

摘要

協同規劃、預測與補貨 (Collaborative Planning, Forecasting and Replenishment; CPFR) 是協同商務中一個新發展的應用實務，主要強調供應鏈上買賣雙方協同合作流程的概念，以提升供應鏈上流程的處理效率。企業需要利用協同合作所獲得之即時資訊來進行預測，減少不確定性因素之影響，提高預測之準確性。CPFR 流程下協同預測階段分為銷售預測與訂單預測，兩者之預測項目與目的並不相同且所需要之資訊亦有所差異。銷售預測著重在市場需求部份的預測；訂單預測則是依據銷售預測、存貨狀況與生產面因素來做實際訂單之預測。由於訂單預測作為下個階段之實際補貨的參考，其預測準確性的要求就格外重要。然而研究文獻多偏向 CPFR 流程架構與導入效益等管理議題，雖有少數針對預測模型之研究，但亦以企業內部銷售預測為主，並未有文獻提出跨企業之協同訂單預測模型，故 CPFR 流程下訂單預測方法之研究探討有其必要性。本研究以 CPFR 流程中接續銷售預測之訂單預測階段為研究主題，蒐集近年來國內外研究 CPFR 與訂單預測之相關文獻為基礎，歸納出協同合作下訂單預測所須具備之屬性與影響因素，並作為模型解釋變數，透過時間序列、多元迴歸與演化策略法 (Evolution Strategies) 的結合，建構一個統整供應鏈上、下游協同資訊與符合 CPFR 流程下訂單預測特性之預測模型。最後以國內某製造業公司與其顧客 (一國際大型零售商) 之訂單資料進行模型驗證，與單純使用時間序列方法或統計迴歸分析的預測結果作績效評比，實驗顯示本研究所提出之訂單預測方法較傳統使用單一時間序列或統計迴歸方法之預測結果佳。

關鍵字：協同規劃預測補貨 (CPFR)、訂單預測、演化策略

Abstract

Collaborative Planning, Forecasting and Replenishment (CPFR) is nowadays a practice of collaborative commerce, emphasizing buyers and sellers' coordination for the efficiency of the process in supply chain. Enterprises utilize instant information obtained from coordinate processes to forecast in order to reduce the influence of the uncertain factor and improve forecasting accuracy. The stage of the collaborative forecasting in CPFR process is divided into sales forecasting and order forecasting which make differences on forecasting objective, subject, and information needed. Sales forecasting focuses on the prediction of the market demand; order forecasting is the prediction of the real orders according to sales forecasting, stock state and productive factor. The accuracy of order forecasting is extremely important because it is regarded as the reference of the replenishment at next stag. The literatures about CPFR mostly probe into manage topics like benefits of implementation or process structures though there are some researches on the forecasting model which mainly discuss sales forecasting inside enterprises. Therefore, it is necessary to investigate into the coordinative order forecasting model under CPFR process. This paper regards order forecasting following sales forecasting in CPFR as the theme. Besides generalizing the necessary parameter of order forecasting based on literatures review, the research presents a hybrid forecasting model which considers coordinative information and order forecasting requirements. It integrates the time series model, regression model, and use evolution strategies to determine its coefficients efficiently. The validity of the forecasting model is verified by experiment on order datum from one manufacturer in Taiwan and its international retailer. The results show that the order forecasting model has better forecasting performance than not only the time series model but also the ordinary regression model.

Keywords: Collaborative Planning, Forecasting and Replenishment, CPFR, Order forecasts, Evolution strategies