

Improving the Efficiency of TOC Demand-Pull and Buffer Management by Incorporating Demand Information Using EWMA in Semiconductor Manufacturing

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Abstract. Products in the semiconductor manufacturing industry usually have characteristics of having short life-spans, volatility in demands and long lead times. Applying the demand-pull approach and buffer management (DPBM) suggested by the Theory of Constraints (TOC) to manage the inventory of such products does not efficiently respond to the unpredicted demand change thus could potentially result in either excessive inventories or shortages. This research proposed a new buffer adjustment mechanism to improve DPBM approach by applying the methodology of Exponentially Weighted Moving Average (EWMA) to integrate the true demands and the rolling forecasts of market in order to make the stock replenishing decision. Real product demand data provided by a wafer foundry in Taiwan is analyzed to demonstrate the effectiveness of the proposed approach. The study results show that the proposed idea can indeed keep a lower inventory level and provide a higher service standard in contrast to the traditional DPBM method.