The Hong Kong University of Science and Technology
Department of Information Systems,
Business Statistics and Operations Management

Seminar Announcement

Spare Parts Supply Chain Models at the US Coast Guard

by

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Date: 31 March 2009 (Tuesday)
Time: 4:00 – 5:30 pm
Venue: Room 4379, ISOM Conference Room (L17/18)

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Abstract
For the past seven years, along with colleagues, we have been working on five projects with the US Coast Guard aircraft repair and service center. The data from these projects have inspired supply chain models that permitted both mathematical analysis as well as interesting insights for practice. We report on two such models.

The first model focuses on the optimal choice of aircraft upgrade and gearbox upgrade in a closed loop supply chain. The model focused on the running upgrade of the HH-65 aircraft at the Coast Guard and involved two closed loop supply chains – one involving aircraft and the other involving gearboxes. Analysis of the model yields optimal policies for aircraft upgrade and gearbox repair. The associated models apply in contexts where new models have to be phased in while existing models continue to operate. Results from the analysis suggested the value of different implementation policies and yielded managerial insights for other contexts.

The second model focuses on using part age information to adjust repair of broken parts in order to minimize inventory costs. The model developed first uses linear programming to link repair and inventory databases. Data from this model was then used to estimate the impact of a part age based repair policy implemented in the system. Analysis of the model generated an approach to identify the optimal signal and ways to maximize the benefit of the signal through use of appropriate repair policies. Application to data suggested the impact of part type on supply chain benefit. Estimates of the benefit of such policies were used to develop specifications for a supply chain system and develop an estimate of expected cost savings by product type.

The models suggest a role for problem contexts to drive academic research that can yield generalizable insights in supply chain research.

Biography
Professor Iyer is the Susan Bulkeley Butler Chair in Operations Management and the Director of DCMME (Dauch Center for the Management of Manufacturing Enterprises) and GSCMI (the Global Supply Chain Management Initiative) at the Krannert School of Management, Purdue University. His research and teaching interests are in the area of supply chain management, interfirm operational coordination and operations management. He is interested in understanding, mathematical modeling, empirical validation of approaches to manage operations in the context of capacity management, resource allocation, supplier contracts, scheduling and inventory planning. He is a Department Editor of Management Science, Associate Editor of Operations Research, on the editorial boards of Operations Research Letters, IIE Transactions, the ECR Journal and Manufacturing and Service Operations Management editorial board, and member of INFORMS. He was president-elect of the MSOM Society of INFORMS in 2001-02 and served as president for the year 2002-03. Prior to joining the Krannert faculty in 1996, Professor Iyer taught at the University of Chicago. He has been affiliated with the Production and Distribution Research Center at Georgia Tech, and a consultant to Daymon Associates, Sara Lee, Turner Broadcasting and others. He served his Chicago community as a pro bono consultant to the Chicago School System and the Chicago Streets and Sanitation Department.