Demand & Sales Forecasting

Estimating future demand with explicit uncertainty so that planning decisions can be made with better evidence.

THE BUSINESS PROBLEM

Planning inventory, staffing, capacity or targets requires a view of future demand. Forecasting uses historical patterns and relevant drivers to estimate what may happen next, while making uncertainty visible. A useful forecast is not simply the most complex model; it must outperform sensible baselines and support the planning decision.

Three questions guide the analysis

01
What are we forecasting?

Define metric, level of detail, horizon and update frequency.

02
What patterns matter?

Identify trend, seasonality, events and structural changes.

03
How accurate is useful enough?

Evaluate error relative to the cost of over- and under-forecasting.

What evidence could we use?

Month	Sales	Promo	Holiday	Stockout
Jan	12,400	No	No	No
Feb	13,100	Yes	No	No
Mar	11,900	No	Yes	Yes

Illustrative data only. The exact variables, definitions and observation windows should be determined by the business decision and available evidence.

How the analysis works

1 — Define horizon

What future period supports the decision?

2 — Build baseline

What does a simple benchmark predict?

3 — Model patterns

Add trend, seasonality or relevant drivers.

4 — Validate

How does performance hold on unseen periods?

5 — Operationalise

How will forecasts be updated and monitored?

Possible analytical approaches

Naive baselines	Essential benchmark for model value.
Time-series models	Capture trend and seasonal structure.
Driver-based models	Include promotions, holidays or external factors when justified.
Prediction intervals	Communicate plausible ranges, not only point forecasts.

From Analysis to Business Action

The analytical output is only useful when it changes a decision, can be interpreted responsibly and has a measurable outcome.

WORKED EXAMPLE

The example below is illustrative rather than a claim about a real dataset. It shows how analytical output can be translated into business interpretation and action.

Illustrative forecast evaluation

MODEL	MAE	INTERPRETATION
Seasonal naive	1,240	Baseline: repeat comparable prior seasonal period.
Time-series model	980	Improves average absolute error versus baseline.
Driver model	910	Further gain after relevant event variables.
Selected approach	910	Best validated error, subject to operational stability.

Illustrative results only. Definitions, thresholds and recommendations should be validated in the context of the organisation, decision and available data.

Potential business applications

INVENTORY
Align stock with expected demand and uncertainty.

STAFFING
Plan capacity around expected peaks and troughs.

TARGETS
Use evidence-based ranges for planning.

SCENARIOS
Prepare for plausible upside and downside demand.

How success should be measured

Forecast error	Does the model beat an appropriate baseline out of sample?
Bias	Does it systematically over- or under-forecast?
Decision cost	Does improved accuracy reduce stockouts, waste, overtime or other planning costs?

DELIVERABLES
Analysis framework · Business interpretation · Prioritised actions · Measurement approach

APPLICABLE ACROSS INDUSTRIES
Retail · E-commerce · Travel · Operations · Services