A Study of Supply Chain Replenishment System of Theory of Constraints for Thin Film Transistor Liquid Crystal Display (TFT-LCD) Plants

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Abstract

The thin film transistor liquid crystal display (TFT-LCD) including three fundamental process stages: Array process, Cell process and Module process is generally called liquid crystal panel by consumers. Each process stage existing the variable manufacturing flow-process and characteristic of capacity results in acquiring individual objective in each plant, however, ignoring the demand in entire supply chain. For instance, Array process and Cell process enthusiastically pursue to reach maximal throughput contributed to have much more work-in-process (WIP) of the panel to Module process. However, the Module process depends on the demand of final customers to assemble finished products. Therefore, the demand of customers and the supply from the upstream process exists asymmetrically to lead the inventory levels ineffectively for controlling. The Theory of Constraints Supply Chain Replenishment System (TOC-SCRS) is supposed to apply the TFT-LCD plants, and is mainly discussed the inventory of TFT-LCD in each plant to study this model of replenishment. The inventory of TFT-LCD in each plant has three critical parameters: Frequency of Replenishment (FR), Reliable Replenishment Time (RRT) and maximum inventory buffer. Furthermore, utilizing FR, RRT, and maximum inventory buffer parameters to calculate the Replenishment quantity and Delivery quantity. However, each inventory is related to each other between upstream and downstream. This study is concerned with TOC-SCRS to each inventory and uses the simulation model to simulate the variation of the each inventory to demonstrate the significance and feasibility of this proposed TOC-SCRS for TFT-LCD plants.

Keyword：Thin Film Transistor Liquid Crystal Display; Theory of Constraints; Supply Chain Management; TOC Supply Chain Replenishment

System