

# FORECASTING USING EXCEL



James Ehiabhi



# About Company

**Tech Innovators Inc.** is a leading company in the consumer electronics market, specializing in cutting-edge gadgets such as Smartphones, Tablets, Smart Home Appliances, and Wearable Technology. Our mission is to leverage technology to enhance the daily lives of our customers, offering innovative and reliable products that meet the evolving needs of the modern consumer.

*James Ehiabhi*

# Business Problem

Tech Innovators Inc. has historically relied on ad-hoc methods and intuition for predicting future sales, which has led to several operational inefficiencies. The absence of formal forecasting methods has resulted in issues such as stockouts, overstock situations, increased holding costs, and suboptimal resource allocation. These challenges hinder the company's ability to meet customer demand efficiently and affect overall profitability. In response to these ongoing issues, Tech Innovators Inc. recently hired a data scientist to develop and implement a reliable forecasting process. The data scientist suggested evaluating multiple forecasting techniques to determine the most effective method for predicting future sales, hence the reason for this task.

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# Objective

The primary objective of this project is to implement and evaluate various forecasting techniques using historical sales data to identify the most effective method for predicting the sales of different product categories for 2025.

Accurate sales forecasting is crucial for optimizing inventory, planning production, and making informed business decisions.

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# Forecasting Techniques

## Naive Approach

The naive forecasting method assumes that the forecast for the next period will be equal to the most recent actual value. It is a simple and quick method but may not be very accurate, especially for data with trends or seasonal patterns.



## Exponential Smoothing

Exponential smoothing assigns exponentially decreasing weights to past observations. It is effective for data with no clear trend or seasonal pattern, providing a balance between recent and older data points.



## Moving Average

The moving average method calculates the average of sales over a specific number of periods and uses it as the forecast for the next period. This technique smooths out short-term fluctuations and highlights longer-term trends or cycles.



## Linear Forecasting

Linear forecasting uses a linear trend line to predict future sales. It assumes that the trend observed in the historical data will continue into the future. This method is useful when the data shows a clear upward or downward trend.



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# Additional Information

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In addressing the sales forecasting needs of Tech Innovators Inc., it's essential to understand the significance of data aggregation. Aggregation methods play a crucial role in the accuracy and reliability of forecasts. Given the company's historical reliance on intuition and ad-hoc methods, choosing the right aggregation method is vital for overcoming operational inefficiencies and enhancing decision-making processes. Let's delve into the different aggregation methods and why monthly aggregation, in particular, provides higher accuracy for Tech Innovators Inc.

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# Aggregation Methods

## Daily Aggregation

- Granularity: Provides detailed daily fluctuations and trends.
- Noise: High level of noise and irregular fluctuations.
- Complexity: Requires more sophisticated models due to more data points.
- Use Case: Suitable for industries with high daily variability and short-term decisions.

## Monthly Aggregation

- Simplicity: Fewer data points, easier to manage and interpret.
- Reduced Noise: Smooths out daily fluctuations, highlighting broader trends.
- Seasonal Patterns: Better captures monthly and seasonal trends.
- Strategic Planning: Ideal for long-term decisions like inventory management and resource allocation.

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# Why Monthly Aggregation is More Accurate for Tech Innovators Inc.

Tech Innovators Inc. faces challenges like stockouts, overstock situations, and suboptimal resource allocation due to the lack of formal forecasting methods. Here's why monthly aggregation offers higher accuracy for this business:

- Operational Efficiency: By smoothing out daily noise, monthly aggregation provides a clearer view of sales trends, reducing the risk of overreacting to random daily fluctuations.
- Seasonal Trends: Monthly data captures seasonal peaks and trends more effectively, crucial for planning inventory and meeting customer demand.
- Strategic Decisions: Simplifies the forecasting process, making it easier to implement and interpret. This supports better long-term strategic planning and resource allocation.
- Reduced Complexity: Fewer data points mean less complexity in the model, making it easier for the newly hired data scientist to implement and for the team to understand.

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# Forecast Benefit for Tech Innovators inc.

Each forecasting technique has its strengths and limitations. Evaluating multiple methods allows Tech Innovators Inc. to:



## Identify the Best Fit

Determine which method provides the most accurate forecasts for different product categories.



## Improve Decision-Making:

Make informed decisions based on reliable forecasts, leading to better inventory management and resource allocation.



## Adapt to Changes

Respond effectively to changes in market trends and consumer behavior by using the most suitable forecasting method.

*James Ehiabhi*

# LET'S GET TO WORK!!!

