

*The Hong Kong Polytechnic University*  
*Department of Logistics and Maritime Studies*  
*Research Seminar*

## **Design and Pricing of Discretionary Service Lines**

by

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**Date: 17 May 2017 (Wednesday)**  
**Time: 10:30am-11:30am**  
**Venue: R401, Shirley Chan Building**  
**The Hong Kong Polytechnic University**

**(Conducted in English)**

### **Abstract:**

We study the offering of discretionary services, services for which longer processing times yield higher quality, but, also create more system congestion. Facing delay-sensitive customers that are heterogeneous in their sensitivity to service quality, firms offer a service line, i.e., a menu of service variants defined by their durations with associated prices. We characterize the optimal service line design under two well-known service operations strategies: First In First Out (FIFO) and Shortest Processing Time (SPT), with the latter giving priority to service variants of shorter duration. We find that, under FIFO, the service line collapses to a single service in absence of customer heterogeneity, but, with SPT, it is optimal to offer a service line with a variety of service variants even when customers are homogeneous; thus, there exists an operational driver for service variety. In addition, while the price increases convexly in the service duration under FIFO, it can be concave under SPT; thus, the price schedule may exhibit a quality premium or quality discount structure, depending on the service operations strategy. Furthermore, for a uniform distribution of customer types, the optimal price structures induce a uniform distribution of demand over all service variants under FIFO, but generate higher demand for lower-quality services (of short duration), giving rise to a long-tail distribution, under SPT. For both FIFO and SPT, we find that selling to customers that are more delay-sensitive always leads to a reduction in the highest service quality (longest duration) offered, but, may lead to an increase of the lowest quality (shortest duration), with the variability of the service times (measured by the coefficient of variation) exhibiting different patterns between FIFO and SPT. Finally, compared to the first-best service line design (by a social planner), the second-best solution (by a monopoly firm with customers self-selecting from the menu) offers better quality always at the high end, and possibly also at the low end, of the service line, yielding greater variability of the service times.

### **Bio:**

Cuihong Li is an Associate Professor of Operations and Information Management at the School of Business, University of Connecticut. Her research explores operations and supply chain management, with a focus on the strategic interactions in the upstream and downstream supply chains. Her research work has been published in *Management Science*, *Manufacturing and Service Operations Management*, *Production and Operations Management*, and other leading academic journals. She serves as a Senior Editor for *Production and Operations Management*, and an Associate Editor for *Decision Support Systems*. Cuihong received her Ph.D. in Management of Manufacturing and Automation from the Tepper School of Business joint with the Robotics Institute, Carnegie Mellon University, and B.S. and M.S. degrees in Automation and Systems Engineering from Tsinghua University, China.

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**All are welcome!**