The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics and Operations Management
Dept of Industrial Engineering & Decision Analytics

Joint Seminar Announcement

Managing Order-Holding Problems in Online Retailing Platforms

by

Dr Yan Zhenzhen

Assistant Professor
School of Physical and Mathematical Sciences
Nanyang Technological University, Singapore

Date	:	**26 March 2021 (Friday)**
Time	:	**10:30 - 11:45 am**
Zoom ID	:	**988 5854 1364 (passcode 568868)**

Abstract: The booming of third-party logistics (3PL) changes the cost structure of an online retailer in the order fulfillment process. The online retailer pays a fixed amount of order arrangement fee to the 3PL to outsource the order fulfillment service for each service request. We study the problem of when an online retailer should send the service request. The trade-off is between the order arrangement fee and the order holding cost. We model the problem as a Markov Decision Process (MDP). By reducing the MDP to a sequence of single-dimensional counterparts, we analytically characterize the optimal order-holding policy. To calculate the policy, we apply a consumer sequential choice model to characterize the transition probabilities, which captures the heterogeneity across different orders and admits a personalized order-holding policy. We further get the closed form of the personalized order-holding policy and provide a piecewise linear approximation of the policy. Extensive numerical tests based on the data set from the 2020 MSOM Data-Driven Research Challenge show that (1) The gap of piecewise linear approximation is as small as 1; (2) The proposed policy achieves a considerable cost reduction compared to two benchmarks in the literature, with an average 30.12% and 14.01% cost reduction for enterprise users in all instances compared with two other widely used policies in the literature, respectively.

Bio: Dr Yan Zhenzhen is an Assistant Professor at School of Physical and Mathematical Sciences, Nanyang Technological University. Dr Yan received her PhD in Management Science from the National University of Singapore, and her BSc and MSc in Management Science, Operations Research from the National University of Defense and Technology in China. Her research interests mainly focus on the interplay between optimization and data analytics. She is keen to solve various operations management problems and engineering problems from the distributionally robust perspective, including supply chain design and operations, e-commerce operations and healthcare operations. She is also particularly interested in data driven pricing problem and sequential decision making problems. Her publications appear in leading journals such as Management Science and Operations Research.

All interested are welcome!

Enquiries: Dept of ISOM