Analytics-led inventory planning helps grocery supermarket chain save $1.8 million annually

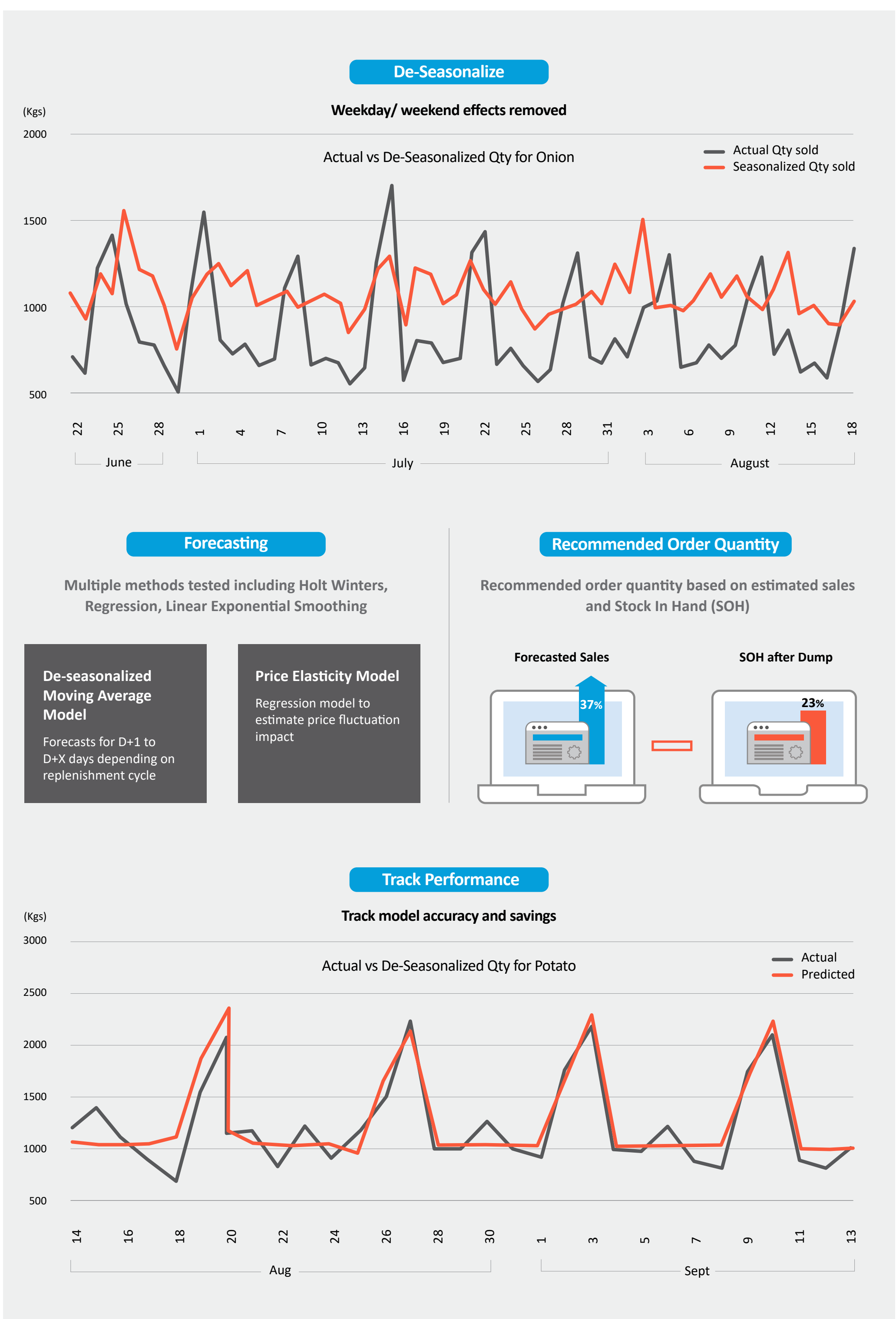**Retail**

Business challenge

Knowing exactly how much inventory to carry is paramount to grocery retail success. Overstocking can lead to loses due to wastage, while understocking translates into missed opportunities. Given that perishable goods have quick replenishment cycles, product indentation and allocation also needs to be quick. To overcome these challenges, a leading grocery supermarket chain turned to data analytics to predict the demand of perishable items and plan their inventory accordingly.

Approach

- Netscribes' team of analysts synthesized the supermarket's historical data on past sales, weather conditions, holiday sales, price changes, etc.
- The data was then treated to neutralize the effects of price fluctuations and seasonality in order to make it analyzable.
- After trialing various predictive models, a combination of time and price elasticity-based models were selected and applied to ensure the estimate garnered was as precise as possible.

De-Seasonalize

Weekday/ weekend effects removed

Actual vs De-Seasonalized Qty for Onion

Legend: — Actual Qty sold — Seasonalized Qty sold

Forecasting

Multiple methods tested including Holt Winters, Regression, Linear Exponential Smoothing

De-seasonalized Moving Average Model
Forecasts for D+1 to D+X days depending on replenishment cycle

Price Elasticity Model
Regression model to estimate price fluctuation impact

Recommended Order Quantity

Recommended order quantity based on estimated sales and Stock In Hand (SOH)

Forecasted Sales — 37%

SOH after Dump — 23%

Track Performance

Track model accuracy and savings

Actual vs De-Seasonalized Qty for Potato

Legend: — Actual — Predicted

Results Delivered

- A recommended inventory quantity was sent to each store by subtracting the forecasted sales from their stock in hand.
- The performance of these prediction models was tracked over a period of 12 months to ensure maximum accuracy.

Benefits

By implementing the recommended inventory planning model, the supermarket chain achieved:

- A highly accurate sales forecasting model with an error rate (MAPE) of only 4% against an industry-accepted rate of 15%
- A significant reduction in waste, contributing to an annual savings of USD 1.8 million
- Precise and reliable forecasts every seven days without any human intervention

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