Forecasting for Far East

Executive summary
A 3 month forecasting project was carried out in the workshop situated in the inventory department of the Wilkinson’s head office. There is a particular concern in forecasting the demand of SKUs imported from the Far East due to their long lead time. The aims of the project were to develop a robust forecasting solution and to integrate them with the Wilkinson’s existing forecasting system for the improved forecasting accuracy. The results showed that the proposed model outperforms the current forecasting system.

The Challenge (Problem)
To fulfill the customers’ demand and to achieve the minimum inventory levels, which are the main goals at Wilkinson, the accurate forecasting is a big concern for the supply chain manager at Wilkinson. Wilkinson imports a large number of SKUs from the Far East with lead time of typically 10–17 weeks and failing to provide accurate forecasts could results in serious inventory problems. As the company is finding it difficult to maintain the proper order cycle due to their low forecasting accuracy, the project is aiming to develop a robust forecasting model for the SKUs that are imported from the Far East.

The Project (Solution)
The company is dealing with more than 50,000 SKUs and around 3000 of them are from the Far East. Due to the limited time line, 312 SKUs covering four different categories were only used for the project. The four categories include ‘HOM’, ‘PET’, ‘DIY’ and ‘KIT’.

The following methods were used as alternative forecasting methods to forecast the SKUs from the Far East:

- Naive
- Simple Exponential smoothing
- Holt’s exponential smoothing
- Holt-Winter’s exponential smoothing
- Damped trend exponential smoothing
- Simple moving average of 6 and 12 periods

Among the different alternative models, the best model was selected for comparison to the existing forecasting model from the Wilkinson.

<table>
<thead>
<tr>
<th>No. of Time Series</th>
<th>DIY</th>
<th>KIT</th>
<th>PET</th>
<th>HOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naïve</td>
<td>21.73</td>
<td>21.95</td>
<td>16.92</td>
<td>23.31</td>
</tr>
<tr>
<td>Existing model</td>
<td>14.71</td>
<td>19.98</td>
<td>16.76</td>
<td>18.36</td>
</tr>
<tr>
<td>The best model</td>
<td>13.73</td>
<td>11.55</td>
<td>9.04</td>
<td>12.69</td>
</tr>
</tbody>
</table>

Table 1 Average MAPE (%) for each group of SKUs

Results and achievements
The proposed models outperformed the Wilkinson’s current forecasting system in terms of producing less forecasting errors. Especially for the time series under the PET category, the proposed model improved the forecasting accuracy by approximately 46% over the existing model at the Wilkinson. Among the 7 alternative models, the damped trend methods were consistently performed best for most of the SKUs.

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