Editors’ Introduction

Information Systems Infrastructure
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Introduction

The first volume in the series presents a collection of papers on key themes, intellectual developments, and emergent issues in foundations, philosophy, and research methods in information systems (IS). Given the diversity in this area, the purpose of this collection is to draw together a number of classic texts and papers written by specialists in their respective fields. As the disciplinary area of information systems is comparatively new, there is a surprising breadth of scope. The IS field draws on a wide range of disciplines that encompass research traditions which sometimes seem poles apart. As with many new fields, this is coupled with striving to achieve respectability and thus there have been many debates regarding rigour and relevance, validity, identity and legitimacy. In order to provide an overview of this area, we have selected a number of influential papers.

The task of selecting material for inclusion is a difficult one. For the purpose of identifying key texts we began by forming an advisory panel and asked each member to recommend their ‘Top 10’ classic papers. One of the hardest decisions was not only which areas to cover, but also which to leave out. Whilst there was some degree of overlap, we were provided with 77 papers (see Appendix and chapters for the full list), and ideally many of these potentially interesting papers could have been included, space permitting. However, our brief for this volume in the series was to suggest 10–15 papers and we did so with the intention of providing a coherent overview of the subject matter. However, we are acutely aware of the many outstanding pieces of work that have not been included and this collection merely represents a starting point for understanding the area. We do not doubt that our selection can be argued about and so we strongly encourage the reader to pursue many of the other references that have been suggested and are provided as an Appendix.

Foundations

IS practice, relying on the use of computer technology, emerged in the early 1950s in the UK and US and grew rapidly worldwide in the 1960s and 1970s. The foundation of IS as an academic discipline is broadly agreed to have followed around the early-mid 1960s, with one of the earlier contributions being from Borre Langebors in Sweden, who pioneered the ‘infological approach’. The scene is set in a paper not in this volume (but see Appendix) written by Langebors (1963) on ‘Some Approaches to the Theory of Information Systems’. This early paper
set out the initial ideas, which distinguished between the infological problem of defining the information to be provided by the information system and the datalogical problem of designing the structure and operation of the system using information technology. The development of his work continued throughout the 1960s and 1970s, the further details of which are more fully discussed in Livirni and Lythinen (1998).

The first paper in this volume is by Mason (2004) on ‘The Legacy of LEO: Lessons learned from an English Tea and Cake Company’s Pioneering Efforts in Information Systems’ This was selected as an example of the contribution that historical awareness may add to the field of information systems research. Despite the offerings from the study of history, the IS community has not developed a strong tradition of historical research, perhaps because of its own lack of maturity. Arguably, historical sensitivity is especially pertinent in a field that is often driven by the ‘awesome potential’ of advanced information and communication technologies. If we are armed with the skills to identify changes and continuities within our field, we may be less inclined to be seduced by new technology, unaware of how to evaluate these changes within their historical context and origins.

This is followed with work by Mason and Mitroff (1973), whose paper ‘A Program for Research in Management Information Systems’ challenges what they describe as the narrow philosophical basis underlying the design of information systems. This basis assumes that there are only a limited number of elements, which comprise an information system; they suggest that other methods are also available for exploration. Although limited to a taxonomy of states for different variables (such as organizational context, class of problem, etc.), nevertheless, the paper challenges the orthodoxy that presupposes problems are well structured, occur within an operational control-hierarchical authority organizational context, and that a computer-based system offers the ‘solution’.

In the third paper of the present volume Earl and Hopwood (1986) add to the questioning of normative, technocratic solutions with a focus on the nature of information processing, with their account of ‘From Management Information to Information Management’. They call for a new perspective that shifts from a concern with management information as a technical phenomenon to a concern with information management as an organizational phenomenon. This shift would help refocus from the existing partial view, which looks at the formal and systematic and is often at variance with what happens in practice, to a broader approach that encompass the informal, the creative and the enterprising.

The fourth paper by Rob Kling (1987) on ‘Defining the Boundaries of Computing across Complex Organizations’ – offers a behaviourally grounded approach that extends traditional considerations of drawing boundaries around groups that influence the adoption and use of an information system. The criteria put forward for drawing boundaries are based on ‘web models’ and these are contrasted with discrete-entity models (described as rational, acontextual, and ahistorical), which were prevalent at the time. Web models are described as a form of ‘resource dependence’ in that they make explicit connections between technology and its social, political, and historical context. In this respect, they acknowledge the social complexity of development and how social forces shape their use. Web models emphasise the importance of the interplay of social and technical features. This notion of the social and the technical has been a recurring theme in debates concerning the nature of information systems¹. Kling went on
to develop these ideas further and subsequently was axiomatic in establishing a research area referred to as 'social informatics' (see the website for the Center for Social Informatics at: http://rkcsi.indiana.edu/), which focuses on social analyses of ICTS. This has close links with the sociotechnical movement, a more socially-oriented perspective which initially focussed on the sociotechnical 'fit' whereby the technical and the social system were developed with a view to maximising job satisfaction (see, for example, the work of Mumford and Weir (1979) that is discussed in some detail in the volume on systems development (REF), although the impact of this approach is far broader than systems development). Other contributions to the sociotechnical movement stressed the arbitrary and misleading nature of distinctions between 'social' and 'technical' elements (for example, Latour and Woolgar, 1979; Williams and Edge, 1996).

Research Approaches

The fifth paper in this volume is by Boland and Day (1989) on 'The Experience of Systems Design: a Hermeneutic of Organisational Action.' It offers a phenomenological account of designing an information system, using in-depth interviews to describe and interpret the experiences of being a systems analyst. The phenomenological approach is intended to reveal the meaning of the design experience, as expressed in the words and experiences of the designer. The hermeneutics of everyday experience produces interpretation as a moving, dialectical process. In order to capture this, the study covers one year in the working life of an analyst (Paula) and uses more than 30 intensive interviews (of between 2–4 hours duration) to step inside the process and reveal structures of meaning at work. The paper describes, in detail, the process of ongoing enquiry and reflection over time. This paper represents a radical departure from much of the mainstream literature of the period and, notably, it is of interest that it was published in the Scandinavian Journal of Management, as opposed to a more mainstream IS journal.

The following paper, 'Studying Information Technology in Organizations: Research Approaches and Assumptions', by Orlikowski and Baroudi (1991), draws on Chua's (1986) classic framework that outlines the philosophical assumptions and approaches that underpin the conduct of research; this is based upon the three epistemological perspectives of positivist, interpretivist and critical research. Their framework is based on the general categories of (i) beliefs about knowledge, (ii) beliefs about physical and social reality, and (iii) beliefs about the relationship between theory and practice. The thrust of their argument is to challenge the unitary view of IS research, which at the time was predominantly positivistic, certainly in the USA, although probably less so in parts of Europe. Their position is supported by evidence from a survey of IS research journals. They argued that much could be gained from the adoption of a plurality of perspectives, a position that was adopted a decade later by Mingers (see below).

In Orlikowski and Baroudi's (1991) survey, just over 3% of the articles were classified as interpretivist. In an attempt to encourage researchers to move beyond the single philosophical position that underlies much IS research, Walsham's (1995) paper on 'Interpretive Case Studies in IS Research: Nature and Method' outlines both the theoretical foundation and the practicality of carrying out interpretivist research, using a case study approach as illustration. While qualitative research
methods are not necessarily interpretivist (they depend upon the philosophical assumptions of the researcher, for example Yin’s (1994) text on case study methods is an example from the positivist perspective) nevertheless the case study approach remains the principal method for many interpretivist field researchers. Walsham’s paper, along with related publications (1993; 1995b) at the time represented a significant advance in the field and contributed substantially to the enhanced legitimacy of interpretivist research.

This was further endorsed by the publication from Klein and Myers (1999), whose paper ‘A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems’ set out to counteract some of the criticism (largely from positivist camps) that the quality of this type of research is difficult to assess. A number of methodological principles had been proposed for case study evaluation (e.g. Benbasat et al., 1987; Yin, 1994), and indeed had become a de facto standard in IS, yet these were based on the natural science model, offering criteria that were deemed inappropriate for interpretive research.

The next paper, by Shultze (2000), was selected as a way of illustrating how the various methodological debates within the IS field had progressed to the extent that papers of this calibre began to be published in what is often regarded by many as the field’s premier journal. Shultze in ‘A Confessional Account of an Ethnography about Knowledge Work’ offers an exploration of knowledge work in situ. What is of particular interest is her provision of much descriptive detail of the doing of ethnographic work. This ethnographical material is intertwined with autobiographical matters, offering a new genre of representation – confessional writing – that is both self-evaluating and self-reflexive.

Mingers (2001), in Chapter 10 of this volume, returns to the question posed by Orlikowski and Baroudi (1991) as to which research methods are appropriate for IS research. In the paper ‘Combining IS Research Methods: Towards a Pluralist Methodology’ he proposes a pluralist approach, whereby different methods are combined together, as opposed to an isolationist approach (see Burrell and Morgan, 1979) based on mutual exclusion and paradigm incommensurability. Mingers suggests that research methods can be detached from paradigms and linked according to the different dimensions of the study and their appropriateness to this. Two frameworks are suggested, which offer the construction of multi-method, multi-paradigmatic research design.

**Evaluating Research: Roles of the IT Artifact, Generalization and Critique**

Orlikowski and Iacono’s (2001) paper represents an interesting aspect of an ongoing debate regarding the core subject matter of the IS field. In their research commentary on ‘Desperately Seeking the IT’ in IT Research: A Call to Theorizing the IT Artifact’ they argue that all too often the technological is taken for granted, and as a consequence under-theorised. Referring back to the work of Kling (1987) and Markus and Robey (1988), they ask what has been done with the alternative conceptualisations of technology that these writers offered in the 1980s. Their survey of articles in the Journal Information Systems Research over the last decade reveals that few papers deeply consider the information technology artifact, preferring instead to focus on the context or the processing capabilities
of the technology. Indeed, they suggest that this occurs to such an extent that should the term 'IS' be replaced with something like 'HR', there would be little difference in the substance of the publication. They call for IS researchers to theorise specifically about the IT artifact and integrate these theorisations more closely into their research.

Progressing the debate on the evaluation of research, presented earlier by Hiroshim and Klein (1999), Lee and Baskerville's (2003) paper discussing ‘Generalizing Generalizability in Information Systems Research’ considers the generalizability of theory to different settings. While sampling-based generalizability is well accepted, it cannot necessarily be used as the norm, despite numerous attempts to do so within case-based IS research. Therefore, they offer a framework for classifying different forms of generalizability, enabling researchers to take advantage of additional and often more appropriate forms of theorisation, freeing them from the constraints and misuse of statistical-type generalisations.

Finally, we come to McGrath’s paper (2006) on “Doing Critical Research in Information Systems: a Case of Theory and Practice Not Informing Each Other”. In 1991, according to Orlikowski and Baroudi (1991), there was hardly any evidence of critical research being published in key IS journals. This situation is now changing, partly due to the pioneering work of researchers such as Lyttinen and Klein (1985), Lyttinen (1997) and Ngwenyama (1991). Although their work is primarily Habermasian in focus, nevertheless these researchers have paved the way for others to enter the field and publish more critically-oriented research. One recurring issue within this emerging area in that critical researchers are notably silent in their descriptions of research methodology and so McGrath’s paper, making reference to recent works by Ageron (2002) and Walshham (2001) poses the following questions: How is criticality achieved? Do we need to give attention to documenting our methodology? Is the methodology different for critical research (as compared to positivist or interpretivist research)? She cites both Ageron and Walsham as providing responses to the questions being raised.

**Conclusion**

The papers within this first collection of the Series speak to a number of audiences and we have aimed to compile a broad cross-section of papers that we consider influential, valuable and provocative. For researchers committed to studying the foundations, philosophies and research methods used in information systems, this book provides an overview of research from a variety of perspectives and across a range of topics and emerging themes. For those who wish to learn more about this area, this volume provides an accessible point of entry into a wide range of subjects so that it is possible to identify areas of interest that have personal appeal and pursue them further in the references listed by the advisory panel, presented in the appendix. For lecturers, it provides resources concerning the historical development of some of the key debates that have raged within IS research. For practitioners, the collection offers access to a range of perspectives and debates that have taken place in the field over a number of years, some of which may stand in contrast to the predominantly managerialist and technicist frameworks of understanding that are traditionally on offer. We hope that this volume contributes to the stimulation of further intellectual ferment and the emergence of an even
more diverse range of articles debating foundations, philosophy and research methods in information systems.

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Appendix: Additional Recommended Papers on Information Systems Infrastructure

This is the complete list of other papers considered as recommendable by the advisory panel for Volume One. These papers had to be excluded through lack of space. A criterion for suggesting which of the papers would be published in the six volumes and which would be cited in the following list was the following: The greater the circulation of the journal in which an article appears, the more available the journal is and hence the lower the need for inclusion in these volumes, a main purpose of which is to make our field's seminal papers accessible around the world. For instance, Harvard Business Review has a circulation of 350,000. Along with the fact that a particular HBR article is, say, 27 years old, such an article would be much less likely to be included as one of the published papers. Citation counts were also examined, but they did not turn out to be a helpful indicator, especially for recently published papers.


Harvey J. and Myers MD (1995), Scholarship and Practice: The Contribution of Ethnographic Methods to Bridging the Gap, Information Technology and People, 8, 3, pp. 13–27


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Notes

1. One issue that has been fiercely debated is that of ‘strong’ versus ‘weak’ constructivism, which later came to involve Kling, who was described as a weak constructivist (see McLoughlin (1997) for an overview of the debate between Woolgar and Geist (1997) on the one hand, and Kling (1992) on the other).