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

Seminar Announcement

Investment in Cost-Reducing IT under Uncertainty – a Duopoly Model

by

Professor Vidyanand Choudhary
University of California, Irvine

Date: Friday, 16 April 2010
Time: 2:30 pm
Venue: Room 4379, ISOM Conference Room (Lift 17/18)

All interested are welcome

Abstract: Many firms such as FedEx and Wal-Mart have invested in Information Technologies such as package tracking systems, inventory management systems and Enterprise Resource Planning (ERP) systems to reduce their costs. We study the role of uncertainty and intensity of industry competition on the amount of investment in IT and the returns from such investment. We develop two duopoly models -- one where the firms determine their investment amount simultaneously and another where they do so sequentially. We find that in the simultaneous move game, an increase in the intensity of competition leads to lower profits yet the firms increase their investment in IT. This result holds when the success of the IT investment is uncertain. In the absence of this uncertainty, the amount of investment is unaffected by changes in the intensity of competition. The investment amount is lower when there is greater uncertainty but the firms' profits are higher.

In the sequential move game, we find that both the leader and the follower invest in IT when the intensity of competition is not too high. While the leader invests more with increasing intensity of competition, the follower invests more when uncertainty is sufficiently high. When there is sufficiently low uncertainty about the success of the IT investment, increasing intensity of competition causes the follower to reduce his investment in IT. The leader invests more than the follower and earns larger profits, however increasing uncertainty about the success of the IT investment reduces the leader's first mover advantage. In contrast to prior analytical literature we show that in a sequential move game, the leader invests more in IT in the sequential move game than the simultaneous move game. The follower invests less than in the simultaneous move game. We also examine the *return ratio* and the *coefficient of variation* and find that the *coefficient of variation* of the follower is often greater than that of the leader and our other results are consistent with prior empirical literature.

(This is joint work with Jingyu Yang)

Biography: Vidyanand (VC) Choudhary is an Associate Professor at the Paul Merage School of Business, University of California, Irvine. Prior to UCI, he was a faculty member at the Tepper School of Business at Carnegie Mellon University. He received his Ph.D. in Management with a focus on Information Systems from Purdue University. His research interests are in the area of economics of information systems and include topics such as information goods pricing strategy, product-line strategy, the economics of electronic intermediaries and the impact of competition on adoption of high-risk technologies by firms. His research has been published in such journals as *Management Science*, *Information Systems Research*, and the *Journal of Management Information Systems*. Professor Choudhary's work has won Best Paper awards at the *International Conference on Information Systems* and the *Workshop on Information Technology and Systems*. He is currently serving as an Associate Editor and Editorial Board member at *Information Systems Research*.