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An Empirical Study on the Analysis and Forecasting of Revenue Trends of Tata Consultancy Services

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Abstract

This study examines the revenue pattern and future growth prospects of Tata Consultancy Services (TCS) through a comprehensive analysis of historical financial data. The research is based on secondary data collected from annual reports covering the period 2016 to 2025. The primary objective of the study is to identify revenue trends, analyse growth behaviour, and project future revenue performance for the period 2026 to 2030. The study employs quantitative time series analysis techniques to evaluate historical trends and generate forecasts. The findings indicate a consistent upward trajectory in revenue, reflecting the company's strong market position, global expansion, and increasing demand for digital and IT services. The forecasted results suggest continued growth in the upcoming years, although the rate of increase shows signs of gradual stabilization.

The study concludes that TCS demonstrates strong financial stability and sustainable growth potential. The findings provide valuable insights for investors, financial analysts, and management in understanding revenue dynamics and strategic planning for future expansion.

Keywords: Revenue Forecasting, Time Series Analysis, Secondary Data, Financial Performance, Growth Trends, Revenue Projection.

1.1 INTRODUCTION OF TCS COMPANY

Tata Consultancy Services (TCS) is an Indian multinational technology company specializing in information technology services and consulting. Headquartered in Mumbai, it is a part of the Tata Group and operates in 150 locations across 46 countries. As of 2024, Tata Sons owned 71.74% of TCS, and close to 80% of Tata Sons' dividend income came from TCS.

Tata Consultancy Services (TCS) is a leading global IT services, consulting, and business solutions organization headquartered in Mumbai, India. Established in 1968, TCS is a part of the Tata Group, one of India's largest and most respected conglomerates. Over the decades, TCS has grown to become one of the

largest IT services companies in the world, serving clients across various industries including banking, finance, retail, telecommunications, healthcare, and manufacturing. TCS's workforce of over 600,000 employees is spread across multiple continents, reflecting its global delivery model.

Tata Consultancy Services (TCS) is a multinational powerhouse in IT services and consulting, headquartered in the bustling metropolis of Mumbai, Maharashtra, India. Founded in 1968, TCS has ascended to become one of the world's largest and most influential IT services providers, catering to a diverse clientele spanning banking, Financial Services, Insurance, Healthcare, retail, manufacturing, telecommunications and energy sectors. As a corner stone of the Tata Group, TCS seamlessly blends a heritage of trust, integrity and social responsibility with a relentless pursuit of technology innovation.

Key Details

- **Headquarters:** Mumbai, Maharashtra, India
- **Founded:** 1968
- **Parent Organization:** Tata Sons Private Limited
- **CEO and Managing Director:** K Krithivasan
- **Employee Strength:** Over 600,000 professionals globally (as of the latest reports)
- **Core Business Areas:** IT services, consulting, business solutions, and outsourcing
- **Global Operations:** Active presence in 55 countries

1.2 STATEMENT OF THE PROBLEM

Tata Consultancy Services (TCS) operates in a highly competitive and rapidly evolving IT industry, where accurate revenue prediction is essential for strategic planning and sustainable growth. Fluctuations in global demand, technological advancements, and economic uncertainties make forecasting future revenues challenging. Traditional methods of financial estimation may not adequately capture these trends.

1.3 OBJECTIVES OF THE STUDY

- To analyse the historical revenue trends of Tata Consultancy Services (TCS) using time series data from 2016 to 2025
- To apply Moving Average (MA) techniques to smooth revenue fluctuations and understand short – term revenue movements.
- To Develop ARIMA Models for capturing autocorrelation and forecasting future revenue based on past patterns
- To implement Exponential Smoothing (ES) models to forecast TCS Revenue by assigning greater weight to recent observations

1.4 SCOPE OF THE STUDY

- The study analyse the historical revenue data of TCS collected from annual or quarterly financial statements

- It uses secondary data only from reliable sources such as TCS annual reports and financial database
- The study applies time series models like ME, ARIMA and ES to analyse revenue patterns.
- It forecast future revenue of TCS for a 5years based on past data.

1.5 RESEARCH METHODOLOGY

- To study past revenue trends and patterns of TCS
- To forecast future revenue using statistical time series techniques

SOURCES OF DATA

For This Study I have been Collected the Secondary from company Income Statement report. Period of forecasting 5 years from 2026 to 2030

TOOLS USED

- Moving Average
- Exponential Smoothing
- ARIMA Model

SOFTWARE USED

- Excel
- SPSS

1.6 LIMITATION OF THE STUDY

- This study is limited to historical revenue data.
- Forecasts may not account for unexpected economic, technological, or regulatory changes.
- Accuracy depends on data quality and model assumptions.

REVIEW OF LITERATURE

Hyndman and Athanasopoulos (2025)[1] - in their financial analytics and forecasting reviews, conducted a meta-analysis of ARIMA and Exponential Smoothing (ES) models and concluded that these classical time-series methods reliably forecast stable segments of financial data. The study emphasized that ARIMA and ES remain effective baseline models in finance due to their robustness and interpretability. highlighted that classical time-series models such as ARIMA and Exponential Smoothing (ES) remain highly useful in financial forecasting.

Their review showed that these models perform particularly well when the financial data is stable and follows consistent patterns over time. By analysing past trends and patterns, both ARIMA and ES can generate reliable short- to medium-term forecasts.

Tushar Gupta (2025)[2] - applied an **ARIMA (1,1,1)** model in Python to forecast the stock prices of **Tata Consultancy Services (TCS)**, a major Indian IT company. The ARIMA model—short for Auto

Regressive Integrated Moving Average—is a well-established statistical forecasting technique that uses past values and past forecast errors to predict future values. By setting the model parameters to (1,1,1), Gupta accounted for one lag of the stock price, one differencing step to make the data stationary, and one lag of the forecast error.

After training the model on historical daily closing prices, the forecast results showed a relatively stable and smooth sequence of predicted prices over the short term. This stability suggested that the model successfully captured recent patterns in the data without producing erratic or unrealistic jumps in forecast values. upta's findings support the practical utility of ARIMA for short-term financial forecasting, especially when price movements exhibit consistent trends and limited volatility.

Singh and Sharma (2019)[3] - analysed the effectiveness of the ARIMA model in forecasting stock prices of major Indian IT companies (excluding TCS). Their study focused on identifying whether ARIMA could accurately capture key time-series characteristics such as trend movement, seasonality, and autocorrelation present in IT sector stock data. The findings showed that ARIMA performed well in modeling price fluctuations and produced reliable short- to medium-term forecasts, particularly in relatively stable market conditions. The researchers concluded that because IT sector companies share similar market dynamics, growth patterns, and investor behaviour, the strong performance of ARIMA in forecasting other IT stocks indirectly supports its suitability for forecasting Tata Consultancy Services

DATA ANALYSIS AND INTERPRETATION

MOVING AVERAGE

A moving average is an arithmetic calculated by adding recent prices and then dividing that figure by the number of time periods in the calculation average. For example, add the closing prices over several periods and divide the sum by the number of periods. Short-term averages react quickly to price changes, whereas long-term averages respond more slowly.

FORMULA

5Years MA = Sum of 5 Consecutive Years /5

Table Showing that Moving Average from 2026 to 2030

Year	Moving Average
2026	215521
2027	225790
2028	232597
2029	234025
2030	232651

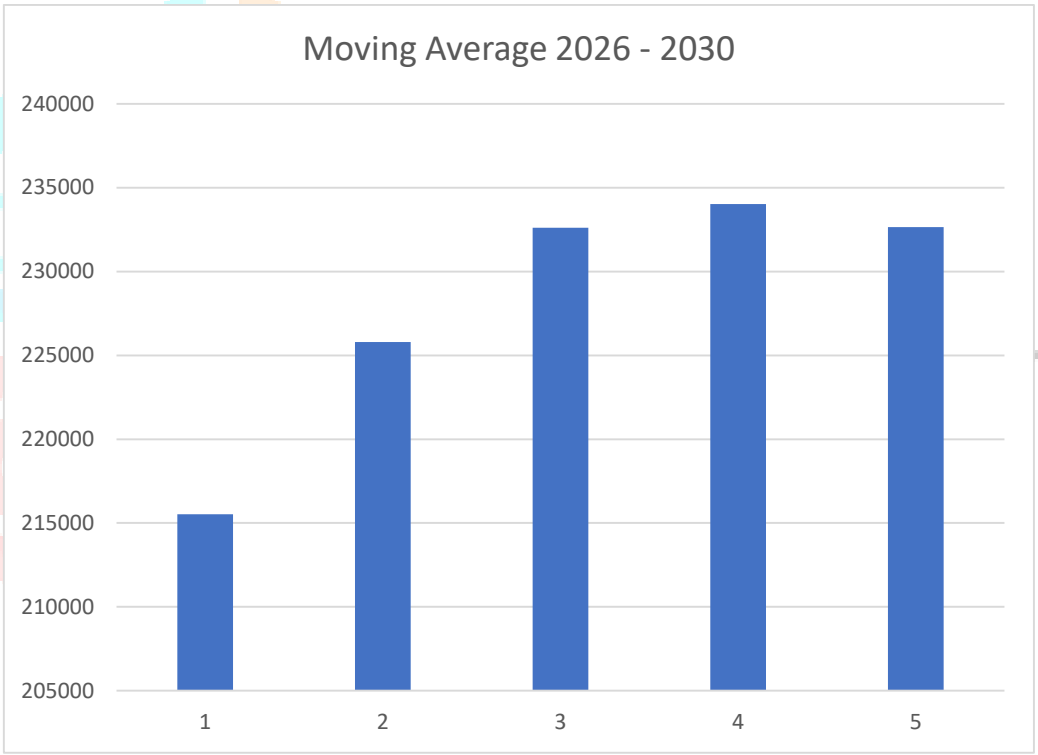
INTERPRETATION

The Moving Average forecast shows a steady increase in revenue from 2026 to 2029, followed by a slight decline in 2030.

INFERENCE

This indicates moderate growth with possible stabilization or minor fluctuation in revenue toward the end of the forecast period.

Chart Showing that Moving Average from 2026 to 2030



4.2.1 EXPONENTIAL SMOOTHING

Exponential smoothing of time series data assigns exponentially decreasing weights for newest to oldest observations. In other words, the older the data, the less priority ("weight") the data is given; newer data is seen as more relevant and is assigned more weight. Smoothing parameters (smoothing constants) - usually denoted by α - determine the weights for observations. Exponential Smoothing means 30% New Data + 70% Old Forecast

FORMULA

Forecast = α x Actual – 1 + (1 – α) x Forecast – 1

Alpha (α) = 0.3

$(1 - \alpha) = 0.7$

Table Showing that Exponential smoothing from 2026 to 2030

2030	
YEAR	**EXPONENTIAL SMOOTHING**
2026	196909
2027	196909
2028	196909
2029	196909
2030	196909

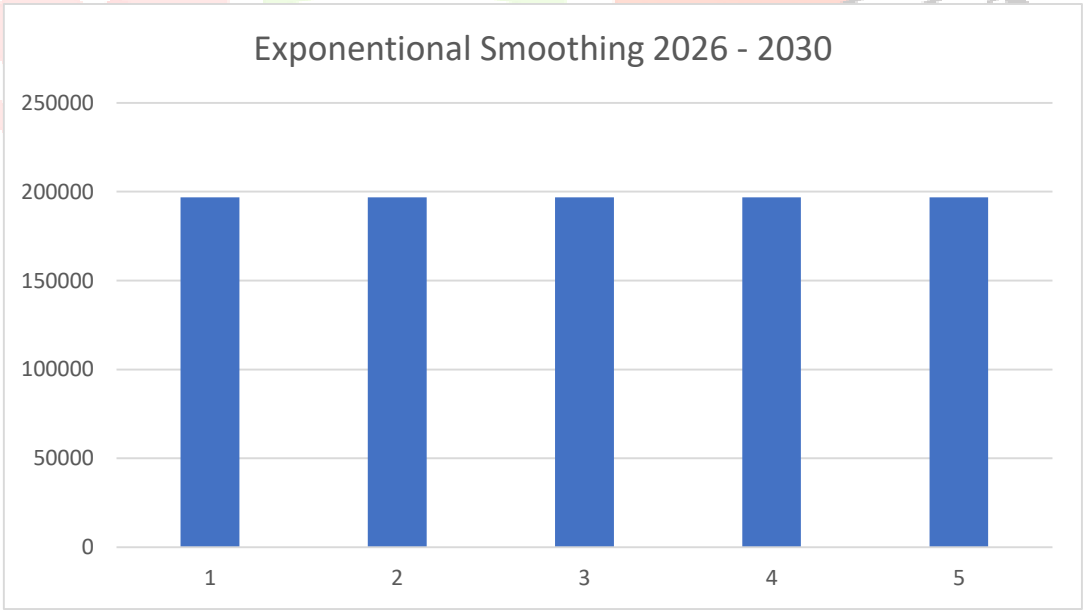
INTERPRETATION

TCS's moving average remains constant at 196,909 from 2026 to 2030, indicating a period of stable performance. This suggests no significant growth or decline during these years.

INFERENCE

The 2030 exponential smoothing forecast of ₹196,909 crore indicates a flat revenue trend, suggesting no significant change from previous years for Tata Consultancy Services.

Chart Showing that Exponential smoothing from 2026 to 2030



AUTOREGRESSIVE INTEGRATED MOVING AVERAGE (ARIMA)

Autoregressive modeling and Moving Average modeling are two different approaches to forecasting time series data. ARIMA integrates these two approaches, hence the name. Forecasting is a branch of machine

learning using the past behavior of a time series to predict the one or more future values of that time series. This is ARIMA (1,1,1)

FORMULA

AR (p) = 1

Difference (d) = 1

MA (q) = 1

Table Showing that ARMA of 2026 to 2030

ARIMA			
YEAR	**FORECAST**	**LCL**	**UCL**
2026	274339	249453	299224
2027	290075	246762	333387
2028	307179	253876	360482
2029	323712	261059	386365
2030	340484	270060	410907

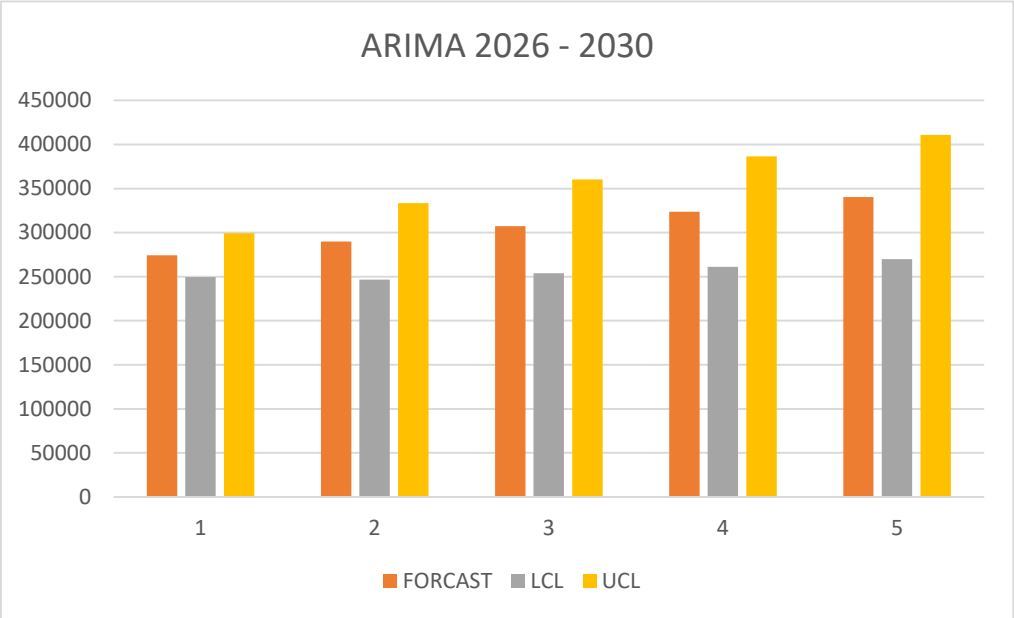
INTERPRETATION

The ARIMA forecast predicts steady growth for TCS from 2026 (274,339) to 2030 (340,484), with increasing upper and lower confidence limits. This indicates a positive trend with expected variability but overall upward momentum.

INFERENCE

The ARIMA forecasts for 2026–2030 show a strong upward revenue trend for TCS, with increasing values and widening confidence intervals indicating growing uncertainty over time.

Chart Showing that ARMA of 2026 to 2030



CONCLUSION

The analysis of TCS revenue using Moving Average, Exponential Smoothing, and ARIMA models provides a comprehensive understanding of its past performance and future growth pattern. The Moving Average method helped in identifying the overall trend by smoothing short-term fluctuations in revenue data. It clearly showed a steady upward movement over the years, indicating consistent financial growth and operational stability. By reducing irregular variations, the method made it easier to observe the long-term direction of revenue performance. This confirms that TCS has maintained steady progress with minimal instability in its revenue pattern.

Exponential Smoothing further strengthened the analysis by giving more importance to recent data values. The results reflected stable and gradual growth with reduced fluctuations. This method proved effective in short-term forecasting and demonstrated predictable revenue behavior from 2025 to 2030. ARIMA provided a more advanced and reliable forecasting approach by considering past trends, seasonality, and variations in the revenue data. The ARIMA results indicated a continuous upward trend with controlled variations, offering confidence in long-term revenue projections. Compared to the other methods, ARIMA delivered more precise and statistically sound forecasts, making it highly useful for strategic planning and decision-making.

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