TRANSORG
ANALYTICS

Forecasting the Growth of Indian Tourism using Exponential smoothing

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Abstract

The diversity of India is legendary, presenting large scope of tourism opportunities. From the Himalayas to desert of Rajasthan, to the natural beauty of Kerala and cultural intensity of Varanasi. India offers something for everyone. It is a treasure house of cultural and traditional embellishes as reflected in its artifacts, scenic beauties of the rivers, sea and mountains, thus enabling it to gain a prestige in the international arena. As per the Travel and Tourism competitiveness Report 2009 by the World Economic Forum, India is ranked 11th in the Asia Pacific region and 62nd overall, moving up three places on the list of the world's attractive destinations.

The tourism ministry has also played an important role in development of industry, initiating advertising campaigns such as 'Incredible India' campaign, which promoted India's culture and tourist attractions in a fresh and memorable way. Tourism in India has strong relevance to economic development, cultural growth and national integration.

Through this white paper an approach to forecast tourist visiting India is presented. Technique of exponential smoothing is used to forecast numbers of tourist that were expected to visit India in 2011 using census 2010 data (Statistical Year Book India 2015, Ministry of Statistics and Programme Implementation).

Business Case

Along with the phenomenal growth in demand for tourism in the world over the past two decades, there is a growing interest in tourism forecasting research.

- Tourism demand is usually regarded as a measure of visitors' use of a good or service.

- It can be measured in terms of tourist arrivals and/or departures, tourist expenditures and/or receipts, travel exports and/or imports, tourist length of stay, nights spent at tourist accommodation, and other.

- Tourists arrival are the most frequently used measure of tourism demand, thus in this paper tourist arrival in India from different regions of the world have been used for forecasting tourist demand.

Approach

This study of TransOrg Analytics deals with predicting the arrival of Tourist of Foreign Nations. TFNs in India by adopting time series statistical tools. Data of annual arrival of TFNs is taken for the period of 2001 to 2010.

For non-seasonal data commonly used techniques are weighted moving averages and exponential smoothing.

Moving Averages: Moving averages rank among the most popular techniques for the preprocessing of time series. They are used to filter random "white noise" from the data, to make the time series smoother or even to emphasize certain informational components contained in the time series.

Exponential Smoothing: This is a very popular scheme to produce a smoothed Time Series. Whereas in Moving Averages the past observations are weighted equally, Exponential Smoothing assigns exponentially decreasing weights as the observation get older. In other words, recent observations are given relatively more weight in forecasting than the older observations.

The forecast value is computed from $F_{t+1} = aY_t + (1-a)F_t$

The above involves a single parameter, the smoothing constant (a) alpha. The speed at which the older responses are dampened (smoothed) is a function of the value of α, which is between 0 and

1. When α is close to 1, dampening is quick and when α is close to 0, dampening is slow. We choose the best value for α so the value which results in the smallest mean of the squared errors

Since the data was not having seasonality trend which is visible from Figure 1 and more weight in forecasting was to be given to recent data we have used Exponential smoothing tool for the purpose of analyzing the data and predicting the figures of future arrival of TFNs in India. This model may help to forecast the arrival of TFNs in upcoming years.
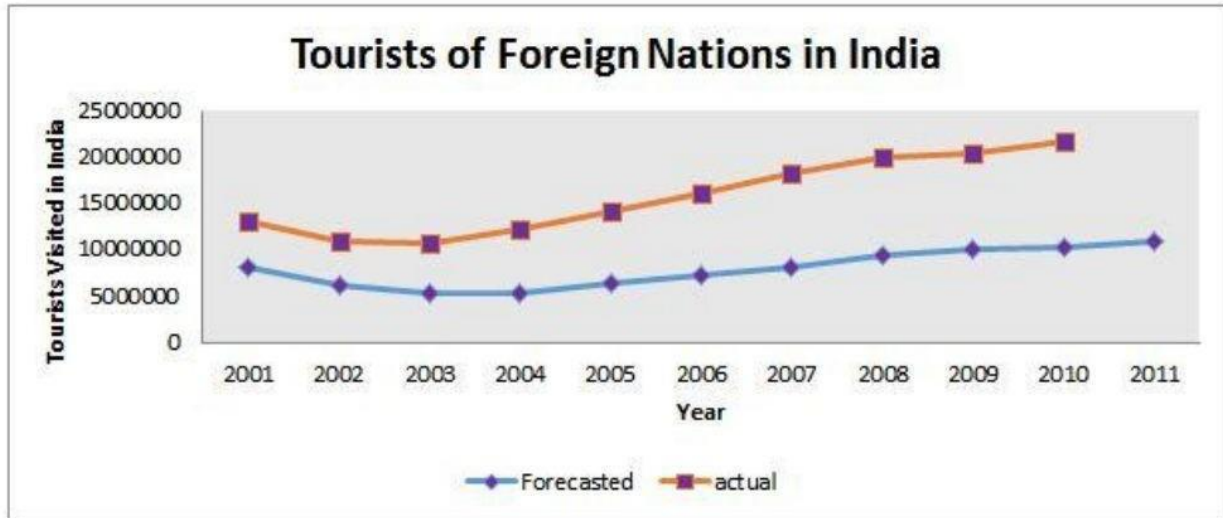
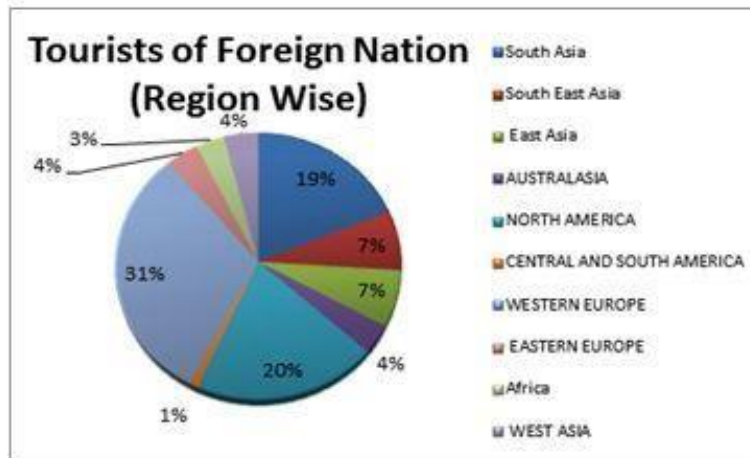Figure 1: Actual and forecasted numbers of tourists visiting India

Figure 2: Region-wise composition of predicted tourist arrivals in India in 2011

Data of region wise tourists visiting India was used to forecast TFN's for year 2011. Contribution of each region is depicted in the Figure 2. Accordingly, a maximum of 31 per cent of the foreign tourists visiting India come from Western Europe. Its neighboring Eastern Europe has an insignificant contribution of 4% tourists only. Using exponential smoothing technique initial forecasted value for year 2001 was taken to be average of number of tourists visited India 2001 to 2010 Then using smoothing constant,α=0.6 (The best value which resulted in the smallest mean of the squared errors)and previous years' actual and forecasted values, next years'

forecasted values were calculated. In exponential smoothing, a new estimate is the combination of the estimate for the present time period plus a portion of the random error generated in the present time period.

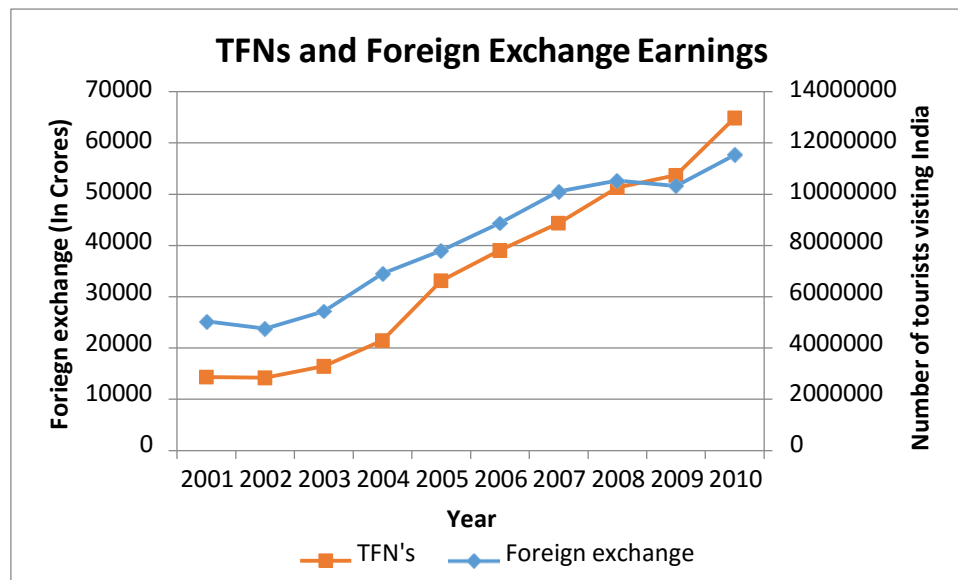| Region	Forecasted(2011)
South Asia	1,029,681.71
South East Asia	400,084.62
East Asia	378,716.10
AUSTRALASIA	196,702.53
NORTH AMERICA	1,114,385.32
CENTRAL AND SOUTH AMERICA	55,541.71
WESTERN EUROPE	1,706,115.40
EASTERN EUROPE	207,613.52
Africa	185,302.67
WEST ASIA	221,182.92

Table 1: Region wise forecasted TFNS for year 2011

Figure 3: Trends of Tourists from Foreign Nations and Foreign Exchange Earning

Tourism is important source of foreign exchange earnings in India. This has favorable impact   on balance of payment of the country. Tourism industry has seen an increasing trend in earnings from foreign exchange which is visible from Figure 3.

Results/Key findings

Tourism is the major driver of economic growth globally. Tourism industry in India is growing and it has vast potential for generating employment and earning large amount of foreign exchange besides giving a fillip to the country's overall economic and social development. Using forecasted values of TFNs Indian government should be prepared for providing better services to foreign tourists. Since tourism is a multi-dimensional activity, and basically a service industry, it would be necessary that all wings of the Central and State governments, private sector and voluntary organizations become active partners in the endeavor to attain sustainable growth in tourism if India is to become a world player in the tourism industry. Foreign exchange is not increasing at the same as the number of tourist's arrival in India. Natural disasters like J&K floods and the Nepal earthquake affected foreign tourist arrivals while the perception that India is not a safe destination continued to prevail.

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