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The Use of History in IS Research: An Opportunity Missed?

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Introduction

History is more or less bunk. It's tradition. We don't want tradition. We want to live in the present, and the only history that is worth a tinker's damn is the history that we make today. Henry Ford's edict on history has, in a sense, become a cliché derided by some as the ignorant spoutings of a self-opinionated, but highly successful entrepreneur, and praised by others for its forthright condemnation of the way historians described the past. It is perhaps ironic that Henry Ford has himself become a historical icon, and that 'Fordism' attached as a label to the kind of industrial organisation he put into place and espoused.

Further study of Ford's attitude has revealed that his view of history is rather more nuanced than the newspaper interview that yielded the quotation suggests. What offended Henry Ford was the concentration of historians on the affairs of state, on the doings of Kings and Presidents, rather than on commercial life and, his particular interest, the evolution of economic activity such as manufacturing.

The second quotation can be heard every day as another disaster unfolds. A search in Google on the phrase 'Lessons will be learned' yielded 46,200,000 finds. Like 'history is bunk', the phrase has become a cliché based on the assumption that the next time a complex system is rolled out the solutions that might have avoided the first disaster will be valid in the new situation.

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Examples of failures, often in major projects, abound. These include Mitev's study of the French railway booking and reservation system SOCRATES (Mitev, 1996), Drummond's analysis of the failure of TAURUS, the London Stock Exchanges' ambitious IT project (Drummond, 1996), the recent Journal of Information Technology's special issue on the UK National Health Services National Programme for Information Technology (*Journal of Information Technology*, 2007) and the Denver Airport automated baggage handling case (De Neufville, 1994). And despite the analysis of past failings in academic journals, the incidence of failure shows little signs of diminishing.

Santayana's much-quoted aphorism 'Those who cannot remember the past are condemned to repeat it' first published in 1905 (republished Santayana, 2009) like the mantra 'we will learn the lessons', has some validity, but its underlying assumption that today's events are merely repetitions of the past will be questioned as will the assumption that we have the capacity and resources to actually learn from past experience.

In this paper, I will argue that the historiography of information systems (IS) is important for understanding IS and its evolution through time, and that understanding even the most transformative, revolutionary, innovations benefits from the study of the historical context. Henry Ford's viewpoint is too prevalent, and in my view damaging to IS research. A study and appreciation of history has a significant part to play in understanding the way information and communication technologies are transforming the world we live in. The argument will be supported by a number of examples.

The paper is set out as follows: Section 'Introduction' is followed by Section 'IS and History' – which notes the extent to which IS research is grounded in historical narrative and which suggests the various historical themes in which much of IS research is conducted. Section 'History, Historians and IS', reflects on aspects of historiography, distinguishing between the story of the past and the way historians interpret and manipulate that story. Section 'A digression on Lenses and Telescopes' defines Telescopes as a way for describing the many strands of IS research, which between them attempt to provide a comprehensive understanding of IS and what makes it a discipline in its own right. The final Section 'Learning and Understanding' is intended as a conclusion that reflects on some of the limits to our understanding and asks how the boundaries of the discipline are set and what aspects of IS are missing from our discourse. The appendix provides an example of the importance of understanding the context in which apparently new ideas are grounded and the pre-history from which the new ideas evolved.

IS and history

The part played by History in the study of IS is clear in the many research domains that are time-based and depend on the discovery of common patterns (Mason *et al.*, 1997a, b; Bannister, 2002). The empirical researcher from the positivistic perspective searches for patterns of activity and behaviour, which support or refute theory-based hypotheses. The interpretivist researcher infers patterns that can be used to build new theories, the grounded theory approach (Bryant and Charmaz, 2007), or patterns that support existing theoretical constructs. A good example of the latter is Drummond's use of escalation theory to explain the failure of the London Stock Exchange's TAURUS system (Drummond, 1996). Researchers coming from a critical theory perspective look for patterns of behaviour that support the critical view that explores, *inter alia,* power relationships and the way power has been used for the exploitation of those denied the power (Mitev and Howcroft, 2005).

The research domains include:

a. Research into Stages of Growth models that attempt to find some pattern in the development of IS at the enterprise level, the sector level or the universal level. The classic and most widely cited example is Nolan's paper in the Harvard Business Review in 1973 (Nolan, 1973). Nolan's model is based on an assumption that the path of development is primarily deterministic. Nolan elaborated his model on the basis of legitimate historical research involving the study of the computing budgets of a number of enterprises, and of their IS application portfolios. The consistency he appeared to find led him to hypothesize a regular pattern of development that would be universally applicable. Nevertheless, the original four stages of the model had to be modified to yield six stages.

   The model has subsequently been subjected to critical reviews such as that of King and Kraemer (1984). They note that the principal tenets of the model have not been independently validated, and suggest the reason lies in problems in the formulation of the model's logical and empirical structure.

   Despite, the criticism levelled at the Nolan Model, such models continue to proliferate. See, for example, the attempt to suggest a model of evolution for the adoption of knowledge management (KM) in the legal profession (Gottschalk, 2002). And the appeal of such models is clear. They appear to take the uncertainty out of the road ahead, and provide a guideline, from any position, on what steps to take next. Nevertheless,

although they rely on the accumulation of historical data, the approach is strictly ahistorical in that it follows a very narrow thread that does not permit the exploration of variables outside that thread.

b. The study of innovation diffusion in the context of IS is a major domain for IS research, which has yielded a large literature. Diffusion research sets out to discover the characteristics that determine the way an innovation – which can be an artefact, a process, or a system – becomes accepted, and used, and subsequently abandoned in favour of an alternative, perhaps newer artefact or process. In other words, it attempts to define the life cycle of inventions and innovations, usually in organisational settings. Once again, there is an underlying thrust to find deterministic models that enable us not only to understand the past, but also to model the future.

   This is recognised by Marchetti, a researcher at the International Institute for Applied Systems Analysis (1980). Marchetti examines long-term innovation and diffusion life cycles for a wide range of human endeavours, finds an underlying consistency rooted in social behaviour, giving an appearance of uniformity to the life cycles. Nevertheless, he allows free will a role in the unfolding of actual events. The extent to which the uniformity found by Marchetti and others is an illusion, which disappears as the focus on actual events sharpens, is still not fully answered.

   Much research in this domain is based, as is the work of Marchetti, on the collection of statistical data related to individual industrial sectors and demographic information. But other studies focus on the experience of individual organizations in the form of case studies, and attempt to derive generalizable explanations of the diffusion phenomenon from that experience. Swanson and Ramiller(1997) suggest an overtly historical approach with their notion of an 'organizing vision' rooted in the shared experiences of a community and lying behind the drive to adopt IS innovations.

   Williams and Pollock (2009), as a result of their study of the implementation of ERP systems, point out the limitations of the typical case study approach in that it focuses narrowly on a particular episode within an organisational setting. To properly understand the complexity of what happens and to be able to make useful generalisations, it is necessary to take a much broader view involving not only the episode under review, but also the whole history of the artefacts and system being studied. They advocate what they call a 'biographical' study of, in their case, the ERP package being implemented. Their approach can be regarded as bringing a proper historical perspective to IS research. However, it has to be noted that, typically, each

biography is unique; hence, they may help us to explain the past in relation to the artefact being studied, but their approach is limited in its ability to predict the future and to 'learn lessons'.

To extend our understanding, we may need to delve into the pre-history of the objects being studied. An example is the study of Decision Support pioneers by Daniel Power. Power asked a number of 'experts' questions about the origins of Decision Support Systems (DSS). The response from, for example, Frank Land (Appendix) suggests that the notions underlying modern DSS are rooted in age-old practices, and that an understanding of these practices can help in the design and implementation of IS systems such as DSS and Executive Information Systems (EIS).

Unfortunately, much current IS research neglects the prehistory and commences its analysis with the computer-based artefact or system, a tendency exacerbated by viewpoints that put prime focus in IS studies on the IT artefact exemplified by, for example, Benbesat and Zmud (2003).

The problems raised by the complexity of the situation in which events unfold might be explained by the following thought experiment:

Suppose we liken the introduction of an IS system (or change in system) to throwing a stone into a pond. We should be able to calculate the propagation of the ripples using laws derived from the study of Physics from some elementary knowledge about the stone and where it is being thrown. Now let us assume that, as in any real organisation, a number of events occur at more or less the same time. In our example, more than one stone differing in mass is thrown into the pond. Further, a passing truck sends a shower of stones into the pond. Now, the ripples from the various stones may combine or dissipate in an interference pattern. The path of the ripples becomes uncertain. The uncertainty is compounded if we bring in other factors such as a variable wind, and below the surface of the pond an unseen landscape with hillocks and valleys, which we might compare to tacit knowledge in the organisation.

The experiment reflects the complexity behind the introduction of new technology or systems. IS research is often grounded in an analysis based on something like the single stone event. A study of history would reveal the inherent uncertainty in attempting to predict outcomes and help to explain the lack of consistent results from IS empirical research.

A great deal of the research in this area is predicated on some kind of life cycle model, involving conception, birth, and finishing with

the demise of what had been an innovation. Examples much quoted include the end of the thermionic valve as a component of computers and its replacement by semi-conductors, leading to a major restructuring of not only computer possibilities, but also the whole of the electronic manufacturing sector. But a less noted phenomenon is the rebirth of an old apparently discarded innovation under a new name, (Land, 1996). Perhaps the rebirth phenomenon is more common in human activity systems then in physical artefacts. Thus, the ideas propagated by the early LEO pioneers (Simmons, 1962) were reborn as Business Process Re-engineering (BPR) by Hammer (Hammer and Champy, 2001), only for it to be whispered that BPR is already dead.

c. The study of IS success and failure has become an important theme in IS research. The majority of the hundreds of studies are based on essentially historical research. Failure studies include: Lyytinen and Hirschheim (1987), Drummond (1996), Glass(1998). Success stories include reports on the applications and organizations, which appear to have built successful systems (Copeland *et al.*, 1995; Mumford, 2003; Land, 2006). Most of these studies attempt an analysis, which aims to explain the reasons that led to the outcome and to generalize from that into prescriptions. A number of papers have examined the research methods that are likely to be appropriate for such research (Dalcher and Drevin, 2003). Most researchers favour some kind of case study research, as, for example, Sauer (1993).
d. Management of change studies are again by their nature based on research that is grounded in a study of historical events. This is another area that has a long research tradition and has built up substantial literature. Pettigrew (1990) who has devoted much of his life as an academic to analysing why and how organisations change through time has set out a reasoned set of prescriptions for a researcher working in this field, which could be termed historiography, though he himself does not use that term. Pettigrew stresses, *inter alia*, the importance of understanding both the organisational context in which change takes place and the changing context in which the organisation itself exists. Management of change studies are usually longitudinal in nature, and the researcher is frequently present over at least part of the period of study as an observer of what takes place. Bannister (2002) notes the difference between longitudinal research and historical research.
e. Studies that set out the historical development of IS within the arena of business and organisational practice and studies of the evolution of IS as an academic discipline. The former are often in the form

of historical narratives worshipping at the shrine of the pioneers, though some include analysis and attempt causal interpretations. Most of these studies concern the history of specific organisations; some concentrate on individual heroes. Examples of all of these include: Simmons (1962), Aris (2000), Land (2000), Baskerville (2003), Mason (2004), Porra *et al*. (2005). Research into the development of IS as an academic discipline was first published by Gary Dickson (1981). As Dickson's widely recognised historical treatment of the field, many studies of IS have tended to concentrate on the history of research perspectives and approaches either globally or in particular regions such as Australia or Europe (Khazanchi and Munkvold, 2000; Lyytinen and King, 2004 – a paper that has an excellent bibliography of relevant papers – Baskerville and Myers, 2002; Vessey *et al*., 2002; Clarke, 2006), though the questioning of the continued relevance of the discipline by Carr (2003) has led to a number of papers examining and justifying IS as a legitimate academic discipline. Examples include: King and Lyytinen (2004), Piccoli (2004), Tapscott (2004). Moschella usefully defines four overlapping 'waves of power' as characterising the evolution of IS over the past decades (1997).

A major attempt to set out the development of the discipline by the selection and republishing of its seminal papers and thus recording its cumulative tradition, is the publication by Sage of the six volume 'Major Currents in Information Systems' (Willcocks and Lee, 2008). The historical development is split into *Information Systems Infrastructure* (Howcroft and Land (2008), *Information Systems Development* (Avison and Baskerville, 2008), *Design Science Theories and Research Practices* (Hevner, 2008), *Management and Information Systems* (Lacity, 2008), *Social and Organizational Information Systems Research* (Liebenau and Mitev, 2008), and *Information Systems, Globalization and Developing Countries* (Avgerou, 2008). Given a limit of 15/16 papers for each section, some important papers were not selected. Nevertheless, the six volumes provide an excellent review of the historical development of the discipline.

History, historians and IS

Historiography can be described as the study of historical methods, and the differences in the approaches to the study of history and what is presented as the historical narrative. Bannister provides an interesting review of the Historiography in Information Systems Research (2002). Bannister notes that what constitutes the historical narrative has changed

with time. Namier (1971) taught that history was concerned with facts, as revealed by the study of, for example, exchequer rolls, while later historians concentrated more on interpretation (Collingwood, 1993).

It is important to distinguish between history and the historian – or the practice of history, historiography. History is the story of the past. That story is embodied in primary and secondary sources including archives such as repositories of, for example, exchequer rolls or clay tablets, memoirs and diaries, biographies, tracts and pamphlets, official reports and enquiries, plays, oral histories, artefacts including objects like Trajans column in Rome. Other secondary sources include accounts of history, written and verbal, and currently digitised, found in databases and data warehouses. Sometimes, it is far from clear whether the historical account is a primary or secondary source, and often it may have elements of both. What is clear is that no history is an unvarnished complete account of the past. Indeed, the study of history consists of making sense of the sources and attempting to fill in the numerous gaps in the historical record and excising parts that seem to the historian in question to be irrelevant or confusing, or sending the wrong (unwanted) message. The study of making sense – interpretation – of fragments is called hermeneutics. Each iteration of sense making – filling the gaps – yields more information, but also shows up anomalies in the interpretation. This requires a further attempt at sense making, involving the reinterpreting of earlier conclusions. A contemporary historian attempting to make sense of an earlier historian's interpretation of the past is engaged in the 'double hermeneutic' (Giddens, 1987), piling interpretation on interpretation and always at some remove from underlying history.

The work of all historians is instrumental – that is, it is done to serve some purpose. And that purpose is often hidden; indeed, it may be tacit in the sense that the historian is unaware that he or she is imparting a 'spin' on the facts revealed.

History is used to send all kind of messages. But the messages – the historical accounts – will be designed to persuade the recipient to think or act in a particular way. In normal discourse this is to be expected. Thus, it is not surprising that the French account of the 100-year war with England designed for French school children differs from that provided by English scholars for British school children. If there are lessons to be learned from the historical account they are different for French and British school children. Perhaps Henry Ford's stricture on history was based on his recognition that the problems lay, not with history, but with historians.[1]

We can see this at work in much IS research. Are the case studies of successful IS applications designed to reveal the truth, or is there a

subsidiary aim to persuade readers of the centrality of IS in providing competitive advantage? Other good examples are the case studies reporting on events, and drawing on some theory to help explain the events. But looking deeper, what is sometimes at work is the exact opposite. The case study report is designed tacitly to illuminate the theory, and to enable the reader to make sense of the theory. One possible example is the study by Walsham and his Ph.D. student of an IS application in India (Walsham and Han, 1991; Walsham and Han, 1992). The study used elements of Gidden's Structuration Theory to help understand the unfolding events in the case. But to an extent the case was used to help in an understanding of Structuration Theory.

One of the success factors stressed by the literature is leadership quality at the level of the Chief Information Officer and general management. Indeed, leadership has, from intuitive insights and from numerous research studies, been seen to play an important role in ensuring success. As Armstrong and Sambamurthy show in their empirical study of IS managers and general management, certain leadership qualities and practices can be associated with organisational assimilation of IT systems (1999). Assimilation, which is implicitly associated with success, '… requires championship and executive leadership. Senior leadership becomes critical for such championship'. But the research tends to be biased towards the implicit association of assimilation with success, in that it does not investigate the cases, reported in anecdotal evidence, in which apparently strong leadership with the desirable qualities identified by the researchers has led an organization to disaster (Baskerville and Land, 2004).

Mohr made the distinction between 'variance'-based research – the model of research that searches for associations between variables by means of statistical analysis of typically survey-based data – and 'process'-based research, which attempts to trace the unfolding events including the antecedents that led to the current state (Mohr, 1982). The 'process' model is grounded in historical research. Applying the model to IS research, Shaw and Jarvenpaa note the predominance of the 'variance' model and lament the relative paucity of 'process'-based research (1997). However, their study finds that many IS research projects are of a hybrid nature, combining some 'process' – history-based – elements with the 'variance'-based research, though even the hybrid studies tend to be dominated by the 'variance' approach.

IS researchers in their quest for explanations tend to look for dominant patterns as typified by the leadership research noted above. They then use the explanations to advise practitioners on how to do IS.

However, in concentrating on the central part of the distribution, they tend to neglect the outliers; and as Taleb (2007) has shown, the realisation of the improbable can have far more profound impacts than the realisation of the expected. This suggests that IS research, regardless of whether it has a 'variance' or a 'process'-based orientation, needs to go beyond the 'mean' in investigating the IS phenomenon.

A digression on lenses and telescopes

The discussion of appropriate methods in IS research frequently uses the word 'lenses' as a metaphor for the chosen research perspective or approach. The implication of the metaphor is that different lenses can study the phenomenon at different magnifications, thus providing options for selecting the degree of granularity to be observed. Of course, different degrees of granularity reveal different aspects of the phenomenon studied. But the desired level of granularity to be observed is only one of the many research perspectives advocated for IS research.

Investigating the IS phenomenon[2] involves understanding a multiplicity of disciplines and a multiplicity of perspectives coming from a number of epistemological stances. Hence, the alternative metaphor of 'telescope' might be a better way of characterising the deployment of multiple IS research perspectives and approaches. Astronomers use different telescopes to provide different degrees of magnification, as do lenses. But many more differences in the phenomenon studied are revealed by the use of different types of telescopes – optical telescopes, radio telescopes, spectroscopic telescopes – which break the received light into the spectrum – X-ray telescopes, telescopes that view the object in the infra red, and so on. In the same way, IS research trains different epistemological telescopes onto the subject of study, the IS phenomenon, highlighting different aspects of the phenomenon and helping to answer different research questions. But between them, the different telescopes build up a comprehensive picture of the phenomenon under scrutiny.

What does the historical IS telescope reveal? At one level of magnification, it reveals the broad flow of IS evolution, leading at one extreme from the clay tablets of Babylon to the internet and Web2. What the flow shows is the remarkable continuity in human activity from the earliest days of civilization to our current state. At the same time, it indicates the major stepping stones amounting to breaks in the continuity of gradual evolution, highlighting the innovations that have resulted in changes and even transformations in the behaviour of human activity

systems. It also reveals that the flow is cyclical with apparent repetitions of history, and that the direction is not always towards 'improvements'. It suggests that there has been a speeding up in the rate of change in the past 200 years and a further acceleration in the past decades, giving credence to the sociologist Zygmund Bauman's depiction of the state of today's society as 'liquid modernity' (Bauman, 2000). To paraphrase Bauman, the new condition is characterised by the flow of electronically mediated information. IT and IS play an important part in the speeding up and unfreezing of human activity systems. Nevertheless, through our telescopic view of change over the aeons, 'viscous modernity' might have been a better description.

A higher magnification with a narrower focus, typical of a case study, reveals more detail. If the telescope is used by a business school Management Information Systems researcher, the focus will characteristically be on IS in an enterprise setting, and issues such as competitiveness, strategy and economic evaluation (for example, Clemons and Row, 1991). If the perspective is that of a sociotechnical researcher, the focus will involve individual and organizational values and ethics (for example, Land *et al.*, 1983a,b), considerations that are less likely to be of concern to the business school researcher. A researcher coming from a perspective rooted in critical theory will focus on issues such as the impact of IS on the human condition, empowerment and exploitation, gender roles and organisational politics (for example, Ngwenyama, 1991). A researcher working in the IS-related topic of human–computer interaction is mainly concerned with the period the human user is working at the keyboard (or touch screen mobile), and the research may focus on tracing the user's eye movements during the time of interaction.

In a strange way, the IS telescope has a number of filters that inhibit the full examination of the phenomenon to be studied. Most theories providing explanations of IS phenomena have an underlying, and sometimes explicit, assumption that human behaviour, in the context of IS, is essentially rational (Avgerou and McGrath, 2007). Only rarely is the underlying rationality of the IS actor questioned, though, as Baskerville and Land noted, the apparently rational actions can have adverse outcomes (2004). One explicit exception is the notion of Drummond of an Icarus factor – a tendency for the IS strategist to have a level of ambition beyond the capability of the organisation to achieve (Drummond, 2008).

As in most human endeavours, in IS too, ignorance and incompetence, and the employment of copy-cat strategies play a significant role

in determining outcomes. Yet none of these figure much as research questions or in explanatory models of even research topics such as the study of IS failures. Again in the real-world serendipity, the chance association of information may play a key role in the way events unfold. But few explanatory models or research questions address the role of serendipity in the history of the phenomenon being studied. Claudio Ciborra is one of the few IS scholars who captured the inherent uncertainty and the role played by serendipity and tinkering in his notion of *bricolage* (Ciborra, 1998). Would researchers schooled in historical research methods overcome the apparent taboos in what constitutes legitimate IS research and explanatory models?

In a world increasingly concerned about the growing incidence of cyber-crime and the use of Information and Communications Technology for anti-social purposes, or for use in warfare, there is a lack of history-based research of the 'biography' or 'ecology' underlying this trend in IS practice. Most research is focused on the way individuals, organisations and society can defend itself against attack. Yet without the understanding coming from studies exploring the history of, for example, cyber-crime, including its prehistory, the defensive prescriptions are almost bound to be one step behind the innovations stemming from the 'dark' elements in our society. Indeed, anecdotal evidence suggests that it takes about 9 months for a bank to learn how to plug the leaks following the latest cybercrime innovation. Criminology should, perhaps, be cited as one of the IS reference disciplines.

Learning and understanding

Does history have a role in throwing light on the many aspects of the IS phenomenon? History is of little use, as Henry Ford surmised, in comprehending all of the impacts of the here and now. For the IS scholar to predict how the latest advances in net and mobile technologies are going to impact society, the study of history may only be of a limited value. Nevertheless, could Henry Ford have developed his ideas about mass production without some understanding of the way manufacturing industry had developed in the late 18th and 19th century? Today's innovator builds on earlier works. Thus, Babbage got his ideas for the design of an automatic computer from visiting France and seeing the way a French mathematician, Gaspard de Prony, had organised the manual work of producing mathematical tables (Hyman, 1985).

KM is a relatively new field for IS study and discourse. It is based on the premise that ICT has transformed society to one based on

knowledge – the 'knowledge society'. Knowledge driven and supported by Information Technology and embedded in IS will provide – taking the business school model of what matters – higher levels of efficiency and enhanced competitive advantage. Taking a more critical view of what matters, it is accepted that knowledge confers power on its owners – a truth proclaimed by Francis Bacon, in the 17th century. Acton, two centuries later, noted that power corrupts. A study of history underlines Acton's edict. Power legitimates what is understood to be knowledge in what Foucault describes as *regimes of truth* (Foucault, 1980, 1982; Avgerou and McGrath, 2007). The power of the Catholic Church with its God-granted 'knowledge' that the earth was the centre of the Universe, overruled the knowledge of Galileo derived from his observations with a telescope, and it was Galileo who was forced to recant (Land, 2009).

The study of KM provides another illustration of the failure of many IS (or in this case KM) researchers to use a more historical approach in their scholarship. A more historical approach would reveal that KM has an ancient lineage even if the term knowledge management was not used. The IS or KM practitioner has much to learn from, for example, Machiavelli and in modern as well as ancient times from the world of politics. But the business world equally has a long-standing record of KM (Land, 2009), though knowledge manipulation might be a more apposite name. It can be found, for example, in its more benign form in what today is termed customer relations management, and includes the KM processes of advertising and the public relations function. In its less benign form, it can be found in the business frauds typified by ENRON and the Ponzi schemes of Madoff. In some ways, KM can be seen at its most effective in the darker applications of its widely lauded processes.

Perhaps the 'productivity paradox' of earlier decades has now been replaced by the 'knowledge paradox'. Those who see Information Technology and IS as ushering in the age of universally shared knowledge, where knowledge is assumed to equate to the truth, might note the statistics of beliefs held by citizens worldwide. Believers in Intelligent Design and Creationism outnumber those who regard Evolution as providing an explanation of the diversity of species. The historian of the 22nd century, looking back at the credit crisis of 2007/2008 and its consequences, may wonder how in a 'knowledge society' replete with the highest technology such events could have caught the world unawares. The technology that the optimists regard as the gateway to the Knowledge Society has equally provided the means for the spreading of

un-knowledge. The student of history would, perhaps, not be surprised by that trend.

History provides a richness in understanding which its neglect denies the IS researcher a vision of the whole story. And it is only with this understanding that we can learn lessons from past and current events. Searching through the record of IS research, we might be disappointed at the lack of explicit recognition of historiography as providing an important component for IS studies. Nevertheless, the topic is not entirely neglected. Indeed, as the citations in this paper indicate, there is a rich vein of research that uses some kind of historical method, and a small number including (Avgerou and McGrath, 2007) that would satisfy both the IS scholar and the critical historian. In order to grow that number and for the discipline to benefit from its insights, the relevance of history to the study of IS must be part of any IS curriculum and must be included in the training of our future researchers, today's cadre of Ph.D. students.

Notes

1. An interesting critique of historians and the value of using history as the basis for 'natural experiments' is provided by the essay *All the world's is a lab* (Diamond and Robinson, 2010).
2. The phrase 'IS Phenomenon' is used in this essay as an umbrella term denoting the whole range of topics concerned with IS which interest the IS scholar.

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Appendix

Frank Land responded by e-mail to six questions from Dan Power, DSSResources.com editor, about his past involvement with computerized decision support systems (DSS) and his current perspective on the issues that need to be addressed.

Q1: How did you get interested in computerized decision support?
Land's Response: Decision Support has an ancient history. Decision makers have always surrounded themselves with specialist staff to provide information as a crucial aid to decision making. In the army, for example, the decision support function was provided by the adjutant.

We can perhaps distinguish two kinds of DSS which we might term *Traditional* and *Modern*. Is there also a Post-Modern type?

Traditional DSS are the historic kind, though today still as important as ever – the decision makers being supported by a range of formal and often informal information and knowledge providers. These may be people, like the adjutant or accountant with formal support roles or informal like the business rival over a game of golf. Or they can be artefacts, formal, like an official report requested by the decision makers, or informal like a newspaper report seen by the decision maker at just the right moment. As is often the case serendipity plays an important role in reaching decisions.

Modern DSS are largely reliant on formal models whose expression and evaluation depends on computer technology. They rely to a considerable extent on mathematical modelling and simulation techniques. Many of the ideas stem from the decision sciences and operational research and were first developed in the run-up to the Second World War as part of the war effort.

My own involvement arose out of my first employment with J.Lyons & Co. in 1952.

J.Lyons & Co, were the largest and best organised company in the UK food trade – restaurants and hotels, food manufacturing including bakery products, confectionary, tea and coffee, and specialist caterers for events such as the annual Wimbledon Tennis Tournament, and the Royal Garden Parties, had established a Systems Research Office in the early 1930s.

In Lyons the management structure was, in a sense, based on decision support. Each functional unit – for example, the bread and cake bakery – had at its head a member of the Board. A liaison unit served that function providing detailed information on each days trading via a set of cost accounts. The head of each

unit was directly responsible to the Board member. He/she were responsible for reporting variances and providing explanations of any variances discovered from the cost accounts to the manager in whose area of responsibility the variance occurred. In addition, the head of each unit was required to work out answers to questions from senior managers of the functional area served of a 'what if' nature. For example, what would be the impact of changing the production mix to increase the production of swiss rolls, or to replace raw material 'a' by raw material 'b'. In practice, they spent much of their time working on these problems and providing the required information for the decision makers. The kind of questions might be of a local operational nature or much more concerned with matters relating to company strategy.

The system had been designed and implemented by one of the true pioneers of Decision Support – JRM Simmons, a Director of J. Lyons, recruited by the company in the early 1920s directly from Cambridge University where he had graduated as the top mathematician of his year. It was John Simmons who had persuaded the Lyons Board to build their own digital computer, Lyons Electronic Office (LEO) to support the business in 1947. His book 'LEO and the Managers (Simmons, 1962) sets out his ideas and shows their development in the computer age.

Thus Lyons had, before the advent of computers, a well developed and effective decision support mechanism though Simmons recognised that computers would play a crucial role in making an effective system even more effective.

Another pioneer was David Caminer who had joined Lyons as a management trainee in the 1930s. On returning from war service David became manager of the Systems Research Office established by Simmons in 1932. David was made head of systems and programming when the decision to build the LEO computer was made. He played a crucial role in the design of most of the early computer applications for the Lyons business. It was perhaps natural for him to see the role of computers at Lyons as supporting the work of the liaison staff. Hence, nearly all early applications dating back to the early 1950s and subsequently incorporated decision support elements. There were numerous examples ranging from the system which helped the managers of the chain of Lyons tea shops in placing their daily orders on the factories and suppliers, to the Bakery Rounds application which printed an order form for each customer the bakery salesman called on, listing the items ordered in previous calls, as a reminder of that customers preferences.

I joined the Lyons computer team in 1953. After graduating from the London School of Economics (LSE) my first job in industry in 1952 was with Lyons working in one of the liaison units described above. As a result I absorbed the Lyons way of working and the way they had developed an organisation capable of supporting management in both its strategic and day-to-day operational decision making. When I became part of the Lyons computer team in 1953 these ideas were already deeply ingrained in my thinking.

Q2: What do you consider your major contribution to helping support decision makers using computers? Why?

Land's Response: As part of the LEO team at Lyons I was responsible for the implementation of a number of computer based applications, at first exclusively for Lyons, and later, when LEO became a subsidiary manufacturing and selling

the LEO range of computers, for a number of industrial clients. The applications included a system for the ice cream business, which advised ice cream retailers how to fill their cabinets based on weather forecasts and the systems knowledge of each customer's ice cream sales history. This system was devised with the help of the Lyons Operational Research team and, looking at it in retrospect, was a step from Traditional DSS to Modern DSS. Another system I was responsible for implementing was the Tea Blending Programme, which supported the tea mangers in determining the best mix of blends to schedule each week based on tea prices and forecast demand. The system was in use, I believe for nearly 30 years.

Later (1967), I was recruited by the LSE to set up teaching and research in systems analysis. About 1970/71 the UK National Computing Centre set up a research project into evaluating the costs and benefits of computer-based information systems. Three of the researchers, Enid Mumford (Manchester Business School), John Hawgood (Durham University) and I (LSE) became interested in developing a tool which could be used by managers to choose between alternative views of what systems requirements really were and alternative methods of meeting the requirements. We developed a Decision Support System called BASYC based on the notions of multi-objective, multi-criteria decision making to be used for that purpose. An important insight gained from experiments with our system with savings banks was that the system enabled a group of decision makers to thoroughly explore the decision space and in doing so to surface often hidden assumptions. The process involved in using the DSS was as important as the numbers produced by the DSS (Land, 1975; Hawgood and Land, 1977).

I subsequently became interested in Executive Information Systems (EIS) and whilst at the London Business School developed an executive course in which EIS was demonstrated with course members role playing senior executives faced with choices on which direction to take.

Q3: What were your motivations for working in this area?
Land's Response: Two archetypical positions had emerged with the growing power of computers and management science. The first, positivistic in its philosophy, has a strong belief in the power of science to model economic and business behaviour. Those who followed this line believed that decision making was best taken out of the hands of fallible human actors and computer armed with management models were the appropriate tools for this. In the 1950s, for example, Bob Deem, a management scientist working for BP, persuaded the company to let him develop a comprehensive computer system which would automate the scheduling of refinery production. Despite the ultimate failure of the system the underlying belief still has wide credence.

The second archetype has its origin in the social sciences. Amongst its tenets is the conviction that the behaviour of a system involving human actors is non-deterministic and emergent. Further, it is argued that the success of such systems requires the active engagement of its stake-holders. This would enable the Sociotechnical system to capture their knowledge, lead to further learning and provide motivation. Hence the role of the computer is to act as an assistant to, rather than as a replacement, of the human participant.

My interest was not in DSS *per se*, but in developing a repertoire of approaches and tools fitting in with my interest in a Sociotechnical view of Information

Systems. DSS and in particular GDSS provided a mechanism for utilising the Sociotechnical precepts.

Q4: Who were your important collaborators and what was their contribution?
Land's Response: Whilst at Lyons and LEO the main collaborators where the managers of the functional units – such as the managers of the tea factory and, of course, my seniors and in particular David Caminer.

My move from industry back to the LSE led to a much greater study of the systems literature. I was influences by Steven Alter's book on DSS which gave a name to some of the ideas I had carried tacitly from my days with LEO, and enabled me to articulate them more clearly.

But the greatest influence was my collaboration with Enid Mumford and John Hawgood. This led directly to our work with the savings bank. More importantly it helped me to find a rationale for the views I had adopted intuitively from my 16 years working with LEO.

My interest in evaluation, fired by the project noted above, was continued later working with David Target (London Business School and Imperial College, London)) and Barbara Farbey (LSE and University College, London). The partnership developed a real synergy resulting in a book and a number of papers based on our joint research with industrial partners.

Another important influence was (and is) Professor Lawrence Phillips Visiting Professor of Decision Science at the LSE (see http://www.lawrencephillips.net/). Larry is another pioneer in this area. He introduced the 'Pod' an environment for group decision making using a variety of aids to help arrive at difficult decisions in situations where radically different solutions are initially advocated. He has repeatedly demonstrated the power of his approach.

But it is impossible to list all the people with whom I collaborated or who contributed to my understanding and learning. Sometimes a conversation over coffee with a colleague was as influential as reading a paper or a book.

Q5: What are your major conclusions from your experiences with computerized decision support?
Land's Response: The best DSS are those which provide clear explanations of the rationale behind the alternatives offered up for consideration and permit the decision makers to explore the decision space and to bring to the surface underlying assumptions and hidden conflicts. But to make the process work it needs a facilitator with an understanding of group behaviour as well as of the way the DSS is constructed.

Without the assistance of a facilitator Managers sometimes find it difficult to follow the underlying logic of the DSS leading either to the dismissal of the DSS or to the blind acceptance of the recommendations without a full understanding of the implications of the choices made. However, at their best, when designed jointly with the decision makers, they can be highly successful.

A DSS which is simply parachuted into the decision situation has little chance of being adopted. Ideally the DSS is the outcome of collaboration between the decision makers and systems designers. The way the DSS is deployed is highly dependent on the working style of individual or group decision makers. The point is illustrated in the 1986 Ph.D. thesis of Richard Baskerville when my student at the LSE. The DSS was designed to support the activities of the Admiral of

the US Navy in charge of its London Office. The very successful system designed to suit the officer in charge was sidelined when he was replaced by an officer with a very different working style (Baskerville and Land, 2004).

Q6: What are the issues associated with decision support that we still need to address? Land's Response: Note the importance of keeping the logic in line with changing conditions in a turbulent world. Too often decision makers, not fully understanding the underlying logic, rely on a model embedded in the DSS which has ceased to reflect the changed world. Designers, on the other hand, often do not ensure the mechanisms are provided for the rapid and easy updating of the models underlying the DSS.

The importance of the informal systems which run though most organisations. These often are more information rich than formal systems, which are restricted in the information they can gather. The importance of informal systems and their role in decision making is often neglected by systems designers.

However, developments in the use of the internet such as Web 2.0 and the ideas behind the open source movement are permitting the informal to infiltrate computer-based systems.

Perhaps most importantly we need to further improve our understanding of how decisions are made and the role played by non-instrumental issues such 'office' politics, human relations and intelligence.

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