

English abstract

It has been verified in pilot projects by many European and American Corporations that Collaborative Planning, Forecasting and Replenishment (CPFR) can improve supply chain performance. Enterprises nowadays in Taiwan are implementing or going to implement CPFR, with hopes to reduce their supply chain operation cost, enhance logistic performance and increase their competition capability consequently. Under CPFR process and supply chain collaboration environment, a supply and demand both sides promised identical sales forecast with well forecasting performance for order decision making and cooperation is very important. Due to the dynamic complexities of both internal and external co-operate environment, many firms resort to qualitative, naive forecasting or other simple quantitative forecasting techniques and have many forecasts in their organization. However, these forecasting techniques lack the structure and extrapolation capability of quantitative forecasting models or without stable performance, while multi-forecasts providing different views of demand. Forecasting inaccuracies exist and typically lead to dramatic disturbances in sales order and production planning.

This paper presents a hybrid forecasting model for sales forecasting requirements in CPFR. A three stage model is proposed that integrate the time series model, regression model and use genetic algorithm to determine its coefficients efficiently. Direct sales information and related planned events in both collaborated sides is used for individual product's "week" sales forecasting. To verify this model, we experiment on two different products and produce forecasts with datum from one manufacturer in Taiwan and its international retailer. The results shows that the hybrid sales forecasting model has better forecasting performance than not only the causal-genetic forecasting model proposed by Jeong et al. (2002), but also ordinary regression model with no genetic training process.

Keywords:

Collaborative Planning, Forecasting and Replenishment, CPFR, Sales forecasts, Hybrid forecasting model, Genetic Algorithm