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Design of Effective Decoupling Point in Build-To-Order Systems: Focusing on Trade-Off Relation between Order-To-Delivery Lead Time and Work in Progress

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Abstract : Since 1990s, e-commerce and internet business have been grown gradually over the word and customers tend to express their demand attributes in terms of specification requirement on parts, component, product structure etc. This paper deals with designing effective decoupling points for build to order systems under e-commerce environment, which can be realized through tradeoff relation analysis between two major criteria, customer order lead time and value of work in progress. These KPIs are critical for successful BTO business, namely time-based service effectiveness on coping with customer requirements for the first issue and cost effective ness with risk aversive operations for the second issue. Approach of this paper consists of investigation of successful business standing for BTO scheme, manufacturing model development of this scheme, quantitative evaluation of proposed models by calculation of two KPI values under various decoupling point distributions and discussion of the results brought by pattern of decoupling point distribution, where some cases provide the pareto optimum performances. To extract the relevant trade-off relation between considered KPIs among 2-dimensional resultant performance, useful logic developed by former research work, i.e. Katayama and Fonseca, is applied. Obtained characteristics are evaluated as effective information for managing BTO manufacturing businesses.

Keywords : build-to-order (BTO), decoupling point, e-commerce, order-to-delivery lead time (ODLT), work in progress (WIP)
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