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Short Life Cycle Time Series Forecasting

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Abstract : The life cycle of products is becoming shorter and shorter due to increased competition in market, shorter product development time and increased product diversity. Short life cycles are normal in retail industry, style business, entertainment media, and telecom and semiconductor industry. The subject of accurate forecasting for demand of short lifecycle products is of special enthusiasm for many researchers and organizations. Due to short life cycle of products the amount of historical data that is available for forecasting is very minimal or even absent when new or modified products are launched in market. The companies dealing with such products want to increase the accuracy in demand forecasting so that they can utilize the full potential of the market at the same time do not oversupply. This provides the challenge to develop a forecasting model that can forecast accurately while handling large variations in data and consider the complex relationships between various parameters of data. Many statistical models have been proposed in literature for forecasting time series data. Traditional time series forecasting models do not work well for short life cycles due to lack of historical data. Also artificial neural networks (ANN) models are very time consuming to perform forecasting. We have studied the existing models that are used for forecasting and their limitations. This work proposes an effective and powerful forecasting approach for short life cycle time series forecasting. We have proposed an approach which takes into consideration different scenarios related to data availability for short lifecycle products. We then suggest a methodology which combines statistical analysis with structured judgement. Also the defined approach can be applied across domains. We then describe the method of creating a profile from analogous products. This profile can then be used for forecasting products with historical data of analogous products. We have designed an application which combines data, analytics and domain knowledge using point-and-click technology. The forecasting results generated are compared using MAPE, MSE and RMSE error scores. Conclusion: Based on the results it is observed that no one approach is sufficient for short life-cycle forecasting and we need to combine two or more approaches for achieving the desired accuracy.

Keywords : forecast, short life cycle product, structured judgement, time series
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