FORECASTING TECHNIQUES

Source Christian Martinez for the AI Finance Club (December 2023)

	MODEL	DESCRIPTION	ADVANTAGES	DISADVANTAGES	USE CASES	SUITABLE INDUSTRY	TOOL RECOMMENDED
N/A	Intuitive Forecasting	Based on human judgment and experience rather than formal analytical methods.	• Flexible • Can incorporate non-quantifiable factors • Quick to implement	• Subjective • Potentially less accurate • Not scalable	Short-term forecasts, in industries with high levels of uncertainty, when data is scarce, and you have experienced sales team.	Startup Businesses	Salespeople's educated guesses
Basic	Run Rate Analysis	Extrapolates future performance from historical data, assuming current conditions continue.	• Simple to calculate • Useful for stable conditions • Requires minimal data	• Assumes constant conditions • Ignores market changes • Potentially inaccurate in dynamic environments	Basic forecasting for stable industries, quick estimation of future sales, budget planning.	Manufacturing	Microsoft Excel
Basic	Linear Regression	Models a linear relationship between inputs and a continuous numerical output variable.	• Simple and explainable • Fast training, • Explainable	• Assumes linear relationships • Sensitive to outliers • Potential underfitting in complex scenarios	Trend analysis, volume prediction, revenue forecasting for new products.	Real Estate	Microsoft Excel, Alteryx or Python
Intermediate	Logarithmic Regression	Uses logarithmic transformation to model relationships.	• Good for modelling diminishing effects • Effective in certain nonlinear scenarios	• Assumes specific type of relationship • Less effective for short-term forecasts • Requires understanding of logarithmic relationships	Situations with diminishing returns, long-term forecasting, market saturation analysis.	Consumer Packaged Goods (CPG)	Alteryx or Python
Intermediate	Time Series Analysis (ARIMA, SARIMA)	Statistical methods for analysing time series data.	• Captures seasonality and trends • Effective for short-term forecasting • Adjusts to changing trends over time.	• Requires stationary data, complex to configure • Not suitable for all types of sales data	Seasonal sales forecasting, demand forecasting for perishable goods, long-term sales planning.	Retail	Alteryx or Python
Advanced	Random Forest	An ensemble learning method for regression using multiple decision trees.	• Handles non-linear data • Robust to outliers • Captures complex relationships.	• Computationally intensive • Less interpretable • Potential overfitting with noisy data.	Sales prediction in diverse categories, across multiple stores/regions, with live data	E-commerce	Python or Microsoft Azure
Advanced	Neural Networks (Deep Learning)	Advanced algorithms modeling high-level abstractions in data.	• High performance with large datasets • Good for complex non-linear relationship • Adaptable to new patterns.	• Requires large data • You need advanced data science skills	High-volume, high-dimensional sales data, forecasting in rapidly changing markets, integrating diverse data sources.	Technology	Python or Microsoft Azure
Advanced	Prophet (by Facebook)	A forecasting tool designed for business applications with seasonal patterns.	• Handles holiday effects well • Robust to missing data • Intuitive for business	• Less effective with non-seasonal data • Moderate complexity	Forecasting seasonal sales, understanding holiday effects, planning inventory.	Tourism and Hospitality	Python