University of Missouri – St. Louis

The Graduate School
Announcement

An oral examination in defense of the dissertation for the degree
Doctor of Philosophy in Business Administration

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Optimizing Inventory for Profitability and Order Fulfillment Improvement

Date: April 22, 2016
Time: 10:00 a.m. to 11:30 a.m.
Place: 212 Express Scripts Hall

Abstract
Despite extensive research on inventory management, few studies have investigated the optimization of inventory policies for maximizing the net present value of profit and order fulfillment performance. This dissertation consists of two essays. Essay One presents a new model to explicitly address nonstationary demand, arbitrary review periods, and SKU-specific lead times, with the objective of maximizing the net present value of profit. The real world application and computational experiments show that the dynamic optimal inventory solutions suggested by the model significantly reduce both safety stock and base stock levels compared to the traditional ABC approach under a periodic-review, order-up-to inventory policy. Essay Two examines two order-based fulfillment performance measures: the order fill rate, defined as the percentage of orders that are completely filled from available inventory; and the average fill rate across orders, defined as the average of the percentage of total units in a customer order that can be filled from on-hand inventory. Two optimization models are developed to maximize the order fulfillment performance measures. Computational results show that the commonly used item-based measure in general cannot adequately indicate order-based performance, and the tradeoffs between profit and order-based measures vary with the inventory budget.

Defense of Dissertation Committee
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