BUSINESS ANALYTICS: RADICAL SHIFT OR INCREMENTAL CHANGE?

ICIS 2012 PANEL STATEMENT

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Abstract

Business analytics systems are seen by many to be a growing source of value and competitive advantage for businesses. However, it is not clear if increasingly advanced analytical capabilities create opportunities for radical change in business or just represent an incremental improvement to existing systems. What are the key questions that researchers should be focusing on to improve our understanding of analytics? And are IS programs teaching students the right things to be successful in this environment? This panel aims to take stock of technological possibilities, practical experience and leading research to assess the current state and future direction of business analytics. In doing so, it will bring together senior researchers and industry representatives to share the leading challenges, opportunities and good practice that they see.

Keywords: *Intelligent systems, Competitive strategy, Cross disciplinary research, Data mining, Decision Support Systems (DSS), Disruptive technologies, Information resources, IS curriculum, IS research agenda, 17. Panels*

Introduction

Business analytics systems are seen by many to be a growing source of value and competitive advantage for businesses (Davenport 2006; LaValle et al. 2011). However, it is not clear if increasingly advanced analytical capabilities create opportunities for radical change in business or just represent an incremental improvement to existing systems.

While conceptually the same as previous generations of decision support technologies, business analytics systems are marked by their increasing focus on pattern recognition and prediction, rather than historical reporting. These systems take advantage of the convergence of two key developments in technology.

First, they draw on the vast explosion of "big data" in recent years, which is projected to continue in the future. While content continues to grow, the explosion in data is being driven particularly by internet activity, mobile technology and the embedding of chips in everyday physical items. Therefore, businesses can increasingly access a vast digital trail about where we are, what we are doing, what we like and the state and location of our physical assets (Brynjolfsson and McAfee 2011a; Lohr 2012).

The trend of "big data" is associated with 3 V's: Volume (large scale), Velocity (moving or streaming data), and Variety (data in different forms, e.g., numerical, text, video). One can add a fourth "V": Veracity. Increasingly, organizations have to deal with more and more uncertain data, i.e., inconsistent, imprecise, ambiguous, and sometimes deceptive data, especially from social media and sensors.

Second, analytics techniques are becoming more powerful, from reporting data to understanding and predicting, and increasingly to optimizing and learning systems that can continually adapt to new conditions. Providers of analytics solutions will need to deliver solutions at acceptable costs and in a consumable manner, without requiring armies of mathematicians for every problem.

This powerful combination of data and analytical techniques enables increasingly complex decisions to be automated. As a result, the possibility of automation is moving far beyond traditional transaction processing tasks into territory which has historically been seen as reliant on human judgment (Brynjolfsson and McAfee 2011b).

However, to what extent does this represent radical change in the business environment? What are the key questions that researchers should be focusing on? And are IS programs teaching students the right things to help them be successful in this environment?

This panel aims to take stock of technological possibilities, practical experience and leading research to assess the current state and future direction of business analytics. In doing so, it will bring together senior researchers and industry representatives to share the leading challenges, opportunities and good practice that they see.

The panel should appeal to a broad range of researchers, especially those interested in practice-orientated research, IT value and decision support technologies. It will also address important questions relating to the skills required of IS professionals and the implications for teaching.

The session will be written up for publication in the *Communications of the Association of Information Systems* journal and in ICAEW's communications with the business community.

Controversial Issues and Panelists' Positions

In order to determine the degree of radical change offered by analytics, it is necessary to consider two aspects. Firstly, analytics may change the external environment and require businesses to rethink their business models, their competitors and the way that they compete in the marketplace. Secondly, analytics may change the internal environment and require businesses to rethink the skills and resources they need, as well as their governance and decision-making structures. Therefore, to address the overall theme of whether we are seeing a radical shift in the business environment, the session will ask two questions:

- To what extent do increasingly advanced analytics systems represent a qualitative change in opportunities to generate value and competitive advantage?

- To what extent do organizations need to develop new resources, capabilities and skills to maximize the impact of analytics systems?

In addressing each question, panelists will consider the implications for both research and teaching:

- drawing on existing literature in the area and outlining where new research is needed; and

- identifying gaps and ways to improve IS teaching concerning analytics.

Question 1: To What Extent do Increasingly Advanced Analytics Systems Represent a Qualitative Change in Opportunities to Generate Value and Competitive Advantage?

Businesses have made substantial investments in reporting technologies for many years, from Executive Information Systems to Business Intelligence. However, it has often proved difficult to pinpoint tangible benefits generated by such systems and improved management information. This is reflected in a lack of research into the benefits of Business Intelligence systems (Jourdan, Rainer and Marshall 2008).

While there is emerging research on the value of being a data-driven organization (Brynjolfsson, Hitt and Kim 2011; Mithas, Ramasubbu and Sambamurthy 2011), there is a real need for greater insight into the ways in which organizations should prioritize their data investments and resources.

As capabilities become more sophisticated, and the amount of data available increases, the opportunities for generating value and competitive advantage will grow. However, analytics capabilities to date have largely concerned incremental change - being embedded into operational processes to improve the management of supply chains and customer relationships and incorporated into risk management processes to enable them to be more proactive.

Are there more radical possibilities to reshape industries and competitive landscapes? Which industries are likely to see most disruption as these capabilities become more sophisticated? And are incumbents well positioned to take advantage of these capabilities? Or is there space for new players?

Furthermore, while the technology may become highly sophisticated, there may be limits on the extent which we can exploit these capabilities in practice. For example, to what extent can analytics improve on the pattern recognition involved in human intuition and judgment (Kahneman 2011)? Where will human judgment continue to be vital? And what other factors may hinder business innovation with analytics?

Questions 2: To What Extent do Organizations Need to Develop New Resources, Capabilities and Skills to Maximize the Impact of Analytics Systems?

There is often an underlying assumption that improved information and tools will lead to better decisions by managers. In turn, better decisions will lead to improved organizational performance. As a result, the focus of research and practice has typically been on improving the quality of data and tools.

However, the presence of more or better information does not necessarily lead to better decisions. Even if managers can make better decisions, that may not translate into improved organizational performance. As a result, understanding and improving tools and data can only provide part of the picture and there is a need to build better understanding of how businesses actually use these systems in practice and the complementary resources needed to exploit them (Shanks et al. 2010). In particular:

- Analytics systems create new questions around organizational agility and our ability to respond to real-time information. How do we manage new risks of information overload, as organizations struggle to determine what data they need to capture and retain, and managers are faced with 24/7 communication channels?

- There may be significant new risks where business models are based on automated decisions. The use of automated trading systems, for example, has been the subject of significant research by economists and regulators. To what extent to we need to understand and control what systems are doing? And how do risk and governance processes need to change in order to manage these risks?

- Organizations are likely to need a wide range of skills in order to exploit business analytics systems, including technical skills, data skills, analytical skills and business skills. While IT departments may have some of these skills, they may have not the analytical skills in particular which may be required to exploit systems. Is this a matter of concern?

In the light of these questions, how should IT departments work with other areas of the organization to build capabilities and a data-orientated culture throughout the business? And what should IS and business students be taught, and how, to help them be successful in this environment (Mithas 2012)?

Panelists' Positions

The panel will bring together diverse perspectives from multiple geographic regions (e.g., Europe, Asia and the USA) in order to share knowledge and develop an agenda for research and teaching. This includes perspectives from:

- research, industry and business; and

- IS economics and decision support systems research.

Panelists will highlight research, thinking and practice based on their distinct perspective.

Value and competitiveness: Erik Brynjolfsson will draw on his research to highlight the economic aspects of analytics and the value that organizations can create through analytics.

Organizational capabilities: Sunil Mithas will draw on his research to discuss the complementary changes in strategies, governance and organizational processes that are needed to deliver benefits in practice (Mithas et al. 2012).

Technical possibilities and limitations: Manish Gupta will bring in his experience as Chief Technologist for IBM India in analytics-based innovations for service delivery to global clients and talk about where analytics technologies are headed over the next 5-10 years.

Business practice: Jane Griffin will focus on business use of analytics, good practices in the area and the skills and capabilities needed by businesses for success in this area.

Kirstin Gillon will moderate the panel. She will introduce each area by drawing on the experience of business use of analytics. ICAEW will liaise with its members prior to the conference to gain a rounded picture of experience in this area, particularly regarding financial information.

Panel Structure

The panel will primarily be run as a discussion between panelists and interaction with the audience. The objective will be to create a dialogue with minimal use of presentations that often result in monologues.

Each panelist will be given one minute to give an initial view as to whether business analytics represents qualitative or incremental change. This will be followed by an audience vote on the question and the gathering of initial audience comments and questions (15 minutes in total).

The session will then be divided into two segments. The moderator will introduce question 1 and invite panelists to comment (about 3 minutes each, 15 minutes in total). The discussion will then be opened up for questions and comments from the audience (about 20 minutes). The process will be repeated for question 2. Therefore, the discussion of each question will last around 35 minutes.

The session will be closed by conclusions and proposed next steps from each panelist (1 minute each).

A conference call will be held prior to the panel to enable panelists to plan their comments and the moderator to structure the session and focus the discussion accordingly.

Biographies

Erik Brynjolfsson

Erik Brynjolfsson is the Schussel Family Professor of Management at the MIT Sloan School of Management, the Director of the MIT Center for Digital Business, and a Research Associate at the National Bureau of Economic Research. He is the Chair of *MIT Sloan Management Review* and editor of the Information System Network. He has served on the Editorial Boards of the *Communications of the ACM*, *Information Systems Research*, *Information Technology and People*, *Journal of Organizational Computing and Electronic Commerce*, the *International Journal of Electronic Commerce*, and *Management Science*. Erik is also the past co-chairman of the Workshop on Information Systems and Economics

Kirstin Gillon

Kirstin Gillon is responsible for *Making Information Systems Work* thought leadership program of ICAEW, a leading professional body with 138,000 members and founded in 1880 as the Institute of Chartered Accountants in England and Wales. She is the principal author of the ICAEW's publications *Measuring IT Returns* and *Building Trust in a Digital Age: Rethinking Privacy, Property and Security*. She is lead author of the ICIS panel reports "Creating, Capturing and Measuring Value from IT Investments - Could We Do Better?", "Information Security and Privacy: Rethinking Governance Models" and "IT Innovation in China: Industry and Business Capabilities" in the *Communications of the Association of Information Systems*. She joined the ICAEW IT Faculty from PricewaterhouseCoopers, where she was a Senior Consultant in its IT consultancy practice. She has a Masters degree in international law from McGill University, Montreal.

Jane Griffin

Jane Griffin is the Deloitte Analytics US and global consulting practice leader and the former national service line leader for Deloitte Consulting LLP's Information Management practice. Jane has served on partner advisory boards for data management vendors and maintains high-level relationships with leading vendors in the information management sector. She authors a monthly column in Information Management magazine and has also published hundreds of articles in various trade journals. In addition, Jane participates in frequent international speaking engagements on topics such as big data, analytics, social media, data governance, master data management and performance management.

Manish Gupta

Manish Gupta is the Director of IBM Research - India and Chief Technologist for IBM India/South Asia. He leads a team developing breakthrough technologies underlying innovation in Services, Software and Systems. Previously, he has held senior leadership positions at IBM Research - India, IBM India Systems and Technology Lab, and the T. J. Watson Research Center, where he led research on software for the IBM Blue Gene supercomputer, which was awarded the 2008 National Medal of Technology and Innovation. Manish received a B.Tech. in Computer Science from IIT Delhi in 1987 and a Ph.D. from the University of Illinois at Urbana-Champaign in 1992. He has co-authored over 75 papers in the areas of high performance compilers, parallel and energy-efficient computing, and Java Virtual Machine optimizations, and has filed twenty patents. Manish is an ACM Distinguished Scientist and a member of the IBM Academy of Technology.

Sunil Mithas

Sunil Mithas is an associate professor at the Robert H. Smith School of Business at the University of Maryland and the author of the book *Digital Intelligence: What Every Smart Manager Must Have for Success in an Information Age*. He was identified as a 2011 MSI Young Scholar by the Marketing Science Institute. Sunil's research focuses on strategic management and the impact of information technology resources and has appeared in journals that include *Management Science, Information Systems Research, MIS Quarterly, Marketing Science, Journal of Marketing,* and *Production and Operations Management*. His papers have won the best paper awards and best paper nominations and featured in practice oriented publications such as *Harvard Business Review*, *MIT Sloan Management Review, Bloomberg, CIO.com, Computerworld,* and *InformationWeek*.

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