Introduction to the Special Issue on Decision Support Systems

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Introduction

Decision support systems (DSS) appeared as a research field and an information systems type in the early 1970s as researchers and managers strove to improve support to management decision makers through leveraging the data stored in management information systems (MIS), which had evolved a decade or more earlier. These transaction processing and reporting systems provided data which could be analysed and modelled using 'hard' tools and concepts from operations research such as optimisation and simulation, and 'soft' approaches from behavioural decision theory. These personal DSS were usually developed by individual, or small groups of, managers to support a single decision task. At the time, the development of these systems was aided by first the minicomputer with moderately user-friendly software for accessing and manipulating databases and financial modelling tools, then later the microcomputer, with spreadsheet software in particular. This support of the individual manager has continued with better, faster, and more flexible software, but DSS has also evolved to accommodate many forms:

- groups of various types through group support systems (GSS) and negotiation support systems (NSS),

- particular types of decision making, both individual and institutional, through executive information systems (EIS), often now referred to as business intelligence (BI),

- expansion of these EIS to a larger scale through data warehouses, and also to the use of artificial intelligence (fuzzy logic and expert systems) in intelligent DSS (IDSS), and

- knowledge-management based DSS focused on organisational learning and knowledge sharing.

DSS research of these various forms is now published and presented in many major journals and conferences, some relating to IS in general and others specialising in DSS.

IFIP Working Group 8.3 2004 Conference on Decision Support Systems

The IFIP Working Group 8.3 2004 Conference on Decision Support Systems was held in Prato, Italy, in July, 2004. This biannual conference is probably the major DSS conference and the 2004 conference contained 86 high quality papers covering all of the above sub-disciplines of DSS. A number of these papers were more highly rated by the reviewers and editors and were nominated for consideration by a small group of journals. A number of these indicated a preference for the Journal of Information Technology. These were reviewed by the editors of the special issue and, from these, eight papers were selected for consideration for this special issue. The authors of these papers were asked to expand and improve the papers in specific ways and, finally, five papers were accepted following this process. These five papers form the Journal of Information Technology Special Issue on Decision Support Systems.

The Selected Papers

The first paper, "A Critical Analysis of Decision Support Systems Research" by David Arnott and Graham Pervan, sets the scene for the whole issue and provides a thorough introduction to the DSS field and all of its sub-disciplines by critically analysing the nature and state of DSS research. The article achieves this by presenting a history of DSS research and practice and then critically analysing 1,020 DSS articles published in 14 major IS and DSS journals. They report that DSS publication is decreasing, and personal DSS and GSS dominate the DSS literature with data warehousing the least published, even though the latter is the most prevalent in practice. They present findings on publishing outlets for DSS, the extent of empiricism in DSS research and associated epistemologies (which reveal the dominance of positivism and design science as a major DSS research category). They also report on a lack of theory-based reference work for DSS, and the lack of clarity in client and user identification in DSS research and suggest strategies for overcoming some of these weaknesses.

The second paper, "A Semiotic Information Quality Framework: Development and Comparative Analysis" by Rosanne Price and Graeme Shanks, presents an information quality framework which is soundly structured, well grounded in theory (particularly semiotics and database integrity theory) and validated through a series of practitioner, academic, and end-user focus groups. The authors conclude that quality information is required for effective decision making in organisations and continuous information quality management is an essential element of decision support. While this is critically so for data warehousing decision support in particular, it applies equally to all forms of decision support. This paper addresses Arnott and Pervan's (2005) reported lack of focus on both data warehousing and solid reference theory.

The third paper, "Are Decision Support Systems Getting People to Conform? The Impact of Work Organisation and Segmentation on User Behaviour in a French Bank" by Franz Rowe, is an extensive longitudinal case study of the implementation of a decision support system to support financial advisors in a large French bank. This case study clearly identifies the client and users of the DSS, has a solid base in theory, collects and analyses both quantitative and qualitative data, and is longitudinal, thus addressing a number of the DSS research weaknesses identified above by Arnott and Pervan (2005) in their overview paper.

The fourth paper, "A Case in Customizing E-Learning" by Karen Neville, Ciara Heavin and Eoin Walsh, presents a qualitative case study that discusses the adoption of a Customer Relationship Management (CRM) philosophy in studying the evolution of e-learning and a Learning Management System (LMS) in a university environment. This electronic LMS is viewed as a kitbag of CRM tools to support both students and instructors, and the case study investigates the factors necessary for acceptance of electronic LMS by both types of users. As such it also addresses some of the weaknesses identified above and provides an example of a knowledge-management base DSS.

The fifth and final paper, "The Adoption and Use of Collaboration Information Technologies: International Comparisons" by Deepinder Bajwa, Floyd Lewis, Graham Pervan and Vincent Lai, presents an extensive survey which investigates factors which influence the adoption and utilisation of the full range of seven collaboration information technologies (CITs), a broad term synonymous with Group Support Systems (GSS). The survey was administered in organisations in three countries, USA, Australia and Hong Kong, which have differences in culture,

geography, structure, ownership, and scale, and reveals some similarities and many differences in CIT adoption and utilisation between these countries.

Conclusion

Collectively, these five papers provide examples of different types of DSS, highlight a number of the strengths of DSS research and address many of the weaknesses. They all come from different perspectives and are based on varying conceptual foundations. Together they represent a snap shot of key papers from the IFIP Working Group 8.3 2004 Conference on Decision Support Systems, and of DSS research in general.

This special issue would not have been possible without the cooperation and assistance of many people: most notably the authors who agreed to revise, extend and re-submit the papers, the reviewers of the original conference papers, and the conference organisers. We thank them and very much hope that you enjoy the papers in this Journal of Information Technology Special Issue on Decision Support Systems.

Reference

Arnott, D. and Pervan, G. (2005) A critical analysis of decision support systems research. *Journal of Information Technology*, **20**(2).