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Demystifying demand forecasting in grocery: strategies to address the unique challenges

Grocers are facing unprecedented top and bottom-line erosion due to stock issues

Frequent Out of stock
Groceries typically have 5% to 10% of their items out of stock which resulted in revenue loss of $1.14 trillion globally in 2020

Wastage due to shorter shelf life
About 30 percent of food in American grocery stores is thrown away!

Over stock
Annual additional cost of holding excess inventory is about 30% of the margin

Rising revenue loss, wastage, inventory cost

Changing consumer behavior has led to unpredictable and volatile demand

Convenience and price-sensitive

The percentage of U.S. adults who prefer pickup or delivery has increased from 5% in 2017 to 23% in 2021

More choices

One-third of U.S. consumers say they are actively looking for new products to try

Impact of events

Demand for some categories such as meat and produce varies as much as by 50%

Changing Consumer Demand

Traditional demand forecasting is ineffective to respond to unpredictable and volatile demand

Traditional forecasts are not tailored for channel, category-store nuances

Static one-time forecasts don’t adapt to dynamic market forces

Overdependence on manual interventions due to inherent data limitations

Traditional forecasts are not tailored for channel, category-store nuances

"one size fits all" approach isn't working anymore

- Traditional forecasting methods use pre-defined rules that do not capture the diversity or complexity of products
- Every category, store and channel behaves differently and needs an individualistic approach

Traditional forecasts are static one-time forecasts that don't adapt to dynamic market forces

What happens on the aisles dictates the demand rather than the long-term trends and cycles

- Traditional forecasting methods do not capture important demand forces that drive demand
- They are also not sensitive to what is happening in the store or even in the aisle in terms of markdowns and promotions
- It also fails to capture short-term cannibalization-like effects due to unavailability of competing products

Traditional forecasts depend heavily on manual interventions due to inherent data limitations

Grocers need a mature forecasting framework that can address inherent data limitations

- Lack of historical data: Shorter product lifecycles
- Sparse data: Ever-widening assortment breadth
- Noisy data: Lack of accurate and clean data
- Manual manipulation of data: Lack of grocery-focused data science

Beyond traditional forecasting – A framework for Agile & Intelligent demand planning

Capture

Ability to consume a **wide variety of data points** that can drive demand without cumbersome configurations

Tailor

Ability to **tailor forecasts at a granular level** (category, store, and channel) by looking at granular data as opposed to rule-based methodology

Adapt

Ability to forecast with **agility to react to market circumstances** with minimal manual intervention

Capture the complete spectrum of Demand Forces

Internal Data Sets

Historical Sales & Inventory

Pricing & Promotions

Product Attributes

Customer Data

External Causal Variables

Weather

Holidays

Market Trends

Events

Comprehensive Data Sets

- Grocers need **multi-variate forecasting** models where potential internal and external indicators of demand are captured as predictors
- **Evaluation and selection of predictors** that are the most impactful should require minimal human intervention
- **Embedded mechanisms** should be able to handle complexities that can arise with noisy, sparse data

Tailor forecasts to channels, store-category using Artificial Intelligence

AI-enabled algorithm selection

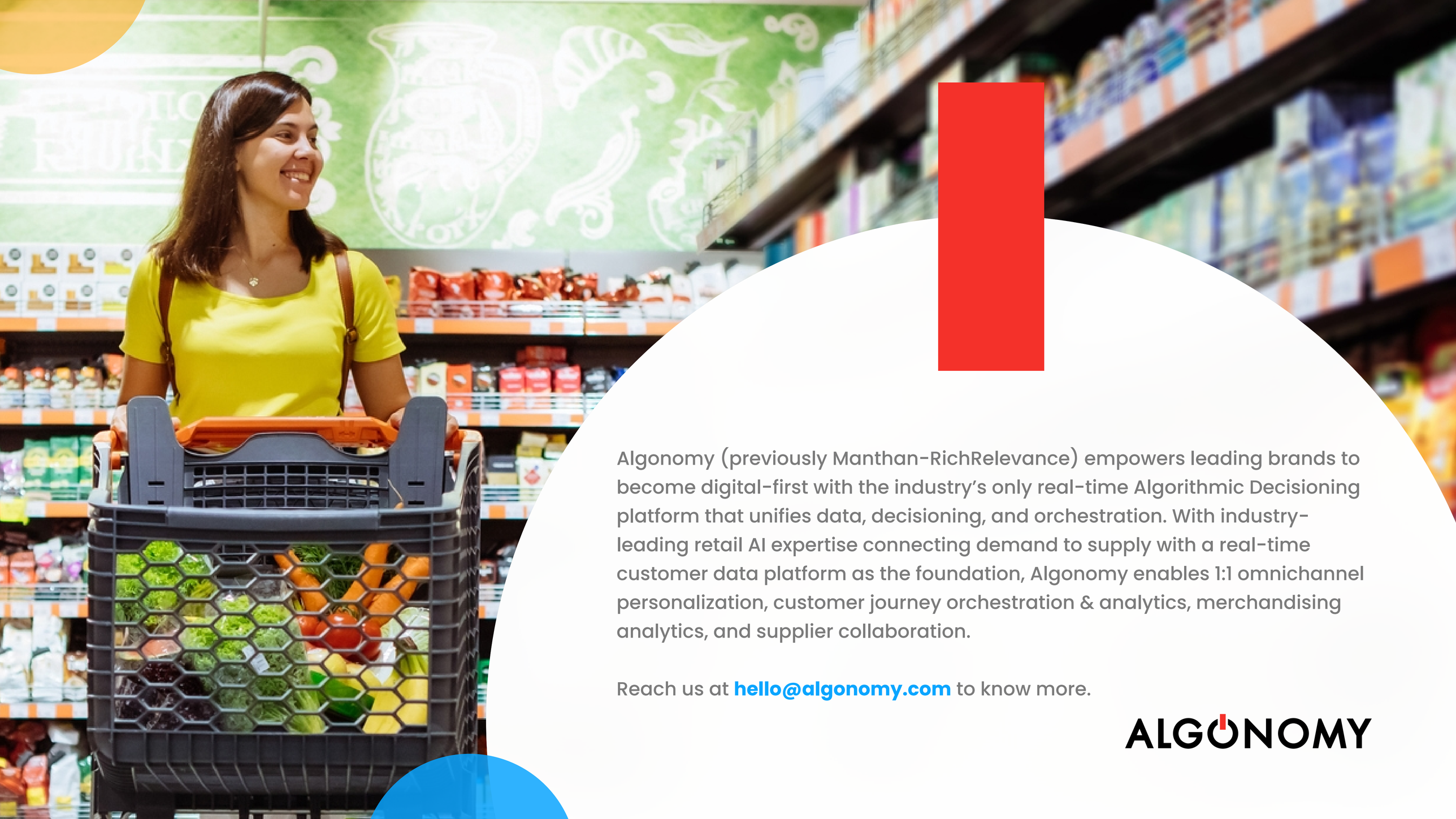
Each category, outlet and channel is different, within data lies the clue to what ensemble of algorithms will be the best-fit

Algorithm	Example
Parametric time-series models	ARIMAX (ARIMA + exogenous variables)
Tree-based machine learning algorithms	Random Forest, XG Boost
Deep learning algorithms	Neural networks

Tailor-made to suit the product

The best-fit criteria needs to accommodate intrinsic qualities of each category

Intrinsic quality of category	Bias towards
Perishable	Reducing wastage
Low margin, high priced	Reducing excessive inventory
Long shelf-life	Overstocking



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Reach us at **hello@algonomy.com** to know more.

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