

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

Seminar Announcement

*Critical mass and willingness to pay for social networks*

by

*Professor J. Christopher Westland*  
*Department of Information & Decision Sciences*  
*University of Illinois*

**Date: 13 February 2009 (Friday)**

**Time: 2:30 – 3:30 pm**

**Venue: Room 4379, ISOM Conference Room (L17/18)**

~~~~~ All interested are welcome ~~~~~

**Abstract**

Disagreement surrounds the formal definitions of ‘critical mass’ and of the economic willingness to pay for membership in a social network. The current paper adapts work from percolation theory to analyze the structure of social networks, and draws an analogy for critical mass in social networks to the concept of phase changes in materials. We show how network growth can be actively managed, and define how to manage the willingness to pay for membership. We show, if achieving a critical mass of members in a social network is our objective, that prior to achieving critical mass, (1) the probability of accepting an invitation  $p$  must vary inversely with individuals’ breadth of contacts; and (2) the number of special interest groups of any size  $s$  will decrease exponentially in  $s$  until immediately below critical mass. Targeted invitations facilitated through sophisticated programs such as AdWords, IndexTools and Google Analytics can help to actively maximize probability of accepting an invitation. Our model defines a willingness to pay for network membership (i.e., a network effect) that is nearly zero below critical mass, and is an involved function of  $p$  above critical mass whose shape appears to be close to a logarithmic function.

**Biography**

J. Christopher Westland is Professor and Head of the Department of Information & Decision Sciences at the University of Illinois – Chicago. He holds a BA in mathematics and an MBA in accounting. He received his PhD in Computers and Information Systems from the University of Michigan. Dr Westland has professional experience in the US as a certified public accountant and as a consultant in information services in the US, Europe, Latin America and Asia. Dr Westland is the author of numerous academic papers and of six books: *Financial Dynamics* (Wiley 2003); *Valuing Technology* (Wiley 2002); *Global Electronic Commerce* (MIT Press 2000); *Global Innovation Management* (Palgrave Macmillan 2008); *Dot-Khan: the Ascent of the Chinese Internet* (Cyan, 2009); and *Global e-Business* (Oxford, 2009). He has served on the editorial boards of Management Science, ISR, IJEC, SSRN, and other scholarly journals, and has served on the faculties at the University of Michigan, University of Southern California, Tsinghua University, Nanyang Technological University, and other academic institutions. Dr Westland has advised on valuation and technology strategy for Microsoft, Intel, Motorola, V-Tech, Aerospace Corporation, IBM, Pacific Bell, and other technology firms.