inventory visibility
- Stock replenishment
- Warehouse space
- Increasing costs
- Poor levels of productivity
- Inefficient use of resources

Machine learning is a powerful tool to tackle a wide range of sales forecasting and demand planning challenges.

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What is Machine Learning?

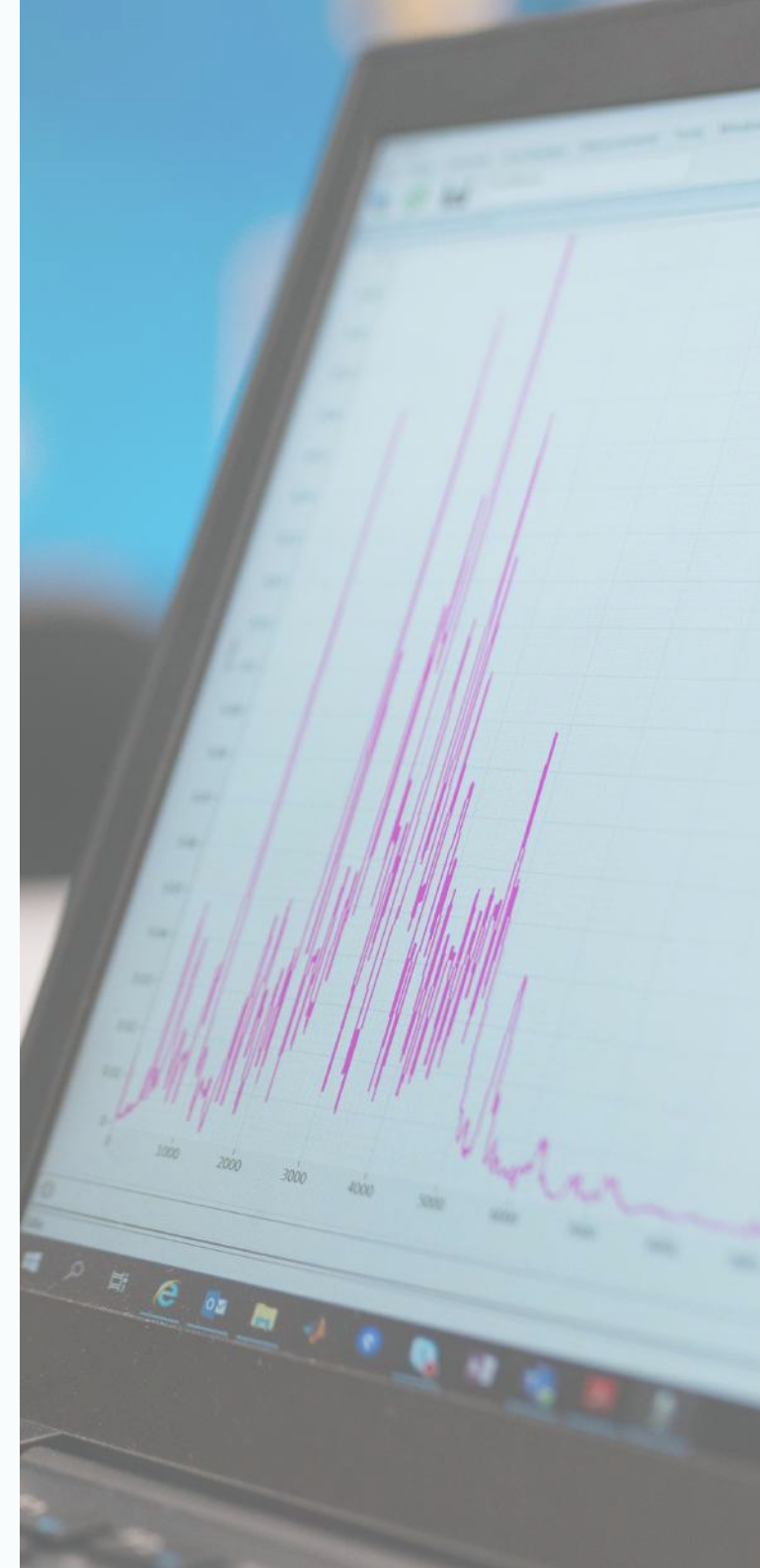
Machine learning is a type of AI (Artificial Intelligence), that can collect, analyze, and learn from large sets of data from a range of sources. Utilizing learning algorithms, large amounts of data and integrated external data sources that impact sales demand can be analyzed with speed.

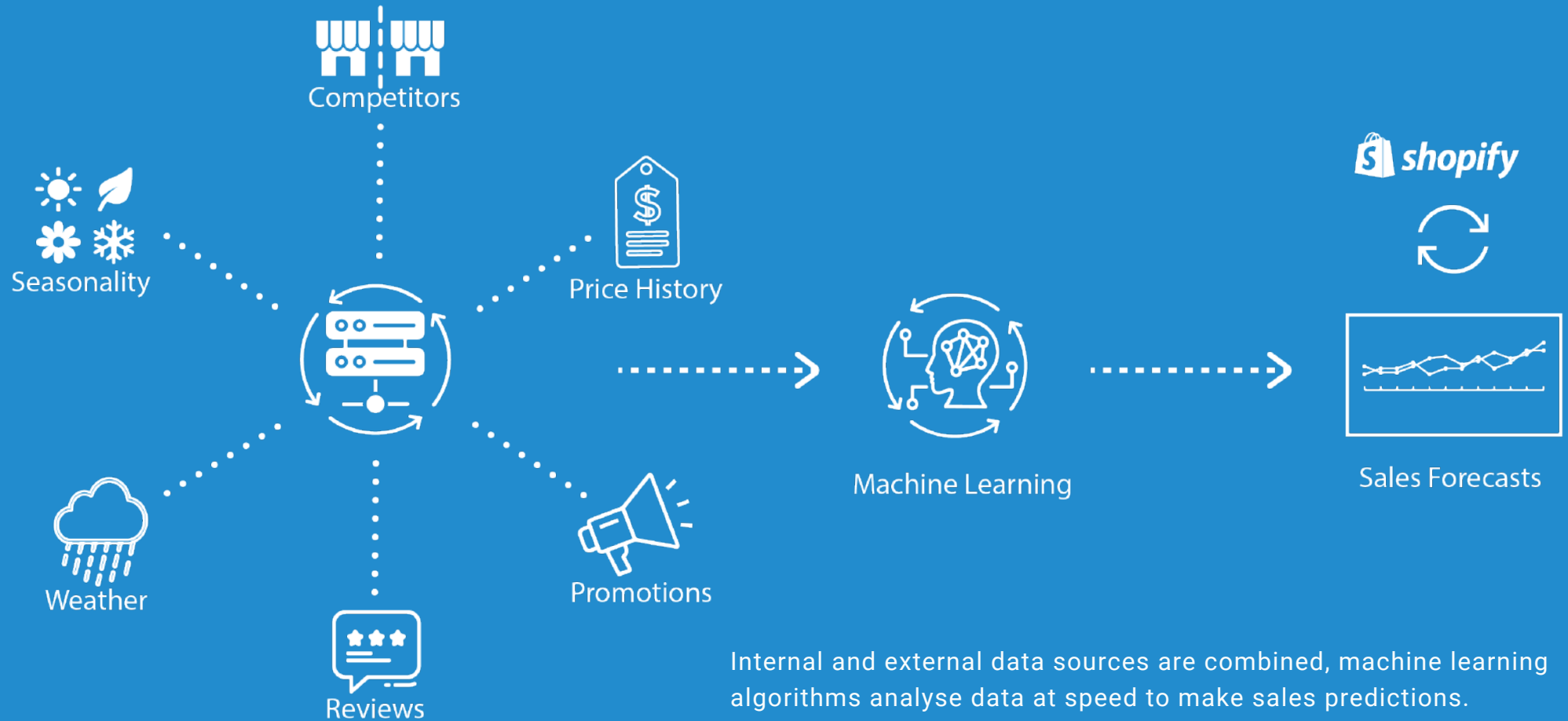
It combines historical sales data and other dynamic variables such as seasonal trends, the weather, events, pricing history, promotions and other marketing activities are considered, their importance scored and weighted to predict future sales demand.

Trends, patterns, anomaly detection and relationships within complex data sets can be identified quickly and the ability to learn and make predictions can take place without human intervention and forecasts improve over time producing more accurate forecasts.

Generating highly accurate demand forecasts by analyzing the multitude of demand driving data to make predictions about product requirements based on location, different channels and for the days, weeks, and months ahead is made even easier and faster with machine learning.

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Confidence in Forecast Accuracy

Machine learning is a forecasting method proven to be more accurate than traditional or legacy methods such as moving averages.

Being able to input large amounts of demand driver data from internal and external sources the method uses high performing algorithms to process the data and learn from it. The processing speed and learning capability ensures that the resulting sales forecasts are stronger and faster.

The more data from different sources and constant improvement over time means that forecast accuracy continues to improve.

TrueStock uses six different metrics to measure how accurate a forecast is and is therefore able to provide more precise forecasts. No demand forecast is ever 100% accurate but with data science the gap is closed in terms of error reduction.

"Machine Learning is really a better prediction machine. It uses multiple data sources, and finds the patterns and correlations in that data to improve the accuracy of the prediction."
McKinsey & Company

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Key Benefits

Better and Faster Decisions

The ability to make better, faster, and more accurate demand prediction decisions provides a host of benefits across the supply chain, customer base, marketing, and financial functions of a company.

As machine learning sales forecasting constantly and automatically improves with time, eCommerce businesses can respond even more quickly to fast changing business situations.

Advanced and predictive analytics via machine learning methods can eradicate the requirement for guesswork in sales forecasting.

"Drive from unknown uncertainty toward known variability by utilizing machine learning for better predictions"
Gartner

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Optimized Demand Planning

With more accurate demand forecasts future inventory, the guesswork can be taken out of deciding what replenishment quantities for products are required. Being able to confidently give suppliers a more reliable anticipation of demand reducing the likelihood of an interrupted product supply.

It is important for demand planners to be able to solve supply chain problems quickly by having access to different planning horizons.

TrueStock generates a forecast horizon that provides a lower, middle, and upper estimate for sales demand each day. A 120-day forecast is also available which helps with operational and tactical demand planning.

Predictive forecasts can be generated at speed to identify unlikely trends in consumer demand to ensure that retailers do not run out of stock.

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McKinsey & Company





Key Benefits

More Resilient Supply Chains

With the continued growth of eCommerce, consumers are demanding product availability and faster delivery. The retail landscape is especially competitive, and customers are expecting products when and how they want them. Giving suppliers a more reliable anticipation of demand for uninterrupted product supply is an important factor for ensuring supply chain resilience.

Supply chains can be optimized by providing suppliers more reliable anticipation of demand for replenishment and an interrupted product supply.

Having a more resilient supply chain by building the capability to respond effectively can reduce vulnerability, increase adaption to uncertainty and preparation for unexpected events.

"Supply chain leaders are starting to realise the ability of machine learning based methods to increase forecasting accuracy and optimize replenishment."

McKinsey & Company

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Increased Profitability and Reduced Costs

Improved demand forecast accuracy can improve the bottom line through revenue growth, cost reduction and productivity improvement. More accurate demand forecasts using machine learning methodology results can inform about precise future replenishment quantities and costs.

This can reduce missed sales opportunities through stock-outs or mark downs on products that have been overstocked. Excess stock takes up extra space, ties up working capital and can result in increasing costs for the business.

The speed and accuracy of machine learning for demand forecasting can free up teams to direct their time for other business tasks.

“Retailers that use machine-learning technology for replenishment have seen its impact in many ways, for instance, reductions of up to 80% in out-of-stock rates, declines of more than 10% in write-offs and days of inventory on hand, and gross-margin increases of up to 9%”
McKinsey & Company





Key Benefits

Improving Customer Loyalty and Retention

The eCommerce space has become increasingly competitive and is driven by customer demand.

Ensuring product availability is key to ensuring customer loyalty and dissatisfaction can occur because of stock-outs.

If a product is not available when and how they want it there is a high risk that consumers will source that product from a competitor.

The effectiveness of B2C (business-to-customer) online transactions and order fulfillment is a significant determinant of customer satisfaction and retention.

Successful first-time orders can determine whether the customer will place future orders with the same eCommerce retailer.

Increased accuracy with machine learning demand forecasts can help reduce those out-of-stock situations and boost customer satisfaction and their experience with the retailer's brand.

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Gain Competitive Advantage

eCommerce businesses can review and modify their sales and marketing strategies in order to gain competitive advantage over other businesses who are not using machine learning for sales forecasting.

Within the TrueStock's machine learning demand forecasting model many dynamic factors including seasonal trends, the weather, events, pricing history, promotions and other marketing activities are considered, and their importance scored and weighted.

Return on investment of marketing from different channels and locations are analyzed and the insights provided allow marketing to pinpoint their future spend and focus.

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Conclusions

Generating fast, more precise sales forecasts with data-driven machine learning technology enables businesses to achieve better results, be more resilient and ultimately grow their business.

Make better decisions for your eCommerce business, drive sales and boost profitability with TrueStock.

[Sign up today for your free 14-day trial](#)



"Wow! Amazing! I'm truly surprised at this service. You are really dedicated to building a solution that works for users."

Shopify Advanced Fashion Retailer, Los Angeles, U.S.A.

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