

Demand Score and Decision Support

Converting expected weekly New Customers into a transparent 0–100 demand-intensity score

STUDY QUESTION

How can a statistical point forecast be translated into an intuitive business-facing score without introducing subjective weights?

Executive Summary

The final forecasting system produces expected weekly New Customers. To make that output easier to interpret operationally, the forecast was converted into a 0–100 Demand Score using an empirical percentile transformation.

The score is not a manually weighted index. Its reference distribution was defined only from usable 2023–2024 development-period predictions, which protected the 2025 holdout from being used to tune the score scale. In 2025, the score had a Spearman rank correlation of approximately 0.905 with actual demand, and observed demand increased monotonically across score quintiles.

Score Construction

Each predicted weekly New Customers value is located within the distribution of development-period model predictions. The resulting percentile is scaled to 0–100. The score therefore represents relative expected demand intensity compared with the model's historical development reference distribution.

Score band	Approx. predicted New Customers	Interpretation
0–20	< 0.86	Unusually weak expected demand
20–40	0.86–3.32	Below-normal expected demand
40–60	3.32–11.70	Typical expected demand
60–80	11.70–15.67	Above-normal expected demand
80–100	> 15.67	Unusually strong expected demand

Why Percentile Scoring Is Useful

- Avoids subjective feature weights because the score is derived from model predictions rather than manually assigned points.
- Provides a common scale for comparing weeks across different parts of the seasonal cycle.
- Preserves the point forecast underneath the score instead of replacing it.
- Makes demand intensity easier to communicate to marketing, operations, and leadership audiences.

Validation Evidence

On the untouched 2025 period, the Demand Score's rank relationship with actual demand was strong: Spearman correlation was approximately 0.905. Observed demand also rose monotonically across score quintiles. That supports the score as an interpretable ranking layer on top of the forecast rather than as an independent model.

How to Use the Score

A high score should be interpreted as a week in which the model expects demand to be unusually strong relative to its development-period reference distribution. A low score indicates unusually weak expected demand. The score can support pacing, performance review, and communication, while the predicted New Customers value remains the primary quantitative forecast.

IMPORTANT DISTINCTION

The Demand Score is a relative demand-intensity indicator, not a probability, causal index, or guarantee of realized customer acquisition.

Key Takeaways

Construction Leakage control

2025 evidence

Operational role

Empirical percentile of predicted New Customers.

Reference scale defined from 2023–2024 development predictions only.

Spearman correlation ≈ 0.905 ; observed demand increased monotonically across score quintiles.

Communication and decision-support layer on top of the underlying forecast.

Limitations and Governance

The score bands are tied to the development-period forecast distribution. As the business accumulates more years of data or materially changes scale, the reference distribution may need to be reviewed. Any recalibration should be versioned and validated rather than silently changing the meaning of a score.

Because the score is derived from forecast output, any limitation in the underlying demand model also carries through to the score.

Portfolio-Ready Summary

SUGGESTED HEADLINE

Turning a forecast into an interpretable 0–100 Demand Score

I translated predicted weekly New Customers into an empirical percentile score rather than a manually weighted index. The score scale was frozen from development-period predictions only, and its 2025 rank relationship with actual demand was strong, creating a transparent decision-support layer without changing the underlying forecast logic.