Trend Estimation in the Tactical Horizon

Executive summary
This project developed statistical forecasting models for FMCG manufacturer Beiersdorf. Focus of the project was on the tactical horizon (8 to 18 months ahead), hence by applying trended models forecasting accuracy is increased.

Challenge overview
Beiersdorf (BDF) is a global fast moving consumer goods manufacturer of skin and beauty care brands, selling 100s of products across 150 affiliates worldwide. The problem of medium to long-term demand forecasting raises a number of necessities that must be properly addressed in the design of the employed forecasting methods. These include long forecasting horizons and a high number of quantities to be forecasted. This in turn limits the possibility of human intervention, frequent introduction of new products for which no past sales are available for parameter calibration and withdrawal of running products. For efficient production planning i.e. ordering of raw materials, assignment of production to various factories, managing delivery obligations, minimization of stock and etc. and a decisive basis for company policies, sales forecasting over a sufficiently long future time horizon is essential.

Implementation of the initiative
The Lancaster Centre for Forecasting, based at the Lancaster University Management School, has as its objective, developing new methods and approaches to forecasting focused on improved organisational practices. It has been particularly concerned with evaluating and improving company forecasting systems, funded by the EPSRC and a large number of companies. It has long standing relations to support Beiersdorf HQ in Germany and its UK division through a mentoring scheme. The project was conducted by a Masters student in Management Science and Marketing Analytics who carried out a 12 week internship onsite.

The problem
The aim of this project is to find out whether the standard assortments are trended, and if so what the best method to forecast them is. In different data aggregations, time series behave differently. The first challenge in studying trends is to find the optimal aggregation level. The optimum aggregation level should give accurate trend forecasts after a reasonable amount of effort. The focus of the study was on the tactical horizon and therefore, to determine what needs to be forecasted the information which needs to steer the supply chain planning decisions in the tactical horizon was defined. Base on the data exploration there were some brands which have consistent changes in their level of demand and thus trended.

64 different model settings were examined in the empirical analysis with use of the “Intelligent Forecaster” software. The analysis explored different algorithms of exponential smoothing and regression, and various routines for optimisation and initialisation. The Exponential Smoothing methods outperformed the Regressions.

Results and achievements
Results were presented to the HQ in Germany. Key outcomes include:
- The optimum aggregation level to investigate standard assortment trend for tactical horizon.
- Automation of trend detection on the high-demand products using the statistical tests in the “Intelligent Forecaster” software.
- Optimal model parameters for aggregated forecasting in the tactical horizon.