

**INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH
PRESENTS
IEOR MONDAY SEMINAR**

APRIL 16, 2007

**3:30 - 4:30 P.M.
3108 ETCHEVERRY HALL**

Timing of RFID Adoption in a Supply Chain

Seungjin "Jin" Whang

Jagdeep and Roshni Singh Professor of Operations, Information and Technology
Graduate School of Business, Stanford University

Abstract

The paper studies the incentives behind the adoption of RFID in a supply chain. One prominent feature of RFID technology is that once RFID tags are attached on the items at an upstream site, the same tags can be re-used at its downstream sites at lower or zero variable cost. This creates an interesting one-sided "free-rider" problem, where the downstream would wait to free-ride on the upstream's first move, but not vice versa. Using a stylized game-theoretic model, we characterize the equilibrium strategies of the two firms. Compared to the first-best solution, firms in equilibrium tend to adopt too late. We then study the dual benefits of technology coordination between the two firms, and find that it would not only save redundant costs of putting tags, but also speed up the downstream's RFID adoption. We also show that the equal-cost-split arrangement shifts the benefit of free-riding to the upstream, thereby mitigating the negative impacts in many cases. But it may distort the market when it operates in the optimal manner. The general message of the model is that technology coordination and cost-split each contribute to the mitigation of the free-rider problem in RFID adoption.

About Seungjin Whang

Prof Whang obtained his PhD at the University of Rochester and joined the faculty of Stanford Business School in 1987. His research interests include supply chain management and information technology. His recent research topics include the adoption of new technologies, the bullwhip effect in a supply chain, the stability of network systems, performance measurement schemes to align the incentives in a multi-echelon inventory settings, and the information sharing in a supply chain. He currently serves as senior editor to *Information Systems Research* and on the Board of POMS. He is co-director of Global Supply Chain Forum of Stanford.

REFRESHMENTS WILL BE SERVED @ 3:00 P.M. – IN ROOM 3108 ETCHEVERRY