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CONTENTS

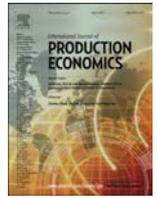
Research Articles

Coordination of competing supply chains with news-vendor and buyback contract D. Wu	1
Modeling stockout risk and JIT purchasing in ready-mixed concrete batching plants M. Wu, Q. Shen, M. Xu and D. Wu	14
Energy efficiency retrofitting services supply chains: Evidence about stakeholders and configurations from the Yorkshire and Humber region case A. Genovese, S.C. Lenny Koh and A. Acquaye	20
Dynamic pooling of make-to-stock and make-to-order operations Z.G. Zhang, I. Kim, M. Springer, G. Cai and Y. Yu	44
The Taiwan national quality award and market value of the firms: An empirical study C.-S. Lin and C.-T. Su	57
The heterogeneous fleet vehicle routing problem with overloads and time windows M.N. Kritikos and G. Ioannou	68
Organizational competence building and development: Contributions to operations management M.A. da Silva Gonçalves Zangiski, E. Pinheiro de Lima and S.E. Gouvea da Costa	76
Reducing sampling costs in multivariate SPC with a double-dimension T^2 control chart E.K. Epprecht, F. Aparisi, O. Ruiz and Á. Veiga	90
On the evaluation of product customization strategies in a vertically differentiated market H. Wong and D. Lesmono	105
Multi-item production planning with carbon cap and trade mechanism B. Zhang and L. Xu	118
Minimizing total tardiness for the order scheduling problem I.S. Lee	128
Dynamic ordering and pricing strategies in a two-tier multi-generation durable goods supply chain J. Jia and J. Zhang	135
Joint optimal lot sizing and production control policy in an unreliable and imperfect manufacturing system B. Bouslah, A. Gharbi and R. Pellerin	143
Implementation critical success factors (CSFs) for ERP: Do they contribute to implementation success and post-implementation performance? J. Ram, D. Corkindale and M.-L. Wu	157
A note on an economic lot size model for price-dependent demand under quantity and freight discounts H.-C. Chang	175

Contents continued on inside back cover



Production-inventory models for a damageable item with variable demands and inventory costs in an imperfect production process P. Guchhait, M. Kumar Maiti and M. Maiti	180
System Dynamics modelling of a production and inventory system for remanufacturing to evaluate system improvement strategies R. Poles	189
Performance analysis and optimization of hybrid manufacturing systems under a batch ordering policy E. Almehdawe and E. Jewkes	200
Product bundling: Impacts of product heterogeneity and risk considerations M. Sheikhzadeh and E. Elahi	209
An approach based on constraint satisfaction problems to disruptive event management in supply chains A. Guarnaschelli, O. Chiotti and H.E. Salomone	223
A heuristic framework based on linear programming to solve the constrained joint replenishment problem (C-JRP) C.A. Amaya, J. Carvajal and F. Castaño	243
EOQ with a correlated binomial supply W.W. Nasr, B. Maddah and M.K. Salameh	248
A strategic needs perspective on operations outsourcing and other inter-firm relationships E. Mazzola and G. Perrone	256
After-sales service competition in a supply chain: Does uncertainty affect the conflict between profit maximization and customer satisfaction? H. Kurata and S.-H. Nam	268
Analyzing the effectiveness of quality management practices in China S.J. Wu and D. Zhang	281
Inventory rationing decision models during replenishment lead time Y.-F. Hung and J.-Y. Hsiao	290
A new multivariate gage R&R method for correlated characteristics R.S. Peruchi, P.P. Balestrassi, A.P. de Paiva, J.R. Ferreira and M. de Santana Carmelossi	301
The interface between "product design and engineering" and manufacturing: A review of the literature and empirical evidence R. Dekkers, C.M. Chang and J. Kreutzfeldt	316
Performance evaluation of a multi-product CONWIP assembly system with correlated external demands C.-W. Park and H.-S. Lee	334
Optimal designs of the double sampling \bar{X} chart with estimated parameters M.B.C. Khoo, W.L. Teoh, P. Castagliola and M.H. Lee	345
The single container loading problem with axle weight constraints A. Lim, H. Ma, C. Qiu and W. Zhu	358
Outsourcing through competition: What is the best competition parameter? E. Elahi	370
Design and operations planning of municipal foodservice systems P. Farahani, M. Grunow and R. Akkerman	383
Stackelberg solution in a vendor-buyer supply chain model with permissible delay in payments M.-S. Chern, Q. Pan, J.-T. Teng, Y.-L. Chan and S.-C. Chen	397



On the evaluation of product customization strategies in a vertically differentiated market

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ABSTRACT

This paper presents a formal approach to evaluate the value of enhancing product customization in a vertically differentiated market. Different from most existing studies that tend to associate the level of customization with the number of product variants, we take a rather different view to the level of customization which we define as the degree to which consumers are involved along the value chain. Consequently, a higher level of customization is achieved when consumers are involved further upstream in the chain. The novelty of our approach stems from the integration of both marketing- and production-related factors that enable us to: consider trade-offs between customization, lead times and manufacturing costs; and analyze how these trade-offs should be addressed in a market in which one group of consumers is highly concerned about product customization, whereas the other group is more concerned about lead time. Through numerical examples, we demonstrate how the interplay between marketing- and operation-related factors affects firm's decision on the most appropriate level of customization.

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1. Introduction

It can be argued that mass customization (MC) represents an essential manufacturing concept for firms striving to maximize the value that their customers derive from buying their products. This new manufacturing concept replaces mass production which is viewed as unsuitable for the present competitive environment (Pine, 1993). This is achieved by allowing customers to individually customize a product that closely matches their individual preferences without significantly compromising cost efficiency. Advances in manufacturing and internet-based information technologies are believed to be the focal enablers, which allow successful MC application in many product categories. For example, Dell allows customers to customize their notebooks; Timbuk offers customized bags; Nike and Adidas allow customers to create their most preferred trainers.

All the above examples are similar in that customers are given the freedom to choose the product specification (among abundant possible options) that best matches their individual preferences. Thus, customers are involved in the production processes, though to a limited extent. One can argue that this customer involvement marks a distinctive characteristic of MC from the more traditional concept that simply increases the number of product variants in

response to the demand for variety. But one could also take a different view, arguing that MC would need a greater level of customer involvement than merely choosing among a large number of permutations. We agree with Lampel and Mintzberg (1996) and Duray et al. (2000) who suggest that the relative degree of product customization is determined by how far consumers are involved in the production cycle. A highly customized product is characterized by customer involvement in the early design stages. In contrast, the level of customization is low if customer preferences are included only at the final assembly stage (see Fig. 1).

While the existence of the two different views of customization cannot be disputed, it should be underlined here that since our main interest is to consider customization level determined by how far the customer can involve in the production cycle, the number of product variants becomes an irrelevant decision variable for the manufacturer. One could argue that whether the customer is involved at the fabrication stage or at the design stage of the production cycle, there could be an infinite number of product variants offered to the customer. However, it is arguable that involving the customer earlier at the design stages will enhance the perceived uniqueness of the product, which in turn contributes positively to the utility a customer experiences (Franke and Schreier, 2008). The consideration of the production and marketing factors in this paper allows us to examine how the choice of the customization level has an impact on the manufacturer's profitability by capturing the interplay between the

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