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Research Spotlights

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Research Spotlights

Research Commentary: Information Technology Substitution Revisited (p. 480)

Dawei Zhang, Zhuo (June) Cheng,
Hasan A. Qurban H. Mohammad, Barrie R. Nault

Critical to our society, economy, and research in information systems (IS) is the impact of information technology (IT) on production, jobs, and other capital. This paper constructs a novel economic measure that determines the trade-offs between the amounts of labor, non-IT capital, and IT capital used in production as the result of wage or price changes. Understanding these trade-offs as the ability of IT capital to substitute for other inputs in production allows managers and policy makers to take advantage of price-adjusted performance improvements. By analyzing an economy-wide industry-level data set covering 1998–2009, the authors find that reductions in the price of IT increase the relative quantity of IT capital in use but are unlikely to change the input share of IT capital—the value of IT capital as a proportion of the value of all inputs. The insight for management is that even though more IT is used due to price declines and quality improvements, IT capital does not cost more as a proportion of the total production cost.

Network Dynamics: How Can We Find Patients Like Us? (p. 496)

Lu (Lucy) Yan, Jianping Peng, Yong Tan

As a good example of social media application in healthcare, online healthcare communities are found to be particularly useful in providing opportunities for patients to help each other. Earlier studies have shown that social networks affect patients' health and reshape their health behaviors and coping strategies; therefore, it is important to understand how they build their own networks with other patients, especially the ones who have similar medical conditions. By studying individuals and their communication ties in an online healthcare social network, the authors find empirical evidence that health-related traits influence their social connections and that a patient's network layout is shaped by her cognitive capabilities. They also observe that patients are reluctant to form very close connections in online healthcare communities.

The insight for management: Despite various advanced tools to enhance user experience, patients in online healthcare communities are found to focus more

on the diversity of information than the concern for reliability. To provide a healthy environment which is crucial for patients' retention and social exchange among them, service providers need to employ mechanisms to improve information quality, knowledge exchange, and especially trust among patients in the virtual space.

IT-Enabled Broadcasting in Social Media: An Empirical Study of Artists' Activities and Music Sales (p. 513)

Hailiang Chen, Prabuddha De, Ye Jeffrey Hu

With the emergence of social media and Web 2.0, broadcasting in the online environment has evolved into a new form of marketing due to the much broader reach, enabled by information technology, compared to what was possible in the past. The authors quantify the effect of artists' broadcasting activities on a well-known social media site for music, MySpace, on the sales of their music, by characterizing two types of broadcast messages, personal and automated. They find that broadcasting in social media has a significant effect on sales, even after controlling for potentially influential factors such as advertising in traditional media channels, album prices, new music releases, user-generated content, and artist popularity. More importantly, they observe that this effect mainly comes from personal messages rather than automated ones. The insight for management: Conducting captivating personal conversations with customers is the key to success in social media marketing. Since the timing and content of such conversations influence the success, firms can optimize the effectiveness of their marketing campaigns by adjusting these factors.

Recommendations Using Information from Multiple Association Rules: A Probabilistic Approach (p. 532)

Abhijeet Ghoshal, Syam Menon, Sumit Sarkar

Recommender systems have enabled firms to effectively target customers with products and services and helped alter the e-commerce landscape. One common technique used to make recommendations involves association rules, which are if/then statements mined from historical market basket datasets to identify relationships across seemingly unrelated items (e.g., the well-cited beer and diapers association). A desirable characteristic of association rules is that they can provide probability estimates along with the mined rules;

this can enable firms to evaluate alternative recommendations using a formal decision theoretic framework. The use of probability calculus enables us to develop a theoretically sound analytical approach to combine information from multiple mined rules to improve the quality of recommendations. Although combining rules in order to identify items to recommend in an optimal manner is in principle a hard problem, we develop a heuristic that provides near-optimal combinations of rules in a fraction of a second. A variety of experiments show that the recommendations made by our approach are more accurate than those made by other state-of-the-art benchmarks, including collaborative filtering and matrix factorization.

The insight for management is that rules can be judiciously combined in real time on e-commerce websites by the use of appropriate analytic techniques, and the resulting improvements in recommendation accuracy should translate to corresponding increases to the bottom lines of firms deploying it.

Contemporaneous and Delayed Sales Impact of Location-Based Mobile Promotions (p. 552)
Zheng Fang, Bin Gu, Xueming Luo, Yunjie Xu

With the wide adoption of mobile technologies, location-based mobile promotion (LMP) has been increasingly used by businesses to attract foot traffic in real time. How does it really affect product sales? Common wisdom suggests that the main effect of LMP is likely to be contemporaneous, because LMP is used to target potential customers in the vicinity. Using a randomized field experiment with 22,000 mobile users with LMP for discounted movie tickets, we find that LMP not only has a strong contemporaneous effect but also a delayed effect for 12 days on product sales. Furthermore, we find that LMP can generate six times of product purchases than non-LMPs, and the total sales effect of LMP could be underestimated by 54% if the delayed sales effect is ignored.

The insight for management: LMP is not just for attracting foot traffic in real time but can also generate product/store awareness that leads to future purchases. Compared with traditional communication technologies, mobile technologies offer unique characteristics, i.e., higher accessibility and location sensitivity. Managers should understand that LMPs promise a new marketing channel to target consumers at the right time and right place and proffer business value in the long run.

Information Disclosure and the Diffusion of Information Security Attacks (p. 565)
Sabyasachi Mitra, Sam Ransbotham

Policies regarding the disclosure of sensitive information have become the focus of significant discussion

in several contexts including information security. Should we disclose information that defenders need to protect systems, but that can also be used for nefarious purposes by attackers? Our empirical study examines the exploitation of software vulnerabilities by a population of attackers. We compare attacks based on software vulnerabilities disclosed through full disclosure and limited disclosure mechanisms. We find that full disclosure accelerates the diffusion of attacks, increases the penetration of attacks within the target population, and increases the risk of first attack after the vulnerability is reported. Interestingly, the effect of full disclosure is greater during periods when there are more overall vulnerabilities reported, indicating that attackers may strategically focus on busy periods for security professionals. Although the aggregate volume of attacks remains unaffected by full disclosure, attacks occur earlier in the life cycle of the vulnerability when the larger population of systems is less likely to be protected. Overall, limited disclosure decreases risk of attack from a software vulnerability, but it can also reduce incentives for software vendors to create better software and can reduce the awareness of defenders about the vulnerability.

Research Note: Why Following Friends Can Hurt You: An Exploratory Investigation of the Effects of Envy on Social Networking Sites among College-Age Users (p. 585)

Hanna Krasnova, Thomas Widjaja, Peter Buxmann, Helena Wenninger, Izak Benbasat

Recent studies increasingly report a negative association between the use of social networking sites (SNSs) and users' subjective well-being. However, the reasons behind these unfavorable effects remain unclear. Focusing on college-age users, the authors suggest that envy can be the missing link in this underexplored relationship. In an exploratory study with 684 users, it is shown that envy is a common reaction to self-presentation of others on an SNS, with "travel and leisure" leading the list of the most common objects of envy. In a further study with 509 users it is demonstrated that envy represents a mechanism that underlies a negative link between the use of SNSs for following information of others and users' well-being. In addition, the authors provide evidence that feelings of envy may also explain the proliferation of self-promotional behaviors on SNSs—a phenomenon they term as the "self-enhancement envy spiral." The insight for management: The use of SNSs is not always pleasant: It can lead to envy, and consequently a loss of well-being and increase in self-promotion behaviors. To ensure their long-term sustainability SNS providers are advised to minimize exposure of young adults to envy-inducing content. Advertisers should account for envious moods

when considering SNSs as possible outlets. The insight for policy: Potential for the loss in well-being calls for caution with regard to the use of SNSs especially by young adults.

Research Note: Migration of Service to the Internet: Evidence from a Federal Natural Experiment (p. 606)
Kai-Lung Hui, I. P. L. Png

Businesses like airlines and banks and all levels of government seek to economize on resources by migrating services to online channels. How does compulsory migration of a service to an online channel affect consumer demand? We exploit a natural experiment in the implementation of the U.S. National Do Not Call Registry to identify the causal effect of a compulsory migration to an online channel. The government allowed western states to register by telephone and through the Internet at all times but allowed the eastern states to register only through the Internet in the first 10 days. Comparing consumer responses in the east (only Internet channel available in the first 10 days) and west (both Internet and telephone channels available), we find robust evidence that many consumers preferred service through the telephone channel. Some were able to cope and registered through the Internet, but 4.3% of consumers who were otherwise interested in the service were lost. The effect was smaller among more educated people. We advise that organizations seeking to migrate service to online channels either continue to provide an option for conventional service (perhaps

rationed in some way) or prepare for a permanent loss of consumers, particularly among the less educated.

Research Note: An Exploration of Risk Characteristics of Information Security Threats and Related Public Information Search Behavior (p. 610)
Jingguo Wang, Nan Xiao, H. Raghav Rao

Information security (IS) threats are increasingly pervasive, and search engines are being used by the public as the primary tool for searching for relevant information. Information that users receive from their searches can be used to overcome knowledge deficiency and to improve IS. Using surveys and a search engine log, the authors evaluate how the risks of IS threats can be characterized and how risk characteristics affect public searches for information on IS threats. The results show that risk characteristics of different IS threats have two dimensions: unknown risks, which are less understood, fairly new, and difficult to observe, and dread risks, which have an immediate and severe impact and are more dreadful. These two risk characteristics drive users' search behaviors in different ways.

The insight for management: To make their existing IS policies and technologies more effective, organizations should motivate and actively engage users in knowledge discovery of IS. In addition, in communicating a particular threat with their users, organizations should tailor their messages based on its risk characteristics to avoid any underestimation or misunderstanding of the threat.