



**Candidate Papers for the:
European Research Paper of the Year 2017 Award**

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Information Systems Research

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Rate of Trade? Identifying Winning Ideas in Open Idea Sourcing

Authors:

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Abstract:

Information technology (IT) has created new patterns of digitally-mediated collaboration that allow open sourcing of ideas for new products and services. These novel sociotechnical arrangements afford finely-grained manipulation of how tasks can be represented and have changed the way organizations ideate. In this paper, we investigate differences in behavioral decision-making resulting from IT-based support of open idea evaluation. We report results from a randomized experiment of 120 participants comparing IT-based decision-making support using a rating scale (representing a judgment task) and a preference market (representing a choice task). We find that the rating scale-based task invokes significantly higher perceived ease of use than the preference market-based task and that perceived ease of use mediates the effect of the task representation treatment on the users' decision quality. Furthermore, we find that the understandability of ideas being evaluated, which we assess through the ideas' readability, and the perception of the task's variability moderate the strength of this mediation effect, which becomes stronger with increasing perceived task variability and decreasing understandability of the ideas. We contribute to the literature by explaining how perceptual differences of task representations for open idea evaluation affect the decision quality of users and translate into differences in mechanism accuracy. These results enhance our understanding of how crowdsourcing as a novel mode of value creation may effectively complement traditional work structures.

Information Systems Research, March 2016, p.27-48.

Managing Citizens' Uncertainty in E-Government Services: The Mediating and Moderating Roles of Transparency and Trust

Authors:

Venkatesh, Viswanath	University of Arkansas
Thong, James Y. L.	Hong Kong University of Science and Technology
Chan, Frank K. Y.	ESSEC Business School
Hu, Paul J. H.	University of Utah

Abstract:

This paper investigates how citizens' uncertainty in e-government services can be managed. First, we draw from uncertainty reduction theory, and propose that transparency and trust are two key means of reducing citizens' uncertainty in e-government services. Second, we identify two key sets of relevant drivers of e-government service use: (1) information quality characteristics, i.e., accuracy and completeness; and (2) channel characteristics, i.e., convenience and personalization. We propose that the means of uncertainty reduction, information quality characteristics, and channel characteristics are interrelated factors that jointly influence citizens' intentions to use e-government. We tested our model with 4,430 Hong Kong citizens' reactions to two e-government services: government websites and online appointment booking. Our results show that the information quality and channel characteristics predict citizens' intentions to use e-government. Furthermore, transparency and trust mediate as well as moderate the effects of information quality and channel characteristics on intentions. A follow-up survey found that citizens' intentions predict use and ultimately, citizens' satisfaction.

Information Systems Research, March 2016, p.87-111

Framing Innovation Opportunities While Staying Committed to an Organizational Epistemic Stance

Authors:

Fayard, Anne-Laure	New York University
Gkeredakis, Emmanouil	University of Warwick
Levina, Natalia	New York University

Abstract:

This paper examines how an organization's culture, and in particular its stance toward the pursuit of knowledge and innovation, matters when confronting new digitally enabled practices for generating novel insights. We draw on an in-depth interpretive study of how two innovation consulting firms encountered crowdsourcing for innovation. Our findings suggest that, although both organizations relied on a similar set of organizational arrangements in their daily consulting work, they enacted different positions vis-à-vis crowdsourcing: one firm further experimented with it, whereas the other rejected it altogether. These different positions emerged as organizational actors examined, framed, and evaluated crowdsourcing as an alternative for generating knowledge. To interpret these findings, we draw on philosophy of science and develop the concept of organizational epistemic stance, defined as an attitude that organizational actors collectively enact in pursuing knowledge. Our analysis suggests that when organizational actors encounter and explore information technology-enabled practices, such as crowdsourcing and big data analytics, they are likely to remain committed to their epistemic stance to frame such practices and judge their potential value for pursuing knowledge. This paper contributes to our understanding of encounters with, and adoption and diffusion of, new organizational practices and offers new ways of thinking about crowdsourcing.

Information Systems Research, June 2016, p. 302-323

On the Ontological Quality and Logical Quality of Conceptual-Modeling Grammars: The Need for a Dual Perspective

Authors:

Clarke, Roger	Queen's University of Belfast
Burton-Jones, Andrew	University of Queensland
Weber, Ron	University of Queensland and Monash University

Abstract:

A core activity in information systems development involves building a conceptual model of the domain that an information system is intended to support. Such models are created using a conceptual-modeling (CM) grammar. Just as high-quality conceptual models facilitate high-quality systems development, high-quality CM grammars facilitate high-quality CM. This paper provides a new perspective on ways to improve the quality of the semantics of CM grammars. For many years, the leading approach to this topic has relied on ontological theory. We show, however, that the ontological approach captures only half the story; it needs to be coupled with a logical approach. We explain how the ontological and logical qualities of CM grammars interrelate. Furthermore, we outline three contributions of a logical approach to evaluating the quality of CM grammars: a means of seeing some familiar CM problems in simpler ways, illumination of new problems, and proving the benefit of modifying existing CM grammars in particular ways. We demonstrate these benefits in the context of the Entity-Relationship grammar. More generally, our paper opens a new area of research with many opportunities for future research and practice.

Information Systems Research, June 2016, p. 365-382

Effect of Knowledge-Sharing Trajectories on Innovative Outcomes in Temporary Online Crowds

Authors:

Majchrzak, Ann
Malhorta, Arvind

University of Southern California and ESADE Business School
University of North Carolina

Abstract:

There is substantial research on the effects of formal control structures (i.e., incentives, identities, organization, norms) on knowledge sharing leading to innovative outcomes in online communities. However, there is little research on how knowledge-sharing trajectories in temporary online crowds create innovative outcomes without these structures. Such research is particularly of interest in the context of temporary online crowds solicited with crowdsourcing in which there is only minimal structure for knowledge sharing. We identify eight types of crowdsourcing with different knowledge-sharing patterns. The focus of this study is on the one type of crowdsourcing—collaborative innovation challenges—in which there is the least restriction on knowledge sharing in the crowd. A content analysis was conducted of all time-stamped posts made in five different collaborative innovation challenges to identify different knowledge-sharing trajectories used. We found that a paradox-framed trajectory was more likely to be followed by innovative outcomes compared to three other knowledge-sharing trajectories. A paradox-framed trajectory is one in which a novel solution emerges when different participants post in the following sequence: (1) contributing a paradox associated with the problem objective, (2) sharing assumptions to validate the paradox, and (3) sharing initial ideas for resolving the paradox in a manner that meets the problem statement. Based on the findings, a theory of paradox-framed trajectories in temporary online crowds is presented along with implications for knowledge creation theories in general and online knowledge-creating communities in particular.

Information Systems Research, December 2016, p. 685-703

Creating Value in Online Communities: The Sociomaterial Configuring of Strategy, Platform, and Stakeholder Engagement

Authors:

Barrett, Michael	Cambridge University
Oborn, Eivor	University of Warwick
Orlikowski, Wanda	Massachusetts Institute of Technology

Abstract:

How is value created in an online community (OC) over time? We explored this question through a longitudinal field study of an OC in the healthcare arena. We found that multiple kinds of value were produced and changed over time as different participants engaged with the OC and its evolving technology in various ways. To explain our findings, we theorize OC value as performed through the ongoing sociomaterial configuring of strategies, digital platforms, and stakeholder engagement. We develop a process perspective to explain these dynamics and identify multiple different kinds of value being created by an OC over time: financial, epistemic, ethical, service, reputational, and platform. Our research points to the importance of expanding the notion of OC users to encompass a broader understanding of stakeholders. It further suggests that creating OC value increasingly requires going beyond a dyadic relationship between the OC and the firm to encompassing a more complex relationship involving a wider ecosystem of stakeholders.

Information Systems Research, December 2016, p. 704-723

Intellectual Property Norms in Online Communities: How User-Organized Intellectual Property Regulation Supports Innovation

Authors:

Bauer, Julia	Fraunhofer Venture
Franke, Nikolaus	WU Vienna University of Economics and Business
Tuertscher, Philipp	VU Amsterdam

Abstract:

In many online communities, users reveal innovative and potentially valuable intellectual property (IP) under conditions that entail the risk of theft and imitation. When there is rivalry and formal IP law is not effective, this could lead to underinvestment or withholding of IP, unless user-organized norms compensate for these shortcomings. This study is the first to explore the characteristics and functioning of such a norms-based IP system in the setting of anonymous, large-scale, and loose-knit online communities. To do so, we use data on the Threadless crowdsourcing community obtained through netnography, a survey, and a field experiment. On this basis, we identify an integrated system of well-established norms that regulate the use of IP within this community. We analyze the system's characteristics and functioning, and we find that the "legal certainty" it provides is conducive to cooperation, cumulative effects, and innovation. We generalize our findings from the case by developing propositions aimed to spark further research. These propositions focus on similarities and differences between norms-based IP systems in online and off-line settings, and the conditions that determine the existence of norms-based IP systems as well as their form and effectiveness in online communities. In this way, we contribute to the literatures on norms-based IP systems and online communities and offer advice for the management of crowdsourcing communities.

Information Systems Research, December 2016, p. 724-750

Turbulent Stability of Emergent Roles: The Dualistic Nature of Self-Organizing Knowledge Coproduction

Authors:

Arazy, Ofer	University of Haifa
Daxenberger, Johannes	Technische Universität Darmstadt
Lifshitz-Assaf, Hila	New York University
Nov, Oded	New York University
Gurevych, Iryna	Technische Universität Darmstadt and German Institute for Educational Research

Abstract:

Increasingly, new forms of organizing for knowledge production are built around self-organizing coproduction community models with ambiguous role definitions. Current theories struggle to explain how high-quality knowledge is developed in these settings and how participants self-organize in the absence of role definitions, traditional organizational controls, or formal coordination mechanisms. In this article, we engage the puzzle by investigating the temporal dynamics underlying emergent roles on individual and organizational levels. Comprised of a multilevel large-scale empirical study of Wikipedia stretching over a decade, our study investigates emergent roles in terms of prototypical activity patterns that organically emerge from individuals' knowledge production actions. Employing a stratified sample of 1,000 Wikipedia articles, we tracked 200,000 distinct participants and 700,000 coproduction activities, and recorded each activity's type. We found that participants' role-taking behavior is turbulent across roles, with substantial flow in and out of coproduction work. Our findings at the organizational level, however, show that work is organized around a highly stable set of emergent roles, despite the absence of traditional stabilizing mechanisms such as predefined work procedures or role expectations. This dualism in emergent work is conceptualized as "turbulent stability." We attribute the stabilizing factor to the artifact-centric production process and present evidence to illustrate the mutual adjustment of role taking according to the artifact's needs and stage. We discuss the importance of the affordances of Wikipedia in enabling such tacit coordination. This study advances our theoretical understanding of the nature of emergent roles and self-organizing knowledge coproduction. We discuss the implications for custodians of online communities as well as for managers of firms engaging in self-organized knowledge collaboration.

Information Systems Research, December 2016, p. 792-812

Folding and Unfolding: Balancing Openness and Transparency in Open Source Communities

Authors:

Shaikh, Maha	University of Warwick
Vaast, Emmanuelle	McGill University

Abstract:

Open source communities rely on the espoused premise of complete openness and transparency of source code and development process. Yet, openness and transparency at times need to be balanced out with moments of less open and transparent work. Through our detailed study of Linux Kernel development, we build a theory that explains that transparency and openness are nuanced and changing qualities that certain developers manage as they use multiple digital technologies and create, in moments of needs, more opaque and closed digital spaces of work. We refer to these spaces as digital folds. Our paper contributes to the extant literature by providing a process theory of how transparency and openness are balanced with opacity and closure in open source communities according to the needs of the development work; by conceptualizing the nature of digital folds and their role in providing quiet spaces of work; and, by articulating how the process of digital folding and unfolding is made far more possible by select elite actors' navigating the line between the pragmatics of coding and the accepted ideology of openness and transparency.

Information Systems Research, December 2016, p. 813-833

Why Do Adults Engage in Cyberbullying on Social Media? An Integration of Online Disinhibition and Deindividuation Effects with the Social Structure and Social Learning Model

Authors:

Lowry, Paul Benjamin	University of Hong Kong
Zhang, Jun	University of Hong Kong
Wang, Chuang	South China University of Technology
Siponen, Mikko	University of Jyväskylä

Abstract:

The dramatic increase in social media use has challenged traditional social structures and shifted a great deal of interpersonal communication from the physical world to cyberspace. Much of this social media communication has been positive: Anyone around the world who has access to the Internet has the potential to communicate with and attract a massive global audience. Unfortunately, such ubiquitous communication can be also used for negative purposes such as cyberbullying, which is the focus of this paper. Previous research on cyberbullying, consisting of 135 articles, has improved the understanding of why individuals—mostly adolescents—engage in cyberbullying. However, our study addresses two key gaps in this literature: (1) how the information technology (IT) artifact fosters/inhibits cyberbullying and (2) why people are socialized to engage in cyberbullying. To address these gaps, we propose the social media cyberbullying model (SMCBM), which modifies Akers' [Akers RL (2011) *Social Learning and Social Structure: A General Theory of Crime and Deviance*, 2nd ed. (Transaction Publishers, New Brunswick, NJ)] social structure and social learning model. Because Akers developed his model for crimes in the physical world, we add a rich conceptualization of anonymity composed of five subconstructs as a key social media structural variable in the SMCBM to account for the IT artifact. We tested the SMCBM with 1,003 adults who have engaged in cyberbullying. The empirical findings support the SMCBM. Heavy social media use combined with anonymity facilitates the social learning process of cyberbullying in social media in a way that fosters cyberbullying. Our results indicate new directions for cyberbullying research and implications for anticiberbullying practices.

Information Systems Research, December 2016, p. 962-986

MIS Quarterly

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An Exploratory Study of the Formation and Impact of Electronic Service Failures

Authors:

Tan, Chee-Wee	Copenhagen Business School
Benbasat, Izak	University of British Columbia
Cenfetelli, Ronald T.	University of British Columbia

Abstract:

E-commerce service failures have been the bane of e-commerce, compelling customers to either abandon transactions entirely or switch to traditional brick-and-mortar establishments. Yet, there is a paucity of studies that investigates how such failures manifest on e-commerce websites and their impact on consumers. This paper, therefore, synthesizes extant literature on e-service and system success to arrive at a novel classification system that delineates e-commerce service failures into information, functional, and system categories, each with its own set of constituent dimensions. Extending expectation disconfirmation theory (EDT), we further distinguish among disconfirmed outcome, process, and cost expectancies as major consequences of e-commerce service failures. A theoretical model of e-commerce service failure classifications and their consequences was constructed together with testable propositions that relate the three failure categories to consumers' disconfirmed expectancies. Finally, we explore the validity of our theoretical model based on descriptive accounts of actual occurrences of e-commerce service failures and their corresponding consequences. Consistent with our theoretical model, information and functional failures were found to be associated with disconfirmed outcome and process expectancies respectively. System failures, on the other hand, do not affect consumers' disconfirmed expectancies, thereby contradicting our predictions. Post hoc analysis on constituent dimensions of information, functional, and system failures yielded additional insights on the preceding observations.

MIS Quarterly, March 2016, p. 1-A31

Contract Design Choices and the Balance of *Ex Ante* and *Ex Post* Transaction Costs in Software Development Outsourcing

Authors:

Benaroch, Michel
Lichtenstein, Yossi
Fink, Lior

Syracuse University
University of East Anglia
Ben-Gurion University of the Negev

Abstract:

This paper examines multiple contract design choices in the context of transaction and relational attributes and consequent ex ante and ex post transaction costs. It focuses on two understudied themes in the IT outsourcing literature. First, while the literature is predominantly concerned with opportunism and consequent ex post hazard costs that contracts can safeguard against, parties to a contract also economize on ex ante transaction costs by their choice of contract type and contract extensiveness. Second, the literature studies the aggregate extensiveness of contracts rather than of distinct contract functions: safeguarding, coordination, and adaptability. Against this backdrop, our research model portrays a nuanced picture that is anchored in the following theoretical interpretation: transaction and relational attributes have implications on specific ex ante and ex post transaction costs, and these implications can be balanced by respective choices in both contract type and the extensiveness of specific contract functions. These two contract design choices complement and substitute for each other in their ability to economize on specific transaction costs. Our analysis of 210 software development outsourcing contracts finds that explanatory power increases when analyzing the extensiveness of individual contract functions rather than the aggregate contract extensiveness, highlighting subtle competing influences that are otherwise masked by an aggregate measure. Our analysis also shows that a preference for time-and-material contracts counteracts the effect of certain transaction attributes on contract extensiveness, and even cancels it out in the case of transaction uncertainty.

MIS Quarterly, March 2016, P. 57-82

Designing for Digital Transformation: Lessons for Information Systems Research from the Study of ICT and Societal Challenges.

Authors:

Majchrzak, Ann	University of Southern California
Markus, M. Lynne	Bentley University
Wareham, Jonathan	ESADE

Abstract:

The article discusses the four implications of the 14 papers in the special issue for any IS research that aims to contribute to the improvement of societal or business conditions. These include that IS researchers interested in societal or business change should expand their definitions of theory to include theories of the problem and of the solution and for IS researchers interested in societal or business change to consider emergent digital designing as a replacement for organizations.

MIS Quarterly, June 2016, P. 267-278

Digital Action Repertoires and Transforming a Social Movement Organization

Authors:

Selander, Lisen	University of Gothenburg
Jarvenpaa, Sirkka L.	The University of Texas

Abstract:

The article addresses the question of how values influence the relationships between a social movement organization (SMO), its supporters and its digital action repertoires in the context of the Swedish affiliate of Amnesty International, a widely recognized and impactful SMO. It cites investigation on how the Swedish affiliate of Amnesty International responded to opportunities to use digital action repertoires and how digital action repertoires changes the interactions and transform the SMO.

MIS Quarterly, June 2016, p. 331-352

A Multiagent Competitive Gaming Platform to Address Societal Challenges

Authors:

Ketter, Wolfgang	Erasmus University
Peters, Markus	Erasmus University
Collins, John	University of Minnesota
Gupta, Alok	University of Minnesota

Abstract:

The article discusses a study that addresses the question of how competitive simulation games can be used to design and evaluate interventions in societal challenges such as making the electric power systems more sustainable. It cites a novel competitive approach called competitive benchmarking (CB) consisting of four elements that include a community-developed competitive simulation, competitive intelligent agents and an open repository of research artifacts and data to answer this question.

MIS Quarterly, June 2016, p. 447-460

The Emergence of Self-Organizing E-Commerce Ecosystems in Remote Villages of China: A Tale of Digital Empowerment for Rural Development

Authors:

Leong, Carmen	University of New South Wales
Pan, Shan L.	University of New South Wales
Newell, Sue	University of Sussex
Cui, Lili	Shanghai University of Finance and Economics

Abstract:

The article discusses a study on the recent emergence of e-commerce villages in rural China that epitomizes information and communication technology (ICT)-enabled development driven by a community. It presents 2 cases of e-commerce villages in rural China to address the research question of how ICT creates and empowers critical actors in a marginalized community. It suggests a definition that will generate a better understanding of ICT-enabled transformation in different economies.

MIS Quarterly, June 2016, P. 475-484

Identity Verification and Societal Challenges: Explaining the Gap Between Service Provision and Development Outcomes

Authors:

McGrath, Kathy

Brunel University

Abstract:

The article focuses on 3 case studies of national identity verification systems and the development of a mechanism-based account to explain outcomes achieved in each case and outlines the importance of trust and distrust in explaining the implementation outcomes from identity verification systems. The study is based on the premise that ambivalence and suspicion are crucial concepts in explaining why some governments are more successful than others in introducing identity verification services.

MIS Quarterly, June 2016, p. 485-500

You Can't Bribe a Computer: Dealing with the Societal Challenge of Corruption Through ICT

Authors:

Srivastava, Shirish, C.	HEC Paris
Teo, Thompson S. H.	National University of Singapore
Devaraj, Sarv	University of Notre Dame

Abstract:

The article discusses a study that proposes an initial nomological network surrounding information and communication technology (ICT) and corruption and theorizes the salient role of basic national institutions and national stakeholder service systems into the mechanisms through which e-government affects corruption. It provides mechanisms by which corruption permeates from the institutional level to the functional service level in a nation and explains how e-government can alleviate it.

MIS Quarterly, June 2016, p. 511-526

TV's Dirty Little Secret: The Negative Effect of Popular TV on Online Auction Sales

Authors:

Hinz, Oliver

Hill, Shawndra

Kim, Ju-Young

TU Darmstadt

Microsoft Research

Karlsruhe Institute of Technology

Abstract:

The article discusses the effects of popular television (TV) shows on online auction sales on the German website Platform.com. Topics include exogenous effects of TV viewership in relation to endogeneity issues in an instrumental variable approach, cross-media effect in relation to consumer attention, and the effects of major news and sports events on TV viewership. The impacts of the 2006 soccer World Cup and the 2008 U.S. Presidential election are addressed.

MIS Quarterly, September 2016, p. 623-644

Exploring Bidder Heterogeneity in Multichannel Sequential B2B Auctions

Authors:

Lu, Yixin	George Washington University
Gupta, Alok	University of Minnesota
Ketter, Wolfgang	Erasmus University
Van Heck, Eric	Erasmus University

Abstract:

The article discusses business-to-business (B2B) auction bidding strategies in multichannel, sequential auctions, focusing on a market for cut flowers, the Dutch Flower Auctions (DFA). Topics include the roles of budgets and transaction costs in bidding strategies, the role of experience in shaping bidding strategies, and the economic impacts of bidding strategies in relation to bidder heterogeneity.

MIS Quarterly, September 2016, p. 645-662

Pirates in the Lab: Using Incentivized Choice Experiments to Explore Preference for (Un)Authorized Content

Authors:

Ćwiakowski, Piotr	University of Warsaw
Giergiczny, Marek	University of Warsaw
Krawczk, Michal	University of Warsaw

Abstract:

The article discusses the use of a laboratory experiment using incentivized choice to find consumer preferences for authorized film material. Topics include the impact of information on the use of funds from sales on the purchase of authorized films, psychological choice aspects of digital piracy, and the consideration of tradeoffs by study participants.

MIS Quarterly, September 2016, p. 709-715

Control Configuration and Control Enactment in Information Systems Projects: Review and Expanded Theoretical Framework

Authors:

Wiener, Martin	Bentley University
Mähring, Magnus	Stockholm School of Economics
Remus, Ulrich	University of Innsbruck
Saunders, Carol	Northern Arizona University

Abstract:

The article discusses the use of information systems (IS) project control in the deployment of information technology (IT). Topics include control portfolio configurations, the relation of control enactment to project control effectiveness, and the methodology used in research on IS project control. The notion of control style in controller-controllee relationships is noted in relation to power dynamics.

MIS Quarterly, September 2016, p. 741-774

Revisiting Group-Based Technology Adoption as a Dynamic Process: The Role of Changing Attitude-Rationale Configurations

Authors:

Bayerl, Petra Saskia

Lauche, Kristina

Axtell, Carolyn

Erasmus University Rotterdam

Radboud University

Sheffield University Management School

Abstract:

The article discusses the collective adoption of technology by groups in relation to the modification of technology adoption rationales and attitudes. Topics include the roles of subgroups in determining group technology adoption states (TASs), the creation of a qualitative approach for group technology adoption, and the continuance or discontinuance of information systems use. Factors in collective decision-making are noted.

MIS Quarterly, September 2016, p. 775-784

Transformational Issues of Big Data and Analytics in Networked Business

Authors:

Baesens ,Bart	KU Leuven and University of Southampton
Bapna, Ravi	University of Minnesota
Marsden, James R.	University of Connecticut
Vanthienen, Jan	KU Leuven
Zhao, J. Leon	City University of Hong Kong

Abstract:

The era of big data and analytics is upon us and is changing the world dramatically. The field of Information Systems should be at the forefront of understanding and interpreting the impact of both technologies and management so as to lead the efforts of business research in the big data era. We need to prepare ourselves and our students for this changing world of business. In this discussion, we focus on exploring the technical and managerial issues of business transformation resulting from the insightful adoption and innovative applications of data sciences in business. We end by providing an overview of the papers included in this special issue and outline future research directions.

MIS Quarterly, December 2016, p. 807-816

Mining Massive Fine-Grained Behavior Data to Improve Predictive Analytics

Authors:

Martens, David	University of Antwerp
Provost, Foster	New York University
Clark, Jessica	New York University
Junqué de Fortuny, Enric	Erasmus University Rotterdam

Abstract:

Organizations increasingly have access to massive, fine-grained data on consumer behavior. Despite the hype over “big data,” and the success of predictive analytics, only a few organizations have incorporated such fine-grained data in a non-aggregated manner into their predictive analytics. This paper examines the use of massive, fine-grained data on consumer behavior—specifically payments to a very large set of particular merchants—to improve predictive models for targeted marketing. The paper details how using this different sort of data can substantially improve predictive performance, even in an application for which predictive analytics has been applied for years. One of the most striking results has important implications for managers considering the value of big data. Using a real-life data set of 21 million transactions by 1.2 million customers, as well as 289 other variables describing these customers, the results show that there is no appreciable improvement from moving to big data when using traditional structured data. However, in contrast, when using fine-grained behavior data, there continues to be substantial value to increasing the data size across the entire range of the analyses. This suggests that larger firms may have substantially more valuable data assets than smaller firms, when using their transaction data for targeted marketing.

MIS Quarterly, December 2016, p. 869-888

Comprehensible Predictive Models for Business Processes

Authors:

Breuker, Dominic	Hitfox Group GmbH
Matzner, Martin	University of Muenster
Delfmann, Patrick	University of Koblenz-Landau
Becker, Jörg	University of Muenster

Abstract:

Predictive modeling approaches in business process management provide a way to streamline operational business processes. For instance, they can warn decision makers about undesirable events that are likely to happen in the future, giving the decision maker an opportunity to intervene. The topic is gaining momentum in process mining, a field of research that has traditionally developed tools to discover business process models from data sets of past process behavior. Predictive modeling techniques are built on top of process-discovery algorithms. As these algorithms describe business process behavior using models of formal languages (e.g., Petri nets), strong language biases are necessary in order to generate models with the limited amounts of data included in the data set. Naturally, corresponding predictive modeling techniques reflect these biases. Based on theory from grammatical inference, a field of research that is concerned with inducing language models, we design a new predictive modeling technique based on weaker biases. Fitting a probabilistic model to a data set of past behavior makes it possible to predict how currently running process instances will behave in the future. To clarify how this technique works and to facilitate its adoption, we also design a way to visualize the probabilistic models. We assess the effectiveness of the technique in an experimental evaluation with synthetic and real-world data.

MIS Quarterly, December 2016, p. 1009-1034

Competitive Benchmarking: An IS Research Approach to Address Wicked Problems with Big Data and Analytics

Authors:

Ketter, Wolfgang	Erasmus University
Peters, Markus	Erasmus University
Collins, John	University of Minnesota
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Abstract:

Wicked problems like sustainable energy and financial market stability are societal challenges that arise from complex sociotechnical systems in which numerous social, economic, political, and technical factors interact. Understanding and mitigating these problems requires research methods that scale beyond the traditional areas of inquiry of information systems (IS) individuals, organizations, and markets and that deliver solutions in addition to insights. We describe an approach to address these challenges through competitive benchmarking (CB), a novel research method that helps interdisciplinary research communities tackle complex challenges of societal scale by using different types of data from a variety of sources such as usage data from customers, production patterns from producers, public policy and regulatory constraints, etc. for a given instantiation. Further, the CB platform generates data that can be used to improve operational strategies and judge the effectiveness of regulatory regimes and policies. We describe our experience applying CB to the sustainable energy challenge in the Power Trading Agent Competition (Power TAC) in which more than a dozen research groups from around the world jointly devise, benchmark, and improve IS-based solutions.

MIS Quarterly, December 2016, p. 1058-1089